

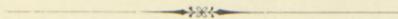
DET KONGELIGE DANSKE
VIDENSKABERNES SELSKABS SKRIFTER

NIENDE RÆKKE

NATURVIDENSKABELIG OG MATHEMATISK AFDELING

TREDIE BIND

MED 1 KORT OG 10 TAVLER



KØBENHAVN

HOVEDKOMMISSIONÆR: LEVIN & MUNKSGAARD

BIANCO LUNOS BOGTRYKKERI A/S

1931—32

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THE DISTRIBUTION WITHIN DENMARK OF THE HIGHER PLANTS

RESULTS OF THE
TOPOGRAPHIC-BOTANICAL INVESTIGATION

I. A BRIEF HISTORICAL
SURVEY OF THE INVESTIGATION

WITH ONE PLATE

BY

C. H. OSTENFELD

D. KGL. DANSKE VIDENSK. SELSK. SKRIFTER, NATURVIDENSK. OG MATHEM. AFD., 9. RÆKKE, III. 1

KØBENHAVN

HOVEDKOMMISSIONÆR: ANDR. FRED. HØST & SØN, KGL. HOF-BOGHANDEL

BIANCO LUNOS BOGTRYKKERI A/S

1931

In 1904 the then existing "Botaniske Forening i Köbenhavn" (the later "Dansk Botanisk Forening") commenced a detailed investigation of the distribution of Denmark's higher plants within the boundaries of the country. Truly, even before that time we had a fair knowledge of the distribution of the various species, but still there were large tracts of the country, especially of Jutland, which highly needed a closer investigation in this respect. The plan of investigation, which had been elaborated on the initiative of the author of this account, was submitted at a general meeting by the committee of the society, and was accepted at a subsequent extraordinary general meeting after some discussion, more particularly as to the suitability of extending the investigation to the lower plants, but also in some degree as to how much ecology the investigation was to include. As the latter was in great part to be based on the observations of mere amateur botanists, the committee insisted that the investigation should be as simple as possible; consequently it was proposed that it should only be floristic and not ecological, and that it should only comprise flowering plants (and vascular cryptogams), but not the lower plants. When put to the vote this view proved absolutely prevalent, and the plan of investigation acquired the form set forth in the *Botanisk Tidsskrift* 26. Bd. pp. XXVI—XXX 1904.¹⁾

Attention shall here be called to certain points of this programme. It was proposed that the investigation should only comprise the so-called higher plants, and should be made by botanists and persons interested in botany all over the country; that the country should be divided into a number of areas of about equal size; these so-called "districts" were to number 47. As regards the smaller islands, the boundaries between the districts were to be formed by the sea or sounds, while for the larger islands they were to be coincident with the boundaries of "Herreder"²⁾, counties, parishes, and, more rarely, with streams and railroads, the principle of utilising the boundaries most easily accessible to the local investigators having everywhere been applied. On a map deposited among the archives of the investigation the boundaries have been exactly drawn, and they are further stated in the description of the districts that accompanies the programme. The purpose of dividing the country into

¹⁾ *Botan. Tidsskr.* Bd. 26. 1, 1904 pp. XXVI. Topografisk botanisk Undersögelse af Danmark iværksat af den botaniske Forening i Köbenhavn.

²⁾ Administrative areas comprising several parishes.

districts was to get a means by which to collect the many notes into definite groups, and thus make them more easily available. Corresponding divisions have been established in other countries where similar investigations have been made, e. g. in Finland, Great Britain and Ireland, certain parts of Germany, etc.

The investigator undertakes to procure a list of the species of plants occurring within his district, or in certain parts of it, and when he thinks his list is as complete as he is able to make it, he will send it to the leaders of the investigation; these leaders insert the information in a large card-catalogue, in which each species has two or three pages (folio) divided into 47 columns corresponding to the 47 districts. When in 1920 northern South-Jutland was restored to Denmark, the investigation was extended to this part also, which was divided into six districts. Thus the number of districts was increased to 53, and as moreover it proved more convenient in the course of the investigations to divide some of the largest districts into two, the number was increased to nearly 60. (Pl. I).

In addition to the large card-catalogue, consisting of 12 fairly thick folio volumes, skeleton maps were prepared, on which the contours of the country and the boundaries of the districts were marked, and which were intended to be filled in during the working up of the material.

Lists of the species the distribution of which it was especially desirable to trace, were then sent to those who offered to join in the investigation, together with a sample showing how to fill out the printed forms that were distributed, particularly during the first period of the investigation. A printed list of all the higher plants in Denmark with their principal synonyms,¹⁾ which could be obtained very cheap, was later added, and a couple of times in the course of the investigation special inquiry forms were sent out, thus relating partly to anemones and pasque-flowers, partly to trees and shrubs, the latter forms to the owners or keepers of almost all Danish forests.

To obtain greater accuracy in the determination of the species, the participants in the work were requested to send in for determination to the Botanical Museum those species as to which they were in doubt, and this request was largely complied with, so that the Danish herbarium of the Museum was greatly increased.

The programme was sent out in the spring of 1904, and at once met with exceptional sympathy, so that the first annual report, which was submitted at the general meeting of the Botanical Society in February, 1905, could enumerate 116 investigators, more than half of whom were teachers in country places, whereas professional botanists and members of the Society had kept aloof, only 27 of the investigators being members of the Society. Later on this state of things was, however, considerably altered.

After issuing the programme for the investigation, the Botanical Society had

¹⁾ MORTENSEN, M. L. og OSTENFELD, C. H. Alfabetisk Fortegnelse over Danmarks Karplanter med Synonymer. Trykt som Manuskript. København 1905. 96 pp.

appointed a "Committee" to take charge of the investigation, which Committee, being permanent during the investigation and the working out of its results, was not to change its composition more than absolutely necessary. The Committee was formed of mag. sc. A. MENTZ, stud. mag. M. L. MORTENSEN, and the author of the present article, with the latter as president and M. L. MORTENSEN as secretary.

In the first few years all the work of the investigation was performed gratuitously, but in 1912 the Society succeeded in obtaining a state grant, which made it possible to work in those tracts where few or no voluntary investigators had offered their services, as also to commence the registration of the numerous lists sent in during the past years, and finally to insert in the card-catalogue all the information obtained from the Danish herbarium of the Botanical Museum as well as the immense number of specific statements which had in the course of time been published in the *Botanisk Tidsskrift* or elsewhere. Obviously it could not be expected that all this work should be performed without some remuneration. The state grant amounted to the considerable sum of 26,000 Kr., apportioned in two triennial and two biennial grants, 9,000 Kr. of which were granted for investigations in the recovered southern part of Jutland, as the investigation in this part of the country had to be made exclusively by investigators sent out specially for the purpose; the direct expenditure on this count was more than 4000 Kr.

On December 3rd, 1911, the energetic and assiduous secretary of the Committee, mag. sc. M. L. MORTENSEN died. The Committee thus lost one of its workers, and as Dr. phil. A. MENTZ now lived at Viborg, only the president remained. To escape from this untenable state of affairs, a new committee was appointed, which, apart from the president, who remained the same, consisted of Professor in the Royal Agricultural College A. OPPERMANN, Assistant Keeper of the Botanical Museum Dr. OVE PAULSEN, and Professor in the University C. RAUNKIÆR, which members have retained their place on the committee up to the present day. In 1927 Professor in the Royal Agricultural College Dr. A. MENTZ and Dr. KNUD JESSEN were further appointed members of the Committee; the latter has acted as secretary for the Committee since 1912.

The progress of the investigation, more particularly the names of the investigators, the lists received from the various districts, etc., have been recorded in a series of brief reports, nineteen in all, all of which have been published in the *Botanisk Tidsskrift* from volume 26 to and including volume 38¹⁾, and in 1926 KNUD

¹⁾ *Botan. Tidsskr.* Bd. **26**. 3. 1905. 1. Beretning for 1904 med Lister over Deltagere pp. LXXVI—LXXX. Bd. **27**. 2. 1906. 2. Beretning (for 1905) med ny Liste over Deltagere pp. XLIV—XLIX. Bd. **28**. 1. 1907. 3. Beretn. (for 1906) med ny Liste pp. VII—IX. 4. Beretn. (for 1907) *Ibid.* 3. 1908. pp. XLI—XLII. Bd. **29**. 1. 1908. 5. Beretn. pp. 84—90. Liste over Distrikterne og deres Undersøgelse. *Ibid.* 2. 1909. 6. Beretn. (for 1908) pp. 194—195. Bd. **30**. 2. 1910. 7. Beretn. (for 1909) pp. 165—166. Bd. **31**. 2. 1911. 8. Beretn. (for 1910) pp. 153—156. Bd. **33**. 1. 1912. 9. Beretn. (for 1911) pp. 61—63. *Ibid.* 2. 1913. 10. Beretn. (for 1912) pp. 159—160. Bd. **34**. 2. (1915). 11. Beretn. (for 1913—14) pp. 71—78 med Oversigt over Undersøgelsen i de enkelte Distrikter. *Ibid.* 5. 1916. 12. Beretn. (for 1915) pp. 249—250. Bd. **36**. 1. 1917. 13. Beretn. (for 1916) pp. 34—35. *Ibid.* 3. 1918. 14. Beretn. (for 1917) pp. 184—187. *Ibid.* 5.

JESSEN worked out a survey of the distribution of the vascular plants in Denmark based upon the material of the Topografic-Botanical Investigation, containing also a description of the boundaries of the districts and mentioning the investigators of each district¹⁾; cfr. p. 9.

At the close of the investigation the Committee has in its possession:

1) the large card-catalogue, in which have been inserted for each species within each district a) the localities from which specimens are kept in the collection of the Botanical Museum, b) the localities based on the lists received, and c) the localities based on the published information — each of these three categories being marked in its special colour ink.

2) The numerous original lists from the investigators.

3) A card-index containing for each species all the localities cited in the literature and mentioned under c), and containing the titles of all the treatises from which the localities have been quoted.

4) The maps on which the distribution of the species are to be inserted as the working out of the material proceeds.

All this very valuable original material has, after the use, been presented to the Danish Collection of the Botanical Museum, which in return will undertake to bring the list of localities mentioned under a) up to date.

It is a matter of course that during the investigation, carried on now for nearly 25 years, several applications have been made to the Committee for permission to utilise parts of the results of the investigation, and such requests have, as a rule, been complied with. This has, of course, especially been the case with requests from this country, but also from our neighbouring country, Sweden, we have received and replied to such inquiries. This is e. g. the case with some few species studied by the late Professor GUNNAR ANDERSSON, with several aquatic plants studied by Professor G. SAMUELSSON at the "Riksmuseet", and with the very brief statements concerning Denmark appearing in the "Skandinaviens Flora", now in course of publication, by OTTO R. HOLMBERG.

Further, the State Experimental Station for Forestry has repeatedly made use of our material; this applies both to the leader, Professor, Dr. A. OPPERMANN, and the laboratory assistant Dr. C. H. BORNEBUSCH. Finally, the present author has used the material, thus in 1911 for a paper on the Danish species of anemones and pasque-flowers, published in the commemorative publication in honour of Professor EUG. WARMING,²⁾ and which was intended to serve as a preliminary paradigm of

1919. 15. Beretn. (for 1918) pp. 321—322. Bd. 37. 1—2. 1920. 16. Beretn. (for 1919) pp. 80—81. Ibid. 5. 1922. 17. Beretn. (for 1920—21) pp. 431—438. Bd. 38. 2. 1923. 18. Beretn. (for 1922) pp. 145—146. Ibid. 3. 1924. pp. 183—186 med Slutord.

¹⁾ JESSEN, KNUD. Oversigt over Karplanternes Udbredelse i Danmark. Udarbejdet paa Grundlag af den topografisk-botaniske Undersøgelses Materiale. Med et Forord af Kommitéen for den topografisk-botaniske Undersøgelse af Danmark. Botan. Tidsskr. Bd. 39, 1926, pp. 137—210, 1 Kort.

²⁾ OSTENFELD, C. H.: Anemone- og Kobjælde-Arternes Udbredelse i Danmark, pp. 241—263. 1 Fig. og 2 Kort. Biologiske Arbejder tilegnede Eug. Warming, 3. Nov. 1911. København 1911.

what the investigation might bring to light. To make this paper as complete as possible even at that early stage of the investigation, a great number of post-cards were sent out, asking various questions which were to be answered.

After the many inquiry forms concerning the occurrence of our trees and shrubs had been sent out, and several replies had been received, I worked out two treatises, one on our elm-trees and the other on our species of lime-trees, both of which were published in the Dansk Skovforenings Tidsskrift, and based, at any rate partially, on the results of the Topographic-Botanical Investigation.¹⁾

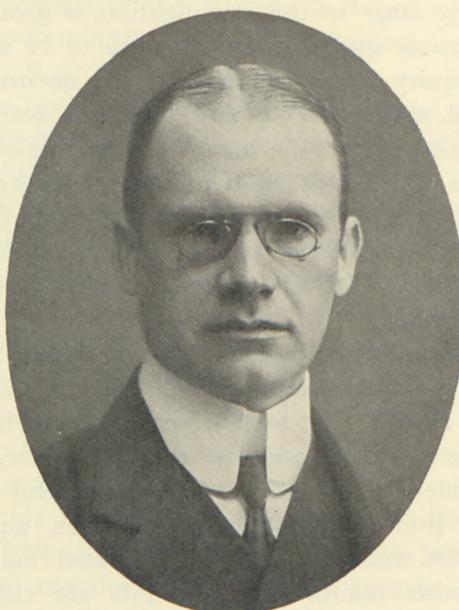
In Dr. KNUD JESSEN's and cand. pharm. J. LIND's comprehensive work, *Det danske Markudkrudts Historie*, 1923,²⁾ diligent use has been made of the data procured by the investigation.

Now, however, the actual working out of the very large material is approaching, for which purpose some aid has been obtained from the Carlsberg Foundation, and this work will naturally extend over several years. It has been planned to publish the treatises at indefinite intervals and in no fixed order, all the more so since some of the papers are intended to deal with a systematical group (family or order), others with a biological group (e. g. trees and shrubs, aquatic plants etc.). It is, however, desirable that the works should be elaborated mainly on the same lines. First the Latin and Danish names of the plants are stated, although it is not intended to enter into a detailed explanation of synonyms and popular names. A more summary view of the distribution in foreign countries is then given, and finally follows the main point, i. e. a record of the distribution of the species within this country. This record is to be rather detailed and, where the distribution presents points of interest, to be accompanied by a map. In cases where probable reasons for the occurrence can be given (e. g. as regards seaside plants, heath plants, calcicolous plants, etc.), these are to be stated, and further, where practicable, a statement as to the prehistoric occurrence of the species in this country and the adjacent countries, based on finds of fossils, is to be added. This work requires an extensive knowledge of the literature, more especially of the floristic literature of the neighbouring countries. Finally, various biological data and remarks concerning the variability of the species and the occurrence and distribution of the varieties will be added.

¹⁾ OSTENFELD, C. H.: *Bemærkninger om danske Træers og Buskes Systematik og Udbredelse*. I. Vore Ælme-Årter. Dansk Skovforenings Tidsskrift 1918, pp. 421 el. fl.

Ibid. II. Vore Lindearter, 1920, pp. 164—181, med et Kort.

²⁾ JESSEN, KNUD og LIND, JENS: *Det danske Markudkrudts Historie*. Vidensk. Selsk. naturh. og mathem. Afd. 8. Række VIII, 1922—23.



1909

C.H. Ostenfeld.

After this "Historical Survey of the Investigation" had been sent to the press, Professor C. H. OSTENFELD has died. For the work at publication of the material of the Topographic-Botanical Investigation his death means an irreparable loss. It was on the initiative of Professor OSTENFELD that the Topographic-Botanical Investigation was started, and he always took the greatest interest in it. He has done an exceedingly great amount of work for the investigation, particularly during the first years, not only in the planning of the whole investigation, but also in the arrangement of the material sent in, the identification of the plants received, replying to inquiries, etc. Even if during the latest years he did not participate in the daily work, he was to the last the leader in the arrangement of all essential matters. And during the publication now commenced of the material of the Topographic-Botanical Investigation his deep insight into all questions relative to the Danish flora will be painfully missed.

The Committee of the Topographic-Botanical Investigation.

APPENDIX

List of the 57 Topographical Districts and of the Botanical Investigators of each District.¹⁾)

(Cfr. Plate I).

As the basis for this division into districts has been employd the latest edition of MANSA's map of Denmark (scale 1:160.000 (Bornholm 1:80.000)). For practical reasons the parochial divisions have as a rule been employed; where the civic boundaries or other boundary lines have exceptionally been used, this is expressly stated.

The condition of the soil within the various districts has been briefly characterised, i. e. it is stated whether clay or sand constitutes the surface of the soil; stretches of bogs and fens as well as littoral meadows are only mentioned quite exceptionally, since such are to be found nearly all over the country.

The Committee takes the opportunity to express its warmest thanks to the numerous collaborators who have worked out lists from their particular areas and thus contributed so essentially to enlarge our knowledge of the Danish flora.

District 1. Horns Herred²⁾. In the northern part mainly blown sand; in the south and southwest raised sea floor and fluvio-glacial sand. — C. FERDINANDSEN and Ö. WINGE (the region round Frederikshavn), M. L. MORTENSEN (the whole district), C. H. OSTENFELD (the region round Frederikshavn), V. SCHMIDT (Dvergetved, Tolne, etc.).

District 2. Vennebjerg Herred and the northern part of Börglum Herred north of the highway from Assenbæk bridge to where it intersects the railroad, which is then followed southwards to the boundary of the county. Predominantly sandy raised sea floor and fluvio-glacial sand; in the west, dunes. — JOHS. GRÖNTVED (the whole district), H. JEPSEN (Börglum Herred), P. J. LUND (the region round Hjörring), J. TH. MIKKELSEN (the region round Hjörring), OVE PAULSEN (Börglum Kloster, Lönstrup), C. M. RÖMER (the parishes of Vrejley, Ugilt, Ilbro, and Povlstrup).

District 3. Læsø. Sandy raised sea floor and blown sand. — C. H. OSTENFELD and J. HARTZ, K. WIINSTEDT.

District 4. Dronninglund Herred and Kær Herred as far as the railway line Aalborg-Hjörring. Mainly fluvio-glacial sand and sandy raised ocean floor. — C. M. KNUDSEN (desultory notes), MORTEN NIELSEN (the parish of Lendum and surroundings), OVE PAULSEN (the southeastern part), A. CHR. THOMSEN (Skæve, Voer, and Hellevad parishes), K. WIINSTEDT (Jydske Aas).

District 5. Hvetbo Herred, the southern corner of Börglum Herred, the western part of Kær Herred and East Hanherred. Hereto Gjöl, Egholm, and Öland. To the west, dunes;

¹⁾ In addition some few flora lists, elaborated before the Topographic-Botanical Investigation commenced its work, but later handed over to its archives, have been included.

²⁾ See footnote 2, p. 3.

otherwise chiefly sandy raised sea floor, on which occur large stretches of bog, e.g. Store Vildmose and others; fluvio-glacial sand is especially found to the westward. — P. FEDDERSEN (coast and dune flora from Bredebjerg to Rödhuse, and Lundergaard bog; Hune parish), L. K. LARSEN (Aaby parish), P. PETERSEN (East Hanherred).

District 6. West Hanherred and Hillerslev Herred. The main part raised sandy ocean floor with blown sand; bordering the Limfjord are large tracts of meadowy embanked land. To the west, moraine clay (near Thisted) and fluvio-glacial sand. — J. GANDRUP (the parish of Kollerup, Kettrup, and Klim Bjerg), POUL LARSEN (Hillerslev Herred), P. PETERSEN (the region round Svinklög), G. THOMSEN (Öslös).

District 7. Hundborg, Hassing, and Refs Herreder, except the northern part of the isthmus at Harboøre, which belongs to district 16. Hereto Jegindö. To the east, chiefly moraine clay, in the centre, fluvio-glacial sand, to the west, dunes. — N. GRÖNKJÆR (northern Thy), F. MICHELSEN (the region round Boddum), J. A. WEILE (southern Thy).

District 8. Mors and Agersö. Chiefly moraine clay. — A. NIELSEN (the parish of Dragstrup and surroundings), JOH. TÖNBORG (E. and W. Assels, Vejerslev, Blidstrup, Örding, and Lörslev parishes).

District 9. Nørre, Hindborg, Harre, and Rødding Herreder in Salling, and the island of Fur. Mainly moraine clay, some fluvio-glacial sand, particularly towards the north and west. — JOHS. GRÖNTVED (Fur), NIELS JUL (Salling), JENS LIND (Salling).

District 10. Slet, Aars (except the portion that belongs to the civic divisions of Gislum and Rinds Herreder), Gislum, and Rinds Herreder. Hereto Livö. By far the greater part of the district is made up of fluvio-glacial sand, but moraine clay occurs in patches; in the north raised sea floor. — JOHS. GRÖNTVED (southern part), J. JEPPESEN (the region round Ranum), KAY PETERSEN (W. Himmerland), K. WIINSTEDT (Livö).

District 11. Fleskum, Hornum, Hellum, and Hindsted Herreder and the part of Aars Herred that does not belong to district 10. Mainly fluvio-glacial sand, moraine clay in patches, which occur especially to the eastward towards a zone of raised sea floor, on which occurs the bog Lille Vildmose. — F. FEYEMANN (desultory notes), K. FRIDERICHSEN (the region round Gudumlund), H. C. L. HANSEN (the southern part), H. HØJGAARD and Mrs. M. HØJGAARD (the parishes of Hæsum, Estrup, and Ö. Hornum), M. F. KLENØ (Hellum and Hindsted Herreder), K. LARSEN (the parish of Mov), A. LINDBERG (desultory notes), F. MICHELSEN (the northern part), P. M. PEDERSEN (the southern part), K. WIINSTEDT (the regions round Mov, Nibe, etc.).

District 12. Anholt. Dunes resting on sandy raised ocean floor; to the west, hills of fluvio-glacial sand. — (Local floras by I. P. JACOBSEN and OVE PAULSEN).

District 13a. Galten, Rougsö, and S. Hald Herreder. To the west chiefly moraine clay; the eastern fourth mainly fluvio-glacial sand. — H. HAMMER (the parish of Voldum), H. JENSEN (the region round Randers), KNUD JESSEN (the parish of Ölst), POUL LARSEN (the eastern part), JENS LIND (the region round Randers), C. H. OSTENFELD (the region round Randers).

District 13b. Onsild, Gjerlev, N. Hald, and Stövring Herreder. To the north, fluvio-glacial sand; to the south and east, moraine clay; farthest eastward meadows on sandy raised sea floor. — H. JENSEN (the region round Randers), KNUD JESSEN (large parts of the district), JENS LIND (the region round Randers), C. H. OSTENFELD (the region round Randers), C. SCHWENSEN, (Trudsholm).

District 14. S. Lyng, Middelsom, Houlbjerg, Lysgaard, N. Lyng, and Hids Herreder. To the north and west principally fluvio-glacial sand and sandy heath plains; the southern and eastern parts predominantly moraine clay. — JOHS. GRÖNTVED and KNUD JESSEN (the Gudenaa valley between Kongens Bro and Tange), S. HANSEN (Bækkelund and the surrounding area), H. JENSEN (the region round Randers), KNUD JESSEN (the southwestern part), JENS LIND (the region round Randers and Viborg), A. MENTZ (various areas), C. H. OSTEN-

FELD (the region round Randers), KR. PEDERSEN, (the region round Viborg), K. WIINSTEDT (the southern part).

District 15. Fjends and Ginding Herreder and the eastern part of Hjerm Herred as far as the highroad Holstebro-Struer. The northeastern corner principally fluvio-glacial sand; to the west, south of Venö Bay, moraine clay; otherwise sandy heath plains. — POUL LARSEN (various notes), JENS LIND (Fjends Herred), A. LINDBERG (Holstebro, Mejrup, and Borbjerg), Mrs. A. OLESEN (the parishes of Struer and Gimsing), K. WIINSTEDT (the region round Holstebro, Struer, and Flyndersö).

District 16. The northernmost part of the isthmus at Harboøre, Vandfuld and Skodborg Herreder, the western part of Hjerm Herred, and Ulfborg Herred except Timring parish. To the north, moraine clay and, at Harboøre, sandy raised sea floor; the southern third mainly old-diluvial fluvio-glacial sand with patches of moraine clay; in the middle of the area, from Holstebro and spreading westward, sandy heath plains. — JUL. LASSEN (the region round Bovbjerg), J. N. NYGAARD (N. Nissum parish), Mrs. A. OLESEN (Humlum, Resen, Ölby, and Fovsing parishes), K. WIINSTEDT (the whole district).

District 17. Hind, Bölling, and Nørre Herreder, Timring parish. Mainly old-diluvial fluvio-glacial sand-plateaus; along Skjern Aa, sandy heath plains and meadows; farthest westward, dunes. — C. FERDINANDSEN and Ö. WINGE (Borris Heath), Miss J. GRÜNER (the region round Söndervig), CARSTEN OLSEN (the whole district), CHR. RASMUSSEN (the region round Tarm).

District 18. Hammerum Herred. Sandy heath plains and old-diluvial plateaus of fluvio-glacial sand with patches of moraine clay, occurring chiefly in the region east of Herning towards Holstebro. — POUL LARSEN (the whole district), TROJEL (the region round Herning), K. WIINSTEDT (the northwestern part).

District 19. Nørre Vang Herred as far as the road from Sandvad inn through Hvejsel to Elgaard, and further the western part of Tyrsting-Vrads Herreder to the highway Aasted bridge—N. Snede—Christianshede. Predominantly sandy heath plains and old-diluvial sandy plateaus ("Bakkeöer"); farthest eastward young-diluvial fluvio-glacial sand and moraine clay. — P. ALSTED (Hvejsel, Törring, Hammer, Vester, and Thyregod parishes), A. BJERREGAARD (the parish of Hvejsel), A. BRINK (the parish of Brande), I. P. KRISTOFFERSEN (Ringgive and S. Omme parishes), P. JENSEN (Törring), KNUD JESSEN (the region round Filskov), A. and J. JUUL (Aale parish), POUL LARSEN (the S. Omme plain), G. THANING (Ö. Nykirke parish).

District 20. The eastern part of Tyrsting-Vrads Herreder and the parishes of Silkeborg and Linna in the Silkeborg jurisdiction. To the southeast, moraine clay, otherwise chiefly fluvio-glacial sand. — C. FERDINANDSEN (the region round Ry and Vissing), J. HARTZ (the region round Ry), A. HOLM (Tyrsting-Vrads Herreder and the parish of Ry), A. and J. JUUL (Fövling parish and the Mattrup woods), KAY PETERSEN (Himmelbjerget), K. WIINSTEDT (the region round Bryrup).

District 21. Gjern Herred except the part that belongs to the Silkeborg jurisdiction, further Sabro, W. Lisbjerg, Hasle, Framlev, Ning, and Hjelmslev Herreder, and the northern part of Hads Herred which belongs to the civic Ning Herred. Almost exclusively moraine clay. — POUL LARSEN (the whole district).

District 22a. Mols and E. Lisbjerg Herreder, and Feldballe parish of Sønder Herred. Further Hjelm. Predominantly moraine clay; to the east much fluvio-glacial sand. — H. JØRGENSEN (Todbjerg, Mejlbj, Hjortshøj, Skødstrup, and Hornslet parishes), A. LANGE (Hjelm), POUL LARSEN (the whole district), A. NIELSEN (Draaby), OVE PAULSEN (the region round Skramsö), K. WIINSTEDT (the peninsula at Æbeltoft, Mols, and the region round Kalö).

District 22b. Nørre and Sønder Herreder except the parish of Feldballe. Principally fluvio-glacial sand; to the east, patches of moraine clay. — SVEND ANDERSEN (northeastern Djursland), AUG. KROGH (the region round Grenaa), POUL LARSEN (the whole district).

District 23. Samsö, Thunö, and the islands east of Samsö. Moraine clay and fluvio-glacial sand, sandy raised sea floor, more particularly in the isthmus between the northern and the southern part of the island. — JUL. LASSEN (Samsö and the smaller islands), A. LANGE (Thunö).

District 24. Hads Herred (except the northwestern part), Vor, Nim, Bjerge, and Hatting Herreder, Nørre Vang Herred (except the portion that belongs to district 19, and the area south of Vejle). Predominantly moraine clay. — N. J. ANDERSEN (the southern part), J. C. E. CHRISTIANSEN (Endelave), J. FISCHER (Bjerge Herred), C. H. OSTENFELD (Juelsminde), KAY PETERSEN (Odder), P. M. PEDERSEN (Hads Herred), K. WIINSTEDT (the whole district).

District 25. The portion of Nørre Vang Herred that lies south of Vejle, further Elbo, Holmans, N. Tyrstrup, Brusk, Törrild, Jerlev, and Andst Herreder. Moraine clay with scattered areas of fluvio-glacial sand; to the west, small stretches of heath plain. — N. J. ANDERSEN (the northeastern part), ALBERT JENSEN (Jelling parish), K. JESSEN (the northwestern part), H. C. KLINGE (the region round Kolding), L. KRING (W. Nebel, Jordrup, and Smidstrup), A. LANGE (the region round Hejls), POUL LARSEN (the northwestern corner), B. MAIGAARD (the parishes of Almind, Bramdrup, Nebel, and Vamdrup), K. NIELSEN (the parishes of Bramdrup, Eltang, and Taulov), C. H. OSTENFELD (the region round Brejning), J. P. J. RAVN (the region round Vonsild), J. M. THOU (N. Tyrstrup Herred), Miss S. THIRSLUND (the parishes of Harte, Bramdrup, Taulov, S. Vilstrup, and Eltang), K. WIINSTEDT (Munkebjerg, Trelde Næs, the region round Randböl and the region round Fredericia on the basis of F. IRMINGER's herbarium).

District 26. Slaugs and Östre Horne Herreder, and the portion of Gjörding and Skads Herreder (viz. the northeastern parts) that does not belong to district 27, and Varde suburban parish. Mainly old-diluvial plateaus of fluvio-glacial sand with scattered clayey patches and sandy heath plains. — R. ASTRUP (Læborg and surroundings), M. P. CHRISTIANSEN (the region round Vejen and Bække), O. GELERT (the flora of the region round Ribe about 1890), A. HOLM (the parish of Ölgod), K. JESSEN (Billund and surroundings), POUL LARSEN (Nørholm), P. J. LUND (the region round Varde), Mrs. I. MOMMSEN (Malt, Folding, and Brörup parishes), J. K. NIELSEN (the region round Grindsted), K. WIINSTEDT (the region round Vorbasse).

District 27. Vester Horne Herred (except Varde suburban parish), the southwestern parts of Skads and Gjörding Herreder to and including the parishes of Alslev, Bröndum, Skads, V. Nykirke, Sneum, Hundrup, and Jernved, and Ribe archdeaconry. Further Fanö and Manö. Along the coast as far as Skallingen and on the islands, blown sand; in Hjerting Bay, on the islands, and along the coast south of Esbjerg, littoral meadows (marsh); otherwise old-diluvial sandy plateaus with scattered areas of clay, especially round Esbjerg. — O. GELERT (the region round Ribe about the year 1890), JOHS. GRÖNTVED (the region round Esbjerg), K. JESSEN (the region round Ribe), POUL LARSEN (the western part), P. J. LUND (the region round Varde, etc.), OVE PAULSEN (Vejrs and surroundings, Oxböl), P. M. PEDERSEN (the region round Esbjerg).

District 28. Vends and Baag Herreder. Hereto Brandsö, Baagö, and Fænö. Predominantly moraine clay with fluvio-glacial sand, more especially in the hilly parts to the southeast. — A. ANDERSEN (the flora of northern Funen), SVEND ANDERSEN (the region round Assens, Helnæs, etc.), M. P. CHRISTIANSEN (Gamborg and the surrounding area), O. HAGERUP (the coast of Little Belt between Fænö and Wedellsborg), L. KRING (Barlöse-Kerte), A. LANGE (the region round Assens; Baagö and Brandsö), K. WIINSTEDT (the region round Assens; notes from F. IRMINGER's herbarium).

District 29. Skovby, Skam, Lunde, and Odense Herreder, with Viggelsö. Predominantly moraine clay, especially in the north; scattered areas of fluvio-glacial sand, especially in the southern part; to the north, raised or embanked sea floor. — A. ANDERSEN (the flora of

northern Funen), SVEND ANDERSEN (the southern part), A. CLAUSEN (Odense and the surrounding area), OTTO MÖLLER (the northeastern part), K. WIINSTEDT (Æbelö).

District 30. Aasum and Bjerge Herreder. Moraine clay; east of Odense, heath plains; to the north, raised sea floor or embanked land. — A. ANDERSEN (the flora of northern Funen), J. GANDRUP (Romsö in Great Belt), H. C. L. HANSEN (the region round Kjerteminde), M. L. MORTENSEN (the whole district), OTTO MÖLLER (Hindsholm).

District 31. Vinding and Gudme Herreder, including Vresen. Almost exclusively moraine clay. — SØREN HANSEN (HALLAR) (the region round Nyborg), M. L. MORTENSEN (the parish of Flödstrup), TROJEL (the region round Nyborg).

District 32. Salling and Sunds Herreder. Further Strynö, Lyö, Taasinge, and the other islets. Predominantly moraine clay; fluvio-glacial sand is especially found in the hilly territory to the westward. — A. EDM. ANDERSEN (the region round Faaborg), SVEND ANDERSEN (Salling Herred etc.), S. HANSEN (Helnæs), A. JOHANSEN (the region round Svendborg), P. M. PEDERSEN (the region round Svendborg; further Taasinge and Thurö), P. A. J. PETERSEN (Avernakö), N. SØRENSEN (southern Funen, Taasinge, and Thurö), K. WIINSTEDT (the region round Svendborg; Taasinge and Thurö).

District 33. Ærø Herred. Moraine clay and small stretches of embanked land. SVEND ANDERSEN (Ærø). Further manuscripts by NOLTE (1825) and KJÆRBÖLLING (about 1840).

District 34. Nørre and Sønder Herred in Langeland. Moraine clay, patches of sand, small areas of embanked land (south of Rudkøbing). — SVEND ANDERSEN (southern Langeland), M. L. MORTENSEN (the southern part), K. MOURITS-ANDERSEN (the whole district).

District 35. Western Lolland as far as the railway line Bandholm—Maribo—Rödby and a line that runs from Rödby southwards to Lille Brundrag, following the boundaries of the parishes. Further Vejrö, Fæmø, Askö, Fejö, etc. Moraine clay, littoral meadows, and embanked land at Nakskov and Rödby Fjords. — C. CHRISTENSEN (Albuen, Slotö, Barneholm), LUDVIG SAUNTE (the whole district), A. HOLM and TROJEL (brief lists).

District 36. Eastern Lolland; further Lilleö, Majbölle Ö, and Kejlsö in Guldborg Sound, and Vigsö. Moraine clay, embanked meadowy tracts along the coast south of Rödby. — C. CHRISTENSEN (the eastern part), V. DANÖ (Central Lolland), L. KRING (the southern east coast), C. H. OSTENFELD (the region round Guldborg, and Vigsö), LUDVIG SAUNTE (the whole district).

District 37. Falster; further Flatö and Kalvö. Moraine clay, embanked ocean floor at Bötö in the south and at Vaalse in the north. — M. P. CHRISTIANSEN (Dyrefod), L. KRING (the whole district), C. H. OSTENFELD (eastern and northern Falster), TROJEL (desultory notes).

District 38. Möen; further Farö, Bogö, Tærö, Langö, and Nyord. Mainly moraine clay, chalk in the Möens Klint. — A. P. ANDERSEN (Bogö), M. P. CHRISTIANSEN (Bogö), Miss J. GRÜNER (Ulfshale), O. HAGERUP (Moen), NILAUS JENSEN (Bogö), K. WIINSTEDT (Möens Klint).

District 39a. Hammer Herred, Baarse Herred (except Rønnede), and Næstved in Tybjerg Herred. Chiefly moraine clay; some fluvio-glacial sand, especially to the southwestward. — M. P. CHRISTIANSEN (Masnedö and Kalvö), VIGGO DANÖ (the region round Vordingborg), JOHS. GRÖNTVED (Knudshoved), K. JESSEN (Köng bog), C. H. OSTENFELD (the Jungshoved peninsula), K. WIINSTEDT (Knudshoved, Vordingborg, Kallehave, Holmegaard bog, Jungs-hoved).

District 39b. Stevns and Faxe Herreder with Rønnede. Mainly moraine clay; chalk cliffs at Stevns. — EILER HØEG (the region round Fakse-Haslev), A. LANGE (Stevns), A. E. THOMSEN (Fakse—Stevns Herreder), K. WIINSTEDT (Køge Sönakke).

District 40. Within the county of Praestö: Bjeverskov Herred and Tybjerg Herred (except Næstved); within the county of Copenhagen: Tune and Ramsö Herreder; Ringsted Herred in the county of Sorö. Chiefly moraine clay. — H. P. ERNSTSEN (desultory notes), J. HARTZ (the region round Køge), C. JENSEN (the region round Skjoldnæsholm), Miss R. SIMONSEN (the region round Slimminge), K. WIINSTEDT (Jægerkroen etc.).

District 41. The county of Sorö except Ringsted Herred; hereto Sprogö, Agersö, Omö, and Egholm. Mainly moraine clay; fluvio-glacial sand is especially found north of Sorö. — E. GRAM (the parishes of Stillinge, Hejninge, and the Slagelse suburban parish), JOH. HANSEN (Nordruplund wood), EILER HÖEG (the region round Herlufsholm), A. LANGE (desultory notes), H. LARSEN (Hindholm and surroundings), SEVERIN PETERSEN (the hills at Vaarby brooke), C. H. OSTENFELD (the region round Sorö), CHR. RASMUSSEN (Krummerup parish, Hindholm, and Tase), TROJEL (the region round Sorö).

District 42. The county of Holbæk: Löve, Arts, and Skippinge Herreder, Tudse Herred (except Tudse Næs east of Gislinge brooke), and the part of Alsted Herred that does not belong to the county of Sorö. Further Sejrö, Nexelö, and Musholm. Moraine clay, but much fluvio-glacial sand in a belt running northwest-southeast; raised sea floor and embanked land at Lammefjord, Saltbæk Vig, Kalundborg and Reersö. — SVEND ANDERSEN (Refsnæs), C. CHRISTENSEN (Lille Vrøj), H. P. ERNSTSEN (the whole district), E. GRAM (Görlev, Bakkendrup, Kirkehelsinge, Drösselbjerg, Finderup, Gjerslev, and Havrebjerg parishes), JOHS. HANSEN (Tersløse, Skjellebjerg, and Nidlöse parishes), JOHS. KEIDING (the region round Brejninge-Bjergsted, and Nexelö), M. J. MATHIASSEN (the parishes of Kirkehelsinge and Drösselbjerg; Musholm), L. G. MÖLLER (the region round Nexelö Bay), Miss R. SIMONSEN (the region round Nidlöse), K. WIINSTEDT (Sejrö and the region round Kalundborg).

District 43. Odsherred, Tudse Næs, and further Hesselö. Mainly moraine clay and fluvio-glacial sand; large areas of raised and embanked, predominantly sandy sea floor in the north and west and at Lammefjord and Sidinge Fjord. — H. ANDERSEN (desultory notes), SVEND ANDERSEN (Odsherred), H. P. ERNSTSEN (Odsherred), K. JESSEN (Hesselö), HAKON JÖRGENSEN (the region round Rörvig), A. LANGE (the region round Nyköbing), JUL. LASSEN (the region round Rörvig), P. J. LUND (Tudse Næs), L. G. MÖLLER (the southwestern corner), K. WIINSTEDT (the northern part).

District 44. Merlöse Herred in the county of Holbæk; Voldborg Herred in the county of Copenhagen; Horns Herred in the county of Frederiksborg; Eskildsö and Ovrö. The northern part of Horns Herred, mainly fluvio-glacial sand and sandy raised sea floor; otherwise chiefly moraine clay. — J. CLAUSEN (the region round Töllöse), H. P. ERNSTSEN (the western part), EILER HÖEG (Horns Herred), C. JENSEN (the region round Hvalsö), P. J. LUND (the region round Holbæk), C. G. PONTOPPIDAN (Ovrö), K. WIINSTEDT (Horns Herred).

District 45a. The remaining part of the county of Copenhagen (i.e. Sokkelund, Smörum, and Sömmes Herreder), and Ölstykke Herred in the county of Frederiksborg. Predominantly moraine clay. — A. LANGE (the whole district), Miss K. RAVNKILDE (Hareskoven), K. WIINSTEDT (desultory notes).

District 45b. The county of Frederiksborg except Ölstykke and Horns Herreder. Moraine clay and much fluvio-glacial sand, the latter especially in the northern part; blown sand occurs north of Frederiksværk. — C. CHRISTENSEN (the region round Asserbo), L. KRING (the region round Hillerød-Tisvilde), A. LANGE (the southwestern part), K. MOURITS-ANDERSEN (the northwestern part), Miss K. RAUNKILDE (the region round Hillerød, Hornbæk, Hellebæk, and Villingebæk), K. WIINSTEDT (Bregnerød Overdrev and other areas).

District 46. The city of Copenhagen (including the incorporated districts as far as Tuborg, Utterslev, Brönshøj, Harrestrup brooke; Amager and Saltholm). Moraine clay and sandy miry littoral meadows on raised sea floor. — SVEND ANDERSEN (Copenhagen), C. CHRISTENSEN (Saltholm), N. GRAM (Prøvestenen), J. GRÖNTVED (Amager Fælled), J. GRÖNTVED and K. JESSEN (Copenhagen), A. LANGE (various notes), M. LÜHRSS (Copenhagen and the surrounding region), OTTO MÖLLER (Copenhagen), A. SCHÆFFER (Amager and Saltholm), K. WIINSTEDT (Saltholm).

District 47. Bornholm and Ærteholmene. Fluvio-glacial sand in the central part of the island; the broad marginal zones consist predominantly of moraine clay; granite is exposed

along the northern and northeastern coasts and to the north and east occasionally in the interior of the island; in the south, dunes. — SOFUS FRANCK (Ærteholmene and the southern part of Bornholm), MISS ELLEN HANSEN (Bornholm), A. LANGE (the northern part), H. MORTENSEN and C. ZAHRTMANN (Bornholm), H. MÖLLER (Bornholm), C. H. OSTENFELD (Bornholm), KAY PETERSEN (the northern part).

District 48. The eastern part of the county of Haderslev as far as the eastern trunk line, and the part of the county of Aabenraa that is bounded by the same trunk line as far as Rødekro and the railway from this place to Aabenraa; Aarø and Barsø. To the west a narrow zone consisting mainly of fluvio-glacial sand and sandy heath plains; east thereof predominantly moraine clay. — SVEND ANDERSEN (St. Jørgens Gaard north of Aabenraa), POUL LARSEN (the whole district).

District 49. The western part of the county of Haderslev and the part of the county of Tønder that lies east of the western trunk line; the southern boundary is formed by the railway Bredebro—Lögumkloster—Hovslund. Chiefly old-diluvial moraine clay and fluvio-glacial sand, and heath plains; the sandy soil is most extensively distributed towards the south and west. — C. A. JØRGENSEN and MØLHOLM HANSEN (Laurup and Tørring Coppices, Gram wood), A. LANGE (the whole district), P. M. PEDERSEN (the northwestern part), P. A. J. PETERSEN (Toftlund parish and surroundings).

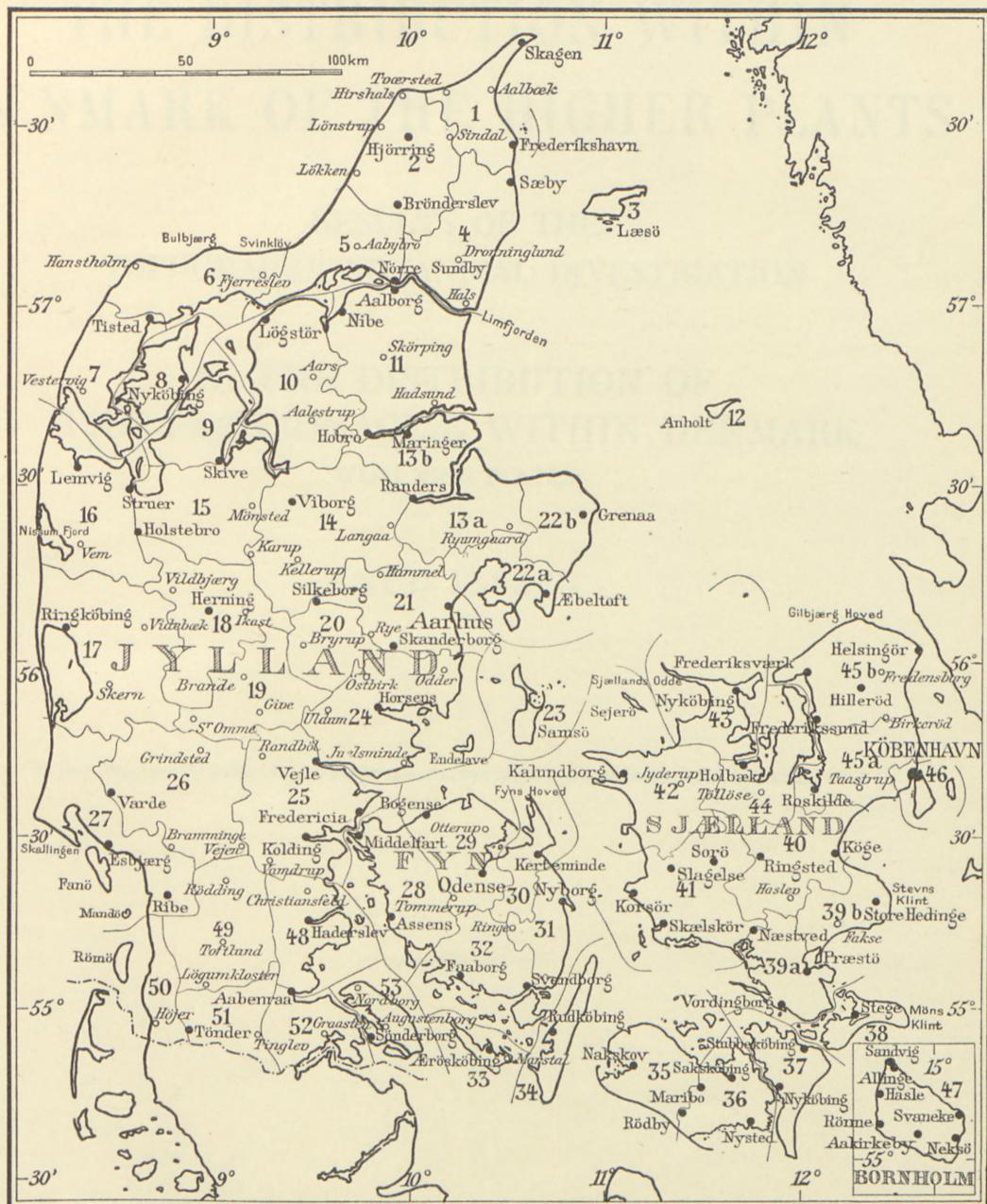
District 50. The county of Tønder west of the western trunk line, including Römö. Marsh, old-diluvial fluvio-glacial sand, and heath plains; near Tønder, moraine clay; on Römö, blown sand, marsh, and sandy beach. — SVEND ANDERSEN (the area Tønder—Højer), P. M. PEDERSEN (the whole district), K. WIINSTEDT (Römö).

District 51. The portions of Tønder and Aabenraa counties that lie between the western and the eastern trunk lines and between the railway Bredebro—Lögumkloster—Hovslund and the frontier. Predominantly sandy heath plains; old-diluvial moraine clay and fluvio-glacial sand, especially to the westward, north of Tønder. — SVEND ANDERSEN (the region round Tønder; Terkelsböl), C. CHRISTENSEN (the whole district).

District 52. The remaining part of Aabenraa and Tønder counties east of the eastern trunk line, and Sundevæld. To the east and north, moraine clay; to the southwest, fluvio-glacial sand and sandy heath plain. — SVEND ANDERSEN (Graasten, the north side of Vemmingbund, Aabenraa), C. H. OSTENFELD (Dybböl, the region round Sønderhav), K. WIINSTEDT (the whole district).

District 53. Als. Moraine clay. — SVEND ANDERSEN (Sønderborg, Hørup Hav, Augustenborg), M. P. CHRISTIANSEN (the whole district), BENGT E. DAHL (Als Nørreskov), JOHS. GRÖNTVED (the south coast of Als), JOHANNES IVERSEN (Als).

The Committee of the Topographic-Botanical Investigation.



Map showing the districts of the Topographic-Botanical Investigation of Denmark, the towns and the greater villages. Each district is marked with its number.

THE DISTRIBUTION WITHIN DENMARK OF THE HIGHER PLANTS

RESULTS OF THE
TOPOGRAPHIC-BOTANICAL INVESTIGATION

II. THE DISTRIBUTION OF
THE PAPILIONACEÆ WITHIN DENMARK
WITH NINE PLATES

BY

KNUD JESSEN

D. KGL. DANSKE VIDENSK. SELSK. SKRIFTER, NATURVIDENSK. OG MATH. AFD., 9. RÆKKE, III. 2



KØBENHAVN

HOVEDKOMMISSIONÆR: ANDR. FRED. HØST & SØN, KGL. HOF-BOGHANDEL

BIANCO LUNOS BOGTRYKKERI A/S

1931

WINTI WINTI ZONTJAJTSAH ANT
STUPLA PELLAZ DOLINER

ANT DO STUPLA
ZONTJAJTSAH DOLINER

DO ZONTJAJTSAH ANT DOLINER
DOLINER DOLINER

DO ZONTJAJTSAH

ДО ЗОНТЯЖТСАХ, АНДО ДО СТУПЛА, ЗОНТЯЖТСАХ, АНДО ДОЛНЕР, АНДО ДОЛНЕР.

БУДИДА

ДО ЗОНТЯЖТСАХ, АНДО ДО СТУПЛА, ЗОНТЯЖТСАХ, АНДО ДОЛНЕР,
ДО ЗОНТЯЖТСАХ, АНДО ДО СТУПЛА, ЗОНТЯЖТСАХ, АНДО ДОЛНЕР.

When the Committee of the Topographic-Botanical Investigation of Denmark is now going to commence the publication of the plant-geographical material collected in its registers, the aim is twofold. First and foremost these papers should serve to deepen and render clear our conceptions of the distribution of the higher plants within the boundaries of the country, and the *Papilionaceæ* have been chosen as the first group to be dealt with, because the most extreme types of distribution in Denmark together with several transitional types are to be found within this family. But in addition the publication of a large number of maps showing the distribution of the various species in Denmark is intended to supply plant-geographers in other countries with a material which will be of importance in connection with the already existing or future mapping of the distribution of the species in the other European countries.

The number of species included here is about the same as that found in C. RAUNKIÆR, *Dansk Ekskursionsflora* 1922, certain cultivated species of the genera *Pisum* and *Vicia* having, however, been left out. The genera as well as the species within each genus have been arranged alphabetically. The descriptions of the geographical conditions of the various species have been uniformly subdivided. After the systematical and Danish names follows a brief statement of the literature used for the description. Here especially the principal floristic works containing information of the distribution of the species have been enumerated; the copious Danish special floristic literature has, as regards its statements of localities, been utilised in the registers of the Topographic-Botanical Investigation, and the localities have been inserted on the maps; so of this literature only the works that have been specially used are cited in each case. Under the heading "Geographical Distribution" the total distribution of the species is first given, and then, more particularly, its occurrence in our neighbouring countries. Under "Occurrence in Denmark" the distribution of the species in our country and the nature of its habitats are stated. If the species occurs in special forms, these are mentioned, particularly if they present facts of plant-geographical interest. As finds of fossils belonging to the family here under consideration have not been made in Denmark, conclusions as to the ways and time of the migration of the species can only be based on plant-geographical data.

In the introduction Professor C. H. OSTENFELD has given an account of the various ways in which the material of the Topographic-Botanical Investigation has

been procured. It can hardly be otherwise than that a part of this material, particularly that based on the flora lists sent in by amateurs, has occasionally been encumbered with errors which it has not always been easy to avoid. Thus the statements as to the degree of frequency are widely discordant, and the conception as to whether a species is wild, may be uncertain. On the whole, however, the large amount of freely contributed work, to which the application of the Committee has given rise all over the country, has increased our knowledge of the distribution of the higher plants to such an extent that, without it, it would have been unsatisfactory to attempt to carry through the work now commenced, viz. the mapping of all the species unequally distributed in our country. However, our knowledge of the distribution of several species, not only the critical ones, is still deficient in various parts of the country, and the continued collecting of notes on the localities of the species will be necessary.

The value of this series of publications will in the first instance depend on the maps. Through these maps our conception of the distribution of the species within Denmark should find the most precise expression hitherto given to it, and it is to be expected that as they increase in number, and the mapping of the distribution of the higher plants proceeds in our neighbouring countries also, the maps will become aids by means of which we may gain a more thorough understanding of the factors conditioning the distribution of the species.

I wish heere to express my best thanks to Mr. WIINSTEDT, Curator of the Botanical Museum for much valuable information given me during the preparation of this paper.

Anthyllis vulneraria L. — Gul Rundbælg.

J. LANGE 1886—88, 824. RAUNKLÆR 1922, 191. MÖLLER-HOLST V, 1882, 101. JESSEN & LIND 1923, 175, 121. STEFÁNSSON 1924, 158. ASCHERSON & GRAEBNER 1906—1910, 620. HEGI IV, 3, 1355. BLYTT 1906, 454. LINDMANN 1926, 382. ANDERSSON & BIRGER 1912, 337, map. 8. HJELT. 1919, 282 f.

Geographical Distribution. European, West Asiatic, North African perennial herb. Occurs almost throughout the whole of Europe with the exception of the extreme northern regions, is found in Iceland, but not on the Faroes; extends eastward to the Caucasus and western Asia, southward to the Sahara and Abessynia. — In Norway it extends from the sea some way into the birch belt to 70° N. lat.; in northern Sweden it is found scattered on mountain sides exposed toward the south, "Sydberg", and further in places where it is possibly anthropochorous; in Finland it (including *f. affinis*) extends northeastward to 67° 45' N. lat.

Occurrence in Denmark. It is found in all districts of the country, generally it is common, though somewhat less frequent in the eastern tracts on moraine clay. It grows particularly on dry and sandy hills and fields, where the cover of vegetation is not too dense, and on grey dunes. Further it is rather commonly sown

in fields laid down in grass. The cultivation of it in this country was commenced shortly before the middle of last century.

Anthyllis vulneraria occurs in several forms. In the dunes there are found very hairy forms, especially *f. maritima* SCHWEIGG., with pale yellow flowers, known e. g. from the west coast of Jutland, Læsø, Tisvilde, and Kikhavn. Further, *f. coccinea* L. (= *rubriflora* D. C.), which has a deep red corolla; it is known in this country from the east coast of Bornholm only, in the region between Gudhjem and the Randkløveskaar; otherwise e. g. from Oeland, Gothland, Sild, and Great Britain.

The species has probably immigrated into Denmark in early post-glacial time.

Astragalus danicus Retz. — Dansk Astragel.

J. LANGE 1886—88, 854. RAUNKLÆR 1922, 191. ASCHERSON & GRAEBNER 1906—1910, 774. HEGI IV, 3, 1410 (map), 1428. BENTHAM & HOOKER 1920, 117. LINDMAN 1926, 383. SEGERSTAD 1924, 150.

Geographical Distribution. A West Asiatic, East and Central European perennial herb, also found in Great Britain, and recorded from North America. More precisely it extends from the Baikal area and Dzungaria in Asia southward to the Caucasus, and thence sporadically through Central Europe, as for instance Hungary, Poland, Bohemia, Germany, the southwestern Alps (Dauphiné and Provence); northward it occurs in Ingria, the Onega Valley (absent from Finland), Estonia and Oesel, Gothland, Scania, Denmark, southern Scotland, eastern and northern England, and occasionally on the west coast of Ireland.

In northern Germany it grows on sunny hills, in light forests, and along the roadsides; in the Rhine area almost as far north as Coblenz; in the Elbe area in the region round Magdeburg; and along the Oder, especially along its lower course; further very sporadically in East and West Prussia, where it is assumed to have been introduced with clover seeds from America. In no part of Germany does it extend to the Baltic.

In Sweden *Astragalus danicus* is found in littoral meadows at Kalmar and between Malmö and Lomma on the west coast of Scania, where it has been known for more than half a century; further on Varvsholmen at Klintehamn on Gothland, and in ruderal habitats near Falkenberg in Halland.

Occurrence in Denmark. (Fig. 33, Pl. X). Its area in Denmark chiefly comprises the regions round the southern part of the Cattegat, the tract from Djursland across Samsø to North Funen; on the north coast of Sealand as far as Tisvilde, whence it spreads towards the south along the west coast of Sealand to Basnæs, as also inland along the Isefjord and the Roskilde Fjord, where it approaches the localities round Copenhagen and the locality at the Korporalskro at Køge Bay known from earlier times. A find, not confirmed in recent times, is HYBERTZ' record of it on the Skovbrink on Ærø. This species nearly always grows in the vicinity of the sea, most frequently on littoral pastures and uncultivated hills and slopes,

but may also be met with at some distance from the coast, thus for instance on the hills at Jyderup and Bjergsted and in other places in Seeland; it is then not actually halophilous, but very tolerant of the presence of salt; in Central Europe it is often associated with calcareous, gypsiferous, and saline soil.

In Central Europe the species is very unequally distributed, and occurs in more or less isolated areas, of which the Danish-Scanian is the most northerly. Presumably the species has immigrated from the south, most probably from the region round the mouth of the river Oder, but it is a remarkable fact that it is almost entirely absent from our southern islands. Possibly it has had a more continuous distribution in the post-glacial period of warmth, and now only remains in particularly favourable localities (cfr. p. 68). HEGI states that it frequently fructifies poorly near the boundaries of its area of distribution; among the specimens from Denmark kept in the herbarium of the University of Copenhagen, there are two with well-developed husks and seeds, namely from Bederslev (district 29¹⁾) and from Basnæs (district 41) respectively, both collected in the month of July, while nearly all the other specimens have been collected in June.

Astragalus glycyphylloides L. — Söd Astragel.

J. LANGE 1886—88, 856. RAUNKLÆR 1922, 191. ASCHERSON & GRAEBNER 1906—1910, 760. HEGI, IV, 3, 1420. BENTHAM & HOOKER 1920, 117. LINDMAN 1926, 383. SEGERSTAD 1924, 87, 88 (map of South Sweden). ANDERSSON & BIRGER 1912, 91, 343 (map 11, North Sweden). BLYTT 1906, 463.

Geographical Distribution. West Asiatic, European perennial herb, occurring in the greater part of Europe, but rare in the Mediterranean region, where it is restricted to the mountains; it is absent from the southern part of the Balkan Peninsula, the Italian islands, and Ireland, and is uncommon in England and Scotland; extends northward as far as Trondhjem Fjord ($63^{\circ} 37'$ N. lat.) and Jemtland (64° N. lat.), Oesel, Estonia, and Ingria (absent from Finland); in western Asia to Altai, Dzungaria, the countries round the Caucasus, and Asia Minor.

In northern Germany the species is usually rather common in light forests, especially below oak-trees, in meadow-scrubs, hedgerows, and the edges of woods, but is rare in the northwestern part of the lowland, and is absent from the islands of the North Sea. SEGERSTAD has mapped its distribution in southern Sweden, where it is fairly common on shrubby hills, particularly below oak-trees and in meadows; it is, however, absent over wide stretches of the interior of the country, in the most oligotrophic regions. In Norway the species is rather common east of the mountains as far as Slidre and Lillehammer, but is of rare occurrence along the south coast to Jæderen; west of the mountains northward to Trondhjem Fjord it is only found occasionally. In Norway as in northern Sweden

¹⁾ As to the position of the districts see C. H. OSTENFELD: A brief historical survey of the investigation, this volume III, 1, p. 9—15, Plate I.

(see map by ANDERSSON & BIRGER) the species thus chiefly occurs in the interior far from the coast.

Occurrence in Denmark. (Fig. 13, Pl. V). In the east of Denmark it is usually rather common in coppices and light woods, along fences and in roadside ditches. It is its demand for not excessively meagre or acid soil and suitable illumination that conditions its distribution and occurrence in this country. Thus it is entirely absent, or very rare, in the western and northern parts of Jutland, not even in the oak scrubs does it feel at ease, and only in the regions with a more fertile soil by the western part of the Limfjord and in northern Vendsyssel does it occur in a number of localities.

The plant has big and heavy seeds, which are apparently not suitable for dispersal over great distances. Its immigration into Denmark may be assumed to have taken place from the south and southeast, partly along the east coast of the peninsula and partly across the valley of the Baltic during the maximum of the post-glacial uplift.

Coronilla emerus L. — Koronille-Busk.

RAUNKLÆR 1922, 192. O. G. PETERSEN 1916, 317. ASCHERSON & GRAEBNER 1906—1910, 858. HEGI IV, 3, 1467, map of the distribution in Central Europe, fig. 1506. LINDMAN 1926, 385. BLYTT 1906, 474.

Geographical Distribution. West Asiatic, South and Central European shrub, which extends northward to southwestern Germany, the Alpine regions, and the Carpathians; further cultivated here and there as an ornamental plant, and sometimes growing as wild in more northerly regions as far as southern Scandinavia. Thus it is occasionally met with on limestone cliffs on Oeland and Gothland, as also at Kragerø and in Bamle in southern Norway, growing in dry coppices and screes, in places very abundantly.

Occurrence in Denmark. The plant has been found in some few places in Seeland, viz. in the forests of Frederiksdal (1841), of Gjorslev (1867), and of Tisvilde (1892), in ruderal habitats near Copenhagen (1928), and finally in the southeastern part of Funen in hedges at the Björnemose (1905). Presumably it has escaped to these places from gardens, where it is occasionally cultivated as an ornamental shrub.

Coronilla varia L. — Broget Kronært.

RAUNKLÆR 1922, 192. ASCHERSON & GRAEBNER 1906—1910, 855. HEGI IV, 3, 1473, map of the distribution in Central Europe, fig. 1506. PRAHL 1890, 43. BLYTT 1906, 474.

Geographical Distribution. West Asiatic and South and eastern Central European perennial herb, extending northward to northern France and northern Germany; in Belgium, Holland, northwestern Germany and in the countries north of the Baltic it is very rare and only anthropochorous; also in the Mediterranean

area proper the species is rare; naturalised in North America. In Central Europe its northern limit runs from the Loraine Jura Mountains through Wesel at the Lower Rhine, Westphalia, the Harz, the western part of Mark Brandenburg (Neuhaldensleben), Schwerin, Stettin, and onward along the coast of the Baltic, which, however, it fails to reach. In northern Germany the species grows in coppices and along the edges of woods and roadsides, but is frequently sown with grass-seeds and, more particularly, with Red Clover seed on cultivated fields, railway slopes, and in waste places, and at the present time is spreading rapidly; here it is perhaps not indigenous too. It is not mentioned in the Swedish floras, but is recorded from Oslo and Bergen as having been casually introduced.

Occurrence in Denmark. The plant has occasionally been collected in ruderal habitats in the Copenhagen Free Port (1900, 1921), in Odense harbour (1915), and at Esbjerg (1916); further it has been found in several places in woods, thus in the region round Langesø near Odense, where it had maintained itself for 20 years, in Hunderup Wood at Odense (1906), and in Höjen Wood near Vejle, where it was growing among firs (1917); in all these places, however, its occurrence is probably due to the activity of man.

Cytisus elongatus W. et Kit.

J. LANGE 1886—88, 882. C. RAUNKIÆR 1922, 185. O. G. PETERSEN 1916, 307. ASCHERSON & GRAEBNER 1906—1910, 325.

Geographical Distribution. Shrub, growing wild on rocks and in coppices in southern France (possibly only escaped from cultivation) and in Ungarn, i. e. in parts of the area of the main species (*C. hirsutus* L.). Otherwise it is frequently cultivated in gardens for ornament.

Occurrence in Denmark. About the same as that of *C. supinus*; specimens run wild have been found e. g. in the woods at Corselitze on the island of Falster in 1862, in Ebberup Kohave on Funen, and at Farum in 1863.

Cytisus laburnum L. — Almindelig Guldregn.

(*Laburnum vulgare* GRISEB.).

J. LANGE 1886—88, 821. RAUNKIÆR 1922, 185. O. G. PETERSEN 1916, 304. ASCHERSON & GRAEBNER 1906—1910, 271. HEGI IV, 3, 1162.

Geographical Distribution. Tree, growing wild in light woods in the Central European mountain regions from the French Jura Mountains to Herzegovina, Servia, and Bulgaria; moreover frequently met with planted and run wild as far as southern Sweden.

Occurrence in Denmark. Generally planted in gardens, parks, and hedges; occurs in nearly all districts, most commonly in the fertile parts of the country; may also be observed escaped from cultivation.

Cytisus supinus L.
(*C. capitatus* JACQ.).

J. LANGE 1886—88, 821. RAUNKLÆR 1922, 185. O. G. PETERSEN 1916, 307. ASCHERSON & GRAEBNER, 1906—1910, 327. HEGI IV, 3, 1175, map of the distribution in Central Europe, fig. 1322.

Geographical Distribution. Pontine shrub, extending from the regions round the Black Sea, Asia Minor included, through nearly the whole area along the Danube, the northern Balkan States, and South Russia to Poland, the upper parts of the rivers Oder and Elbe, and the southern Alps to France. In northern Germany it occurs both planted and as a fugitive from cultivation.

Occurrence in Denmark. It is more rarely planted in gardens than *C. laburnum*, and is very rarely observed running wild, yet it has been found e. g. in Riis Skov (1869) and in some few places in northern Funen.

Genista anglica L. — Engelsk Visse.

J. LANGE 1886—88, 820. RAUNKLÆR 1922, 186. MENTZ 1906, 177. WARMING 1919, 142. HORNE-MANN 1806, 656. FERDINANDSEN 1918, 71. ASCHERSON & GRAEBNER 1906—1910, 246. HEGI IV, 3, 1209, 1195, map. fig. 1338. HANNIG 1926, map. 10. BENTHAM & HOOKER 1920, 103. LINDMAN 1926, 376. MÖRNER, 1922, 356.

Geographical Distribution. Atlantic dwarf shrub, extending from Jutland to Scotland and England, thence over Northwest Germany with the Friesian Islands, the Netherlands, Belgium, nearly the whole of France, except the eastern and southern districts, and the northwestern part of the Iberian Peninsula; in addition, it occurs in some small isolated areas, especially in southern Halland in Sweden on dry hills and heather moors, in the Black Forest, on Calabria, and on the northwest coast of Morocco. In Northwest Germany, where the species is of common occurrence, preferably in somewhat damp heaths, its southeastern limit may be drawn from Ribnitz in northeastern Mecklenburg, through Neuwaldensleben, Goslar at the Harz, and Brunswick to Achen.

Occurrence in Denmark. (Fig. 4, Pl. II). *G. anglica* is rather common in the greater part of Jutland south of the Limfjord, where it is chiefly associated with the *Calluna* heath. But it has also proved common in several tracts north of the Limfjord, thus e. g. in Thy, East Hanherred and West Hanherred, and in the southern portion of Vendsyssel, while it has not been noticed in the most northerly regions of this part of the country. Here the northern limit of the species must be drawn. It is far more common in the eastern tracts of the peninsula than *G. pilosa*, but like the latter it is absent from the island of Als. Just like *G. tinctoria* it has spread to Funen, where it has been known, since the days of HORNEMANN (1806), from Vissenbjerg and Verninge, and from the northwestern part of the island, in the vicinity of Middelfart and Hindsgavl, since 1847; further it has been known from Svendborg since 1876. It grows both on hilly heathland and on the heath-plains, and soon makes its appearance on the young dune heaths. Like the other heath plants

it shuns lime, and is modest in its demand for nourishment. C. FERDINANSEN designates it as acidophilous. In this country it seems to grow in drier soil than in Northwest Germany (MENTZ).

It may be stated with certainty that the immigration of this plant has taken place from the south and southwest, probably in late post-glacial time.

Genista germanica L. — Tysk Visse.

J. LANGE 1886—88, 820. RAUNKLÆR 1922, 186. MENTZ 1906, 174. ASCHERSON & GRAEBNER, 1906—1910, 244. ASCHERSON & GRAEBNER, 1899, 428. HEGI IV, 3, 1210. PRAHL 1890, 39. W. CHRISTIANSEN 1926, 146, 205, map. fig. 70. LINDMAN 1926, 376.

Geographical Distribution. Principally a Central European dwarf shrub, which occurs from the Volga (the governments of Saratow and Nijni Novgorod) northward across Grodno and Graduenz in Poland, and southwestern Sweden to the southern part of Jutland; further in Germany, South Holland, the eastern and central parts of France (very doubtful in the Iberian Peninsula), and southward across northern Italy and the Balkan Peninsula.

In Central Europe it grows in dry woods and on sunny, grassy slopes; it is absent i. a. in northwestern Hanover, on the North Sea islands, and along the Baltic coast eastward from Wollin; in Holstein it occurs sporadically in woods and coppices, in German Schleswig in one single locality only south of the town of Schleswig; in Sweden it is very uncommon, still it may be found on dry hills and heaths in northern Scania, southern Halland, and in Dalsland.

Occurrence in Denmark. (Fig. 1, Pl. II). *G. germanica* has been noted from about 20 localities in southern Jutland, but in several of these it has not been observed in recent years. It is not so closely associated with the *Calluna* heath as *G. anglica* and *G. pilosa*, in its choice of habitat it is more like *G. tinctoria*, growing principally in the scrub of the heath-clad hills. Like our other species of *Genista*, it must have immigrated from the south through Holstein and Schleswig, doubtless in late post-glacial time.

Genista pilosa L. — Haaret Visse.

J. LANGE 1886—88, 821. RAUNKLÆR 1922, 186. MENTZ 1906, 167. WARMING 1919, 142. ASCHERSON & GRAEBNER 1906—1910, 265. HEGI IV, 3, 1203. BENTHAM & HOOKER 1920, 103. NEUMAN 1901, 342. LINDMAN 1926, 376.

Geographical Distribution. A western Central (and South) European dwarf shrub, occurring from southwestern Sweden across Jutland to South England (rare), Southwest Europe to Portugal and Central Spain, and to North and Central Italy, the northern part of the Balkan countries, Northwest Galicia, Southwest Poland, and Posen (very rare). In the North German lowlands, where it grows in pine forests, on heaths, and hills exposed to the sun, it decreases in number towards the east. It is very rare in Mecklenburg (the Rostock heath) and Anterior Pomerania

(Wolgast), is rather widely distributed in Further Pomerania as far as the Oder, but is absent from West and East Prussia (formerly observed at Osterode). In Sweden it occurs on moors in the western part of the country, viz. northern Scania, southern Halland, and western Smalandia, but is rather uncommon. In Norway it is entirely absent.

Occurrence in Denmark. (Fig. 3, Pl. II). *G. pilosa* has been found in Jutland only. North of the Limfjord it is rare, and in the West Hanherred, Thy, and Mors it has only been collected in some few localities. In Salling and large parts of Himmerland the species is likewise very rare, and in the whole region rich in moraine clay in the east of Jutland, from Randers Fjord to the southern boundary of Denmark, it is almost entirely absent. Its main area is thus the western and central portions of the peninsula. Here it is closely associated with the heaths; it occurs both on hilly moorland and on the heath-clad late-glacial plains, it being very modest in its demands on the content of nutrient substances in the soil.

The species has no doubt immigrated from the southwest and spread over the peninsula from the south in late post-glacial time. Its absence in East Jutland is no doubt due to edaphic factors, at any rate it does not seem to have any connection with climatic conditions.

Genista tinctoria L. — Farve-Visse,

J. LANGE 1886—88, 820. RAUNKLÆR 1922, 185. MENTZ 1906, 163. WARMING 1919, 143. HORNE-MANN 1806, 655. ASCHERSON & GRAEBNER 1906—1910, 255. ASCHERSON & GRAEBNER 1899, 428. HEGL IV, 3, 1200. WITTICH 1889, 90, Taf. III, fig. 10. BENTHAM & HOOKER 1920, 103. NEUMAN 1901, 342. HARTMAN 1879, 314. A. BLYTT 1906, 452.

Geographical Distribution. A South and Central European undershrub, occurring from Asia Minor, the Caucasus, and Ural, across southern and Central Europe (with the exception of Portugal and the islands of the Mediterranean) to England, South Scotland, and Ireland (rare); northward to Denmark, Norway (a single locality), Southwest Sweden, Germany, in Poland northward to Grodno. A very closely allied form, *G. sibirica* L., is found in southwestern Siberia.

In the North German lowlands, where it grows in dry meadows, in foliferous and coniferous woods, and in coppices, it decreases in frequency towards the east, and even in Pomerania it is almost absent in the vicinity of the Baltic coast (Rügen, Usedom, and Wollin), but extends eastward to Dirschau at Danzig. Among the German North Sea islands it is only present on Sild.

In Sweden it occurs along the west coast on "dry grass fields" (pastures). It is common in the region round Halmstad, in some places in western Gothland, and in Scania, where it is both cultivated and run wild. It is the only species of *Genista* represented in Norway, where it is only found in the most southerly part of the country, thus among ling in pine woods at Brevik.

Occurrence in Denmark. (Fig. 5, Pl. III). It occurs almost exclusively in Jutland. It is rather uncommon in Vendsyssel and in the two Hanherreder as well as in

certain tracts in the interior of Jutland, viz. on the late-glacial heath-plains and in the sand dune area along the west coast, but may otherwise often be rather common. This has some connection with the fact that it is not quite unpretentious on the nutrient substances of the soil. It prefers the "better" heaths where hard-pan is absent or slightly developed, and attains its greatest frequency on hills where heath alternates with wood and scrub. It thrives best in the outskirts of woods and coppices, but is also frequently found by the roadsides. As a spontaneous plant it is known from the islands from some few localities in western Funen only, viz. at Hindsgavl, and at Vissenbjerg, where it has been known since 1806. Furthermore it grows in the Vejlby wood, at Strib, and on Fænø and Brandsø in the Little Belt, but is apparently absent from the island of Als.

In eastern Denmark there has occasionally been found a form of *G. tinctoria*, which K. WINSTEDT has referred to *v. Delarbret* Coss., indigenous in Central and southern France and in the Pyrenees. The Danish localities, where the form is doubtless anthropochorous, carried in with grass seed, are Fakse Ladeplads (1899), a railway slope at Masnedsund in the south of Seeland (1928), and Galløkken at Rønne on the island of Bornholm (1926).

The northern limit of the species, as regards its general distribution, runs across northern Jutland, and it may be assumed with certainty to have immigrated into the peninsula from the south, probably rather late. Its absence in the east of Denmark is singular, since suitable soil can hardly be lacking there.

Lathyrus aphaca L. — Bladlös Fladbælg.

J. LANGE 1886—88, 849. J. LANGE 1896, 286. RAUNKLÆR 1922, 194. ASCHERSON & GRAEBNER 1906—1910, 1020. HEGI IV, 3, 1590. PRAHL 1890, 45. NEUMANN 1901, 313.

Geographical Distribution. An annual herb, assumed to be originally indigenous in the Orient, from Balkan to Afghanistan, and Egypt, where it occurs chiefly as a weed among the grain; thence it has been carried to the whole area of the Mediterranean and to Central and western Europe, where it has occasionally become naturalised (archæophytic). In North Germany and the North it is ephemeral, and principally occurs in ruderal habitats. It has occasionally been noted in Sweden, but seems to be unknown in Norway.

Occurrence in Denmark. According to M. T. LANGE, KYLLING mentions it from Falster in 1648. According to J. LANGE it occurred at Odense in the years 1835—37, and was collected in 1840 on the dam by Næsbyhoved wood, likewise at Odense. Then it was observed in 1897 at the harbour of Svendborg, and has later been collected near several towns, *e. g.* Randers, Aarhus, Vejle, Fredericia, Kolding, Nykøbing Sj., and Copenhagen, everywhere round harbours and in ruderal habitats. At Kristiansminde near Svendborg it has further been found in 1906, growing in coppices, and at Skovsbo (likewise district 32) it was found in 1925,

richly fructifying on railway slopes, here, as at Odense in 1840, presumably sown with grass seed, as done in Sweden, according to NEUMAN. It seems as if its seed cannot normally ripen in our country.

Lathyrus heterophyllus L. — Vinge-Fladbælg.

J. LANGE 1886—88, 852. RAUNKIÆR 1922, 195. E. RØSTRUP 1864, 40. KYLLING 1648, 82. ASCHERSON & GRAEBNER 1906—1910, 1017. HEGI IV, 3, 1599. LINDMAN 1926, 388. HARTMAN 1879, 295. STERNER 1922, 304, 307, 326, Pl. 4.

Geographical Distribution. This eastern Central European, perennial herb, which is closely related to *L. silvester*, is distributed from Southeast France and Piemont to Central Russia (not found on the Balkan Peninsula, doubtful in the Iberian Peninsula). In the North German lowlands it is very rare, and is only recorded from some few localities in Posen, West Prussia, and East Prussia. It is most frequent in mountain regions, growing on dry and warm slopes where the soil is rich in lime, chiefly in hazel- and oak-scrub; it seems never to have been cultivated to any great degree (HEGI). In Sweden it is not rarely seen, especially in Smalandia and West Gothland, but also in southern Scania; extends northward as far as Nerke.

Occurrence in Denmark. KYLLING is thought to have known it from Loland, and E. MÖLLER-HOLST found it on fences at Raahave on the same island about the middle of last century, but later it has not been observed there. C. H. OSTENFELD collected it at Hindsgavl about 1900; however, since then it has not been found in Danmark. In the said localities the plant has presumably escaped from occasional cultivation in gardens. It is a species native to more southerly and easterly regions, and can hardly persist in our climate.

Lathyrus maritimus (L.) Bigelow — Strand-Ært.

J. LANGE 1886—88, 850. RAUNKIÆR 1922, 194. J. SCHMIDT 1899, 145 f. O. RØSTRUP 1902, 37. ASCHERSON & GRAEBNER 1906—1910, 1032. HEGI IV, 3, 1585. W. CHRISTIANSEN 1926, 187. BENTHAM & HOOKER 1920, 126. DRUCE 1908, 19. MURATOVA 1926, a, Pl. I. HARTMAN 1879, 297. ARESCHOUG 1881, 324. NEUMAN 1901, 312. LINDMAN 1926, 389. NORMAN 1895, 218. BLYTT 1906, 468.

Geographical Distribution. Circumpolar, perennial herb, distributed in South Alaska and Canada, along the seashores and by the large lakes in Canada; present in South Greenland, where it occurs from the sea to about 530 meters altitude, further in Iceland, northern Europe, and East Asia from Kamtschatka to Korea and Japan; recorded from South Chile.

Its sub-Arctic — Atlantic — Baltic area of distribution within Europe is more precisely defined: the Shetland Isles, Kerry in Ireland and some few places on the coasts of southern and eastern England, the eastern part of the French Channel-coast, the coasts of Belgium and Holland (introduced in recent times), the German and Jutlandish North Sea coasts and islands, sporadic localities along the south

and east coast of the Baltic eastward from Mecklenburg (Boltenhagen, Warne-münde) — recently, however, it has immigrated to the east coast of Holstein and German Schleswig —, Rügen and Usedom in Pomerania, West and East Prussia (more frequent), the coasts of the Baltic states (scattered), the Gulf of Finland and both sides of the Gulf of Bothnia to Södermanland, Oeland, Gotland, Sandö, the south and west coasts of Scania, Hveen, the Danish islands, sporadic localities along the coasts of Halland, Bohuslen, and southern Norway from Hvalörerne to Jæderen, further it occurs at Ranen, but is more common in the district of Tromsö, West and East Finmark, particularly along the shores, but also on dry hills farther inland to an altitude of 520 meters above sea-level; common farther on along the Polar Sea and the White Sea, at Ladoga and Onega.

Occurrence in Denmark. (Fig. 10, Pl. IV). Along the west coast of Jutland from the Emmerlev Cliff across Romö, Fanö, and Skallingen to the Scaw it is generally not rare on sandy shores, in direct continuation of its area along the German North Sea coast. It grows in several places along the western part of the Limfjord as far as Salling (district 9). Further it occurs sporadically in Seeland, on the coasts along the Cattegat, and on Sejrö as well as from Køge Bay across Møen to Falster, on the east coast of which it is rather common; to the west hereof it is present in three places only, viz. Kramnitze on Lolland, Erikshale on Ærø, and on Basnæs. On Bornholm it is rather common.

The peculiar form *f. acutifolius* BAB. is in Denmark mainly restricted to the west coast of Jutland, where the chief form seems to be rare (Skallingen), and to the Limfjord; in the east of Denmark it is known from Basnæs. Further it is recorded e. g. from Bohuslen, Helsingland, and the Shetland Isles. JOHS. SCHMIDT's investigations of the anatomy of the leaves of *L. m.* might suggest that at any rate one of the characters of the "North Sea type", i. e. of *f. acutifolius*, viz. the isolateral structure of the leaves, has been produced by external conditions, more particularly by the salineness of the soil and intense illumination, but it is still a matter of doubt whether *f. acutifolius* can on this basis alone be considered as a mere local adaptation to the conditions of the locality, as long as it can be found on the slightly saline coasts of the Baltic, and its chief form may be met with even on Skallingen.

It is stated by several authors that the seeds of *L. m.* may remain floating on the water for a long space of time, up to 10 months. J. SCHMIDT states that seeds of *L. maritimus* had driwen ashore on some small sandy islets without phanerogamic vegetation lying abt. 15 km west of Falster, and it appeared from an examination made by NORMAN that 59 per cent of the seeds could float on sea water, while 41 per cent sank; O. ROSTRUP has shown that after having remained for 36 days in 3.5 per cent salt water, the power of germination of the seeds is only very little reduced. The species is therefore no doubt distributed along the coasts by the action of the sea, cfr. for instance its migration along the western part of the Baltic (CHRISTIANSEN); its unequal distribution, e. g. on the Danish coasts, thus its entire absence

from the east coast of Jutland and Funen, must probably have some connection with the course of the currents in our inland seas during the time, i. e. autumn and winter, when the seeds of *L. m.* that are capable of germinating may be supposed to float in the sea; for these long stretches of coast are not entirely devoid of suitable localities for this species.

No finds of fossils of *L. m.* have been made, but it must be assumed that as a circumpolar species it is at any rate older than the latest glaciation and that it spread northward during the melting of the inland ice, when the coasts afforded suitable localities for it. Possibly it has persisted in our degrees of latitude since the time of the melting of the ice, and might very well have found suitable life-conditions on the coasts of the North Sea and the Cattegat throughout the post-glacial period. The migration of the species to the Baltic and the Gulf of Bothnia may be assumed to have taken place by two routes and at different times, partly in late glacial time from the White Sea through the strait possibly existing at that time to the Finnish Gulf — its occurrence at Ladoga and Onega may perhaps be considered as a relict from that time — partly in and after the Littorina period, when the subsidence of the land had given admittance to the sea through the Sound and the Belts to the Baltic basin. The distribution of the species along the Swedish coast of the Cattegat and along both the coasts of the Sound probably indicates its Littoral, or post-Littoral, road of migration to the Baltic.

Lathyrus montanus Bernh. — Krat-Fladbælg.

(Syn. *Oroborus tuberosus* L. — Knoldet Glatbælg).

J. LANGE 1886—88, 853. RAUNKLÆR 1922, 195. ASCHERSON & GRAEBNER 1906—1910, 1060. HEGI IV, 3, 1581. LINDMAN 1926, 389. BLYTT 1906, 467. CEDERCREUTZ 1927, 124, maps 5 and 53.

Geographical Distribution. European perennial herb, distributed from Ireland, Scotland, the Shetland Isles, and southern Fennoscandia eastward across Central and southern Russia; absent from the greater part of the Danube countries, and doubtful on the Balkan Peninsula; extends, however, southward to Dalmatia (rare), Italy, France, and the Iberian Peninsula. It prefers soil poor in, or destitute of lime, and may be very common, especially in heaths, pastures, and in dry and open woods, but is absent over wide stretches, e. g. in the greater part of the North German lowlands, and among the North Sea islands it is only found on Sild.

In the Scandinavian Peninsula it is generally of common occurrence on heather moors, pastures, and in coppices; in Norway as far as Kristiansund (63° N. lat.) and isolated on Lekö ($65^{\circ} 4'-6'$ N. lat.), in a single place extending into the birch belt; in Sweden it extends northward to Dalarne and Ångermanland; in Finland it is only found in the southwestern part, including the Aland Isles (see CEDERCREUTZ, maps 5 and 53).

Occurrence in Denmark. (Fig. 7, Pl. III). The species is spread over the greater part of the country, and is common on pastures, grassy slopes, and heaths, in light and dry woods and coppices, particularly in the more meagre regions, whereas it does not thrive quite so well in neutral or basically reacting ground, and in regions where moraine clay is the principal surface formation it either occurs more rarely or may be entirely absent. This is the case over wide stretches in the southern part of the country, as for instance portions of South and West Seeland, Møen, Falster, Lolland, Langeland (except at Guldstav and Kjelbjerg), Funen (with the exception of its northern part and Helnæs), Als, and Samsø. It is likewise absent from the meadows and marshy tracts of western South Jutland, on our North Sea islands, probably also in the sand dune area along the west coast as far as the Limfjord, and on Læsø and Anholt.

Lathyrus niger (L.) Bernh. — Sort Fladbælg.

(Syn. *Orobus niger* L. — Sort Glatbælg).

J. LANGE 1886—88, 853. RAUNKIÆR 1922, 195. ASCHERSON & GRAEBNER 1906—1910, 1051. HEGI IV, 3, 1572. PRAHL 1890, 46. BENTHAM & HOOKER 1920, 126. HARTMAN 1879, 298. LINDMAN 1926, 389. BLYTT 1906, 468. HJELT 1919, 194.

Geographical Distribution. European perennial herb, extending over nearly the whole continent—except the most northerly regions, Great Britain (but present in two localities in Scotland), Holland, northern Belgium, and the North German lowlands. Here the northwestern limit of the species runs from Metz over Siegen in Westphalia to Bielefeld, Hannover, Neuhausen at Magdeburg, to Ratzeburg at Lübeck; in the province of Schleswig-Holstein it occurs in scattered growths in the eastern part only; it is met with everywhere in light woods, chiefly in oak woods, on hills, and in coppices. The species extends eastward to the Caucasus and southward to Algeria, where it is rare.

In the Scandinavian Peninsula the species is rather uncommon, but may occur in woods, coppices, and on screes, in Sweden northward to Helsingland and Dalarna; in eastern Norway northward to Nordre Land and Ringsaker, but it is rarer west of the mountains, and likewise north of the Dovre to Leksvigen on the north side of Trondhjem Fjord ($63^{\circ} 40'$ N. lat.); in Finland only in the extreme southwestern regions.

Occurrence in Denmark. (Fig. 16, Pl. V). J. LANGE's statement that the plant occurs occasionally in all provinces, is further illustrated by the map. On Bornholm, Seeland, and Funen it has been found in a fairly great number of localities, which, however, are somewhat irregularly distributed; thus groups of localities are found in South and Southwest Seeland along the coast, round Skarritsø, Alindemagle, and in the central parts of Northeast Seeland, as also, though more rarely, in the south and north of Funen. Further it is known from several, most frequently scattered, finds along the east coast of Jutland from Flensburg Fjord

to Mariager Fjord, principally in woods at or near the coast. In addition it has been observed sporadically from the area south of the Limfjord to the regions round Viborg and Buderupholm wood in Himmerland, in a single locality in Vendsyssel (Dal wood at Tolne), and in the western part of southern Jutland, viz. in coppices at Grimstrup, Oxevad, and Tevring.

The species prefers light woods and outskirts of woods, wooded slopes and coppices; it is most frequent in regions rich in moraine clay, but does not seem to be strictly eutrophic. Its East-Jutlandish area is a direct continuation of its area in eastern Schleswig-Holstein. No doubt a migration has taken place by this route to Jutland and Funen, but the species is very likely of such ancient origin in the North (its northern limit runs slightly north of that of the oak), that it still may have utilised the continental connection between northern Germany and the Danish Islands as well as between these latter.

Lathyrus paluster L. — Kær-Fladbælg.

J. LANGE 1886—88, 851. RAUNKÆR 1922, 195. ASCHERSON & GRAEBNER 1906—1910, 1033. HEGI IV, 1582. PRAHL 1890, 46. BENTHAM & HOOKER 1920, 126. STEFÁNSSON 1924, 160. LINDMAN 1926, 389. SEGERSTAD 1924, 94, map fig. 119. BLYTT 1906, 469.

Geographical Distribution. A sub-Arctic, Central European perennial herb. It is distributed from northern Asia, across Russian and Finnish Lapland, the Finmark, and Iceland (rare), southward to the Iberian Peninsula, northern Italy, the northern part of the Balkan Peninsula, and Ukraine. It is absent from the Mediterranean region proper, is rare e. g. in western France, Belgium, England, and Ireland, and is doubtful in Scotland. It grows in marshes, meadows and boggy woods, and is equally distributed over northern Germany, in Holstein in the southwestern part, and in German Schleswig at Eckernförde, Langballeaa at Flensburg Fjord, and Træsö south of Flensburg. In the Scandinavian Peninsula it grows in wet meadows and occurs nearly throughout the whole of Sweden — its distribution in the south of this country has been mapped by SEGERSTAD —, in Norway it occurs, but rarely, east of the mountains from Tjömö to Hedemarken, in Vesteraalen on the Hadselø (68° 30' N. lat.), and here and there in the lowest parts of the Finmark from Alten to Varanger.

Occurrence in Denmark. (Fig. 15, Pl. V). J. LANGE records it from bogs and wet meadows in all Danish provinces; it is sporadic, and disappears intermittently in several places. The map in fig. 15 shows the known finds in Denmark, but in many of the localities one will now, no doubt, seek it in vain. It has been most frequently found in the southern part of Bornholm, Lolland, and Seeland, to which corresponds a relatively extensive distribution over Scania and southern Blekinge. From Funen finds are recorded from the northern part, and from Jutland from a number of localities, nearly always in the vicinity of the coast, so that the large central part of the peninsula is without finds. The plant seems to prefer regions

with calcareous soil (cfr. its distribution in southern Sweden), but is by no means restricted to these, since it is found in the north and west of Jutland in regions poor in lime, and is absent from several tracts markedly rich in moraine clay, e. g. large stretches of Funen, Als, etc., but it may always be found in marshes comparatively rich in nourishment and presumably only slightly acid, and does not occur in bogs of a more oligotrophic type.

Being one of the species extensively distributed in northern Europe, it has no doubt immigrated into Denmark early in post-glacial time, before the formation of the western part of the Baltic; its distribution in Central Europe renders it probable that it has migrated to this area from the east, and hence the conjecture that it has found its way into Denmark from the south and southeast, would seem reasonable.

Lathyrus pratensis L. — Gul Fladbælg.

J. LANGE 1886—88, 849. RAUNKIÆR 1922, 194. OLSEN 1921, 50 f. OSTENFELD 1901, 70. STEFÁNSSON 1924, 161. ASCHERSON & GRAEBNER 1906—1910, 1029. HEGI IV, 3, 1587. MURATOVA 1926, a, Pl. I. BLYTT 1906, 468. LINDMAN 1926, 389.

Geographical Distribution. European, Asiatic, North African perennial herb, distributed over nearly the whole of Europe to Iceland, where it is common in the south; further it occurs in the Faroe Islands (on homefields), and in northern Scandinavia; it is rare at high mountain levels and in the Mediterranean area; occurs in Russia as far as the Arctic Circle, in temperate Asia to Transbaikalia, southward to the Himalayas and Asia Minor; hardly native in Japan; found in North Africa southward to Abessinia; naturalised in North America.

As in northern Germany, it is also common in Scandinavia, occurring in meadows and light coppices, in the mountains also on screes, as far north as Tromsø and South Varanger, often penetrating into the birch belt, but seldom reaching the northern limit of the birches.

Occurrence in Denmark. The species grows in meadows with a nearly neutral or basic reaction ($\text{pH } 6.0 - 7.9$) or at the edge of ditches and in light woods; has been noted in all districts except No. 12 (Anholt), and in all of them the degree of frequency is common or rather common, except in some few western tracts, where it is apparently less frequent (districts Nos. 15, 16, 18, and partly 26 and 27). The highly down-haired form *villosus* DREJER has been collected in all parts of the country, scattered over dry and sunny places, thus on slopes or on grey dunes.

Lathyrus sativus L. — Spansk eller Indisk Ært.

RAUNKIÆR 1922, 195. ASCHERSON & GRAEBNER 1906—1910, 1003. HEGI IV, 3 1604. MURATOVA 1926, a, Pl. I.

Geographical Distribution. Annual herb and old cultivated plant, possibly originally indigenous in western Asia, viz. in the area between the Caucasus, the

Caspian Sea, and northern India, but since antiquity cultivated for its grain and as forage for cattle in the Mediterranean region and in the southern tracts of Central Europe, where it now lives as archæophyte in waste places and at roadsides. It is still cultivated in several places in the south of Germany, in Bohemia, and Austria, and easily runs wild. In northern Germany it only appears intermittently in waste places, e.g. at Hamburg and Berlin. Its seed is known from prehistoric tombs in Egypt, from the Neolithic station at Lengyel in Bosnia, and from Troja.

Occurrence in Denmark. Since the end of last century the species has been collected in waste places in several parts of the country, thus at the harbour of Odense, Skaarup Skovmølle, the harbours of Bandholm, Kalundborg, and Holbæk, and in a couple of places in the vicinity of Copenhagen 1891—1912. From 1891 a find of the plant is recorded from a clover-field at Vindehelsinge, near Slagelse, and in 1912 a specimen was found in a clover-field at Lyngø on Thyholm.

Lathyrus silvester L. — Skov-Fladbælg.

J. LANGE 1886—88, 851. RAUNKIÆR 1922, 195. ASCHERSON & GRAEBNER 1906—1910, 1014. ASCHERSON & GRAEBNER 1899, 453. HEGI IV, 3, 1593. W. CHRISTIANSEN 1926, 145, 173, map. 43. BENTHAM & HOOKER 1920, 124. BLYTT 1906, 469. HARTMAN 1879, 296. ANDERSSON & BIRGER 1912 84, 94. SEGERSTAD 1924, 94, map fig. 120. CEDERCREUTZ 1927, 123, map. 47. MURATOVA 1926, a, Pl. I.

Geographical Distribution. European perennial herb, distributed over nearly the whole of Europe, but absent from the most northerly regions, Iceland, and the Faroe Islands, the extreme southern parts of the Iberian Peninsula and the Balkan Peninsula; present in the Caucasus. — In northern Germany it is of scattered occurrence in dry woods and coppices; it has occasionally been cultivated as a forage-plant, and has run wild to great extent. According to CHRISTIANSEN's map, it occurs sporadically in eastern Holstein from the area round Altona to Eckernförde, but only in a few places farther westward, and farther northward in South Jutland only along the east coast. In the Scandinavian Peninsula it extends northward to Trondhjem Fjord and Ångermanland; is rather uncommon, and grows in coppices, on dry grassy slopes, and on screes; within the northern area confined to southward-facing slopes. On SEGERSTAD's map of its distribution in southern Sweden it is seen to avoid the central, more oligotrophic regions. In Finland, where it is specific to grove-meadows ("lövängar")¹⁾, it is found sporadically in the southern tracts as far north as 62° N. lat. (CEDERCREUTZ).

Occurrence in Denmark. (Fig. 14, Pl. V). It grows in woods, coppices, on fences, and on the edge of ditches. J. LANGE records it as not rare. This applies to most regions of the islands and the east coast of Jutland from the southern boundary to the southern part of Djursland, i.e. the regions of the country that are richest in moraine clay, but outside these areas it is of rarer occurrence, e.g.

¹⁾ Cf. e. g. STERNER 1922, 339.

round Randers and Mariager Fjords, in Himmerland, the western area of the Limfjord, and northern Vendsyssel; or it may be entirely absent, as in nearly the whole of central and western Jutland. It prefers slopes and broken ground, which offer it plenty of light and a dry and warm, not too poor soil; hence it is frequently found along the coast or in hilly, much fissured territory, as for instance in certain tracts in the north of Seeland. e.g. at Jyderup and in other places, further round Tolne in Vendsyssel, etc. Remarkable is its immigration into the West Jutlandish pine plantations at Husby and Ulfborg, where it was observed in 1914 on the grassy slopes of ditches.

L. silvestris varies chiefly with regard to the width of its leaves: *v. platyphyllus* (RETZ.), with elliptical leaflets, has occasionally been collected in waste places or on cultivated soil (Hesselvig Enggaard), but also in localities apparently not influenced by cultivation, presumably in highly nutrient soil. *v. stenophyllus* LGE. (*ensifolius* BUEK.), with linear-lanceolate leaflets, has been collected in various places in Vendsyssel, eastern Jutland, Funen, Seeland, Møen, and Bornholm.

Lathyrus sphæricus Retz. — Enblomstret Fladbælg.

J. LANGE 1886—88, 849. RAUNKIÆR 1922, 195. OSTENFELD 1914, 68. WIINSTEDT 1924, 314. A. ANDERSEN 1909, 427. ASCHERSON & GRAEBNER 1906—1910, 1037. HEGI IV, 3, 1606. LINDMAN 1926, 389. ARESCHOUG 1881, 326, 571. FRISENDAHL 1924, 241 f.

Geographical Distribution. Mediterranean, Pontine annual herb, distributed on either side of the Mediterranean, eastward to the Caspian Sea, westward to Madeira and the Canary Islands. Its rather continuous area to the north extends to Switzerland, South Tyrol, Istria, Hungary, and the Crimea; further it is found in the Rhine Valley, and in occasional localities on Bornholm and in the south of Sweden. In southern Europe it lives in pastures "trockener Weiden", meadows, oak scrubs, vineyards, arable land, and at roadsides; it is regarded by HEGI as anthropochorous in the Rhine Valley and the Scandinavian localities.

In Sweden it was first observed in 1869 on a grass-clad, southward-facing slope at Kullen, where "the position of the locality makes it highly improbable that the occurrence here of this plant is due to human influence" (ARESCHOUG). The species has maintained itself here during subsequent years, and has been sown in other places on Kullen. In 1921 it was found on Brattö northeast of Marstrand, likewise on rock sides with a southerly exposure, in a quite natural association of plants; here, too, the species has maintained itself since. FRISENDAHL states that in Sweden propagation only takes place through seeds, which germinate in the spring, the embryo plants that appear in the autumn dying in the course of the winter.

Occurrence in Denmark. In 1884 E. RØSTRUP found *L. sphæricus* in great quantity on a steep, southward-exposed, grassy slope on the Hammershus cliff; since then it has repeatedly been collected there, the last time in 1927 (K. WIINSTEDT), when it was quite common. It grows there in an abundant and varied company of

grasses, i. a. the more southerly species *Poa bulbosa*, and numerous perennial plants not visibly affected by cultivation; that is to say, in a similar way as in the Swedish localities. The species is further recorded by A. ANDERSEN from Næsbyhoved near Odense Canal, no doubt from waste places; however, the find has not been confirmed, so very likely there is a mistake here. On the whole the species is almost unknown in waste places in the North (FRISENDAHL 247 f.). The species can hardly be considered as anthropochorous in Scandinavia, but whether it is here a relict from the post-glacial warm period, during which it may have had a wider and more continuous northerly distribution than at the present day, or whether it has been spread to Bornholm and southern Sweden by birds of passage, one of whose routes runs along this stretch, can for the time being hardly be decided with certainty. FRISENDAHL, who has investigated the subject, regards the plant as a relict, since in its distribution and mode of occurrence it shows an obvious analogy with the South Scandinavian species, which doubtless in many cases grow isolated on the North Swedish "Sydberg", (southward-facing mountain slopes) as relicts from the post-glacial period of warmth, far to the north of their proper range.

Lathyrus tuberosus L. — Knoldet Fladbælg.

J. LANGE 1886—88, 850. RAUNKLÆR 1922, 195. M. T. LANGE 1859, 11, 14. SIMON PAULLI 1648, 243. JOHAN PAULLI 1761, 247. ASCHERSON & GRAEBNER 1906—1910, 1019. HEGI IV, 3, 159f. HARTMAN 1879, 296. LINDMAN 1926, 389. SEGERSTAD 1924, 197, map fig. 387.

Geographical Distribution. HEGI is of opinion that this tuberiferous plant is originally indigenous in western Asia and possibly also in the Lower Danube valley, but that as far back as prehistoric times it has spread over large stretches of Europe in association with cereal culture. At the present day it is spread over the greater part of Europe from the northern parts of the Mediterranean region (and Algeria) northward to southern England, northern Germany, southern Scandinavia, Poland, and Estonia; in Asia it extends eastward to the Yenisei, Dzungaria, the Caucasus, and Syria.

The species is rather common in South and Central Germany as a neophyte in half-cultivated formations, on the outskirts of woods, and on pastures "Magerwiesen"; it is very rare in Northwest Germany and in eastern Prussia, but fairly common in Brandenburg, Further Pomerania, Posen, and western Prussia, especially in the river basins. In Sweden it grows as a weed in fields and gardens, as also in the meadows of large estates in Scania, East Gothland, and the landscapes round the Mälaren, where it has run wild since it was cultivated in the 18th century for the sake of its edible tubers.

Occurrence in Denmark. It is found in BURSER's herbarium (1625—39), collected at Bistrupgaard near Roskilde, where it survived to 1880. On the Kastelsvolden in Copenhagen it was collected in 1848 (now disappeared), in waste places at Næsbyhoved near Odense in 1909, and at Lappen near Elsinore in 1927.

In this country, too, the plant has doubtless formerly been cultivated for its tubers. SIMON PAULLI, who calls it *Glandes terrestres*, pea-nut, heath-pea, writes that it occurs in several places, since it is cultivated in some gardens and grows wild "near shrubs" and even amidst rye and barley. The tuber, he says, is bigger than an acorn, but hardly one of twenty people knows these edible roots. Also other botanists of the 17th century mention the plant. KYLLING states it to be common, but has no doubt confused it with *L. montanus*; possibly this is also the case with SIMON PAULLI. In this country it has hardly been so commonly used as in several places in foreign countries (JOHAN PAULLI). Its relatively great frequency in Sweden may be due to the close alliance between the latter country and Germany in the 17th and 18th centuries.

***Lathyrus vernus* (L.) Bernh. — Vaar-Fladbælg.**

(Syn. *Orobus vernus* L. — Vaar-Glatbælg).

J. LANGE 1886—88, 853. RAUNKÆR 1922, 195. ASCHERSON & GRAEBNER 1906—1910, 1047. HEGI IV, 3, 1574. PRAHL 1890, 46. HARTMAN 1879, 297. LINDMAN 1926, 389. STERNER 1922, 240, 367, 409, Pl. 22. SEGERSTAD 1924, 94 (map fig. 121), 112, 115. BLYTT 1906, 467. HJELT 1919, 195.

Geographical Distribution. Sub-Arctic, Baltic, eastern Central and South European, West Asiatic perennial herb, absent e. g. from Great Britain, Ireland, Belgium, Holland (except Limburg), Northwest Germany, North and West France, the southern part of the Balkan Peninsula, and the Italian islands. To the east the species extends to West Siberia, the Caucasus, and Asia Minor. Its north-western limit in Germany follows the line Achen—Köln—Osnabrück—Braunschweig across Altmark to the eastern tracts of Holstein and Schleswig; in the western part of Holstein it is only found at Schwabstedt. For the rest it occurs sporadically in northern Germany, especially in foliferous woods. In Sweden it extends northward to Ångermanland and Jemtland, is not uncommon in the south of the country, particularly to the east, more infrequent to the north. In Norway it is fairly common east of the mountains, rare west of the mountains in the interior of the fjords, and occurs here and there north of the Dovre as far as Ranen ($66^{\circ}15'$ N. lat.). In Finland it is rather frequent as far as 62° N. lat., but rarer northward to 67° N. lat.; also present on Kola along the White Sea. Occurs throughout Scandinavia and Finland in coppices and woods.

Occurrence in Denmark. (Fig. 23, Pl. VII). The plant grows in shady woods in fresh mould in the southeastern part of the country: northern Bornholm, Falster, Lolland (especially along Guldborg Sound), Möens Klint, Seeland (particularly in the western and central districts, but is absent e. g. in the northernmost of the three northerly peninsulas), Funen (chiefly in the south), eastern Jutland in the coastal tracts from Kollund wood by Flensburg Fjord to Mariager Fjord and Nörlund woods in Himmerland, being most frequent in the central part of this tract. An old record of *L. v.* from Nykøbing Mors has never been verified. Its distribution

within Denmark is doubtless conditioned by its general easterly distribution and by its demand for a soil not too poor in nutrient substances.

Immigration from the south and southeast, probably at an early period of the Continental epoch.

Lotus corniculatus L. — Almindelig Kællingetand.

J. LANGE 1886—88, 840. RAUNKIÆR 1922, 191. JESSEN & LIND 1923, 125, 332. OSTENFELD 1901, 70. FERDINANDSEN 1918, 62. ASCHERSON & GRAEBNER 1906—1910, 676. HEGI IV, 3, 1367. BLYTT 1906, 462. LINDMAN 1926, 382.

Geographical Distribution. Euro-Asiatic perennial herb, extending over nearly the whole of Europe, temperate Asia southward to India, and North Africa; anthropochorous in Australia. — In the Scandinavian Peninsula it extends to $71^{\circ} 5'$ N. lat., and in the mountains ascends into the willow belt, being common on hills, in meadows, sandy fields, and similar places. It is spontaneous on the Faroes. In Germany, too, the species is common in meadows and fields.

Occurrence in Denmark. Common in all districts of the country on soil poor in lime as well as on calcareous soil. It occurs partly as a spontaneous plant on dry hills, dikes, along roads, and on slopes, further on white as well as grey dunes, and on heaths, but in addition it is commonly cultivated in an introduced form under the name of "Bredbladet italiensk Kællingetand" (Broad-leaved Italian Bird's-foot Trefoil).

The species is very variable. The most conspicuous inland forms are *v. microphyllus* LGE., collected on dunes on the west coast of Jutland (Agger, Blaavand, and Esbjerg), by the Lögstør Channel, and on the shores at Fyns Hoved; and *v. villosus* THUILL., known from shores, dunes, gravel-pits, and dry hills at Kanegaard on Bornholm, Tiköb in the north of Seeland, Thunö, Anholt, Læsö, Aalborg, Tvræsted in Vendsyssel, and Svinklöv in Western Hanherred.

Owing to its extensive northward distribution, it must be assumed that the species has immigrated in early post-glacial time, during the maximum of the elevation of the land-surface, doubtless from the south.

Lotus tenuis W. & Kit. — Smal Kællingetand.

J. LANGE 1886—88, 840. RAUNKIÆR 1922, 191. ASCHERSON & GRAEBNER, 1906—1910, 683. ASCHERSON & GRAEBNER 1899, 441. HEGI IV, 3, 1369. PRAHL 1890, 43, 285. LINDMAN 1926, 382. BLYTT 1906, 463.

Geographical Distribution. South and Central European, West Asiatic perennial herb. It extends over the greater part of Europe, northward to Denmark and southern Sweden (absent as a spontaneous plant in Norway, Finland, and northern Russia); eastward to Turkestan, Afghanistan, and Dzungaria; and southward to North Africa. It generally occurs very sporadically, preferring saline

and moist soil. — In northern Germany, where it is not common, it is chiefly found in littoral meadows, e. g. in the Dithmarsch, on the east coast of Schleswig-Holstein from Lübeck to the Slien and on Bæverö off the north coast of Angel; it is not recorded from Mecklenburg, and from the south coast of the Baltic it is only mentioned from the region round Putzig northwest of Danzig, but may have been overlooked or confused with the allied form *L. corniculatus*. In Sweden, too, it is found in littoral meadows, but rather rarely, viz. in Scania, Halland, and southern Smalandia.

Occurrence in Denmark. (Fig. 27,¹⁾ Pl. VIII). In regions where *L. tenuis* occurs unaffected by cultivation, it is only found in littoral meadows and similar situations near the shore. It is not uncommon on Bornholm, and is met with here and there in suitable localities, on the coasts of the other islands. The absence of such localities, e. g. in the north of Seeland, explains that the species has not been recorded from this region. In Jutland the species is much rarer, but is recorded from some few places on the east coast between Hejls and Kalø, in the area of the Limfjord at Venö Bay and at Birkelse ("singly and rare"), from the meadows of S. Farup near Ribe, and from Fanö. These southwestern localities of the species must be considered as a northerly continuation of its area in the Dithmarsch. Its northern limit runs through Denmark and southern Sweden.

A form of this species, viz. "Smalbladet italiensk Kællingetand" (Narrow-leaved Italian Bird's-foot Trefoil), is cultivated together with clover, but is less-constant than the corresponding form of *L. corniculatus*.

Here, near its northern limit, *L. tenuis* is largely confined to saline soil, and its distribution along the southern Danish coasts must then probably at the earliest have taken place in Littoral time. As it is a warmth-demanding species, its advance towards the north must have been favoured during the post-glacial optimum of warmth.

Lotus uliginosus Schrank. — Sump-Kællingetand.

J. LANGE 1886—88, 839. RAUNKIÆR 1922, 191. ASCHERSON & GRAEBNER 1906—1910, 674. HEGI IV, 3, 1372. HARTMAN 1879, 306. SEGERSTAD 1924, 78, 86, 213. BLYTT 1906, 463.

Geographical Distribution. West Asiatic, Central and West European, Mediterranean perennial herb. Extends from Tibet, Armenia, and the Caucasus northward through Central Russia to Latvia, the most southerly districts of Sweden and Norway, and Great Britain; southward across the countries on either side of the Mediterranean to Spain, except the southern part of the Balkan Peninsula and the Italian islands; is further found on Madeira. It is common in northern Germany in moist meadows, and occurs in similar places in southern Sweden, viz. in about fifty localities especially within the southwestern districts: Scania,

¹⁾ On the map the localities from grassy fields and waste places has been left out.

Halland, and Blekinge, and more rare in Bohuslen, East Gothland, Smalandia, and on Store Carlsö by Gothland, partly spread with seed sown in grass fields. As regards Norway, it is only recorded from the southernmost tracts: Vaale in Jarlsberg, Brevik, and Romsdal.

Occurrence in Denmark. (Fig. 8, Pl. III). The species is not uncommon in wet meadows and bogs, being characteristic of spring-bogs, in most tracts of Jutland, Funen, certain parts of Seeland, and Bornholm, while it is apparently quite absent, or very rare, in the extreme north of Jutland, the northern regions of Seeland, and on Møen, Lolland, Falster, and Langeland. It is not recorded from districts 2, 12, 34, 38, 45 b, and 46.

Within Denmark the form *villosus* LAMOTTE (*vestitus* LGE.) is known from Rømø, Fanø, and boggy moors at Ulfborg; it is a southerly form, chiefly met with in dry localities in southern Europe, but also e. g. near Vienna; farther northward, besides in Denmark, it is found on the islands Sild and Föhr. *L. uliginosus* has doubtless immigrated from the south, probably in relatively late post-glacial time.

Lupinus angustifolius L. — Smalbladet Lupin.

RAUNKLÆR 1922, 185. ASCHERSON & GRAEBNER 1906—1910, 231. HEGI IV, 3, 1158.

Geographical Distribution. Annual herb, growing wild throughout the Mediterranean area from the Iberian Peninsula to Syria, otherwise occurring both cultivated and wild in South and Central Europe, and particularly in eastern Europe. It was introduced into Germany from Spain, it would seem in the sixteenth century; it is seldom cultivated to any great extent.

Occurrence in Denmark. In this country it is cultivated like the Yellow Lupine, but more rarely, and is inconstant like the latter.

Lupinus luteus L. — Gul Lupin.

RAUNKLÆR 1922, 185. MÖLLER-HOLST 1881, IV, 204. SIMON PAULLI 1648, 80. ASCHERSON & GRAEBNER 1906—1910, 228. HEGI IV, 3, 1157.

Geographical Distribution. Annual herb, a native of the western parts of the Mediterranean area, probably especially of the Iberian Peninsula; is said to have been introduced into southern Italy and southern France, where it has now run wild; as a cultivated plant it also occurs in more remote regions, thus as far as southern Scandinavia and Russia. In Germany it has been cultivated as an ornamental plant at any rate since 1560, but as green manure only to any great extent since about 1850.

Occurrence in Denmark. It is frequently cultivated in sandy fields as a nitrogenous plant for ploughing into the soil, more rarely as a fodder plant, and is most frequent in Jutland. The employment of Yellow Lypine in agriculture was

commenced in the seventies of last century; it often grows wild in the vicinity of the fields, but it is very sensitive to frost, and is inconstant. SIMON PAULLI records it as cultivated in gardens for medicinal purposes.

Lupinus polyphyllus Lindl. — Mangebladet Lupin.

RAUNKLÆR 1922, 185. ASCHERSON & GRAEBNER 1906—1910, 223. HEGI IV, 3, 1154.

Geographical Distribution. Perennial herb, a native of western North America, and introduced into Europe as a green manure, or as a fodder and ornamental plant; in recent time it is also used as fodder for game. It easily runs wild, and is apparently quite naturalised e. g. in many parts of the North German plain.

Occurrence in Denmark. In this country, too, it is cultivated in gardens as an ornamental plant, and is used here and there in woods as a fodder plant for pheasants and roedeer. It may run wild and may then occasionally be met with in great abundance in such places, e. g. in open patches in Priis Wood on Langeland and in Graasten park.

Medicago falcata L. — Segl-Sneglebælg.

J. LANGE 1886—88, 837. RAUNKLÆR 1922, 187. FERDINANDSEN 1918, 73. HORNEMANN 1821, 790. KYLLING 1688, Nr. 1021. ASCHERSON & GRAEBNER 1906—1910, 398. HEGI IV, 3, 1259. A. CHRISTIANSEN 1913, 18. W. CHRISTIANSEN 1926, 138, 175. BENTHAM & HOOKER 1920, 106. KOUSNETZOFF 1926, fig. 5. LINDMAN 1926, 378. BLYTT 1906, 455.

Geographical Distribution. Asiatic, South and Central European perennial herb, distributed in temperate Asia from China and southward to Persia, over most of Europe, extending northward to Perm, Nijni-Novgorod, Estonia, southern Scandinavia, Denmark, and the eastern tracts of England, where it is rare. In Central Europe it grows on sunny, particularly stony, slopes and hillsides, along roads, and in waste places; it decreases in number towards the northwest, viz. in Belgium and northwestern Germany, where it is hardly indigenous. In Holland it is occasionally found in the eastern tracts, growing on hills, and further here and there in waste places in towns. As a spontaneous species within Europe it is mainly an Eastern Central European and Mediterranean plant.

In Sweden *M. falcata* is met with in similar situations as in Central Europe, thus in the south of the country from Scania to Vestmanland and Upland, and is rather common in several places; in Norway it is only found as an anthropochore in the southern part of the country.

Occurrence in Denmark. (Fig. 19, Pl. VI). *M. falcata* grows in this country partly in waste places, e. g. by the harbours of many of our towns or near large mills, partly by roadsides and, more rarely, on dry hillsides and in similar places, more particularly in the fertile regions. It thrives especially well on calcareous soil

(e. g. Möens Klint, Dybdal at Aalborg, Mönsted), but is by no means confined to it. C. FERDINANDSEN refers it to the plants preferring alkaline soil. As will appear from the map, it has been found rather scattered on the islands and in the eastern part of the peninsula as far as Frederikshavn. Its absence in the west of Jutland (except by the harbour of Esbjerg and in the surrounding waste places) and in southern Jutland as well must be viewed in connection with its very sporadic occurrence in the Northwest German lowlands. Here as there it will probably be best to regard it as an archæophyte and a neophyte. It is mentioned by KYLLING, and seems to have been rather widely distributed in the country at the time of HORNE-MANN. It has not hitherto been used for cultivation, but its seeds are occasionally sown together with other seeds, especially Lucerne, and from the fields with Lucerne *M. falcata* may migrate to the edges of ditches and to hill slopes.

M. falcata v. gracilis URBAN grows in localities similar to those of the chief form, and has a similar distribution.

Medicago falcata × sativa Rchb. — Sand-Lucerne.

(*M. media* PERS. — *M. varia* MARTYN).

J. LANGE 1886—88, 837. RAUNKIÆR 1922, 187. MÖLLER-HOLST 1882, V, 309. ASCHERSON & GRAEBNER 1906—1910, 401. HEGI IV, 3, 1264. O. HAGEM 1919, 149.

Geographical Distribution. Transitional forms between *M. sativa* and *M. falcata* occur within the areas where both these species are found, and in addition not infrequently in company with only one of them. The hybrid does not, however, seem to have been observed in Norway.

Occurrence in Denmark. This hybrid has been collected in about half a score localities in the east of Jutland, viz. from Aalborg to Aabenraa, further in Vendsyssel and East Hanherred, viz. in districts 1, 6, 11, 13 a, 21, 22 a, 25, and 48; in addition it is known from Samsø, some few places on Funen (districts 28, 29, 31, and 32), Langeland, Møen, and, scattered, from most districts of Seeland (39 a, 42 to 46), being apparently commonest in districts 42 and 45 b. On Bornholm it is rather common at Hammershus and along the Hammer railroad. It grows chiefly in waste places and in similar situations in the environment of towns and along roadsides. It must be assumed that its presence is in some degree due to hybridisation between the two parent species, since it has been established through several experiments (HAGEM a. o.) that such a crossing very easily takes place, by which our plant, in some degree prolific itself, is produced; but the latter may also have been introduced directly from abroad together with seed, e. g. of Lucerne. The mixing of this hybrid in grass fields on the German model has previously been attempted in this country. It made far less demands on the content of nutrient substances in the soil than Lucerne, but nevertheless it has not been much used in our country.

Medicago hispida Gaertner.

RAUNKLÆR 1922, 187. ASCHERSON & GRAEBNER 1906—1910, 428. ASCHERSON & GRAEBNER 1899, 433. HEGI IV, 3, 1270. NEUMAN 1901, 332. LINDMAN 1926, 378. BLYTT 1906, 456. HJELT 1919, 246.

Geographical Distribution. Southwest Asiatic, Mediterranean annual herb, distributed from India to the West African islands; naturalised along the west coast of Europe from Portugal to the British Isles; anthropochorous in northern Europe, as an ephemeralophyte, in America, South Africa, and East Asia.

In the North German lowlands it is rare as an anthropochorous plant on arable land; particularly in earlier times it was introduced in ballast to Swedish harbours as far as southern Norrland; known from similar places in the south of Norway and Finland; has also been found as a weed on arable land in Sweden.

Occurrence in Denmark. The species was observed for the first time in 1845 at Thorvaldsens Museum in Copenhagen (introduced in packing material from Italy). Towards the end of the century it was collected at Brede Ladegaard (district 45 a), whence it spread to the neighbourhood as a weed in clover fields. From this century it is hardly known in Denmark except as a ruderal plant, and has been found as such e. g. at Nørresundby, Aalborg, Randers, Horsens, Vejle, Fredericia, Nakskov, Copenhagen, and on Amager. At Öxnebjerg on Funen it was found on arable land in 1925, having been brought there with rubbish from a mill. It is a highly variable plant, which in this country, too, exhibits several forms, thus for instance *v. apiculata* (WILLD.) and *v. confinis* KOCH.

Medicago lupulina L. — Humle-Snæglebælg.

J. LANGE 1886—88, 838. RAUNKLÆR 1922, 187. FERDINANDSEN 1918, 63. OLSEN 1925, 11. GRÖNTVED 1929, 63. JESSEN & LIND 1923, 341. ASCHERSON & GRAEBNER 1906—1910, 393. HEGI IV, 3, 1255. KOUSNETZOFF 1926, fig. 5. NEUMAN 1901, 331. BLYTT 1906, 456. SEGERSTAD 1924, 33, 35, 213.

Geographical Distribution. Euro-Asiatic perennial herb distributed over temperate Asia, the whole of Europe except the most northerly regions, and North Africa; anthropochorous in North America. In northern Germany it is common on arable land, in grass fields, meadows, and along roads; the same is the case in Sweden, where it particularly grows in regions rich in nutritive substances and closely built over, as far as southern Norrland. It is recorded to be rather common in Norway east of the mountains from Mandal to Romedal, where it occurs in low-lying tracts, most frequently as an anthropochorous plant, but also appearing under conditions which might suggest that it is possibly spontaneous, while west and north of the mountains it is very rare and no doubt anthropochorous.

Occurrence in Denmark. In Denmark, too, the species is largely confined to arable land, grass fields, stubble fields, waste places, etc., and is classed by FERDINANDSEN as a plant living on alkaline soil (cfr. CARSTEN OLSEN 1925); but it is also met with in high-lying meadows and on uncultivated hillsides and, more

rarely, on grey dunes. It is rather equally distributed and fairly common throughout the country. Perhaps it is originally a native in our flora, but since the seventies of last century it has been rather largely cultivated in grass fields, and was formerly also introduced with seeds. It is found in BURSER's herbarium, and is mentioned by KYLLING.

The species varies greatly, and frequently occurs in this country, in company with the chief form, *var. glandulosa* MERTENS & KOCH (= *v. Willdenowii* BOENN.), where the plant is often more hairy, and the fruits, frequently also the fruit stalks and leaflets, are covered with glandular hairs.

Medicago minima (L.) Bartalini. — Liden Sneglebælg.

J. LANGE 1886—88, 838. RAUNKIÆR 1922, 187. ASCHERSON & GRAEBNER, 1906—1910, 437. HEGI IV, 3, 1273. A. CHRISTIANSEN 1913, 18. W. CHRISTIANSEN 1926, 138, map 26. BENTHAM & HOOKER 1920, 107. LINDMAN 1926, 378. STERNER 1922, 291, 300, 327, 397.

Geographical Distribution. Southwest Asiatic, Mediterranean, eastern Central European annual herb, extending from India and western Asia across the Mediterranean countries northwestward to France, and onward to the southeastern parts of England (rare), Belgium, and Holland (mainly anthropochorous); its northwestern limit in Germany runs from the Rhine province through the regions round the lower Main — Wetzlar — S. E. Harz — Neuwaldensleben — Tangermünde — Neustrelitz — Neubrandenburg — Malchin — Bützow — Unter-Trave — — Rügen; its limit to the north and east runs through the Danish islands, southern Sweden, the region round the Lower Vistula to southern Russia and the Caucasus.

In Germany it is characteristic of sunny, dry diluvial hills, on calcareous as well as on sandy soil. According to W. CHRISTIANSEN it occurs sparsely at Unter-Trave, and is on the whole rare in the vicinity of the Baltic. In Sweden, where the species is rare, it is met with in dry, sandy pastures in Scania and Halland, Oeland and Gotland. Not recorded from Norway.

Occurrence in Denmark. (Fig. 32, Pl. IX). Within Denmark *M. minima* grows on dry, usually sandy hills and cliffs in the southeastern part of the country, viz. on the southwest and northwest coasts of Bornholm, on the cliffs of Möen, in scattered localities in western Lolland and southern Sealand, a good many localities along the coast of northwestern Sealand, on Samsö and some islands in Stavnsfjord, Vejrö, and Anholt, with which the only Jutlandish locality of the species, viz. the Jernhatt at Ebeltoft, falls into line; finally some few finds have been recorded from the north of Funen. In several of the localities mapped, the species has, however, not been observed in recent years. It shows no tendency to select soil affected by cultivation, and must be considered as a southerly species, spontaneously immigrated from the southeast, and whose northwestern limit runs from Halland across Anholt, the southeastern part of Djursland, and North Funen to Travemünde.

Medicago sativa L. — Foder-Lucerne.

J. LANGE 1886—88, 837. RAUNKIÆR 1922, 187. K. HANSEN 1907. OLSEN 1925, 9. JESSEN & LIND 1923, 342. ASCHERSON & GRAEBNER 1906—1910, 397. HEGI IV, 3, 1260. KOUSNETZOFF 1926, fig. 5.

Geographical Distribution. Asiatic, South and Central European perennial herb, spread over Europe as far as southern Scandinavia and Estonia; in temperate Asia from East Asia southward to Tibet and India; North Africa; and North America (anthropochorous). Since antiquity Lucerne has been cultivated in the lands round the Mediterranean, and after the Middle Ages in Central Europe, where it has consequently been naturalised to a rather great extent; probably it was originally growing wild only in southern Russia, Asia, and North Africa (ASCHERSON & GRAEBNER, cf. also KOUSNETZOFF).

Occurrence in Denmark. The first attempts at cultivating Lucerne in Denmark date back to the middle of the 18th century, but it was only in the course of the latter half of the 19th century and in subsequent years that this cultivated plant gained a more considerable distribution in our country. Lucerne spreads easily from the fields to the edge of ditches, grassy slopes, and gravel-pits, and in places where the competition is not too excessive, it may persist for several years. It is often designated as a calcicolous plant, and according to CARSTEN OLSEN it thrives best on soil whose P_H value is about 6.5—7.0. It has been recorded, cultivated as well as run wild, from nearly all districts of Denmark, but it is only in the more fertile regions of the country with a clayey soil that it is of rather frequent occurrence.

Melilotus albus Desr. — Hvid Stenklover.

J. LANGE 1886—88, 834. RAUNKIÆR 1922, 187. KYLLING 1688, No. 649, p. 96. ASCHERSON & GRAEBNER 1906—1910, 449. HEGI IV, 3, 1245. A. CHRISTIANSEN 1913, 18. BENTHAM & HOOKER 1920, 108. LINDMAN 1926, 379. NEUMAN 1901, 333. BLYTT 1906, 457. HJELT 1919, 253.

Geographical Distribution. West Asiatic, European biennial herb, which is only adventitious, at any rate in the northernmost parts of Europe, but which, according to HEGI, seems to have become naturalised in western Europe early in historic times (about 1500 at the least) even if it gives the impression of being spontaneous in many places. It is absent or rare e. g. in Belgium and Great Britain. It is of scattered occurrence all over northern Germany, Holstein and Schleswig included, growing especially by the roadside, along fields, and on sunny hills covered with coppice; it is, however, considered as not indigenous within this area, though with the exception e. g. of the localities along the Elbe in Holstein (ASCHERSON & GRAEBNER). In Sweden it is rare, but may be found on cultivated soil, along railroads, near towns and harbours, and in waste places northward to southern Norrland; in Norway it is found in similar situations in the southern part of the country; likewise in Finland. The species extends southward to Spain,

Central Italy, and Greece; in the southernmost localities, too, it is only sporadic and adventitious. To the east it extends to West Siberia, Tibet, and India. Anthropochorous in America and Australia.

Occurrence in Denmark. The species is represented in most of the districts, but is commonest in the eastern fertile parts of the country, and rare in the northern and western tracts of Jutland, not being recorded e. g. from districts 6, 8, 16, 17, 18, and 51; further it is not mentioned from Læsø and Anholt. It is almost everywhere associated with soil more or less affected by cultivation; thus it is principally to be found in grass fields and clover fields, where it has been sown as an impurity in seed, and in waste places in the neighbourhood of towns and harbours; from such places it may spread along the shore, where it is recorded from several places, e. g. Bornholm and the north of Seeland. It may also persist for some time on uncultivated, grass-clad slopes, and loves places where the lime is exposed in the surface of the soil, especially in limestone quarries, thus in the limestone area north of Grenaa and at Mönsted.

M. albus is probably not spontaneous north of the Baltic, but it has early been introduced into Denmark, and is constantly being introduced, with grain and seed. KYLLING mentions it in 1688.

Melilotus altissimus Thuill. — Höj Stenklöver.

(Syn. *Melilotus officinalis* WILLD.).

J. LANGE 1886—88, 835. RAUNKLÆR 1922, 188. M. T. LANGE 1859, 12. JESSEN & LIND 1923, 126. ASCHERSON & GRAEBNER 1906—1910, 445. HEGI IV, 3, 1241. PRAHL 1890, 41. A. CHRISTIANSEN 1913, 19. BENTHAM & HOOKER 1920, 107. NEUMAN 1901, 333. LINDMAN 1926, 379. LINDQUIST 1925, 153 f. (2 maps). BLYTT 1906, 457. HJELT 1919, 253.

Geographical Distribution. Asiatic, Central and South European biennial herb, extending from Japan through Siberia and Armenia, and the greater part of Europe, northward to Ingria, Estonia, and southern Scandinavia. In northern Germany it grows in meadows and moist copsewoods, along ditches, generally on soil rich in salts and nutritive substances, hence mainly on the seashore, in saline spots, on the banks of lakes and rivers, and in waste places. Within Schleswig-Holstein it is stated to be distributed over the banks of the Elbe and the shores of the Baltic, and at Oldesloe Saline. In Sweden it occurs i. a. in waste places near towns and harbours as far as southern Norrland, but in a number of localities along the coasts of Bohuslen, western Scania, and on Gotland it must, according to LINDQUIST, be assumed to be spontaneous (see his fig. 2, p. 167), and NEUMAN describes a variety, *var. paluster* (KIT.) SCHULT, that lives on the seashore and in moist places in southern Sweden. Similarly, in the southwestern and most low-lying parts of Norway the species may be found here and there by the roadside and on the seashore from Flekkefjord to Oslo and Ringerike, but appears occasionally on wharves as far as Trondhjem. In Finland it has only been found

as an anthropochorous plant. In Great Britain, too, where it is not common, it is generally adventitious, but seems to be spontaneous in the south of England and on the east coast of Ireland.

Occurrence in Denmark. (Fig. 17, Pl. VI). During the preparation of the map, the available statements concerning *M. altissimus* in the literature and the flora lists have, as far as possible, been sifted, regard having been paid to the obvious possibility of confusion with *M. officinalis*, so that all uncertain statements as to its occurrence on cultivated soil and in waste places have been omitted. The species then proves to have a southeastern distribution, being most frequent on the islands, in particular Seeland, Falster, and Funen, and along the southern part of the east coast of Jutland almost as far as Aarhus, but it is also met with in the southern part of Himmerland and along the Limfjord. It grows on bluffs by the shore and on high-lying beaches as well as, more rarely, on steep uncultivated slopes farther inland, on dikes and along roads (e. g. in district 41). Further it may be found as an anthropochorous plant in waste places, but far less frequently than *M. officinalis*; this no doubt has some connection with the fact that it is much less frequently sown with clover seed in grass fields than the species just mentioned. It is present in SCHUMACHER's herbarium, collected "ad vias et littoribus" at Springforbi (district 45 a), probably about the year 1800, and according to M. T. LANGE it is mentioned by Danish botanists of the 17th century.

Within Denmark *M. altissimus* is apparently a spontaneous plant, associated with coast bluffs and similar places, and its distribution would seem to suggest that it has immigrated from the south and southeast.

Melilotus dentatus (W. & K.) Pers. — Strand-Stenklöver.

J. LANGE 1886—88, 836. RAUNKJÆR 1922, 188. ASCHERSON & GRAEBNER 1906—1910, 443. HEGI IV, 3, 1239. PRAHL 1890, 40. CHRISTIANSEN 1913, 18. LINDMAN 1926, 379. LINDQUIST 1925, 166.

Geographical Distribution. West Asiatic, Pontine, South Baltic, halophilous annual or biennial herb, extending from West Siberia, Turkestan, and Asia Minor through southern Russia, the area of the Lower Danube, Austria, and Poland to Estonia, Germany, southern Sweden, and southeast Denmark. In northern Germany it is usually rather uncommon, is absent in East Prussia, but occurs on the coast of Rügen, at Stralsund, in several places in Mecklenburg, e. g. near Warnemünde, at Sulsdorf on Femern, from Heiligenhafen to Grossenbrode in the circuit of Oldenburg in Holstein, and on the west coast of the southern and northern Dithmarsches; on the whole it is scattered all over Germany, chiefly in Thuringia, Saxony, the Elb Valley, Brandenburg, Pomerania, West Prussia, and Posen, westward to Lüneburg, Hessen and the plain of the Rhine between Oppenheim and Baden. Throughout its area of distribution it grows on salt steppes, in saline meadows, littoral meadows, or, occasionally, on river banks.

In Sweden the species has been found since 1814 in about half a score localities in littoral meadows in western Scania, but in several of these it has later disappeared. LINDQUIST assumes that it has immigrated to Scania from Seeland.

Occurrence in Denmark. (Fig. 29. Pl. IX). Within Denmark it is a south-easterly species, exclusively confined to littoral meadows and clayey, miry seashores, especially along the smaller waters south of Seeland and Funen; further it is of scattered occurrence along the west coast of Seeland to Saltbæk Vig, in the southern parts of the Issefjord, at Frederikssund, and round Copenhagen, where it has geographical connection with the Scanian area; further it is found on the north coast of Funen and at Stavnsfjord on Samsö. Records of finds from Gamborg Fjord (district 28) and the old statement from Haderslev require confirmation. — The northwestern limit of the species within the area here considered may then be drawn from western Scania through the north of Seeland, Samsö, and Funen to the Dithmarsch. Curiously enough, positive finds are lacking from the east coast of the peninsula north of the circuit of Oldenburg in Holstein.

Everywhere in Denmark, as in Sweden and Germany, *M. dentatus* is confined to absolutely natural associations; in Denmark it is an obligatory halophyte, and there are no reasons for considering it, with HEGI, as anthropochorous. It is doubtless spread by the aid of water, since, according to LINDQUIST, the pod, which continuously encloses at any rate part of the seeds, has considerable floating power, and may remain floating on the water for several days, while the seeds themselves almost instantly sink. How its migration across the European continent has taken place, is not known, but in the Baltic area it has probably been spread by the currents of the sea; this cannot, however, have taken place until the Littrina time, at the earliest, when the salt water penetrated into the Baltic, and the warm summer climate favoured the advance towards the north of this southern species. Its immigration into northern Europe must have taken place from the southeast.

Melilotus indicus (L.) All. — Indisk Stenklöver.

RAUNKIÆR 1922, 188. ASCHERSON & GRAEBNER 1906—1910, 2, 461. HEGI IV, 3, 1247. LINDMAN 1922, 379. BLYTT 1906, 457.

Geographical Distribution. Southwest Asiatic, Mediterranean annual herb, extending eastward to India, and introduced over wide stretches of northern Europe and South Africa, North and South America, southern Asia, and Australia.

In Germany it is chiefly found in the seaport towns Bremen, Hamburg, Kiel, Eckernförde, and in addition e. g. in several places in Brandenburg. In Sweden and Norway it is only known as a casual visitor in waste places.

Occurrence in Denmark. A ruderal plant, observed for the first time in 1892 on Klövermarksvej by Copenhagen and at Örritslevgaard in northern Funen; since then it has constantly appeared, only to disappear again shortly afterwards,

in a large number of localities, most frequently in seaport towns, thus in Aalborg, Hobro, Aarhus, Vejle, Esbjerg, Assens, Odense, Svendborg, Nysted, Kalundborg, Nykøbing S., Elsinore, Copenhagen, and at Lyngby.

Melilotus officinalis (L.) Lam. — Mark-Stenklöver.

(*M. arvensis* WALLR.).

J. LANGE 1886—88, 835. RAUNKIÆR 1922, 188. JESSEN & LIND 1923, 347. ASCHERSON & GRAEBNER, 1906—1910, 452. HEGI IV, 3, 1243. BENTHAM & HOOKER 1920, 108. LINDMAN 1926, 379. LINDQUIST 1925, 161. BLYTT 1906, 457. HJELT 1919, 250.

Geographical Distribution. West Asiatic, European annual or biennial herb. Within Europe it is widely spread with cultivation, but is absent e. g. in the southern parts of Italy and the Balkan Peninsula as well as in the sub-Arctic regions; within Great Britain it only occurs in some of the most easterly counties of England.

In northern Germany it grows along the roads, in fields and waste places, more rarely in dry meadows and on hills (pastures); it is not always constant and in northwestern Germany, in particular, it has not become naturalised. In Sweden the species flourish in waste places and grass fields, most frequently to the south, where it tends to become naturalised, but it is introduced even as far north as $67^{\circ} 50'$ N. lat. It was first noticed in 1847, evidently introduced with foreign seed, and spread rapidly during the end of the seventies and the beginning of the eighties, probably in connection with the development of the railway net. In Norway it has been observed as an anthropochorous plant in several places in the southern part of the country from Oslo to Trondhjem. In Finland, too, it is adventitious.

Occurrence in Denmark. The species was not reported with certainty from Denmark until 1852, when it was found in a field south of Aalborg, but during the immediately subsequent time it became rapidly known from a number of localities, nearly always growing in clover and grass fields, and gradually as the cultivation of grass fields was extended, the finds of *M. officinalis* increased in number. It is now recorded from nearly all districts of the country (except Nos. 3, 17, 19, and 22 b), and is stated to be rather common within several of the most easterly districts. From the fields, or directly from foreign countries, it may spread to the waste places of towns, where it may attain an exceptionally vigorous growth. It shows no particular tendency to migrate to soil little affected by cultivation.

Melilotus wolgicus Poir. — Russisk Stenklöver.

RAUNKIÆR 1922, 188. ASCHERSON & GRAEBNER 1906—1910, 451. HEGI IV, 3, 1238. LINDMAN 1926, 379.

Geographical Distribution. South Russian biennial herb, introduced with Russian grain into several other countries. It is inconstant within the northern

tracts of Europe, is known from northern Germany since 1885, from southern Sweden, growing in waste places, since 1904, from Oslo, and from Denmark.

Occurrence in Denmark. The species has repeatedly been noticed in waste places near towns, thus in the period from 1907 to 1917 at Horsens, Vejle, Esbjerg, Odense, Assens, Svendborg, and Copenhagen. Since 1917 it has only been found at Aalborg, in 1927. The species can hardly withstand winter in Denmark, and when its importation into Denmark has almost ceased since 1917, this is doubtless a consequence of changes in the Russian market.

***Onobrychis viciifolia* Scop. — Foder-Esparsette.**
(*O. sativa* LAM.).

J. LANGE 1886—88, 856. RAUNKLÆR 1922, 192. MÖLLER-HOLST I, 1877, 564. OSTENFELD 1918, 321. C. CHRISTENSEN 1922, 430. ASCHERSON & GRAEBNER 1906—1910, 877. HEGI IV, 3, 1488. BENTHAM & HOOKER 1920, 122. LINDMAN 1926, 385.

Geographical Distribution. West Asiatic, Central European and Mediterranean perennial herb, distributed from Transbaikalia, Persia, and Asia Minor, through eastern Europe to Ladoga and Onega; to the north it still occurs as a spontaneous plant in South, Central, and East Germany, and probably in the eastern and southern parts of England; in more northerly regions as far as Stockholm it is only found cultivated or as escaped from cultivation; absent from the southern part of the Balkan Peninsula, and recorded as cultivated and escaped from cultivation from Sicily, Sardinia, and North Africa; the same applies to North America.

Occurrence in Denmark. Cultivation on a small scale of *O. viciifolia* has repeatedly been attempted in Denmark since the middle of the 18th century and up to the present day (the earliest known attempt is recorded from Bornholm 1769), and it is no doubt by escaping from such attempts at cultivation, or after having been sown as an impurity in clover seed, that the plant has made its way into the more or less natural pasture like plant communities, where it may occasionally be found. Thus it has been observed by roadsides, on railway slopes, and on grassy, uncultivated hills, altogether in about half a score localities chiefly in the east of Jutland as far north as to Himmerland, further on Funen, Langeland, Seeland, and Møen. It is best known from its occurrence on the chalk down Graaryg on Møen.

***Ononis arvensis* L. — Stinkende Krageklo.**
(*O. hircina* JACQ.).

J. LANGE 1886—88, 823. RAUNKLÆR 1922, 186. ASCHERSON & GRAEBNER 1906—1910, 343. ASCHERSON & GRAEBNER 1899, 431. A. CHRISTIANSEN 1913, 18. LINDMAN 1926, 377. STERNER 1922, 240, 363, 375, Pl. 19. A. BLYTT, 453. HJELT 1919, 280.

Geographical Distribution. Pontine, Baltic undershrub or perennial herb, extending from southern Russia and the northern part of the Balkan countries,

across eastern Central Europe, parts of Denmark, and the southern districts of the Scandinavian Peninsula. In eastern Europe it has its main distribution in the steppes, where it is chiefly restricted to the river meadows, and grows in company with many species characteristic of our meadows, e. g. *Festuca pratensis*, *Phleum pratense*, and *Alopecurus pratensis* (STERNER p. 363).

In the eastern part of the North German lowlands the species grows in meadows and pastures ("Triften"), along roads, and in similar places; it is still rather common in Further Pomerania and Posen, but is doubtful as a spontaneous plant west of the Oder. From Holstein only a single locality is recorded (viz. Jenfeld in Stormarn). In Sweden the plant occurs in dry meadows and along field borders within the southern districts from Scania to Värmland and Upland, but is absent from the interior of the South Swedish highland; lives in Norway in similar places and on sea-shores in the lowest tracts in the east of the country northward as far as Valdres and the region round Mjösen, and is further met with, though more rarely, west of the mountains northward to Lysøen in the county of Nordre Trondhjem ($64^{\circ} 57'$ N. lat.). According to STERNER, its extensive distribution in southern Scandinavia is mainly due to human agency, even if it may perhaps also be spontaneous within those regions, e. g. on Oeland and on Gottska Sandön. The species is found in some few places on the shore within the Nyland district in the south of Finland.

Occurrence in Denmark. (Fig. 22, Pl. VII). Within our country the plant is met with in localities similar to those of Germany and Sweden, viz. in grassy meadows and along fences, and has, it would seem, a remarkable distribution in two fairly distinct main areas, a southeasterly and a northwesterly area. Thus positive finds of it are recorded from Bornholm, Lolland, Seeland, where it seems to be most frequent in the northern part, from Funen, and Samsö; it is unknown throughout the southern part of Jutland as far as the region round Aarhus, where it is very rare; it would be desirable that some few records of it from the southern part of Himmerland should be confirmed by herbarium specimens; It occurs again rather commonly in the northern and western parts of Vendsyssel, on Læsö, and round the western part of the Limfjord.

The western limit of the species in northern Europe thus runs from western Norway, through northern Jutland, Funen, and Lolland almost to the mouth of the Oder; its Baltic-Scandinavian range thus presents a singular expansion towards the Atlantic of the area of this otherwise East European continental species. Apparently no certain data are available which might give support to the conjecture that it is not an apophyte in Denmark. The immigration must have taken place from the south-east or east.

***Ononis repens* L. — Mark-Krageklo.
(*O. procurrens* WALLR.).**

J. LANGE 1886—88, 823. RAUNKLÆR 1922, 186. OLSEN 1921, 91. ASCHERSON & GRAEBNER 1906—1910, 344. ASCHERSON & GRAEBNER 1899, 431. HEGI IV, 3, 1225. LINDMAN 1926, 377. SEGERSTAD 1924, 158, fig. 285. BLYTT 1906, 453.

Geographical Distribution. South and West-Central European undershrub, which to the southeast and east extends to the northern part of the Balkan Peninsula, Poland, Lithuania, Estonia, and Oesel, northward to the southern part of Scandinavia. In northern Germany it generally decreases towards the east, where it is chiefly restricted to the regions near the Baltic; it grows in dry meadows, pastures ("Triften"), at roadsides, and on the outskirts of woods; is also found on the North Sea islands. In Norway it is confined to the most southerly and low-lying stretches along the coast from Mandal and Hvalörne to Oslo and Ringerike, growing on dry hills and sea-shores; in Sweden it is likewise chiefly a seaside plant, distributed along the coast of the Cattegat, more frequent in Scania and Blekinge, and on Oeland and Gotland; extends northward to Nordbotten.

Occurrence in Denmark. (Fig. 12, Pl. IV). *O. repens*, our commonest Restharrow, has been observed in almost all districts (except 3, 18, and 50); it is, however, not quite equally distributed, being common, or fairly common, on the islands and throughout eastern Jutland to and including Himmerland, and in parts of the two Hanherreder, while from other regions, more especially parts of Vendsyssel, Thy, and the central and western tracts of Jutland only very desultory notes are at hand. It grows mainly in pastures, along roads, fences, and on the outskirts of woods, and show the most luxuriant growth on soil not too poor in nutrient substances and with a neutral or basic reaction. During the primitive agricultural conditions of earlier times the plant has been much favoured, since extensive perennating grassy areas arose at the sacrifice of woods. After the close of the latest glaciation it probably spread over Central Europe from the west and southwest, and must be assumed to have invaded Denmark from the southwest and south.

***Ononis spinosa* L. — Strand-Krageklo.**
(*Ononis campestris* KOCH).

J. LANGE 1886—88, 822. RAUNKLER 1922, 186. ASCHERSON & GRAEBNER 1906—1910, 351. ASCHERSON & GRAEBNER 1899, 431. PRAHL 1890, 39. LINDMAN 1926, 377. SEGERSTAD 1923, 378. BLYTT 1906, 454.

Geographical Distribution. West Asiatic, South and Central European undershrub, extending eastward to Central Asia, the Caucasus, and Asia Minor. In northern Germany it occurs in pastures ("Triften") and dry meadows, along roads, and on the outskirts of woods, decreasing in frequency towards the east; in western Prussia only in the neighbourhood of the Vistula; in Holstein and Schleswig it may be frequent in patches along the Elbe and the coasts. The species is rare in Sweden, occurring only in Scania, a single locality in Blekinge, and on Gotland; in Norway it is only known from a couple of places in the vicinity of Oslo, growing in woodland meadows with calcareous soil.

Occurrence in Denmark. (Fig. 26, Pl. VIII). The map only gives such finds as can be checked by herbarium specimens, or have been mentioned by experienced

florists, and the species has presumably a wider distribution within the dotted area than indicated on the map. Within Denmark it is almost exclusively found in close association with the shore, in dry littoral meadows or pastures, and may occasionally be met with along the coasts of all the waters south of a line drawn from Hjerting across Samsö, the northern part of Hornsherred, to Copenhagen, and this northern limit continues eastward through Scania and Blekinge, whence it bends northeastward to Gotland. It is, however, absent from Bornholm. Beyond this northern limit of continuous distribution, the species, as already mentioned, occurs at Oslo, where it prefers calcareous soil like so many other southern species in their most northerly habitats. It has presumably immigrated to Denmark from the south in late post-glacial time.

Ornithopus perpusillus L. — Liden Fugleklo.

J. LANGE 1886—88, 857. RAUNKIÆR 1922, 191. FERDINANDSEN 1918, 68. JESSEN & LIND 1923, 126, 356. ASCHERSON & GRAEBNER 1906—1910, 839. HEGI IV. 3, 1477. P. KNUTH 1895, 54. LEHMANN 1895, 426, 549. LEDEBOUR I, 1842, 696. LINDMAN 1926, 384.

Geographical Distribution. Sub-Atlantic, West-Central European annual herb, which extends from western Italy through northern Spain, France, north-western Switzerland, and Germany to Ireland, Scotland, Denmark, and Scania; not spontaneous east of the Vistula (rare), in Poland, Bohemia, Austria, or Hungary, and the same is presumably the case with its occurrence near Moscow and Tver (LEDEBOUR).

In Germany, where it grows in sandy fields, on inland downs, in pine woods, and on heaths, more particularly along the heath roads, it is especially common in the sandy regions along the Rhine, the Elbe, and the Oder, but may otherwise be absent over wide stretches. In Sweden it is only found in the south of Scania, on sandy fields near the sea; it is, however, very rare, and has now almost disappeared.

Occurrence in Denmark. (Fig. 6, Pl. III). The species has its headquarters in the western part of Jutland south of the Limfjord, where it grows in old sandy grass fields, in gravel-pits, and in similar places, principally on acid soil (FERDINANDSEN). In Vendsyssel and the Hanherreder it is entirely absent. It is rare in Thy and the northern part of eastern Jutland, but is somewhat more frequent farther southward in eastern Jutland. Among the Jutlandish districts it has not been observed in Nos. 1—6, 11, 12, 13 a, 21, 22 a, and 23.

The species is not uncommon on Funen, especially in the western and southern parts; it is further found on Taasinge and Langeland, while east of the Great Belt it has only been collected in about ten localities, chiefly in Southwest Sealand.

Within Denmark *O. perpusillus* bear hardly the mark of originality which it exhibits in its choice of habitats in northern Germany, and it has, at any rate, been greatly favoured by the cultivation of the land, which has given it far greater

possibilities of finding suitable localities, with open, dry, and warm soil and only slight competition, though even prior to the cultivation of the country it may doubtless have found means of maintaining itself on open, shrubby hills, slopes, and dry grassy plains, especially in Jutland. Its northeastern limit runs from north-western Jutland across Seeland to Scania, and it may be assumed to have immigrated into the country in late post-glacial time, having penetrated from the south through Holstein and Schleswig to Jutland, whence it has spread to the islands.

Ornithopus sativus Brotero. — Serradella.

Ornithopus roseus DESF.

J. LANGE 1886—88, 857. RAUNKIÆR 1922, 192. MÖLLER-HOLST V, 1882, 183. ASCHERSON & GRAEBNER 1906—1910, 842. HEGI IV, 3, 1478. LINDMAN 1926, 384.

Geographical Distribution. Westerly Mediterranean annual herb indigenous in Spain and Portugal; its originality in South and West France and in North-west Africa is perhaps doubtful; since the nineteenth century it has been cultivated in the sandy tracts of Central Europe, particularly in the North German and the Dutch lowlands; is further cultivated in Denmark and Sweden, where it occasionally runs wild.

Occurrence in Denmark. *O. sativus* is not infrequently cultivated in sandy fields in Denmark as a forage plant; it is sown either separately or in maslin, and is further frequently sown in rye fields in the spring. The cultivation of the species in this country was not commenced to any great extent until after 1874. It often escapes from cultivation, and may persist in the fields for several years; as a plant that has run wild it is thus especially common in the south of Jutland.

Sarothamnus scoparius (L.) Wimm. — Gyvel.

J. LANGE 1886—88, 819. O. G. PETERSEN 1920, 388. WARMING 1919, 118, 141. FERDINANDSEN 1918, 72. MENTZ 1906, 185. OPPERMANN 1928, 9. HORNEMANN 1837, 229. KYLLING 1688, 52. ASCHERSON & GRAEBNER 1906—1910, 289. HEGI IV, 3, 11, 82. PRAHL 1890, 39. LINDMAN 1926, 377. SEGERSTAD 1924, 160, map fig. 289. BLYTT 1906, 452.

Geographical Distribution. West-Central and South European shrub, extending from western Europe northward to the most southerly part of the Scandinavian Peninsula; southward to the Iberian Peninsula, Italy, and the northern part of the Balkan Peninsula; eastward to Hungary (very rare), Central and southern Poland; in Lithuania it is presumably planted. The southern and eastern limits of its area as an indigenous plant are very difficult to draw, since plantings cannot always be distinguished from isolated localities with spontaneous plants. Outside Europe it is found growing wild on Madeira and Teneriffa, and planted in Ural-Siberia, Japan, and India.

In Germany it occurs as a spontaneous plant, probably rather unequally distri-

buted. It is characteristic of heaths and other soil poor in lime, dry and sandy hills, open pine woods, and is especially common e. g. within the greater part of the area of the Elbe from Bohemia to the Lüneburg Heath, in the Havel region, the region of the Upper and the Lower Oder, and in parts of the Schleswig-Holstein heaths; otherwise it is rare in the North German lowland as far as East Prussia, where it has possibly been planted.

In Sweden *S. scoparius* occurs chiefly in the coast stretches of Scania, Blekinge, and Halland, possibly originally wild in the sandy areas (SEGERSTAD), widely dispersed by cultivation in eastern Smalandia and as far as Upland, and on Oeland and Gotland. In Norway it is found in the low-lying southern regions, thus on heathland at Kristianssand, Mandal (probably escaped from cultivation), and Grimstad.

Occurrence in Denmark. *S. scoparius* grows in all parts of the country, chiefly in acid soil (FERDINANDSEN), but under somewhat different conditions. It is most frequent in the meagre and heathery tracts of Jutland, where it prefers the highly broken heathy ground, and is also often common on the older dunes along the west coast. It shuns, however, heaths with well-developed hard-pan as well as the wet heath. In the east of Jutland, from Djursland westward to the area round Skanderborg and west of the fjords, it is of far more scattered occurrence, and it is not known from Als. Even if the species has been much spread with cultivation, it may no doubt be considered as originally wild in Jutland in the area south of the Limfjord. North of this fjord it is perhaps otherwise; HORNEMANN was of opinion in 1837 that its northern limit must be drawn along the fjord. However, when the species is now common in several regions in Vendsyssel, the two Hanherred, Thy, and Mors, this has doubtless some connection with the fact that during the last century it has been planted and sown in numerous places in plantations, on heaths, and along hedges, and from such localities it has been able to spread itself rapidly.

It must be taken for granted that *S. scoparius* has in a similar way spread to several more easterly tracts of Denmark. Thus it is often sown on railway slopes, and has at any rate previously been cultivated as a fodder-plant for wild animals (hares). On Funen *S. scoparius* is rather common in the west and south, on hills, heaths, and the outskirts of woods, while it is rare throughout the remaining part of this island, as well as in the majority of the other districts of the islands, yet rather common e. g. in northeastern Sealand, where from it was known already in the 17th century. Is not recorded from districts 23, 33, 34, 46, and 53. It is fairly common on Bornholm, where it seems only to be cultivated, or to have escaped from cultivation. The cultivated forms in Denmark belong mainly to a southwesterly race, which do not tolerate the climate here so well as the danish race. —

Tetragonolobus siliquosus (L.) Roth. — Kantbælg.

J. LANGE 1886—88, 841. RAUNKIÆR 1922, 191. HORNEMANN 1821, 788. ASCHERSON & GRAEBNER 1906—1910, 691. ASCHERSON & GRAEBNER 1899, 441. HEGI IV, 3, 1373. ROUY 5, 1899, 155. LINDMAN 1926, 383. HARTMAN 1879, 306.

Geographical Distribution. Pontine, Mediterranean, Central and Southwest European perennial herb, occurring in the south of Europe (except southern Italy), North Africa, nearly the whole of France (in Belgium, according to CRÉPIN, only anthropochorous); it extends northward to Holland, Denmark, southern Sweden, Oesel, and Estonia (at Werder); eastward to Poland, Central Russia, Crimea, the Caucasus, and Asia Minor.

In northern Germany it is only found — very scattered — between the Elbe and the Oder, and only at Swinemünde and in several places on Rügen does it reach the Baltic. It is absent in Schleswig, Holstein and Mecklenburg and in the west and east of Prussia, but was formerly found at Thorn; farther south, however, e.g. in Austria, Switzerland, and several tracts of southern Germany, it is rather widely distributed. Its habitats in Germany and other parts of Central Europe are fertile meadows, mainly with saline soil; in France it is recorded from moist meadows, the edges of ditches, and from littoral meadows and the sandy shores of the Mediterranean (*f. maritimus*).

In Sweden the species is fairly common on sea-shores in Scania, Blekinge, and eastern Smalandia, on Oeland and Gotland, and in places it may also be found at some distance from the coast, growing on moist ground.

Occurrence in Denmark. (Fig. 34, Pl. X). Within Denmark the species has two main areas of distribution: Bornholm, where it forms a connecting link between the Southeast-Swedish localities and those of Rügen and the west and southwest coasts of Seeland. Its most northerly locality, where it grows somewhat isolated, is on Gníben; it has previously been collected at Orehoved on Falster, and at Bjerremark on Lolland, and is recorded by ancient florists, most recently by M. T. LANGE (1857) from Marstal on Ærø, and by KJÆRBÖLLING from Horne Næs on Funen (1738); however, in these southernmost localities it has now doubtless disappeared. A record by HORNEMANN of *T. siliquosus* from Lökken at Skager Rack is probably due to a mistake.

Within Denmark the species is largely associated with the coasts; thus on Seeland, and formerly on Falster and Lolland, it grows in littoral meadows, while on Bornholm, where true littoral meadows are quite diminutive, it often grows on the rocky shores. It is further occasionally found some way inland in moist meadows or in bogs; farthest from the coast it has been collected at Aasedammen in Almindingen on Bornholm, and at Lundby, Bøgelunde, and Fuirendal in the southwest of Seeland. The species is not decidedly halophytic, but tolerates the presence of salt in the soil very well.

The commonest form in Central Europe, viz. *genuinus* GREN. & GODR., which is more or less hairy and has thin, not fleshy leaves, is not known in Denmark; the form growing in our country is the *maritimus* SER., which is smooth and has fleshy leaves.

Rügen and Swinemünde being the only localities of the species along the south coast of the Baltic, the immigration into Denmark of this southerly species

may perhaps best be assumed to have originated from these regions, presumably by dispersal by the currents of the sea, as is the case for instance with *Lathyrus maritimus*. The time of immigration is probably Littoral.

Trifolium agrarium L. — Humle-Klöver.

J. LANGE 1886—88, 827. RAUNKLÆR 1922, 189. JESSEN & LIND 1923, 128, 430. GRAEBNER 1904, 35. PRAHL 1890, 42. A. CHRISTIANSEN 1913, 19. ASCHERSON & GRAEBNER 1906—1910, 481. HEGI IV, 3, 1293. NEUMAN 1901, 336. SEGERSTAD 1924, 135, 137. BLYTT 1906, 458. HJELT 1919, 274. CEDERCREUTZ 1927, 122, fig. 12.

Geographical Distribution. Pontine, South and eastern Central European, and Baltic annual herb, absent over wide stretches in western Europe; in North Germany its western limit runs from Lingen through Bassum south of Bremen to the region round Harburg. In the Central German highland it grows in meagre meadows and in light foliferous and coniferous woods, and is more common here than in the lowlands. In Holstein and Schleswig it occurs sporadically, mostly singly, on grassy ground, and is considered as anthropochorous. It extends northward to southern Norway, where it is fairly common east of the mountains from Hvalörne and Kristianssand to Slidre and Froen, growing on dry hills and mountains sides (up to 300—470 meters above the sea); west of the mountains it is very rare, but may be found as far north as Trondhjem and Stenkjær. In Sweden it extends to southern Norrland, growing in similar situations as in Norway and in addition in fields, but its distribution is much affected by cultivation, more especially the cultivation of grass fields, so that it would be very difficult to delimit its original area (SEGERSTAD). In Finland it reaches northward to $62^{\circ} 50'$ N. lat., and is found in meadows and on cultivated soil; is considered by CEDERCREUTZ to be anthropochorous.

Occurrence in Denmark. (Fig. 20, Pl. VI). The plant is chiefly found on the islands and in the east of Jutland as well as in the areas along the Limfjord, but with unequal frequency within the various districts, so that it may be unknown over wide stretches immediately adjacent to areas exhibiting many finds of it. The species does not make special demands on the fertility of the soil, and is met with both on moraine clay and on sandy soil, most frequently on, or very near, arable land, e. g. along roads. No doubt it is extensively spread by the sowing of grass seed, and when so few finds of it are recorded from the western regions of Jutland, one of the reasons may be that the cultivation of grass fields has been least developed here. It generally occurs isolated, or in small numbers, and has no great independent power of dispersal under the conditions prevailing in our country; presumably it is not indigenous in our flora, but has been introduced with cultivation. BURSER discovered it about the year 1630 near Sorö, along the margins of fields, and KYLLING records it in 1688 from fields, growing among the corn.

Trifolium alpestre L. — Skov-Klöver.

J. LANGE 1886—88, 834. RAUNKLÆR 1922, 190. ASCHERSON & GRAEBNER 1906—1910, 575. HEGI IV, 3, 1344. W. CHRISTIANSEN 1926, 138, 152, 200, 203, map 34. STERNER 1922, 239, 329, 332, 334, Pl. 6. HARTMAN 1879, 313.

Geographical Distribution. East, South, and eastern Central European perennial herb, common in southern Europe, though absent from the majority of the Mediterranean islands and e. g. in the most southerly part of Greece. Towards the west and north it extends to Spain, in Central France to Lorraine, through the southern Rhine-lands to Osnabrück, Braunschweig, Lüneburg, and eastern Holstein, thence to the southeasterly parts of Denmark, including Bornholm, and onwards across Oesel and Estonia to Ural; southeastward to the Caucasus region. In northern Germany it is of scattered occurrence east of the limit just mentioned, growing in dry woods, coppices, and dry meadows, often in company with *T. montanum*. In Scania it has been found by ELIAS FRIES near Harlösa, and is recorded from Kullaberg and Roslått, but has not been observed since the middle of last century.

Occurrence in Denmark. (Fig. 35, Pl. X). *T. alpestre* has been noted in a considerable number of localities in the east of Seeland, growing in high-lying dry woods, on wooded slopes, tumuli, and similar places, from Lystrup Wood near Frederikssund in the north to Gjorslev Wood in the south, and from the Hornsherred coast of Issefjord in the west to a wooded hill situated between Nymölle and Stampen in the east. As collected outside this area, the species is only represented in the herbarium from Bederslev Dale in the north of Funen (1897), but is further recorded in the litterature from some few other localities, thus from Stjernebjerg at Langesø west of Odense (ANTON ANDERSEN 1889, 1909), Möens Klint (KAMPHÖVENER 1835), and Rönne on Bornholm (BAAGØE 1866). Even if these lastmentioned records have not been confirmed, the geographical position of the localities may to some extent lend support to the assumption that the determination is correct. More difficult in this respect is the matter with regard to the three old records of the species from northern Jutland, viz. from the area round Aalborg by M. T. LANGE, Aarslev (by Aarhus or by Randers) by HORNEMANN, and Understed¹⁾ in Vendsyssel by C. JENSEN (1881). One cannot here disregard the possibility that a confusion has taken place with a narrow-leaved form of *T. medium*.

In Denmark the species is near its northwestern limit, and the absence of this eastern species from Oeland, Gotland, Bornholm, and southern Sweden — apart from the few localities whence it has now disappeared — is a singular fact. Another peculiarity meets us in its distribution in Denmark, in that its main area lies isolated in the north of Seeland, although the species must have immigrated into Denmark from the south or southeast. It is probable, in this as in other

¹⁾ Mr. K. WIINSTEDT has informed me that he has repeatedly searched for *T. alpestre* on the hills at Understed, but without finding it.

cases, that during the post-glacial optimum of warmth, especially during the more continentally marked sub-boreal period, the species has had a more continuous distribution here near its northwestern limit. A concurrent factor in the interruption of such a more continuous area has perhaps been the sub-Atlantic deterioration of the climate, in connection with the constantly increasing cultivation of the localities suitable for the growth of the species. In several of the habitats in northern Seeland previously known it has now been ousted by cultivation.

Trifolium arvense L. — Hare-Klöver.

J. LANGE 1886—88, 831. RAUNKIÆR 1922, 190. FERDINANDSEN 1918, 68. JESSEN & LIND 1923, 128, 431. ASCHERSON & GRAEBNER 1906—1910, 530. HEGI IV, 3, 1322. LINDMAN 1926, 382. STERNER 1922, 289. BLYTT 1906, 461. HJELT 1919, 261.

Geographical Distribution. West Asiatic, European annual herb, extending southward to North Africa and the Canary Islands. It is common in northern Germany, growing on sandy fields and in dry, grassy areas with noncalcareous soil (dunes and heaths). It is rather common in similar situations in South and Central Sweden, rarer in southern Norrland and in Norway, where it occurs along the coast in the south of the country (from Jæderen to Svinesund); still farther northward it is very rare, but occurs at Trondhjem. In Southwest Finland it extends to 61° 40' N. lat.

Occurrence in Denmark. This plant, an inhabitant in particular of acid soil, is recorded from all the districts as common or fairly common. It attains its greatest frequency in the sandy tracts of Jutland as well as on the islands, and may be one of the characteristic plants of sandy pastures poor in nutritive elements, e. g. littoral plains, and may otherwise be found on dunes, on the shore, and on coast cliffs, further in sandy fields, cultivated heaths, and along roads. It has hardly ever been cultivated, but has been much favoured by the cultivation of the country, which has brought about an interruption of the continuous covering of vegetation, such as those of the heath and the woods. No doubt it has immigrated independently of man, and might always have been able to find suitable localities along the shore, on dunes, and on sands.

Trifolium elegans Savi.

J. LANGE 1886—88, 829. RAUNKIÆR 1922, 189. JESSEN & LIND 1923, 433. ASCHERSON & GRAEBNER 1906—1910, 496. NEUMAN 1901, 338. BLYTT 1906, 460.

Geographical Distribution. About the same as that of *T. hybridum*, to which it is very closely allied. It grows in similar situations as *T. hybridum*, but is generally rare within the northern parts of its area of distribution. From Belgium

it is only recorded as anthropochorous. Most likely *T. elegans* has often been overlooked, or has not been distinguished from *T. hybridum*; this has most likely taken place in Sweden. In Norway there occurs the form *T. hybridum f. prostratum* SOND., which is at any rate closely related to *T. elegans*.

Occurrence in Denmark. *T. elegans* has occasionally been found in clover fields in the southeastern part of the country, thus in the north of Seeland, on Lolland, Ærø, the eastern part of Funen, and further in a few places in Vendsyssel, most frequently in the period from 1865 to 1869. The earliest find was made at Klingstrup in the southeast of Funen in 1865. In addition it has been collected a couple of times in waste places in the neighbourhood of Copenhagen, most recently in 1927.

Trifolium filiforme L. — Spæd-Klöver.

(*T. micrantum* VIVIANI).

J. LANGE 1886—88, 825. RAUNKLÆR 1922, 188. WINSTEDT 1908, XXXV. ASCHERSON & GRAEBNER 1906—1910, 479. HEGI IV, 3, 1290. PRAHL 1890, 43. BENTHAM & HOOKER 1920, 115. DRUCE 1908, 18. BLYTT 1906, 459.

Geographical Distribution. Pontine, Mediterranean, Atlantic annual herb, extending from the Caucasus regions through the South European countries and North Africa to the Canary Islands; thence towards the north along the west coast of Europe from Portugal to Belgium; is further present in Great Britain northward to Roxburghshire, in Denmark, and in southern Norway (coast cliffs at Kristianssand). Everywhere it prefers sandy and stony ground, dry meadows, and other uncultivated soil, particularly in the vicinity of the coasts.

Occurrence in Denmark. (Fig. 28, Pl. VIII). The plant is of rather scattered occurrence within a continuous area comprising the coasts of our southern waters, viz. South Lolland, Southwest Seeland, Funen, and the islands south thereof, as well as the east coast of Jutland from Flensburg Fjord to Horsens Fjord. Several of the finds are of ancient date, and have not been confirmed in recent times; this applies chiefly to those made farthest to the southwestward. It always grows in littoral meadows, principally in the somewhat high-lying stretches away from the sea, and is hardly an obligatory halophyte.

In view of its distribution in Europe as a whole, it must in our country be considered as a southerly, Atlantic form. Its areas in the south of Central Denmark and at Kristianssand in the south of Norway are isolated localities far from its main area in the west and southwest (it is entirely absent along the stretch Flensburg Fjord to Belgium), and it occurs in those parts of Denmark which have the mildest climate. From this point of view its occurrence in this country may perhaps be seen as a relict, and it is conceivable that during the warm Atlantic period the species had a wider distribution in northwestern Europe.

Trifolium fragiferum L. — Jordbær-Klöver.

J. LANGE 1886—88, 830. RAUNKIÆR 1922, 189. J. ANDERSEN & H. ÖDUM 1930, 74. ASCHERSON & GRAEBNER 1906—1910, 524. HEGI IV, 3, 1316. BENTHAM & HOOKER 1920, 113. KOUSNETZOFF 1926, fig. 2. HARTMAN 1879, 311. SEGERSTAD 1924, 58, fig. 16. BLYTT 1906, 460.

Geographical Distribution. West Asiatic, Central and South European, North African perennial herb. In Northwest Europe its northern limit is found along the seashores, running from the Baltic states across the Aland Isles, Upland (an advanced post at Sundsvall in Medelpad), Westmanland, bending round the South Swedish coasts to Norway, and onward along the south coast of this country to Lister; occurs only locally in Scotland and Ireland, while it is common in England; extends southward to Abyssinia, Madeira, and the Canary Islands; eastward to Asia Minor, Syria, Persia, and Turkestan.

The species is halophilous, though not decidedly halophytic, and is especially associated with the seashore. It may, however, also be found commonly distributed far from the shore, e. g. south of the Baltic, and then grows partly in saline soil ("Salzstellen"), thus in several places in Germany in association i. a. with *Juncus compressus*, *Atropis distans*, *Lotus tenuis*, *Erythraea pulchella*, partly in moist perennial pastures in company with *Lolium perenne*, *Potentilla anserina*, *Trifolium repens*, *Plantago major*, etc., and together with these species it grows along the edges of roads, even in rather dry but rich and calcareous clayey soils. Common to all the normal localities of the species is apparently a high osmotic pressure of the solution of nutrient substances in the soil, no matter what combination has produced it.

Occurrence in Denmark. (Fig. 9, Pl. IV). Within Denmark *T. fragiferum* is principally found in littoral meadows, and is common almost everywhere in the country where such are found, even when they are quite diminutive, as along the coasts of Bornholm. The map shows that it has most frequently been found along the shores of the islands except e. g. the coast of northern Sealand, which is devoid of littoral meadows, and further in certain tracts of the east coast of Jutland, along the Limfjord, Nissum Fjord, and the southern part of the west coast (in meadows between the dunes and in the marsh). In Vendsyssel, near the northern limit of the species, it is recorded from scattered localities only.

Besides on the coasts *T. fragiferum* also occurs in several places inland. This seems especially to be the case on Seeland and Lolland-Falster. At Rislev north of Næstved, in Mullerup Bog, at Gjedsbjerg west of Nyborg, and possibly in other places, the presence of the species, together with a series of other halophilous species, is due to the presence of salt-springs. In other cases it is found on the banks of lakes and in meadows where the presence of salt has not been ascertained.

During the maximum of the post-glacial uplift, when most of the Danish coasts extended far outside their present position, *T. fragiferum* may at any rate have been rare within the present area of the country, except perhaps in the neighbourhood of some streams or salt-springs. Considering the southerly distribution

of the species in Scandinavia, it is perhaps even possible that it has not immigrated until the Littorina time. At any rate it was not until this and later times that the littoral meadows, where it now abounds, came into existence. An immigration from the south seems most probable.

Trifolium hybridum L. — Alsike-Klöver.

J. LANGE 1886—88, 829. RAUNKIÆR 1922, 189. JESSEN & LIND 1923, 433. ASCHERSON & GRAEBNER 1906—1910, 495. HEGI IV, 3, 1929. COSTE I, 1901, 343. BENTHAM & HOOKER 1920, 114. KOUSNETZOFF 1926, fig. 2. LINDMAN 1926, 381. BLYTT 1906, 460.

Geographical Distribution. Pontic European perennial herb, extending from Asia Minor, Caucasia, and Transcaucasia through the greater part of Europe except, particularly, the extreme northern parts. HEGI considers it to be originally indigenous probably in Atlantic Europe only, but its distribution is influenced by cultivation to such a great extent, that it would be difficult to define clearly the original area of distribution of the species. In the Mediterranean countries it is generally rare, and it is doubtful whether it is indigenous; in western Europe it is found along the coasts and in river valleys, and in the mountainous regions of France in fertile meadows, fields, and on the outskirts of woods, but it is recorded as naturalised e. g. from Normandy and England; it is likewise widely distributed in Central Europe, especially in meadows, but is assumed to have been introduced, intentionally or unintentionally, during the latest centuries.

The species was hardly common in Sweden when LINNÉ discovered it in the parish of Alsike in Upland; but after that at his inducement it was cultivated in grass fields, it has become commonly distributed in meadows and grass fields from Scania to Norrland. In Norway it is met with in cultivated meadows, where it is rather common, though not originally wild, in the most low-lying, southern parts of the country as well as west and north of the mountains as far as $63^{\circ} 51'$ N. lat.; farther northward it is scarce, and probably only of casual occurrence. HJELT considers it as belonging to the spontaneous flora of Finland; it has, however, now become the species of clover that it most commonly cultivated in the country. In Finland it extends northward to 64° N. lat.

Occurrence in Denmark. The species is recorded to be fairly common or common, cultivated as well as escaped from cultivation, in the majority of districts of the country; exceptions are, besides Læsø and Anholt, some West and Central Jutlandish districts (16, 17, and 26), where it has been less extensively cultivated. The species easily escapes from the fields, and is frequently found on the edges of ditches, in high-lying meadows, and in similar uncultivated places near the cultivated ground. — The earliest record of *T. hybridum* from Denmark is due to O. F. MÜLLER (1767), who thought he had found it in abundance at Køge Inn. However, later authors do not mention this find, and possibly it is a case of erroneous determination; it is not until about 1840 that it is recorded as cultivated from this

country, and in the following years it was observed in several places as escaped from cultivation, and soon became of more common occurrence.

Trifolium incarnatum L. — Blod-Klöver.

J. LANGE 1886—88, 834. RAUNKLÆR 1922, 190. JESSEN & LIND 1923, 128, 434. ASCHERSON & GRAEBNER 1906—1910, 544. HEGI IV, 3, 1328. BENTHAM & HOOKER 1920, 110. LINDMAN 1926, 382

Geographical Distribution. Mediterranean, Atlantic annual herb, extending over southern Europe from the Iberian Peninsula to the Balkan Peninsula and Hungary, southward to Algeria, northward to France and southwestern England (Lizard Point). The wild form is *var. Molinerii* (BALB.) DC., which is only seldom introduced with grass seed into Central Europe; among the cultivated forms *f. elatius* GIB. & BELLI is the commonest, and is cultivated in Central and northern Europe, where it easily escapes to grassy ground of different kinds, but is only intermittent. In Sweden, too, the species may occasionally be found, cultivated as well as run wild.

Occurrence in Denmark. As might be expected from a plant occasionally sown in fields set out to grass, *T. incarnatum* is recorded from nearly all districts of Denmark. Sometimes it may be found as an escape from cultivation on the edges of ditches and in similar situations as also in waste places, but it is not constant in our climate, being killed by frost. — In the run wild state the species was observed for the first time in Denmark in 1842 by Thorvaldsens Museum, directly introduced from Italy, but had previously been cultivated as an ornamental plant. It was, however, not until about 1860, when the cultivation of it in grass fields was occasionally commenced, that it became more commonly distributed in the country.

Trifolium medium L. — Bugtet Klöver.

J. LANGE 1886—88, 833. RAUNKLÆR 1922, 190. FERDINANDSEN 1918, 70. ASCHERSON & GRAEBNER 1906—1910, 566. HEGI IV, 3, 1342. KOUSNETZOFF 1926, fig. 3. HARTMAN 1879, 312. BLYTT 1906, 462. HJELT 1919, 259. CEDECRRREUTZ 1927, 122.

Geographical Distribution. West Asiatic, European perennial herb, occurring throughout Europe except in the most northerly regions and southern Italy, Greece, and Dalmatia. It is of scattered occurrence all over northern Germany in woods, dry meadows, and along roads, but avoids cultivated ground. In Sweden it extends northward to Ångermanland and Jemland. In Norway, where it is of common occurrence east of the mountains and in the interior of the fjords, but rarer along the coast, it extends to the regions round Trondhjem; east of the mountains it may sometimes extend beyond the limit of the birch belt, and in this country it is recorded from dry hills and mountain sides, while in Sweden and Finland, where it extends northward to $63^{\circ} 12'$ N. lat., it inhabits meadows and grove-meadows.

Occurrence in Denmark. The species is recorded from all districts except No. 12 (Anholt). In nearly all of them it is common, only in the most heathery tracts in the west of Jutland it is more infrequently met with. It grows on uncultivated hills, pastures, the outskirts of woods, and along ditches and hedges, mainly in acid soil, and here, too, it avoids cultivated ground.

The species may vary, having sometimes more erect stems and narrower leaflets (*f. strictum* HARTM.), or it may be low with prostrate or pendulous branches and dark red flowers in somewhat bigger flower heads (*f. humile* LGE.). In our country both forms seem to have about the same distribution as the main species.

Trifolium minus Relhan. — Fin Klöver.

J. LANGE 1886—88, 826. RAUNKLÆR 1922, 188. JESSEN & LIND 1923, 128, 435. GRÖNTVED 1927, 18, 39. ASCHERSON & GRAEBNER 1906—1910, 277. HEGI IV, 3, 1288. LINDMAN 1926, 381. BLYTT 1906, 459.

Geographical Distribution. A Central and South European and Caucasian annual herb, whose northern limit runs through Latvia (Riga — Vindau), the extreme southwestern part of Finland (anthropochorous), southern Sweden to Smalandia and Bohuslen, and the Norwegian coastal regions as far as Bergen.

Occurrence in Denmark. The species has about the same distribution within the country as *T. procumbens*, but is probably often still more common. It grows in similar localities as the species just mentioned, and is sown together with it as weed in the grass fields but is apparently more common in uncultivated pastures. It is perhaps indigenous in our flora.

Trifolium montanum L. — Bjærg-Klöver.

J. LANGE 1886—88, 828. RAUNKLÆR 1922, 189. WINSTEDT 1925, 300. ASCHERSON & GRAEBNER 1906—1910, 505. HEGI IV, 3, 1310. PRAHL 1890, 42. W. CHRISTIANSEN 1926, 138, map 34. LINDMAN 1926, 381. STERNER 1922, 301 (fig. 6), 332, 401. BLYTT 1906, 461. KOUSNETZOFF 1926, fig. 2.

Geographical Distribution. West Asiatic, Pontine, East and Central European perennial herb. Within Europe its northern limit runs through Central Perm, Petrograd, southern Finland, eastern Sweden south of Gefle, to an isolated locality on Hovedö near Oslo; westward it extends through Scania, Seeland, eastern Holstein, thence along a line from Warnemünde through Hanover, the Rhine province to southeastern Belgium, and onwards through the eastern parts of France to Central Spain; it is absent from South Europe proper, i. e. from South Italy and the southern part of the Balkan Peninsula.

In the North German lowlands, east of the limit stated above, *T. montanum* occurs in scattered growth in dry meadows, in foliferous woods, on hills, and along roads. In eastern Sweden it is rather common in pastures rich in herbaceous plants and with calcareous soil ("meadow steppes", STERNER), and near Oslo it occurs in low coppices on calcareous mountains.

Occurrence in Denmark. (Fig. 36, Pl. X). The species is not rare in the southeastern part of Bornholm, where it is met with on the edges of meadows and bogs, growing on fairly dry soil with abundant herbaceous vegetation, while in the remaining part of Denmark it has apparently only survived on Hessel Bakker, i. e. pasture hills, partially covered with copse, on the southern outskirts of Ganlöse Egede. Formerly, however, the species has had a somewhat greater distribution in Seeland. In the herbarium we thus find specimens collected in the neighbourhood of the Flaskekro southwest of Copenhagen in the period from 1823 to 1866, partly "on a hill behind the Flaskekro", and partly "east of the Flaskekro in the vicinity of the field well", as well as specimens collected on the Vesterfælled at Copenhagen in 1841. MARTIN VAHL found it on the littoral pasture between the Skillingskro and Køge Inn (Fl. Dan. 1172), and HANS MORTENSEN records it in 1872 from Nymölle; possibly it has also grown on Hesselö (see LYNGBY's manuscript).

Geographically the localities of *T. montanum* on Seeland and Bornholm are closely connected with its Scanian area, where it is fairly common. This south-easterly, continentally marked species must have immigrated into Scandinavia from the east and southeast, probably at the time when the climate was least under the influence of the Atlantic, since throughout northern Europe it avoids the western coastal tracts most exposed to this influence. Possibly it is a sub-boreal immigrant in Scandinavia.

Trifolium pratense L. — Röd Klöver.

J. LANGE 1886—88, 832. RAUNKIÆR 1922, 190. OLSEN 1921, 50. JESSEN & LIND 1923, 128. GRØNTVED 1927. STEFÁNSSON 1924, 162. ASCHERSON & GRAEBNER 1906—1910, 547. HEGI IV, 3, 1331. KOUSNETZOFF, 1926, fig. 2. LINDMAN 1926, 382. BLYTT 1906, 461. HJELT 1919, 256.

Geographical Distribution. Euro-Asiatic perennial herb, occurring in western Asia as far as Altai, Balkal, Cashmere, and Garwall in India; wild as well as cultivated throughout Europe except in the extreme northerly regions; present in Algeria; completely naturalised in North and South America and on New Zealand.

In Central Europe it grows wild in meadows, pastures ("Triften"), and coppices. In Sweden it occurs in similar situations almost all over the country. In Norway it is common in dry meadows and on hills as far north as Tromsö and Kvænangen ($69^{\circ} 48'$ N. lat.); still farther northward it is only occasionally met with; it extends from the sea some way into the birch belt, at times even beyond the limit of the birches. In Finland the cultivated form has its northern limit at Kemi, while the wild form extends to $69^{\circ} 10'$ N. lat. In Iceland it is anthropochorous.

Occurrence in Denmark. After *T. pratense* since the middle of the 18th century, and in an increasing degree since the middle of last century, has been cultivated in Denmark, it is now one of the commonest plants of the country, and occurs in

all districts, most commonly in cultivated and semi-cultivated formations. No doubt, however, the species was frequent in the more fertile parts of the country even before the cultivation of grass fields was commenced, and certainly even before the introduction of agriculture in to Denmark. Humous meadows, pastures with clay or sand in the sub-soil and with a neutral or slightly acid reaction, and copse-clad hills and cliffs are the localities where the species may be met with as a spontaneous plant.

T. pratense is highly variable. Among the wild forms occurring in this country, *var. spontaneum* WILLK., encountered in meadows and coppices, and *var. villosum* WAHLB. (= *var. depressum* J. P. JACOBSEN), growing on dunes, sandy pastures, coast cliffs, and hillsides, may especially be separated. *V. sativum* SCHREB. is common everywhere, cultivated and run wild, in meadows, on the edges of ditches, and in similar situations; it is possibly a South European form which has been introduced by cultivation into more northerly regions. Finally, *v. expansum* HAUSSKN. (= *v. americanum* HARZ) has been introduced into our country with American seed, but is presumably originally indigenous in Hungary and Dalmatia; this form, too, grows as a run wild plant in this country on the edges of ditches and in waste places.

Owing to the common distribution of the species within subarctic Fennoscandia, it seems reasonable to assume that it belongs to our earliest post-glacial immigrants.

Trifolium procumbens L. — Udstrakt Klöver.

J. LANGE 1886—88, 826. RAUNKIÆR 1922, 188. FERDINANDSEN 1918, 68. JESSEN & LIND 1923, 128, 435. BENTHAM & HOOKER 1920, 114. ASCHERSON & GRAEBNER 1906—1910, 476. HEGI IV, 3, 1289. BLYTT 1906, 459. NEUMAN 1901, 336. HJELT 1919, 277.

Geographical Distribution. West Asiatic, European annual herb, which in Fennoscandia is spread over western Finland (anthropochorous), Sweden as far as Norrland, and the southernmost low-lying parts of Norway, more especially from Oslo to Jæderen. In Scandinavia, Germany, as well as in other regions, it lives in meadows, grass fields, on grassy hills, the edges of ditches, lawns, etc., extensively distributed by cultivation.

Occurrence in Denmark. *T. procumbens* is mentioned from all the districts of the country, and is no doubt common in all of them. It is acidophilous, and is most frequently found on grassy soil, especially in associations much influenced by cultivation; it is generally sown as an impurity in clover and grass seeds, which circumstance has doubtless contributed considerably to its extensive distribution in the country, still it may also occur e. g. on pastures. It seems uncertain whether it can be considered as originally belonging to our flora.

Trifolium repens L. — Hvid Klöver.

J. LANGE 1886—88, 829. RAUNKIÆR 1922, 189. FERDINANDSEN 1918, 66. JESSEN & LIND 1923, 128, 436. STEFÁNSSON 1924, 161. ASCHERSON & GRAEBNER 1906—1910, 497. HEGI IV, 3, 1302. KOUSNETZOFF 1926, fig. 3. NORMAN 1895, 198.

Geographical Distribution. West Asiatic, European perennial herb, extending beyond the Polar and Alpine limits of the trees, and southward to North Africa; it is found, though probably only as anthropochorous, on Madeira and the Azores, in the Cape Colony, North and South America, and East Asia.

The species is principally met with in meadows, pastures, grass fields, on lawns, and at roadsides, and is of common occurrence throughout Central and northern Europe. Its great frequency has some connection with the fact that it is not very exacting with regard to the content of nutrient substances in the soil, and that it is extensively cultivated and very easily spread with cultivation; it thrives best in soil requiring lime.

Occurrence in Denmark. *T. repens* is common in all districts of the country. The cultivation of the species was commenced in Denmark as early as about the middle of the 18th century, but even prior to that time it had been spread by cultivation, thus for instance by farm animals, as it obviously has taken place e. g. in northern Norway. *T. repens* has, however, doubtless lived in the North prior to the introduction of agriculture and the rearing of cattle, e. g. on patches of meadows in woods and in similar places, and considering its present extensive distribution towards the north, it seems very likely that it has immigrated at an early date.

Trifolium spadiceum L. — Brun Klöver.

J. LANGE 1886—88, 827. RAUNKIÆR 1922, 189. WIINSTEDT 1928, 225. W. CHRISTIANSEN 1926, 176, map 85. PRAHL 1890, 42. ASCHERSON & GRAEBNER 1906—1910, 484. HEGI IV, 3, 1294. STERNER 1922, 360, 407. BLYTT 1906, 458. HJELT 1919, 271.

Geographical Distribution. East and eastern Central European annual herb, which extends from northern Perm, Shenkursk in Archangel, and Finland from $65^{\circ} 20'$ N. lat. in the north, and from Orenburg and Podolien in the south, across the Central European highland to the Rhine province and the mountains of southern France and northern Spain; it is rare along the Apennines as far as Calabria, and is present in Servia and Bulgaria; it further occurs, mainly as a colonist, at roadsides and in meadows, scattered over Central Sweden and southern Norrland, on Oeland (probably spontaneous (STERNER)), in the south of Norway, and in the Baltic lowlands.

Occurrence in Denmark. The species was first observed in this country in 1892 in a bog a Ruds Vedby on Seeland (district 42), where it has survived at any rate till about the year 1900. In 1927 it was found, growing abundantly in a small meadow south of Kolding, at the boundary between the moist meadowland

and the higher-lying arable land. These two Danish localities, in connection with the habitats of the species in eastern Holstein, mapped by CHRISTIANSEN, and its very few localities in the remaining part of the North German lowlands east of Hanover, fill up the gap between the area of the species in eastern Sweden and in the Rhine province and Thuringia. As in Holstein, and on the whole in northern Germany, where the species is not regarded as originally indigenous, it may be anthropochorous in the two Danish localities.

Trifolium striatum L. — **Stribet Klöver.**

J. LANGE 1886—88, 831. RAUNKLÆR 1922, 190. GRÖNTVED 1929, 20 f. O. ROSTRUP 1900, 147. JESSEN & LIND 1923, 128. ASCHERSON & GRAEBNER 1906—1910, 527. HEGI IV, 3, 1324. PRAHL 1890, 42. KRAUSE 1893, 127. LINDMAN 1926, 381. SEGERSTAD 1924, 162, 163, fig. 295.

Geographical Distribution. Pontine, Mediterranean, and West European annual herb, extending from Caucasia and the Crimea, through southern Europe, to Northwest Africa and Madeira; in western Europe from Portugal to England, southern Scotland, Ireland (very rare) and southern Scandinavia; in Central Europe, where it is of very scattered occurrence, it extends eastward to the Oder and southern Russia.

In northern Germany the species is generally rare and frequently inconstant; it is most frequent in Neuvorpommern and on Rügen, is recorded from Mecklenburg as a migratory plant that has made its appearance in several places in the course of the last few generations; it is rather commonly distributed in Schleswig-Holstein, but according to PRAHL probably originally introduced. Its distribution in Sweden has been mapped by SEGERSTAD, according to whom it occurs in sandy fields, on hillsides, and in waste places in the vicinity of the coast along the stretch from Gotland and Öland through southern Blekinge to the southern and western parts of Scania, and thence sporadically along the coast of Halland to some distance south of Gothenburg. It is absent in Norway.

Occurrence in Denmark. (Fig. 21, Pl. VII). The species is generally fairly common on the islands — the absence of dots in Central Sealand is possibly due to incomplete investigation — and in the east of Jutland almost as far as Randers, and is further recorded from a number of localities round the western part of the Limfjord. It seems to be almost entirely absent from Himmerland, Vendsyssel, and the southwest of Jutland; its northern limit runs through the northern part of the peninsula. It prefers localities where the plant covering is not quite close, growing especially in gravel-pits, in dry, sandy or gravelly grass fields, on dikes and slopes, in pastures, and waste places, and thrives best on acid or neutrally reacting "warm" soil, probably mainly in soil not too poor in nutrient substances.

The species varies greatly within the Mediterranean region, while in northern Europe it is almost exclusively represented by the form *var. genuinum* LGE.; this, however, appears in a couple of forms dependent on the nature of the habitat, viz.

f. strictum DREJ., occurring where *T. striatum* grows in tall vegetation, e. g. in fields; and *f. prostratum* LGE., encountered in warm localities exposed to the sun and with a low and open vegetation.

T. striatum is much spread by cultivation in different ways, and also as an impurity in grass seed sown in fields laid down in grass. From the fields it may migrate to uncultivated soil in the neighbourhood, where it is apparently able to exist independently of cultivation, as a naturalised plant, but is probably no more than in northern Germany originally a native of the Danish flora. It was known to Danish botanists in the 17th century.

***Trigonella coerulea* (L.) Seringe — Mölurt.**
(*Melilotus coeruleus* DESR.)

RAUNKIÆR 1922, 186. ASCHERSON & GRAEBNER, 1906—1910, 379. HEGI IV, 3, 1233.

Geographical Distribution. Southeast European annual herb which has spread by human agency to vast areas of Central Europe, since in earlier times it was cultivated as a medicinal plant, or, owing to its perfume, reminiscent of that of *Trifolium foenum græcum*, was used as an admixture in cheese or bread. In recent times it has been introduced in several places as a ruderal plant.

Occurrence in Denmark. In this country the plant is known from cultivation in a few places, viz. from a garden at Marienborg west of Hadsund (1871) and from a farm by Frederiksværk (1883), where it was employed as an admixture in cheese. Further it has been collected in waste places near Aarhus in 1895, near Benzon's chemical factories at Copenhagen in 1887—95, and at Kastrup Mill and in other waste places on Amager in 1893—99.

***Trigonella ornithopodioides* D. C. — Fugleklo-Bukkehorn.**

J. LANGE 1886—88, 836. RAUNKIÆR 1922, 186. HORNEMANN, 1821, 779. ASCHERSON & GRAEBNER 1906—1910, 510. HEGI IV, 3, 1279. BENTHAM & HOOKER 1920, 108. DRUCE 1908, 16.

Geographical Distribution. Atlantic, West Mediterranean annual herb, known from the western part of the Mediterranean region (South Italy, Corsica, the Iberian Peninsula, North Africa), the west coast of Europe as far as Holland, and from coastal tracts in several parts of England, South Scotland, and Ireland; it is recorded from dunes on the island of Sild in 1768, but has not been observed since that time, probably it has been adventitious in that locality; it has — at any rate — been present on Læsø and Bornholm. — It grows mainly on bare slopes and along roads, usually in the vicinity of the coast.

Occurrence in Denmark. HORNEMANN found the plant in the period from 1806 to 1821, growing abundantly on the eastern side of Christiansø at Bornholm, but later it has been searched for in vain in this locality. In 1885 it was observed on an

old alluvial beach south of Nexö, near the shooting ground, in the neighbourhood of which there are some waste places, and was also collected here in 1887; and as late as 1890 it was found in nearly the same place (viz. the shore south of Ferskesö), where it occurred rather plentifully. J. P. JACOBSEN records *Trigonella ornithopodioides* from Læsö in 1870, and J. LANGE confirms the correctness of the determination; the nature of the habitat is unknown. In 1892 P. NIELSEN discovered the plant among mangolds at Tystofte Experimental Station in the south of Seeland. Later the species has not been recorded from Denmark.

Perhaps *T. ornithopodioides* on Bornholm, Christiansö, and Læsö may best be considered as having been introduced in the ballast of sailing vessels from West European ports.

Ulex europaeus L. — Tornblad.

J. LANGE 1886—88, 819. RAUNKIÆR 1922, 186. MÖLLER-HOLST VI, 1883, 52. WARMING 1919, 118. HORNEMANN 1821, 756. KYLLING 1688, 53, No. 386. ASCHERSON & GRAEBNER 1906—1910, 284. HEGI IV, 3, 1190. LINDMAN 1926, 377. BLYTT 1906, 452.

Geographical Distribution. West European shrub, which has been introduced from the Iberian Peninsula, France, Belgium, Holland, and the British Isles, into more easterly regions; thus it occurs, planted as well as wild, in Denmark, near Mandal in the south of Norway, in southern Sweden (Scania, Bohuslen, Smalandia, Oeland, and Gotland), in Central Europe as far as the Sudetic Mountains, and in the Balkan Peninsula. It is frequently anthropochorous in the North German lowlands and in the neighbourhood of the Baltic, in several places apparently naturalised, chiefly on railway embankments, on sunny outskirts of woods, and in similar situations. In the more easterly regions it often dies down to the ground in the winter.

Occurrence in Denmark. *Ulex europaeus* occurs in all parts of the country, but is not equally common in all of them, being much more frequent (frequency here and there) in most regions of the islands and eastern Jutland as far as the Limfjord than in the area north of this fjord or in the heathy tracts of western Jutland. It is not recorded from districts 3, 12, 39 a, 46, and 51. In several places it is planted as a hedge plant, or is sown in order to protect, or serve as food for, the game, and is able to propagate itself, mainly in sandy tracts, where it may be found along roads, on the outskirts of woods, and on pastures, forming small scrubs; or it may migrate to the shore, as it has done by Vivild in Djursland. The reason why *U. europaeus*, although it thrives best on sandy soil, is comparatively rare in the west of Jutland, must probably be sought in the circumstance that these regions have only recently been cultivated to any great extent; KYLLING records it from Ribe, and HORNEMANN knew it from some few localities on Als, in Jutland, Funen, and Bornholm.

On the whole the behaviour of the species in this country shows that it is

not originally wild; moreover it does not always endure our climate, and in severe winters dies down to the ground.

Vicia angustifolia Roth. — Smal Vikke.

J. LANGE 1886—88, 846. RAUNKIÆR 1922, 194. JESSEN & LIND 1923, 453. ASCHERSON & GRAEBNER 1906—1910, 971. HEGI IV, 3, 1547. MURATOVA 1926, b, Pl. I. PRAHL 1899, 44. LINDMAN 1926, 387. SEGERSTAD 1924, 36, 102, 112. BLYTT 1906, 473. HJELT 1919, 212.

Geographical Distribution. West-Asiatic, European annual herb, extending over nearly the whole of Europe with the exception of the extreme northern regions. It is everywhere extensively distributed as a field weed, more particularly the form *segetalis* (THUILL.) KOCH, but is also found — e. g. in northern Germany — in coppices and open woods, on pastures and dunes; this is especially the case with *f. Bobartii* KOCH, which e. g. within Holstein and Schleswig is met with in »dry meadows« (pastures) and on sandy hills, mainly near the coast. In Scandinavia, too, the species occurs on cultivated soil and — as *f. Bobartii* — in natural associations, or associations only slightly affected by cultivation, on dry hills (pastures), in coppices, and on sea-shores. In Sweden *f. Bobartii* hardly extends as far northward as the oak, but as an adventitious plant the species may be found as far as Norrbotten. In Norway the species is rare, and is only found in the most low-lying tracts as far as Skedsmo and Bergen. In Finland it extends northward to 65° N. lat., but only in fields, *f. Bobartii* is absent.

Occurrence in Denmark. *V. angustifolia* is distributed nearly throughout the whole of the country, and is probably almost equally frequent in the west and the east. Still it is not recorded from district No. 17 and within district No. 18 from Holstebro only, while both north and south thereof, viz. in districts 16 and 26—27, it is recorded to be common or fairly common. Nor is it recorded from Ærø. — Its extensive distribution in the country is no doubt essentially conditioned by the fact that it is common as a weed among the corn; this is especially true of the form *segetalis*, whereas *f. Bobartii* in this country, too, is found in more natural associations, chiefly in coppices, along hedgerows, on pastures, grey dunes, and dune heaths, and may probably be considered as spontaneous within Denmark. The distribution of this form deserves a closer investigation, it being probably more unequally distributed than the chief species. The specimens of this form kept in the Herbarium (about 30 sheets) are derived from districts within the eastern and southern parts of the country, to which must be added some few finds from districts 1, 3, 8, 12, and 19. By far the greater number of the finds originate from localities situated near the coast.

Vicia cassubica L. — Kassubisk Vikke.

J. LANGE 1886—88, 842. RAUNKIÆR 1922, 193. ASCHERSON & GRAEBNER 1906—1910, 923. HEGI IV, 2, 1523. W. CHRISTIANSEN 1926, 147, 177, 183, map. 84. LINDMAN 1926, 386. STERNER 1922, 304, 346 (fig. 24), 349, 403. BLYTT 1906, 472.

Geographical Distribution. Pontine, Mediterranean, eastern Central European perennial herb, extending over South and Central Russia from Saratow, Simbirsk, and Orenburg through Vitebsk, Livonia, southwestern Estonia, Osel, and southern Sweden to the south of Norway and Denmark; thence through North and Central Germany, Southwest France to Central Spain, and onwards to the south across Italy, the Balkan Peninsula (except the southern part of Greece), Bessarabia, the Crimea, Asia Minor, Armenia, Syria, and the Caucasus.

In northern Germany *V. cassubica* is commonest to the east, in dry woods and on hills, and reaches its northwestern limit along a line drawn from Flensburg through the southern Dithmarsches, Hamburg, Lauenburg, Lüneburg, Celle, Hildesheim, the Harz, Hessen, and Pfalz; (it is absent in southeastern France, Alsace-Lorraine, Baden, Würtemberg, South Bavaria, Switzerland, North Tyrol, Carinthia, Salzburg, and Upper Austria). The distribution of the species within Holstein and German Schleswig is shown on a map by W. CHRISTIANSEN. In certain tracts of Sweden it is especially common on rocks and dry wooded hills; according to STERNER, who has mapped its distribution in that country, it extends northward to Stockholm, and is especially common in the eastern part of southern Sweden, in Scania, and along the west coast to Gothenburg; its northernmost localities in western Sweden lie between the frontier and lake Wener. Within Norway it occurs in similar localities as in Sweden, thus on the south coast between Lyngör and Christianssand, but is absent from the area round Oslo. According to information furnished by KJELL KOLTHOFF to STERNER it is widely spread within restricted areas of Sweden because birds of prey devour gallinaceous birds which have its seeds in their caws.

Occurrence in Denmark. (Fig. 18, Pl. VI). As regards the distribution of the species in this country, three areas may be distinguished, viz. Bornholm, northern Seeland, and scattered localities in Jutland and Funen. It is fairly common on Bornholm. The finds of it in Seeland are mainly centred in the region north of Copenhagen, where, however, it is now very rare, even if it has not quite disappeared, and in the region round the Isefjord. While the Seeland areas of the species correspond to the Scanian, its widespread localities in Jutland, from Apenrade and Bramminge to Agdruplund in Vendsyssel, must be regarded in connection with the West Swedish and South Norwegian as well as with the German localities in southern Schleswig and Holstein. The northern part of the western limit of the species runs through Jutland. In several of the localities in Jutland and Funen it has not been observed since the first half of the last century, so it has possibly disappeared there. On the whole it has probably been largely ousted during the last few generations owing to destruction of its habitats by cultivation or the clearing of forests. It prefers high, dry, and wooded hills, coppices, or heathery hills. Possibly it has also been ousted from some localities during the sub-Atlantic deterioration of the climate, since here near its northwestern limit the sub-boreal

warm and continentally marked climate must especially have favoured the growth of this southeasterly species. The immigration must have taken place from the east or southeast, probably during the post-glacial optimum of warmth.

Vicia cracca L. — Muse-Vikke.

J. LANGE 1886—88, 843. RAUNKIÆR 1922, 193. STEFÁNSSON 1924, 159. OSTENFELD 1901, 71. FERDINANDSEN 1918, 67. JESSEN & LIND 1923, 129, 454. ASCHERSON & GRAEBNER 1906—1910, 929. HEGI VI, 3, 1529. MURATOVA 1926, b, Pl. I. LINDMAN 1926, 387. BLYTT 1906, 472.

Geographical Distribution. European, Asiatic perennial herb, distributed over Asia from China and Kamtschatka, throughout Europe, Iceland (growing in dry meadows and on cultivated soil), the Faroes (in the home-fields only); it is further found in Northwest Africa, in North America (possibly anthropochorous), and by the ancient Norse house ruins at Igaliko in South Greenland. In Central and North Europe it is common in meadows and pastures, coppices and woods, along the seashores, in fields, and on other soil influenced by cultivation; in the Scandinavian mountains it ascends into the birch belt, but rarely beyond the limit of the birch.

Occurrence in Denmark. The species is common within all districts of the country, growing on fences, along roads, in coppices, in meadows, on the seashore, on dunes, and in cultivated fields, mainly on soil not requiring lime. *V. cracca* varies greatly; some dominant forms are *f. latifolia* COOS. & GODR., occurring chiefly in woods, coppices, and along hedgerows, *f. sericea* PETERM. (= *f. humilis* NEUM.) and near to this *f. leptophylla* FR., which are largely attached to the dunes and the sea shores.

Vicia dumetorum L. — Krat-Vikke.

J. LANGE 1886—88, 844. RAUNKIÆR 1922, 192. ASCHERSON & GRAEBNER 1906—1910, 917. HEGI IV, 3, 1521. PRAHL 1890, 44. KRAUSE 1893, 130. LINDMAN 1926, 386.

Geographical Distribution. Siberian, eastern Central European perennial herb. Within Europe it extends from Central and South Russia to the northern Balkan countries, northern Italy, and the Pyrenees, through the south and east of France, southern Belgium (very rare), Germany (except the northwestern part), and southeastern Denmark to South Sweden. In Germany its northwestern limit runs from the Main through Thuringia, southern Hanover, Neuhausleben near Magdeburg to the eastern part of Mecklenburg; it is rare in Uckermark and Pomerania (is mainly found in the Oder Valley), in West Prussia it is only found in the area of the Vistula, and in East Prussia it is much scattered; its northern limit runs through Vilna. In Sweden it is of rare occurrence, but may be found in

groves in southern Scania, Halland, eastern Smalandia, East Gothland, northward to Stockholm.

Occurrence in Denmark. (Fig. 31, Pl. IX). It is a southeasterly species, met with, though very rarely, in woods and coppices. In the last generation it has only been observed in Ganlöse Ore in the north of Seeland and further in the wood on Helnæs and in the Skovkrog by Assens (district 28). In several of the localities indicated on the map it has now probably disappeared. This is doubtless true of the two old finds in the north of Jutland (viz. by GÖTSCHE and KAMPHÖVENER) — which correspond to the localities in Halland, — as well as to HORNEMANN's find of it at Esbønderup in northern Seeland. A part of the northwestern limit of the species runs through Denmark, to which it has no doubt immigrated from the southeast. It may be assumed that during the post-glacial optimum of warmth it had the conditions for a wider and more continuous distribution within the areas where its northern limit is to be found at the present day.

Vicia hirsuta (L.) Koch. — Laadden Vikke.

J. LANGE 1886—88, 847. RAUNKIÆR 1922, 192. JESSEN & LIND 1923, 129, 455. ASCHERSON & GRAEBNER 1906—1910, 906. HEGL 1926, b, Pl. I. LINDMAN 1926, 386. BLYTT 1906, 470. HJELT 1919, 219.

Geographical Distribution. Euro-Asiatic annual herb, extending over temperate Asia and nearly the whole of Europe except the most northerly tracts of Scandinavia, southward to North Africa; it is anthropochorous in North and South America, Australia, New Zealand, and Polynesia. It is common in northern Germany, growing on arable land, along roads, and in coppices and hedges. In Sweden it extends northward to southern Lapland, and in Norway to $64^{\circ} 5'$ N. lat., being anthropochorous at any rate in the northernmost tracts. Within Scandinavia it grows, besides on arable land, on dry, uncultivated hills, on rocks, scree, and in coppices. It is rather common in the south of Finland as far as 66° N. lat., probably solely as an adventitious plant. PALMGREN thinks it quite possible that the species is indigenous on the Aland Isles.

Occurrence in Denmark. The species is distributed nearly throughout the whole country, being generally common on the islands and in the east of Jutland, but evidently rarer and absent in patches north of the Limfjord and in the west of Jutland. It is not recorded from Læsø (3), Vester Hanherred (6), and the West Jutland districts 16, 17, and 18 (except the region round Holstebro). Its habitats are mainly to be sought on fences, along roads, in gravel-pits, on dry grassy hills, in sandy fields, on seashores, dunes, and cliffs, among the corn, and in waste places. Even if its distribution in this country, and on the whole in northern Europe, is much affected by cultivation, it chiefly gives the impression of being indigenous in Denmark.

Vicia lathyroides. L — Vaar-Vikke.

J. LANGE 1886—88, 846. RAUNKLÆR 1922, 194. FERDINANDSEN 1918, 70. JESSEN & LIND 1923, 456. GRÖNTVED 1929, 20 f. ASCHERSON & GRAEBNER 1906—1910, 959. HEGI IV, 3, 1541. BENTHAM & HOOKER 1920, 123. LINDMAN 1926, 387. SEGERSTAD 1924, 62, fig. 27. BLYTT 1906, 474. HJELT 1919, 215.

Geographical Distribution. Pontine, Mediterranean, and West-Central European annual herb, which is not uncommon in England and Scotland, but very rare in Ireland, and to the north, in Fennoscandia, extends to southern Norway (viz. Kristianssand, Grimstad, Kragerö, and Hvaloen), West Gothland, Upland, and the Aland Isles (rare, and not noticed prior to 1890), and extends eastward to Libau, East Prussia, Southwest Poland, the Crimea, the Caucasus, Asia Minor, and Lebanon; southward to the Mediterranean and the Atlas range, but in the Mediterranean region it is much rarer than farther northward, and is entirely absent over wide stretches; it is likewise absent from the calcareous areas between the Black Forest and the Bohemian Forest. In northern Germany it is of common occurrence mainly on sandy and warm soil, thus in pastures ("trockne Grasplätze", "trockne Hügel"), in open woods, along roadsides, and in fallow-fields. Within Scandinavia it is found in similar situations as also on rocks. In Norway as well as in Sweden it is chiefly restricted to a narrow belt along the coast, a circumstance which, since the species is here near its northern limit, is probably due to its heat demand in the spring time.

Occurrence in Denmark. The plant is found in all parts of the country, mainly in sandy, preferably acid soil, thus on pasture hills, coast bluffs, littoral pastures, alluvial beaches, grassy downs, roadside slopes, grass fields, and similar places. As it flowers early in the spring (April—May) and withers immediately after maturation of the seed, it has doubtless frequently been overlooked, so that its distribution within Denmark cannot be determined in details on the basis of the available material. It is recorded to occur rather commonly or here and there in several tracts of the islands as well as in the east and north of Jutland south of the Limfjord. It is only sparsely recorded from the area north of this fjord, and seems to be entirely absent from certain parts of central and western Jutland. It is often frequent near the coast, but by no means restricted to it, as in Sweden and Norway. The situation and extent of the country no doubt ensures to it a sufficiently mild spring everywhere, but its partiality for sandy soil has perhaps some connection with the fact that this is warmer in the spring than the clayey soil.

J. LANGE distinguishes *f. cirrhata* as a separate form having its leaves elongated into tendrils; it has the same distribution in this country as the chief form.

The species has probably immigrated from the southwest rather late in post-glacial time.

Vicia orobus D. C. — Lyng-Vikke.

J. LANGE 1886—88, 841. RAUNKLÆR 1922, 193. DREJER 1838, 244. ASCHERSON & GRAEBNER 1906—1910, 920. HEGI IV, 3, 1525. W. CHRISTIANSEN 1917, 43. BENTHAM & HOOKER 1920, 122. K. TROLL 1925, 310 (fig. 1). BLYTT 1906, 471.

Geographical Distribution. Atlantic perennial herb. A map by K. TROLL shows, somewhat uncritically as to details, a series of more or less isolated areas, within which the species grows in foliferous woods, on heaths, and in pastures, viz. northern Spain, the Pyrenees, Southwest and Central France, the Jura Mountains in Switzerland, occasional localities along the central part of the Rhine, e. g. in Spessart, 37 localities within England-Scotland (chiefly in Devonshire, Wales, the Isle of Man, southern Scotland, and the island Skye in $57\frac{1}{2}^{\circ}$ N. lat.), 4 localities in Ireland, further Jutland, and southwestern Norway, where it is fairly common on dry hills and in coppices within the most low-lying tracts along the sea from Farsund and Lister to Söndmöre (the *Ilex* region).

Occurrence in Denmark. (Fig. 2, Pl. II). Now solely a Jutlandish species, which has been found in the heathery tracts of the peninsula, mostly in the central parts, avoiding the areas with moraine clay, in about half a hundred localities, growing on heathery hills and on the outskirts of coppices; it is absent along the east coast except between Randers Fjord and the Limfjord as well as in the western coastal tracts; north of the Limfjord it has been observed in a few localities only. It is further recorded from earlier times as having been found in the north of Seeland between Lyngby and Frederiks dal (undated specimens in HORNEMANN's herbarium have been taken by the finder to be *V. cassubica*), and, according to a statement by DREJER on Brede Bakker and near Roskilde. These finds have, however, newer been verified, and the possibility of confusion with *V. cassubica* or of an interchange of the labels cannot probably be rejected; this last-named species has been known from Frederiks dal and Brede since the first half of last century.

Among the numerous isolated areas of the species, Jutland is one of those within which it is most frequent, and moreover it has doubtless been exterminated in several places owing to the cultivation of the locality. Possibly *V. orobus* has had a more continuous distribution in western Europe in Atlantic time, but in view of the present distribution of the species it seems most natural to assume that the Jutlandish and the West Norwegian areas have received the species from Britain. As to the dispersal of seeds, nothing is known.

Vicia pannonica Crtz. — Ungarsk Vikke.

RAUNKLÆR 1922, 194. ASCHERSON & GRAEBNER 1906—1910, 981. ASCHERSON & GRAEBNER 1899, 452. HEGI IV, 3, 1552. MURATOVA 1926, b, Pl. I. PRAHL 1890, 44.

Geographical Distribution. Annual herb, considered to be originally spontaneous in the Lower Danube countries only, but as a fully naturalised archæo-

phyte it is at any rate distributed in the Mediterranean countries from Spain and Oran in Algeria to the Caucasus and Persia. In Central Europe it seems to be spreading rapidly in recent years, being introduced with grain, and migrating from fields and waste places to roadsides, railway embankments, etc. In southern Germany it has been spreading since the end of last century, in Bavaria since 1875, at Mannheim since 1880, and in Alsace after 1900. In northern Germany it is still rare, but was observed near Hamburg in 1883.

Occurrence in Denmark. *V. pannonica* has been obtained from 7—8 different localities, chiefly waste places or building sites in seaports, viz. from Randers, Horsens, Svendborg, Kalundborg, and several places in Copenhagen; it has further been collected near Staby in district 16, in a field with rye and vetches, and in a young wood at Christiansminde near Svendborg it was found run wild in abundance in 1905. It was first discovered in a waste place, Klövermarken, on Amager in 1885; most recently it has been collected in the Free Port at Copenhagen (1921), probably introduced with fruit. On the hole its occurrence in this country seems to indicate that it has particularly been introduced with vetch seed as fodder for horses.

In several of the localities there has further been found *var. striata* (MB.) GRISEB. (= *v. purpurascens* D. C.). with dark purple petals, while the chief form has yellow flowers.

Vicia sepium L. — Gærde-Vikke.

J. LANGE 1886—88, 845. RAUNKLÆR 1922, 193. OLSEN 1921, 67. ASCHERSON & GRAEBNER 1906—1910, 953. HEGL IV, 3, 1538. MURATOVA 1926, b, Pl. I. LINDMAN 1926, 386. SEGERSTAD 1924, 106, fig. 161. BLYTT 1906, 473. HJELT 1919, 207. CEDERCREUTZ 1927, 123. STEFÁNSSON 1924, 159.

Geographical Distribution. West Asiatic, European perennial herb, widely distributed towards the north; it is common in Finland — being specific to grove-meadows — as far as 63° N. lat., but may be found northward to 67° N. lat.; in the Scandinavian Peninsula it is common on the west side as far as 67° 56' N. lat., but is found even as far as Tromsö (69° 30' N. lat.), and extends from the sea up into the birch belt, rarely slightly beyond the limit of the birch; it grows in meadows, on copse-clad hills, and at roadsides. In Iceland it occurs in some few places. In northern Germany, Holstein and Schleswig included, it is fairly common in similar localities as in Scandinavia, but is absent from the North Sea islands. Within the Mediterranean region proper, e. g. Greece, it is absent or very rare. It extends eastward to Armenia, the Caucasus, Cashmere, and the Baikal Lake.

Occurrence in Denmark. (Fig. 11, Pl. IV). It grows in woods and coppices, and thrives best in fresh soil rich in nutrient elements and with almost neutral reaction, but is not so commonly distributed as recorded by J. LANGE, being rare or absent over large areas in the western part of the peninsula where woods are

scarce. From Læsö and Anholt it has not been recorded either. It is, however, common on the islands and in the east of Jutland, growing in moraine clay and other not too thoroughly washed soil, chiefly inside the limits of the latest glaciation. When it is stated to be fairly common as far westward as in district 49, this has probably some connection with the fact that woods are more frequent here than in the other tracts of western Jutland, where it is not common in the oak scrubs.

V. sepium may occur in a variety with whitish yellow flowers, *f. ochroleuca* BAST, collected in several parts of the country; a peculiar form is *f. montana* KOCH with much elongated, acute leaves and fewer flowers in the clusters; according to K. WIINSTEDT it flowers considerably later than the main form, and has been collected in some few places in Seeland and eastern Jutland.

Vicia silvatica L. — Skov-Vikke.

J. LANGE 1886—88, 842. RAUNKIÆR 1922, 192. ASCHERSON & GRAEBNER 1906—1910, 925. HEGI IV, 3, 1526. PRAHL 1890, 45. BENTHAM & HOOKER 1920, 122. MURATOVA 1926, b, Pl. I. LINDMAN 1926, 386. SEGERSTAD 1924, 102, 103 (map), 113, 115. ANDERSSON & BIRGER 1912, 45, 162, maps pp. 46 and 391. HJELT 1919, 199. BLYTT 1906, 471.

Geographical Distribution. Euro-Asiatic perennial herb which is spread from western Asia (Transbaikalia) over sub-Arctic, Central and western Europe; it extends northward to the southern part of the Kola Peninsula (67° N. lat.), Ångermanland, and Jemtland, along the west coast of Norway to $67^{\circ} 56'$ N. lat. Within Fennoscandia it is to be found in woods, grove-meadows, and on screes, and but rarely extends beyond the limit of the conifers. The map by SEGERSTAD shows it to be represented in southern Sweden, most frequently in the eutrophic regions, e. g. in Scania; in the north of Sweden it is almost exclusively found on calcareous soil. It is rather common in the British islands, and extends southwards to southern France, northern Italy (rare), and the northern part of the Balkan Peninsula.

In northern Germany it lives in shady woods, chiefly beech woods; it decreases in frequency towards the west, is absent from the Hanoverian plain as well as Holland and Belgium, and the western part of Holstein and Schleswig, but occurs sporadically in the east of the two latter provinces.

Occurrence in Denmark. (Fig. 24, Pl. VII). A southeastern species, occurring here and there on the islands and in the east of Jutland, but unequally distributed. Thus it is rare on Bornholm, is not recorded from Lolland, Langeland, and Samsö, and seems to be rare e. g. in the north of Seeland. In Jutland, where it is rather equally distributed on the east coast, it occurs from the southern boundary to Randers. It has further occasionally been found in oakscrubs in the west and north of the peninsula, thus in Nörbølling and in Tirslund Coppices (district 26), at Borris (district 17), in the coppices by Bratskov (district 5), and at Linderumgaard

(district 2). It is mainly associated with soil rich in nutritive substances, and occurs principally in foliferous woods, growing on high-lying chasmy ground or on copse-clad slopes. The limits for its distribution within Denmark are no doubt conditioned by edaphic factors.

Considering its extensive distribution towards the north, it seems very likely that it has immigrated into Denmark in early post-glacial time, probably from the south or southeast.

The form *maritima* LGE., with a more dense growth and smaller leaflets, has occasionally been found in the southern part of Djursland, growing on stony raised beaches.

Vicia tenuifolia Roth. — Langklaset Vikke.

J. LANGE 1886—88, 843. RAUNKIÆR 1922, 193. ASCHERSON & GRAEBNER 1906—1910, 934 HEGI IV, 3 1533. W. CHRISTIANSEN 1926, 147, 173, map. 85. LINDMAN 1926, 387. STERNER 1922, 239, 359, 404.

Geographical Distribution. West Asiatic, European, North African perennial herb. Its distribution within Europe is Pontine, East-, South-, and eastern Central-European; yet it occurs almost throughout the whole of France, but is absent in Great Britain; from Lorraine its northwestern limit in Germany runs through the Nahe and Lahn Valley, the Harz, Braunschweig, Neuhausleben north of Magdeburg, Havelberg at the lower bend of the Elbe, Grabow and Dassow in western Mecklenburg, Hamburg, and Altona to a few places in eastern Holstein (Neustadt and Oldenburg). Within the other part of Germany it is of very scattered occurrence, being most frequent in the vicinity of the large rivers, growing in coppices and light foliferous woods; it is found in similar situations in Sweden, where it occurs rarely or occasionally in Scania, southeastern Smalandia, East Gothland, Oeland, and Gotland, being more common on Oeland only. In eastern Europe its northern limit runs through Livonia, Grodno, Tula, Nijni Novgorod to southern Perm; in Asia it extends to Dzungaria and Armenia.

Occurrence in Denmark. (Fig. 30. Pl. IX). A southeasterly species, growing here and there on fences, in coppices, and on bluffs, principally on the islands. It is most frequent on Møen, in several places of Seeland, near the coast, and in the northeastern part of Funen. The northwestern limit of the species in Germany continues northward across Als (Mommark), western Funen (Sønderby Klint by Assens, Gamborg), and Horsens (waste places) to Grenaa.

V. tenuifolia, which, according to STERNER, is characteristic of the South Russian steppes, reaches its extreme northwestern limit in Denmark; it has doubtless immigrated from the south or southeast, and during the post-glacial maximum of warmth it must have had the greatest chances for colonising in our country.

Vicia tetrasperma (L.) Moench — Tadder-Vikke.

J. LANGE 1886—88, 848. RAUNKIÆR 1922, 192. JESSEN & LIND 1923, 129, 456. ASCHERSON & GRAEBNER 1906—1910, 912. ASCHERSON & GRAEBNER 1899, 448. HEGI IV, 3, 1517. PRAHL 1890, 45. BENTHAM & HOOKER 1920, 121. LINDMAN 1926, 386. SEGERSTAD 1924, 102, 112. BLYTT 1906, 471. CEDERCREUTZ 1927, 123.

Geographical Distribution. Euro-Asiatic, North African annual herb, which extends from the Yenisei region in the north to southern Finland (62° N. lat.), Dalarne and Gestrikland in Sweden, and to $61^{\circ} 15'$ N. lat. in Norway, mainly east of the mountains. In the south of Finland it is peculiar to the vegetation of grove-meadows, and is regarded by CEDERCREUTZ as apophytic; also in Sweden and Norway, where, besides on arable land, it occurs on dry hills, rocks exposed towards the south ("Sydberg"), and in coppices (*f. tenuifolia* Fr.), it is considered as spontaneous. It is hardly indigenous in Scotland, very rare in Ireland, but fairly common in England. In northern Germany it is found in scattered growth on arable land as also in meadows and other grassy places, in coppices, and on dunes, being most frequent along the Vistula and the Elbe, and in the eastern part of Holstein; it is absent from the western part of Schleswig-Holstein and the North Sea islands. HEGI regards it as a neophyte, colonised within recent times in northern Germany, and as an archæophyte in the Central European agricultural regions, even if its presence there prior to the 16th century has not been ascertained.

Occurrence in Denmark. (Fig. 25, Pl. VIII). Within Denmark *V. tetrasperma* is decidedly a southeasterly species, which is commonest on Bornholm, Møen, Falster, Lolland, the southern parts of Seeland and Funen, and Als; in the remaining parts of the islands as also in the east of Jutland from the boundary to southern Djursland it is of more scattered occurrence; it has further been found in waste places near Randers, Hobro, Aalborg, and Esbjerg; finally it has been found growing in sandy fields near Viborg. Three uncertain finds recorded from districts 8, 9, and 11 have not been inserted on the map. It grows chiefly along fences and roads, on uncultivated hills, sandy fields, coast bluffs, coast cliffs on Bornholm, dunes, and seashores, and further in cleared patches in woods, in waste places, and among the corn.

If we compare the available data concerning the occurrence of the species in the countries east and south of Denmark, with its choice of habitats in this country, the possibility can hardly be rejected that *V. tetrasperma* is an apophyte, immigrated from the east or south east and widely spread by the activity of man.

Vicia villosa Roth. — Sand-Vikke, Dunhaaret Vikke.

J. LANGE 1886—88, 844. RAUNKIÆR 1922, 193. JESSEN & LIND 1923, 457. ASCHERSON & GRAEBNER 1906—1910, 940. HEGI IV, 3, 1534. MURATOVA 1926, b, Pl. I. LINDMAN 1926, 387. BLYTT 1906, 473.

Geographical Distribution. Annual herb, assumed to be originally native in the Mediterranean region and possibly in Southeast Europe also, but having been

introduced as a weed, chiefly in the corn-fields, and cultivated as a fodder plant, it has gradually spread to the greater part of Europe as well as to West Asia and North Africa. It has long been naturalised in northern Germany as a weed among the corn, being most frequent in the eastern tracts as far as Mecklenburg, and in Holstein. Since the eighties of last century it has been cultivated as a valuable forage plant, by which it has become further distributed; outside the fields, it occurs in waste places, on earthen banks, and in coppices as an escape from cultivation. In Sweden it is found in fields as far as southern Norrland; in Norway in the southern part of the country, between Oslo and Haugesund, and by Trondhjem.

Occurrence in Denmark. It is doubtful whether *V. villosa* has been distributed in Denmark prior to the middle of last century, but after that the first positive find of it was made in 1853, it was soon noticed in several other places. As late as twenty years afterwards, it was, however, hardly known outside Seeland, and it was only towards the end of the century that it became more common. This was caused by the fact that about 1885 the cultivation of it as a stall-fodder plant, or mixed with rye, was largely commenced. Even if it was a disappointment as a cultural plant, and is only seldom cultivated at the present day, it is still frequently met with in fields, growing among the corn, and in waste places, or, as escaped from cultivation, on the edges of ditches, since its seeds easily mature and buried in the soil may retain their power of germination for several years. It is recorded from the majority of the districts, occurring, with a frequency ranging from here and there to common, in sandy as well as in clayey tracts, but has not been mentioned from districts 7, 19, 33, 35, and 50—53. Within Denmark *V. villosa* may be considered as an anthropochorous species, which after having been cultivated for a series of years has become more widely distributed.

Survey of the Distribution of the Papilionaceæ in Denmark.

When in the following the various species of the *Papilionaceæ* will be grouped according to their distribution within Denmark, this will be done on purely geographical lines of division, and not until a larger number of plant families have been dealt with in a similar manner to this, will it be possible, on the basis of the material of the Topographic-Botanical Investigation, to take up a definite standpoint towards that division of Denmark into floristic provinces which has previously been attempted, thus especially by J. LANGE in 1849 and A. S. ÖRSTED in 1871 (cfr. also EUG. WARMING 1904, pp. 99—106). The available material, however, invites an attempt to form ideas as to the roads and time of immigration of the species.

Judging from general systematical and plant-geographical relations, it may be assumed that at any rate the bulk of the species here considered are older than

the latest ice age, and that as the inland ice retreated northward for the last time and temperature conditions improved in northern Europe, they gradually pushed their way towards these regions from their glacial refuges. Where the latter are to be sought, appears in many cases from the present distribution of the species, the Atlantic species having doubtless survived the latest ice age in southwestern Europe, while, reversely, the area of now easterly species must be assumed to have extended in Glacial time across southeastern Europe and the adjoining tracts, in certain cases including western Asia. Also as regards species with a more extensive east-westerly distribution in Europe it must be supposed, after the analogy of the distribution of certain forest trees as to which conditions have been more fully elucidated by bog-finds, that it is the above-mentioned marginal zones of Europe, or in many cases probably also western Asia, that have served as glacial refuges. Regarding such species as show a markedly one-sided distribution over vast areas of the Northwest-European continent, it may then in general be assumed that on the basis of this distribution it will be possible, so far as the western, southern, or eastern species are concerned, to draw inferences as to the direction from which the species in question have immigrated into Denmark. As regards the immigration from the north, the case is somewhat different, since a northerly distribution of a species within Denmark may just as well be conceived to have resulted from a northward shifting of the southern limit of the species under the influence of the post-glacial optimum of climate, as from a late immigration from the north, e. g. during the post-glacial deterioration of the climate. Finds of fossils can alone settle this question, which is closely associated with the question of relicts, so frequently discussed. In other cases, too, changes in the distribution of certain species may perhaps have taken place, which would render uncertain our conclusions as to their roads of immigration.

No important finds of fossils of the *Papilionaceæ* having been made in the post-glacial deposits of northern Europe, we are confined to plant-geographical evidences only in our suppositions as to the time of immigration of these species (cfr. KNUD JESSEN and JENS LIND 1923, p. 60 f.). In this connection it seems of significance to note which of the species of our country extend to the sub-Arctic regions of Fennoscandia, since in case these are at the same time widely distributed within Europe, it is highly probable that they have immigrated into Denmark at an earlier date than those species whose northern limits lie essentially farther southward. It is stated how the northern limits of such species lie in relation to the northern limit of the oak, since within the range of advance of this tree we find the essential difference between the Central European—South Scandinavian flora of deciduous woods and the North Scandinavian flora of coniferous woods. A question, however, that is occasionally raised concerning some few species, whether their limits of distribution are conditioned by time, i. e. that they may not yet have succeeded in occupying all the regions where conditions are on the whole favourable to them, must for the present in reality be said to have reference to a large number of

spontaneous species, since as yet it has only been ascertained of a minority of species that their limits are determined by external conditions i. e. climate, soil conditions, and competition from other plants.

EUG. WARMING (1904, p. 83 f.) has studied the causes of the unequal distribution of the species within Denmark, and points out as specially important factors the way of immigration, the time of immigration, and the nature of the soil (herein included the influence of competing species). He recommends a comparative study of the floristics of the associations within the various parts of the country in order to throw light upon the history of immigration, "since as the same associations demand the same soil, this factor will consequently be eliminated".

On the other hand, EUG. WARMING only attaches little importance to the difference in climate between the various tracts of the country, his attention being here mainly directed towards the distribution of the so-called Atlantic species, that is to say, to the distance of their habitats from the shores of the North Sea. Later investigations undertaken by experts in forestry especially L. A. HAUCH and A. OPPERMANN, have, however, shown that certain climatological conditions formerly little noticed must be considered to be of material importance to the growth of certain forest trees, thus for instance the variations in the amount of precipitation and in the duration of the frost-free periods, which are dependent partly on the distance from the coast and the altitude above the sea, partly on the geographical position. The duration of the frost-free periods varies within the various regions of the country from less than 39 per cent to more than 61 per cent of the whole year; and that a protracted period of growth within the regions with warm summers is of vital importance to the distribution of certain herbaceous plants, seems to be evident from circumstances which will be touched upon in the following. In the discussion as to whether a southern species which has its northern limit in Denmark and is at the same time extensively distributed in Central Europe, is advancing, or whether it has perhaps formerly had a wider distribution towards the north, it is of importance to keep in mind what has been brought to light during the last decades by investigation of the post-glacial deposits, viz. that in northern Europe the optimum of warmth of the post-glacial climate was in the centuries before Christ succeeded by the so-called post-glacial deterioration of the climate, which brought about a considerable lowering of the summer temperature and more abundant precipitation. For it has been shown that in the warm period a great number of "southern" phanerogams have had a far more northerly distribution than at the present time. As regards the northward advance into Denmark of specially thermophilous species, this warm period has, climatologically, been the most favourable, and the assumption of a retreat of the northern limit of such species during the sub-Atlantic deterioration of the climate will correspond well with the geological results, and seems at the outset more likely than the conjecture that they should be advancing species. A closer investigation of the localities in which such southerly species thrive, would in this connection be of great value, more particularly as regards the exposure of the

habitats, since in our country, too, analogies to the North Swedish "sydberg", i. e. cliffs exposed toward the south, may very likely be found, on which lodge plant associations that compared with their surroundings exhibit a distinct southern character.

In the following the Danish species of *Papilionaceæ* will be divided into seven geographical main groups, according as they are found fairly equally distributed all over the country or only within certain areas. Under each of these groups will be added some comprehensive remarks on the general distribution of the spontaneous species, their immigration, and, in certain cases, the conditions that may be assumed to determine the limits of their distribution within this country.

I. Westerly Species.

A. Apophytes.

1) Occurring only, or almost exclusively in Jutland:

- | | |
|---|--|
| <i>Genista germanica</i> (Fig. 1. Pl. II) | <i>Genista anglica</i> (Fig. 4. Pl. II) |
| <i>Vicia orobus</i> (Fig. 2. Pl. II) | <i>Genista tinctoria</i> (Fig. 5. Pl. III) |
| <i>Genista pilosa</i> (Fig. 3. Pl. II). | |

The species are ranged according to increasing frequency. *Genista germanica* has been found in about 20 localities in the southwest of Jutland; *Vicia orobus* and *Genista pilosa* occur within the same regions of Jutland, although with a considerable difference in frequency; they occur almost exclusively south of the Limfjord, where they are intimately associated with the sandy soil, and avoid the moraine clay of the east coast; as regards *Vicia orobus* on Seeland, see p. 61 *G. anglica* and *G. tinctoria* have a somewhat wider distribution north of the Limfjord, and may be found in most regions in the east of Jutland; *G. tinctoria*, which is most exacting, is most common here, whereas it avoids the meagre tracts in the west of Jutland; both species are represented in some few localities on Funen.

As regards their distribution within Europe, *Vicia orobus* and *Genista anglica* are purely Atlantic; *G. pilosa* is sub-Atlantic, *G. tinctoria* is Central and South European and has an extensive distribution towards the east, while *G. germanica* is an easterly Central European species. All four species of *Genista* occur, though for the most part rarely, in the west of southern Sweden, while only *G. tinctoria* is found in Norway, viz. in a single locality in the south. *Vicia orobus* occurs in southwestern Norway. Very probably it is chiefly the conditions of the soil which, in Denmark, have limited the species of *Genista*, the Atlantic as well as the more eastern species, almost exclusively to Jutland, even if it seems peculiar, especially as regards *G. tinctoria*, that it has not attained a wider distribution on the islands, where many localities would very likely present a suitable soil; but despite the fact that it is able to spread over wide distances, which is evidenced by

its occurrence in Sweden and Norway, it has evidently not been capable of spreading on Funen since the middle of the last century.

As to *Vicia orobus*, an immigration from the west may possibly be assumed. The *Genista* species must have invaded Jutland from the south, *G. anglica* e. g. having made its way from western Europe, *G. germanica* from eastern Europe. Among these species the latter is probably the one that has immigrated most recently; it is not possible to show that it is still spreading in the country, more probably it is threatened with extermination, e. g. on account of cultivation. All the species of *Genista* have doubtless immigrated during the latter part of post-glacial time.

2) Species mainly distributed in Jutland, more scattered on the islands, and decreasing in frequency towards the east.

Ornithopus perpusillus (Fig. 6. Pl. III)
Sarothamnus scoparius.

Both species prefer sandy soil, and may thrive in soil poor in nutrient substances. The former is chiefly found on dry, grassy hills and fields; it is absent from northeastern Jutland, is very rare on Seeland and the southerly islands, and extends eastward to southern Scania. It is a sub-Atlantic species, whose northeastern limit runs through Denmark and Scania. As a wild plant *S. scoparius* is chiefly restricted to the heaths of Jutland south of the Limfjord, but occurs, planted as well as run wild, in the north of Jutland and in several parts of the islands. Possibly it is also originally wild in southwestern Sweden and southern Norway. This species, too, has a sub-Atlantic distribution within Europe, and both species must have invaded Jutland from the south, having migrated from western Europe, evidently in the latter part of the post-glacial period.

B. Anthropochorous Species.

1. Mainly in Jutland:

Cultivated and run wild.

Ornithopus sativus.

II. Species distributed nearly all over the country.

A. Apophytes.

* <i>Anthyllis vulneraria</i>		<i>Trifolium medium</i>
<i>Lathyrus montanus</i> (Fig. 7. Pl. III)	*	<i>— pratense</i>
* — <i>pratensis</i>	*	<i>— repens</i>
* <i>Lotus corniculatus</i>		<i>Vicia angustifolia</i>
<i>Lotus uliginosus</i> (Fig. 8. Pl. III)	*	<i>— cracca.</i>
<i>Trifolium arvense</i>		

The majority of these species are fairly equally distributed throughout the country. As regards some of the species, the circumstance that they are cultivated besides growing wild, may, however, to some extent have contributed to this. Thus this is doubtless the reason why *Anthyllis vulneraria* has been noted more frequently in the eastern clayey tracts than would otherwise have been the case, and *Trifolium pratense*, which seems to prefer soil with about neutral reaction, would presumably, were it not for the influence of cultivation, have been less frequent in the west of Jutland. The two species, *Lathyrus pratensis* and *Vicia angustifolia*, which likewise prefer neutrally or even basically reacting soil, are less common in certain parts of western Jutland, while such an unequal distribution is less conspicuous as to *Vicia cracca* which also prefers alkaline soil. The majority of the other species prefer either soil poor in lime, or are rather indifferent as to the reaction of the soil. The species within this group are mainly indigenous to heaths, copices, dunes, meadows, and bogs, occurring most frequently in oligotrophic or mesotrophic plant associations.

All these species are widely distributed both in the west and east of Central Europe, most of them in southern Europe too; all of them, with the exception of *Lathyrus montanus*, are extensively distributed in the northern parts of Asia, and the six species marked with an asterisk are further found within the sub-Arctic regions of Europe. These may then probably have immigrated into Denmark even in early post-glacial time, or still earlier. The northern limits of the remaining five species within Fennoscandia almost coincide with the northern limit of the oak; they seem to require a somewhat higher summer temperature than the other species, and have presumably immigrated at a later period of post-glacial time.

To determine the direction whence these species have immigrated into Denmark, it would be necessary to know their glacial refuge, whence they pushed their way onwards after the close of the last ice-age. However, nothing certain is known in this respect, but considering the extensive distribution within Asia of the greater number of the species, it may be assumed that here, at any rate, these species have had a refuge during the glacial period; further the southeastern and southwestern parts of Europe must be taken into consideration in this respect; presumably the species of this group have followed easterly, southeasterly, or southwesterly roads of migration to Denmark.

B. Anthropochorous species, occurring more or less frequently throughout the country.

Archæophytes.

<i>(Medicago lupulina)</i>	<i>(Trifolium minus).</i>
<i>(Trifolium procumbens)</i>	

Weeds in grass fields (ephemerophytes).

Melilotus officinalis.

Cultivated species, more or less frequently escaping from cultivation.

<i>Cytisus laburnum</i>	<i>Trifolium hybridum</i>
<i>Lupinus luteus</i>	— <i>incarnatum</i>
<i>Medicago sativa</i>	<i>Vicia faba</i>
<i>Pisum arvense</i>	— <i>sativa</i>
— <i>sativum</i>	— <i>villosa</i> .

Under this heading may also be mentioned *Cytisus elongatus*, *C. supinus*, *Lupinus angustifolius*, and *L. polyphyllus*, which are cultivated here and there, though it is uncertain whether this takes place all over the country; as escapes from cultivation they are very rare.

It may be doubtful whether the three species first mentioned should more properly be regarded as archæophytes, since they also occur outside the actually cultivated soil; they are, however, spread widely by cultivation, and all the three species are equally distributed throughout the country.

III. Strand-plants with a more common distribution.

Trifolium fragiferum (Fig. 9. Pl. IV)

Lathyrus maritimus (Fig. 10. Pl. IV).

The species first mentioned occurs almost everywhere along the coast where littoral meadows are found, and only exceptionally farther inland (see p. 46). Being a West Asiatic, Central and South European, North African halophilous species, which does not reach the northern limit of the oak in the north, it has presumably immigrated to the Danish coasts from the south or southeast, i. e. from Central Europe, where it is common on saline soil and in meadows with a rich soil. North of the Baltic it is everywhere associated with the seashore, so in southeastern Denmark, at any rate, it can hardly as a common plant date farther back than to the Littorina time. Considering its general northward distribution it seems equally improbable that a greater age can be assigned to it on our other coasts.

Concerning *Lathyrus maritimus*, see p. 14.

IV. Species, distributed on the islands and in the east of Jutland, more rarely in the north of Jutland, and very rare, or absent, in the west.

A. Apophytes.

<i>Vicia hirsuta</i>	<i>Lathyrus silvester</i> (Fig. 14. Pl. V)
— <i>lathyroides</i>	* — <i>paluster</i> (Fig. 15. Pl. V)
* — <i>sepium</i> (Fig. 11. Pl. IV)	— <i>niger</i> (Fig. 16. Pl. V)
<i>Ononis repens</i> (Fig. 12. Pl. IV)	<i>Melilotus altissimus</i> (Fig. 17. Pl. VI)
<i>Astragalus glycyphylloides</i> (Fig. 13. Pl. V)	<i>Vicia cassubica</i> (Fig. 18. Pl. VI)

The order in which the species have been arranged corresponds fairly well to their decreasing degree of frequency, so that, as regards distribution, the first-mentioned approach the species within group II, while e. g. *Melilotus altissimus* forms a connecting link with group VI. They are species which are mainly associated with the youngest diluvial deposits, in that they avoid the older, more washed surfaces. The two species first mentioned prefer an acidly reacting soil, while e. g. *Ononis repens* and *Vicia sepium* are at any rate very partial to localities with a nearly neutral reaction of the soil.

Five of the species within this group, viz. *Vicia sepium*, *Astragalus glycyphylloides*, *Lathyrus silvester*, *L. niger*, and *Vicia cassubica*, are more or less closely associated with woods and coppices, and their distribution within the country must thus be essentially dependent on the presence of such growth, while the other species are partial to localities of a more common distribution.

Vicia cassubica, *L. niger* and to a much less extent *Lathyrus paluster*, and *Astragalus glycyphylloides*, have an eastern distribution within Europe, being absent or rare i. a. in northwestern Germany, Holland, and the British Isles; as regards these species, an immigration into Denmark from the southeast or south may thus be assumed. *Vicia lathyroides* and *Ononis repens*, which have a sub-Atlantic distribution in Europe, must accordingly be assumed to be southwestern immigrants. The remaining species have a more common eastern and western distribution in Central Europe, and they may have spread to Denmark from their glacial refuges in Asia or in southeastern or southwestern Europe.

Vicia sepium and *Lathyrus paluster* extend farthest northward, and are distributed within the sub-Arctic regions of Fennoscandia; in accordance herewith they may have immigrated very early in post-glacial time, or still earlier. Incorporated at a somewhat later date in our flora are probably *Lathyrus niger*, *L. silvester*, *Astragalus glycyphylloides*, which in Fennoscandia extend slightly beyond the limit of the oak, as well as possibly *Vicia hirsuta* and the two sub-Atlantic species *Ononis repens* and *Vicia lathyroides*, and further *Vicia cassubica* and *Melilotus altissimus*, which do not extend as far northward as the said tree.

B. Anthropochorous Species.

(The islands, eastern Jutland, and the regions round the Limfjord).

Archæophytes.

- | | |
|---|---|
| <i>Medicago falcata</i> (Fig. 19. Pl. VI) | <i>Trifolium agrarium</i> (Fig. 20. Pl. VI) |
| <i>Melilotus albus</i> | — <i>striatum</i> (Fig. 21. Pl. VII). |
| (<i>Medicago falcata</i> × <i>sativa</i>) | |

Cultivated and escaped from cultivation.

Ulex europaeus.

V. Species distributed on the islands and in the north of Jutland, but absent from southwestern Jutland.

Ononis arvensis (Fig. 22. Pl. VII).

The distribution of this species within Denmark is characterised by being almost as frequent in the western area of the Limfjord and northwestern Vendsyssel as on the islands, whereas positive finds in Jutland from the area south of the Limfjord are very rare. It is the type of distribution, to which also e. g. *Echium vulgare* and to some extent *Plantago media* belonged, until these species within recent times have been spread almost all over the country by the aid of cultivation.

The geographical distribution of the species from the river meadows of the Pontine steppes to the coasts of Atlantic western Norway viewed in connection with its absence from the northwestern part of the European continent seems very singular, but demonstrates with some weight that it is an eastern or southeastern immigrant.

VI. Species distributed on the islands and in the east of Jutland, but rare north of Djursland.

A. Apophytes.

* *Lathyrus vernus* (Fig. 23. Pl. VII)

* *Vicia silvatica* (Fig. 24. Pl. VII)

— *tetrasperma* (Fig. 25. Pl. VIII).

Like the species belonging to group IV, these are mainly associated with the eutrophic areas of the young-glacial diluvia, the two first-mentioned being peculiar to foliferous woods, the latter to pastures, sandy fields, fences, and similar situations, as well as to cultivated soil. The two former, which have an Euro-Asiatic — sub-Arctic distribution, but are absent from the northwestern part of the European continent — *Lathyrus vernus* from the British Isles also —, have doubtless immigrated into Denmark from the southeast. Possibly *Vicia tetrasperma* has immigrated spontaneously from the east, where it seems to be more independent of cultivation than in northern Germany. It extends almost as far north as the oak.

B. Anthropochorous Species,

(rare or very rare).

Ephemeral species.

Lathyrus aphaca

Vicia pannonica

Medicago hispida

Trigonella coerulea.

Cultivated and run wild species.

Onobrychis viciifolia

(*Trigonella coerulea*).

VII. Southerly species, distributed on the islands including Samsö, rare in Jutland north of Horsens, or absent.

A. Apophytes.

1. Species distributed in the west as well as the east.

Ononis spinosa (Fig. 26. Pl. VIII)

Lotus tenuis (Fig. 27. Pl. VIII).

Both these species are spread over West Asia, Central- and South Europe. The northern limit of *L. tenuis* runs through Denmark and the southernmost part of Sweden. As to *O. spinosa* an advanced post in warm soil is recorded from the extreme south of Norway, but its northern limit of continuous distribution runs through the south of Denmark, Scania, Blekinge and Gotland. The immigration of these species must have taken place from the south.

2. Species distributed in southeastern Jutland and the western part of the islands.

Trifolium filiforme (Fig. 28. Pl. VIII).

This Mediterranean Atlantic species, which most easterly reaches southwestern Sealand and Guldborg Sound, occupies within Denmark a small isolated area like that near Kristianssand in southern Norway. An immigration from the southwest seems most probable.

3. Species occurring chiefly on the islands including Samsö.

Melilotus dentatus (Fig. 29. Pl. IX) *Medicago minima* (Fig. 32. Pl. IX)

Vicia tenuifolia (Fig. 30. Pl. IX). *Astragalus danicus* (Fig. 33. Pl. X).

Vicia dumetorum (Fig. 31. Pl. IX)

Melilotus dentatus, which is associated with littoral meadows, is most frequent in the southern parts of the islands, areas within which the four other species are almost entirely absent, or very rare. Within Europe the four first-mentioned species have a southerly and easterly, e. g. a Pontine-Mediterranean, Pontico-Sarmatian or eastern Central European distribution, and their northern and northwestern limits run through southernmost Sweden and Denmark. *Astragalus danicus*, which is absent from the Mediterranean region proper, exhibits some extension in the British Isles, but is not present in northwestern Germany; its northern limit lies in Denmark and the extreme south of Sweden. An immigration of these species into Denmark from the southeast is most probable.

4. Species absent or rare west of the Great Belt.

Tetragonolobus siliquosus (Fig. 34. Pl. X)

Trifolium alpestre (Fig. 35. Pl. X)

— *montanum* (Fig. 36. Pl. X).

Here must also be mentioned *Lathyrus sphæricus*, whose position within the flora is doubtful.

In Europe these species have a markedly southern and eastern — Pontine-Mediterranean and eastern Central European — distribution; they all of them occur in the south of Sweden, *T. montanum* in the south of Norway also, viz. near Oslo; their northern and northwestern limits run through Denmark. As to *T. montanum*, an immigration from the east seems most probable, while *Tetragonolobus siliquosus* and *Trifolium alpestre* must have invaded the country from the southeast, and *Lathyrus sphæricus* most likely from the south.

All the species mentioned under points 1, 2, and 3 as also *Tetragonolobus siliquosus* are almost exclusively found within the warmest regions of Denmark. Only very few localities of these species are found in tracts with a shorter duration of the frost-free period — i. e. the interval between the last frost in the spring and the first frost in the autumn — than 180 days (50 per cent of the year), and they are chiefly found within regions where the frost-free period comprises 200 to more than 220 days (55.6 to 61.1 per cent or more of the year), and where the mean temperature of July is not lower than 16° C. These regions are precisely the coasts and the islands of the southern part of the Cattegat and the Belts, the islands south of Funen, the coast stretches on the west, south, and east sides of Lolland-Falster, Møen, Amager, and Saltholm, the coast stretches of Bornholm, as well as coast stretches and islands within or near the southwestern part of Jutland¹⁾ (H. HANSEN 1919, p. 129 (map), 136. L. A. HAUCH 1919, fig. 10 p. 21 and 1930, fig. 3, p. 30). Thus it is seen that these species, nearly all of which have their northern limit in Denmark, occur in tracts where the period of growth is most prolonged and which have the warmest summer, only certain Jutlandish finds having been made in regions without these areas. In view of these facts it seems reasonable to assume that it is the climatological conditions, more especially the duration of the period of growth and the high summer temperature, which have fixed the limits for the distribution of these species in Denmark. I. a. it is species like these that may have benefited by the mild climate of the post-glacial warm period, and at that time may have reached a maximum of distribution which they have later had to give up under the influence of the deterioration of the climate, similarly to what has been the case with several relatively thermophilous species within Fennoscandia; seen from this point of view, the northern and more isolated localities of several of these species may perhaps be considered as relict localities.

B. Anthropochorous Species.

(All of them very rare).

1. Occurring in Jutland as well as on the islands.

Colonist: *Trifolium spadiceum*.

¹⁾ As regards several of the localities, which according to the available, very summarily meteorological map lie outside the said tracts with the protracted frost-free period, it is very probable that a closer investigation would show that local conditions, particularly the exposure of the locality, cause a more favourable local climate than may prevail in the region as a whole.

Ephemeralophytes:

Coronilla varia

Melilotus indicus.

Melilotus wolgicus

2. Occurring on the islands, not, or only exceptionally, in Jutland.

Colonist:

(*Trigonella ornithopodioides*).

Ephemeralophytes:

Lathyrus sativus

(*Lathyrus tuberosus*).

Cultivated and run wild species:

Coronilla emerus

Lathyrus tuberosus

Lathyrus heterophyllus

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EXPLANATION OF THE PLATES

In the preparation of the maps showing the distribution of the higher plants in Denmark, hatching or fine-dotting of the areas of the species have been employed, as well as marking with circles of all the various localities whence the species are recorded, this being the best way of obtaining a cartographic reproduction of the available material.

An entirely filled out circle localises a find which has been checked by specimens kept in the Botanical Museum of the University of Copenhagen.

A circle with a dot in the centre localises a find either published in the literature, or recorded in the flora lists of the Topographic-Botanical Investigation.

A circle without a dot in the centre indicates that the species has not been found again in this locality within recent times, whence it has thus possibly, or doubtless, disappeared.

Hatching indicates that the species is found with the frequency "here and there", "rather common" or "common" within the hatched area. (A distinction between the various degrees of frequency by means of different hatching proved impracticable).

Marking with fine dots has been employed for strand-plants instead of hatching.

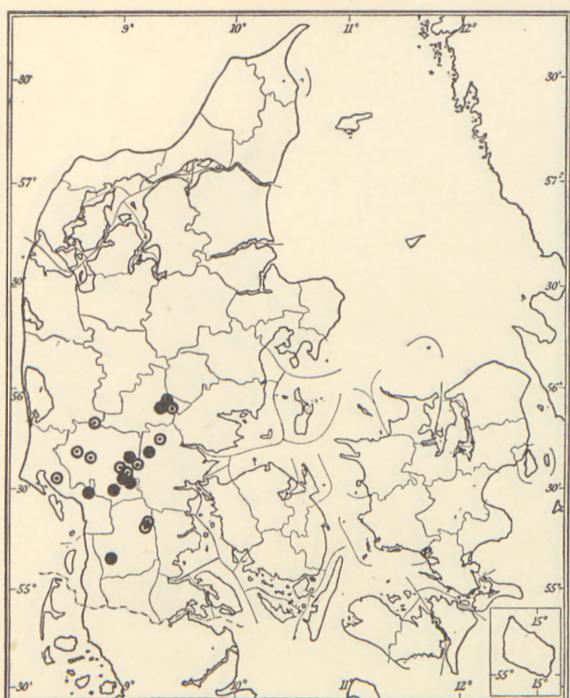


Fig. 1. *Genista germanica* L.

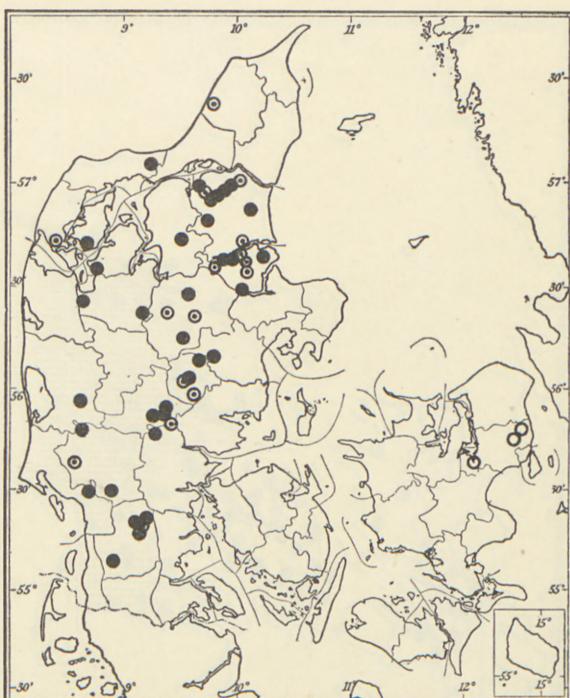


Fig. 2. *Vicia orobus* DC.

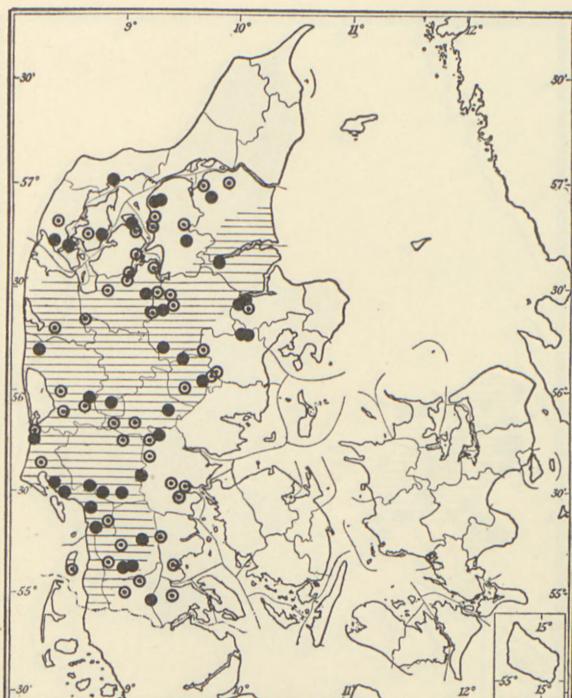


Fig. 3. *Genista pilosa* L.

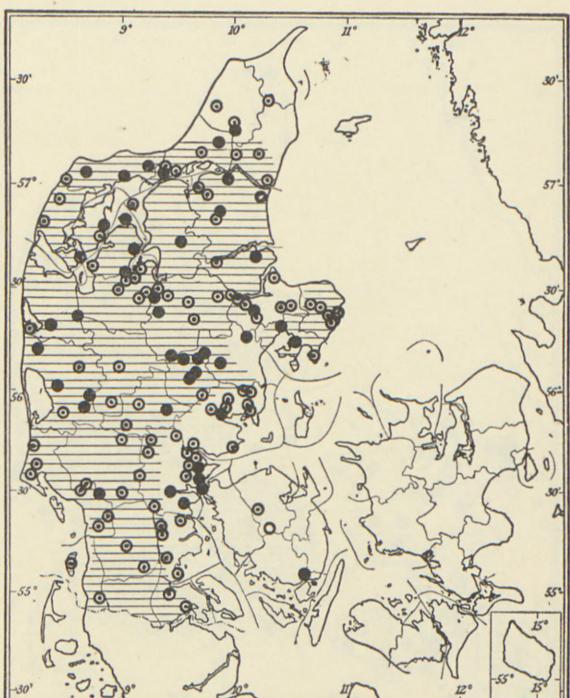


Fig. 4. *Genista anglica* L.

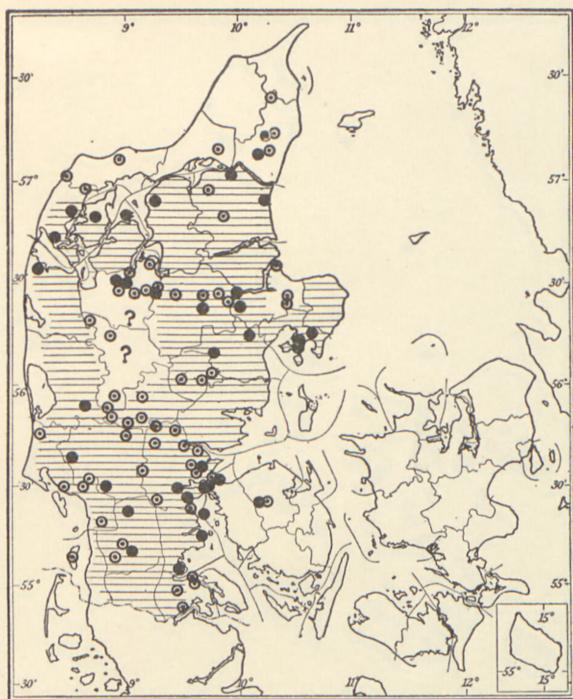


Fig. 5. *Genista tinctoria* L.

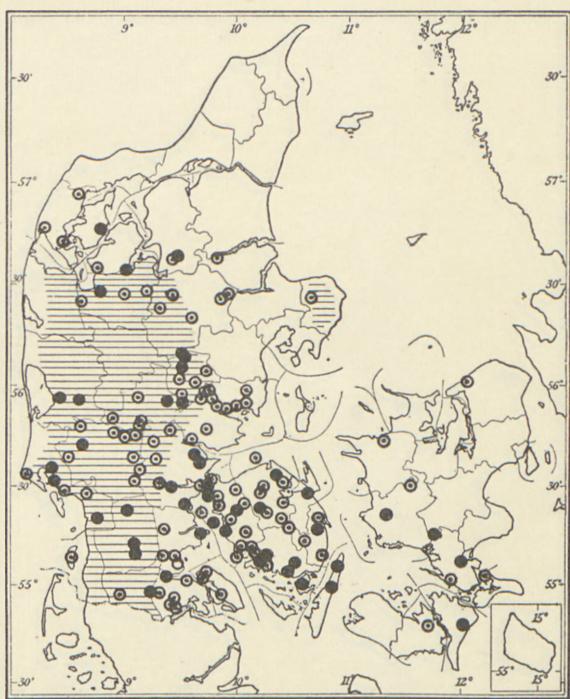


Fig. 6. *Ornithopus perpusillus* L.

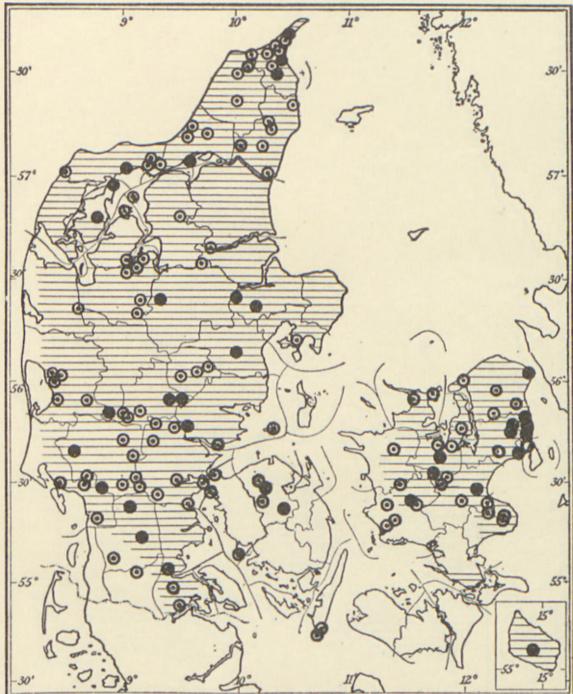


Fig. 7. *Lathyrus montanus* BERNH.

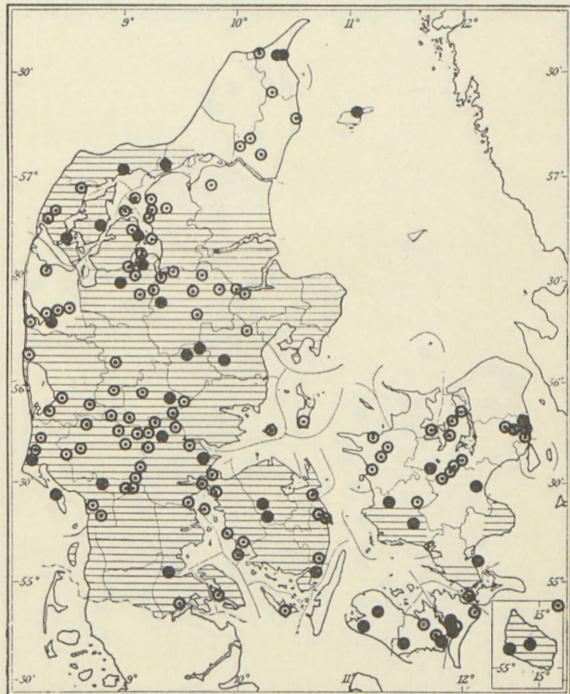


Fig. 8. *Lotus uliginosus* SCHRANK.

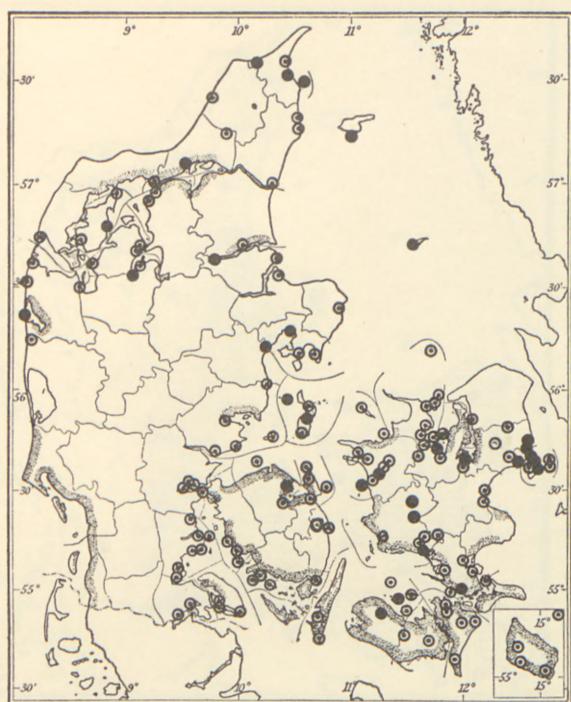


Fig. 9. *Trifolium fragiferum* L.

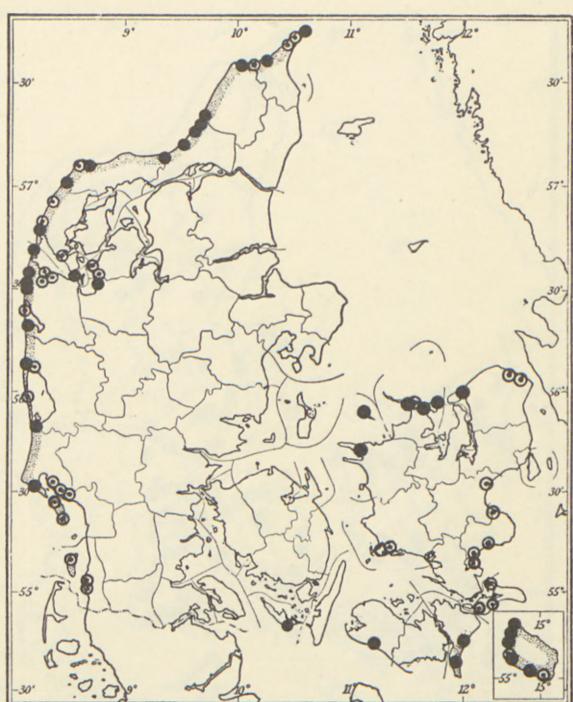


Fig. 10. *Lathyrus maritimus* (L.) BIGELOW.

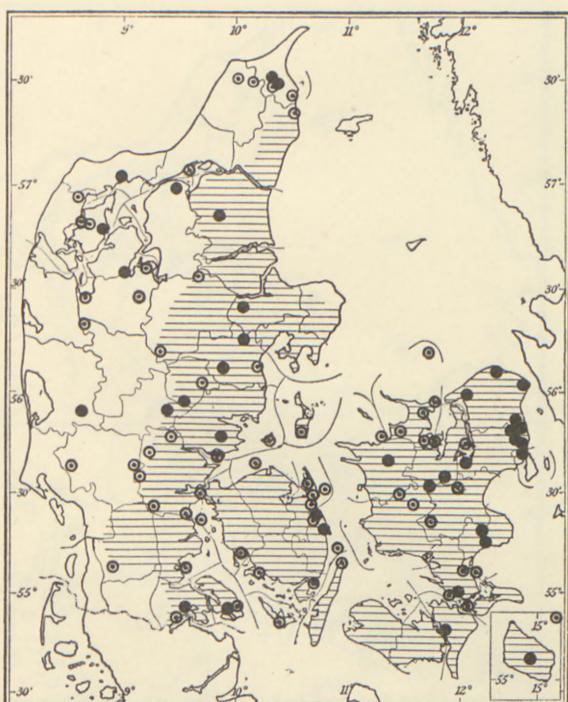


Fig. 11. *Vicia sepium* L.

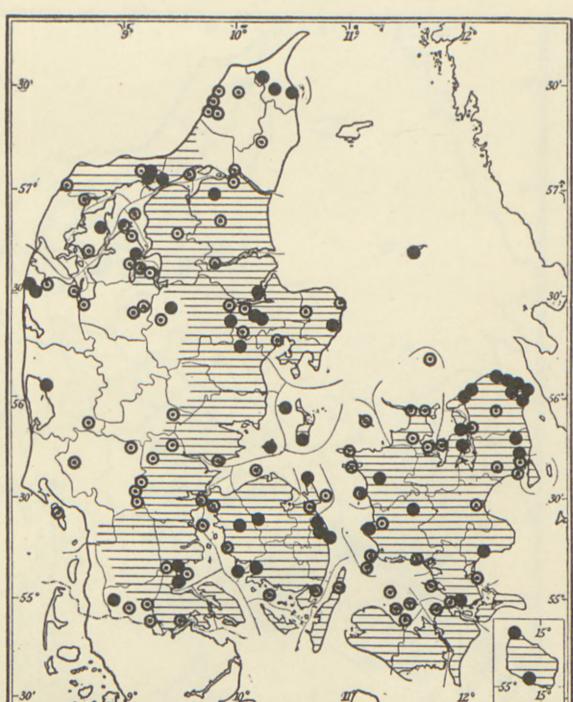


Fig. 12. *Ononis repens* L.

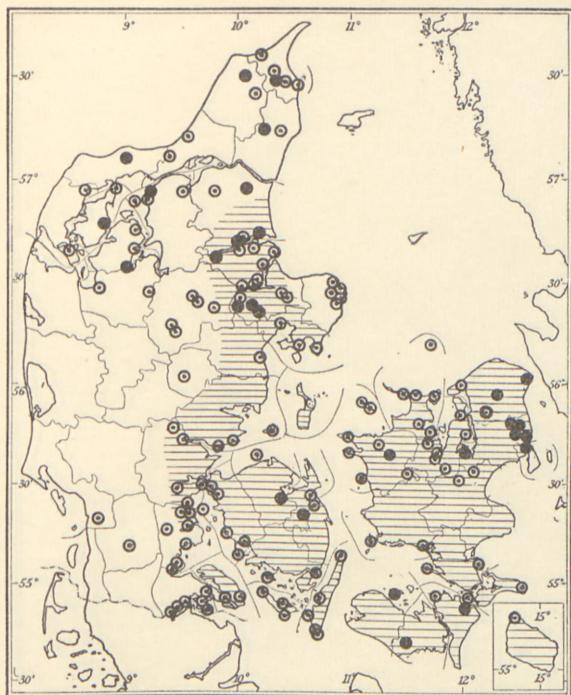


Fig. 13. *Astragalus glycyphylloides* L.

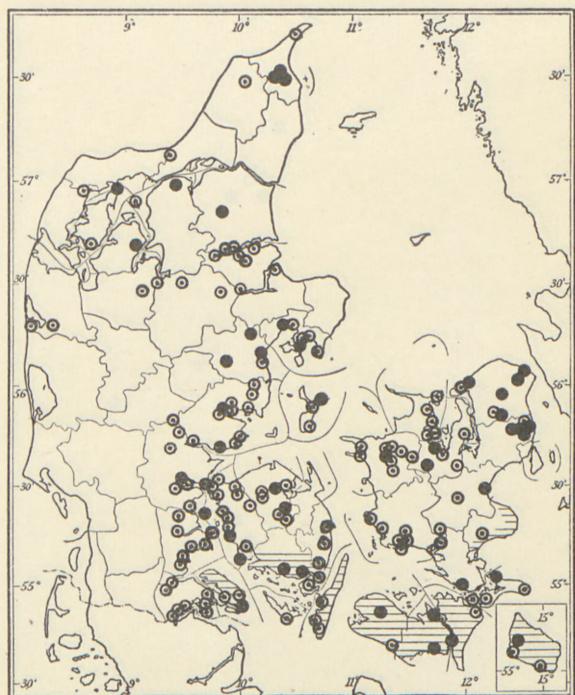


Fig. 14. *Lathyrus silvester* L.

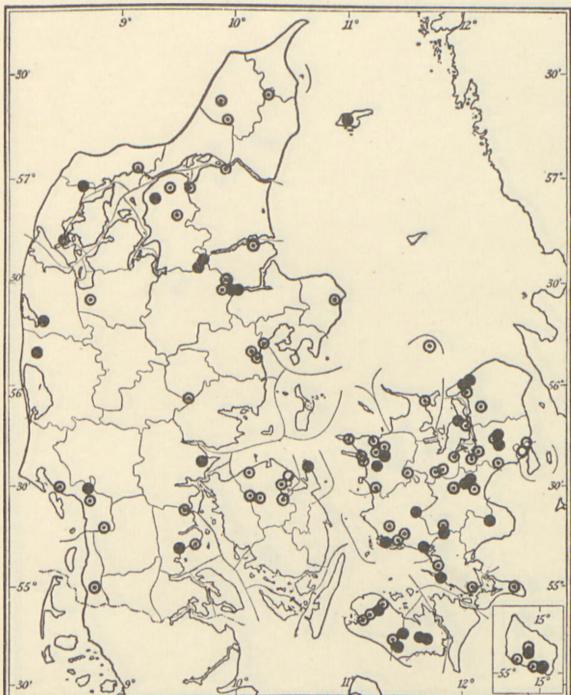


Fig. 15. *Lathyrus palustris* L.

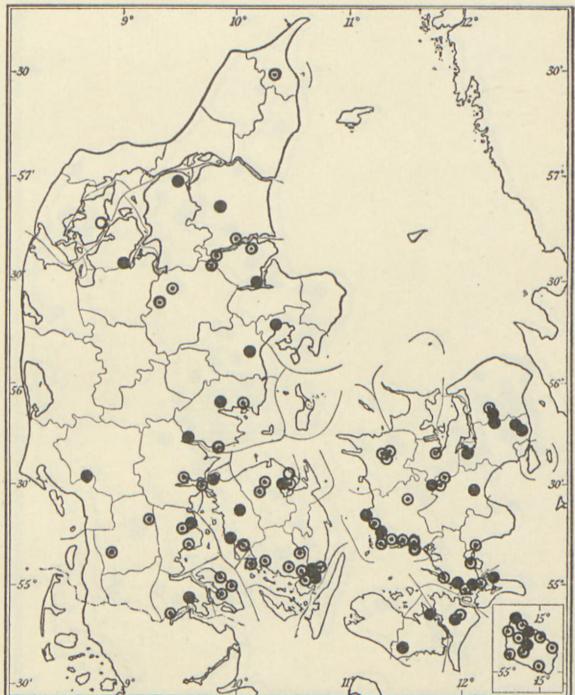


Fig. 16. *Lathyrus niger* (L.) BERNH.

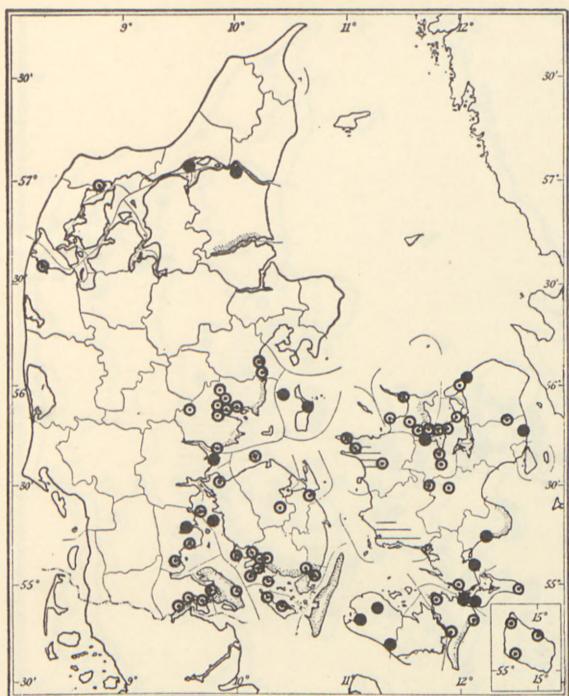


Fig. 17. *Melilotus altissimus* THUILL.

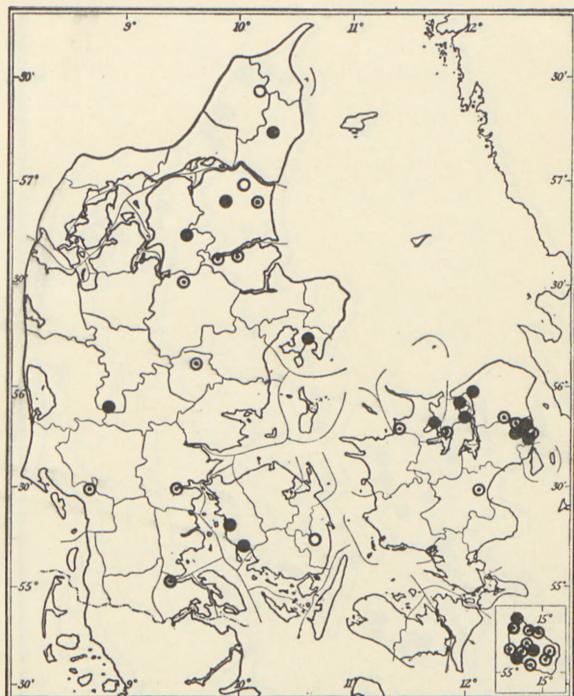


Fig. 18. *Vicia cassubica* L.

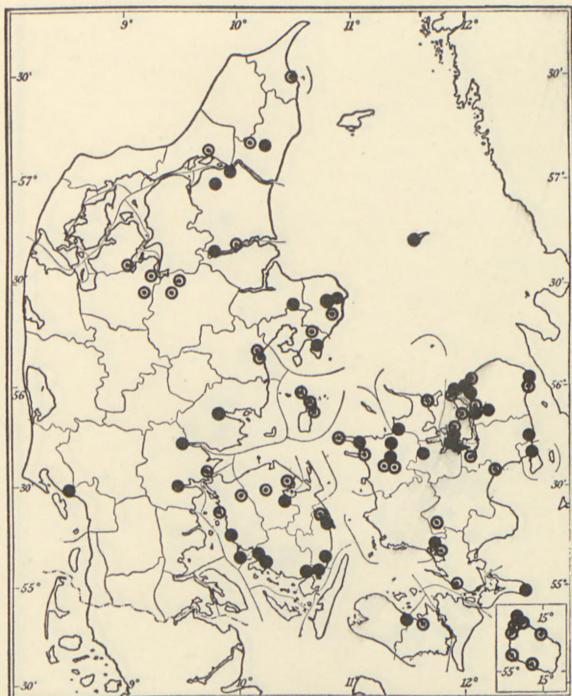


Fig. 19. *Medicago falcata* L.

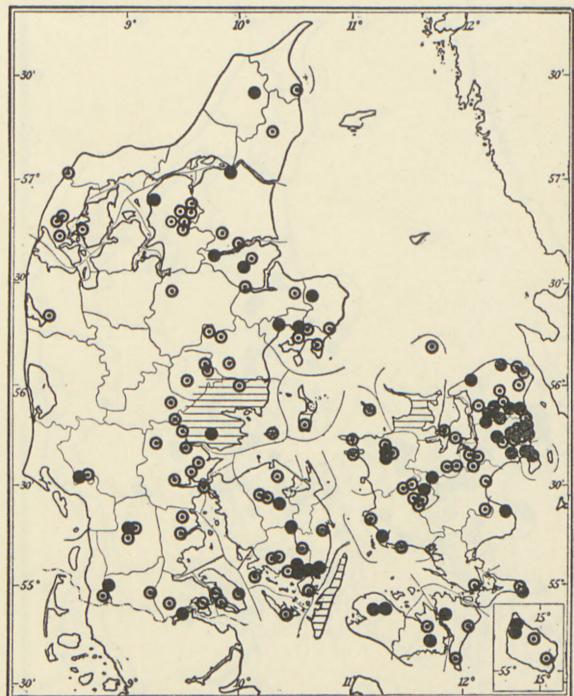


Fig. 20. *Trifolium agrarium* L.

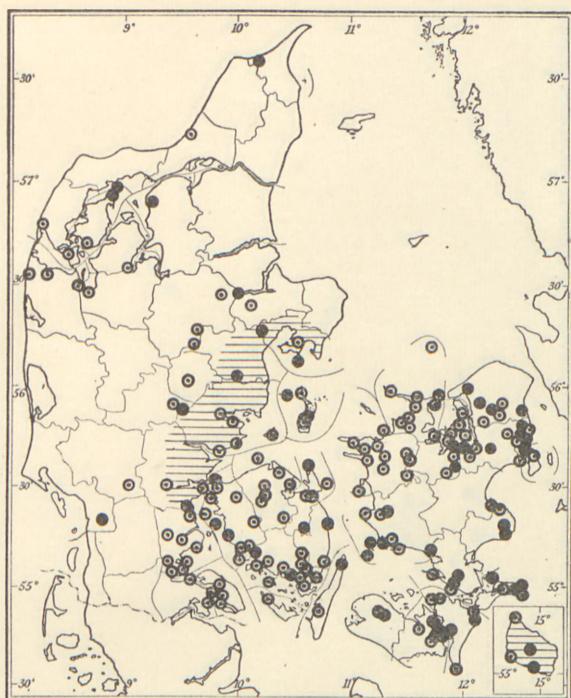


Fig. 21. *Trifolium striatum* L.

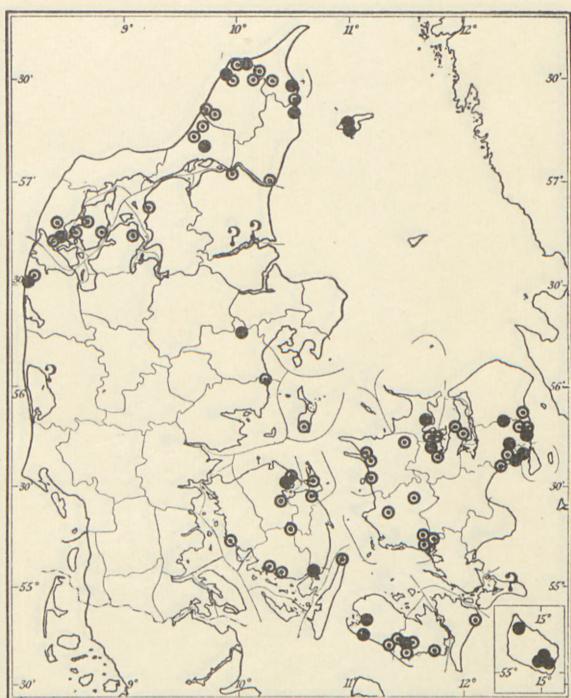


Fig. 22. *Ononis arvensis* L.

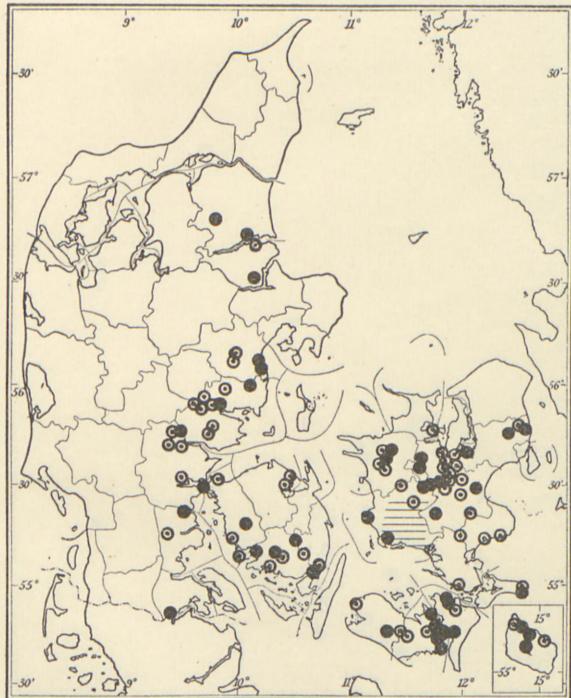


Fig. 23. *Lathyrus vernus* (L.) BERNH.

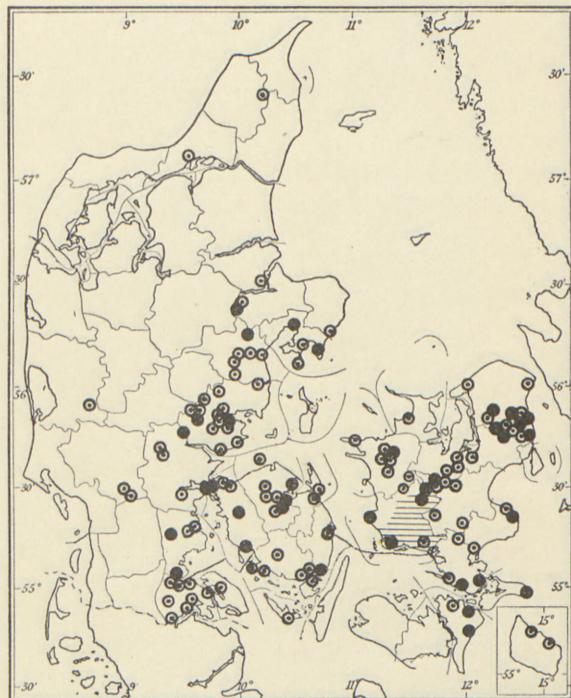


Fig. 24. *Vicia silvatica* L.

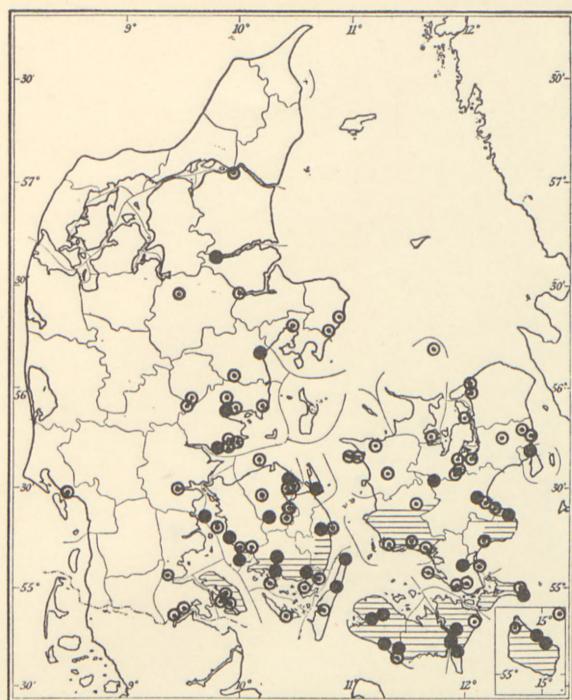


Fig. 25. *Vicia tetrasperma* (L.) MOENCH.

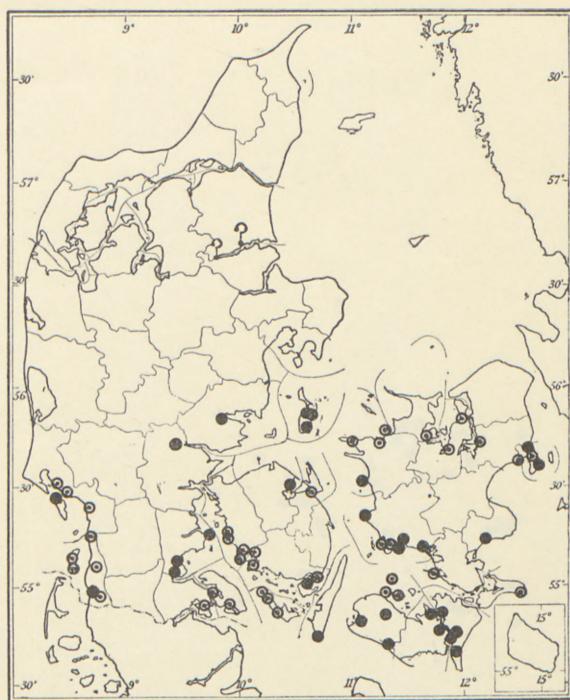


Fig. 26. *Ononis spinosa* L.

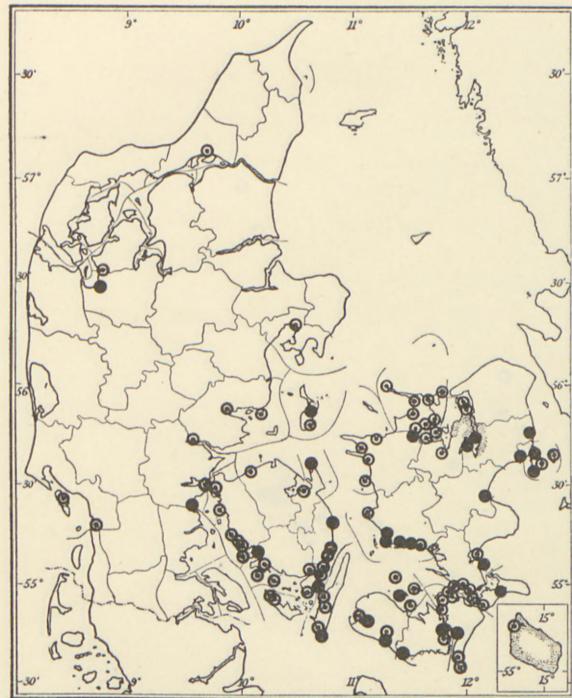


Fig. 27. *Lotus tenuis* W. & Kit.

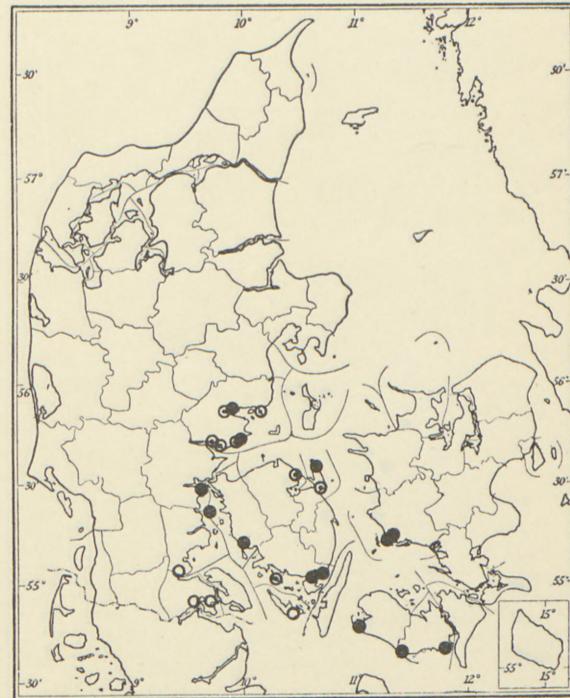


Fig. 28. *Trifolium filiforme* L.

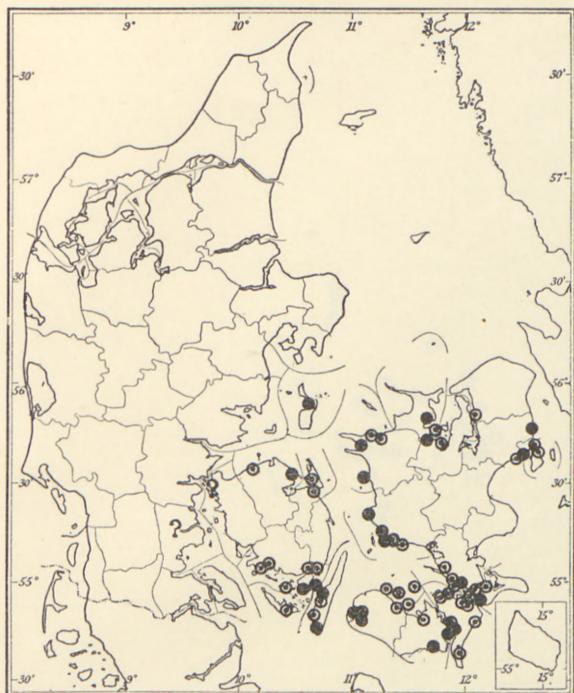


Fig. 29. *Melilotus dentatus* (W. & Kit.) Pers.

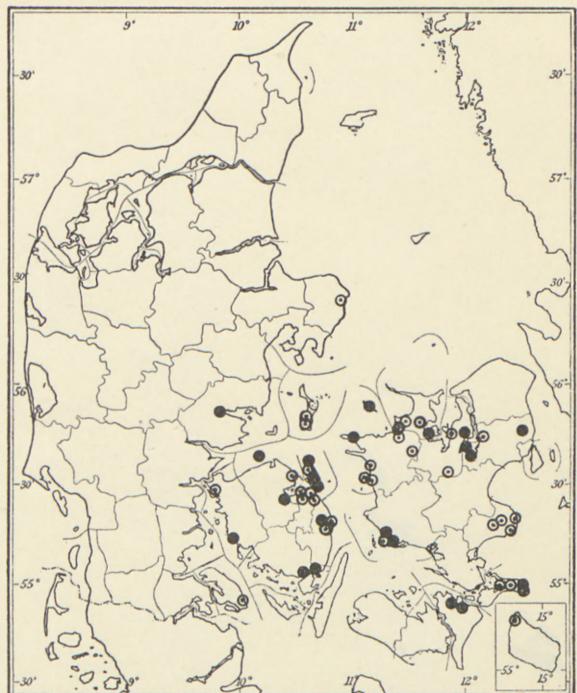


Fig. 30. *Vicia tenuifolia* ROTH.

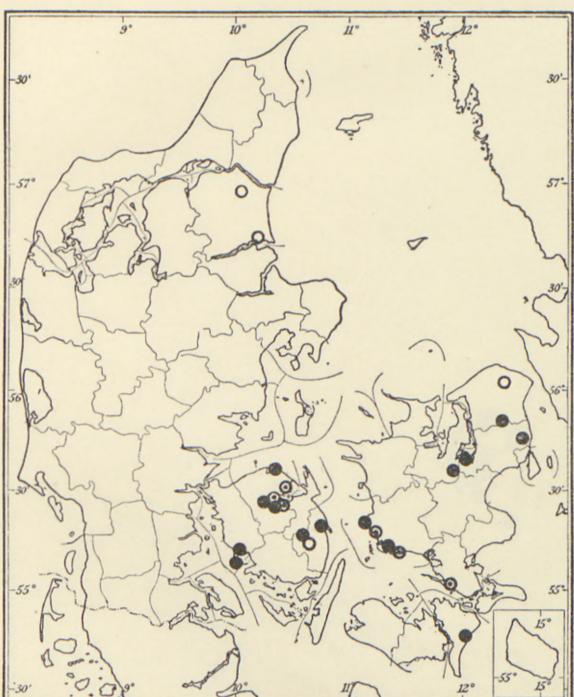


Fig. 31. *Vicia dumetorum* L.

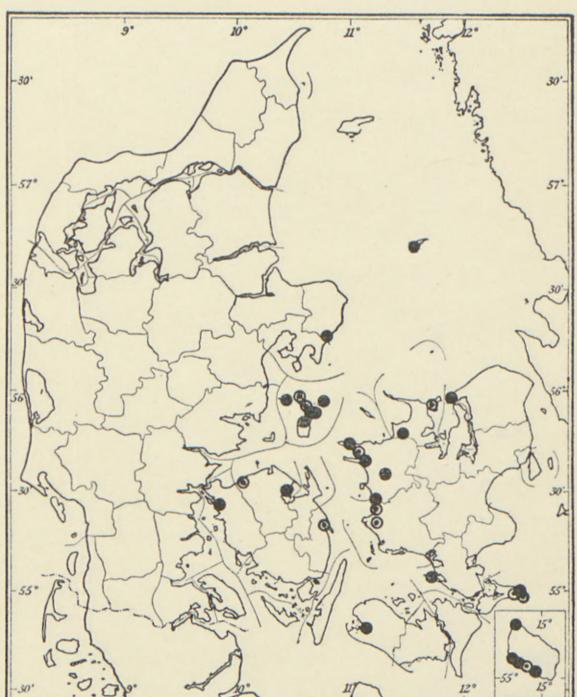


Fig. 32. *Medicago minima* (L.) BARTALINI.

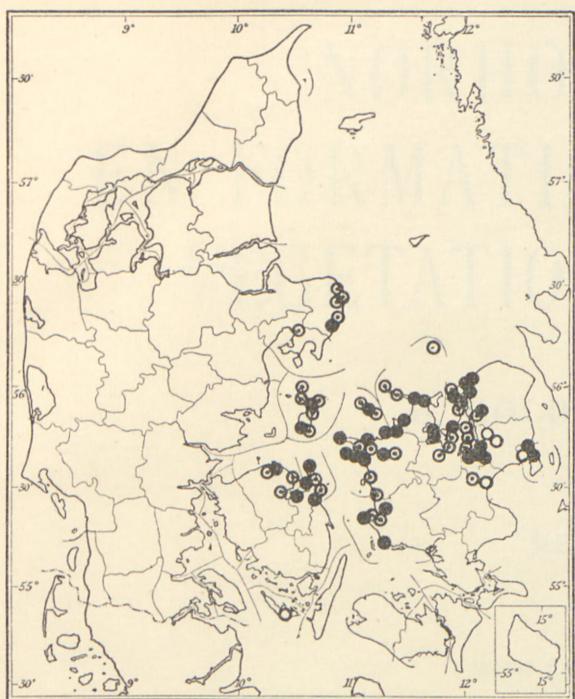


Fig. 33. *Astragalus danicus* RETZ.

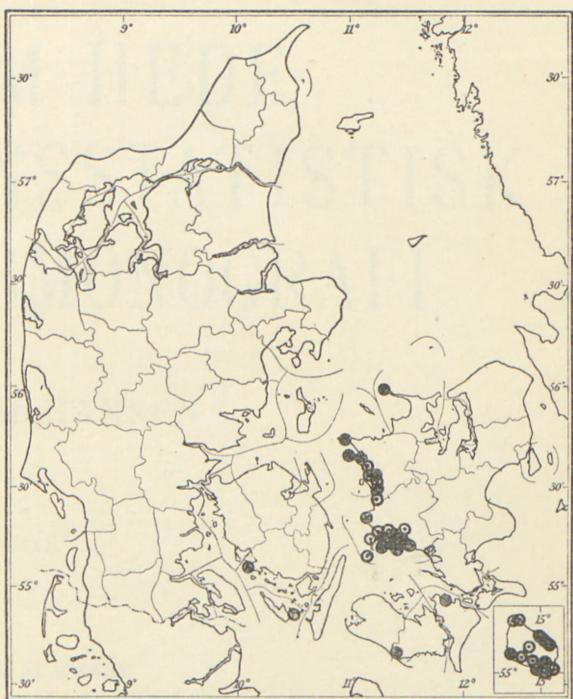


Fig. 34. *Tetragonolobus siliquosus* (L.) ROTHS.

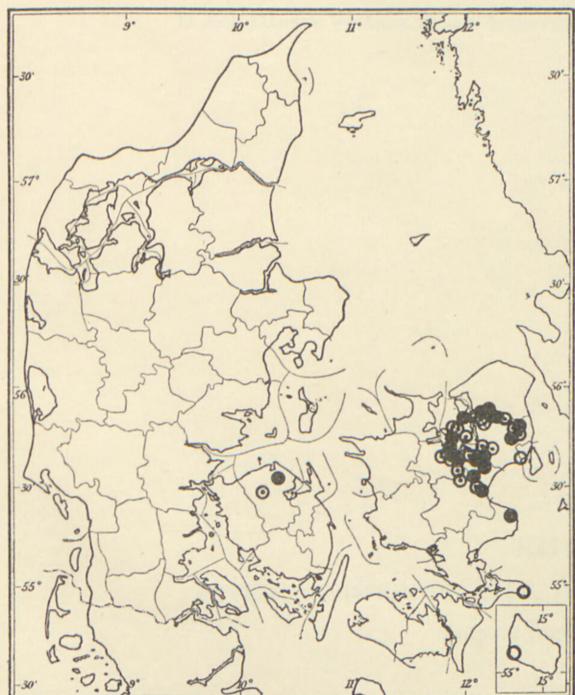


Fig. 35. *Trifolium alpestre* L.

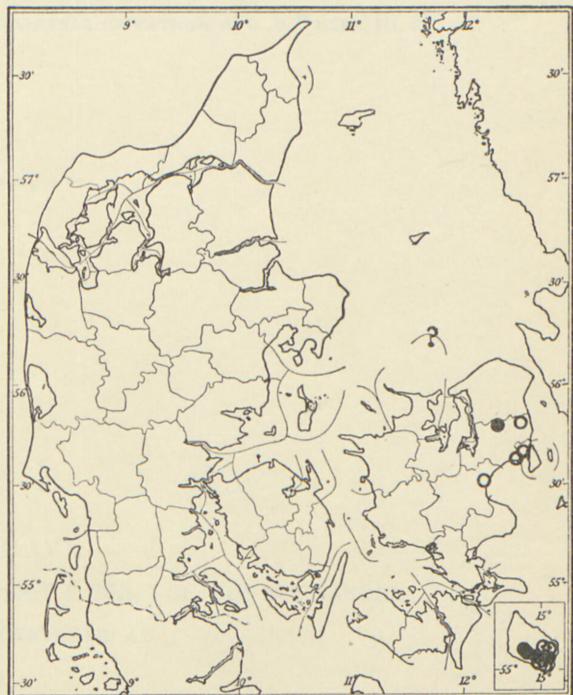


Fig. 36. *Trifolium montanum* L.

NØRHOLM HEDE, EN FORMATIONSSTATISTISK VEGETATIONSMONOGRafi

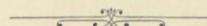
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H. MØLHOLM HANSEN

MED 1 KORT

WITH ENGLISH SUMMARY

D. KGL. DANSKE VIDENSK. SELSK. SKRIFTER, NATURVIDENSK. OG MATHEM. AFD., 9. RÆKKE, III. 3.



KØBENHAVN

HOVEDKOMMISSIONÆR: ANDR. FRED. HØST & SØN, KGL. HOF-BOGHANDEL

BIANCO LUNOS BOGTRYKKERI A/S

1932

НОРДЕН НЕДЕ
ЕН ФОРАМІНІСТАТИСК
ВЕГЕТАЦІОННОГРАФІ

Із збірки музею Академії наук України

Том 1

ГІАНІТИ ПАЛІОЗОІУ

ХХІ друк. Н. В. до Академії наук України, заснованої Указом Імператора 1783 р.

Ізд. Академії наук

Фінансоване з бюджету України та з бюджету Науково-дослідного центру
«Науковий архів Академії наук України»

BOTANIKEREN
C. RAUNKIÆR
TILEGNET I TAKNEMMELIGHED
OG BEUNDRING

— Юлианов
ЯЗЫКИАЛ
документы и письма
около 1900

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Indledning.

I Aaret 1913 lod Stamhusbesidderinde Frøken I. K. ROSENØRN-TEILMANN ved kgl. Resolution af 28. August 1913, tinglæst 3. December s. A., fredlyse c. 350 ha Hede under Stamhuset Nørholm, saaledes at Fredningen blev lagt som en Servitut paa Ejendommen. Fredningsdeklarationen er saalydende:

»Underskrevne Frøken INGEBORG KRISTIANE ROSENØRN-TEILMANN, Besidderinde af Stamhuset Nørholm, erklærer herved, at Nørholm Hovedgaard, uden Hensyn til om Stamhuset Nørholm vedbliver at bestaa, eller om det gaar over til fri Ejendom, belægges med følgende Servitut«:

»Den til Gaarden hørende Hede, ialt c. 350 Hektar geometrisk Maal, hvis Grænser er mærkede med en graa Farvetone paa en under 22. Juli 1912 til Justitsministeriet indsendt Kopi af Matrikelkortet, skal vedblivende høre til Hovedgaarden eller, i Tilfælde af Udparellering, til den tilbageblivende Hovedparcel, og Arealet skal bevares i sin naturlige Tilstand som et Billed af de store Hedeegne, der i tidligere Tid omgav Herresædet Nørholm. Den nævnte Hede maa saaledes hverken bebygges, opdyrkes til Ager eller omdannes til Skov; ejheller maa den benyttes til Kreaturgræsning eller lægges ud til Dyrehave; dens Jordsmon skal bevares uforandret med Undtagelse af den Grusgravning, til hvilken det offentlige Vejvæsen er berettiget, og Arealet maa ingensinde gennemskæres af private Vejanlæg eller andre Færdselslinier udover de til Avlsgaardens Drift fornødne Markveje og Hedespor.«

»Hvis nogen Besidder eller Ejer af Nørholm skulde forse sig mod ovenstaaende Bestemmelser, da skal Paataleret tilkomme Justitsministeriet efter Indstilling enten af Universitetets Professor ordinarius i Botanik eller fra Forstanderen for Statens forstlige Forsøgsvæsen, saaledes at Ministeriet efter Anvisning af de nævnte Mænd kan lade saa vidt muligt ethvert Spor af det foretagne Indgreb i Hedens Natur udslette, hvilket Arbejde udføres paa Bekostning af Hovedgaarden Nørholms Besidder, respektive Ejer.«

»De tvende nævnte Videnskabsmænd skal til enhver Tid have uhindret Adgang til at tage Arealet i Øjesyn, og af Hensyn til eventuelle videnskabelige Undersøgelser skal der ligeledes til enhver Tid være uhindret Adgang for enhver, der dertil har skriftlig Tilladelse fra en af de nævnte Tilsynshavende.«

»Tilsynet med Overholdelse af Servituten føres uden Udgift for Besidderen, respektive Ejeren af Hovedgaarden Nørholm.«

Nørholm, den 8. September 1913.

I. K. ROSENØRN-TEILMANN.

Der findes for Lenskontrollens Vedkommende intet til Hinder for, at nærværende Deklaration tinglæses.

Justitsministeriet, den 2. Oktober 1913.

P. M. V.

RENTZMANN /V. GIESE.

Den ved ovenstaaende Dokument fredede Hede, der i det følgende for Kortheds Skyld kaldes Nørholm Hede, tiltrak sig hurtig Naturelskernes og Naturforskernes Opmærksomhed og i den endnu kun korte Aarrække, Heden har henligget i fredet Tilstand har den ofte været Maalet for Exkursioner enten fra Enkeltmands eller fra en eller anden naturvidenskabelig Forenings Side.

»Naturhistorisk Forening for Jylland« er, saa vidt vides, den første Forening, der har besøgt Heden, efter at den var blevet fredet. I »Flora og Fauna« 1918: 89—92 meddeler HULDA PETERSEN i ESBEN PETERSEN's Exkursionsberetning den første Planteliste fra Heden. Senere har den været besøgt to Gange af »Botanisk Forening«, første Gang i 1919 under Adjunkt Poul LARSEN's Ledelse. — Cfr. Botanisk Tidsskrift 37: 64—65, 1920, anden Gang i 1927. — Cfr. Bot. Tidsskr. 40: 165, 1928.

Det varede dog ikke længe, førend Spørgsmaalet om mere indgaaende Undersøgelser blev taget op til Overvejelse, idet de to Institutioner, Universitetet og Statens forstlige Forsøgsvæsen, der i Følge Fredningsdeklarationen skal føre Tilsyn med Heden, hver for sig iværksatte Undersøgelser ud fra de respektive Institutioners specielle Virkeomraader.

Fra Statens forstlige Forsøgsvæsen foreligger der allerede et første Bidrag i en Afhandling af A. OPPERMANN og C. H. BORNEBUSCH: Nørholm Skov og Hede. — Det forstlige Forsøgsvæsen i Danmark 11: 257—360, 1930. I dette Arbejde er ikke blot Hedens Vegetation og Trævækst blevet behandlet ud fra specielle forstlige Synspunkter, men der meddeles tillige en Række historiske Data, Heden og Skoven vedrørende, samt gives en Fremstilling af Hedens almindelige Naturforhold og en Analyse af dens Vegetation. En anden og meget betydningsfuld Side af disse Undersøgelser var Udlæggelsen af et Kvadratnet paa Heden. Der er ingen Tvivl om, at dette Kvadratnet, der paa en tydelig, men dog ikke iøjnefaldende Maade er markeret i Terrænet, vil være et ligesaa uundværligt Støtte ved fremtidige Undersøgelser som det har vist sig at være for de Undersøgelser, der hidtil er blevet udført.

Samtidig med disse Undersøgelser iværksattes af daværende Professor botanices C. RAUNKIÆR¹⁾ en Undersøgelse over Hedens Vegetation, idet Hovedsagen for disse var at give en botanisk-plantogeografisk Beskrivelse af Heden. Det faldt i mit Lod først at assistere Professoren, senere paa egen Haand at fuldføre Undersøgelserne.

¹⁾ Med Støtte fra Carlsbergfondet.

Jeg benytter derfor denne Lejlighed til at bringe Professor RAUNKIÆR min ærbødige og varmtfølte Tak, fordi jeg paa et saa tidligt Tidspunkt af min botaniske Udvikling fik Lejlighed til at arbejde i Marken med Opgaver, der, samtidig med at give et sikkert Iagttagesesgrundlag til Støtte ved litterære Studier, hurtig gjorde mig fortrolig med dansk Plantogeografis bedste videnskabelige Traditioner. Den Naturopfattelse jeg gennem disse Undersøgelser fik, har jeg ved mindre senere Undersøgelser nok været i Stand til at udvide, men ikke at ændre.

Kap. I. Hedens Kortlægning og Areal.

De Undersøgelser, der i det følgende skal gøres nærmere Rede for, udførtes i Aarene 1921, 1922 og 1924. Sommer 1921 anvendtes til Rekognosering af Terrænet og til Fremstilling af en Del Specialkort. I Løbet af Sommeren 1922 (Juli—August) blev Kortlægningen af Hedens Plantesamfund og Opmaalingen af Trævæksten foretaget; endelig udførtes i Maanederne Juli—August 1924 de formationsstatistiske Undersøgelser.

Allerede under Arbejdet i 1921 erfaredes Nødvendigheden af ved mere indgaaende plantekartografiske Undersøgelser at have et detailleret Kortmateriale over hele Arealet. I Forvejen var der ganske vist Adgang til ikke mindre end to Kortarbejder over Heden: Matrikelkortet i Maalestok 1:4000 og Generalstabens Maalebordsblad Nr. 3104 i Maalestok 1:20000, men ingen af disse tilfredsstiller selv beskedne Krav om Detailrigdom. Der var derfor ingen anden Udvej end selv at foretage en Kortlægning; Resultatet af dette Arbejde er nedlagt i medfølgende farvelagte Kortbilag.

Som Grundlag for Kortlægningsarbejdet i Marken benyttedes det af A. OPPERMANN og C. H. BORNEBUSCH udlagte Koordinatsystem, der bestaar af 40 Fikspunkter, beliggende i Hjørnerne af et solret liggende Kvadratnet med Maskevidde 400 m.

Fikspunkternes Beliggenhed fremgaaer af Fig. 1 (cfr. A. OPPERMANN og C. H. BORNEBUSCH: Nørholm Skov og Hede. — Det forstlige Forsøgsvæsen i Danmark 11: 257—360, 1930, fig. 4, pag. 267). Om Koordinatnettet og dets Fremstilling skriver A. OPPERMANN 1930 p. 267—268 følgende: »Først blev der afsat en Linie nøjagtigt fra Øst til Vest (Linien 6—11¹) paa Kortet Fig. 4), og paa denne blev der for hver 400 m oprejst Perpendikulærer ved Hjælp af en Theodolit. Syd for Grundlinien blev der lagt tre parallelle Linier (12—18, 19—22, 23—24) i Afstanden 400, 800 og 1200 m, og mod Nord Linien 1—5 i 300 Meters Afstand. Det saaledes fremkomne Koordinatsystem blev mærket ude i Terrænet paa følgende Maade: Ved hvert af de fem Punkter 6, 8, 10, 16 og 20 blev der sat en firhugget Sten, hvis sydlige Kant staar nøjagtigt 20 cm Nord for Punktet, saaledes at man let kan finde Linierne 6—10 og 10—20. I hvert af de 40 Punkter, som staar paa Kortet, blev der nedrammet et Gasrør af c. 50 Centimeters Længde og med en Lysning paa c. $3\frac{1}{2}$ cm, saaledes at man passende kan sætte en Landmaalerstok eller en Stage ned i Røret. Dettes øverste Kant staar i Højde med Jordens Overflade og er dækket af en flad Sten. Lige Nord og Syd for hvert Rør — undtagen dem der staar i de fem forannævnte Punkter — blev der i en Afstand lig Spadebladets Bredde gravet to Huller, c. 15 cm dybe og

¹) ɔ: næstøverste vandrette Linie paa Fig. 1.

en Spadebredde i Kvadrat. I flere af Linierne blev der desuden sat Mellem punkter med 200 og i et enkelt Tilfælde (6c) 100 Meters Afstand fra Hovedpunkterne.

Mærkerne i Terrainet kan kun ses paa ganske kort Afstand; de virker ikke forstyrrende i Landskabet, og de er sikrede mod Overlast, da det er vanskeligt at finde dem.«

Det foreliggende Koordinatsystem med en Linieafstand paa 400 m var dog ikke tilstrækkelig findelt til selve Kortlægningsarbejdet. En Linieafstand paa 100 m maatte

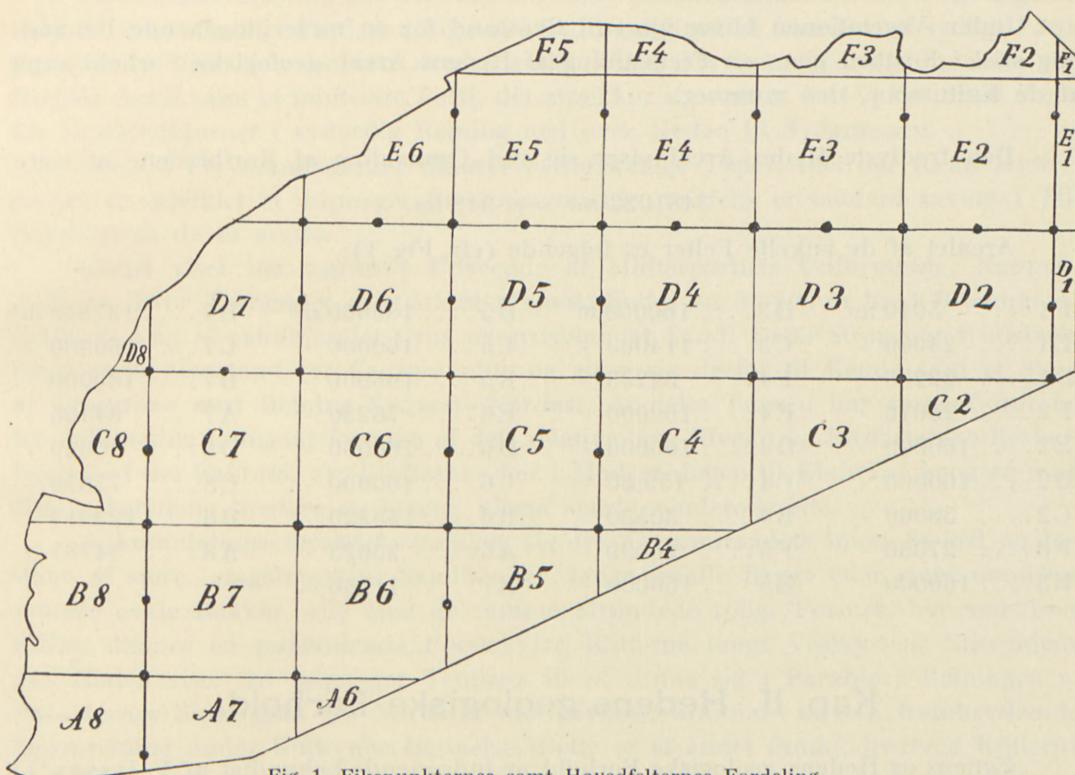


Fig. 1. Fikspunkternes samt Hovedfelternes Fordeling.

anvendes. I hver af de store Felte blev der da ved Hjælp af Stokke indlagt dette mindre Kvadratnet; ved tillige at indlægge dette i Nabofelte til et givet Omraade fik man baade tilstrækkelig mange Fikspunkter og rette Linier til at Kortlægningsarbejdet kunde gennemføres med ønskelig Nøjagtighed. Der blev kortlagt et enkelt af de store Felte ad Gangen. Kortet i Marken blev tegnet paa Millimeterpapir i Formatet 1:1000; 1 m i Naturen svarer til 1 mm paa Papiret; de enkelte store Felte blev saaledes kortlagt paa et 40×40 cm stort Stykke Millimeterpapir. Paa Kortbladene indtegneses først og fremmest Arealets Grænser, dernæst Terrænformer som Kløfter, Skrænter og Bakker, Grænserne mellem de forskellige Vegetationstyper: Ore, Grønning, *Calluna*- og *Erica*-Hede, Grønmoser, *Myrica*- og Vældmoser, Kulturspor som Veje, Diger, Grøfter, Høj- og Lavspændingsledninger, Grus-, Sand-, Mergel-

og Tørvegrave samt Spor efter Tørveskrælning, Kulmiler, Hustomter, Agerfurter, Kæmpehøje o. l. Samtidig hermed blev de enkelte paa Heden voxende Traer indtegnet og opmaalt, ligesom en Række karakteristiske Plantarters Nærværelse eller Mangel i de enkelte smaa Felter blev noteret. Alt dette Materiale er anvendt til Fremstilling af Kortfigurerne i nærværende Afhandling ^{o:} først og fremmest det store farvelagte Kort over Terræn og Plantesamfund i Maalestok 1:4000, dernæst de mindre Kort over Kulturspor, de enkelte Traers og Plantarters Udbredelse paa Heden samt Detailkortene over Grønmøser o. l.

Inden Vegetationen bliver gjort til Genstand for en mere indgaaende Behandling skal i Korthed gives en Fremstilling af Hedens Areal, geologiske Forhold samt af de Kulturspor, den rummer.

Den fredlyste Hedes Areal viser sig ved Opmaaling af Kortbladene at være
 $3481022 \text{ m}^2 = \text{c. } 348 \text{ ha.}$

Arealet af de enkelte Felter er følgende (cfr. Fig. 1):

F1....	5040 m ²	D3....	160000 m ²	D5....	160000 m ²	D7....	137848 m ²
E1....	24000 -	C3....	114000 -	C5....	160000 -	C7....	160000 -
D1....	22200 -	F4....	34233 -	B5....	106000 -	B7....	160000 -
F2....	25016 -	E4....	160000 -	E6....	76230 -	A7....	84466 -
E2....	160000 -	D4....	160000 -	D6....	160000 -	D8....	10029 -
D2....	160000 -	C4....	159;80 -	C6....	160000 -	C8....	77870 -
C2....	38000 -	B4....	30530 -	B6....	158320 -	B8....	123917 -
F3....	27366 -	F5....	26699 -	A6....	23625 -	A8....	84787 -
E3....	160000 -	E5....	160000 -	E7....	11366 -		

Kap. II. Hedens geologiske Forhold.

Egnens og Hedens geologiske Forhold er indgaaende behandlet af A. JESSEN¹⁾ i Beskrivelsen til Kortbladet Varde. Det fremgaar heraf, at det fredede Areal indtager Størstedelen af det smukke Flyvesandterræn, der findes udviklet paa Hedesletten Syd og Øst for Varde-Aa-Dalen, umiddelbart Syd for Herresædet Nørholm. Medens Arealet mod Øst og Syd ved en med Bjergfyr beplantet, lav Dige kunstig er afgrænset mod Omgivelserne, er Hedens Grænser mod Nord og Vest forsaavidt naturlige, som de her dannes af Engene langs Vardeaa og giver sig til Kende i Terrænnet som mere eller mindre stejle Skrænter. Længst mod Sydvest og Nordøst er Skrænterne 7—10 m høje og staar her stejlt mod Aadalen. Fra disse to Yderpunkter aftager de mere eller mindre stærkt i Højden mod Nordvesthjørnet, hvor Hedesletten ved Stokkebro gaar jævnt over i Varde-Aa-Dalen. Efter al Sandsynlighed maa dette sidste betragtes som et

¹⁾ Cfr. Beskrivelse til Geologisk Kort over Danmark (i Maalestok 1 : 100.000). Kortbladet Varde ved AXEL JESSEN. — Danmarks geologiske Undersøgelse. I. Række. Nr. 14. Kbh. 1922.

sekundært Fænomen: Resultatet af den Sandflugt, der har været af en såa afgørende Betydning for Udformningen af Landskabet. Grænsen mellem Hedeslette og Aadalen paa den modsatte Side af Dalen danner i hvert Fald stejle Skrænter paa dette Sted, og Overkanten paa de to modstaaende Sider har sikkert, inden Aadalen dannedes, ligget i Flugt med hinanden. Skrænternes Højde Nord og Vest for Aadalen svarer i hvert Fald til Højden af den af Sandflugten überørte Del af Hedesletten, Syd for Aadalen. I begge Tilfælde er Højden over Havet c. 16—17 m.

Flyvesandsterrænet paa Hedesletten S. f. Nørholm falder i 3 naturligt afgrænsede Partier: et østligt Parti, fra Tophøj i Syd mod Nord til Aadalen, et sydligt Parti, der især er udviklet som en overordentlig smuk Flyvesandsparabel udenfor det fredede Areal samt et midterste Parti, der strækker sig som et 1—1½ km bredt Bælte fra Nordvesthjørnet i sydøstlig Retning ned over Heden til Sydgrænsen.

Disse 3 Flyvesandspartier tilhører to forskellige Typer, idet der foran Midterpartiet er udviklet et udpræget Erosionsomraade, medens et saadant savnes i Tilknytning til de to andre.

Kortet viser det nærmere Udseende af Midterpartiets Udfomning. Nærmest Aadalen, hvor Terrænet er stærkest afblæst, findes en 3—400 m bred Bræmme af veklende Lag af sandblandet Grus og grusblandet Sand. Dette Strøg har i udstrakt Grad været Genstand for Grusgravning og giver sig derfor til Kende som et Strøg af Grusgrave med Retning Sydvest—Nordøst. At dette Terræn har været Genstand for Afblaesning fremgaar foruden af dets relative lave Niveau og Jordarternes Beskaffenhed af det Faktum, at »Kløfterne« her i Modsætningen til Kløfterne længere mod Øst er betydelig bredere og lavere, altsaa stærkt vinderoderede.

Akkumulationsomraadet strækker sig fra Grusomraadets imod Sydøst og bestaar af store, uregelmæssige Sandbanker, lange smalle Rygge eller ejendommelige mindre ovale Bakker, alle med de samme afrundede rølige Former, hvorved disse Klitter danner en paafaldende Forskel fra Klitterne langs Vestkysten. Klitvoldene paa Heden viser en udpræget Tendens til at ordne sig i Parabler; Retningen af Parablersnes Sider gaar fra Nordvest mod Sydøst, svarende til den fremherskende Stormretning under Klitternes Dannelse. Dette er et andet Punkt, hvorved Klitterne paa Nørholm Hede adskiller sig fra Klitterne langs Vesterhavet, hvor Parablersidernes Retning er Vest—Øst.

De rolige, afrundede Former og den forskellige Længderetning synes at tyde paa, at vi her staar over for Dannelser af betydelig ældre Dato end Klitterne langs Vesterhavet, hvis Dannelse først er begyndt i relativ sen Alder, op imod historisk Tid. Det Spørgsmaal melder sig da, om der er nogen Mulighed for at bestemme Tids punktet for Klitternes Dannelse paa Nørholm Hede og derigennem naa til en dybere Forstaaelse af Hedens Fysiognomi. Denne Mulighed synes at være til Stede, men forudsætter et Kendskab til Egnens geologiske Opbygning og Udvikling.

Det er velkendt, at Vestjylland bestaar af et Bælte af ældre Glacialdannelser over yngre Tertiærdannelser, mod Øst stødende op til og dækket af Glacialaflejringer fra en senere Istid og mod Vest dækket af alluviale Klit- og Marskdannelser. Ønsker man et mere indgaaende Billede af Egnens Geologi er dette i de allersidste Aar mulig-

gjort gennem Publikationen af Kortbladene og Kortbladsbeskrivelserne, Bække, Varde og Blaavandshuk.¹⁾

Det fremgaar heraf, at Nørholm Hede er beliggende paa den Strimmel Hedeslette langs Vardeaa, der forbinder Grindsted Hedeslette med Havet og adskiller Varde-Aadum Bakkeø mod Nord med Esbjerg Bakkeø mod Syd.

Faststaaende Tertiærlag gaar i Dagen paa adskillige Steder af Sydkraaningerne paa Varde-Aadum Bakkeø, umiddelbart Nord for Nørholm Hedeslette, saaledes ved Aalling Mark, i Aaskrænterne paa Vestsiden af Vardeaa-Dalen ud for Hoddeskov og i Hesselho-Teglvaerk Ø. f. Tistrup Station, endvidere paa adskillige Steder i Skrænterne ved Linding Aa ud for Horne. Aflejringerne er Glimmerler og Glimmersand, de østligere af ældre ɔ: nedre- og mellem-miocæn, de vestligere af yngre ɔ: øvre mio-cæn Dato.

Ovenover Tertiærlagene i disse Egne finder vi Glacialdannelserne, dels Morænedels Smeltevandsaflejringer.

De ældste Glacialaflejringer, der findes, maa henføres til trediesidste Istid. Aflejringerne, der er paavist ved Kalsgaard Sydvest for, Ansager og Skovlunde Nordøst for Heden, er et mørkegraa, meget haardt, sandet og fint gruset, relativt kalkfattigt Moræneler. Paa alle de 3 ovennævnte Lokaliteter er det overlejret af en lagdelt, kalkrig Lerart, hvis Aflejringstid er henført til Begyndelsen af næstsidste Interglacialtid; det Tidspunkt hvor Yoldialeret ved Esbjerg aflejredes.

Medens den »nedre« Moræne i Lighed med Tertiæraflejringerne ikke er paavist indenfor Grænserne af det fredede Areal, er det lagdelte Ler fundet paa ikke mindre end 3 Steder: ved Foden af Skrænterne mod Nordøst og Sydvest samt umiddelbar Øst for den dybe Vældmose i F5. Paa det sidstnævnte Sted findes det i saa stor Udstrekning, at det har kunnet anvendes til Mergel- og Lergravning.

Paa Hedesletten Øst, Syd og Vest for det fredede Areal naar det lagdelte Ler paa talrige Steder i Dagen og finder Anvendelse til Mergling.

Det lagdelte Smeltevandsler spiller en meget stor Rolle i Opbygningen af Vestjylland og repræsenterer en udpræget Ledehorizont i de glaciaale Aflejringer. Det overlejres dog flere Steder af de mere eller mindre mægtige Moræne- og Smeltevandsaflejringer fra næstsidste Istid, der danner de øvre Lag af de vestjyske Bakkeører, saaledes ogsaa paa Varde-Aadum og Esbjerg Bakkeø samt muligvis de nedre Partier af Hedesletternes Sandaflejringer.

Aflejringerne fra den 2. danske Interglacialtid, det Tidspunkt, hvor Brørupmoserne længere Øst paa dannedes, kendes ikke fra Egnene omkring Nørholm; derimod har Dannelsen af Bakkeernes Vandlob i Følge V. MADSEN: Terrainformerne paa Skovbjerg Bakkeø, Medd. geol. Foren., Bd. 6, 1921, taget sin Begyndelse i denne Periode.

I Løbet af sidste Istid skete saa den store Udjævningsproces paa de vestjyske Bakkeører ligesom Hedesletterne mellem disse byggedes op, saaledes at Landskabet

¹⁾ Cfr. Beskrivelse til geologisk Kort over Danmark (i Maalestok 1 : 100.000). Kortbladet Blaavandshuk ved A. JESSEN. — D. g. U. I Række Nr. 16, 1925. Kortbladet Bække ved V. MILTHERS. — D. g. U. I Række Nr. 15. 1925.

i store Træk var udformet i sin nuværende Skikkelse, da Isen for Alvor trak sig tilbage fra Østjylland. Bakkeørne laa da som store fladt kuppelformede Strækninger ind mellem hvilke der strakte sig de fladt kegleformede Hedesletter, hvis Toppunkter eller System af Toppunkter var beliggende langs Israndslinien i Øst, medens Keglefladerne under en stærkere til svagere Hældning mod Vest først forsvinder ind imellem Bakkeørne og tilsidst sammen med disse ud under Havet. Den mere minutiose Udformning af Landskabet, Dannelsen af Aadlene, Tørve- og Flyvesandsaflej-ringerne stod endnu tilbage. Disse Processer gennemførtes først i Løbet af de derpaa følgende Tidsrum: Sen- og Postglaciatiden ∘ de lange Tidsrum, der er forløbet siden Isen begyndte at trække sig tilbage fra sin yderste Stilstandslinie i Nord- og Østjylland.

Den mere detaillerede Udformning af Landskabet i Tilknytning til Nørholm Hede bestaar i Dannelsen af Kløfterne og Skraenterne ud mod Aadalen, i Sandflugten og Dannelsen af de talrige større eller mindre Lavninger paa Heden og endelig i Aflejringerne af Tørv, den nyere Sandflugt i Hedens Nordøsthørne samt i Ferskvandsalluviet. At den ovennævnte Rækkefølge svarer til Formationernes Dannelses-følge fremgaar af en umiddelbar Betragtning af Kortet: Sandflugten forefandt og udformede Kløfterne, og Dannelsen af Lavningerne med Tørv og Ferskvandsalluvium forudsætter Tilstedeværelsen af Klitdannelserne. Spørgsmalet bliver dernæst dette, om en nøjere Tidsfæstelse af de enkelte Dannelser er muligt; Takket være Statsgeolog MILTHER's detaillerede Undersøgelse over Stadierne for Isens Tilbagerykning paa Kortbladsomraadet Bække er en endog ret nøje Tidsfæstelse af de forskellige Stadier af Hedens Udformning nu muliggjort.

Det er velkendt¹⁾, at Afsmelningstiden, Senglaciatiden falder i en Række Hoved afsnit, beliggende mellem udprægede Stilstandslinier i Isens Tilbagerykning. Den sidste Nedisnings yderste Grænse mod Vest gaar paa Kortbladsomraadet Bække fra Brørup i Syd i en Bue fra Læborg over Vorbasse til Randbøl og herfra videre i nordvestlig Retning. De østlige Partier af Grindsted Hedeslette har saaledes under sidste Nedisning været isdækket, og Smeltevandet er strømmet ud fra hele Isranden, eroderende stejle Skraenter i Bakkeørernes Sider. Da Isen begyndte at trække sig tilbage, koncentreredes Afløbet af Smeltevandet over Grindsted Hedeslette i 2—3 større Afløb — en stor Del af Smeltevandet fandt nemlig hurtig Afløb syd paa over Hedesletterne langs Holme-, Holsted- og Kongeaadlene — der efterhaanden skar sig dybt ned i den oprindelige Slette udformende Dalene, hvor Aaerne i Nutiden strømmer. Dannelsen af Vardeaa-Dalen, Nord og Vest for Nørholm Hede maa saaledes ogsaa henføres til dette Tidsrum.

Da Isranden trak sig endnu længere Øst paa til Anst-Egtved-Gadbjerg-Linien formindsedes Vandmængderne yderligere og dermed ogsaa Vandstanden i Aadlene. Der var dermedaabnet Mulighed for Dannelsen af de dybe Erosionskløfter, der især præger Nordranden af Heden. Dette har efter resulteret i en Udtørring af Hedeslettens øvre Lag og derved har der været Mulighed til Stede for Sandflugt. Hvorvidt

¹⁾ Cfr. Oversigt over Danmarks Geologi. — Danmarks geologiske Undersøgelse, V. Række Nr. 4, 1928, Tavle II.

Sandflugten straks har taget sin Begyndelse efter at Grundvandstanden paa Heden var blevet sänket eller først har fundet Sted senere hen, faar staa hen, sandsynligvis har det første været Tilfældet.

Tidspunktet for den overvejende Sandflugt paa Kortbladsomraadet Bække henfører V. MILTHERS i første Instans til et Tidsrum, der ligger forud for Tørvedannelsen og Oldtidsbebyggelsen, idet Tørvemoserne med Indhold af Fyrrestubbe hviler paa Flyvesand og Kæmpehøjene ofte findes opført paa Klitvoldene. Dermed er Sandflugtens senglaciale eller eventuelt glaciale til interglaciale Alder sandsynliggjort. Imidlertid har MILTHERS yderligere kunnet vise, at Sandflugten ikke blot findes paa de Omraader, der i sidste Istid var isfrie, men ogsaa paa det Bælte af sidste Nedisningsomraade, som ligger mellem yderste og næstyderste Israndslinie, men derimod ikke Øst for denne sidste Linie. Da Sandflugten især findes paa Hedesletterne, hvor Muligheden for en saadan først var til Stede et Stykke ind i Senglaciatiden, kan Sandflugten ikke være af endnu ældre Dato : fra sidste Istid eller eventuelt fra sidste Interglaciatid.

Tidspunktet for den overvejende Sandflugt i Vestsjælland maa derfor henlægges til det Afsnit af Senglaciatiden, der begrænses af yderste og næstyderste Israndslinie, til Daniglaciatidens første Afsnit.

Er Sandflugten paa Nørholm Hede nu samtidig med Sandflugten længere Øst paa? Dette synes at være Tilfældet.

At den ikke er af ældre : glacial eller interglacial Alder maa anses for givet, da vi har at gøre med en geologisk Dannelse fra sidste Glaciatid, hvor Muligheden for Sandflugt først var til Stede, efter at Smeltevandet et Stykke ind i Senglaciatiden havde trukket sig tilbage til Aadalen. At den heller ikke er af postglacial Alder fremgaar af de samme to Forhold, MILTHERS har fremdraget som gældende for Sandflugten Øst paa: Moserne paa og ved Nørholm Hede indeholder i Følge C. H. BORNEBACH 1930 p. 339. Ved af Birk, Fyr og Eg i de nedre Lag ligesom ogsaa Kæmpehøjene paa og ved Heden er byggede ovenpaa Klitvoldene. Af Hedens 5 Kæmpehøje findes ikke mindre end 4 paa Klittoppe og paa den store Flyvesandsparabel umiddelbar Syd for Heden findes anbragt yderligere to Kæmpehøje.

Det kan derfor betragtes som givet, at vi staar overfor en Flyvesandsdannelse fra Senglaciatiden og, da Formerne er rolige og udjævnede, specielt fra dette Tidsrums tidligere Afsnit.

Er man først indstillet paa at betragte Overfladeformerne paa Heden som et Produkt af senglaciale og dermed arktiske Naturforhold, vil man pludselig staa overfor Forklaringen af en Række paafaldende Afvigelser fra de nutidige Klitdannelser langs Vesterhavet. Saaledes i første Instans den afvigende Retning i Parabelsidernes Længde-retning: i Nutiden er denne Vest → Øst, tidligere Nordvest → Sydøst svarende til, at den overvejende Vindretning i Senglaciatiden var en anden, mere nordvestlig end i Nutiden; endvidere i de rolige afrundede Former, der er et Udslag af den Jordflydning, der virker i arktiske Egne. Paa Flyvesandsbakernes Øst- eller Sydøstsider finder man ejendommelige, skovlformige Fordybninger, der fuldstændig svarer til de Lavninger, der f. Ex. i det islandske Højland træffes i Tilknytning til og er

udformede af større Snedriver. Partiet omkring Sydøstsiden af Bakken i D3—D2 er saaledes et udpræget Snejlep parti. De talrige Smaalavninger, der i Nutiden er vanddækkede om Vinteren, og Manglen af Erosionsfelter i Tilknytning til Flyvesands-partierne mod Nordøst og Sydvest opnaar ogsaa den naturligste Forklaring ved at antage hele Omraadet som værende udformet under arktiske Forhold.

Ser man paa Beliggenheden af Flyvesandspartier paa Hedesletterne paa Kort-bladsomraadet Varde, er det paafaldende, hvor næje Flyvesandet er knyttet, dels til de spidsvinklede Tvede, der opstaar, hvor en Bæk østfra støder op til en Aa, dels til Syd- eller Østsiderne, hvor der fra Vest- eller Nordsiderne støder en Bistrøm til Hovedstrømmen. At der i førstnævnte Tilfælde ogsaa under nuværende Naturforhold er Mulighed for Dannelsen af et Flyvesandsparti er umiddelbart indlysende, da der her dannes fremspringende Skränter, stærkt udsatte for Vinden. Derimod er det andet Tilfælde uforskrligt under de nuværende Forhold, hvor Vandmængden i Biløbene er saa smaa, at den ikke kan have en afbøjende Indflydelse paa Hovedstrømmens Retning. Anderledes har Forholdene været i Senglacialtiden, hvor hele Aadalen har været Strømleje og hvor Biløbene i Snesmeltingstiden har ført saa store Vandmængder, at de har kunnet presse Strømmen over mod den modsatte Side og eroderet stejle Skränter her, der saa har kunnet tjene som Udgangspunkt for Sandflugt. Paa Nørholm Hede hører Midterpartiet ind under det førstnævnte, medens Partierne mod Nordøst og Sydvest hører til sidstnævnte Tilfælde. Bifloderne, der hører hertil, er henholdsvis Kybæk og Linding Aa; det er i Terrænnet let at se, at de modstaaende Sider af Aadalen ikke blot staar med usædvanlig stejle Sider, men ogsaa danner Buer ind i Hedesletten.

Kap. III. Kultursporene paa Heden.

Det er indlysende, at et Hedeareal beliggende saa tæt ved beboede Egne som Tilfældet er med Nørholm Hede, maa blive og har været Genstand for Kulturpaavirkning af forskellig Art. En nærmere Betragtning af Heden afslører ogsaa en lang Række saadanne Paavirkninger. Adskillige af disse, f. Ex. Lyngplukning, Græsning og Hedebrande, har selvfolgelig været af en saa forbigaaende Karakter, at de nu enten slet ikke eller kun vanskeligt kan paavises. Andre derimod har sat saa varige Spor, at de til Stadighed vil være bevarede. De større og mere fremtrædende af disse Kulturspor blev indtegnede paa det i 1922 udfærdigede Kort og ses paa Fig. 2.

Da en Fremstilling af Kultursporene forudsætter et indgaaende Kendskab til Kulturudviklingen i disse Egne, og da en Behandling heraf ligger udenfor Rammerne af nærværende Arbejde, nojes vi her under Henvisning til Fig. 2 med en skematisk Fremstilling af de paaviste Kulturspor.

De første synlige Spor af Menneskers Færden paa og ved Heden er her som andet Steds Kæmpehøjene. Af saadanne findes der paa det fredede Areal ikke mindre end 5 — I—IV paa Fig. 2. — En beliggende i E2, tre i C6 og en i A7. Alle disse Kæmpehøje, der er forsyneede med Nationalmuseets F.M. Mærke, hører til samme

relativ høje, kuppelformige Type. I B 5 findes en Gruppe paa 3 smaa, flade Høje (VI); da de ligger paa et Terræn, der ikke har været Genstand for Sandflugt, er disse Høje muligvis ogsaa Oldtidsminder.

Alle de øvrige Kulturspor eller Kulturpaavirkninger paa Heden er af betydelig senere Dato. Kultursporene er enten Veje, Diger og Grøfter, Spor efter industriel eller landbrugsmæssig Udnyttelse eller Indflydelser fra Nutidskulturen; til disse sidste maa henregnes Høj- og Lavspændingsledninger over Heden.

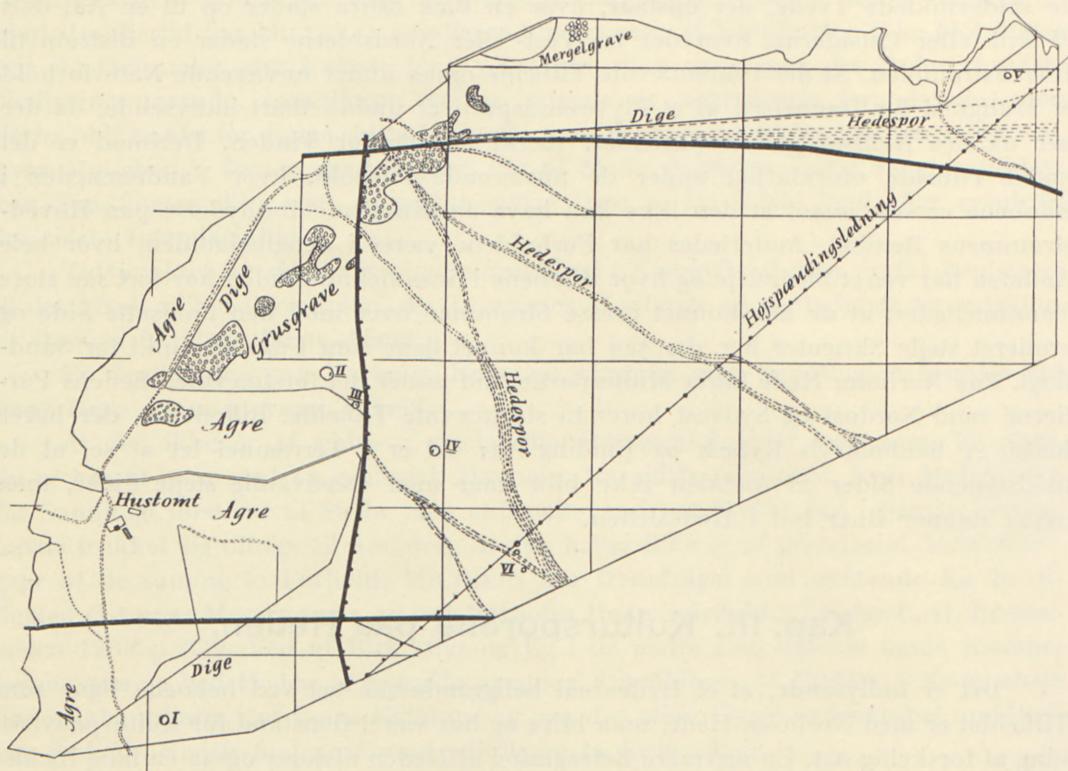


Fig. 2. Kultursporene paa Heden.

Vejene paa Heden er enten smalle Marksror, gamle, ofte meget brede Hedespør fra en ældre Tid eller indgrøftede Veje, der stadig benyttes.

De smalle Marksror er enten Engveje eller Mølleveje. Engvejene gaar enten fra selve Gaarden Nørholm eller fra Gaardene i Skamstrup til Engene langs Hedens Vest- og Nordgrænse, Sydvest og Øst for Herresædet Nørholm; det er indlysende, at Benyttelsen af disse Vejsror kun er ringe og kun knyttet til de Tider af Aaret, hvor der arbejdes med Høet i Engene. Noget mere benyttes de Spor, der fra Gaarden Lemsig, Sydvest for Heden, Aagaard Øst for Heden og Skamstrup-Gaardene Syd for Heden fører op til Vandmøllen ved Nørholm.

Som gamle Hovveje maa betegnes de talrige Vejsror, der fra Hedens Grænser i Øst, Syd og Sydvest fører ind mod Nørholm. I Nutiden benyttes disse Vejsror ikke

og er derfor saa sterkt lyngklædte, at de paa Afstand falder sammen med Omgivelserne. Nærved viser de sig som parallele Rækker af Kamme og Furer, ofte i stort Antal.

Færdslen over Heden i Nutiden følger de relativt nye, indgrøftede og planerede Veje, hvorfra en fører fra Nørholm Øst paa, en anden, Vesterbækvejen, gaar mod Syd.

Det fredede Areal er afgrænset mod Omgivelserne ved Diger og Grøfter. Langs Hedens Øst- og Sydside er Grænsen markeret ved en lav Dige beplantet med Bjergfyr; denne er i Følge C. H. BORNEBUSCH 1930 p. 284 bygget omkring 1890. Mod Vest er Grænsen markeret ved en bred vandførende Grøft, mod Nord kun ved et Pigtraadshegn.

Inde paa Heden i nogen Afstand fra Vest- og Nordgrænsen findes 3 forskellige Digestykker, det længste af disse findes paa Hedens nordøstlige Parti og fører fra Hedens Nordøsthjørne omrent helt ind til Gaarden. Paa det vestlige Parti er bygget to Diger, det ene gaar fra Sydvesthjørnet i nordøstlig Retning op til Vesterbækvejen, hvor det standser ved Dalsænkningen. Det andet og mindre Dige er bygget et Stykke inde paa Heden paa det nordvestlige Parti.

Af Grøfter paa Heden findes der kun en, der gaar fra Vesterbækvejen i Øst gennem Dalsænkningen til Vestgrænsen.

En ny Gruppe af Kulturminder repræsenterer de Spor, Udnyttelsen af Hedens Jordarter, Grus, Sand, Ler og Tørv, har efterladt paa Heden. Størst Udnyttelse har Gruslagene langs Nordveststranden fundet, hvad de talrige og store Grusgrave viser. Denne Udnyttelse finder Sted den Dag i Dag, idet det offentlige Vejvæsen i Følge Fredningsdeklarationen er berettiget til at grave Grus paa Heden og stadig udnytter denne Ret. I Feltet E6 samt langs de indgrøftede Veje findes enkelte Sandgrave og i Felt F5 et lille Parti Ler- eller Mergelgrave.

Udnyttelsen af Tørvlagene har ligeledes fundet Sted i ret udstrakt Grad og bestaaet dels i Skæring af Tørv dels i Klynegravning. Tøveskæringen har især fundet Sted i Felterne A6—A7 og C4—C5, hvor *Erica*-Hedens Grænsen mod *Calluna*-Heden er af en mere uregelmæssig og kantet Karakter end i Hedens øvrige Felter og hvor man paa adskillige Steder direkte kan paavise Mærker efter Tøveskæring.

Af Moserne har især Mosen i C3, i A6 og i mindre Grad Mosen i C4—C5 været benyttet til Klynegravning. Mosen i C3 endnu ikke helt tilgroet Grøft i Dalsænkningen i C7—C8, samt lange Rækker af Agerfurer, der nærmere viser Omfanget af Opdyrkningen. Paa Fig. 2 er der med en punkteret Linie angivet Grænserne for den største Opdyrkning, der omfatter Arealerne Vest for de to Diger og Arealerne i Tilknytning til Dalsænkningen.

Paa Hede partiet Vest for Vesterbækvejen forekommer en Del Spor, der viser, at store Dele af Heden her har været under Kultur. Sporene er dels nogle Hustomter i Østsiden af B8, en endnu ikke helt tilgroet Grøft i Dalsænkningen i C7—C8, samt lange Rækker af Agerfurer, der nærmere viser Omfanget af Opdyrkningen. Paa Fig. 2 er der med en punkteret Linie angivet Grænserne for den største Opdyrkning, der omfatter Arealerne Vest for de to Diger og Arealerne i Tilknytning til Dalsænkningen.

Kap. IV. Floralister.

1. Fanerogamer.

<i>Achillea millefolia</i>	<i>Calamagrostis epigeios</i>
— <i>ptarmica</i>	<i>Callitricha hamulata</i>
<i>Agropyrum repens</i>	<i>Calluna vulgaris</i>
<i>Agrostis alba</i>	<i>Caltha palustris</i>
— <i>canina</i>	<i>Campanula rotundifolia</i>
— <i>spica venti</i>	<i>Capsella bursa pastoris</i>
— <i>tenuis</i>	<i>Cardamine pratensis</i>
<i>Aira caryophyllea</i>	<i>Carex arenaria</i>
— <i>praecox</i>	— <i>canescens</i>
<i>Ajuga reptans</i>	— <i>caryophyllea</i>
<i>Alchimilla minor</i>	— <i>glauca</i>
<i>Alectorolophus crista-galli</i>	— <i>Goodenoughii</i>
— <i>major</i>	— <i>hirta</i>
<i>Alisma plantago-aquatica</i>	— <i>leporina</i>
<i>Alnus glutinosa</i>	— <i>pallescens</i>
<i>Andromeda polifolia</i>	— <i>panicea</i>
<i>Anemone nemorosa</i>	— <i>pilulifera</i>
<i>Angelica silvestris</i>	— <i>pulicaris</i>
<i>Antennaria dioeca</i>	— <i>rostrata</i>
<i>Anthoxanthum odoratum</i>	— <i>stellulata</i>
<i>Anthriscus silvester</i>	<i>Centaurea jacea</i>
<i>Anthyllis vulneraria</i>	<i>Cerastium arvense</i>
<i>Arabidopsis thaliana</i>	— <i>caespitosum</i>
<i>Arctostaphylos uva ursi</i>	— <i>semidecandrum</i>
<i>Arenaria serpyllifolia</i>	<i>Chamaenerium angustifolium</i>
<i>Armeria vulgaris</i>	<i>Chenopodium album</i>
<i>Arnica montana</i>	<i>Chrysanthemum leucanthemum</i>
<i>Avena elatior</i>	<i>Cicuta virosa</i>
— <i>pubescens</i>	<i>Cirsium arvense</i>
<i>Baldingera arundinacea</i>	— <i>lanceolata</i>
<i>Barbarea stricta</i>	— <i>palustre</i>
<i>Batrachium aquatile</i>	<i>Convallaria majalis</i>
<i>Bellis perennis</i>	<i>Corynephorus canescens</i>
<i>Betula pubescens</i>	<i>Crataegus monogyna</i>
<i>Botrychium Lunaria</i>	<i>Cuscuta epithymum</i>
<i>Briza media</i>	<i>Cynosurus cristatus</i>
<i>Bromus mollis</i>	<i>Dactylis glomerata</i>
— <i>pratensis</i>	<i>Deschampsia caespitosa</i>
<i>Brunella vulgaris</i>	— <i>flexuosa</i>

<i>Dianthus deltoides</i>	<i>Hydrocotyle vulgare</i>
<i>Drosera rotundifolia</i>	<i>Hypericum perforatum</i>
<i>Dryopteris spinulosa</i>	— <i>pulchrum</i>
<i>Empetrum nigrum</i>	— <i>quadrangulum</i>
<i>Epilobium palustre</i>	<i>Hypochoeris maculata</i>
<i>Equisetum arvense</i>	— <i>radicata</i>
— <i>fluviatile</i>	
— <i>silvaticum</i>	
<i>Erica tetralix</i>	<i>Iris pseudacorus</i>
<i>Erigeron acer</i>	<i>Jasione montana</i>
<i>Eriophorum polystachyum</i>	<i>Juncus bufonius</i>
— <i>vaginatum</i>	— <i>conglomeratus</i>
<i>Erophila verna</i>	— <i>effusus</i>
<i>Euphrasia gracilis</i>	— <i>lamprocarpus</i>
<i>Festuca ovina</i>	— <i>squarrosum</i>
— <i>rubra</i>	— <i>supinus</i>
<i>Filago minima</i>	<i>Juniperus communis</i>
<i>Fragaria vesca</i>	<i>Knautia arvensis</i>
<i>Frangula alnus</i>	<i>Lathyrus montanus</i>
<i>Galium boreale</i>	— <i>pratensis</i>
— <i>harcynicum</i>	<i>Lemna minor</i>
— <i>mollugo</i>	<i>Leontodon autumnalis</i>
— <i>palustre</i>	<i>Linaria vulgaris</i>
— <i>verum</i>	<i>Linum catharticum</i>
<i>Genista anglica</i>	<i>Lolium perenne</i>
— <i>pilosa</i>	<i>Lotus corniculatus</i>
— <i>tinctoria</i>	— <i>uliginosus</i>
<i>Gentiana pneumonanthe</i>	<i>Luzula campestris</i>
<i>Geranium pusillum</i>	— <i>multiflora</i>
— <i>silvaticum</i>	— <i>pilosa</i>
<i>Geum rivale</i>	— <i>silvatica</i>
<i>Glyceria aquatica</i>	<i>Lychnis flos cuculi</i>
— <i>fluitans</i>	<i>Lycopodium clavatum</i>
<i>Gnaphalium silvaticum</i>	— <i>selago</i>
— <i>uliginosum</i>	<i>Lysimachia vulgaris</i>
<i>Heleocharis multicaulis</i>	<i>Lythrum salicaria</i>
— <i>palustris</i>	<i>Majanthemum bifolium</i>
<i>Hieracium boreale</i>	<i>Melampyrum vulgarum</i>
— <i>pilosella</i>	<i>Melandrium dioecum</i>
— <i>rigidum</i>	<i>Mentha aquatica</i>
— <i>umbellatum</i>	<i>Menyanthes trifoliata</i>
<i>Holcus lanatus</i>	<i>Molinia coerulea</i>
— <i>mollis</i>	<i>Myosotis micrantha</i>
	— <i>palustris</i>
	— <i>versicolor</i>

Myrica gale
Nardus stricta
Narthecium ossifragum
Oenanthe aquatica
Ononis arvense
Orchis maculatus
 — *latifolius*
Ornithopus perpusillus
Oxycoccus quadripetalus
Pedicularis palustris
 — *silvatica*
Phragmites communis
Picea canadensis
 — *excelsa*
Pimpinella saxifraga
Pinus montana
 — *silvestris*
Pirus malus
Plantago lanceolata
 — *major*
 — *maritima*
Poa annua
 — *compressa*
 — *pratensis*
Polygala vulgare
Polygonatum multiflorum
Polypodium vulgare
Populus tremula
Potamogeton lucens
 — *natans*
Potentilla erecta
 — *palustris*
Quercus robur
Radiola millegrana
Ranunculus acer
 — *bulbosus*
 — *lingua*
 — *repens*
Rhynchospora alba
Ribes pubescens
Rubus idaeus
Rumex acetosa
 — *acetosella*

Rumex crispum
 — *hydrolapathum*
Sagina procumbens
 — *subulata*
Salix aurita
 — *capraea*
 — *cinerea*
 — *repens*
Sarothamnus scoparius
Saxifraga granulata
Scirpus cæspitosus
 — *silvaticus*
Schranthus annuus
 — *perennis*
Scorzonera humilis
Senecio vulgaris
Sherardia arvensis
Sieblingia decumbens
Silene vulgaris
Solidago virg-aurea
Sorbus aucuparia
Sparganium erectum
 — *simplex*
Spergula arvensis
Spergularia rubra
Spiraea ulmaria
Stachys palustris
Statice armeria
Stellaria Dilleniana
 — *graminea*
 — *media*
 — *uliginosa*
Succisa pratensis
Tanacetum vulgare
Taraxacum purpureum
Teesdalea nudicaulis
Thymus serpyllum
Trientalis europaea
Trifolium arvense
 — *medium*
 — *pratense*
 — *procumbens*
 — *repens*

Trollius europaeus
 Tussilago farfara
 Typha latifolia
 Urtica dioica
 Utricularia minor
 Vaccinium myrtillus
 — uliginosum
 — vitis idaea
 Valeriana excelsa

Veronica chamaedrys
 — officinalis
 — scutellata
 Vicia angustifolia
 — cracca
 — tricolor
 Viola canina
 — Riviniana
 — palustris

2. Likener.

Alectoria jubata (L.)
 Baeomyces roseus Pers.
 — rufus (Huds.)
 Cetraria caperata (L.)
 — chlorophylla (Humb.)
 — diffusa (Web.)
 — glauca (L.)
 — tenuissima (L.)
 Evernia prunastre (L.)
 Cladonia alpestris (L.) Rabh.
 — chlorophaea (Flk.)
 — coccifera (L.) Willd.
 — cornuto-radiata Coëm.
 — crispata (Ach.) Flot.
 — deformis Hoffm.
 — degenerans (Flk.) Spreng.
 — Delessertii Nyl.
 — digitata (L.) Hoffm.
 — fimbriata (L.)
 — Floerkeana (Fr.) Sommerf.
 — foliacea (Huds.) Schaefer.
 — furcata (Huds.) Schrad.
 — glauca Flk.
 — gracilis (L.) Willd.
 — impexa Harm.
 — ochrochlora (Flk.)
 — papillaria (Ehrh.) Hoffm.
 — portentosa Duf.
 — pityrea (Flk.)
 — rangiferina (L.) Web.
 — rangiformis Hoffm.

Cladonia squamosa (Scop.) Hoffm.
 — strepsilis (Ach.)
 — sylvatica (L.) Harm.
 — tenuis (Flk.) Harm.
 — uncialis (L.) Hoffm.
 — verticillata Hoffm.
 — Zoppii Wain.
 Coriscium viride (Arch.)
 Normandina pulchella (Borr.)
 Ochrolechia tartarea (L.)
 Parmelia acetabulum (Neck.)
 — aspidota (Ach.)
 — exasperatula Nyl.
 — fuliginosa (E. Fr.) v. laetevi-
 rents (Flot.)
 — furfuracea (L.)
 — physodes (L.)
 — subaurifera Nyl.
 — sulcata (Tayl.)
 — tubulosa (Hagen.)
 Parmeliopsis aleurites (Ach.)
 — ambigua (Wulf.)
 Peltigera canina (L.)
 — malacea (Ach.)
 — polydactyla (Nech.)
 Physcia aipolia (Ach.)
 — ascendens (E. Fr.) Bitter
 — stellaris (L.)
 — tenella (Scop.)
 Ramalina calicaris (L.)
 — farinacea Ach.

Ramalina fraxinea (L.)
— *populina* (Ehrh.)
Stereocaulon condensatum Hoffm.

Usnea barbata (L.)
— *hirta* (L.)
Xanthoria polycarpa (Ehrh.)

3. Mosses.¹⁾

Blepharozia ciliaris (L.) Dumort.
Cephalozia bicuspidata (L.) Dumort.
— *bicuspidata* var. *Lammeriana* (Hüb.) Breidl.
— *connivens* (Dicks.) Spruce.
— *fluitans* (Nees.) Spruce
— *media* Lindb.
Cephaloziella Curnowii Macw.
— *divaricata* (Franc) Schiffn.
— *elachista* (Jack) Schiffn.
— *Hampeana* (Nees) Schiffn.
Jungermannia barbata Schmid.
— *bicrenata* Schmid.
— *exsectiformis* Breidl.
— *Floerkei* E. & M.
— *gracilis* Schleich.
— *Hatcheri* Evans.
— *inflata* Huds.
— *Kunzeana* Hub.
— *minuta* Crantz.
— *porphyroleuca* Nees.
— *ventricosa* Dicks.
Kantia Trichomanis (L.) S. F. Gray.
Lepidozia setacea (Web.) Mitt.
Lophocolea bidentata (L.) Dumort.
— *heterophylla* (Schrad.) Dumort.
Martinellia compacta (Roth.) C. J.
— *gracilis* Lindb.
— *irrigua* (Nees) Lindb.
— *nemorosa* (L.) S. F. Gray
Mylia anomala (Hook.) S. F. Gray.
Nardia scalaris (Schrad.) S. F. Gray.
Odontoschisma sphagni (Dicks.) Dumort
— *denudatum* (Nees) Dumort.

Pellia epiphylla (L.) Lindb.
— *Neesiana* (Gottch.) Limpr.
Riccardia incurvata Lindb.
— *pinguis* (L.) S. F. Gray.
Sphagnum acutifolium Ehr.
— *amblyphyllum* Russ.
— *compactum* De C.
— *cuspidatum* Ehr.
— *magellanicum* Brid.
— *palustre* L.
— *papillosum* Lindb.
— *squarrosum* Crome.
— *subsecundum* Nees.
— *tenellum* Pers.
— *teres* (Schimp.) Ångst.

Acrocladium cuspidatum (L.) Lindb.
Amblystegium Juratzkanum Schimp.
Barbula unguiculata (Huds.) Hedw.
Brachythecium albicans (Neck.) Br.eur.
— *rutabulum* (L.) Br.eur.
— *velutinum* (L.) Br.eur.
Bryum erythrocarpum Schwägr.
— *bimum* Schreb.
Calliergon cordifolium (Hedw.) Kindb.
— *giganteum* (Schimp.) Kindb.
— *stramineum* (Dicks.) Kindb.
Camptothecium lutescens (Huds.) Br.eur.
Campylopus brevipilus Brush. & Sch.
— *piriformis* (Schultz) Brid.
Ceratodon purpureus (L.) Brid.
Climacium dendroides (L.) Web. & Mohr.
Cratoneuron filicinum (L.) Loeske.
Dicranella heteromalla (L.) Schimp.
Dicranum Bonjeani De Not.
— *intermedium* Crome.

¹⁾ Bestemmelsen af Mosserne er foretaget af Hr. mag. scient. TH. SØRENSEN.

- Dicranum scoparium* (L.) Hedw.
— *rugosum* (Hoffm.) Brid.
— *spurium* Hedw.
Eurhynchium piliferum (Schreb.) Br.eur.
— *praelongum* (L.) Hobk.
— *praelongum* var. *Stokesii*
(Turn.) Hobk.
Fissidens adianthoides (L.) Hedw.
Fontinalis antipyretica L.
Gymnocybe palustris Fries.
Hylocomium parietinum (L.) Lindb.
— *proliferum* (L.) Lindb.
— *squarrosum* (L.) Bruch. &
Sch.
— *triquetrum* (L.) Bruch. &
Sch.
Hypnum fluitans L.
— *aduncum* Hedw.
Leucobryum glaucum (L.) Schimp.
Mnium cuspidatum (L.) Neck. var. *ela-*
tum (Bruch. & Sch.) Lindb.
— *hornum* L.
— *rostratum* Schrad.
— *undulatum* (L.) Neck.
Orthotrichum affine Schrad.

- Philonotis fontana* (L.) Brid.
Plagiothecium denticulatum (L.) Bruch.
& Sch.
— *undulatum* (L.) Bruch. &
Sch.
Polygonum urnigerum (L.) Pal de B.
Pohlia nutans (Schreb.) Lindb.
Polytricum commune L.
— *gracile* Menz.
— *juniperinum* Willd.
— *piliferum* Schreb.
— *strictum* Banks.
Pottia intermedia (Turn.) Fürnr.
Rhacomitrium canescens (Timm.) Brid.
— *hypnoides* (L.) Lindb.
Scleropodium purum (L.) Limpr.
Stereodon cupressiformis (L.) Brid.
— *cupressiformis* (L.) var. *eric-*
torum Bruch. & Sch.
— *cupressiformis* var. *resupina-*
tus (Wil.) Warnst.
— *imponens* (Hedw.) Brid.
Thuidium Philiberti Limpr.
Tortula ruralis (L.) Ehr.
— *subulata* (L.) Hedw.

Kap. V. Plantesamfundene.

Det geologiske Totalindtryk af Heden bliver dette, at den er et Flyvesandsland-skab paa Hedeslette udformet under arktiske til subarktiske Naturforhold. Ud over dette Terræn er den postglaciale Flora spredt og differentieret i de Plantesamfund, der i Nutiden beklæder Landskabet; takket være det stærkt kuperede Terræn viser den indbyrdes Fordeling af Plantesamfundene sig med stor Lovmæssighed.

Den Kaarfaktor, der paa den af Kultur mest uberoede Del af Nørholm Hede især virker plantefordelende, er Vandmængden i Jorden. Efter Graden af denne Faktor er uddifferentieret følgende Række af Plantesamfund ordnede efter stigende Indhold af Fugtighed i Jorden: *Arctostaphylos*-Hede, *Calluna-Empetrum*-Hede, *Erica*-Hede, *Myrica*-Mose og »Vældmose« samt en Række forskellige Grønmosetyper, der indbyrdes adskilles ved Forskellighed i Vanddækningstidens Længde.

De Svingninger Grundvandstanden i Aarets Løb er underkastet synes ligeledes at være af afgørende Betydning for Vegetationens Sammensætning. Da Heden, som tidligere anført, staar med stejle Skråenter ud mod Aadalen, er det indlysende, at

Svingningerne i Grundvandsstanden er størst nær Aadalen, og at de bliver mindre og mindre, jo længere man kommer ind. Maaden, hvorpaa en given Fugtigheds-mængde kommer i Stand, er ligeledes af udslaggivende Karakter: Trykvand betinger saaledes en hel anden Vegetation end Overfladenvand. Den plantogeografiske Undersøgelse kommer derfor i første Instans til at gaa ud paa en Graduering af disse Kaarfaktorer ved Hjælp af Vegetationen, dernæst paa en Konstatering af det nærmere Sammenspil mellem disse to Elementer, Vegetation og Kaar. Resultaterne bestaar dels i en Opstilling af en Række Plantesamfund dels i en Kortlægning og i en Analyse af disse.

Ved Kortlægningen er der kun taget Hensyn til visse Hovedtyper, saaledes i første Instans *Calluna*-Hede, *Erica*-Hede og Grønmose — fremstillet paa Kortet ved henholdsvis en brun, en rød og en grøn Farve. Udbredelsen af de enkelte Typer fremgaar af Kortet; mest overvældende virker den Lovmæssighed, hvormed den indbyrdes Fordeling af de 3 Hovedtyper er gennemført: hver af de c. 150 Grønmosser vil man uden Undtagelse finde omgivet af en smallere til bredere Bræmme af *Erica*-Hede, der efter opefter afløses af *Calluna*-Hede.

Mindre tydelig er maaske Zonationen i Tilknytning til Aadalen. Kortet viser dog, at alle *Myrica*-Moserne kun findes længst inde paa Heden, ligesom Ore, Grønning og Vældmose kun findes langs Skrænterne ud mod Aadalen. I Virkeligheden er denne Zonation ligesaa paafaldende som den ovennævnte, blot er Gentagelsen af Lovmæssighederne ikke saa talrige. Forskellen viser sig foruden i Tilstedeværelsen af forskellige Vegetationstyper ogsaa deri, at de Vegetations-

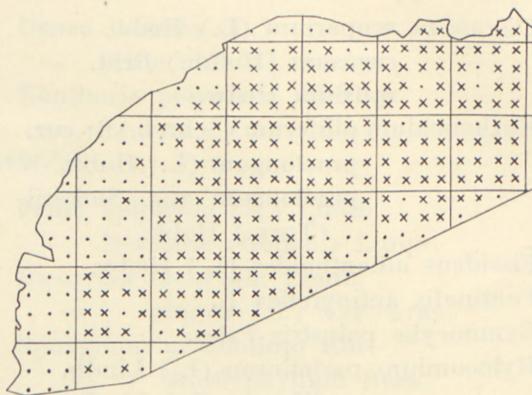


Fig. 3. *Arctostaphylos uva ursi*.

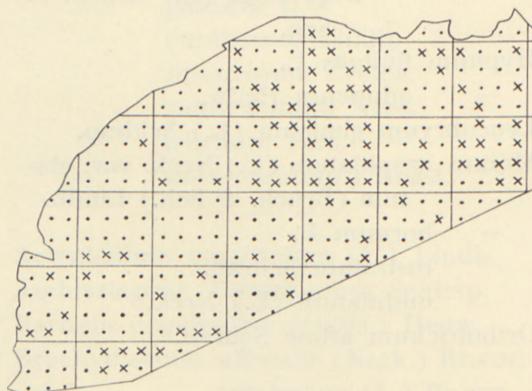


Fig. 4. *Salix repens*.

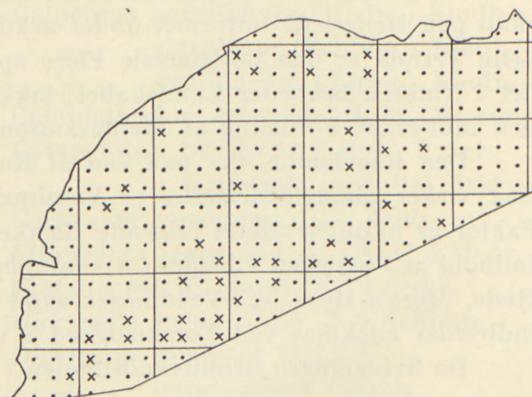
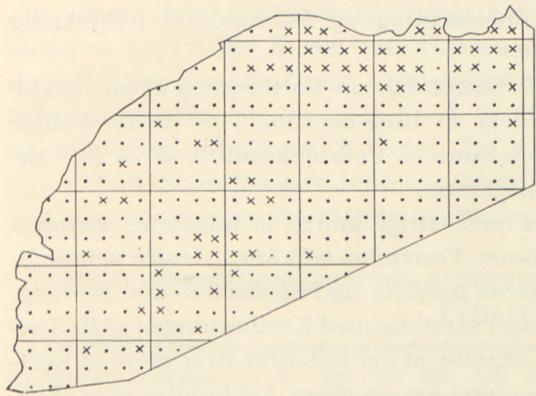
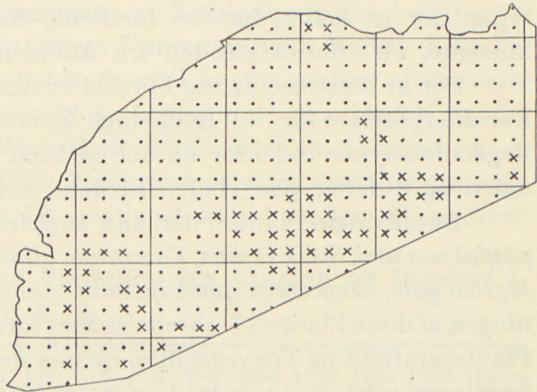
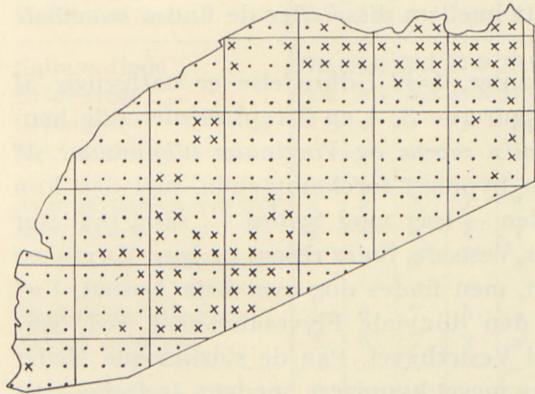
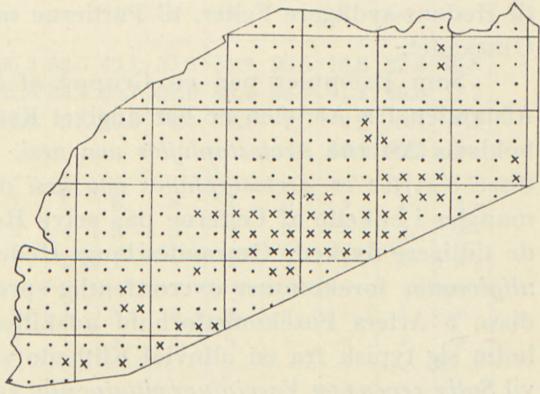
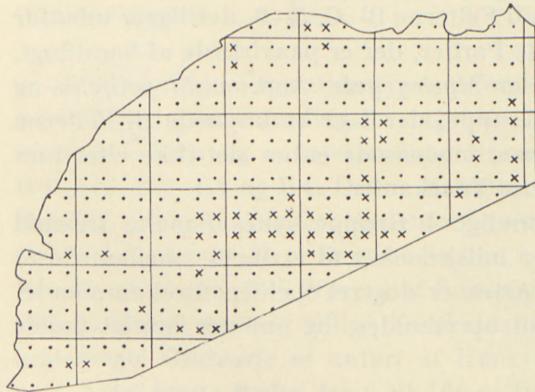
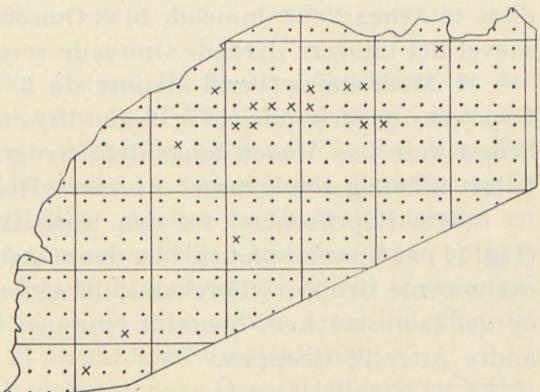


Fig. 5. *Vaccinium uliginosum*.

Fig. 6. *Vaccinium vitis idaea*Fig. 9. *Oxycoccus quadripetalus*.Fig. 7. *Arnica montana*.Fig. 10. *Andromeda polifolia*.Fig. 8. *Myrica gale*.Fig. 11. *Populus tremula*.

typer, der er fælles, har en forskellig Sammensætning og forekommer i forskellig Mængde, alt efter Afstanden fra Aadalen.

For at illustrere denne Forskel er der foretaget dels en Kortlægning af en Række Karakterplanter for de forskellige Zoner, dels en Linietaxering¹⁾ af de forskellige Vegetationstyper indenfor en 800 m bred Bræmme — Feltrækkerne 3—4 — fra Aadalen og indefter paa Heden til dens Sydøstgrænse.

De udvalgte Planter, der kan suppleres med talrige andre, er følgende: *Arctostaphylos uva ursi*, *Salix repens*, *Vaccinium uliginosum*, *Vaccinium vitis idaea*, *Arnica montana*, *Myrica gale*, *Oxycoccus quadripetalus*, *Andromeda polifolia* og *Populus tremula*. Kortlægningen af disse Planters Udbredelse blev foretaget samtidig med Kortlægningen af Hedens Plantesamfund og Trævegetation og paa den Maade, at der indenfor hver af de til Kortlægningen udstukne mindre Kvadrater blev noteret om en given Art fandtes eller ikke. Denne Maade at foretage en Kortlægning paa er selvfølgelig ret grov, men dog tilstrækkelig fintmærkende til at illustrere Formalet: Vegetationens Ændring fra Aadalen og indefter.

Arterne kan grupperes, eftersom de især er enten knyttede til Skrænterne eller til Hedens sydlige Felter, til Partierne midt imellem disse eller de findes over hele Omraadet.

Som Exempler paa en Gruppe af Planter, hvis Udbredelse er uafhængig af Afstanden fra Aadalen er her angivet Kortfigurerne 3, 4 og 5 repræsenterende henholdsvis Arterne *Arctostaphylos uva ursi*, *Salix repens* og *Vaccinium uliginosum*. Af disse 3 Arter er *Arctostaphylos uva ursi* den hyppigst forekommende, idet den kun mangler i enkelte af Felterne paa selve Heden — især mod Sydøst —, samt indenfor de tidlige dyrkede Omraader langs Hedens Vestside. *Salix repens* og især *Vaccinium uliginosum* forekommer overordentlig spredt, men findes dog over hele Arealet. Ved disse 3 Arters Forekomstforhold adskiller den diluviale Flyvesandshede ved Nørholm sig typisk fra en alluvial Klithede ved Vesterhavet. Paa de sidstnævnte Heder vil *Salix repens* og *Vaccinium viliginosum* være meget hyppigere, medens *Arctostaphylos uva ursi* enten slet ikke vil forekomme eller kun findes yderst spredt.

Vaccinium vitis idaea og *Arnica montana* (Fig. 6—7) er Repræsentanter for en ret talrig Artsgruppe, der især er knyttet til Skrænterne langs Hedens Nordside, samt for disse to Arters Vedkommende til et Omraade i Felterne B—C, 5—6, der ligger udenfor saavel det tidlige dyrkede Omraade som de Partier, der er paavirkede af Sandflugt.

I Modsætning hertil danner de 3 Arter *Myrica gale*, *Andromeda polifolia* og *Oxycoccus quadripetalus* (Fig. 8—9—10) en Gruppe, der især er knyttede til Felterne længst inde paa Heden langs dens Sydgrænse, medens de enten slet ikke eller kun yderst tilfældig forekommer nærmere Hedens Yderkanter.

Som Repræsentant for den teoretisk mulige 4. Gruppe synes *Populus tremula* (Fig. 11) at kunne opfattes, idet denne Art er indskrænket til et Bælte imellem de to ovennævnte Gruppers Forekomstomraader. Arten er dog ret sjælden forekommende, og det faar staa hen, hvorvidt Gruppen kan opretholdes, og om der iøvrigt findes andre Arter til Gruppen.

¹⁾ Angaaende Linietaxeringsmetoden henvises til THORE C. E. FRIES: Den synekologiska Linjetaxeringsmetoden. — Flora och Fauna, 1919.

Hvad disse 4 Artsgrupper viser om Ændringen af Vegetationen fra Aadalen og indefter, viser tillige Kortet over Plantesamfundenes Udbredelse paa Heden. Foruden de to tidlige nævnte Zoner, kendtegnet henholdsvis ved Tilstedeværelsen af Orevegetation langs Skrænterne mod Nord og *Myrica*-Mose længst inde paa Heden, er det let at udpege yderligere 2 Zoner. En *Calluna*-Hede-Zone nærmest Aadalen og en *Erica*-Hede-Zone længere inde, — denne sidste Zone med et stort Antal Grønmosser. For paa en mere exakt Maade at illustrere det relative Forhold mellem Mængderne

Tabel 1. Vegetationstypernes procentvise Fordeling fra Aadalen og indefter i Feltserien 3—4.

Afstand fra Aadalen	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1500 m
m	6026	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	6840	4729	3215
Orevegetationen	7.3	1.9	»	»	»	»	»	»	»	»	»	»	»	»	»
Grønning	»	3.8	6.3	0.3	»	»	»	»	»	»	»	»	»	»	»
Vældmose	12.7	2.8	»	»	»	»	»	»	»	»	»	»	»	»	»
Calluna-Hede	77.8	86.3	89.5	87.9	79.8	56.3	58.5	49.1	53.8	51.9	50.5	16.6	32.3	76.6	
Erica-Hede	2.2	5.3	4.3	11.8	17.4	32.3	35.7	30.7	37.9	39.1	38.9	41.1	46.9	17.3	
Grønmose	»	»	»	»	2.8	11.4	5.8	20.3	8.4	9.1	7.5	0.2	0.4	6.1	
<i>Myrica</i> -Mose											3.2	42.1	20.3	»	
Arctostaphylos uva ursi	2	5	8	7	8	7	8	8	8	7	5	»	2	»	
Salix repens	2	4	4	4	1	3	4	5	5	2	1	1	2	»	
Vaccinium viliginosum	»	2	2	»	»	1	2	1	»	1	1	1	2	»	
Vaccinium vitis idaea . . .	4	6	7	5	»	»	1	»	»	»	»	»	1	»	
Arnica montana	3	6	7	2	»	»	»	»	»	»	»	»	»	»	
<i>Myrica</i> gale	2	1	»	»	»	2	2	»	1	1	3	6	3	»	
Andromeda polifolia . . .	»	1	1	»	»	1	2	»	4	6	5	6	3	»	
Oxycoccus quadripetalus	2	1	»	»	»	1	2	»	4	5	4	6	3	»	
Populus tremula	»	1	»	3	1	2	»	»	»	»	»	»	»	»	

af de forskellige Vegetationstyper i forskellig Afstand fra Hedens Nordrand, er der med Kortet som Grundlag foretaget en Linietaxering af Vegetationstyperne indenfor en 800 m bred og c. 1500 m lang Bræmme omfattende Felterne F3—F4, E3—E4, D3—D4, C3—C4 og B4. Denne Bræmme deltes ialt i 15, 100 m brede, i vestlig—østlig Retning gaaende Bælter; indenfor hver af disse maaltes for hver 10 m langs en 800 m lang Linie, hvor stort et Stykke af denne de enkelte Vegetationstyper optager Resultaterne udtrykt i Procent af Summen af de 10 Liniestykker à 800 m er sammenstillet i Tabel 1, hvor tillige Forekomsttallene af de ovennævnte Arter indenfor det undersøgte Omraade er anført af Hensyn til en direkte Sammenligning.

I det første Bælte, fra 0 til 100 m fra Aadalen opnaar Orevegetationen og Vældmosen deres maximale Udbredelse, idet de indtager henholdsvis 7.3 og 12.7 % af

det samlede Areal; iøvrigt er det *Calluna*-Heden, der danner Vegetationens Grundmasse med ikke mindre end 77.8 % af hele Arealet. *Erica*-Heden er kun repræsenteret med 2.2 %. Grønmoserne findes slet ikke udviklede.

Det derpaa følgende Bælte fra 100 til 500 m fra Aadalen er det egentlige *Calluna*-Hede-Bælte, hvor *Calluna*-Heden beslaglægger ikke mindre end 80—90 % af hele Arealet. Indenfor dette Bælte, der mangler Grønmoser og svarer til det ovenfor ved *Arnica montana* og *Vaccinium vitis idaea* karakteriserede Omraade, kan der yderligere skelnes mellem et ydre Bælte, fra 100 til 300 m-Linien, hvor *Empetrum*-Grønningen opnaar Maximum i Udbredelse, 6.3 %, og et indre Bælte, fra 300 til 500 m-Linien, hvor *Erica*-Heden begynder at tage til i Mængde.

Fra 500 m-Linien til 1300 m-Linien faar vi *Erica*-Hede-Bæltet, idet 30—50 % af Arealet her er beklædt med *Erica*-Hede, medens *Calluna*-Hedens Andel er gaaet ned til 50 % eller derunder. *Erica*-Hede-Bæltet er ligeledes det Omraade, hvor Grønmoserne opnaar deres smukkeste Udvikling. Kurven for Grønmosernes Udvikling indenfor dette Bælte udviser ikke mindre end 3 forskellige Toppunkter, et første mellem 5 og 600 m-Linien, et andet mellem 7 og 800 m-Linien og et tredie mellem 9 og 1000 m-Linien svarende til den maximale Udvikling af 3 forskellige Grønmosetyper. Mellem 11 og 1200 m-Linien faar vi dernæst et 4. Toppunkt for Mosedannelse svarende til den optimale Udvikling af *Myrica*-Mose. De 4 Toppunkters Højde er henholdsvis 11.4, 20.3, 9.1 og 42.1 %. De to inderste af *Erica*-Hede-Bæltets Underzoner repræsenterer den ovenfor paapegede Zone med *Andromeda polifolia*, *Oxycoccus quadripetalus* og i mindre Grad *Myrica galla*.

De inderste 200 m, fra 13 til 1500 m-Kurven, af den linietaxerede Bræmme repræsenterer endelig et nyt *Calluna*-Hede-Bælte med en *Calluna*-Hede % paa 76.6 og en *Erica*-Hede % paa 17.3. Det nye Maximum for Grønmosse (6.1 %) repræsenterer maximal Udvikling af den sommertørre Grønmosse.

Som Grundlag for Linietaxeringen har som tidligere nævnt medfølgende Kortbilag tjent, var Linietaxeringen udført i Marken og under Hensyntagen til samtlige oprædende Formationer indenfor saavel Hede- som Mosesamfundene, var Vegetationsforskellighederne i forskellig Afstand fra Aadalen blevet endnu mere udpræget end ovenfor paapeget. *Calluna*-Hede, *Erica*-Hede og Grønmosse repræsenterer hver for sig en Række Formationer, hvis maximale Arealudvikling da vilde have vist sig at have ligget i forskellig Afstand fra hinanden og fra Aadalen.

En mere indgaaende Behandling af Vegetationen falder naturligst i følgende Afsnit:

1. *Calluna*-Heden.
2. *Erica*-Heden.
3. Hede-Moserne.
4. Grønmoserne.

Calluna-Heden.

Langt det største Areal af Heden er beklædt med den egentlige *Calluna*-Hede, det Plantesamfund, hvor *Calluna vulgaris* er Fysiognomi-Dominant. Indenfor dette

Plantesamfund er der paa Nørholm Hede udviklet ikke mindre end 3 forskellige Formationer:

1. *Arctostaphylos*-Heden eller den høje *Calluna*-Hede.
2. *Calluna-Empetrum*-Heden eller den lave *Calluna*-Hede.
3. Den hemikryptofytige *Calluna*-Hede.

I Tilknytning til *Calluna*-Heden vil tillige blive omtalt Orevegetationen og Indre-Sande- og Skræntvegetationen i Hedens Nordøsthjørne.

Arctostaphylos-Heden forekommer som sammenhængende Vegetationstæppe paa alle de højere, mere tørre Strækninger af de Partier, der paa Kortet er angivet med rødbrun Farve, saaledes i første Instans paa de mange Klitvolde og Bakker, der findes spredt ud over Heden, men dernæst ogsaa og ikke mindst i *Calluna*-Hede-Bæltets indre Partier. *Arctostaphylos*-Heden mangler fuldstændig paa de tidligere dyrkede Partier af Heden samt paa det gennemkløftede Parti af Hedens Nordrand, hvor Lyngen er saa kraftig, at den passive Chamaefyt *Arctostaphylos uva ursi* ikke kan trives under dens Skygge.

I Tabel 2 anføres Cirklingsresultaterne¹⁾ og de paa Basis af Cirklingsresultaterne opstillede biologiske Spektre fra 7 forskellige Lokaliteter af *Arctostaphylos*-Hede. Ved Analysen er undersøgt saavel Mos- og Likenvegetation som den fanerogame Vegetation. Den samlede Artstæthed varierer fra 8.2 til 10.6. Likenvegetationen er den rigest udviklede med en Artstæthed, der ligger mellem 3.7 og 5.9; den fanerogame Vegetation og især Mosvegetationen er i Forhold hertil relativ fattig med Artstæheder, der for den første Gruppens Vedkommende ligger imellem 2.4 og 3.3 og for den sidste Gruppens Vedkommende mellem 1.6 og 2.6. Alt i alt dog en yderst arts-fattig Vegetation.

Af Fanerogamer optræder kun de 3 Chamaefytter: *Arctostaphylos uva ursi*, *Calluna vulgaris* og *Empetrum nigrum* som Frekvensdominanter. Hvad der iøvrigt forekommer af Fanerogamer har kun Tilfældighedens Præg. De 3 Chamaefytter er alle ret lave, 15—20 cm høje og ikke særlig yppige af Vækst, saaledes at der fremkommer talrige, større eller mindre Mellemrum. Disse er udfyldt med et tæt graat Likentæppe med *Cladonia impexa*, *silvatica* og *rangiferina* som konstant forekommende Frekvensdominanter og med *Cladonia uncialis* og *chlorophaea* samt *Cetraria aculeata* som tilfældige Frekvensdominanter. Underneden Likentæppet, men især i Skyggen af Chamaefytterne forekommer den artsspredte Mosevegetation med *Stereodon cupressiformis* som Frekvensdominant og de to Arter *Blepharozia ciliaris* og *Hylocomium parietinum* som konstant forekommende lav-, mellem- eller eventuelt høj-frekvente Arter.

Calluna-Empetrum-Heden. Tabel 3, Nr. 1—9. Denne Hedetype forekommer paa de lavere, lidt fugtige Partier af *Calluna*-Heden især i Hedens midterste og østlige Partier.

¹⁾ Angaaende Cirklingsmetoden henvises til C. RAUNKJÆR: Formationsundersøgelse og Formationsstatistik. — Bot. Tidsskr. 30, 1909.

Tabel 2 a. Arctostaphylos-Heden.

Lokalitet Nr. 1 beliggende Nord for Grønmose E 1-2 Nr. 1. Nr. 2. Øst for Vesterbækvejen og Syd for Ovalhøjene. Nr. 3. Øst for den store Grønmose i D3. Nr. 4. Klitbanke i Nordøsthjørnet af D4. Nr. 5. Sydsiden af den vestlige Ovalhøj (D6). Nr. 6. Sydsiden af den østlige Ovalhøj (D5). Nr. 7. Sydsiden af en Klitbanke i D4.

Nr. 1—6 $25 \times \frac{1}{10} m^2$, Nr. 7 $20 \times \frac{1}{10} m^2$.

		1	2	3	4	5	6	7
Calluna vulgaris	Ch	96	88	64	92	100	100	100
Empetrum nigrum	Ch	84	100	100	96	84	92	100
Arctostaphylos uva ursi	Ch	56	100	76	92	88	92	95
Carex panicea	G	»	16	8	»	»	»	»
Deschampsia flexuosa	H	»	20	»	4	»	»	»
Scirpus caespitosus	H	»	»	4	»	»	»	»
Genista anglica	Ch	»	»	12	»	»	»	»
— pilosa	Ch	»	4	4	»	»	»	»
Cladonia impexa . . . . .	..	100	100	100	100	100	100	..
— silvatica . . . . .	..	88	96	96	92	92	100	..
— rangiferina . . . . .	..	92	100	80	92	96	92	..
— uncialis . . . . .	..	60	64	52	32	84	88	..
Cetraria aculeata . . . . .	..	44	28	44	20	84	92	..
Cladonia chlorophaeae . . . . .	..	44	36	28	16	16	40	..
— squamosa . . . . .	..	4	20	8	8	»	12	..
— crispata . . . . .	..	24	»	8	4	»	24	..
— gracilis . . . . .	..	»	32	8	»	36	36	..
— glauca . . . . .	..	»	»	4	4	»	»	..
— Floerkeana . . . . .	..	»	»	4	»	»	»	..
— desticta . . . . .	..	»	»	»	»	4	»	..
— furcata . . . . .	..	»	»	»	4	»	»	..
— pleurota . . . . .	..	»	»	»	»	»	»	..
Hypnum cupressiformis . . . . .	..	100	100	96	92	100	96	..
Blepharozia ciliaris . . . . .	..	72	72	44	40	96	60	..
Hylocomium parietinum . . . . .	..	8	4	28	28	68	36	..
Stereodon imponens . . . . .	..	8	»	»	»	»	»	..
Cephaloziella Hampeana . . . . .	..	8	»	»	»	»	»	..

Tabel 2 b. De biologiske Spektre for de i Tabel 2 a anførte Lokaliteter.

	Artstæthed				Den fanero-game Frekvenssum	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1	8.9	2.4	4.6	2.0	236	100.0	»	»	»	»
2	9.8	3.3	4.8	1.8	328	89.0	6.1	4.9	»	»
3	8.7	2.7	4.3	1.7	268	95.0	1.5	3.0	»	»
4	8.2	2.8	3.7	1.6	284	98.6	1.4	»	»	»
5	10.5	2.7	5.1	2.6	272	100.0	»	»	»	»
6	10.6	2.8	5.9	1.9	284	100.0	»	»	»	»
7	»	»	»	»	295	100.0	»	»	»	»

og træffes her ligesaa konstant bæltedannende omkring *Erica*-Heden, som denne træffes omkring Grønmoser. Ud fra Forekomstforholdene er der saaledes ingen Twivl om Formationens Mellemstilling mellem *Arctostaphylos*-Hede og *Erica*-Hede. Ogsaa i Henseende til Artssammensætning er Formationens intermediaære Stilling let at paavise, idet en Række Fugtigheds-Arter, der enten ikke eller kun sparsomt forekommer i *Arctostaphylos*-Heden, i *Calluna-Empetrum*-Heden viser en kendelig Forøgelse af F⁰/o.

Calluna vulgaris og *Empetrum nigrum* er Formationens to eneste fanerogame Frekvensdominanter. Af Likener dominerer *Cladonia impexa*, *silvatica*, *rangiferina*, *uncialis* og eventuelt *Cladonia chlorophaea* og *Cetraria aculeata*, medens *Cladonia squamosa*, *crispata*, *districta* og *Floerkeana* er mere lavfrekvente, men konstant forekommende Arter. Mosvegetationens eneste konstant forekommende Frekvensdominant er *Stereodon cupressiformis*, medens *Blepharozia ciliaris* og *Hylocomium parietinum* er mere tilfældig forekommende. Af nye lavfrekvente, men konstant forekommende Mosser i den lave *Calluna*-Hede maa især nævnes *Dicranum scoparium* og *Leucobryum glaucum*.

Et særligt interessant Tilfælde frembyder *Calluna*-Heden paa Bakker, Klitvolde og lignende ikke altfor lave Forhøjninger. Paa saadanne Bakker vil man altid finde *Arctostaphylos*-Heden

udviklet paa den insolerede Sydsiden og *Calluna-Empetrum*-Heden paa den exsolerede Nordside. Fig. 12 A og B viser Fordelingen af *Arctostaphylos*- og *Calluna-Empetrum*-Heden paa de to vestlige Ovalhøje i henholdsvis D6 og D5. I Tabel 2 a repræsenterer Lokalitet Nr. 5 og 6 Sydsiden af henholdsvis den vestlige og den østlige af de to i denne Sammenhæng behandlede Ovalhøje, medens Tabel 3 a Nr. 1 og 2 repræsenterer de respektive Nordsider. Forskellen mellem Syd- og Nordside viser sig ikke blot i den dominerende Chamaefytvegetation, men Arter

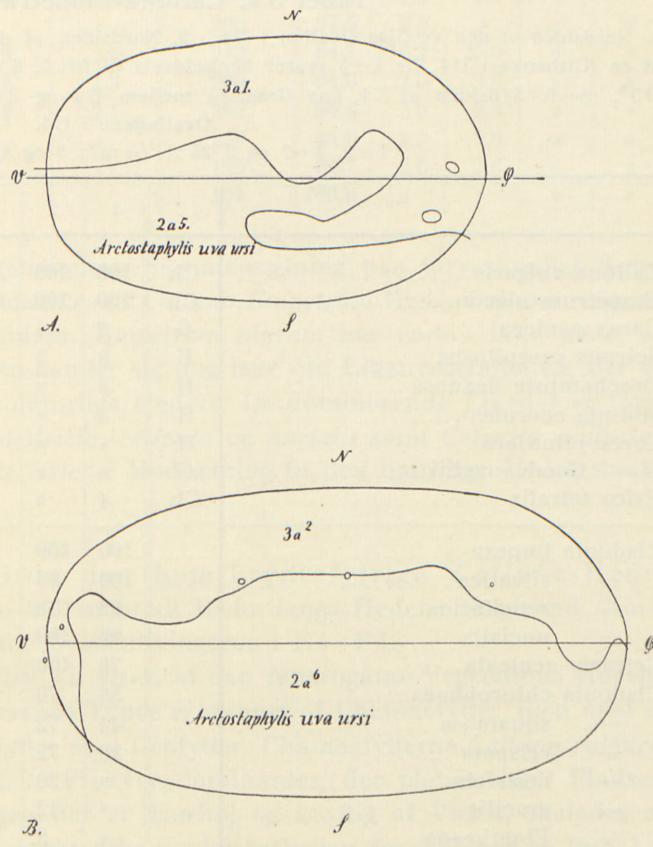


Fig. 12 A og B. Fordelingen af *Arctostaphylos uva ursi* paa Sydsiderne af de to vestlige Ovalhøje i Felteerne D6 og D5. Vegetationens Sammensætning fremgaar af Tabel 2 a Nr. 5 og 6. Tabel 3 a Nr. 1 og 2 viser Vegetationens Sammensætning paa Bakernes Nordsider.

som *Carex panicea*, *Scirpus caespitosus*, *Erica tetralix*, *Cladonia squamosa*, *Leucobryum glaucum*, *Dicranum scoparium* o. fl. a. vil om end spredt træffes paa Nordsiderne, men mangle paa Sydsiderne, hvor man til Gengæld af Likener f. Ex. vil træffe større Mængder af *Cladonia gracilis*.

Tabel 3 a. Calluna-Empetrum-Heden.

1. Nordsiden af den vestlige Ovalhøj i D 6. 2. Nordsiden af den østlige Ovalhøj i D 6. 3. Nordsiden af en Klitbanke i D 4. Nr. 1—3 svarer henholdsvis til Nr. 5, 6 og 7 i Tabel 2 a. 4. Øst for Grønmose D 3⁸. 5—6. Sydsiden af E 4, paa Grænsen mellem D 4 og E 4. 9. Tørveskrællet fugtig Hede øst for Ovalhøjene i C 4.

1—2, 4—7 og 9 25 × 1/10 m²; 3 og 8 20 × 1/10 m².

		1	2	3	4	5	6	7	8	9
Calluna vulgaris.....	Ch	100	100	90	72	96	80	100	95	96
Empetrum nigrum.....	Ch	100	100	100	96	92	92	88	85	8
<i>Carex panicea</i>	G	8	4	»	64	4	20	8	5	»
<i>Scirpus caespitosus</i>	H	8	4	5	4	4	4	4	5	»
<i>Deschampsia flexuosa</i>	H	8	»	»	12	4	»	»	»	»
<i>Molinia coerulea</i>	H	»	»	»	12	»	»	»	»	»
<i>Carex pilulifera</i>	H	»	»	»	»	»	8	»	»	»
— <i>Goodenoughii</i>	G	»	»	»	4	»	»	»	»	»
<i>Erica tetralix</i>	Ch	4	»	5	8	»	»	»	»	»
<i>Cladonia implexa</i>.....	..	100	100	..	100	100	100	..	..	96
— <i>silvatica</i>.....	..	100	96	..	100	96	92	..	..	40
— <i>rangiferina</i>.....	..	92	76	..	96	92	84	..	..	32
— <i>uncialis</i>.....	..	96	100	..	84	96	80	..	..	84
<i>Cetraria aculeata</i>.....	..	76	100	..	64	96	68	..	..	100
<i>Cladonia chlorophaea</i>.....	..	56	76	..	68	80	60	..	..	48
— <i>squamosa</i>.....	..	44	72	..	32	72	36	..	..	24
— <i>crispata</i>.....	..	28	72	..	24	76	36	..	..	100
— <i>destricta</i>.....	..	»	20	..	12	48	12	..	..	100
— <i>gracilis</i>.....	..	»	12	..	»	»	»	..	..	8
— <i>Floerkeana</i>.....	..	»	8	..	12	12	20	..	..	48
— <i>pleurota</i>.....	..	»	8	..	»	12	»	..	..	100
— <i>glauca</i>.....	..	»	»	..	»	»	»	..	..	8
— <i>papillaria</i>.....	..	»	»	..	»	»	»	..	..	4
<i>Hypnum cupressiforme</i>.....	..	100	96	..	100	92	100	..	..	..
<i>Blepharozia ciliaris</i>.....	..	100	40	..	28	24	72	..	..	..
<i>Hylocomium parietinum</i>.....	..	80	40	..	12	4	16	..	..	..
<i>Dicranum scoparium</i>.....	..	4	24	..	4	4	»	..	..	..
<i>Leucobryum glaucum</i>.....	..	28	24	..	»	4	»	..	..	..
<i>Rhacomitrium hypnoides</i>.....	..	»	8	..	»	4	8	..	..	..
<i>Stereodon imponens</i>.....	..	»	4	..	»	»	»	..	..	..
<i>Jungermannia porphyroleuca</i>.....	..	»	4	..	»	»	»	..	..	..
— <i>excetiformis</i>.....	..	»	4	..	»	»	»	..	..	..
<i>Cephaloziella elachista</i>.....	..	»	»	..	4	»	»	..	..	..
— <i>divaricata</i>.....	..	»	»	..	8	»	12	..	..	..

Tabel 3 b. De biologiske Spektre for Calluna-Empetrum-Heden.

	Artstæthed				Den fanerogame Frekvenssum	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1	11.3	2.3	5.9	3.1	228	89.5	7.0	3.5	»	»
2	11.9	2.1	7.4	2.4	208	96.2	1.9	1.9	»	»
3 . . . . .	..	..	..	..	200	97.5	2.5	»	»	»
4	10.2	2.7	5.9	1.6	272	64.7	10.2	25.0	»	»
5	11.1	2.0	7.8	1.3	200	94.0	4.0	2.0	»	»
6	10.0	2.0	5.9	2.1	204	84.3	5.9	9.8	»	»
7 . . . . .	..	..	..	..	200	94.0	2.0	4.0	»	»
8 . . . . .	..	..	..	..	190	94.7	2.6	2.6	»	»
9 . . . . .	..	..	..	..	104	100.0	»	»	»	»

Tabel 3a, Nr. 9, viser Vegetationens Sammensætning paa tørveskrællet Bund indenfor et Omraade, der iøvrigt dækkes af *Calluna-Empetrum-Hede*. *Calluna vulgaris* er her den eneste Frekvensdominant. *Empetrum nigrum* har endnu ikke naaet at hævde sin gamle Plads. Interessen samler sig dog især om Likenvegetationen, der er vidt forskellig fra de omgivende naturlige Hedes. De dominerende Likener er først og fremmest *Cladonia pleurota*, *destricta*, *crispata* og *uncialis* samt *Cetraria aculeata*: bægerformede eller svagt grenede Arter i Modsætning til den naturlige Hedes stærkt grenede Typer.

Den 3. Type af *Calluna-Hede*, den hemikryptofytrige *Calluna-Hede*, forekommer fortrinsvis i et 100—200 m bredt Bælte langs Hedens Nordrand, Nord for det østgaaende Dige og Øst for Dalsænkningerne i E4—F4.

De biologiske Spektre i Tabel 4b viser, at den fanerogame Vegetations Hovedmasse i Lighed med de to foregaaende Typer er dannet af Chamaefytter, men med et stort Islæt af saavel Hemikryptofytter som Geofytter. Chamaefytterne *Calluna vulgaris* og *Empetrum nigrum* er de typiske Frekvensdominanter, der pletvis deler Pladsen med *Vaccinium vitis idaea*. Lyngen her er knæhøj og kraftig af Vækst, saaledes at Likenvegetationen bliver trængt stærkt tilbage. Artstæheden for Likener er kun 1.5 c. $\frac{1}{4}$ af Artstæheden i de to foregaaende *Calluna*-Hedetyper. Til Gengæld faar vi en kraftigere udviklet Undervegetation af Mosser, Hemikryptofytter og Geofytter af Arter som *Deschampsia flexuosa*, *Potentilla erecta* og *Trientalis europaea* og Mosser som *Stereodon cupressiformis*, *Hylocomium parietinum*, *proliferum* og *triquetrum*, *Dicranum rugosum* og *scoparium*. Vegetationernes nærmere Sammensætning fremgaar iøvrigt af Tabel 4a, Nr. 2—4.

En Variant af den hemikryptofytrige *Calluna-Hede* træffes i Felterne B5—B6, Øst for den sydgaaende Vej. Den adskiller sig fra Hovedtypen ved Tilstedeværelsen af *Arctostaphylos uva ursi*, ved at Lyngen er betydelig lavere af Vækst og ved iøvrigt at have den for *Arctostaphylos*-Heden karakteristiske Liken- og Mosvegetation. Den nærmere Sammensætning fremgaar af Tabel 4, Nr. 1.

Tabel 4 a. Vegetationen i Nordøsthjørnet.

Nr. 1—4. *Calluna*-Hede, 5—7 Empetrum-Grønning og 8—11 Orevegetation [Nr. 1. Græsrig *Arctostaphylos*-Hede vest for de 3 smaa Høje i B 5].

Nr. 1—2 og 4 $25 \times \frac{1}{10} \text{ m}^2$, 3 og 7 $20 \times \frac{1}{10} \text{ m}^2$, 5—6 og 8—11 $10 \times \frac{1}{10} \text{ m}^2$.

		1	2	3	4	5	6	7	8	9	10	11
<i>Calluna vulgaris</i>	Ch	56	100	100	84	»	»	5	»	20	»	»
<i>Empetrum nigrum</i>	Ch	100	96	100	100	90	70	100	»	»	10	»
<i>Arctostaphylos uva ursi</i> ..	Ch	92	»	15	»	»	»	»	»	»	»	»
<i>Vaccinium vitis idaea</i>	Ch	»	»	10	100	50	»	100	»	»	»	60
<i>Molinia coerulea</i>	H	80	»	20	»	100	100	45	100	70	100	100
<i>Deschampsia flexuosa</i>	H	56	64	60	64	90	10	65	20	30	60	90
<i>Potentilla erecta</i>	H	4	»	35	4	90	50	45	50	10	90	60
<i>Trientalis europaea</i>	G	48	36	65	8	80	80	60	100	10	40	60
<i>Festuca ovina</i>	H	»	»	»	»	60	80	45	70	80	70	10
<i>Agrostis canina</i>	H	»	»	5	4	»	»	25	»	»	»	»
<i>Arnica montana</i>	H	»	»	5	12	30	20	15	10	»	10	»
<i>Campanula rotundifolia</i> ...	H	»	»	»	»	»	»	10	»	30	»	»
<i>Carex arenaria</i>	G	»	»	5	»	»	»	»	»	»	»	»
— <i>Goodenoughii</i>	G	»	4	»	»	4	»	»	»	»	»	»
— <i>panicea</i>	G	8	»	»	16	»	10	55	»	20	70	»
— <i>pilulifera</i>	H	4	»	5	4	»	»	45	10	30	»	»
<i>Convallaria majalis</i>	G	»	»	»	»	»	»	»	»	10	»	»
<i>Erica tetralix</i>	Ch	»	»	»	»	8	»	»	»	»	»	»
<i>Galium harcynicum</i>	Ch	»	»	»	»	30	20	45	10	40	50	»
<i>Genista anglica</i>	Ch	8	4	10	8	»	10	20	»	10	»	»
— <i>pilosa</i>	Ch	8	»	20	16	»	»	15	»	»	»	»
<i>Hieracium umbellatum</i> ...	H	»	»	»	»	10	10	5	40	»	»	»
<i>Hypochoeris maculata</i> ...	H	»	»	»	»	10	»	10	20	»	»	»
<i>Lycopodium clavatum</i> ...	Ch	»	»	10	»	20	20	15	20	»	»	»
<i>Majanthemum bifolium</i> ...	G	»	»	»	8	»	»	5	»	»	»	»
<i>Nardus stricta</i>	H	»	8	»	»	10	»	»	»	»	»	»
<i>Scirpus caespitosus</i>	H	4	»	»	»	»	»	»	»	10	»	»
<i>Scorzonera humilis</i>	H	»	»	»	»	10	»	5	»	»	»	»
<i>Sieblingia decumbens</i> ...	H	»	»	»	»	»	10	5	10	10	»	»
<i>Solidago virg-aurea</i>	H	»	»	»	»	»	»	5	»	»	»	»
<i>Succisa pratensis</i>	H	»	»	»	»	10	»	10	10	»	10	»
<i>Vaccinium uliginosum</i> ...	Ch	»	»	»	12	»	»	»	»	»	»	»
<i>Viola canina</i>	H	»	»	»	»	»	»	»	»	10	»	»
<i>Cladonia impexa</i> .....	..	100	72	..	..	..	..	40	..	..	10	10
— <i>silvatica</i> .....	..	84	28	..	..	..	..	10	..	..	»	»
— <i>rangiferina</i> .....	..	80	28	..	..	..	..	10	..	..	»	»
— <i>uncialis</i> .....	..	32	8	..	..	..	..	»	..	..	»	»
— <i>chlorophphaea</i> .....	..	40	8	..	..	..	..	10	..	..	»	»
— <i>squamosa</i> .....	..	4	»	..	..	..	..	»	..	..	»	»
— <i>gracilis</i> .....	..	8	»	..	..	..	..	»	..	..	»	»
<i>Peltigera canina</i> .....	..	»	8	..	..	..	..	»	..	..	»	»
<i>Cetraria aculeata</i> .....	..	8	»	..	..	..	..	»	..	..	»	»
— <i>islandica</i> .....	..	4	»	..	..	..	..	»	..	..	»	»

Tabel 4 a (fortsat).

		1	2	3	4	5	6	7	8	9	10	11
Stereodon cupressiformis	..	100	96	..	..	..	..	95	..	..	100	100
Blepharozia ciliaris	..	48	88	..	..	..	..	5	..	..	»	»
Hylocomium parietinum	..	56	100	..	..	..	..	80	..	..	70	10
— proliferum	..	»	20	..	..	..	..	5	..	..	»	»
— triquetrum	..	»	20	..	..	..	..	»	..	..	»	»
Leucobryum glaucum	..	4	4	..	..	..	..	»	..	..	»	»
Dicranum rugosum	..	»	48	..	..	..	..	»	..	..	»	»
— scoparium	..	»	12	..	..	..	..	10	..	..	»	»

Orevegetationen. I noje Tilknytning til den hemikryptofytrige *Calluna*-Hede er Orevegetationen udviklet. Denne Vegetationstype findes kun i ringe Udstrækning paa Heden, praktisk talt kun som smalle Bræmmer langs Aaskrænterne længst mod Nordøst; et særligt smukt Parti træffes i Felterne F3, E3 og E2.

I Følge en Tradition har dette Parti tidligere været lyngklædt og Orevegetationen af temmelig ny Dato i stadig Vandring Vest paa. For om muligt at konstatere, hvorvidt dette er Tilfældet eller ej, blev der i Juni 1921 nedrammet to Pæle med en indbyrdes Afstand paa 170 m. Grænsen mellem sammenhængende Lyng og Orevegetation blev dernæst kortlagt i Forhold til denne Linie. Ad Aare vil man da kunne paavise, hvorvidt der foregaar en eventuel Forskydning af Lynghedens Grænse mod Vest. Stillingen Sommer 1921 fremgaar af Fig. 13.

Orevegetationens Sammensætning fremgaar af Tabel 4 a, Nr. 5—11. Nærmest Lyngheden, hvis Sammensætning tidligere er behandlet, finder man et Bælte —

Tabel 4 b. De biologiske Spektre for de i Tabel 4 a anførte Lokaliteter.

	Artstæthed				Den fanerogame Frekvenssum	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1	10.36	4.7	3.6	2.1	468	56.4	31.6	12.0	»	»
2	8.52	3.1	1.5	3.9	312	64.1	23.1	12.8	»	»
3 .....	..	..	..	..	465	57.0	28.0	15.1	»	»
4 .....	..	..	..	..	456	70.2	22.8	7.0	»	»
5 .....	..	..	..	..	690	27.5	60.9	11.6	»	»
6 .....	..	..	..	..	550	21.8	61.8	16.4	»	»
7	10.4	7.7	0.7	2.0	770	39.0	45.5	15.6	»	»
8 .....	..	..	..	..	470	6.4	72.3	21.3	»	»
9 .....	..	..	..	..	420	16.7	73.8	9.5	»	»
10	7.2	5.4	0.1	1.7	540	11.1	68.5	20.3	»	»
11	5.0	3.8	0.1	1.1	380	15.8	68.4	15.8	»	»
2—4 .....	..	4.1	..	..	1233	63.8	24.6	11.6	»	»
5—7 .....	..	6.7	..	..	2010	29.4	56.1	14.5	»	»
8—11 .....	..	4.5	..	..	1810	12.5	70.8	16.7	»	»

Tabel 5 a. Indre Sande — Vegetationen i Nordøsthjørnet.

1—3 Indre Sandet, 4 Aaskrænt.

		1	2	3	4
Deschampsia flexuosa	H	48	80	100	72
Carex arenaria	G	4	100	100	8
Weingaertneria canescens	H	4	70	30	»
Calluna vulgaris	Ch	12	»	»	48
Empetrum nigrum	Ch	60	»	»	48
Agrostis tenuis	H	»	»	30	»
Genista anglica	Ch	»	»	»	8
— pilosa	Ch	»	»	»	16
Hypochoeris radicata	H	»	20	60	»
Phragmites communis	G	»	»	30	»
Rumex acetosella	G	4	»	»	4
Thymus serpyllum	Ch	»	»	»	28
Cetraria aculeata . . . . .	..	12	20	90	92
Cladonia impexa . . . . .	..	4	»	70	8
— rangiferina . . . . .	..	»	»	10	»
— silvatica . . . . .	..	»	»	30	»
— chlorophaea . . . . .	..	»	»	90	20
— furcata . . . . .	..	»	»	10	»
— pleurota . . . . .	..	»	»	»	16
— glauca . . . . .	..	»	»	»	12
— verticillata . . . . .	..	»	»	»	4
— destricta . . . . .	..	»	»	»	52
Stereocaulon condensatum . . . . .	..	»	»	»	20
Polytrichum piliferum . . . . .	..	92	20	100	100
Ceratodon purpureus . . . . .	..	»	»	60	»
Pohlia nutans . . . . .	..	»	»	70	»
Dicranum scoparium . . . . .	..	»	»	20	»
— spurium . . . . .	..	»	»	10	»
Bryum erythrocarpum . . . . .	..	»	»	10	»
Stereodon cypresiformis . . . . .	..	»	»	10	»
Hylocomium parietinum . . . . .	..	»	»	10	»
Scapania compacta . . . . .	..	»	»	30	»
Cephaloziella divaricata . . . . .	..	»	»	30	»
— Hampeana . . . . .	..	»	»	10	»
Jungermannia birenata . . . . .	..	»	»	10	»
— ventricosa . . . . .	..	»	»	10	»
— Hatcheri . . . . .	..	»	»	10	»
Total Artstæthed . . . . .	..	2.4	3.1	10.4	5.5
Fanerogamer . . . . .	..	1.3	2.7	3.5	2.3
Likener . . . . .	..	0.2	0.2	3.0	2.2
Mosser . . . . .	..	0.9	0.2	3.9	1.0
Den fanerogame Frekvenssum . . . . .	..	132	270	350	232
Ch . . . . .	..	54.5	»	»	63.8
H . . . . .	..	39.4	63.0	62.9	31.0
G . . . . .	..	6.1	37.0	37.1	5.2
Th . . . . .	..	»	»	»	»

Empetrum-Grønningen — hvor Ch % endnu er ret høj, c. 30, med *Empetrum nigrum* som Fysiognomi- og Frekvensdominant. 56 % af den fanerogame Vegetation bestaar af Hemikryptofytter som *Molinia coerulea*, *Deschampsia flexuosa*, *Potentilla erecta*, *Trientalis europaea* og *Festuca ovina*, samt en hel Del lavfrekvente Arter. Mos- og især Likenvegetationen er yderst sparsom.

I den egentlige Orevegetation, Tabel 4 a, Nr. 8—11, føres Processen endnu videre. H % stiger til 70.8, Ch % aftager til 12.5, Mos-vegetationen og Likenvegetationen er paa Grund af et tæt Tæppe af vissent fjorgammelt Græs trængt stærkt tilbage. Likener mangler praktisk talt helt, og Mos-vegetationen er kun repræsenteret af spinkle Individser af *Stereodon cupressiformis*. Den dominerende Fanerogamvegetation er især sammensat af *Molinia coerulea*, *Deschampsia flexuosa*, *Potentilla erecta*, *Trientalis europaea* og *Festuca ovina*, kort sagt alle de Arter, der fandtes som Undervegetation i den hemikryptofytige *Calluna*-Hede.

Indre Sande-Vegetationen. Tabel 5 a, Nr. 1—3.

Paa Heden findes kun et Indresandeparti, en temmelig dyb, skaalformig Lavning i Toppen af Bakken i E1, umiddelbar Nord for Vejen. Til Trods for Arealets ringe Udstrækning, 60—65 m langt og 20—25 m bredt, er Vegetationen dog ret differentieret. Længst mod Vest, hvor Erosionen er stærkest, findes den sparsomste Vegetation (Tabel 5 a Nr. 1). Bunden bestaar af grusblandet, løst Sand, der bindes af forskellige Planter, især *Polytrichum piliferum*. Den fanerogame Vegetation er yderst spredt, Artstætheden kun 1.3, og bestaar især af store, flade, sandfyldte *Empetrum*-Tuer. Længere mod Øst i Lavningen, hvor Sandet aflejres, faar vi først en *Carex arenaria*-Zone (Tabel 5 a Nr. 2) med *Weinmannia canescens* og *Deschampsia flexuosa*, men uden Mosser og Likener, dernæst

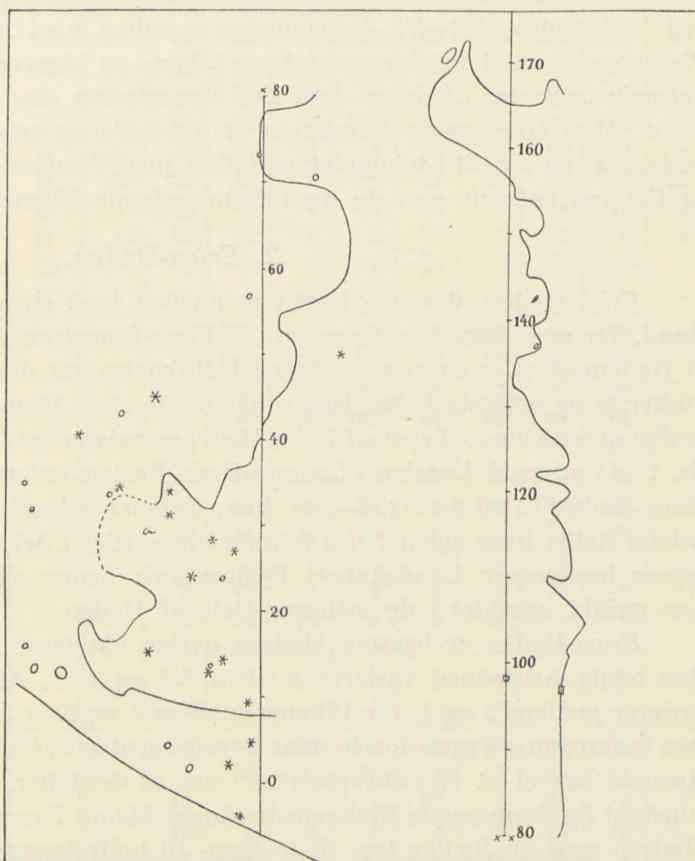


Fig. 13. Grænselinien mellem Orevegetation og *Calluna*-Hede i Nordøsthjørnet.

i Partiets Østrand en Zone med *Deschampsia flexuosa*, *Carex arenaria* og *Hypochoeris radicata* og med en relativ tæt Liken- og Mosvegetation. Den totale Artstæthed i denne Zone er ikke mindre end 10.4, den fanerogame Artstæthed 3.5; Artstætheden for Likener 3.0 og for Mosser 3.9. (Cfr. Tabel 5 a Nr. 3.)

En Vegetation, der staar Indresandevegetationen nær, forekommer paa de stejle Skrænter ned mod Aaen, hvor der indtil for nylig har fundet Erosion og Nedskridninger Sted. Tabel 5 a Nr. 4 viser Vegetationens Sammensætning fra et gammelt Skred ved Aaskrænten i F2—F3. Vegetationen er aaben, med Sandet skinnende frem mellem Planterne. Sandet bindes især af en Liken- og Mosvegetation dannet af Arter som *Cetraria aculeata*, *Cladonia stricta*, *Stereocaulon condensatum* og *Polytrichum pilifерum*. Den fanerogame Vegetation er artsfattig og artsspredt, Artstætheden 2.3, og bestaar af en spredt Chamaefytvegetation med *Thymus serpyllum*, *Empetrum nigrum* og *Calluna vulgaris* som de mest fremtrædende Elementer.

2. *Erica*-Heden.

Erica-Heden, der paa Kortet er angivet med en rødviolet Farve, er knyttet til Bund, der er en Grad fugtigere end *Calluna-Empetrum*-Hedens, men samtidig for tør til Hedemose eller Grønmose. Størst Udbredelse har denne Vegetationstype i Hedens midterste og østligste Felter især omkring de store Grønmoser og Hedemoser. Det er muligt at adskille to Typer af *Erica*-Hede, en relativ tør *Calluna-Erica*-Hede (Tabel 6 a Nr. 1—4) ud mod Aadalen i *Calluna*-Hede-Bæltets inderste Partier og en relativ fugtig *Erica*-Hede (Tabel 6 a Nr. 5—10), hvor *Calluna vulgaris* fysiognomisk spiller en ubetydelig Rolle, hvor enten *Erica tetralix* alene eller i Selskab med Likener eller Cyperraceer bestemmer Landskabets Fysiognomi; denne sidste Type af *Erica*-Hede er især smukt udviklet i de østlige Dele af Heden.

Erica-Heden er ligesom Hedens øvrige Plantesamfund artsfattig og artsspredt. Den totale Artstæhed varierer mellem 8.3 og 12.1. Artstætheden for Fanerogamer varierer mellem 3 og 4, for Likener mellem 4 og 6 og for Mosser mellem 1.2 og 2.7. Den fanerogame Vegetation bestaar hovedsageligt af Chamaefytter, dog med vekslende Mængde saavel af Hemikryptofytter som af Geofytter. *Erica tetralix* er den eneste konstant forekommende Frekvensdominant blandt Fanerogamerne, den maa dog dele Pladsen med en Række lav- til mellem- til højfrekvente Arter som *Calluna vulgaris*, *Empetrum nigrum*, *Carex panicea* og *Goodenoughii*, *Scirpus caespitosus* og *Eriophorum polystachyum*. Likenvegetationen er langt rigere. *Cladonia impexa*, *silvatica* og *uncialis* er konstant forekommende Frekvensdominanter, *Cladonia rangiferina* og *Cetraria aculeata* mere tilfældigt forekommende. *Cladonia chlorophaea*, *crispata*, *squamosa* og *Cetraria islandica* forekommer ligeledes konstant, omend i ret vekslende Mængder. Mosvegetationen er stadig ret artsspredt omend Artstallet er i Stigning. Den eneste Frekvensdominant er *Stereodon cupressiformis*. *Blepharozia ciliaris*, *Leucobryum glaucum*, *Racomitrium hypnoides* og *Hylocomium parietinum* er konstante lav- til mellem-frekvente Arter. Bemærkelsesværdigt er det store Antal *Hepaticae* i *Erica*-Heden i Modsætning til *Calluna*-Heden. Ingen af Arterne forekommer dog i nævneværdig Mængde.

Tabel 6 a. Erica-Heden.

1—4. Calluna-Erica-Hede. 1. Syd for Vesterbækvejen, umiddelbart Øst for Grusterrænet. 2. Nord for Grønmose E 1—2. 3. D 4. 4. E 4's sydlige Parti. 5—10. Ren Erica-Hede. 5. Nordvesthjørnet af D 2. 6. Nordøst for Mosen i C 4—C 5. 7. Østsiden af Grønmose D 3³. 8. Sydvestsiden af D 3. 9. Erica-Hede i Nordøsthjørnet af D 4. 10. Sammested som Lokalitet Nr. 1.

1—9. $25 \times \frac{1}{10} m^2$; 10. $20 \times \frac{1}{10} m^2$.

		1	2	3	4	5	6	7	8	9	10
Erica tetralix	Ch	84	96	84	68	100	100	88	100	80	90
Calluna vulgaris	Ch	64	52	60	84	4	32	36	24	28	40
Empetrum nigrum	Ch	8	40	60	68	36	12	28	32	60	5
Carex panicea	G	8	60	68	88	100	16	96	20	64	65
— Goodenoughii	G	8	24	64	24	4	16	32	68	64	»
Scirpus caespitosus	H	48	48	16	8	28	44	12	48	40	25
Eriophorum polystachyum	G	»	40	8	»	44	12	4	»	12	»
Molinia coerulea	H	»	40	»	»	»	20	8	4	8	»
Andromeda polifolia	Ch	»	4	»	»	»	24	»	32	»	»
Juncus squarrosum	H	»	»	»	»	»	»	»	4	8	»
Cladonia impexa . . . . .	..	..	100	100	100	100	100	100	100	100	..
— silvatica . . . . .	..	..	80	100	100	72	88	80	100	96	..
— rangiferina . . . . .	..	..	80	80	88	32	56	72	96	80	..
— uncialis . . . . .	..	..	68	88	96	100	84	92	84	84	..
Cetraria aculeata . . . . .	..	..	32	80	72	40	20	20	32	40	..
Cladonia chlorophaea . . . . .	..	..	24	48	76	4	40	8	60	40	..
— crispata . . . . .	..	..	8	44	44	20	20	20	12	28	..
— squamosa . . . . .	..	..	8	44	44	12	20	24	24	32	..
— gracilis . . . . .	..	..	8	8	»	4	»	»	8	»	..
Cetraria islandica . . . . .	..	..	8	12	4	4	»	4	28	8	..
Cladonia decorticata . . . . .	..	..	»	20	12	»	»	»	»	8	..
— Floerkeana . . . . .	..	..	»	8	12	»	»	»	8	»	..
— pleurota . . . . .	..	..	»	»	4	»	»	»	4	4	..
— degenerans . . . . .	..	..	»	»	»	4	»	»	»	»	..
Stereodon cupressiformis . . . . .	..	..	76	96	96	60	92	88	100	88	..
Blepharozia ciliaris . . . . .	..	..	40	64	36	28	44	72	64	64	..
Hylocomium parietinum . . . . .	..	..	12	»	4	»	32	4	24	8	..
Leucobryum glaucum . . . . .	..	..	16	»	8	8	4	8	20	16	..
Rhacomitrium hypnoides . . . . .	..	..	4	24	24	20	4	12	24	8	..
Dicranum scoparium . . . . .	..	..	»	16	»	»	»	4	»	12	..
Stereodon imponens . . . . .	..	..	»	4	»	»	»	8	»	20	..
Pohlia nutans . . . . .	..	..	4	»	»	»	»	»	»	»	..
Sphagnum tenellum . . . . .	..	..	»	»	»	4	4	»	»	4	..
Cephalozia media . . . . .	..	..	»	»	»	»	4	»	»	4	..
Cephaloziella divaricata . . . . .	..	..	»	12	12	»	»	»	»	»	..
— Hampeana . . . . .	..	..	4	»	»	»	»	4	4	8	..
Jungermannia gracilis . . . . .	..	..	»	»	»	»	4	8	28	16	..
— inflata . . . . .	..	..	»	»	»	4	»	»	4	4	..
— ventricosa . . . . .	..	..	»	»	»	»	»	4	4	8	..
— Kunzeana . . . . .	..	..	4	»	»	»	»	4	»	»	..
— minuta . . . . .	..	..	»	»	»	»	»	»	4	»	..
Odontoschisma sphagni . . . . .	..	..	»	»	»	»	»	4	8	8	..

Tabel 6 b. De biologiske Spektre for Erica-Heden.

	Artstæthed				Den fanéro-game Frekvenss.	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1 .....	..	..	..	..	220	70.9	21.8	7.3	»	»
2	9.8	4.0	4.2	1.6	404	47.5	21.8	30.7	»	»
3	12.1	3.6	6.3	2.2	360	56.7	4.4	38.9	»	»
4	11.7	3.4	6.5	1.8	340	64.7	2.4	32.9	»	»
5	8.3	3.2	3.9	1.2	316	44.3	8.9	46.8	»	»
6	9.0	2.8	4.3	1.9	276	60.9	23.2	15.9	»	»
7	9.5	3.0	4.2	2.2	304	50.0	43.4	6.6	»	»
8	11.6	3.3	5.6	2.7	332	56.6	16.9	26.5	»	»
9	11.5	3.6	5.2	2.7	364	46.2	15.4	38.5	»	»
10 .....	..	..	..	..	225	60.0	11.1	28.9	»	»

3. Hedemosesamfundene.

Paa et Niveau en Grad fugtigere end *Erica*-Heden kommer Mosesamfundene til Udvikling. Vældmoserne i Kløfterne ud mod Aadalen, Grønmoserne i en Afstand af 500—1000 m fra Aadalen og Hedemoserne endnu længere inde paa Heden, 12—1300 m fra Aadalen.

Hedemoserne, hvis Overflade altid er stærkt tuet, forekommer i to forskellige Formationer: en *Myrica*-Mose og en *Erica-Eriophorum vaginatum*-Mose. Af disse vil den sidstnævnte altid forekomme som Randzone omkring den første.

Hedemosernes floristiske Sammensætning fremgaar af Tabel 7 Nr. 1—5 og 6—8. Den totale Artstæthed for de to Formationer under et varierer fra 10.7 til 12.9. Vegetationens Hovedmasse dannes i Modsætning til Hedens af Fanerogamer og Mosser, medens Likenvegetationen kun er sparsomt udviklet. Artstætheden for de respektive Grupper varierer for Fanerogamerne Vedkommende mellem 5.3 og 5.9, for Mossernes Vedkommende mellem 3.4 og 7.3 og for Likernerne Vedkommende mellem 1.1 og 1.9.

Myrica-Mosesens floristiske Sammensætning er overordentlig ensformig, hvad et Blik paa Tabel 7 Nr. 1—5 tydelig viser. Vegetationen bestaar af en homogen Blanding af *Myrica gale*, *Eriophorum vaginatum*, *Erica tetralix*, *Empetrum nigrum*, *Andromeda polifolia*, *Oxycoccus quadripetalus*, *Calluna vulgaris* og *Eriophorum polystachyum*. — Skyldes Mosesens Oprindelse for en Del Trykvand, hvad der er Tilfældet med Østsiden af den store Mose i C4—C5, ændres Vegetationen i Retning af Vældmosens bl. a. ved den rigelige Tilstedeværelse af *Molinia coerulea*, *Narthecium ossifragum* og *Gentiana pneumonanthe*. — Den eneste Liken, der spiller nogen Rolle, er *Cladonia impexa*; kun enkelte andre Arter som *Cladonia silvatica*, *chlorophaea*, *squamosa* og *uncialis* forekommer i ringe Mængde. Mosvegetationens eneste konstant forekommende Frekvensdominant er stadigvæk *Stereodon cupressiformis*. Det mest karakteristiske ved Mosvegetationen er iøvrigt det store Indhold af *Hepaticae* af hvilke *Odontoschisma sphagni*, *Jungermannia ventricosa*, *Kantia trichomanes*, *Cephalozia*

Tabel 7 a. Hedemoserne.

1—5. Myrica-Mosen. 1. Mosen i C4—C5. 2. Nordøstlige Hedemose (D1—D2). 3. Sydøstlige Hedemose (C2—D2). 4. Vestsiden af den store Hedemose i C4—C5. 5. Østsiden af samme. 6—8. Erica-Mosen. 6. Sammested som Nr. 1. 7. Sydsiden af Hedemosen i C3. 8. Nordlige Del af C3. 9—10. Vældmosen. Beliggenhed i E4—F4. 1—10. $25 \times \frac{1}{10} m^2$.

		1	2	3	4	5	6	7	8	9	10
Myrica gale	...	100	84	100	96	96	»	»	»	88	92
Erica tetralix	...	72	72	64	80	20	96	96	100	88	96
Eriophorum vaginatum	...	92	100	96	96	56	100	92	100	4	20
Empetrum nigrum	...	76	76	96	96	44	92	92	8	24	»
Andromeda polifolia	...	64	72	28	56	44	80	92	96	»	»
Oxycoccus quadripetalus	...	68	60	56	28	12	96	88	96	32	12
Calluna vulgaris	...	36	24	44	28	4	20	16	60	24	»
Eriophorum polystachyum	...	28	34	40	76	28	20	20	20	56	96
Scirpus caespitosus	...	32	12	»	4	4	16	20	»	28	4
Carex Goodenoughii	...	»	»	»	20	4	12	32	40	»	»
Molinia coerulea	...	4	»	32	4	100	8	4	32	100	96
Narthecium ossifragum	...	»	»	»	»	12	»	»	»	80	80
Gentiana pneumonanthe	...	»	»	»	»	8	»	»	»	4	20
Carex panicea	...	»	»	»	»	»	»	»	»	16	40
Potentilla erecta	...	»	»	»	»	»	»	»	»	4	»
Juncus squarrosus	...	»	»	»	»	»	»	»	»	8	»
Deschampsia flexuosa	...	»	»	»	»	»	»	»	»	4	12
Vaccinium vitis idaea	...	»	»	»	»	»	»	»	»	8	»
— uliginosum	...	»	»	»	4	»	»	»	»	»	»
Agrostis canina	...	»	»	»	»	»	»	»	»	4	»
Equisetum limosum	...	»	»	»	»	»	»	»	»	»	8
Cladonia impexa	...	100	96	88	88	..	100	100	12	80	16
— silvatica	...	24	8	16	12	..	20	32	»	32	»
— chlorophaea	...	32	52	24	48	..	32	36	»	12	»
— squamosa	...	4	20	»	12	..	8	16	64	»	»
— uncialis	...	12	»	8	4	..	8	4	32	12	»
— rangiferina	...	4	8	»	»	..	»	4	»	4	»
— glauca	...	»	4	»	»	..	»	»	»	»	»
— Floerkeana	...	»	4	»	»	..	»	»	4	»	»
Sphagnum cuspidatum	...	56	52	28	24	..	40	4	88	»	24
— tenellum	...	28	16	12	32	..	24	8	72	16	24
— acutifolium	...	24	4	40	8	..	16	»	»	20	24
— papillosum	...	»	»	»	»	..	4	»	»	12	28
— subsecundum	...	»	»	»	»	..	»	»	»	4	40
— magellanicum	...	»	»	»	»	..	»	»	»	4	8
Odontoschisma sphagni	...	60	20	44	36	..	72	60	100	48	36
Jungermannia ventricosa	...	24	20	16	32	..	48	44	44	»	»
— inflata	...	4	4	»	»	..	4	4	88	»	»
— porphyroleuca	...	»	4	»	»	..	16	»	»	»	»
— gracilis	...	»	»	»	»	..	56	16	8	»	»
— minuta	...	»	»	»	»	..	»	4	36	»	»
— Kunzeana	...	»	»	»	»	..	»	16	28	»	»

Tabel 7 a (fortsat).

		1	2	3	4	5	6	7	8	9	10
Blepharozia ciliaris.....	..	4	»	4	12	..	20	24	60	4	»
Kantia trichomanes.....	..	4	4	8	4	..	16	8	4	12	»
Mylia anomala.....	..	»	12	»	»	..	12	»	»	»	»
Lepidozia setacea.....	..	4	»	4	»	..	»	»	24	8	»
Cephalozia media.....	..	24	16	16	8	..	28	12	52	16	4
— connivens.....	..	»	12	»	»	..	»	4	»	»	»
Cephaloziella Hampeana.....	..	24	20	16	44	..	20	16	16	8	»
— elachista.....	..	»	8	4	»	..	»	4	20	»	»
— divaricata.....	..	»	»	»	»	..	4	»	»	»	»
Scapania gracilis.....	..	»	»	»	»	..	4	»	»	»	»
Martinellia gracilis.....	..	»	»	»	»	..	»	»	20	»	»
Stereodon cupressiformis.....	..	88	96	96	96	..	88	92	»	84	48
— imponens.....	..	»	»	»	»	..	»	»	60	»	»
Hylocomium parietinum.....	..	36	28	60	60	..	64	64	»	24	4
Hypnum fluitans.....	..	»	»	»	»	..	»	»	4	»	»
Campylopus pyriformis.....	..	4	»	4	»	..	»	»	»	»	»
Leucobryum glaucum.....	..	24	20	8	12	..	16	20	4	4	»
Dicranum scoparium.....	..	»	»	»	4	..	»	8	»	»	»
Polytrichum gracilis.....	..	»	4	»	»	..	»	»	»	»	»
Pohlia nutans.....	..	»	4	4	4	..	12	»	»	»	»
Gymnocybe palustris.....	..	»	»	16	4	..	16	8	»	»	4

Tabel 7 b. De biologiske Spektere for Hedemoselokaliteterne.

	Artstæthed				Den fanero-game Frekvensss.	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1.....	11.6	5.7	1.8	4.1	572	72.7	22.4	4.9	»	»
2.....	10.7	5.3	1.9	3.4	532	72.9	21.1	6.0	»	»
3.....	10.7	5.6	1.4	3.8	556	69.8	23.0	7.2	»	»
4.....	11.3	5.9	1.6	3.8	588	66.0	17.7	16.3	»	»
5.....	..	..	..	..	432	50.9	41.7	7.4	»	»
6.....	12.9	5.4	1.7	5.8	540	71.1	23.0	5.9	»	»
7.....	11.6	5.5	1.9	4.2	552	69.9	21.1	9.4	»	»
8.....	13.9	5.5	1.1	7.3	552	65.2	23.9	10.9	»	»
9.....	9.8	5.7	1.4	2.6	572	46.2	41.3	12.6	»	»
10.....	8.4	5.8	0.2	2.4	576	34.3	40.3	23.6	1.4	»

media og *Cephaloziella Hampeana* er de hyppigst forekommende. Af Bladmosser og Sphagnaceer forekommer *Hylocomium parietinum*, *Leucobryum glaucum*, *Sphagnum cuspidatum*, *tenellum* og *acutifolium*.

Erica-Eriophorum vaginatum-Mosens floristiske og biologiske Forhold svarer ret nøje til *Myrica*-Mosens. *Andromeda polifolia* og *Oxycoccus quadripetalus*

spiller dog en noget større Rolle her end i *Myrica*-Mosen; en anden og vigtig Forskel er den store Stigning af *Hepaticé*-Mængden i *Erica-Erioph. vaginat.*-Mosen.

Af typiske Hedemoser findes der i alt kun 5 paa Heden, fra Øst mod Vest følgende: i D2, umiddelbar Vest for Tophøj og Østgrænsen to smaa Moser, i C3 en større Mose, der nu er næsten helt opgravet, i C4—C5 Hedens største Mose og endelig i A6—B6 Nordspidsen af en udenfor det fredede Areal liggende Mose, der dog ogsaa er helt opgravet.

De to smaa østlige Hedemoser gør Indtryk af næppe nogen Sinde at have været Genstand for Tørvegravning, idet begge Mosers Overflade er dækket af Tuer med den tidligere beskrevne Hedemosevegetation uden Spor af Tørvegrave eller af den for disse karakteristiske Vegetation. Tabel 7 Nr. 2 viser Vegetationens Sammensætning i den nordlige, Tabel 7 Nr. 3 i den sydlige af disse Moser. Begge Moser er omgivet af en Bræmme af *Erica-Eriophorum vaginatum*-Formationen, der især er smukt udviklet langs Østranden, men langs Vestsiderne kun pletvis er til Stede. Udefter er begge Moserne til alle Sider omgivet af *Erica*-Hede.

Mosen i C3 er som tidligere nævnt næsten helt opgravet, saaledes at kun Randzonen med *Erica-Eriophorum vaginatum* er tilbage. Langs Randen af den store Tørvegrav, der udfylder Mosens centrale Del, findes dog Pletter tilbage af *Myrica*-Formationen. Tabel 7a Nr. 7 og 8 viser Cirklingsresultaterne fra Randzonen.

Mosegravene er fyldt med *Sphagnum* og et tæt Tæppe af Fanerogamer som *Eriophorum polystachyum* og *vaginatum* samt *Carex Goodenoughii*.

Hele Mosen er omgivet af et paa sine Steder ret bredt Bælte af *Erica*-Hede.

Hedens største og bedst bevarede Mose — Mosen i C4—C5 — er dannet i en flad skaalformig Lavning, der mod Sydvest, Øst og Nordøst er begrænset af lave Klitvolde og mod Vest har Afløb ud til Aadalen. I Lighed med de øvrige Moser er ogsaa denne omgivet af et Bælte af *Erica*-Hede, der især mod Nordøst er meget bredt. Selve Mosen er smukkest og mest regelmæssig udviklet i Lavningens østlige Del, hvor Tørven har en Dybde paa c. $\frac{3}{4}$ m. Mod Vest aftager Tørvedybden mere og mere og har ved Veststranden kun en Dybde paa c. $\frac{1}{4}$ m. Her erstattes Hedemoseformationerne af en fugtig *Erica*-Hede med spredte Grønmoser.

Mosens Midterparti er beklædt med den typiske *Myrica*-Formation, hvis Sammensætning fremgaar af Tabel 7a Nr. 1, 4 og 5. I dette Afsnit af Mosen findes en Del mindre Mosegrave, især Vest for de 4 store Birke og Øst for Højspændingslinien. Disse Mosegrave er vandfyldte med et tæt Tæppe af *Sphagnum cuspidatum* paa Overfladen og med en spredt Bevoksning af *Juncus supinus*, *Carex rostrata*, *Heleocharis multicaulis* og *Eriophorum polystachyum*.

Erica-Eriophorum vaginatum-Formationen, hvis floristiske Sammensætning fremgaar af Tabel 7a Nr. 1, omgiver ogsaa her *Myrica*-Formationen. Smukkest udviklet er Formationen langs Mosens Østrand, et uregelmæssigt smalt Bælte findes langs Sydvestranden og et betydeligt bredere, men uregelmæssigt formet Bælte langs Nordøstranden.

Vældmosen. I Mundingen af den dybe Kløft, der fra Vestsiden af F4 strækker sig i sydøstlig Retning ind i Heden, findes udviklet et lille Moseparti, der i floristisk

Sammensætning meget minder om Vældmoserne i Klitterænnet langs Vesterhavet, og hvis Dannelsel og Bestaaen er betinget af Trykvand. I Tabel 7 a Nr. 8 og 9 er Mosens floristiske Sammensætning fremstillet. Frekvensdominanterne er *Myrica gale*, *Erica tetralix*, *Eriophorum polystachy whole*, *Molinia coerulea* og *Narthecium ossifragum*. Likensaavelsom Mosvegetationen er betydelig fattigere her end i Hedemoserne, *Sphagnum*-Arterne er mere fremtrædende, *Hepaticéerne* er trængt stærkt tilbage.

4. Grønmoserne.

Som Kortet viser, er Antallet af Grønmoser paa Heden meget stort, en Optælling giver som Resultat et Aantal paa ikke mindre end 157; hertil kommer yderligere en Række Moser, hvis Areal var saa ringe, at de ikke blev indtegnede. Kortet viser tillige et karakteristisk Træk i Grønmosernes Fordeling paa Arealet: i det yderste 4—500 m brede Bælte, *Calluna*-Hede-Bæltet, forekommer der praktisk talt ingen Grønmoser; disse er knyttede til det indenfor liggende 5—600 m brede *Erica*-Hede-Bælte. Ved den ovenfor nærmere behandlede Linietaxering af Feltserierne 3 og 4, der maa anses for typiske for hele Heden, fremgik det, at Grønmoserne opviste 3 forskellige Toppunkter i Henseende til Udbredelse indenfor det undersøgte Areal. Det første Toppunkt i en Afstand af 5—600 m fra Aadalen betegner maximal Udvikling af den sommertørre Grønmose-Type, *Dicranum-Rhacomitrium*-Grønmosen, det andet Toppunkt 7—800 m fra Aadalen svarer til den mere eller mindre sommerfugtige *Sphagnum*-Grønmose, og endelig kendetegner det tredie Toppunkt i Afstanden 9—1000 m fra Aadalen maximal Udvikling af en fugtig *Sphagnum*-Grønmose, der danner Overgang til selve Hedemosen. Paa Heden forekommer yderligere, dog kun repræsenteret ved de to Grønmoser D 3¹³ og D 4¹⁰ en 4. Type: fugtige *Sphagnum*-Grønmoser med speciel udviklet Randzonevegetation. Denne Type er knyttet til Lavninger i Klitbankerne.

De fleste af Grønmoserne er kun af ringe Udstrækning, andre indtager et større Areal. De mindste, men til Gengæld de talrigste, forekommer i Hedens midterste og vestlige Felter, medens Grønmoserne mod Øst er færre, men betydelig større. Vegetationen er i de mindre Grønmoser ensartet gennem hele Mosen, i de lidt større ses ofte et fugtigere Midterparti, hvis Vegetation er forskellig fra Randzonens. I de meget store østlige Grønmoser forekommer en stærk Bæltedannelse. En Undersøgelse over Grønmosernes Vegetation bliver derfor først og fremmest en Undersøgelse over Bæltedannelsen i de enkelte Moser og en Klassifikation af de paaviste Plantesamfund.

A.. *Dicranum-Rhacomitrium*-Grønmoserne.

Som Exempler paa sommertørre Grønmoser er undersøgt foruden en Del mindre Moser uden Zonation Grønmoserne D 2⁹⁻¹⁰, B 4³ og D 3¹². Undersøgelerne har bestaaet dels i en Analyse, dels i en Kortlægning af de tilstedeværende Formationer. Analyseresultaterne er sammenstillet i Tabellerne 8 og 9.

Grønmose D 2⁹⁻¹⁰ (Tabel 8 a Nr. 1—3 og Fig. 14) er beliggende i Hedens nordøstlige Del i Nordkanten af Felt D 2 og bestaar som Kortskitsen viser af et næsten

kreds rundt, lidt dybere vestlig Parti, hvorfra der i østlig og sydøstlig Retning udgaar et Par mindre dybe Lavninger indbyrdes adskilte ved en *Calluna-Empetrum* bevokset Forhøjning.

Størstedelen af det vestlige Parti er bevokset med en meget tæt Vegetation af sparsomt fruktificerende *Carex Goodenoughii* med spredte *Agrostis canina* og *Nardus strictus*. Bunden er dækket af et tykt Lag visne fjorgamle *Carex*-Blade, der bevirker en sparsommere Udvikling af Mosvegetationen. Som Tabel 8 a Nr. 1 viser, bestaaer denne af Arter som *Stereodon cupressiformis*, *Blepharozia ciliaris*, *Dicranum scoparium*, *Hylocomium parietinum* og enkelte andre. Nogen Likenvegetation findes ikke.

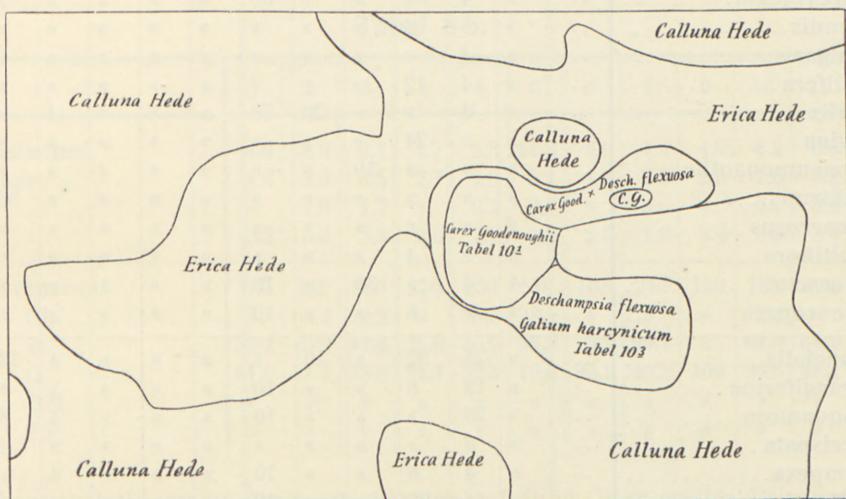


Fig. 14. Grønmose D 2⁹⁻¹⁰.

Ud mod Mosens Rand samt i den nordlige Bugt træder *Carex Goodenoughii* som dominerende Plante stærkt tilbage og Vegetationen er her dannet af *Deschampsia flexuosa*, *Nardus strictus*, *Eriophorum polystachyum* (ikke fruktificerende), *Carex panicea* og *Carex Goodenoughii* samt enkelte Individer af andre Arter (cfr. Tabel 8 a Nr. 2). Mosvegetationen er frodigere udviklet her end i den rene *Carex Goodenoughii*-Formation og er fortrinsvis dannet af de samme Arter: *Stereodon cupressiformis*, *Hylocomium parietinum*, *Dicranum scoparium* og *Blepharozia ciliaris*, nogle Arter er dog nye som *Jungermannia inflata* og *Cephaloziella Hampeana*. Likener er til Stede, men spiller ikke nogen stor Rolle, hyppigst forekommer *Cladonia Floerkeana*, *squamosa* og *uncialis*.

I den sydøstlige Bugt, der er mindre dyb end de to foregaaende Afsnit af Mosen, har vi en Græs-Grønmosevegetation med *Deschampsia flexuosa* som Fysiognomidominant og med *Galium harcynicum* og *Carex panicea* som Frekvensdominanter. Vegetationen er iøvrigt ret aaben og gør Indtryk af at være under Indvandring, hvad Tilstedeværelsen af en hel døde Lyngstængler ogsaa synes at tyde paa. Mosvegetationen (cfr. Tabel 8 a Nr. 3) svarer noje til Mosvegetationen i den nordøstlige

Tabel 8 a. Sommertørre Grønmoser. Cfr. Teksten.

		1	2	3	4	5	6	7	8	9	10	11	12	13
Carex Goodenoughii . . . . .	..	100	60	16	100	30	50	100	28	100	48	100	100	56
— panicea . . . . .	..	»	64	80	100	100	40	4	64	50	12	20	28	52
Eriophorum polystachyum . . .	..	»	72	24	»	»	»	»	8	»	»	»	8	40
Molinia coerulea . . . . .	..	4	»	»	»	100	80	»	100	»	100	100	»	4
Deschampsia flexuosa . . . . .	..	»	84	100	»	»	100	4	8	»	»	4	16	100
Nardus strictus . . . . .	..	28	48	4	»	»	100	»	»	»	»	»	»	64
Agrostis canina . . . . .	..	28	4	4	30	»	»	»	40	»	»	64	88	56
Galium harcynicum . . . . .	..	»	4	80	»	»	50	»	»	»	»	»	»	4
Agrostis tenuis . . . . .	..	»	»	4	»	»	»	»	»	»	»	»	»	»
Calluna vulgaris . . . . .	..	»	4	»	»	»	»	»	»	»	»	»	»	»
Carex pilulifera . . . . .	..	»	4	12	»	»	»	»	»	»	»	»	»	»
Erica tetralix . . . . .	..	»	4	»	»	20	70	»	»	»	4	»	»	»
Festuca ovina . . . . .	..	»	»	24	»	»	»	»	»	»	»	»	»	»
Gentiana pneumonanthe . . .	..	»	»	»	10	»	»	»	»	»	»	»	»	»
Juncus filiformis . . . . .	..	»	»	»	»	»	»	»	»	»	»	36	»	»
— squarrosum . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	»	24
Luzula multiflora . . . . .	..	»	»	4	»	»	»	»	»	»	»	»	»	»
Potentilla erecta . . . . .	..	4	4	»	30	»	10	»	»	»	»	»	»	»
Trientalis europaea . . . . .	..	»	»	8	»	»	10	»	»	»	»	»	»	»
Cladonia uncialis . . . . .	..	»	28	32	»	10	»	»	»	»	4	12	»	20
— rangiferina . . . . .	..	»	12	8	»	»	10	»	»	»	»	»	8	16
— squamosa . . . . .	..	»	28	»	»	10	»	»	»	»	4	8	»	28
— crispata . . . . .	..	»	8	»	»	»	»	»	»	»	»	4	»	16
— impexa . . . . .	..	»	4	8	»	»	10	»	»	»	4	»	»	»
— Floerkeana . . . . .	..	»	44	96	»	»	40	»	»	»	»	»	»	68
Cetraria islandica . . . . .	..	»	4	8	»	»	»	»	»	»	»	»	»	»
Cladonia chlorophaea . . . .	..	»	»	12	»	»	»	»	»	»	»	»	»	»
— gracilis . . . . .	..	»	»	4	»	»	»	»	»	»	»	4	»	»
— silvatica . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	»	4
— pleurota . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	»	4
Blepharozia ciliaris . . . . .	..	80	84	76	»	40	100	96	52	90	64	84	68	100
Stereodon cupressiformis . . .	..	88	92	72	90	»	80	80	16	»	»	48	28	44
Dicranum scoparium . . . . .	..	72	80	76	20	40	»	96	8	80	24	100	100	100
Rhacomitrium hypnoides . . .	..	12	»	»	90	100	»	16	100	50	20	92	88	20
Hylocomium parietinum . . . .	..	60	76	72	»	»	90	4	»	»	4	88	100	100
Stereodon imponens . . . . .	..	4	»	»	»	60	»	4	»	80	12	8	»	»
Pohlia nutans . . . . .	..	8	»	»	»	»	»	»	»	»	»	12	20	»
Jungermannia inflata . . . . .	..	»	28	40	»	»	»	»	»	»	20	»	8	36
Cephaloziella Hampeana . . .	..	»	20	24	»	»	30	»	4	10	»	»	»	»
Jungermannia Kunzeana . . .	..	»	»	8	»	»	70	»	»	»	»	»	»	»
— Hatcheri . . . . .	..	»	»	4	»	»	»	»	»	»	»	»	»	»
— Floerkei . . . . .	..	»	»	4	»	»	70	»	»	»	»	»	»	»
Leucobryum glaucum . . . . .	..	»	»	»	»	20	»	»	»	»	»	»	»	»
Dicranum intermedium . . . .	..	»	»	»	»	10	»	»	»	»	»	»	»	»
Jungermannia gracilis . . . . .	..	»	»	»	»	»	20	»	»	10	»	»	»	»
— barbata . . . . .	..	»	»	»	»	»	40	»	»	»	»	»	»	»

Tabel 8 a (fortsat).

	1	2	3	4	5	6	7	8	9	10	11	12	13
Dicranum rugosum	»	»	»	»	40	»	»	»	»	»	»	»
Hylocomium squarrosum	»	»	»	»	10	»	»	»	»	»	»	»
Dicranum spurium	»	»	»	»	»	»	8	»	»	»	»	»
Jungermannia ventricosa	»	»	»	»	»	»	»	20	»	»	»	×
Sphagnum cuspidatum	»	»	»	»	»	»	»	»	4	»	»	»
— compactum	»	»	»	»	»	»	»	»	4	»	»	»
— tenellum	»	»	»	»	»	»	»	»	8	»	»	»

Tabel 8 b.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Totale Artstæthed	4.9	8.6	9.1	4.7	5.3	11.3	4.0	4.4	4.9	4.4	6.8	6.4	9.8
Fanerogamer	1.6	3.5	3.6	2.7	2.5	5.1	1.1	2.5	1.5	1.6	3.2	2.4	4.0
Likener	»	1.9	1.7	»	0.1	0.7	»	»	»	0.1	0.2	0.1	1.6
Mosser	3.2	3.8	3.8	2.0	2.7	5.5	3.0	1.9	3.4	2.6	3.4	3.9	4.2
Frekvenssum	164	352	360	270	250	510	108	248	150	164	324	240	400
Ch	»	3.4	22.2	»	8.0	23.5	»	»	»	2.4	»	»	1.0
H	39.2	40.9	42.2	25.9	40.0	56.9	3.7	59.7	»	61.0	51.9	43.3	62.0
G	61.0	55.7	35.6	74.1	52.0	19.6	96.3	40.3	100	36.6	48.1	56.7	37.0
HH	»	»	»	»	»	»	»	»	»	»	»	»	»
Th	»	»	»	»	»	»	»	»	»	»	»	»	»

Bugt, Likenvegetationen er derimod stærkere udviklet, især spiller Primærthallus af *Cladonia Floerkeana* en stor Rolle.

Mod Øst fortsætter den nordlige Bugt i en *Erica-Scirpus-Cladina-Hede*, den sydlige Bugt er derimod omgivet af *Calluna-Empetrum-Hede*. Mod Vest støder Grønmosen op til et meget smukt Parti ren *Erica-Scirpus-Hede*.

Hele Mosen var, da Undersøgelserne i Juli 1924 blev foretaget, fuldstændig tør.

Grønmose B4⁴ (Tabel 8a Nr. 4—6).

Et andet Exempel paa en sommertør, zonedelt Grønmose er den lille Grønmose B4⁴. I Henseende til Vegetationens Sammensætning staar den Grønmose D2⁹⁻¹⁰ ret nær. I Mosens Midte bestaar Vegetationen af et tæt Tæppe af *Carex Goodenoughii* og *Carex panicea* med *Stereodon cupressiformis* og *Rhacomitrium hypnoides* i Bunden. Spredt findes *Potentilla erecta* og *Agrostis canina* samt den paa Heden sjeldent forekommende *Gentiana pneumonanthe* (Tabel 8a Nr. 4).

Paa lidt højere Bund (Tabel 8a Nr. 5) er Vegetationen dannet af *Carex panicea* og *Molinia coerulea* i et tæt Mostætte af *Rhacomitrium hypnoides*. Spredt forekommer en Del Fanerogamer, Likener og Mosser som *Carex Goodenoughii*, *Erica tetralix*, *Cladonia uncialis* og *Floerkeana*, *Stereodon imponens*, *Blepharozia ciliaris*, *Leucobryum glaucum*, *Dicranum scoparium* og *intermedium*.

Imod Mosens Nordvesthjørne gaar denne Formation over i en Græs-Grønmose med *Nardus strictus*, *Deschampsia flexuosa* og *Molinia coerulea* som Frekvensdominanter og med en rigelig Iblanding af Arter som *Erica tetralix*, *Galium harcynicum*, *Potentilla erecta* og *Trientalis europaea* samt de to Carex-Arter *Carex Goodenoughii* og *panicea*. Bunden i denne Formation er tuet og paa og imellem Tuerne findes en yppig Mosvegetation dannet af Arterne *Blepharozia ciliaris*, *Stereodon cupressiformis* og *Hylocomium parietinum* men med et paafaldende stort Kontingent af *Hepaticae*. Likenerne spiller ligeledes en større Rolle i denne Formation end i den lavere liggende *Molinia-Carex panicea*-Formation. Primærhallus af *Cladonia Floerkeana* er hyppigt forekommende.

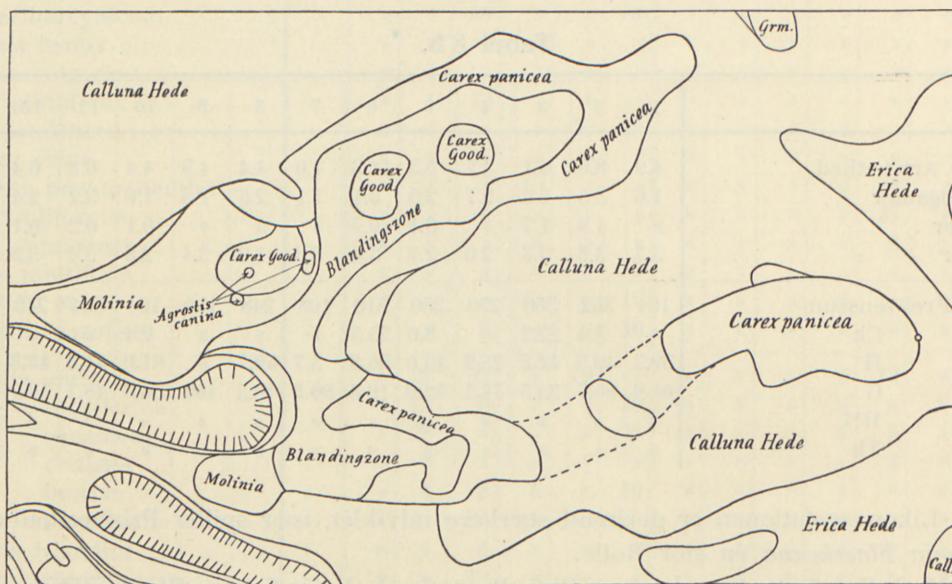


Fig. 15. Grønmose D 3¹².

Grønmose D 3¹². (Cfr. Tabel 9 a Nr. 1—8 samt Fig. 15.)

Det største og smukkest udviklede, men ogsaa det artsfattigste Grønmosekomplex af denne Type er D 3¹². Mosen ligger umiddelbart Nordøst for den midterste Klitknude og bestaar af to i nordøstlig—sydvestlig Retning gaaende Slunder, adskilt ved en *Calluna-Empetrum* bevokset Forhøjning. Disse to næsten parallelt løbende Slunder er formodentlig gamle Flodeljer for Smeltevandet, der en Tid har løbet i denne Retning fra Sønder Omme Fladen ud mod Havet. Da der saa senere blev Sandflugt, har en Klitrimme lagt sig hen over Lavningernes Vestside og derved hindret Vandet i at løbe bort. Dette har saa atter givet Anledning til Dannelsen af en Grønmose af en meget karakteristisk og for de to Slunder næsten overensstemmende Bygning.

Fig. 15 viser Grønmosens Formationer og dens Omgivelser. Ejendommeligt for Mosen er Manglen eller den ringe Udvikling af en *Erica*-Hede-Zone og det til Trods for, at denne Formation iøvrigt er veludviklet indenfor Feltet. De fleste Steder grænser Grønmosen derfor op til *Calluna-Empetrum*-Hede.

Tabel 9 a. Grønmose D 3¹².

		1	2	3	4	5	6	7	8
Molinia coerulea .....	..	100	»	»	»	»	»	»	»
Carex Goodenoughii .....	..	12	100	100	70	96	»	8	64
— panicea .....	..	»	»	»	»	88	100	100	100
Eriophorum polystachyum .....	..	»	»	12	»	76	»	8	12
Agrostis canina .....	..	»	»	»	100	»	»	»	»
Erica tetralix .....	..	»	»	»	»	»	»	»	16
Scirpus caespitosus .....	..	»	»	»	»	4	»	»	»
Cladonia uncialis .....	..	»	»	»	»	24	68	88	92
— rangiferina .....	..	»	»	»	»	24	52	28	48
— impexa .....	..	»	»	»	»	4	32	12	28
— squamosa .....	..	»	»	»	»	24	52	44	32
— crispata .....	..	»	»	»	»	8	4	4	20
— Floerkeana .....	..	16	»	»	»	»	4	»	»
Sphagnum cuspidatum .....	..	»	»	100	»	32	»	»	»
Stereodon imponens .....	..	16	8	»	40	100	100	100	96
Rhacomitrium hypnoides .....	..	»	4	»	20	72	52	60	56
Blepharozia ciliaris .....	..	16	4	»	»	100	100	96	100
Dicranum scoparium .....	..	4	»	»	40	76	52	8	28
Hylocomium parietinum .....	..	»	»	»	»	20	56	»	4
Cephaloziella divaricata .....	..	»	»	»	»	»	»	4	4
— Hampeana .....	..	»	»	»	»	8	»	»	8
Dicranum Bonjeani .....	..	52	»	»	»	»	52	4	»
— spurium .....	..	»	»	»	»	4	»	8	8
Gymnocybe palustris .....	..	»	»	4	»	»	»	»	»
Hypnum fluitans .....	..	»	»	20	»	»	»	»	»
Jungermannia inflata .....	..	»	»	»	»	4	»	12	»
— Kunzeana .....	..	»	»	»	»	»	»	»	8
— ventricosa .....	..	»	»	»	»	32	»	»	4
Leucobryum glaucum .....	..	»	»	»	»	»	»	4	16
Pohlia nutans .....	..	4	»	»	»	»	4	»	»
Polytrichum commune .....	..	4	»	»	»	»	4	»	»
Sphagnum subsecundum .....	..	»	»	12	»	»	»	»	»
Totale Artstæthed .....	..	1.8	1.2	2.5	2.7	8.0	6.8	5.8	7.4
Fanerogamer .....	..	1.1	1.0	1.1	1.7	2.6	1.0	1.2	1.9
Likener .....	..	0.2	»	»	»	0.8	2.1	1.8	2.2
Mosser .....	..	0.5	0.2	1.4	1.0	4.5	3.9	2.9	3.3
Frekvenssum .....	..	112	100	112	170	264	100	116	192
Ch .....	..	»	»	»	»	»	»	»	8.3
H .....	..	89.3	»	»	58.8	1.5	»	»	»
G .....	..	10.7	100.0	100.0	41.2	98.5	100.0	100.0	91.7
HH .....	..	»	»	»	»	»	»	»	»
Th .....	..	»	»	»	»	»	»	»	»

Det nordlige Parti af Mosen er det største og dybeste; men dog ikke dybere end at det en stor Del af Sommeren er helt udtørret. Det dybeste Parti ligger i Midten af Lavningen, lidt Nord for den vestlige Rimmes Endepunkt, og er dækket af en tæt Vegetation af kraftigt voxende *Carex Goodenoughii* (Tabel 9 a Nr. 2). Bunden mellem Planterne er dækket af de døde fjorgamle *Carex*-Blade, der ligger saa tæt, at Mosvegetationen ikke kan komme til Udvikling. I Tilknytning til dette *Carex Goodenoughii*-Parti er der udviklet en *Agrostis canina-Carex Goodenoughii*-Formation med en noget rigeligere Mosvegetation. Denne Formation findes dog kun som 3 smaa — faa Meter store — Bevoksninger (Tabel 9 a Nr. 4).

Længere mod Øst ligger, som Fig. 15 viser, endnu et Par Pletter bevokset med *Carex Goodenoughii* (Tabel 9 a Nr. 3). Planterne vokser dog ikke saa tætte her, og Bunden er dækket af et tyndt Tæppe af *Sphagnum cuspidatum* med spredte *Sphagnum subsecundum*, *Hypnum fluitans* og *Gymnocybe palustris*.

I Lavningens vestlige Parti findes en stærk tuet Vegetation med *Molinia coerulea* som eneste Fysiognomidominant og med spredt voxende *Carex Goodenoughii* (Tabel 9 a Nr. 1). Paa Siderne af *Molinia*-Tuerne findes en yderst sparsom Mos- og Liken-vegetation. Aarsagen til denne Sparsomhed maa sikkert her som andet Steds søges i det tætte Dække af visne fjorgamle Græsblade, der dækker Bunden mellem Tuerne. Formationen er renest udviklet Vest for *Carex*-Lavningen, mod Øst udviskes dens Karakter mere og mere, idet *Molinia*-Tuerne bliver mere og mere spredtstaende og *Carex Goodenoughii* tiltager i Mængde.

Paa lidt højere Bund end de tre foregaaende Formationer faar vi i et Bælte Øst for og omgivende disse en Vegetation dannet af en ligelig Blanding af *Carex Goodenoughii*, *Carex panicea* og *Eriophorum polystachyum* (ikke fruktificerende) (Tabel 9 a Nr. 5). Mosvegetationen er veludviklet og sammensat først og fremmest af *Stereodon imponens* og *Blepharozia ciliaris*: begge Arter forekommer med en Frekvensprocent paa 100. Mindre hyppige er *Rhacomitrium hypnoides* og *Dicranum scoparium*, sparsomt forekommer *Hylocomium parietinum*, *Sphagnum cuspidatum* og *Jungermannia ventricosa* og enkeltvis en Del andre Arter. Likenvegetationen er stadig sparsomt udviklet, hyppigst forekommer *Cladonia uncialis*, *squamosa* og *rangiferina*.

Langs Mogens Rand imod Nordøst, Øst og Sydøst findes et smallere til bredere Bælte med *Carex panicea* som eneste dominerende Fanerogam (Tabel 9 a Nr. 6). Mosvegetationen er ogsaa i denne Formation veludviklet og dannet først og fremmest af *Stereodon imponens* og *Blepharozia ciliaris* med en rigelig Indblanding af *Rhacomitrium hypnoides*, *Dicranum scoparium* og *Bonjeani* samt *Hylocomium parietinum*. Likenvegetationen er langt mere fremtrædende i denne end i den ovennævnte Formation og dannet af Arterne *Cladonia uncialis*, *rangiferina*, *squamosa* og *impexa*.

Carex panicea-Formationen grænsler op til *Erica*-Hede eller *Calluna-Epemtrum*-Hede.

Det sydlige Parti af Mosen er mindre af Areal og ikke saa bred og dyb som det nordlige. Bortset fra Mangelen af *Carex Goodenoughii* og *Agrostis canina*-Formationen, der netop er en Følge af dette Forhold, er Vegetationen og dens Fordeling den samme her som i det nordlige Parti, hvad et Blik paa Fig. 15 tilstrækkelig tydelig

viser. Lavningens Vestside er her som ovenfor dækket af en *Molina*-Formation med den tidligere beskrevne karakteristiske Udseende og Bygning. Øst for *Molinia*-Formationen forekommer den samme *Eriophorum polystachyum*-*Carex Goodenoughii*-*Carex panicea*-Formation som ovenfor og atter her gaar den jævnt over i en *Carex panicea*-Randzone, hvis floristiske Sammensætning fremgaar af Tabel 9a Nr. 7. Denne Formation fortørner sig i den Øst for Lavningen liggende *Calluna-Empetrum*-Hede, men fortætter sig igen i den længere mod Øst liggende Grønmose D3¹⁰, hvis Vegetation er gengivet i Tabel 9a Nr. 8. Mod Syd grænser Grønmosen op til en *Erica-Carex panicea-Scirpus*-Hede.

De 3 ovennævnte Grønmoser er de bedste Exempler paa sommertørre Grønmoser paa Heden. Hertil hører ligeledes de fleste af Hedens smaa Grønmoser. I Tabel 8a Nr. 7—13 er anført en Række Exempler paa disse Grønmosers Vegetation, hver Kolonne repræsenterende hver sin lille Grønmose. Der møder os her det samme Totalindtryk af Vegetationen som ved de ovennævnte mere kompliceret byggede Grønmoser: en artsfattig, artsspredt Vegetation dannet af Hemikryptofytter og Geofytter eller en ligelig Blanding af begge Livsformtyper, for nogle Formationers Vedkommende med en ringe Likenvegetation. Relativ artstæt er Mosvegetationen med *Dicranum scoparium*, *Rhacomitrium hypnoides*, *Blepharozia ciliaris*, *Stereodon cupressiformis*, *Stereodon imponens* og *Hylocomium parietinum* som mere eller mindre konstant forekommende Frekvensdominanter. *Sphagnum*-Arterne og Hepaticerne spiller ingen eller kun en ubetydelig Rolle.

I de geofytrige Typer er *Carex Goodenoughii* den eneste Fysiognomi- og Frekvensdominant og repræsenterer en relativ fugtig Type; i de hemikryptofytrige mere tørre Formationer deler denne Art eller *Carex panicea* Pladsen med Hemikryptofytter som *Molinia coerulea*, *Deschampsia flexuosa* og *Agrostis canina*. I disse er Likenvegetationen relativ righoldig.

B. *Sphagnum cuspidatum*-Grønmoserne.

De dybere Smaamoser eller de større Lavninger længere inde paa Heden vil være vanddækkede det meste af eller hele Sommeren med de Afgigelser i Vanddækningstidens Længde som Vexlingen mellem tørre og fugtige Somre selvfølgelig giver Anledning til. Virkningen paa Vegetationen af den større Jordfugtighed spores først og fremmest paa Mosvegetationen, der i denne Grønmosetype bestaar af *Sphagnum cuspidatum*. I de centrale, fugtigste Partier er Arten eneraadende, mod Randen mere eller mindre stærkt indblandede med en Række andre Arter, *Sphagnum*-Arter eller *Hepaticae*. De fleste større Grønmoser og en Mængde smaa, forudsat at de er tilstrækkelig dybe, hører til denne Grønmosetype. Typen er især udbredt i Hedens midterste og østlige Felte. De store Grønmoser i Felte D5—D6 hører ogsaa til denne Type.

Som Exempler paa de større mere kompliceret byggede Grønmoser af denne Type er undersøgt Grønmose E1—2¹, D3³ og D5—6⁷, som Exempler paa mindre kompliceret byggede Grønmoser D3⁸ og D2⁴.

Grønmose E1—2¹ (cfr. Tabel 10 a Nr. 1—10 og Fig. 16) er en 20—60 m bred c. 300 m lang Grønmose, der er beliggende i Hedens nordøstlige Hjørne, umiddelbart Syd for Vejen fra Nørholm Øst paa til Hodde. Mosens østlige Parti afskæres af Grænselinien og ligger Øst for det fredede Areal. I hele sin Udstrækning er Mosen en *Sphag-*

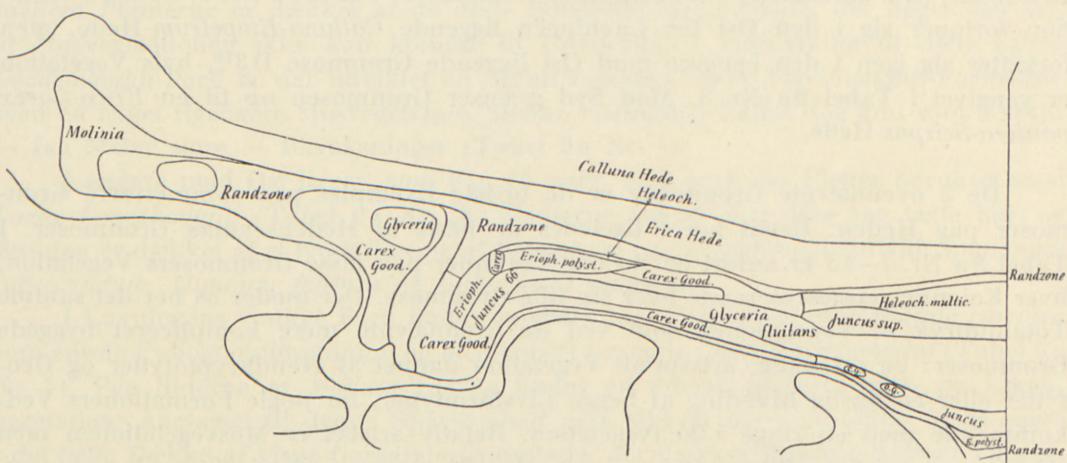


Fig. 16. Grønmose E 1—2¹.

num cuspidatum-Mose, idet denne Art i Mosens Midte er eneherskende, imod Randen og imod Vest i Selskab med en Del *Sphagnum subsecundum*. Paa *Sphagnum*-Tæppet findes udviklet en Række Formationer, hvis Udbredelse er indtegnet paa Fig. 16. Rækkefølgen af Formationer er fra Mosens Midte mod dens Rand:

- | | |
|--|--------------------|
| 1) <i>Glyceria fluitans</i> -Formationen | Tabel 10 a Nr. 1—2 |
| 2) <i>Juncus supinus</i> -Formationen | — 10 a Nr. 3—4 |
| 3) <i>Heleocharis multicaulis</i> -Formationen | — 10 a Nr. 5 |
| 4) <i>Carex Goodenoughii</i> -Formationen | — 10 a Nr. 6 og 8 |
| 5) <i>Eriophorum polystachyum</i> -Formationen | — 10 a Nr. 7 |
| 6) <i>Molinia coerulea</i> -Randzonen | — 10 a Nr. 9—10 |

Paa Grund af Mosens langstrakte Form bliver de enkelte Formationer ogsaa udviklede som lange smalle, undertiden afbrudte Baand, hvis indbyrdes Fordeling dog tydelig lader sig paavise, hvad enten man i Mosens østlige Parti gaar fra Midten mod Nord eller Syd eller passerer paa langs gennem Mosen mod Vest. De fugtigste Formationer: *Glyceria fluitans*-, *Juncus supinus*- og *Heleocharis multicaulis*-Formationen er smukkest udviklet i Mosens østlige Parti, hvor de øvrige Formationer kun findes som meterbrede Baand. Mod Vest forsvinder de førstnævnte mere eller mindre hurtigt, medens *Carex Goodenoughii*, *Eriophorum polystachyum* og *Molinia coerulea* til Gengæld danner store rene Bestande. En mere indgaaende Behandling af Mosen viser dette nærmere.

Tabel 10 a. Grønmose i E 1—2.

		1	2	3	4	5	6	7	8	9	10	11	12
Glyceria fluitans	HH	96	96	72	12	4	»	»	»	»	»	»	»
Juncus supinus	H	20	20	100	100	24	»	4	»	»	»	»	»
Hydrocotyle vulgaris	H	28	84	100	100	72	4	4	»	»	»	»	»
Agrostis canina	H	»	24	»	76	12	»	4	»	»	»	»	»
Eriophorum polystachyum	G	»	8	20	20	12	28	100	16	4	100	4	»
Heleocharis multicaulis	H	»	»	36	4	100	»	»	»	»	»	»	»
Carex Goodenoughii	G	»	»	»	»	»	100	8	100	80	48	24	»
Molinia coerula	H	»	»	»	»	»	»	»	4	88	100	40	»
Carex panicea	G	»	»	»	»	»	»	»	76	28	60	»	»
Erica tetralix	Ch	»	»	»	»	»	»	»	12	16	96	»	»
Empetrum nigrum	Ch	»	»	»	»	»	»	»	»	»	40	84	»
Calluna vulgaris	Ch	»	»	»	»	»	»	»	»	»	52	96	»
Arctostaphylos uva ursi	Ch	»	»	»	»	»	»	»	»	»	»	56	»
Andromeda polifolia	Ch	»	»	»	»	»	»	»	»	4	4	»	»
Nardus strictus	H	»	»	»	»	»	»	»	»	8	»	»	»
Scirpus caespitosus	H	»	»	»	»	»	»	»	»	»	48	»	»
Sphagnum cuspidatum . . . . .	..	100	100	100	100	100	100	100	100	72	100	»	»
— subsecundum . . . . .	..	»	»	»	»	»	»	»	80	8	64	»	»
Jungermannia inflata . . . . .	..	»	»	»	»	»	»	»	»	88	12	»	»
Blepharozia ciliaris . . . . .	..	»	»	»	»	»	»	»	»	52	4	40	72
Stereodon imponens . . . . .	..	»	»	»	»	»	»	»	»	84	4	»	4
— cupressiformis . . . . .	..	»	»	»	»	»	»	»	»	»	76	100	»
Hypnum fluitans . . . . .	..	»	»	»	»	»	»	»	56	8	»	»	»
Cephaloziella Hampeana* . . . . .	..	»	»	»	»	»	»	»	4	»	»	4	8
Sphagnum tenellum . . . . .	..	»	»	»	»	»	»	»	»	8	»	»	»
— compactum . . . . .	..	»	»	»	»	»	»	»	»	4	»	»	»
Jungermannia Kunzeana . . . . .	..	»	»	»	»	»	»	»	»	20	»	4	»
— ventricosa . . . . .	..	»	»	»	»	»	»	»	»	20	»	»	»
Rhacomitrium hypnoides . . . . .	..	»	»	»	..	..	..	..	..	32	»	4	»
Pohlia nutans . . . . .	..	»	»	..	..	..	..	..	..	8	»	4	»
Hylocomium parietinum . . . . .	..	»	»	..	..	..	..	..	..	8	»	12	8
Dicranum scoparium . . . . .	..	»	..	..	..	..	..	..	..	16	»	»	»
— spurium . . . . .	..	»	..	..	..	..	..	..	..	4	»	»	»
Leucobryum glaucum . . . . .	..	»	..	..	..	..	..	..	..	»	»	16	»
Cladonia impexa . . . . .	..	..	..	..	..	..	..	..	..	»	»	100	100
— silvatica . . . . .	..	..	..	..	..	..	..	..	..	»	»	80	88
— rangiferina . . . . .	..	..	..	..	..	..	..	..	..	»	»	80	92
— uncialis . . . . .	..	..	..	..	..	..	..	..	..	»	»	68	60
— chlorophaea . . . . .	..	..	..	..	..	..	..	..	..	»	»	24	44
Cetraria aculeata . . . . .	..	..	..	..	..	..	..	..	..	»	»	32	44
— islandica . . . . .	..	..	..	..	..	..	..	..	..	»	»	8	»
Cladonia squamosa . . . . .	..	..	..	..	..	..	..	..	..	12	»	8	4
— crispata . . . . .	..	..	..	..	..	..	..	..	..	»	»	8	24
— gracilis . . . . .	..	..	..	..	..	..	..	..	..	»	»	8	»

Tabel 10 b. De biologiske Spektre.

	Artstæthed				Den fanero-game Frekvenss.	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1	2.4	1.4	»	1.0	144	»	33.3	»	66.7	»
2	3.3	2.3	»	1.0	232	»	55.2	3.4	41.4	»
3	4.3	3.3	»	1.0	328	»	72.0	6.1	22.0	»
4	4.1	3.1	»	1.0	312	»	89.7	6.4	3.8	»
5	3.2	2.2	»	1.0	224	»	92.9	5.4	1.8	»
6	2.3	1.3	»	1.0	132	»	3.0	97.0	»	»
7	2.2	1.2	»	1.0	120	»	10.0	90.0	»	»
8	3.6	1.2	»	2.4	120	»	3.3	96.7	»	»
9	7.0	2.6	0.1	4.3	260	4.6	33.8	61.5	»	»
10	4.8	3.0	»	1.8	300	5.3	36.0	58.7	»	»
11	9.8	4.0	4.2	1.6	404	47.5	21.8	30.7	»	»
12	8.9	2.4	4.6	2.0	236	100.0	»	»	»	»

Hvor Mosen er fugtigst findes en *Glyceria fluitans-Sphagnum cuspidatum*-Formation, Tabel 10 a Nr. 1—2; *Glyceria fluitans* er rigelig fruktificerende men ret spredt staaende. Hist og her vokser tillige *Juncus supinus*, *Hydrocotyle* og *Agrostis canina*, denne sidste Art især mod Vest i Formationens smallere Del, endvidere enkelte Skud af *Eriophorum polystachyum*. Lokalitet Nr. 1 er fra Formationens østlige, brede Parti, Nr. 2 fra det smalle vestlige.

Lidt nærmere Randen saavel mod Nord som mod Syd bliver *Juncus supinus* Frekvensdominant og danner ved sine røde Stængler en velafgrænsset Formation uden om *Glyceria*-Formationen. *Juncus supinus* er Karakterplante sammen med *Hydrocotyle* og i Mosens vestlige Del ligeledes sammen med *Agrostis canina*, spredt forekommer endvidere *Glyceria fluitans*, *Eriophorum polystachyum*, *Heleocharis multicaulis* og et enkelt Sted *Comarum palustre* (Tabel 10 a Nr. 3—4).

Heleocharis multicaulis-Formationen følger efter *Juncus*-Bæltet, den er smukkest udviklet i Grønmosens nordøstlige Del, hvor den danner et 50—60 m langt og indtil 12—14 m bredt Bælte; endvidere findes Formationen som et næppe meterbredt Bælte Nord for *Eriophorum polystachyum*-Formationen længere mod Vest. Det store nordøstlige Parti er kun en Tunge af et større og langt renere udviklet Parti af en *Heleocharis multicaulis*-Formation som ligger i Mosens østlige, ikke fredede Parti.

Formationens floristiske Sammensætning fremgaar af Tabel 10 a Nr. 5. *Heleocharis multicaulis* danner et tæt mørkegrønt Tæppe ovenpaa *Sphagnum cuspidatum*-Tæppet, temmelig hyppig forekommer ligeledes *Hydrocotyle* og hist og her Tuer af *Carex Goodenoughii* samt spredte Skud af *Eriophorum polystachyum* og smaa Pletter af *Juncus supinus*.

Carex Goodenoughii-Formationen findes som et smallere til bredere Bælte udenfor og ovenfor de nys nævnte Formationer. Den er især veludviklet i Mosens udvidede Midterparti og forekommer endvidere som et isoleret Parti længere Vest paa. Tabel 10 a Nr. 6 viser Vegetationens Sammensætning det førstnævnte Sted, Tabel 10 a Nr. 8

det sidstnævnte. *Carex Goodenoughii* er eneste Frekvensdominant, paa førstnævnte Lokalitet vokser Arten i større eller mindre Tuer, med lodret voksende Rhizomer, paa sidstnævnte med vandret voksende og som et jævnt Tæppe. I mindre Mængde forekommer *Eriophorum polystachyum*, *Hydrocotyle vulgaris* og *Molinia coerulea*. Mosvegetationen er det førstnævnte Sted udelukkende dannet af *Sphagnum cuspidatum*; paa sidstnævnte Lokalitet af denne Art i Selskab med *Sphagnum subsecundum* og *Hypnum fluitans*.

Eriophorum polystachyum-Formationen er ligeledes stærkest udviklet i Mosens midterste Parti og forekommer under Fugtighedsforhold, der næppe er forskellige fra *Carex Goodenoughii*-Formationens.

Eriophorum polystachyum er den eneste fanerogame Frekvensdominant. Arten er i denne Formation rigeligt fruktificerende (cfr. Tabel 10 a Nr. 7).

Omgivende Mosen i hele dens Ustrækning, men især veludviklet i dens vestlige Del forekommer en Randzone med *Molinia coerulea* og ikke fruktificerende *Eriophorum polystachyum* som Frekvensdominanter. Spredt i denne Formation forekommer endvidere *Carex Goodenoughii*, *Carex panicea*, *Erica tetralix* o. fl. a. Mosvegetationen (Tabel 10 a Nr. 10) er sammensat af *Sphagnum cuspidatum* og *Sph. subsecundum* og enkelte andre Arter. En Likenvegetation mangler.

Som en Variant af *Molinia*-Randzonen maa Vegetationen i Mosens Nordvesthjørne opfattes. Denne bestaar her af *Molinia coerulea*, *Carex Goodenoughii* og *Carex panicea*. *Molinia* forekommer som større eller mindre Tuer og *Carex*-Arterne vokser i Mellemrummene mellem disse. Mosvegetationen er vidt forskellig fra den egentlige Randzones. Paa den fugtigste Bund nærmest Randzonen og i Mellemrummene mellem Tuerne bestaar den fortrinsvis af *Sphagnum cuspidatum*, nærmere Randen især af *Jungermannia inflata*, *Kunzeana* og *ventricosa*, *Blepharozia ciliaris* og *Stereodon imponens* (Tabel 10 a Nr. 9).

Mosen er i sin hele Ustrækning omgivet af et Bælte af *Erica tetralix*-Hede, der opadtil efter gaar over i *Calluna-Arctostaphylos*-Hede. De to sidste Kolonner i Tabel 10 a viser den nærmere Sammensætning af den omgivende Hede. Vegetationen er nu totaltændret. Grønmosernes Geofyt- og Hemikryptofytvegetation har nu helt eller delvist maattet vige Pladsen for Hedens Chamaefytvegetation. *Sphagnum*-Arterne er erstattede af en Bladmosvegetation, og der er udviklet en rig Vegetation af Likener mellem Chamaefytterne.

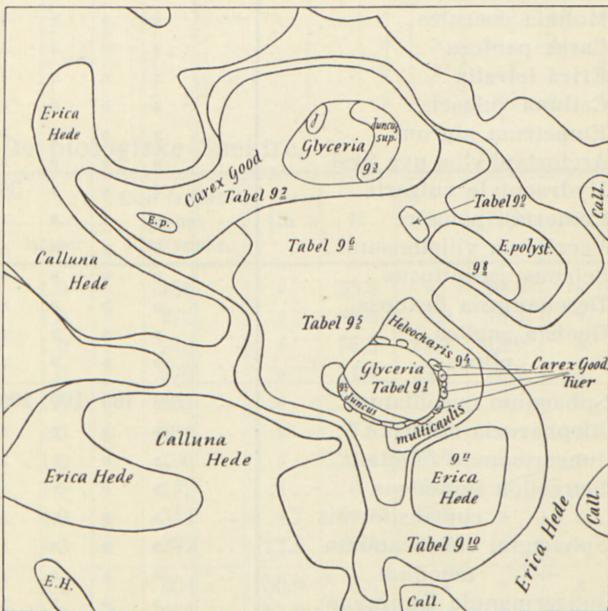


Fig. 17. Grønmose D 3³.

Tabel 11 a. Grønmose D³.
1—13. 25 × 1/10 m².

		1	2	3	4	5	6	7	8	9	10	11	12	13
Glyceria fluitans . . . . .	..	100	36	32	12	»	»	»	»	»	»	»	»	»
Agrostis canina . . . . .	..	16	100	88	100	32	8	32	8	»	»	»	»	»
Juncus supinus . . . . .	..	32	100	100	40	»	»	4	»	»	»	»	»	»
Heleocharis multicaulis . . . . .	..	4	28	»	100	20	4	»	»	»	»	»	»	»
Eriophorum polystachyum . . . . .	..	»	8	20	36	100	100	52	24	100	84	4	»	»
Carex Goodenoughii . . . . .	..	»	»	8	48	80	88	100	100	40	60	32	4	»
Molinia coerulea . . . . .	..	»	»	»	4	»	4	4	»	100	100	8	12	»
Carex panicea . . . . .	..	»	»	»	»	»	»	»	»	88	80	96	64	»
Erica tetralix . . . . .	..	»	»	»	»	»	»	»	»	16	32	88	8	»
Calluna vulgaris . . . . .	..	»	»	»	»	»	»	»	»	»	8	36	72	64
Empetrum nigrum . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	96	100
Arctostaphylos uva ursi . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	»	76
Hydrocotyle vulgaris . . . . .	..	4	»	»	36	»	»	»	»	»	»	»	»	»
Comarum palustre . . . . .	..	»	»	»	»	»	»	4	»	»	»	»	»	»
Vaccinium viliginosum . . . . .	..	»	»	»	»	»	»	»	»	»	4	»	»	»
Scirpus caespitosus . . . . .	..	»	»	»	»	»	»	»	»	»	»	12	4	4
Deschampsia flexuosa . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	12	»
Genista anglica . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	»	12
— pilosa . . . . .	..	»	»	»	»	»	»	»	»	»	»	»	»	4
Sphagnum cuspidatum . . . . .	..	100	100	100	100	100	100	100	100	100	88	»	»	»
Blepharozia ciliaris . . . . .	..	»	»	»	»	»	»	»	»	32	80	72	28	44
Jungermannia inflata . . . . .	..	»	»	»	»	»	»	»	»	100	100	»	»	»
Stereodon imponens . . . . .	..	»	»	»	»	»	»	»	»	100	80	8	»	»
— cupressiformis . . . . .	..	»	»	»	»	»	»	»	»	»	»	88	100	96
Sphagnum subsecundum . . . . .	..	»	»	»	»	»	»	»	»	56	24	»	»	»
— tenellum . . . . .	..	»	»	»	»	»	»	»	»	28	48	»	»	»
Jungermannia Kunzeana . . . . .	..	»	»	»	»	»	»	»	»	40	52	4	»	»
— ventricosa . . . . .	..	..	..	..	..	..	..	..	..	4	24	4	»	»
— gracilis . . . . .	..	..	..	..	..	..	..	..	..	»	8	8	»	»
Lepidozia setacea . . . . .	..	..	..	..	..	..	..	..	..	4	»	»	»	»
Cephaloziella Hampeana . . . . .	..	..	..	..	..	..	..	..	..	»	28	4	»	»
Cephalozia media . . . . .	..	..	..	..	..	..	..	..	..	»	4	»	»	»
Cephaloziella elachista . . . . .	..	..	..	..	..	..	..	..	..	»	»	»	4	»
— divaricata . . . . .	..	..	..	..	..	..	..	..	..	»	»	»	8	»
Odontoschisma sphagni . . . . .	..	..	..	..	..	..	..	..	..	»	»	8	»	»
Hypnum fluitans . . . . .	..	..	..	..	..	..	..	..	..	»	24	»	»	»
Hylocomium parietinum . . . . .	..	..	..	..	..	..	..	..	..	»	8	4	12	28
Dicranum scoparium . . . . .	..	..	..	..	..	..	..	..	..	16	44	4	4	»
— intermedium . . . . .	..	..	..	..	..	..	..	..	..	»	16	»	»	»
— spurium . . . . .	..	..	..	..	..	..	..	..	..	»	8	»	»	»
Pohlia nutans . . . . .	..	..	..	..	..	..	..	..	..	4	16	»	»	»
Leucobryum glaucum . . . . .	..	..	..	..	..	..	..	..	..	»	»	8	»	»
Rhacomitrium hypnoides . . . . .	..	..	..	..	..	..	..	..	..	»	»	12	»	»
Gymnocybe palustris . . . . .	..	..	..	..	..	..	..	4	»	4	»	»	»	»
Cladonia uncialis . . . . .	..	..	..	..	..	..	..	..	..	20	32	92	84	52
— squamosa . . . . .	..	..	..	..	..	..	..	..	..	4	8	24	32	8

Tabel 11 a (fortsat).

		1	2	3	4	5	6	7	8	9	10	11	12	13
Cladonia impexa	»	»	100	100	100	
— silvatica.....	»	»	80	100	96	
— rangiferina	»	»	68	96	44	
Cetraria aculeata	»	»	20	64	44	
— islandica.....	»	»	4	»	»	
Cladonia crispata	»	»	20	24	12	
— chlorophaea.....	»	»	8	68	28	
— Floerkeana	»	»	»	12	4	
— destricta	»	»	»	12	»	
— gracilis.....	»	»	»	»	8	
— glauca.....	»	»	»	»	4	

Tabel 11 b. De biologiske Spektre.

	Artstæthed				Den fanero-game Frekvenss.	Ch	H	G	HH	Th
	Total	Fanerog.	Likener	Mosser						
1	2.6	1.6	»	1.0	156	»	35.8	»	64.1	»
2	3.7	2.7	»	1.0	272	»	83.8	2.9	13.2	»
3	3.5	2.5	»	1.0	248	»	75.8	11.3	12.9	»
4	4.8	3.8	»	1.0	376	»	74.5	22.3	3.2	»
5	3.3	2.3	»	1.0	232	»	22.4	77.6	»	»
6	3.0	2.0	»	1.0	204	»	7.8	92.2	»	»
7	3.0	2.0	»	1.0	196	»	20.4	77.6	2.0	»
8	2.3	1.3	»	1.0	132	»	6.1	93.9	»	»
9	8.6	3.4	0.2	4.9	344	4.7	29.1	66.3	»	»
10	10.6	3.7	0.4	6.5	372	12.9	26.9	60.2	»	»
11	9.4	3.0	4.2	2.2	304	50.0	6.6	43.4	»	»
12	10.2	2.7	5.9	1.6	272	64.7	10.3	25.0	»	»
13	8.3	2.6	4.0	1.7	260	98.5	1.5	»	»	»

Grønmose D3³ (Tabel 11a Nr. 1—10 samt Fig. 17¹) svarer i Henseende til Antallet af Formationer, deres indbyrdes Fordeling og Sammensætning i et og alt til den ovenfor beskrevne Grønmose E1—2¹, hvad en Sammenligning mellem Fig. 16 og 17 og Tabel 10 og 11 hurtig vil vise.

Ligesom i den ovenfor beskrevne Grønmose finder vi ogsaa her paa den fugtigste Bund en aaben Vegetation af *Glyceria fluitans* voksende i et Tæppe af *Sphagnum cuspidatum*. Renest er denne Formation udviklet i et Parti Nordøst for *Erica*-Øen (Tabel 11a Nr. 1). I Mosens nordlige Parti forekommer Formationen ligeledes, men der har her fundet en rigelig Indvandring af *Eriophorum polystachyum* og *Carex Goodenoughii* Sted, saa Formationens karakteristiske Udseende er blevet udvisket.

Junicus supinus-Formationen genfinder vi ligeledes saavel ved Mosens nordlige som dens sydlige Fordybning (Tabel 11a Nr. 2—3), begge Steder med en rigelig Indblanding af *Agrostis canina*.

¹⁾ Ved Formationsbetegnelserne paa Fig. 17 er fejlagtigt indført Tallet 9 i Stedet for 11.

Heleocharis multicaulis-Formationen er kun udviklet som et smalt Bælte paa Øst- og Sydsiden af Mosens sydlige Fordybning. *Agrostis canina* er ligeledes her Frekvensdominant (Tabel 11a Nr. 4), ligesom der findes en rigelig Indblanding af andre til mere tør Bund knyttede Arter.

Mosens største Areal indtages dog af de to Formationer, der fysiognomisk er kendetegnet af Arterne *Eriophorum polystachyum* og *Carex Goodenoughii*. Tabel 11a Nr. 5 og 6 viser Sammensætningen af *Eriophorum polystachyum*-Formationen. Nr. 7 og 8 af *Carex Goodenoughii*-Formationen. Medens *Eriophorum polystachyum* kun spiller en ringe Rolle i *Carex*-Formationen, er *Carex Goodenoughii* Meddominant i *Eriophorum*-Formationen. *Carex Goodenoughii*-Formationen er især udbredt mod Nord og Øst i Mosen, *Eriophorum*-Formationen især mod Sydvest. Grænserne mellem de to Formationer er dog ret udflydende.

Som et Bælte omkring alle de nævnte Formationer finder vi ligeledes her den ovenfor nærmere beskrevne *Molinia coerulea*-Randzone med *Molinia coerulea*, ikke fruktificerende *Eriophorum polystachyum* og *Carex panicea* som Frekvensdominanter (Tabel 11a Nr. 9—10). Mere spredt forekommer *Carex Goodenoughii* og *Erica tetralix*. Særlig bemærkelsesværdig er Randzonens Mosvegetation. Medens Artstætheden for Mosser i de øvrige Formationer kun er 1.0 svarende til, at *Sphagnum cuspidatum* er den eneste forekommende Mos-Art, er Artstætheden for de to analyserede Randzonelokaliteter henholdsvis 4.9 og 6.5. Stigningen skyldes især en Række Hepaticé-Arter som *Jungermannia inflata*, *Kunzeana* og *ventricosa*, *Blepharozia ciliaris*, *Cephalozella Hampeana*. Slægten *Sphagnum* er repræsenteret ved følgende Arter *Sph. cuspidatum*, *subsecundum* og *tenellum*, Bladmosserne især ved *Stereodon imponens*, *Hypnum fluitans*, *Dicranum scoparium* o. fl. a. Frekvensdominanterne er *Sphagnum cuspidatum*, *Jungermannia inflata*, *Stereodon imponens* og *Blepharozia ciliaris*. Likenvegetationen er yderst sparsom til Stede, kun repræsenteret ved de to Arter *Cladonia uncialis* og *Cladonia squamosa*.

Randzonen er smukkest udviklet i Mosens sydlige Parti omkring *Erica*-Øen og langs Østsiden, mod Nord er den kun til Stede som en næppe meterbred Bræmme.

Paa *Erica*-Øen og især Øst for Grønmosen forekommer en temmelig fugtig *Erica*-Hede med rigelig *Carex panicea* (Tabel 11a Nr. 11), paa endnu højere Niveau forekommer *Calluna-Empetrum*-Heden (Tabel 11a Nr. 12) og ovenfor denne Formation forekommer paa Klitvoldene den i Tabel 11a Nr. 13 analyserede *Arctostaphylos*-Hede.

Grønmose D⁵⁷ (Tabel 12a Nr. 1—5).

Denne Grønmose, der er beliggende i Flyvesandspartiet lidt Øst for Vesterbækvejen, maa henføres til samme Type som de to foregaaende selvom den er betydelig mindre og selvom der paa Grund af de afvigende Terrainforhold er fremkommet visse Afvigelser.

Paa det dybeste Vand midt i Mosen finder vi et Par Bevoksninger af *Carex Goodenoughii* med enkelte Individer af *Eriophorum polystachyum*, *Juncus supinus* og *Heleocharis multicaulis* paa et tæt Tæppe af *Sphagnum cuspidatum*. *Carex Goodenoughii* forekommer ligesom i de store østlige Grønmoser i den tueformede Form.

Tabel 12 a. Grønmose D5⁷, D3⁸ og D1⁴.

		1	2	3	4	5	6	7	8	9
Heleocharis multicaulis	H	8	100	»	»	»	»	»	»	»
Carex Goodenoughii	G	100	»	40	60	»	100	60	40	96
Eriophorum polystachyum	G	28	8	100	100	10	40	100	12	100
Molinia coerulea	H	»	4	92	15	»	»	28	4	»
Carex panicea	G	»	»	40	10	100	»	56	100	»
Oxycoccus quadripetalus	Ch	»	»	»	90	»	»	»	»	»
Juncus supinus	H	12	28	»	»	»	»	»	»	»
Agrostis canina	H	»	64	»	»	»	»	»	»	»
Erica tetralix	Ch	»	»	»	40	10	»	40	»	»
Empetrum nigrum	Ch	»	»	»	30	»	»	»	4	»
Calluna vulgaris	Ch	»	»	»	25	»	»	»	»	»
Eriophorum vaginatum	H	»	»	»	»	»	»	4	»	»
Cladonia squamosa . . . . .	..	»	»	»	»	60	»	»	40	»
— uncialis . . . . .	..	»	»	»	»	40	»	8	32	»
— impexa . . . . .	..	»	»	»	»	»	»	»	12	»
— crispata . . . . .	..	»	»	»	»	»	»	»	4	»
— silvatica . . . . .	..	»	»	»	»	»	»	»	4	»
Cetraria islandica . . . . .	..	»	»	»	»	»	»	»	4	»
Sphagnum cuspidatum . . . . .	..	100	100	100	45	100	100	100	12	100
— subsecundum . . . . .	..	12	»	68	10	10	»	72	»	100
— tenellum . . . . .	..	»	»	4	45	60	»	36	»	»
— compactum . . . . .	..	»	»	4	10	50	»	16	»	»
— acutifolium . . . . .	..	»	»	»	90	»	»	»	»	»
Blepharozia ciliaris . . . . .	..	»	»	»	30	80	»	40	88	»
Jungermannia inflata . . . . .	..	»	»	4	40	100	»	80	»	»
— Kunzeana . . . . .	..	»	»	»	30	20	»	20	»	»
— ventricosa . . . . .	..	»	»	»	20	20	»	8	48	»
— gracilis . . . . .	..	»	»	»	5	»	»	»	»	»
Cephaloziella Hampeana . . . . .	..	»	»	»	10	20	»	»	»	»
— divaricata . . . . .	..	»	»	»	10	20	»	»	»	»
Cephalozia media . . . . .	..	»	»	»	25	10	»	»	»	»
Odontoschisma sphagni . . . . .	..	»	»	»	35	»	»	4	»	»
Kantia trichomanes . . . . .	..	»	»	»	10	»	»	»	»	»
Cephaloziella elachista . . . . .	..	»	»	»	10	»	»	»	»	»
Mylia anomala . . . . .	..	»	»	»	15	»	»	»	»	»
Stereodon imponens . . . . .	..	»	»	»	5	90	»	28	64	»
Hylocomium parietinum . . . . .	..	»	»	»	15	50	»	8	36	»
Gymnocyte palustris . . . . .	..	»	»	»	35	»	»	»	»	»
Leucobryum glaucum . . . . .	..	»	»	»	5	50	»	»	»	»
Stereodon cupressiforme . . . . .	..	»	»	»	»	20	»	»	»	»
Rhacomitrium hypnoides . . . . .	..	»	»	»	»	80	»	»	52	»
Dicranum scoparium . . . . .	..	»	»	»	»	10	»	28	56	»
— spurium . . . . .	..	»	»	»	»	20	»	»	»	»
— intermedium . . . . .	..	»	»	»	»	»	»	4	»	»
Hypnum fluitans . . . . .	..	»	»	»	»	»	»	60	»	80

Tabel 12 a (fortsat).

		1	2	3	4	5	6	7	8	9
Total Artstæthed .....	...	2.6	3.0	4.5	8.8	9.7	2.4	8.0	6.1	4.8
Fanerogamer .....	..	1.5	2.0	2.7	3.8	1.2	1.4	2.9	1.6	2.0
Likener .....	..	»	»	»	»	0.4	»	0.1	1.0	»
Mosser .....	..	1.1	1.0	1.8	5.0	8.1	1.0	5.0	3.6	2.8
Den fanerogame Frekvenssum .....	..	148	204	272	375	120	140	288	160	196
Ch .....	..	»	»	»	49.3	8.3	»	13.9	2.5	»
H .....	..	13.4	96.1	33.8	5.4	»	»	11.1	2.5	»
G .....	..	86.5	3.9	66.2	45.3	91.7	100.0	75.0	95.0	100.0
HH .....	..	»	»	»	»	»	»	»	»	»

Som et Bælte omkring *Carex Goodenoughii*-Formationen, men især smukt udviklet Øst for denne forekommer en *Heleocharis multicaulis*-Formation (Tabel 12 a Nr. 2) *Heleocharis multicaulis* er den eneste fanerogame Frekvensdominant, hyppigt forekommer tillige *Agrostis canina* og *Juncus supinus*.

Langs Grønmoseens Rand og helt omgivende de to nys nævnte Formationer forekommer en typisk Randzone-Vegetation med Karakterplanterne *Molinia coerulea*, *Eriophorum polystachyum* (ikke fruktificerende), *Carex panicea* og *Carex Goodenoughii* (Tabel 12 a Nr. 3). Mosvegetationen er dannet af *Sphagnum cuspidatum* og *Sphagnum subsecundum*.

Foruden disse 3 normalt byggede Formationer er der i denne Grønmose yderligere udviklet to, der nærmest maa betragtes som Variationer af Randzonens. Den ene Formation er udviklet i Grønmoseens Nordøsthjørne og bestaar af en næsten ren *Carex panicea*-Bevoksning i en overordentlig artstædt Mosvegetation (Tabel 12 a Nr. 5). Sphagnaceer og Hepaticer danner Hovedbestanddelen, selvom Bladmosser ogsaa er rigelig repræsenteret. Frekvensdominanter er følgende *Sphagnum cuspidatum*, *Blepharozia ciliaris*, *Jungermannia inflata*, *Stereodon imponens* og *Rhacomitrium hypnoides*. Likenvegetationen er dannet af *Cladonia squamosa* og *uncialis*. Ingen af Arterne spiller dog nogen Rolle.

Den anden Variation af Randzone findes langs Mosens Vest- og Sydside paa Grænselinien mellem Klitvold og Mose (Tabel 12 a Nr. 4). Vegetationens Grundbestanddel er en Række store *Sphagnum*-Tuer, dannet af flere forskellige *Sphagnum*-Arter. Ovenpaa disse er der saa kommet en speciel fanerogam Vegetation til Udvikling. Denne Vegetation minder nærmest om Randzonens, men med en ringe Udvikling af *Molinia coerulea*. Til Gengæld forekommer *Oxycoccus quadripetalus* som Frekvensdominant. I *Sphagnum*-Tuerne har der udviklet sig en speciel Mosvegetation, fortrinsvist dannet af Hepaticer.

De 3 Grønmoser E1—2¹, D3³ og D5⁷ er de tre eneste Moser paa Heden af denne Type, hvor der er udviklet en Sumpvegetation, idet *Glyceria fluitans*-, *Juncus supinus*- og *Heleocharis multicaulis*-Formationen nærmest maa henregnes hertil. De

fleste *Sphagnum cuspidatum*-Grønmoser er enten bevokset med en ensartet Vegetation af en af de tre ovennævnte mere tørre Formationer dannet af Arterne *Eriophorum polystachyum*, *Carex Goodenoughii* og *Molinia coerulea* eller ogsaa med en Vegetation, hvor en af Formationerne danner et Bælte omkring den i Rækken umiddelbart følgende fugtigere Formation.

Som Exempel paa det førstnævnte Tilfælde kan tjene Grønmose D²⁴ (Tabel 12 a Nr. 9). Mosen er en *Sphagnum*-Mose med *Sphagnum cuspidatum* og *Sphagnum sub-*

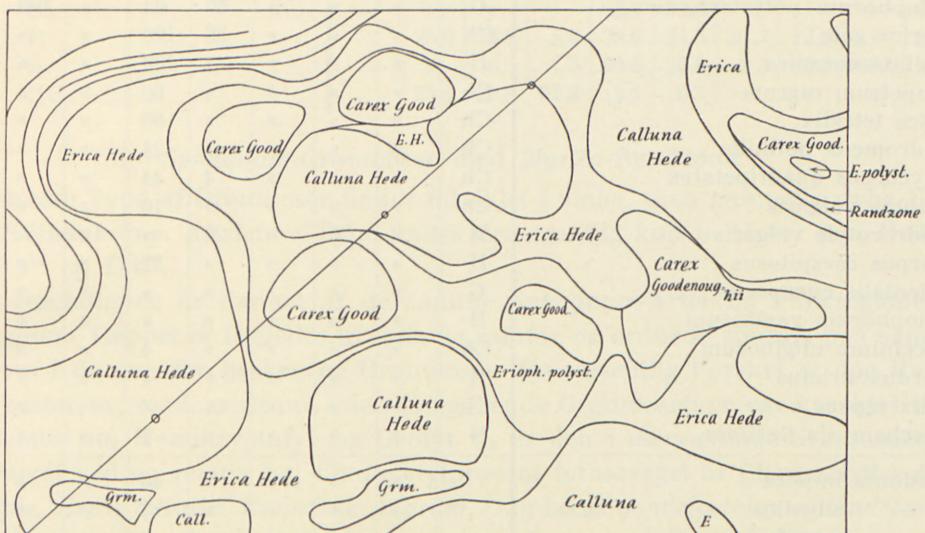


Fig. 18. Grønmose D³.

secundum som dominerende Arter. *Carex Goodenoughii* og *Eriophorum polystachyum* er de to eneste forekommende fanerogame Frekvensdominanter.

Fig. 18 viser et Exempel paa det andet Tilfælde, en ret stor Grønmose D³, hvor den relativ fugtige *Carex Goodenoughii*-Formation er opdelt i ikke mindre end 5 forskellige Dele, adskilt og omgivet af tørrere Formationer. I Tabel 12 a Nr. 6—8 er Cirklingsresultaterne for de paaviste Formationer opført. Midterpartierne er dannet af næsten rene *Carex Goodenoughii*-*Sphagnum cuspidatum*-Bevoksninger (Tabel 12 a Nr. 6). I Mosens sydøstlige Partier er Randzonevegetationen dannet af *Carex Goodenoughii*, *Carex panicea*, *Molinia coerulea*, *Erica tetralix* og *Eriophorum polystachyum* — denne sidste Art er eneste Frekvensdominant. Mosvegetationen er relativ artsrig og artstæt og er især dannet af Sphagnaceer og Hepaticeer. Tabel 12 a Nr. 7 viser nærmere, hvilke Arter der forekommer og med hvilken Hyppighed, Arterne optræder. Længere mod Vest træder *Eriophorum* mere og mere tilbage, idet *Carex panicea* indtager dens Plads som eneste Frekvensdominant. Parallelt med Ændringen i den fanerogame Vegetation forløber en Ændring i den kryptogame, idet Likenvegetationen tiltager i Mængde, medens Mosvegetationen aftager. Indenfor Mosserne er Sphagnaceer og Hepaticeer trængt tilbage, medens Bladmosserne er tiltaget i Mængde, cfr. iøvrigt Tabel 12 a Nr. 8.

Tabel 13 a. Grønmose D4¹⁰ og D3¹⁴.

		1	2	3	4	5	6	7	8	9
Menyanthes trifoliata	HH	90	60	92	32	»	»	»	»	»
Juncus supinus	H	30	80	»	4	»	100	4	»	»
Heleocharis multicaulis	H	»	92	12	44	»	10	12	»	»
Carex rostrata	HH	»	»	100	12	4	»	»	»	»
— Goodenoughii	G	»	20	4	100	56	10	»	100	48
Eriophorum polystachyum	G	»	»	»	60	64	»	100	52	32
Myrica gale	Ch	»	»	»	36	100	»	»	»	100
Molinia coerulea	H	»	»	»	4	100	»	»	»	92
Empetrum nigrum	Ch	»	»	»	»	60	»	»	»	96
Erica tetralix	Ch	»	»	»	»	60	»	»	»	68
Andromeda polifolia	Ch	»	»	»	»	24	»	»	»	64
Oxycoecus quadripetalus	Ch	»	»	»	4	44	»	»	»	60
Calluna vulgaris	Ch	»	»	»	»	16	»	»	»	20
Hydrocotyle vulgaris	H	»	36	»	20	»	»	»	»	»
Scirpus caespitosus	H	»	»	»	»	32	»	»	»	16
Trientalis europaeus	G	»	»	»	»	»	»	»	»	20
Eriophorum vaginatum	H	»	»	»	»	»	»	»	»	16
Vaccinium uliginosum	Ch	»	»	»	»	4	»	»	»	4
Nardus strictus	H	»	»	»	»	4	»	»	»	»
Salix repens	Ch	»	»	»	»	4	»	»	»	»
Deschampsia flexuosa	H	»	»	»	»	4	»	»	»	»
Cladonia impexa . . . . .	..	»	»	»	»	40	»	»	»	32
— silvatica . . . . .	..	»	»	»	»	8	»	»	»	4
— rangiferina . . . . .	..	»	»	»	»	4	»	»	»	12
— chlorophaea . . . . .	..	»	»	»	»	8	»	»	»	4
— Floerkeana . . . . .	..	»	»	»	»	4	»	»	»	»
Sphagnum cuspidatum . . . . .	..	100	100	100	100	60	100	100	100	36
— subsecundum . . . . .	..	90	56	64	76	44	»	16	»	»
— tenellum . . . . .	..	..	..	..	..	28	..	..	..	8
— acutifolium . . . . .	..	..	..	..	..	8	..	..	..	8
Blepharozia ciliaris . . . . .	..	..	..	..	..	20	..	..	..	52
Jungermannia inflata . . . . .	..	..	..	..	..	8	..	..	..	4
— Kunzeana . . . . .	..	..	..	..	..	4	..	..	..	4
— ventricosa . . . . .	..	..	..	..	..	4	..	..	..	16
Cephaloziella Hampeana . . . . .	..	..	..	..	..	8	..	..	..	16
Cephalozia media . . . . .	..	..	..	..	..	»	..	..	..	12
— fluitans . . . . .	..	..	..	..	..	»	..	..	..	4
Odontoschisma sphagni . . . . .	..	..	..	..	..	16	..	..	..	12
Kantia trichomanes . . . . .	..	..	..	..	..	4	..	..	..	8
Hypnum fluitans . . . . .	..	..	..	..	..	12	..	..	..	4
Stereodon cupressiformis . . . . .	..	..	..	..	..	60	..	..	..	64
Hylocomium parietinum . . . . .	..	..	..	..	..	44	..	..	..	60
Dicranum scoparium . . . . .	..	..	..	..	..	8	..	..	..	4
Gymnocybe palustris . . . . .	..	..	..	..	..	8	..	..	..	20
Leucobryum glaucum . . . . .	..	..	..	..	..	»	..	..	..	4
Dicranum rugosum . . . . .	..	..	..	..	..	»	..	..	..	4

Tabel 13 a (fortsat).

		1	2	3	4	5	6	7	8	9
Totale Artstæthed .....	..	3.1	4.4	3.7	4.8	9.8	2.2	2.3	2.5	10.3
Fanerogamer .....	..	1.2	2.9	2.1	3.1	5.8	1.2	1.2	1.5	6.4
Likener .....	..	»	»	»	»	0.6	»	»	»	0.5
Mosser .....	..	1.9	1.6	1.6	1.8	3.4	1.0	1.2	1.0	3.4
Den fanerogame Frekvenssum .....	..	120	288	208	308	576	120	116	152	636
Ch .....	..	»	»	»	12.7	54.2	»	»	»	64.8
H .....	..	25.0	72.2	5.8	22.8	24.3	91.7	13.8	»	19.5
G .....	..	»	6.9	1.9	50.6	20.8	8.3	86.2	100.0	15.7
HH .....	..	75.0	20.8	92.3	13.9	0.7	»	»	»	»

C. *Sphagnum*-Grønmoser med *Myrica*-Randzone.

En tredie Type af Grønmoser findes udviklet i smaa, men temmelig dybe Lavninger i Klitbankerne. Af denne Type findes der egentlig kun to Moser paa Heden, nemlig D3¹⁴ og D4¹⁰.

Mosvegetationen er dannet af de samme *Sphagnum*-Arter og Fanerogamerne paa *Sphagnum*-Tæppet er ligeledes til Dels de samme og ordnede zonevis paa samme Maade som i de ovenfor beskrevne Grønmoser. En væsentlig Forskel er dog Randzonens Vegetation; medens denne i den foregaaende Grønmosetype var karakteriseret ved en relativ høj Hemikryptofyt- og Geofyt % er den i nærværende Grønmosetype karakteriseret ved en relativ høj Chamaefytprocent forårsaget af Chamaefyutter som *Myrica gale*, *Erica tetralix*, *Empetrum nigrum*, *Oxycoccus quadripetalus* og *Andromeda polifolia*, kort sagt de fleste af de Arter, der forekommer i Hedemoserne.

Nedenfor følger en nærmere Beskrivelse af begge Moserne, D4¹⁰ og D3¹⁴.

Grønmose D4¹⁰ (Tabel 13a Nr. 1—5). I den midterste Del af Mosen findes en c. meterdyb *Sphagnum*-Sump dannet af *Sphagnum cuspidatum* og *Sph. subsecundum*. Paa Hængesækken vokser i Mosens østlige Del en spredt *Menyanthes trifoliata*-Vegetation (Tabel 13a Nr. 1); i den vestlige Del en *Carex rostrata*-Vegetation med spredte *Menyanthes* (Tabel 13a Nr. 3).

Omkring den østlige Halvdel af Sumpen, *Menyanthes trifoliata*-Formationen, findes paa betydelig lavere Bund en Bevoksning af *Heleocharis multicaulis* og *Juncus supinus* med spredte *Menyanthes* og *Hydrocotyle* (Tabel 13a Nr. 2).

Som en Ring omkring disse 3 Formationer forekommer *Carex Goodenoughii* i den karakteristiske tuede Vækstform (Tabel 13a Nr. 4). Foruden Karakterplanten findes i denne Formation paa Grund af dens ringe Udstrækning saavel Planter fra den egentlige Hængesæk som f. Ex. *Menyanthes*, *Heleocharis* og *Juncus supinus*, som fra den ovenfor liggende Randzone, f. Ex. *Myrica* og *Molinia*.

Til alle Sider er Mosen begrænset af en flere Meter bred Randzone. *Myrica gale* og *Molinia coerulea* er Frekvens- og Fysiognomidomianter, men med en rigelig Indblanding af andre Arter som f. Ex. *Erica tetralix*, *Empetrum nigrum*, *Andromeda polifolia*, *Oxycoccus quadripetalus*, *Calluna vulgaris*, *Carex Goodenoughii*, *Eriophorum*

polystachyum, *Scirpus caespitosus*. Af Kryptogamer spiller Mosserne en relativ fremtrædende Rolle, medens Likernes Betydning er underordnet. Mosvegetationen er dannet af en ligelig Blanding af Sphagnaceer, Hepaticer og Bladmosser. Ingen Arter er dog frekvensdominerende (Tabel 13 a Nr. 5).

En Ejendommelighed ved Mosen er endvidere Mangelen af en *Erica*-Hede ovenover Randzonen, der gaar umiddelbart over i *Calluna*-Heden. Forholdet er dog snarere det, at *Erica*-Heden er gaaet op i *Myrica*-Zonen.

Grønmose D3¹⁴ (Tabel 13 a Nr. 6—9 og Fig. 19¹) er som den foregaaende en *Spaghnum*-Mose, men ikke saa dyb som denne. Mosens Vegetation er bygget paa følgende Maade. Den midterste, fugtigste Del af Mosen er bevokset med *Eriophorum polystachyum* (Tabel 13 a Nr. 7), imod Nordvest i denne Formation forekommer en lille Plet *Juncus supinus* (Tabel 13 a Nr. 6) og som et mere eller mindre bredt Bælte uden om disse to Formationer forekommer den i Tabel 13 a Nr. 8 analyserede *Carex Goodenoughii*-Formation. Denne Formation grænser opad til en Randzonevegetation, hvis Sammensætning er forskellig paa Mosens forskellige Sider. Mod Nordøst, hvor Randen er mindre stejl, er den dannet af *Molinia coerulea*, *Eriophorum polystachyum*, *Carex Goodenoughii* og *Carex panicea*, de to førstnævnte Arter som Frekvensdominanter, de to sidstnævnte som mere underordnede Bestanddele. Denne Randzonevegetation, der er identisk med Randzonevegetationen hos den ovenfor behandlede Grønmosetype, grænser op til *Erica-Scirpus*-Hede og denne Formation grænser atter op til *Calluna*-Hede.

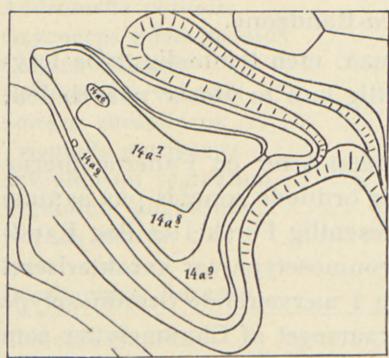


Fig. 19. Grønmose D3¹⁴.

handlede Grønmosetype, grænser op til *Erica-Scirpus*-Hede og denne Formation grænser atter op til *Calluna*-Hede.

Langs Mosens stejle Sydvest- og Sydsider er Randzonens Sammensætning og Omgivelser vidt forskellige fra Nordøstsiden, men svarer noje til Randzonen i D4¹⁰, hvad en Sammenligning mellem Kolonnerne 5 og 9 i Tabel 13 a vil vise. Begge Steder er *Myrica gale* og *Molinia coerulea* Frekvensdominanter, og for begge Moser gælder det, at Randzonen grænser umiddelbart op til *Calluna*-Hede uden et mellemliggende *Erica*-Hede-Bælte.

D. *Sphagnum tenellum-Eriophorum vaginatum*-Grønmoser.

Som Exemplarer paa den Type af Grønmoser, der er knyttet til *Erica*-Hede-Bæltets inderste Zone er undersøgt de to Grønmoser D3¹ og C3⁵.

Grønmose D3¹ (Tabel 14 a Nr. 1—6 og Fig. 20¹). Mosen ligger umiddelbart Syd for den store Grønmose D3³ og er til alle Sider omgivet af en *Erica*-Hede. Hele Mosen er dækket af et tæt Tæppe af *Sphagnum cuspidatum*. Ude midt i Mosen findes en 10—15 m lang og c. 10 m bred Plet, hvor *Sphagnum*-Tæppet er stærkt iøjnerefaldende.

¹) Paa Fig. 19 er ved en Fejtagelse indført Tallet 14 i Stedet for 13, paa Fig. 20 Tallet 13 i Stedet for 14 som Formationsfortegnelse.

Ved nærmere Eftersyn viser det sig, at *Sphagnum*-Tæppet er gennemvævet af *Agrostis canina*-Stængler (Tabel 14 a Nr. 1). Øst for dette Parti findes et mindre, hvor *Polygonum amphibium* især tager til i Mængde, delende Pladsen med *Eriophorum polystachyum* og *Agrostis canina* (Tabel 14 a Nr. 2). Omkring disse to Formationer findes et Bælte af tuet *Carex Goodenoughii* med spredt *Eriophorum polystachyum* (Tabel 14 a Nr. 3).

I den østlige Halvdel er Mosen begrænset af en Randzone, der fortørner sig i en *Erica-Carex panicea*-Hede og er sammensat af *Molinia coerulea*, ikke fruktificerende *Eriophorum polystachyum*, *Carex Goodenoughii* og *Carex panicea*, altsaa en Vegetation, der nøje svarer til Randzonens i Grønmosetype B.

Helt anderledes er Forholdet ved Mosens Vestside, her er Vegetationen dannet af *Eriophorum vaginatum*, *Molinia coerulea*, *Carex Goodenoughii* og *Eriophorum polystachyum*. Vegetationen er noget tuet og paa Tuerne er Chamaefyterne ved at indvandre. I Mellemrummene mellem Tuerne forekommer et tæt Tæppe af *Sphagnum*, især *Sphagnum cuspidatum*, i mindre Mængde *Sph. subsecundum* og *tenellum* og *Hypnum fluitans*. Paa Tuerne *Hepaticae*, især *Jungermannia inflata* (Tabel 14 Nr. 4).

Længere mod Sydvest, hvor Bunden er blevet lidt højere, indfinder Chamaefyterne sig i større Mængde paa Tuerne, især *Erica tetralix*, *Andromeda polifolia* og *Oxycoccus quadripetalus* i mindre Mængde *Calluna vulgaris* men ingen *Empetrum* (Tabel 14 a Nr. 5). *Carex Goodenoughii*, *Eriophorum polystachyum* og *Molinia coerulea* er trængt stærkt tilbage og spiller ikke nogen Rolle i Vegetationens Fysiognomi. Tuerne er temmelig brede, men ikke særlig høje, og det er sikkert en af Grundene til, at Mellemrummene mellem Tuerne er dækket af *Sphagnum*. Paa Tuerne forekommer en rig Mosvegetation, næsten udelukkende *Hepaticae*. *Jungermannia inflata*, *ventricosa*, *gracilis*, *Kunzeana* og *minuta*, *Odontoschisma sphagni* og *Blepharozia ciliaris* er de vigtigste. Der forekommer ligeledes paa Tuerne en sparsom udviklet Likenvegetation, især dannet af *Cladonia squamosa* og *uncialis*.

Denne Formation grænsrer op til en *Erica-Scirpus*-Hede med *Juncus squarrosus* og *Andromeda polifolia*.

Grønmose C³⁵ (Tabel 14 a Nr. 6—9 og Fig. 21).

Mosens sydøstlige Parti er en stor, temmelig fugtig *Carex Goodenoughii*-Mose. Artens Vækst er her tueformet. Spredt i Formationen forekommer *Eriophorum polystachyum* samt enkelte Tuer af *Molinia coerulea* og *Eriophorum vaginatum* (Tabel 14 a Nr. 6).

Mod Nordvest bliver Bunden højere og Mosen mere tør. *Eriophorum vaginatum*- og *Molinia*-Tuerne tager stærkt til i Antal og præger Vegetationen. *Carex Goodenoughii* er traadt stærkt tilbage selvom Artens Frekvensprocent stadig er høj. *Eriophorum polystachyum* findes med uforandret Hyppighed (Tabel 14 a Nr. 7).

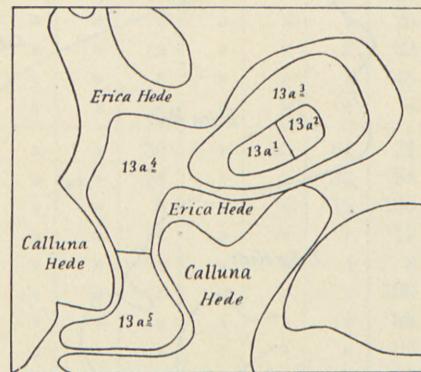


Fig. 20. Grønmose D 3¹.

Mellemrummene mellem Tuerne er udfyldt med *Sphagnum cuspidatum* med spredte *Sph. tenellum* og *Hypnum fluitans*. Paa Tuerne ses enkelte *Erica*, *Andromeda* og *Oxycoccus* samt *Jungermannia inflata*.

Gaar man endnu længere mod Nordvest faar man her en *Erica tetralix-Eriophorum vaginatum*-Mose af samme Fysiognomi og Sammensætning som den ovenfor beskrevne. Dens floristiske Sammensætning fremgaar af Tabel 14a Nr. 8. En Sam-

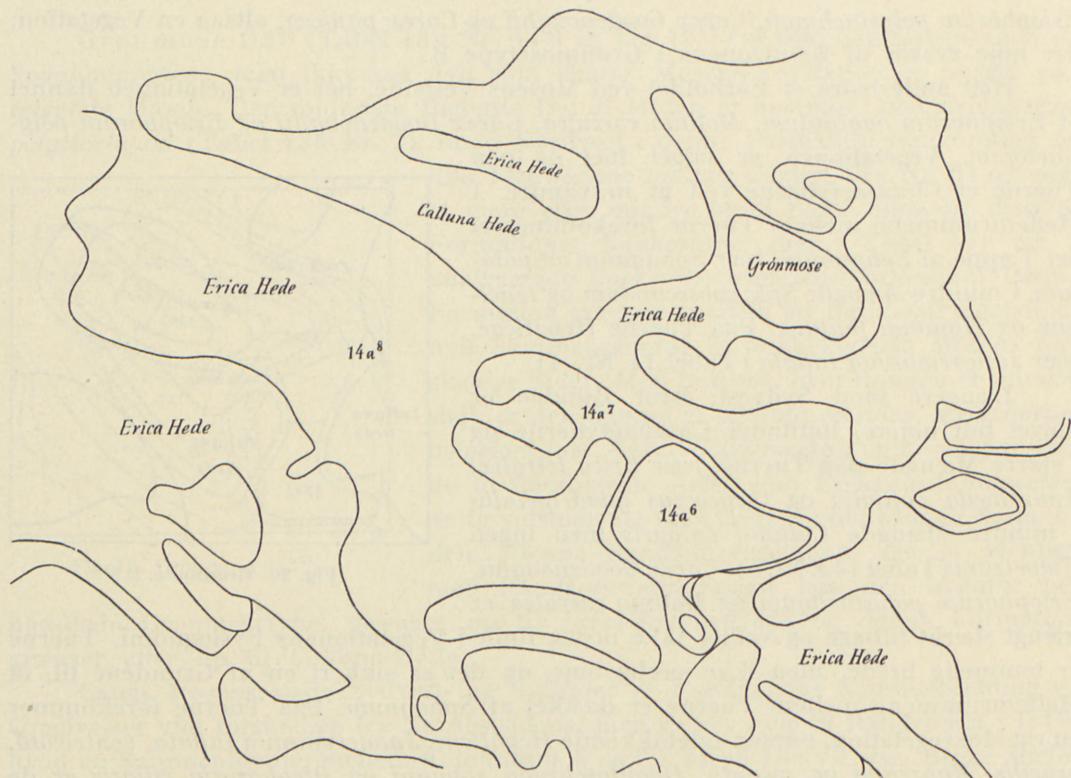


Fig. 21. Grønmose C3⁵.

menligning mellem Kolonne 5 og 8 viser, hvor nøje en Overensstemmelse der er mellem de to Lokaliteter.

Erica-Eriophorum vaginatum-Mosen grænser ligeledes her op til en *Erica-Scirpus caespitosus*-Hede (Tabel 14a Nr. 9).

Ser vi bort fra de specielle Enkeltheder ved Moserne af denne Type, er deres Sammensætning denne:

Hvor Mosen er fugtigst er Vegetationen dannet af *Carex Goodenoughii*, *Eriophorum polystachyum* og *Sphagnum cuspidatum*. Tabel 14a Nr. 3 og 6.

Længere inde kommer *Molinia coerulea* og *Eriophorum vaginatum* til. Bunden bliver tuet og dette medfører en Forandring i Mosvegetationen, idet *Sphagnum cuspi-*

Tabel 14 a. Grønmose D3¹ og C3⁵.

Tabel 14 a (fortsat).

		1	2	3	4	5	6	7	8	9
Stereodon cupressiformis .....	..	»	»	»	»	»	»	»	»	100
Rhacomitrium hypnoides .....	..	»	»	»	»	»	»	»	»	24
Mnium hornum .....	..	»	»	»	»	4	»	»	»	»
Gymnocybe palustris .....	..	»	»	»	»	8	»	»	»	»
Totale Artstæthed .....	..	2.2	3.6	2.6	7.8	12.8	3.0	7.6	13.9	11.6
Fanerogamer .....	..	1.2	2.6	1.7	3.9	5.4	2.0	4.1	5.5	3.3
Likener .....	..	»	»	»	»	0.8	»	0.2	1.1	5.6
Mosser .....	..	1.0	1.0	1.0	3.9	6.6	1.0	3.4	7.3	2.7
Den fanerogame Frekvenssum .....	..	120	264	168	388	544	204	408	552	332
Ch .....	..	»	»	»	7.2	59.6	»	14.7	65.2	56.6
H .....	..	80.0	21.2	11.9	47.4	25.7	19.6	47.1	23.9	16.9
G .....	..	6.7	42.4	88.1	45.4	14.7	80.4	38.2	10.9	26.5
HH .....	..	13.3	36.4	»	»	»	»	»	»	»
Th .....	..	»	»	»	»	»	»	»	»	»

datum nu maa dele Pladsen med *Sph. tenellum*, *Hypnum fluitans*, *Jungermannia inflata* o. fl. a. Tabel 14a Nr. 4 og 7.

Paa den tørreste Bund er Chamaefytterne, især *Erica tetralix* og *Eriophorum vaginatum* dominerende, medens *Carex Goodenoughii*, *Eriophorum polystachyum* og *Molinia coerulea* er traadt stærkt tilbage. Der forekommer i denne Formation en sparsom Likenvegetation hovedsagelig dannet af *Cladonia uncialis* og *Cladonia squamosa*. Mest ejendommelig er dog Formationens Mosvegetation, der næsten udelukkende bestaar af *Hepaticae*. Tabel 14a Nr. 5 og 8.

Moserne er omgivet af *Erica-Scirpus caespitosus*-Hede.

Kap. VI. Oversigt over Livsformernes og Arternes Fordeling i Hedens forskellige Formationer,

specielt i Formationer ordnede efter stigende Indhold af
Fugtighed i Jordbunden.

Med den ovenfor givne Behandling af Hedens Plantevækst er søgt løst den ene af de to Opgaver, der stilles den i Marken arbejdende Plantogeograf, at give en Beskrivelse af det foreliggende Landskab ved Hjælp af de existerende Plantesamfund og at give en Beskrivelse af de existerende Plantesamfund ved Hjælp af Plantearterne og Livsformerne. Den anden og botanisk set langt vigtigere Opgave er den at undersøge de givne Arters Forhold overfor de i Landskabet virkende Kaarfaktorer, d. v. s. at foretage en Bestemmelse af hvilke plantefordelende Faktorer der findes og af deres Betydning for Plantevæksten. Som bevidst Forskningssynspunkt er den af betydelig yngre Dato end den første og langt vanskeligere, saafremt Kravet om Kaaranalyse

stilles i hele sin videnskabelige Strenghed; den forudsætter da alle fysiske og kemiske Specialvidenskabers Medvirken og er dermed for en Botaniker praktisk talt uløselig.

Det bliver derfor nødvendigt at indgaa et Kompromis mellem det ønskelige og det mulige, idet man først maa gøre sig klart, hvad der er Hovedformaalet med Undersøgelsen; er det den fysisk-kemiske Side af Undersøgelsen, der er Hovedformaalet, bliver Resultatet sikkert bedst ved at overlades til en Fysiker eller Kemiker, er det derimod den botaniske Side, bliver det nødvendigt at slaa af paa Kravene om exakte Kaarbestemmelser ved at lade en relativ Kaarbestemmelse gaa forud for en exakt. Det er denne sidste Mulighed, der maa antages i det lange Løb at være mest frugtbar for Botanikken, og som derfor søgeres realiseret her. Der er endnu saa mange let iagttagelige Kaarfaktorer, hvis artsfordelende Betydning endnu langt fra er undersøgt til Bunds til, at der er nogen Grund til at kaste sig ud i fysisk-kemiske Specialanalyser.

Som tidligere nævnt er den vigtigste plantefordelende Faktor paa Nørholm Hede Graden af Fugtighed i Jordbunden. At gøre Rede for hvor mange forskellige Fugtighedszoner, der findes, og hvorledes Livsformerne og Arterne er fordelt i denne Fugtighedsskala bliver derfor den første Opgave for denne Side af Undersøgelserne. I Tabel 15 er nærmere angivet Fordelingen af samtlige Arter af Fanerogamer, Likener og Mosser i Fugtighedsskalaen, specielt som den er realiseret i *Erica*-Hede-Bæltet.

Det er her muligt at paavise ikke mindre end 9 forskellige Fugtighedszoner, af hvilke *Arctostaphylos uva ursi*-Formationen repræsenterer den tørreste Zone, *Glyceria fluitans*-Formationen den fugtigste. De mellemliggende Zoner indtager den Plads i Fugtighedsskalaen, som deres Nummer i Tabellen angiver, idet de tørreste er anført først, de fugtigste til sidst.

Talværdierne i en given Kolonne er de gennemsnitlige Frekvensprocenter for den givne Art eller Livsform i den givne Formation. Arterne er opført i alfabetisk Orden, idet dog de forskellige Grupper er holdt for sig.

De forskellige Kolonner i Tabel 15 er Middelværdierne af følgende Tabeller:

- Nr. 1. *Arctostaphylos uva ursi*-Heden. Tabel 2 Nr. 1—6.
- 2. *Calluna-Empetrum*-Heden. Tabel 5 Nr. 1—2 og 4—6.
- 3. *Erica*-Heden. Tabel 6 Nr. 2—9.
- 4. *Molinia coerulea*-Randzonen. Tabel 8 Nr. 9—10, Tabel 9 Nr. 9—10 og Tabel 12 Nr. 2 og 7.
- 5. *Carex Goodenoughii*-Formationen. Tabel 8 Nr. 6 og 8, Tabel 9 Nr. 7 og 8 og Tabel 12 Nr. 1 og 6.
- 6. *Eriophorum polystachyum*-Formationen. Tabel 8 Nr. 7, Tabel 9 Nr. 5 og 6 og Tabel 12 Nr. 6.
- 7. *Heleocharis multicaulis*-Formationen. Tabel 8 Nr. 5, Tabel 9 Nr. 4 og Tabel 12 Nr. 2.
- 8. *Juncus supinus*-Formationen. Tabel 8 Nr. 3 og 4, Tabel 9 Nr. 2—3.
- 9. *Glyceria fluitans*-Formationen. Tabel 8 Nr. 1 og 2 og Tabel 9 Nr. 1.

Tabel 15. Livsformernes og Arternes Fordeling i Erica-Hede-Bæltets
Fugtighedsskala.

	1	2	3	4	5	6	7	8	9
Artstætheden. Total	9.5	10.9	10.4	7.3	2.7	3.3	3.7	3.9	2.8
Fanerogamer	2.8	2.2	3.4	3.1	1.5	1.9	2.7	2.9	1.8
Likener	4.7	6.6	5.0	0.1	»	»	»	»	»
Mosser	1.9	2.1	2.1	4.1	1.3	1.5	1.0	1.0	1.0
Frekvensprocentsum	1672	1112	2696	1836	868	752	804	1160	532
Ch	97.2	85.7	53.4	6.9	»	»	»	»	»
H	1.5	6.0	18.4	28.5	7.7	10.0	87.8	80.3	41.4
G	1.3	8.4	29.6	64.6	92.0	90.0	10.5	6.7	1.1
HH	»	»	»	»	0.3	»	1.7	13.0	57.4
Ch <i>Andromeda polifolia</i>	»	»	8	1	»	»	»	»	»
<i>Arctostaphylos uva ursi</i>	84	»	»	»	»	»	»	»	»
<i>Calluna vulgaris</i>	90	90	40	1	»	»	»	»	»
<i>Empetrum nigrum</i>	93	96	42	»	»	»	»	»	»
<i>Erica tetralix</i>	»	2	90	20	»	»	»	»	»
<i>Genista anglica</i>	2	»	»	»	»	»	»	»	»
— <i>pilosa</i>	1	»	»	»	»	»	»	»	»
<i>Vaccinium uliginosum</i>	»	»	»	1	»	»	»	»	»
H <i>Agrostis canina</i>	»	»	»	»	7	11	59	66	13
<i>Carex pilulifera</i>	»	2	»	»	»	»	»	»	»
<i>Deschampsia flexuosa</i>	4	5	»	»	»	»	»	»	»
<i>Eriophorum vaginatum</i>	»	»	»	1	»	»	»	»	»
<i>Heleocharis multicaulis</i>	»	»	»	»	1	6	100	17	1
<i>Hydrocotyle vulgaris</i>	»	»	»	»	1	1	36	50	39
<i>Juncus squarrosus</i>	»	»	2	»	»	»	»	»	»
— <i>supinus</i>	»	»	»	»	3	1	31	100	24
<i>Molinia coerulea</i>	»	2	10	85	1	1	3	»	»
<i>Nardus stricta</i>	»	»	»	1	»	»	»	»	»
<i>Scirpus caespitosus</i>	1	5	31	»	»	»	»	»	»
G <i>Carex Goodenoughii</i>	»	1	37	55	100	68	16	2	»
— <i>panicea</i>	4	20	64	61	»	»	»	»	»
<i>Eriophorum polystachyum</i>	»	»	15	81	31	100	19	17	1
HH <i>Comarum palustre</i>	»	»	»	»	1	»	»	»	»
<i>Glyceria fluitans</i>	»	»	»	»	»	»	5	38	97
<i>Cetraria aculeata</i>	52	81	42	»	»	»	»	»	»
— <i>islandica</i>	»	»	9	»	»	»	»	»	»
<i>Cladonia chlorophoaea</i>	30	68	38	»	»	»	»	»	»
— <i>crispata</i>	10	47	24	»	»	»	»	»	»
— <i>degenerans</i>	»	»	1	»	»	»	»	»	»
— <i>destricta</i>	1	18	5	»	»	»	»	»	»
— <i>Floerkeana</i>	1	10	4	»	»	»	»	»	»
— <i>furcata</i>	1	»	»	»	»	»	»	»	»
— <i>glauea</i>	1	»	»	»	»	»	»	»	»
— <i>gracilis</i>	19	2	4	»	»	»	»	»	»
— <i>impexa</i>	100	100	100	»	»	»	»	»	»

Tabel 15 (fortsat).

	1	2	3	4	5	6	7	8	9
Cladonia pleurota.....	»	4	2	»	»	»	»	»	»
— rangiferina	92	88	73	»	»	»	»	»	»
— silvatica	94	97	90	»	»	»	»	»	»
— squamosa	9	51	26	4	»	»	»	»	»
— uncialis	63	91	87	4	»	»	»	»	»
Dicranum intermedium	»	»	»	3	»	»	»	»	»
— scoparium	»	7	4	17	»	»	»	»	»
— spurium	»	»	»	2	»	»	»	»	»
Gymnocybe palustris	»	»	»	1	»	»	»	»	»
Hylocomium parietinum	29	30	11	4	»	»	»	»	»
Hypnum fluitans.....	»	»	»	15	9	20	»	»	»
Leucobryum glaucum.....	»	11	10	»	»	»	»	»	»
Pohlia nutans.....	»	»	1	5	»	»	»	»	»
Rhacomitrium hypnoides	»	4	15	5	»	»	»	»	»
Stereodon cupressiformis	97	97	87	»	»	»	»	»	»
— imponens	1	1	4	49	»	»	»	»	»
Sphagnum compactum.....	»	»	»	4	»	»	»	»	»
— cuspidatum.....	»	»	»	93	100	100	100	100	100
— subsecundum.....	»	»	»	49	15	25	»	»	»
— tenellum.....	»	»	2	21	»	»	»	»	»
Blepharozia ciliaris	64	53	44	35	»	»	»	»	»
Cephalozia media	»	»	1	1	»	»	»	»	»
Cephaloziella divaricata.....	»	4	3	»	»	»	»	»	»
— elachista.....	»	1	»	»	»	»	»	»	»
— Hampeana	1	»	3	5	1	»	»	»	»
Jungermannia excetiformis	»	1	»	»	»	»	»	»	»
— gracilis	»	»	7	1	»	»	»	»	»
— inflata	»	»	1	64	»	»	»	»	»
— Kunzeana	»	»	1	22	»	»	»	»	»
— minuta	»	»	1	»	»	»	»	»	»
— porphycoleuca	»	1	»	»	»	»	»	»	»
— ventricosa	»	»	2	9	»	»	»	»	»
Lepidozea setacea	»	»	»	1	»	»	»	»	»
Odontoschisma sphagni.....	»	»	3	1	»	»	»	»	»
Bladmosser	1.27	1.50	1.32	1.01	0.09	0.15	»	»	»
Halvmosser	0.65	0.60	0.63	1.39	0.01	»	»	»	»
Tørvemosser	»	»	0.02	1.67	1.15	1.25	1.0	1.0	1.0

En nærmere Gennemgang af de enkelte Arters Fordelingsforhold i Fugtigheds-skalaen er unødvendig, da Hensigten med Tabellen blot er denne paa en klar Maade at give en talmæssig underbygget Fremstilling af de forskellige Arters Reaktion overfor Fugtigheden i Jorden. Af større Interesse er derimod Livsformernes Fordeling i Fugtighedsskalaen.

Chamaefytterne har saaledes Maximum i Klasse 1, herfra aftager de i Værdi nedefter, først svagt i Klasse 2, stærkere og stærkere i Klasse 3 og 4 og fra Klasse 5 og nedefter findes de overhovedet ikke. Modsat Chamaefytterne forholder Helofytterne sig. Maximum for denne Livsformtype ligger i Klasse 9 og fra denne Klasse aftager de meget stærkt opefter. Geofytterne har Maximum i 5. Klasse og aftager herfra lige stærkt til begge Sider, men udfylder dog hele Fugtighedsskalaen. Den ejendommeligste Fordeling udviser dog Hemikryptofytterne, idet Kurven her er totoppet, med et relativt Maximum i 4. Klasse og et andet i 7. Klasse med et udpræget Minimum i Klasse 5.

Ser vi dernæst paa Artstæthedskurven, viser de samme Fordelingsforhold sig her. Den totale Artstæthedskurve er størst i 2. og 3. Klasse, herfra aftager den svagt opefter og stærkt nedefter, den fanerogame Artstæthedskurve har Maximum i Klasse 3, Likenernes i Klasse 2 og Mossernes i Klasse 4. Inden for den sidstnævnte Gruppe har Bladmosserne Maximum i Klasse 2, Halvmosserne i Klasse 4 og Tørvemosserne i de nedre Klasser.

En anden og vigtig plantefordelende Faktor paa Nørholm Hede er Grundvandstandens aarlige Svingning; den er som bekendt størst i Nærheden af Aadalen og mindst længst borte fra den. For de relativt tørre Zoner viser Virkningen sig saa tydeligt, at man kan opstille de to forskellige Vegetationsbælter, et ydre *Calluna*-Hede-Bælte og et indre *Erica*-Hede-Bælte. Holder vi os udelukkende til *Erica*-Hede-Bæltet er det tvivlsomt om Virkningen paa de tørre Formationer stadig kan paavises. *Arctostaphylos*-Heden, *Calluna-Empetrum*-Heden og *Erica*-Heden, ø: Vegetationen i de tre øverste Fugtighedsklasser, har praktisk talt samme Sammensætning ved Bæltets ydre og indre Kant; derimod er der en meget stor Forskel i Vegetationens Sammensætning i næste Fugtighedsklasse (Klasse 4) og denne Forskel maa givetvis være betinget af Forskel i Grundvandsstandens aarlige Svingninger, der er størst udefter og mindst indefter. I Tabel 16 er de gennemsnitlige Værdier for alle de Fugtighedsformationer, der findes indenfor *Erica*-Hede-Bæltets Fugtighedsklasse 4, d. v. s. de Formationer, der ligger mellem *Erica*-Hedens nedre Grænse og *Carex Goodenoughii*-Formationens øvre.

Formationernes Rækkefølge er denne:

1. repræsenterer *Myrica*-Mosen. Tabel 7 Nr. 1—4.
2. *Erica-Eriophorum vaginatum*-Mosen. Tabel 7 Nr. 6—8 og Tabel 14 Nr. 5 og 8.
3. Randzonen i Grønmosetype C. Tabel 13 Nr. 5 og 9.
4. *Myrica*-Vældmosen nær Aadalen. Tabel 7 Nr. 9—10.
5. *Deschampsia flexuosa*-Formationen i Grønmosetype A. Tabel 8 Nr. 2, 3, 6 og 13.
6. *Eriophorum vaginatum-Molinia*-Formationen i Grønmosetype D. Tabel 14 Nr. 4 og 7.
7. Randzonen i Grønmosetype B. Tabel 8 Nr. 9—10, Tabel 9 Nr. 9—10 og Tabel 12 Nr. 2 og 7 = Tabel 15 Nr. 4.
8. *Molinia*-Zonen i Grønmosetype A. Tabel 8 Nr. 5, 8, 10 og 11.

Den væsentligste Virkning af Grundvandstandens aarlige Svingning er efter Tabel 16 denne, at Ch %, Mængden af Tørvemos og især af Halvmosser er størst,

Tabel 16. Livsformernes og Arternes Fordeling i de forskellige Formationer i Klasse IV i Erica-Hedebæltets Fugtighedsskala.

	1	2	3	4	5	6	7	8
Artstætheden. Total	11.1	13.0	10.1	9.1	9.7	7.7	7.3	5.2
Fanerogamer	5.6	5.5	6.1	5.8	4.1	4.0	3.1	2.5
Likener	1.7	1.3	0.6	0.8	1.5	0.1	0.1	0.1
Mosser	3.8	6.2	3.4	2.5	4.3	3.7	4.1	2.7
Frekvenssum	2248	2740	1212	1148	1622	796	1836	986
Ch	70.4	66.2	59.5	40.3	12.5	11.0	6.9	2.7
H	21.1	23.5	21.9	40.8	50.5	47.3	28.5	53.1
G	8.6	10.4	18.3	18.1	37.0	41.8	64.6	44.2
HH	»	»	0.4	0.7	»	»	»	»
Ch	Andromeda polifolia	55	54	44	»	»	14	1
	Calluna vulgaris	33	40	18	12	1	2	1
	Empetrum nigrum	86	40	78	12	»	2	»
	Erica tetralix	72	98	64	92	19	16	20
	Galium harcynicum	»	»	»	»	35	»	»
	Myrica gale	95	»	100	90	»	»	»
	Oxycoccus quadripetalus	53	94	52	22	»	10	»
	Salix repens	»	»	2	»	»	»	»
	Vaccinium uliginosum	1	»	4	»	»	»	1
	— vitis idaea	»	»	»	4	»	»	»
H	Agrostis canina	»	»	»	2	12	»	»
	— tenuis	»	»	»	»	1	»	»
	Carex pilulifera	»	»	»	»	4	»	»
	Deschampsia flexuosa	»	»	2	8	96	»	»
	Eriophorum vaginatum	96	98	8	12	»	90	1
	Festuca ovina	»	»	»	»	6	»	»
	Gentiana pneumonanthe	»	»	»	12	»	»	»
	Juncus squarrosus	»	»	»	4	»	»	»
	Luzula multiflora	»	»	»	»	1	»	»
	Molinia coerulea	10	23	96	98	21	98	85
	Nardus stricta	»	»	2	»	54	»	1
	Narthecium ossifragum	»	»	»	80	»	»	»
	Potentilla erecta	»	»	»	2	1	»	»
	Scirpus caespitosus	12	7	24	16	»	»	»
G	Carex Goodenoughii	5	33	52	»	46	78	55
	— panicea	»	»	»	28	59	2	61
	Eriophorum polystachyum	45	24	47	76	34	86	81
	Juncus filiformis	»	»	»	»	»	»	9
	Trientalis europaea	»	»	10	»	2	»	»
HH	Carex rostrata	»	»	2	»	»	»	»
	Equisetum limosum	»	»	»	4	»	»	»
	Cetraria islandica	»	»	»	»	3	»	»
	Cladonia chlorophaea	39	14	6	6	3	»	»
	— crispata	»	1	»	»	6	»	1
	— Floerkeana	1	2	2	»	62	»	»

Tabel 16 (fortsat).

	1	2	3	4	5	6	7	8
Cladonia glauca.....	1	»	»	»	»	»	»	»
— gracilis.....	»	»	»	»	1	»	»	»
— impexa.....	93	46	36	48	5	»	»	1
— pleurota.....	»	»	»	»	1	»	»	»
— rangiferina.....	3	1	8	2	12	»	»	»
— silvatica.....	15	10	6	16	1	»	»	»
— squamosa.....	9	38	»	»	17	8	4	3
— uncialis.....	6	20	»	6	20	»	10	7
Campylopus piriformis	2	»	»	»	»	»	»	»
Dicranum intermedium	»	»	»	»	»	»	3	3
— rugosum	»	»	2	»	10	»	»	»
— scoparium	1	2	6	»	64	»	17	43
— spurium	»	»	»	»	»	»	2	2
Gymnocybe palustris	5	6	14	2	»	»	1	»
Hylocomium parietinum	46	26	52	14	85	»	4	1
— squarrosum	»	»	»	»	3	»	»	»
Hypnum fluitans.....	»	5	8	»	»	58	15	»
Leucobryum glaucum.....	16	10	2	2	»	»	»	5
Mnium hornum.....	»	1	»	»	»	»	»	»
Pohlia nutans.....	3	2	»	»	5	»	5	»
Polytrichum gracilis.....	1	»	»	»	»	»	»	»
Rhacomitrium hypnoides	»	»	»	»	5	»	5	78
Stereodon cupressiformis	94	36	62	66	72	»	»	16
— imponens	»	26	»	»	»	»	49	20
Sphagnum acutifolium	19	5	8	22	»	»	»	»
— compactum.....	»	»	»	»	»	»	4	1
— cuspidatum.....	40	63	48	12	»	100	93	1
— magellanicum	»	»	»	6	»	»	»	»
— papillosum	»	1	»	20	»	»	»	»
— subsecundum	»	»	22	22	»	24	49	»
— tenellum	22	50	18	20	»	78	21	3
Blepharozia ciliaris	5	46	36	2	90	»	35	60
Cephalozia connivens	3	1	»	»	»	»	»	»
— fluitans	»	»	2	»	»	»	»	»
— media.....	16	32	6	10	»	»	1	»
Cephaloziella divaricata	»	1	»	»	»	»	»	»
— elachista	3	9	»	»	»	»	»	»
— Hampeana	26	18	12	4	19	12	5	1
Jungermannia barbata	»	»	»	»	10	»	»	»
— Floerkei	»	»	»	»	19	»	»	»
— gracilis	»	22	»	»	5	»	1	»
— Hatcheri	»	»	»	»	1	»	»	»
— inflata	2	55	6	»	26	74	64	5
— Kunzeana	»	22	4	»	20	»	22	»
— minuta	»	22	»	»	»	»	»	»

Tabel 16 (fortsat).

	1	2	3	4	5	6	7	8
<i>Jungermannia porphyroleuca</i>	1	3	»	»	»	»	»	»
— <i>ventricosa</i>	23	47	10	»	»	10	9	»
<i>Kantia trichomanes</i>	5	7	6	6	»	»	»	»
<i>Lepidozia setacea</i>	2	13	»	4	»	»	1	»
<i>Martinellia gracilis</i>	»	8	»	»	»	»	»	»
<i>Mylia anomala</i>	3	2	»	»	»	»	»	»
<i>Odontoschisma sphagni</i>	40	84	14	42	»	6	1	»
<i>Scapania gracilis</i>	»	1	»	»	»	»	»	»
Bladmoss'er	1.68	1.14	1.46	0.84	2.44	0.58	1.01	1.68
Halvmoss'er	1.29	3.93	0.96	0.68	1.90	1.02	1.39	0.66
Tørvemosser	0.81	1.19	0.96	1.02	»	2.02	1.67	0.05

hvor Svingningerne er mindst, medens H % og Mængden af Bladmoss'er er størst, hvor Svingningerne er størst ø: nærmest Aadalen, og dette gælder, hvad enten man sammenligner de relativt tørre Formationer som Nr. 1, 2 og 5 eller de relativt fugtige som Nr. 6 og 8. Geofytterne synes at have et Maximum paa Middelværdierne mellem de to Yderpunkter, idet G % er størst i Nr. 7, Randzonene i Grønmosetype B.

Kap. VII. Trævæksten.

Samtidig med at de ovenfor meddelte Undersøgelser blev foretaget har A. OPPERMANN og C. H. BORNEBUSCH underkastet Hedens Vegetation og Trævækst en lignende Undersøgelse og publiceret Resultaterne i det tidligere nævnte Arbejde: Nørholm Skov og Hede. — Det forstlige Forsøgvæsen i Danmark 11: 257—360, 1930. Hedens Vegetation og Trævækst er undersøgt af C. H. BORNEBUSCH, medens A. OPPERMANN har gjort den paa Vestsiden af Aadalen liggende Egeskov til Genstand for sine Undersøgelser og Betragtninger.

Da jeg i visse Henseender er i Stand til at supplere den af C. H. BORNEBUSCH givne Behandling af Trævæksten, anføres nedenstaaende Undersøgelser.

Under Kortlägningsarbejdet blev som tidligere nævnt de enkelte Træer indtegnete paa det store Kort samtidig med, at Træernes Højde blev maalt og indført. For ikke at give det farvelagte Kort alt for stor Detailrigdom er Træerne ikke blevet indført paa dette, men i Stedet for indtegnete paa en Række mindre Kort, Fig. 22—29.

Ved Opmaalingen blev ikke alle de paa Heden voksende Træer indtegnete, kun de Træer der voksende enkeltvis ude paa Heden og havde en Højde paa 50 cm eller derover blev taget med. Langs Hedens Grænser, i Felterne E6—E7 og i Grusgravpartiet C7—D7, blev der tilbage en Del Trægrupper, hvis Tilstedeværelse kun er angivet med Stjerne og hvor de enkelte Træers Højde ikke blev opmaalt. — Det er det ufuldstændige ved denne Undersøgelse, idet den oprindelig kun tog Sigte paa

Fastlæggelsen af saa mange Fixtpunkter som mulig paa selve Hedefladen. Der er dog ingen Grund til at formode, at Billedet af Trævæksten og dens Fordeling paa Heden vil ændres selvom samtlige Træer blev taget med.

Sommer 1922 var der paa Heden foruden en Del Trægrupper i alt 473 Træer. Paa Fig. 22 er alle disse Træer og Trægrupper indtegnete og Kortet viser tydeligt, hvorledes Trævæksten er koncentreret langs Hedens Nordkant og Vestside, og hvor

Tabel 17. Antallet af fritstaaende Træer i Hedens forskellige Felter.

En Stjerne antyder Grupper af ikke optalte eller opmaalte Træer.

		Betula	Juni-perus	Picea	Pinus mont.	Pinus silv.	Sorbus	Crataegus	Frangula alnus
F1.....	6	»	1	1	»	»	1	»	3
E1.....	2	1	1	»	»	»	»	»	»
D1.....	»	»	»	»	»	»	»	»	»
F2.....	8	»	1	»	»	»	7	»	»
E2.....	14	3	2	»	1	»	7	1	»
D2.....	2	»	2	»	»	»	»	»	»
C2.....	4	»	1	»	3	»	»	»	»
F3.....	2*	»	»	»	»	»	2*	»	»
E3.....	10	»	4	»	1	»	5	»	»
D3.....	13	6	1	»	5	»	1	»	»
G3.....	2	1	»	»	1	»	»	»	»
F4.....	10	»	1	»	»	»	8	1	»
E4.....	26	5	2	»	9	»	10	»	»
D4.....	13	8	»	2	3	»	»	»	»
G4.....	10	7	1	»	2	»	»	»	»
B4.....	2	»	1	1	»	»	»	»	»
F5.....	1	»	»	»	1	»	»	»	»
E5.....	44*	10*	»	11	20	3	»	»	»
D5.....	20	11	»	5	2	2	»	»	»
C5.....	13	12	»	1	»	»	»	»	»
B5.....	7	2	2	1	1	1	»	»	»
E6.....	*	—	—	**	—	—	—	»	»
D6.....	30	11	7	5	3	3	»	1	»
C6.....	12	3	3	»	»	6	»	»	»
B6.....	70	31	2	6	6	22	3	»	»
A6.....	1	»	»	»	»	1	»	»	»
E7.....	»	»	»	»	»	»	»	»	»
D7.....	14*	4*	»	»	»	10	»	»	»
C7.....	29*	5*	1	»	»	23	»	»	»
B7.....	49	14	»	7	2	23	3	»	»
A7.....	1	»	»	»	1	»	»	»	»
D8.....	6	»	»	»	»	6	»	»	»
C8.....	12	1	»	1	»	10	»	»	»
B8.....	32	14	2	4	1	2	5	4	»
A8.....	8	»	»	»	»	2	5	1	»
Ialt	473	149	35	45	62	114	57	8	3

Tabel 18. Trævegetationens Højdeforhold Sommer 1922.

cm	0	50	100	150	200	250	300	350
Betula	1	70	45	17	8	5	2	
Juniperus	7	16	7	1	»	»	»	
Picea	2	24	9	6	1	2	1	
Pinus mont.	6	38	14	2	»	»	»	
Pinus silv.	»	26	51	12	12	5	3	
Sorbus auc.	»	13	26	7	»	4	2	
Crataegus	»	5	1	1	»	»	»	
Frangula alnus.	»	3	»	»	»	»	»	
	16	195	153	46	21	16	8	

faa Træer der findes paa Hedens midterste og østlige Felter. En Undersøgelse af de enkelte Træarters Udbredelse viser en indbyrdes stor Uoverensstemmelse saavel i Antal om i Udbredelse. Af Birk (*Betula pubescens*) findes ialt 149 enkeltstaaende Træer spredt over største Delen af Heden. Hedepartiet Nord for den østgaaende Vej mangler dog ganske Birke, det samme gælder de østlige Felter og et lille Parti mod Sydvest. Resten af Heden bærer en mere eller mindre spredt Birkebevoksning. Øst for den sydgaaende Vej staar Birkene endnu ret spredt, men jævnt fordelt. Vest for Vejen er Bevoksningerne mere pletvis og tæt, især samlede i 3 Partier, et Parti i B6—B7, et i B8 og et i C7—D7.

I Modsætning til Birken forekommer Enen (*Juniperus communis*) ret faatallig. En Optælling paa Kortet udviser kun et Antal paa 35, der dog maa suppleres med en Gruppe ikke indtegnede Ener i Hedens Nordøsthjørne (i F3). Arten forekommer spredt over hele Arealet, maaske med en Antydning af Koncentration langs Hedens Nordøstrand.

Tabel 19. Trævegetationen og Træernes gennemsnitlige Højder i Hedens forskellige Plantesamfund.

	Betula pub.		Picea		Pinus mont.		Pinus silv.		Sorbus aucup.	
		em		em		em		em		em
Ore	—	—	—	—	—	—	—	—	4	141
Calluna-Hede	67	104	32	96	48	84	45	144	33	151
Erica-Hede	24	133	2	125	9	78	—	—	—	—
Grønmose	6	163	—	—	—	—	—	—	—	—
Myrica-Hede	7	206	—	—	—	—	—	—	—	—
Calluna-mark o. l.	17	111	8	169	3	123	64	149	16	139
Erica-mark o. l.	17	174	1	180	—	—	—	—	—	—
Grusgrave	10	137	2	165	—	—	—	—	—	—
Naturformationer . . . . .	..	121	..	97	..	83	..	144	..	150
Kulturformationer . . . . .	..	141	..	169	..	123	..	149	..	139

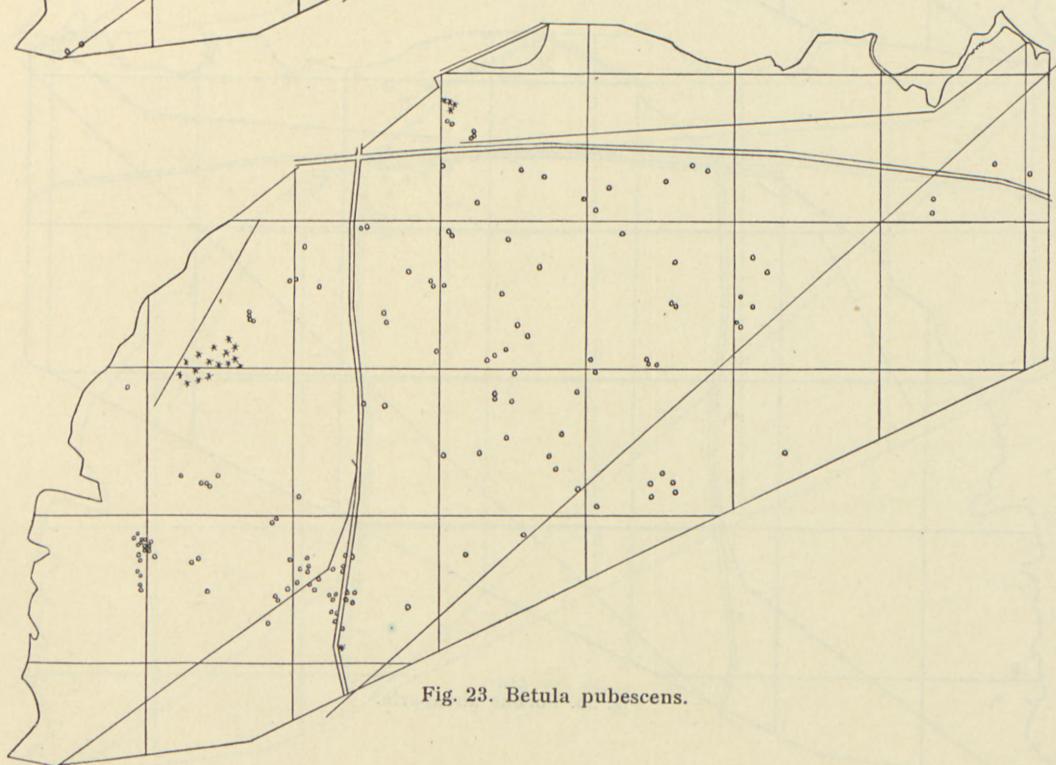
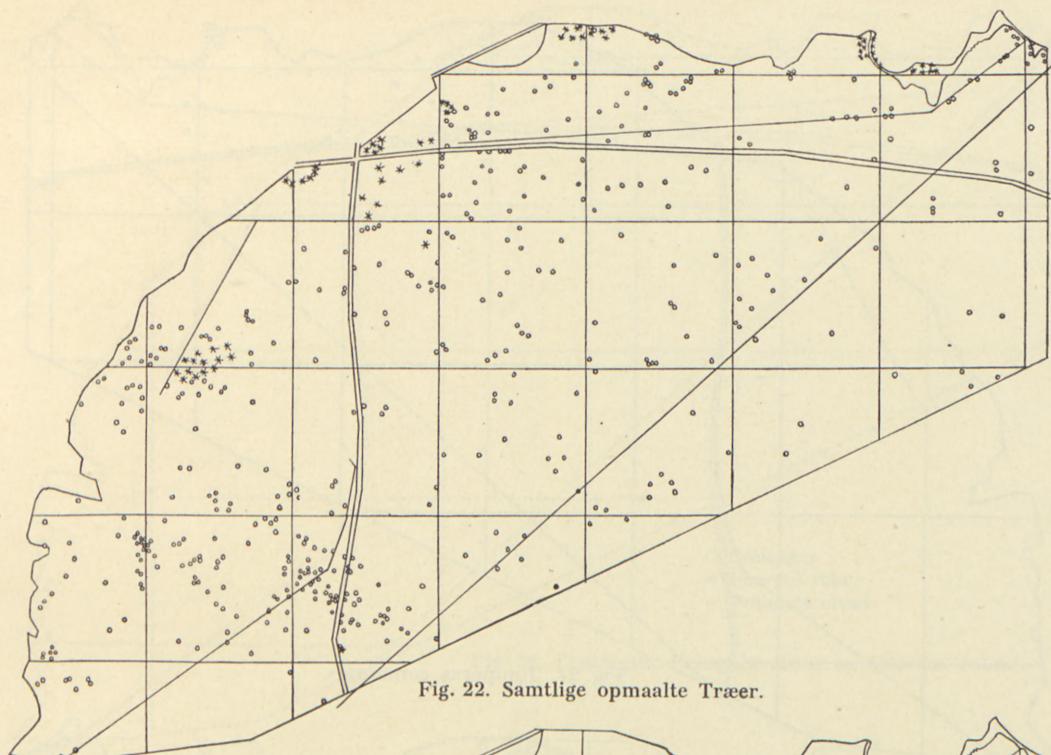
Birk og Ene er de to eneste Træer paa Heden, der er nogenlunde jævnt fordelt over hele Arealet, for begge Arter dog med en ret udpræget Tendens, for Birk til Koncentration mod Vest og for Ene til Koncentrationer mod Nordøst. Alle de andre Arters Udbredelse paa Heden er egentlig kun en udpræget Effektuering af de to førstnævnte Arters Tendens. *Sorbus aucuparia*, *Crataegus*, *Frangula alnus* og *Quercus* er mere eller mindre udprægede Repræsentanter for den sidstnævnte Type, *Picea*, *Pinus montana* og *Pinus silvestris* for den første Type.

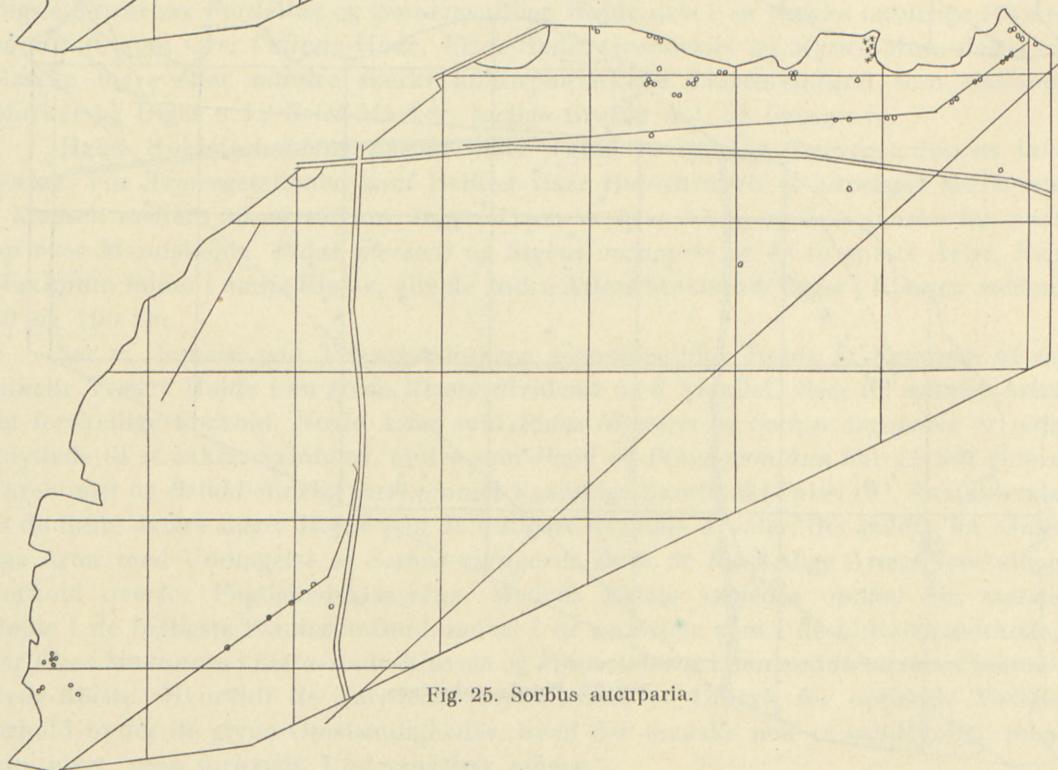
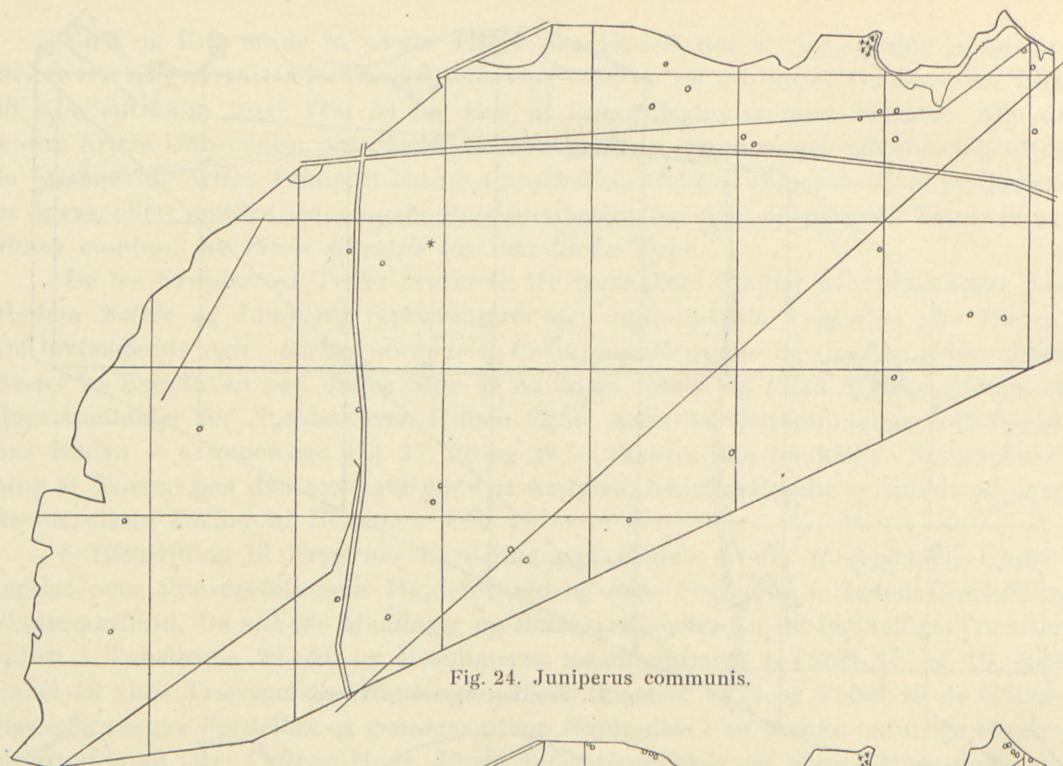
De tre Grupper af Træer svarer til tre forskellige Stadier af Trævæksten paa Heden. *Betula* og *Juniperus* repræsenterer den oprindeligste Trævækst paa Heden. De løvfældende Arter *Sorbus aucuparia*, *Crataegus*, *Frangula* og *Quercus* er de sidste Rester af Egeskoven paa denne Side af Aadalen. *Pinus*- og *Picea*-Arterne endelig er Repræsentanter for Nutidsskoven i disse Egne. Arternes ejendommelige Udbredelse paa Heden — sammenlign Fig. 27, 28 og 29 — skyldes den forskellige Sammensætning af Skoven paa den modsatte Side af Aadalen, hvorfra Frøene er spredt ud over de nærmeste Partier af Heden.

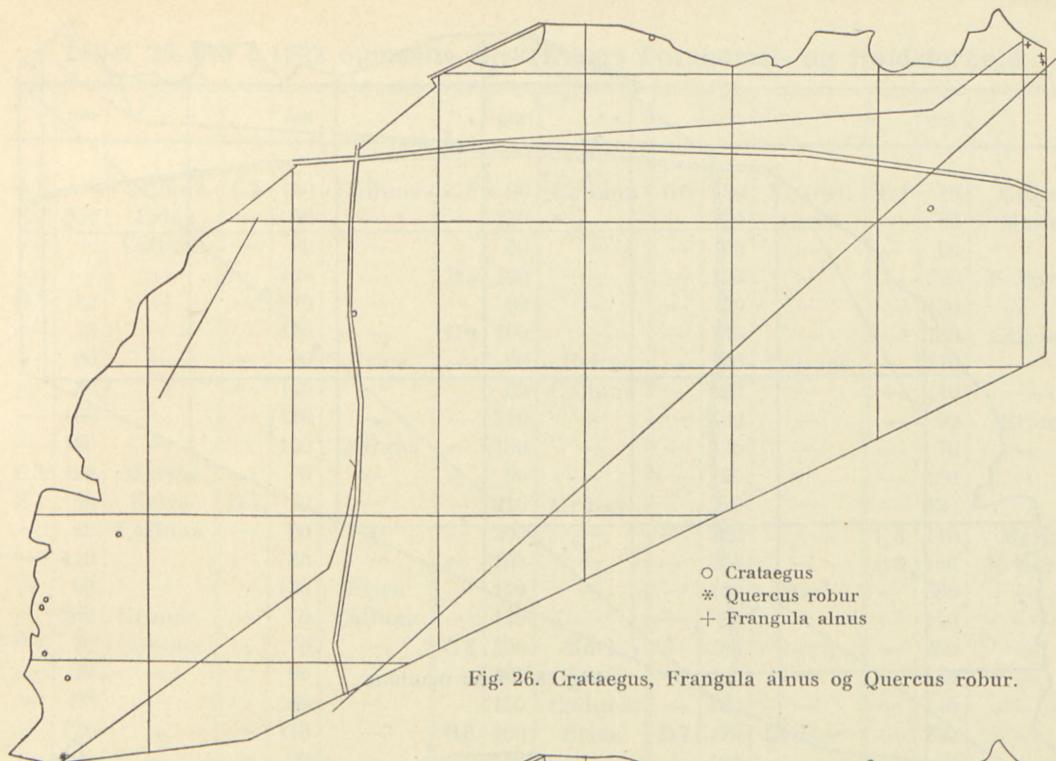
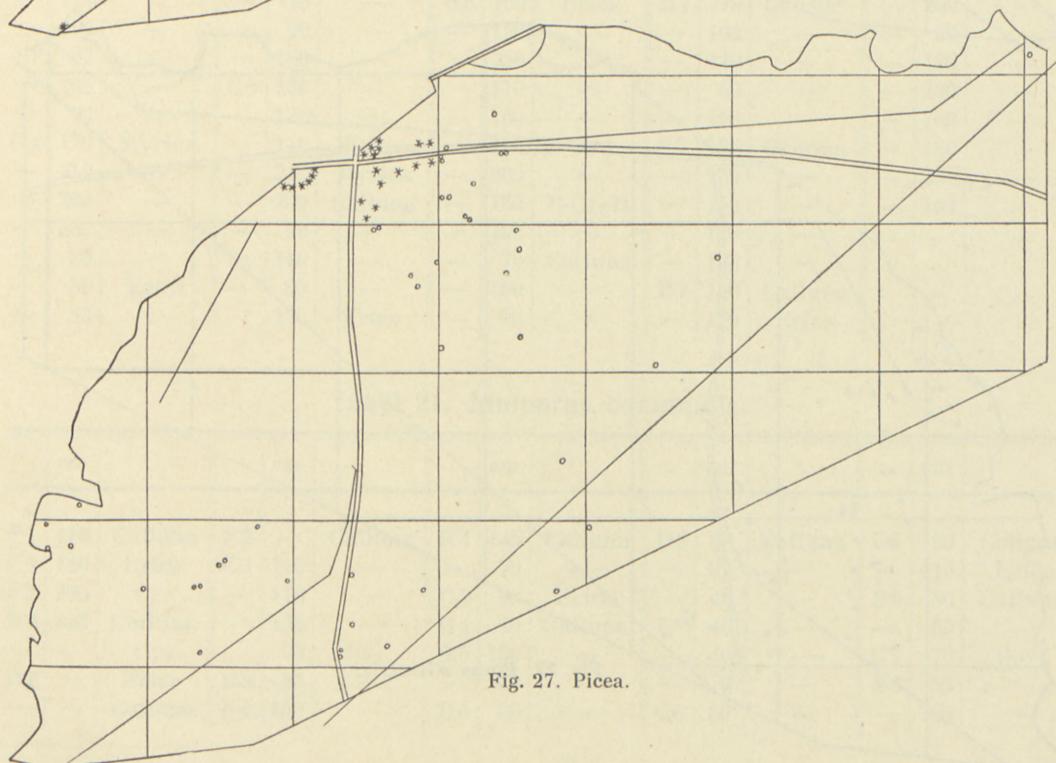
I Tilknytning til Træernes Fordeling paa Heden er der foretaget en Undersøgelse over Trævegetationens Højdeforhold og dens Fordeling i Hedens forskellige Plantesamfund. De enkelte Maalinger og Bestemmelser er for de forskellige Træarter opført i Tabellerne 20—26 og Resultaterne sammentrængt i Tabel 18 og 19, idet Tabel 18 viser Trævegetationens Højdeforhold Sommer 1922 og Tabel 19 de 5 hypsigste Træarters Fordeling og gennemsnitlige Højde dels i en Række naturlige Plantesamfund, som Ore, *Calluna*-Hede, *Erica*-Hede, Grønmoser og *Myrica*-Mose dels i en Række mere eller mindre stærkt kulturpaavirkede Plantesamfund som *Calluna*-Marker og Diger o. l., *Erica*-Marker, fugtige Grøfter o. l. og Grusgrave.

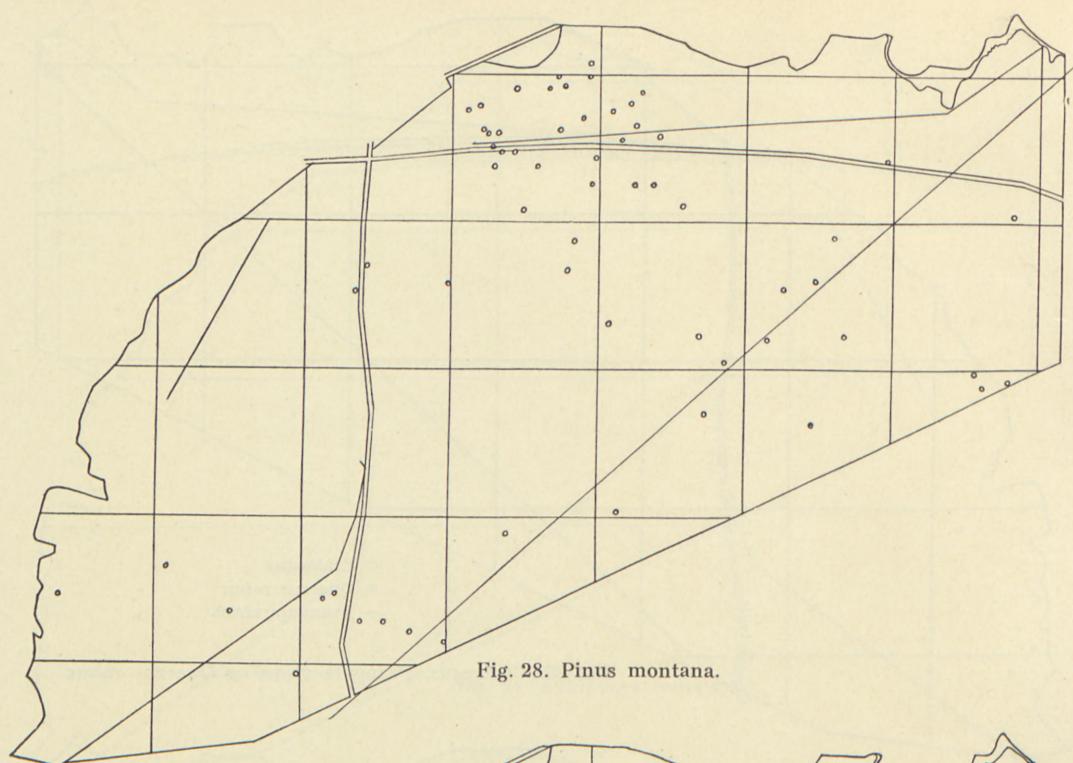
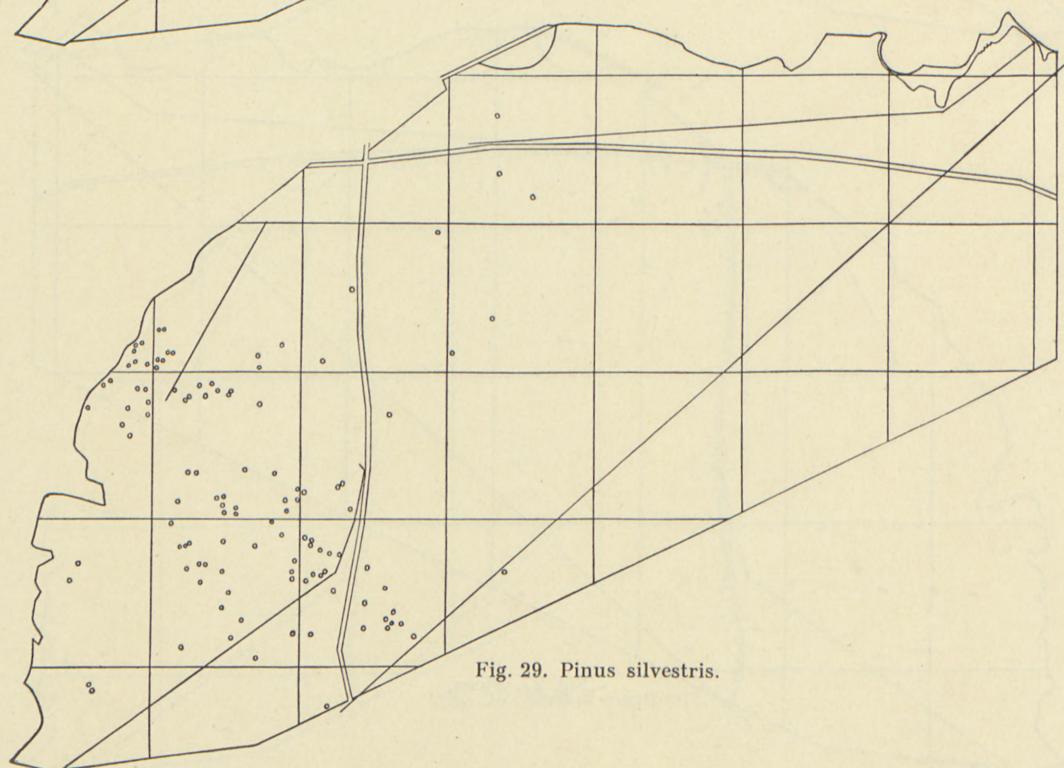
Hvad Højdeforholdene angår viser Tabel 18 tydeligt Trævegetationens lave Vækst. For Trævegetationen som Helhed viser Højdekurven et udpræget Maximum i Klassen mellem 50 og 100 cm. Ingen Træer er over 3.5 m og kun ganske faa naar op over Mandshøjde. *Pinus silvestris* og *Sorbus aucuparia* er de to eneste Arter, hvis Maximum falder i næste Klasse, alle de andre Arters Maximum ligger i Klassen mellem 50 og 100 cm.

Ser vi dernæst paa Trævegetationens gennemsnitlige Højde ∅: Summen af de enkelte Træers Højde i en given Klasse divideret med Antallet, viser de enkelte Arter ret forskellige Forhold. Nogle Arter som *Pinus silvestris* og *Sorbus aucuparia* er nøje knyttede til et enkelt Samfund, andre som *Picea* og *Pinus montana* har en lidt videre Forekomst og *Betula* endelig forekommer i samtlige Samfund (Tabel 19). Paafaldende er de fleste Arters større Højde paa de tidlige dyrkede Arealer, det gælder for samtlige Arter med Undtagelse af *Sorbus aucuparia*, samt de forskellige Arters forskellige Forhold overfor Fugtighedsklasserne. Medens *Betula* saaledes opnaar sin største Højde i de fugtigste Plantesamfund, saavel i de naturlige som i de kulturpaavirkede, har *Picea* Maximum i *Erica*-Hede-Klassen og *Pinus*-Arterne i den endnu tørrere *Calluna*-Hede-Klasse. Hvorvidt de antydede Højdeforhold er Udtryk for optimale Vækstforhold under de givne Omstændigheder, hvad der maaske nok er sandsynligt, men ikke givet, maa fornyede Undersøgelser afgøre.





Fig. 26. *Crataegus*, *Frangula alnus* og *Quercus robur*.Fig. 27. *Picea*.

Fig. 28. *Pinus montana*.Fig. 29. *Pinus silvestris*.

Tabel 20. De i 1922 opmaalte Birketræers Forekomst- og Højdeforhold.

	cm			cm			cm			cm			cm	
E 1	— ¹⁾	Calluna	C 5	150	Calluna	C 5	90	Calluna	B 6	130	E. Grøft	B 7	80	Erica
E 2	330	Erica	—	90	—	—	150	—	—	90	Grøft	—	80	Mark
—	—	Calluna	—	90	—	—	60	—	—	100	—	—	90	—
—	—	—	—	130	—	B 5	100	—	—	120	—	—	240	E. Mark
D 3	80	—	—	210	—	—	90	—	—	150	—	—	130	—
—	70	—	—	120	—	D 6	100	—	—	140	—	—	180	Calluna
—	90	—	—	90	Erica	—	90	Erica	—	200	Calluna	—	170	—
—	80	—	—	140	—	—	60	Calluna	—	190	—	—	110	—
—	100	—	—	120	—	—	110	—	—	100	—	—	90	Erica
—	130	—	—	100	Calluna	—	130	—	—	120	—	—	70	—
C 3	120	Myrica	—	90	—	—	90	—	—	80	—	—	150	—
E 4	90	Erica	D 5	90	—	—	210	Grusgr.	—	90	—	—	130	—
—	80	Calluna	—	60	—	—	200	—	—	160	—	C 8	110	Mark
—	110	—	—	80	—	—	190	—	—	230	—	B 8	150	E. Mark
—	90	—	—	130	Erica	—	110	—	—	140	Mark	—	300	—
—	200	Grønm.	—	70	Calluna	—	140	—	—	80	—	—	110	—
D 4	70	Calluna	—	70	—	C 6	150	Mark	—	80	—	—	250	—
—	70	—	—	90	—	—	100	Grøft	—	100	—	—	180	—
—	90	—	—	60	—	—	150	Calluna	—	100	—	—	140	—
—	120	—	—	110	—	B 6	100	Erica	D 7	70	Grusgr.	—	260	—
—	100	—	—	90	—	—	120	—	—	100	—	—	90	—
—	80	—	—	100	—	—	250	—	—	140	—	—	120	—
—	165	—	C 5	130	—	—	110	—	—	60	—	—	280	—
—	90	—	—	120	—	—	100	—	—	150	—	—	100	—
C 4	170	Myrica	—	140	Erica	—	100	—	C 7	120	Grønm.	—	180	—
—	310	—	—	240	Myrica	—	300	—	—	150	—	—	200	—
—	260	—	—	100	Calluna	—	160	C-Grøft	—	150	—	—	100	—
—	250	—	—	90	—	—	100	—	—	170	—	..	..	..
—	90	—	—	110	—	—	70	Calluna	—	190	—	..	..	..
—	50	Erica	—	60	—	—	100	—	B 7	100	Calluna	..	..	..
—	80	—	—	150	Erica	—	90	—	—	170	Erica	..	..	..

Tabel 21. Juniperus communis.

	cm			cm			cm			cm			cm	
F 1	110	Calluna	C 2	—	Calluna	E 4	145	Calluna	D 6	80	Calluna	C 6	90	Calluna
E 1	140	Erica	E 3	110	—	—	70	—	—	40	—	—	110	Erica
F 2	200	Ore	—	110	—	C 4	90	Erica	—	40	—	B 6	80	Calluna
E 2	100	Calluna	—	135	—	B 4	40	Calluna	—	40	—	—	80	—
—	—	Ore	—	70	—	B 5	100	—	—	40	—	C 7	70	Mark
D 2	—	Erica	D 3	50	—	—	60	—	—	70	—	B 8	50	—
—	—	Calluna	F 4	100	—	D 6	80	—	C 6	60	—	—	90	—

¹⁾ Højden ikke maalt.

Tabel 22. *Pinus silvestris*.

	cm			cm			cm			cm			cm	
E5	130	Calluna	B6	220	Calluna	D7	80	Mark	C7	110	Calluna	B7	110	Mark
—	100	—	—	170	—	—	80	—	—	100	—	—	110	—
—	90	—	—	130	—	C7	90	—	B7	240	—	D8	110	—
D5	80	—	—	170	—	—	90	—	—	80	—	—	120	—
—	120	—	—	190	—	—	160	—	—	90	—	—	120	—
B5	210	—	—	150	Mark	—	100	—	—	280	Mark	—	150	—
D6	90	—	—	100	—	—	140	—	—	110	—	—	120	—
—	150	—	—	340	—	—	150	—	—	110	—	—	130	—
—	80	—	—	250	—	—	140	—	—	100	—	C8	130	—
C6	110	Mark	—	120	—	—	160	—	—	—	—	—	110	—
—	330	—	—	150	—	—	160	—	—	230	—	—	130	—
—	90	—	—	90	—	—	150	—	—	260	—	—	130	—
—	150	—	—	290	—	—	—	—	—	80	—	—	—	—
—	120	—	—	200	—	—	170	—	—	70	Calluna	—	110	—
—	120	Calluna	—	210	—	—	140	—	—	180	—	—	150	—
B6	100	—	A6	90	Calluna	—	140	—	—	90	—	—	—	—
—	300	—	D7	110	—	—	110	—	—	120	—	—	120	—
—	190	—	—	110	—	—	130	Calluna	—	220	—	—	—	—
—	220	—	—	90	—	—	150	—	—	220	—	B8	170	—
—	250	—	—	120	Mark	—	110	—	—	280	—	—	130	—
—	120	—	—	110	—	—	90	—	—	150	Mark	A8	350	—
—	210	—	—	100	—	—	110	—	—	110	—	—	170	—
—	140	—	—	100	—	—	110	—	—	220	—	..	..	—

Tabel 23. *Picea*.

	cm			cm			cm			cm			cm	
E1	110	Calluna	E5	90	Calluna	D5	60	Calluna	B6	100	Erica	B7	70	Calluna
E5	70	—	—	230	—	—	70	—	—	150	—	—	100	—
—	80	—	—	190	—	C5	70	—	—	80	Calluna	C8	350	Mark
—	80	—	—	70	—	B5	—	—	—	70	—	B8	110	—
—	80	—	D4	40	—	D6	120	—	—	300	—	—	110	—
—	100	—	—	—	—	—	110	—	B7	120	Mark	—	270	—
—	60	—	B4	50	—	—	80	—	—	110	—	—	180	E. Mark
—	60	—	D5	60	—	—	170	Grusgr.	—	160	—	..	..	..
—	60	—	—	90	—	—	160	—	—	120	—	..	..	..
—	90	—	—	90	—	B6	170	Calluna	—	60	Calluna	..	..	..

Tabel 24. *Pinus montana*.

	cm			cm			cm			cm			cm	
E2	120	Calluna	C2	120	Erica	D3	40	Calluna	D3	60	Calluna	E4	50	Calluna
C2	—	—	E3	—	Calluna	—	70	Erica	C3	100	—	—	70	—
—	—	—	D3	70	—	—	70	—	E4	70	—	—	150	—

Tabel 24 (fortsat).

	cm				cm			cm			cm			cm	
E 4	80	Calluna	F 5	90	Erica	E 5	90	Calluna	E 5	50	Calluna	B 6	60	Calluna	
—	70	—	E 5	110	Calluna	—	100	Erica	—	80	Erica	—	60	—	
—	130	Erica	—	40	—	—	70	Calluna	D 5	100	—	—	80	—	
—	60	Calluna	—	80	—	—	60	..	—	80	Calluna	—	160	—	
—	110	—	—	110	—	—	120	Calluna	B 5	120	—	B 7	80	—	
D 4	60	—	—	60	—	—	60	Erica	D 6	110	—	—	110	Mark	
—	85	—	—	80	—	—	130	—	—	50	—	A 7	70	—	
—	70	—	—	90	—	—	120	Calluna	D 6	60	—	B 8	190	—	
C 4	90	—	—	100	—	—	120	—	B 6	100	—	..	..	..
—	50	—	—	80	—	—	100	—	—	70	—	..	..	..

Tabel 25. *Sorbus aucuparia*.

	cm				cm			cm			cm			cm	
F 1	150	Calluna	E 2	300	Calluna	F 4	150	Calluna	E 4	200	Calluna	B 8	170	Mark	
F 2	90	—	—	170	—	—	70	—	—	130	—	—	110	—	
—	130	—	—	200	—	—	80	—	—	120	—	—	70	—	
—	150	—	—	—	—	—	300	—	—	150	—	A 8	120	—	
—	120	Ore	—	—	—	—	350	—	B 6	260	Dige	—	200	—	
—	135	—	—	120	—	—	110	—	—	130	—	—	90	—	
—	110	—	E 3	90	—	E 4	100	—	—	100	—	—	150	—	
—	200	—	—	90	—	—	100	—	B 7	120	—	—	140	—	
F 3	165	Calluna	—	80	—	—	80	—	—	140	—	..	..	..
—	150	—	—	—	—	—	100	—	—	180	Mark	..	..	..
—	130	—	D 3	320	—	—	120	—	B 8	120	—	..	..	..
E 2	260	—	F 4	120	—	—	120	—	—	120	—	..	..	..

Tabel 26.
Crataegus.

Frangula alnus.

	cm				cm			cm			cm			cm	
E 2	—	Grøft	B 8	100	Mark	B 8	90	Mark	..	..	..	F 1	90	Calluna
F 4	100	Calluna	—	100	—	A 8	140	—	..	..	..	—	60	—
D 6	170	Grøft	—	100	—	..	..	..	..	..	..	—	60	—

RETTELSER

Pag. 147 (49) Grønmose B⁴. Læs: Grønmose B³.
 — 159 (61) D 1⁴. Læs: D 2⁴.

SUMMARY

The tract of heath investigated in the present paper is situated in western Jutland c. 10 km to the north-east of Varde and immediately south and east of the estate of Nørholm. On the initiative of Miss INGEBORG KRISTIANE ROSENØRN-TEILMANN, the entail holder, an easement was imposed in 1913 according to which the area "must neither be built on, brought under cultivation as arable land, nor transformed into forest, neither must it be used for the grazing of cattle nor set out to a deerpark." The superintendence of the preserved area was left partly to the Professor in ordinary of Botany in the University of Copenhagen and partly to the Director of the Experimental Forestry of the State.

The preserved tract of heath, which covers an area of c. 350 ha, is situated on a plain of heathland separating the Varde-Aadum Hills in the north from the Esbjerg Hills in the south, and connects a series of large tracts of heath in central Jutland with the North Sea. Thus the heath at Nørholm belongs to a type, the soil of which is extremely poor in nourishment. The poverty of the soil was further increased when the terrain, in one of the first periods of the last glacial epoch, was exposed to a strong sand-drift whose traces may be seen at the present day partly in the numerous characteristically rounded dunes and hills, partly in the erosion area which bounds the heath on the north-west and is exhibited in a long row of large gravel pits of a southwest-northeast trend. On the coloured map accompanying this paper the gravel pits as well as the banks of drift-sand and the traces of the shifting sand found elsewhere on the heath are plainly shown.

On account of its slight value for cultivation the area has been allowed to remain in its natural condition and has only been used for the grazing of sheep and cattle. For a time the greater part of the tracts to the west of the road running southward and the two dykes found there was under the plough, but this cultivation was subsequently given up, and the entire conserved area is now allowed to remain as heathland which in its broad features has preserved the original character of the landscape.

However, though the heath, apart from the circumstances mentioned above, has in the main retained its original character, the long periods during which it has been surrounded by land in culture have nevertheless left lasting traces on its soil. Fig. 2 shows the chief of these. The earliest are the barrows scattered over the heath and occurring especially on the dunes; of considerably later date are

the numerous track-ways (socage roads) all leading towards the estate; of still later origin are the dykes, the roads bordered by ditches, the low and high tension lines, and the traces of the industrial exploitation of the various kinds of soil: the sand-, clay-, gravel-, and turf-pits.

The growth of trees on the heath may be regarded as the result of another group of cultural influences. Chapter VII gives a detailed treatment of this group. All the trees that had reached a height of $\frac{1}{2}$ m or more in 1922 (the year of investigation) were mapped, measured, and referred to the various formations. Figs. 22—29 and Tables 17—26 embody the results of these investigations. In Fig. 22 all the trees of the heath are marked. The map shows plainly the greater concentration of the trees in the western and north-eastern parts, a fact which must be put down to a vigorous sowing of seeds and fruits from the adjacent wood on the western side of Aadalen. Figs. 23—29 show the distribution respectively of *Betula pubescens*, *Juniperus communis*, *Sorbus aucuparia*, *Crataegus + Frangula alnus*, *Quercus robur*, *Picea*, *Pinus montana*, and *Pinus silvestris*. The latter three species, especially, show a concentration towards the west; the same applies in some degree to *Betula pubescens*, whilst *Juniperus communis* is more equally distributed throughout the area.

Next, Table 17 gives the number of trees in each separate area of the species mentioned, Table 18 gives the average height of the individual species of trees, and Table 19 the average height of a number of trees (*Betula*, *Picea*, *Pinus montana*, *P. silvestris*, and *Sorbus aucuparia*) in the various formations of the heath, partly in a series of natural formations such as grass heath, *Calluna* heath, meres, *Myrica* moor, partly in a series of cultural formations such as *Calluna* field, *Erica* field, and gravel pits. The table clearly shows that the formations affected by cultivation afford a better soil for the growth of trees than the corresponding natural formations, and, again, that the natural formations are of varying value to the individual species of trees.

The principal object of the investigation, however, was an analysis of the vegetation of the heath, particularly of the more original formations. The method employed was that described by C. RAUNKJÆR in "Formationsundersøgelse og Formationsstatistik", Botanisk Tidsskr. 30, 1909—10, "Measuring Apparatus for Statistical Investigations of Plant Formations, ibid. 33, 1912, and "Recherches statistiques sur les formations végétales", Vid. Selsk. Biol. Medd. I No. 3, 1918.

The principle of the method is to record and tabulate the flora of a series of small areas which may differ in size but are most frequently 0.1 sq.m. and the number of which is 10, 20, or 25 within the same formation. The result achieved in this way is a collective flora list which is the total of the 10, 20, or 25 individual lists. Each of the species occurring is thus provided with a numerical value, the frequency percentage, $F\%$, of the species, which expresses the average distance of the individuals and which may form the numerical basis for further considerations on the formation and its biological conditions. For this purpose a quadratic frame is employed having a surface area of 0.1 sq.m. or a radius of such a length

that the area of the circle will likewise be 0.1 sq.m. This instrument, the Raunkjær Circling Apparatus, when in use is fastened to the end of a stick, and is thus a handy apparatus for the work and easily carried about during the investigations.

On Nørholm Heath a circling apparatus spanning an area of 0.1 sq.m. was employed, and as a rule 25 such areas were investigated. In each area a sample was taken in which the phanerogams, lichens, and mosses were examined. The mosses, particularly the hepaticas, were gathered from each sample and microscopically determined by mag. scient. TH. SØRENSEN.

Chapter IV contains a list of all the plants, phanerogams, lichens, and mosses, occurring on the heath.

Chapter V deals with the vegetation conditions of the heath. An account is given of the plant associations, which are mapped and analysed.

In the part of Nørholm Heath least affected by cultivation the environmental factor chiefly determining the distribution of the plants is the amount of water in the soil. According to the predominance of this factor the plant associations have been arranged in a series showing an increasing amount of water in the soil. The gradation is as follows: *Arctostaphylos* heath, *Calluna-Empetrum* heath, *Erica* heath, *Myrica* moor, and spring moor, besides a series of different types of meres, distinguished by the differing length of time during which they are under water.

The annual fluctuations in the amount of ground-water likewise seem to be of decisive importance for the composition of the vegetation. The nearer the locality is to the river valley, the greater the fluctuations, the farther away, the smaller. Connected herewith are rather considerable differences in the frequency of the individual species, the composition of the vegetation, and the proportional quantity of the formations.

In the summer of 1922 the distribution of the principal types of formations was mapped by the aid of the net of quadrats marked out on the heath by A. OPPERMANN and C. H. BORNEBUSCH (cf. A. OPPERMANN and C. H. BORNEBUSCH, *Nørholm Skov og Hede*. — *Det forstlige Forsøgsvæsen i Danmark II*, 1930, and Fig. 1). On the appended colour chart the *Galluna* heath is shown in brown, the *Erica* heath in red, and the meres in a green shade. The distribution of the *Myrica* moor is shown by special hatching.

The map shows very clearly the regular proportional distribution of the individual types of vegetation. On account of the very uneven ground due to the blown sand, the number of meres is very large, c. 150, and it is hardly possible to find a mere which lacks a belt of *Erica* heath and *Calluna* heath.

A similar zonal distribution of the types of vegetation is conditioned by the distance from the river valley, i.e. from the northern and western side of the heath. We find an outer zone, some 100 m wide, in which the tall *Calluna* heath, rich in hemicryptophytes and poor in lichens, is dominant, together with types of vegetation more sparsely distributed but peculiar to this zone, such as grass heath, mere, and spring moor. Then follows the typical belt of *Calluna* heath covering a couple of areas to the north (3 and 4), where the numerical proportion of the different types

of vegetation has been determined from c. 100 m to 500 m inwards across the heath. From the 500 m line to the 1300 m line we get a belt of *Erica* heath in which 30 to 50 p.c. of the area is covered with *Erica* heath, whilst the *Calluna* heath has been reduced to 50 p.c. or less. In this belt the meres attain their finest development. One type of mere is most handsomely developed c. 500—600 m from the northern margin, another type 700—800 m from it, and a third type between the 900 m and 1000 m lines. Between the 1100 m and 1200 m lines there is a fourth maximum for bog formation. Here the *Myrica* moor, rich in chamaephytes, attains its optimum development. Within the belt of *Erica* heath, along the southern margin of the heath, we get a c. 200 m wide belt where the *Calluna* heath is again dominant. Table 1 shows the numerical proportion of the various types of vegetation at different distances from the northern margin of the heath.

The zonal distribution of the flora and vegetation in relation to the river valley likewise appears from the varying distribution of a series of species on the heath. In Figs. 3—11 the distribution of such a series of species is mapped in its broad features. *Arctostaphylos uva ursi*, *Salix repens*, and *Vaccinium uliginosum* are examples of a type of species which are uniformly distributed over the entire area, but in very different quantity. *Vaccinium vitis idaea* and *Arnica montana* are representatives of a group, rich in species, which is intimately associated with the outermost zones of the belt of *Calluna* heath, whilst the main distribution of *Myrica gale*, *Andromeda polifolia*, and *Oxycoccus quadripetala* is in the innermost zone of the belt of *Erica* heath.

The natural plant associations occurring on Nørholm heath and each comprising a number of different formations are the following: *Calluna* heath, *Erica* heath, moors and meres.

The *Calluna* heath covers by far the largest area of the heath. Typical *Calluna* heath occurs in the following formations: *Calluna* heath rich in hemicryptophytes, which appears especially along the outer margin of the heath; *Arctostaphylos* heath or the tall *Calluna* heath, which occurs on the southern side of the dunes and hills and in the outer zones of the belt of *Erica* heath as well as in the inner tracts of the belt of *Calluna* heath; and *Calluna-Empetrum* heath or the low *Calluna* heath, the distribution of which is determined by the incipient influence on the vegetation of the ground water. This type occurs on the northern slopes of hills and dunes and on the lower tracts nearest the *Erica* heath. The grass heath and the vegetation of the inner sands, which occur as isolated patches in the *Calluna* heath, are types of vegetation which are most closely allied to the *Calluna* heath.

The statistic analysis of the formations of the *Arctostaphylos* heath appears from Table 2 a, Nos. 1—7, and the biological spectra based on the circling results from Table 3 b. The dominating species as to frequency are *Arctostaphylos uva ursi*, *Calluna vulgaris*, *Empetrum nigrum*, *Cladonia impexa*, *silvatica*, *rangiferina* and *uncialis*, as also *Cetraria aculeata*, *Hypnum cupressiformis*, and *Blepharazia ciliaris*.

Arctostaphylos uva ursi is absent from the *Calluna-Empetrum* heath, whereas a number of species more dominant in the lower and damper areas are present. Table 3, Nos. 1—9, shows the composition of the formation.

The composition of the *Calluna* heath, rich in hemicryptophytes, appears from Table 4 a, Nos. 1—4. The biological spectra show considerably higher hemicryptophyte and geophyte percentages than the two preceding types of *Calluna* heath, even though the chamaephyte percentage is dominant in this formation too. The higher hemicryptophyte and geophyte percentages are especially due to the two species *Deschampsia flexuosa* and *Trientalis europaea*. The lichen vegetation is rather scanty.

As will appear from Table 4, Nos. 5—7 and 8—11, the *Empetrum* heaths and grass heaths show the further development of a *Calluna* heath rich in hemicryptophytes and geophytes, whilst camaephytes are absent here (with the exception of *Empetrum nigrum* in the former formation), being replaced as frequency dominants by the species which are less dominant in the *Calluna* heath rich in hemicryptophytes. The most frequent species are *Molinia coerulea*, *Deschampsia flexuosa*, *Potentilla erecta*, *Trientalis europaea*, and *Festuca ovina*; the number of mosses and especially of lichens is greatly reduced.

On Nørholm Heath the vegetation of the inner sands only occurs in a small isolated patch eastward on the heath, in the area E 1 on the hill immediately north of the road. The composition of the vegetation appears from Table 5, Nos. 1—3. A nearly allied vegetation occurs along the river banks in the north-eastern corner. Table 5, No. 4, shows the composition of this vegetation.

Erica heath occurs in a relatively dry *Calluna-Erica* heath, Table 6, Nos. 1—4, and a damper, pure *Erica* heath, Table 6, Nos. 5—10. Physiognomically *Erica tetralix*, *Cyperaceae* and lichens are the dominants.

Moors likewise occur in two different formations: a *Myrica* moor and an *Erica-Eriophorum vaginatum* moor, the latter, however, only as a marginal zone surrounding the former. It is a peculiarity of both these formations in contrast to all the other formations of the heath that the surface is knolly. It is covered by a phanerogam and moss vegetation relatively rich in species, whereas the lichen vegetation is poor in species. The floristic composition of the formation appears from Table 7, Nos. 1—5 for the *Myrica* moor, and Nos. 6—8 for the *Erica-Eriophorum vaginatum* moor.

A nearly allied plant association is the spring moor. However, it only occurs in the clefts in the northern margin of the heath towards the river valley, and is without connection with and at a great distance from the above-mentioned moors. A comparison between Nos. 8—9 in Table 7 and the other columns of the table will show the floristic, biological, and statistic similarities and dissimilarities between this type of moor and the heath moors.

Merces. As the map will show, a great number of meres occur on the heath, the greatest number and the largest ones being found in the middle and eastern areas. As previously mentioned, there occur various types of meres, distributed in

zones in relation to the river valley. Nearest the river valley, attaining its finest development at a distance of 5—600 m, there occurs the summer-dry *Dicranum-Rhacomitrium* mere, and some hundred metres further inland a moist Sphagnum mere which forms a transition to the heath moor. A fourth type of mere occurs in depressions in the dunes.

In the small meres the vegetation is uniform throughout, whereas, in the larger meres, a more or less zonal distribution always occurs.

A. The summer-dry mere comprises most of the smaller meres and some few larger ones. Tables 8 and 9 show the circling results for a series of small and some few larger meres of this type. The larger ones are D 2⁹⁻¹⁰, i.e. meres Nos. 9—10 in the areas D 2, B 4³, and D 3¹². The characteristic feature of this type is the moss vegetation consisting of leaf mosses such as *Dicranum scoparium*, *Rhacomitrium hypnoides*, *Stereodon cupressiformis*, and *Hylocomium parietinum*, more or less mixed with hepaticas such as *Blepharazia ciliaris* and various species of *Jungemannia*, but no *Sphagnum* species. The individual species of mosses may often occur in remarkably pure growths or with a very slight admixture of other species. In the moss carpet there is a dense vegetation of hemicryptophytes and geophytes, varying according to the varying degree of moisture of the moss.

On the driest soil there occur either entirely or almost entirely pure growths of grasses such as *Deschampsia flexuosa*, *Nardus stricta* or *Molinia coerulea* with a scattered vegetation of chamaephytes and lichens. On the moister soil there occur *Carex panicea* or *Carex Goodenoughii* in pure or mixed growths. Lichens are absent from these formations.

D 3¹² affords a particularly fine example of these meres. Table 9, Nos. 1—8, shows its floristic composition, Fig. 15 the distribution of the individual formations. The mere consists of two halves, a larger northern half and a smaller southern one, but both show the same parallelism of composition. Farthest westward there occurs in both sections a pure *Molinia coerulea* growth; next follows, though only in the northern half, a pure, very dense *Carex Goodenoughii* growth, then a mixed zone with *Carex Goodenoughii*, *Carex panicea*, and *Eriophorum polystachyum* in a dense carpet of moss with lichens and, finally, farthest eastward and at the edge of the mere, a *Carex panica* formation with the same mosses and lichens.

B. The *Sphagnum-cuspidatum* meres occur especially in the eastern and middle areas of the heath.

As examples of the larger, conspicuously zonal meres of this type we have here investigated E 1—2¹, D 3³, and D 5—6⁷, as examples of meres of a less complex structure, D 3⁸ and D 2⁴. It is a common feature of these meres that they have a pure *Sphagnum cuspidatum* carpet in the middle which, towards the margin, becomes more or less mixed with other species such as *Sphagnum*, hepaticas, and leaf mosses.

Passing from the middle of the mere towards the margin, i.e. from a more moist to a less moist soil, we get the following series of formations:

1. The *Glyceria fluitans* formation, Table 10a, Nos. 1—2, and Table 11a, No. 1.

2. The *Juncus supinus* formation, Table 10a, Nos. 3—4, and Table 11a, Nos. 2—3.
3. The *Heleocharis multicaulis* form., Table 10a, No. 5, and Table 11a, No. 5.
4. The *Carex Goodenoughii* formation, Table 10a, Nos. 6 and 8, Table 11a, Nos. 7—8.
5. The *Eriophorum polystachyum* form., Table 10a, No. 7, and Table 11a, Nos. 5—6.
6. The *Molinia coerulea* marginal zone, Table 10a, Nos. 9—10, Table 11a, Nos. 9—10.

Fig. 16 shows the distribution and extension of the formation in E 1—2¹ and Fig. 17 in D 3³. D 5—6⁷ is a smaller mere, poorer in species but in other respects corresponding well with the two large meres.

These three meres are the only ones with a real swamp vegetation, since the first three formations must be regarded as such. All the rest of the *Sphagnum* meres consist either exclusively, as D 2⁴, or in great part, as D 3⁸, of the less moist formations.

C. *Sphagnum* meres with a marginal zone of *Myrica*. A third type of mere, nearly allied to the preceding type, occurs in the small, rather deep depressions in the dunes. The chief difference is the presence of a marginal zone rich in chamaephytes. The only two meres belonging to this type are D 4¹⁰ and D 3¹⁴. Table 13a, Nos. 1—5, shows the composition of D 4¹⁰, and Table 13a, Nos. 6—9 and Fig. 19 that of D 3¹⁴. Columns 5 and 9 show the composition of the marginal zone of *Myrica*.

D. The fourth type of mere is the *Sphagnum tenellum* — *Eriophorum vaginatum* mere associated with the inmost zone of the belt of *Erica* heath. Table 14a, Nos. 1—5 and Fig. 20, and Table 14a, Nos. 6—9 and Fig. 21 show the results of the investigation of meres D 3¹ and C 3⁵.

The composition of the meres is as follows. On the dampest soil the vegetation consists of *Carex Goodenoughii* and *Eriophorum polystachyum*, Table 14a, Nos. 3 and 6. On drier soil it consists of *Molinia coerula* and *Eriophorum vaginatum*, Table 14a, Nos. 4 and 7. The *Sphagnum cuspidatum* carpet shows here an admixture of *Sph. tenellum*, *Hypnum fluitans*, *Jungermannia inflata* and several other species. On still drier soil the dominants are chamaephytes, especially *Erica tetralix* and *Eriophorum vaginatum*, whilst *Carex Goodenoughii*, *Eriophorum polystachyum*, and *Molinia coerulea* are greatly reduced. Table 14a, Nos. 5 and 8.

Chapter VI, finally, contains a survey of the floristic and biological peculiarities of the various formations of the heath. Table 15 shows the distribution of the individual species and life-forms in the scale of moisture of the belt of *Erica* heath. It is possible to show the presence of no less than 9 different zones of moisture of which the *Arctostaphylos* heath represents the driest, the *Glyceria fluitans* swamp the most moist.

Table 16 gives a list of the average values of all the moist formations found within moisture class 4 of the belt of *Erica* heath, i.e. of the formations lying

between the lower limit of the *Erica* heath and the upper limit of the *Carex Goode-noughii* formation.

The sequence of formations is as follows:

1. The *Myrica* moor. Table 7, 1—4.
2. The *Erica-Eriophorum vaginatum* moor. Table 7, 6—8, and Table 14, 5 and 8.
3. The marginal zone of the mere of type C. Table 13, Nos. 5 and 9.
4. The *Myrica* spring moor near the river valley. Table 7, Nos. 9—10.
5. The *Deschampsia flexuosa* formation in the mere of type A. Table 8, 2, 3, 6 and 13.
6. The *Eriophorum vaginatum-Molinia* formation in the mere of type D. Table 14, 4 and 7.
7. The marginal zone in the mere of type B. Table 8, 9—10 and Table 12, 2 and 7 = Table 15, 4.
8. The *Molinia* zone in the mere of type A. Table 8, Nos. 5, 8, 10 and 11.

The nearer the formation is to the river valley, i. e. to the northern margin of the heath, the greater the H % and the density of the leaf mosses; the more distant, the greater the Ch %, the density of *Sphagna* and *Hepaticae*. The ratio will be the same whether the comparison be made between the relatively dry formations such as Nos. 1, 2, and 5, or the relatively moist formations such as Nos. 6 and 8. The geophytes seem to attain a maximum in the mean values between the two extremes, the G % being highest in No. 7, the marginal zone of the mere of type B.

Fig. 1. Distribution of the fixed points.

Fig. 2. Traces of human activity on the heath. The map shows the roads bordered with ditches, indicated by double contours; the socage roads, stippled; dykes; high and low tension lines; gravel pits, sand and marl pits, as well as the limits of the areas formerly under cultivation. The Roman numerals I—VI denote a row of barrows and a small group of hills (VI). H, sites of houses.

Fig. 12, A and B. The distribution of *Arctostaphylos uva ursi* on the southern slopes of the two western oval hills in areas D 6 and D 5. The composition of the vegetation is given in Table 2a, Nos. 5 and 6. Table 3a, Nos. 1 and 2, shows the composition of the vegetation on the northern slopes of the hills.

Fig. 13. The boundary line between the grass heath and the *Calluna* heath in the north-western corner.

Figs. 14—21. Meres.

Table 1. The percentage distribution of the types of vegetation inwards from the river valley in areas 3—4.

Table 2a. The tall *Calluna* heath. Locality No. 1, situated north of mere E 1—2. No. 2, east of the Vesterbæk Road and south of the oval barrows. No. 3, East of the large mere in D 3. No. 4, dune in the north-eastern corner of D 4. No. 5, the southern slope of the western oval barrow. (D 6). No. 6, the southern slope of the eastern oval barrow (D 5). No. 7, southern slope of a dune in D 4.

Table 2b. The biological spectra of the localities given in table 2a. Density. Total. Phanerogams. Lichens. Mosses. The phanerogamic frequency total.

Table 3a. The low *Calluna* heath. 1. Northern slope of the western oval barrow in D 6. 3. Northern slope of one of the dunes in D 4. Nos. 1, 2 and 3 correspond respectively to Nos. 5, 6 and 7 in Table 1a. 4. Eastern side of mere D 3^a. 5—6. Southern side of E^a on the border between D 4 and E 4. 9. Moist heath stripped of peat east of the oval barrows in C 4.

Table 3b. The biological spectra of the low *Calluna* heath.

Table 4a. The vegetation in the north-eastern corner. 1—4 *Calluna* heath. 5—7 *Empetrum* grass heath. 8—11 grass heath. (Locality No. 1 is an *Arctostaphylos* heath rich in grass to the west of the 3 small barrows in B 5).

Table 4b. The biological spectra of the localities given in Table 4a.

Table 5a. The vegetation of the inner sands, north-eastern corner. 1—3 inner sands. 4 river bank.

Table 6a. The *Erica* heath. 1—4 *Calluna-Erica* heath. 1. South of the Vesterbæk Road, immediately east of the gravel pit. 2. Immediately north of mere E 1—2. 3. D 4. 4. Southern side of E 4. 5—10. Pure *Erica* heath. 5. North-western corner of D 2. 6. North-east of the mere in C 4—C 5. 7. Eastern side of mere D 3^a. 8. South-western side of D 3. 9. *Erica* heath in the north-eastern corner of D 4. 10. Same as locality No. 1.

Table 7a. Moors. 1—5 *Myrica* moor. 1. The moor in C4—C5. 2. The north-eastern moor (D 1—D 2). 3. The south-eastern moor (C 2—D 2). 4. The western side of the large moor in C4—C5. 5. Eastern side of the same. 6—8. *Erica* heath. 6. Same locality as No. 1. 7. Southern side of the moor in C3. 8. Northern side of same. 9—10. Spring moor. Situated in E4—F4.

The biological spectra of the moor localities.

Table 8a. Summer-dry meres. Cf. text.

Table 9a. Mere. D 3¹².

Table 10a. Mere in E 1—2.

Table 11a. Mere. D 3³.

Table 12a. Mere. D 5⁷, D 3⁸, and D 1⁴.

Table 13a. Mere. D 4¹⁰ and D 3¹⁴.

Table 14a. Mere. D 3¹ and C 3⁵.

Table 15. Distribution of the life-forms and the species in the scale of moisture of the belt of *Erica* heath. Density. Frequency percentage total.

Table 16. The distribution of the life-forms and the species in the various formations of class IV in the scale of moisture of the belt of *Erica* heath.

Table 17. The number of scattered trees in the various areas of the heath. An asterisk denotes groups of trees not counted or measured.

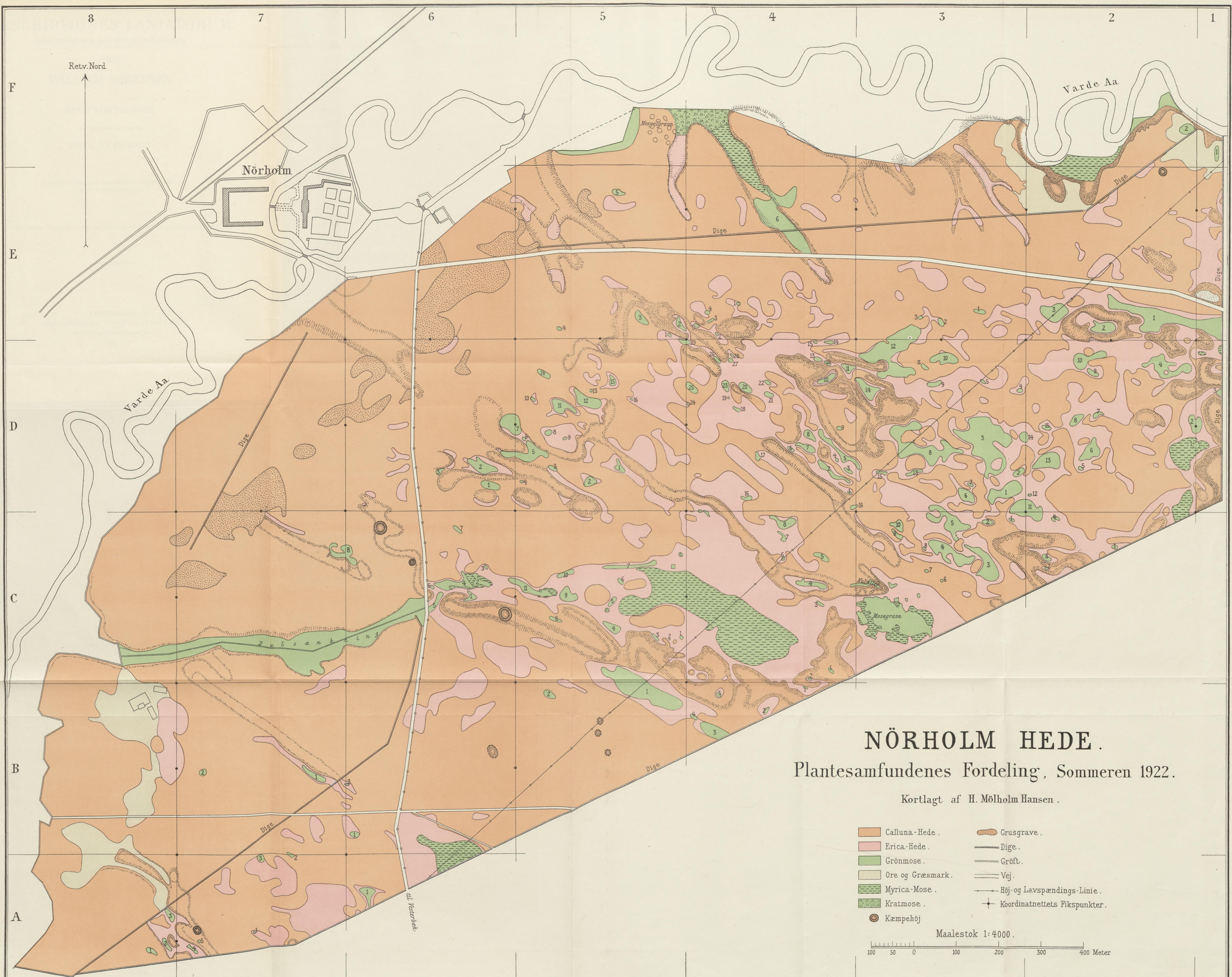
Table 18. Height of trees in the summer of 1922.

Table 19. The distribution and average height of the trees in the various plant associations of the heath. Grass heath, *Calluna* heath, *Erica* heath, meres, *Myrica* moor. *Calluna* field etc. *Erica* field etc. Gravel pits. Natural formations. Formations due to cultivation.

Table 20. Occurrence and height of the birches measured in 1922.

The Heath at Nörholm. The Distribution of the plant formations 1922.

<i>Calluna</i> heath.	Gravel pit.
<i>Erica</i> -heath.	Dyke.
Mere.	Ditch.
Grass heath.	Road.
<i>Myrica</i> -moor	High- and low tension line.
<i>Salix</i> -moor	Fixed points of the quadrat net.
Barrow.	



DESCRIPTIONES LANIATORUM

(ARACHNIDORUM OPILIONUM SUBORDINIS)

FECIT

WILLIAM SØRENSEN

OPUS POSTHUMUM

RECOGNOVIT ET EDIDIT

KAI L. HENRIKSEN

WITH A PREFACE AND NOTES IN ENGLISH
AND 29 TEXTFIGURES

D. KGL. DANSKE VIDENSK. SELSK. SKRIFTER, NATURVIDENSK. OG MATHEM. AFD., 9. RÆKKE, III. 4.



KØBENHAVN

HOVEDKOMMISSIONÆR: LEVIN & MUNKSGAARD

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Preface.

The late Danish zoologist Dr. WILLIAM SØRENSEN (1848—1916) was among the first who thoroughly investigated the remarkable Arachnid group *Opiliones Laniatores*. His first publication on this group appeared in 1873, and in the following decades he published half a score of important papers dealing with the morphology and anatomy of the group and giving taxonomic contributions to the knowledge of it. In the number of genera and species new to science described in these papers were included several remarkable types which caused the founding of new families. At that time SØRENSEN was probably the zoologist who had the greatest experience in the difficult taxonomy of the group, and he knew from autopsy by far the greater part of the species then described. He intended to write a monograph of the group, and for that purpose he had at his disposal all the material belonging to the Copenhagen Zoological Museum as well as material given or lent him by different persons and museums, and he had begun to work out descriptions of the new forms included in this material. At about the commencement of the new century he turned his mind to other works which took the main part of his time and interest, so his work with the *Laniatores* advanced but slowly or nearly came to a stand-still.

During the same time other arachnologists (LOMAN, POCOCK a. o.) published descriptions of *Laniatores* unknown to SØRENSEN, and in 1911 the German arachnologist C. FR. ROEWER began an ample descriptive activity, publishing revisions of the different groups of *Laniatores* based on very abundant material which enabled him to multiply the number of species very considerably, until ROEWER in 1923 could collect all the species known in an extensive manual: Die Webspinnen der Erde. It may, for instance, be noted that the family *Triaenonychidae* only contained 1 species before SØRENSEN'S time, SØRENSEN added 5 new species, but now the world fauna includes 71 species.

The fact that an increasing number of species were described by other zoologists, and that SØRENSEN himself only knew a small — steadily decreasing — number of all existing species, no doubt played its part in causing a pause in SØRENSEN'S work.

When Dr. SØRENSEN died in 1916 he left behind him much preliminary work for the intended monograph, viz. notes upon families, transcriptions of diagnoses concerning genera and species formerly published by SØRENSEN and others, etc., as

well as a number of descriptions of genera and species new to science. The latter descriptions were for the most part only present in rough draughts — some of the species even in two or more different draughts — and jotted down in a way (words abbreviated, the handwriting in pencil very bad) that makes them most difficult to decipher.

The Danish zoologist C. WITH began a revision of these posthumous manuscripts in order to prepare as much as possible for publication. Dr. WITH, however, only accomplished the revision of three lesser groups (*Minuidæ*, *Tricomatidae* and *Stygnidæ*) in a manuscript ready for the press; he was working at the revision of the family *Cosmetidæ*¹⁾ when he died in 1923. Then the present editor was charged with the work and — besides the just named four families — revised nearly all the remaining families, making the whole manuscript ready for the press. Having also added remarks to the groups dealt with by WITH, and in these parts also put in some descriptions found later on, etc., the present editor is responsible for the appearance and arrangement of SØRENSEN's notes and descriptions published here.

As mentioned above, only a fractional part of all forms known now-a-days were known to SØRENSEN, and of an even smaller number of genera and species descriptions were present in his posthumous manuscripts. Therefore it is not possible to publish any monographic treatment of the whole group based on the said manuscripts — as was hoped when Dr. WITH began his revision. The very detailed descriptions of new genera and species (to which may be added some few descriptions of species formerly described by others and reinvestigated by SØRENSEN) can, however, for the most part be made ready for the press, and as moreover they include descriptions of three new families (sensu SØRENSEN), there is every reason to publish all these descriptions and associate SØRENSEN's name with them in memory of the outstanding and conscientious work done by him on the group *Opiliones*.

SØRENSEN has the honour of having delimited the principal taxonomic groups, and — as mentioned above — several families were based upon remarkable new forms described by him. Some few of the families characterized in the earliest of SØRENSEN's taxonomic papers could not, however, be maintained, and later on they were withdrawn again; thus he united the family *Pachylidæ* with *Gonyleptidæ* (1902), and in after years he doubted that the family *Zalmoxidæ* could be held apart from *Phalangodidæ*. In the intended monograph SØRENSEN admitted 15 families viz.: *Oncopodidæ*, *Samoidæ*, *Phalangodidæ*, *Stygynopsidæ*, *Minuidæ*, *Olynthidæ* (in the meantime described by ROEWER as *Tricomatinae*), *Biantidæ*, *Ereccanidæ*, *Epedanidæ*, *Assamiidæ*, *Cosmetidæ*, *Stygnidæ*, *Hernandariidæ*, *Gonyleptidæ*, and *Triaenonychidæ*.

¹⁾ The introductory remarks to *Cosmetidæ* were written by WITH, *Det. medd. Dansk. Naturh. Foren.*

No doubt the characters distinguishing the families (sensu SØRENSEN) from each other are not in all instances of the same taxonomic value, and consequently some families are more closely related mutually than with other families. This was recognized by ROEWER who has arranged the families in another way than did SØRENSEN and he considers some of SØRENSEN's families to be subfamilies under two of the 5 families which he admits. A comparison of the groups of SØRENSEN and ROEWER will show this:

W. SØRENSEN:		C. FR. ROEWER:
Oncopodidæ		Oncopodidæ
Samoidæ		Phalangodidæ Samoinæ
Phalangodidæ (incl. Zalmoxidæ)		Phalangodinæ
Stygnopsidæ		— 0
Minuidæ		— 0
Olynthidae		Tricommatinæ
0		Stygnommatinæ
Biantidæ	{	Biantinæ
0		Ibaloniinæ
Erecananidæ		Podoctinæ
0		Erecananinæ
Epedanidæ	{	Acrobuninæ
Assamiidæ	{ Assamiidæ	Saracinicinæ
0		Epedaninæ
Cosmetidæ	Cosmetidæ	Dampetrinæ
Stygnidæ	{ Gonyleptidæ	Assamiinæ
Hernandariiidæ		Trionyxellinæ
0		Prostygninæ
0		Stenostygninæ
0		Stygninæ
0		Heterostygninæ
Gonyleptidæ (incl. Pachylidæ)	{ Hernandariinæ	Hernandariinæ
		Cranaïnæ
		Heterocranainæ
		Stygnocranainæ
		Phareinæ
		Pachylinæ
		Gonyleptinæ
		Mitobatinæ
		Coelopyginæ

Neither is the arrangement of ROEWER quite adequate (see the discussion heading the *Phalangodoidea* and *Gonyleptoidea* below), and the characters used by

ROEWER for separating groups and genera are often merely heuristic, but it seems most probable to the editor that the groups *Phalangodidæ* and *Gonyleptidæ* sensu ROEWER really comprise groups (subfamilies ROEWER, families SØRENSEN) of lesser systematic range than for instance *Assamiidæ* or *Cosmetidæ*, and that an arrangement according to this view seems more likely to express the mutual relationship between the groups.

If this be admitted, it will be a mere matter of judgment whether the genera are to be ranged into 5 families comprising a number of subfamilies (ROEWER) or into 5 series (superfamilies) 3 of which are only represented by 1 family, the other 2 each comprising a number of families (SØRENSEN). As this paper contains genera and species recognized by SØRENSEN, it would seem most natural to retain the term "family" everywhere in the arrangement of the material treated below, but the editor has introduced in their proper places below the two names *Phalangodoidea* and *Gonyleptoidea* for characterizing the families (sensu SØRENSEN) which were to be included as subfamilies in the families *Phalangodidæ* and *Gonyleptidæ* sensu ROEWER.

Each of the families treated below is characterized by a diagnosis in Latin worked out by SØRENSEN, but the editor has in some instances supplemented or emended the text when it was thought necessary because of the families containing genera unknown to SØRENSEN. In the general introduction I have also inserted remarks upon such forms unknown to SØRENSEN when I judged it to be of interest. In the diagnoses of the genera I have likewise in some few instances inserted, altered or deleted words or sentences in order to separate these groups from others which were not known by SØRENSEN.

Otherwise, especially in the descriptions of the species, Sørensen has the full credit and responsibility for all that is written in Latin, while the remarks of the editor are given in English. In a few instances the whole specific description is given in English; this means that SØRENSEN left such scanty and fragmentary notes upon the species in question that the editor — who has reinvestigated the animals — is responsible for the whole description, and is thus the author of the species.

In the following are given contributions to the knowledge of most of the families. Nothing new was, however, found in SØRENSEN's manuscripts concerning *Triænonychidæ*, and it has not been possible to the editor to treat the notes upon the family *Gonyleptidæ*. These two families do not therefore occur, in the following pages.

Finally I beg to thank the Trustees of the Carlsberg Fund for a grant which enabled me to undertake the revision of the posthumous manuscripts of Dr. SØRENSEN.

KAI L. HENRIKSEN.

Opiliones Laniatores.

Oculi aut tuberi communi impositi (e.g. *Epedanidæ*) aut sat late disjuncti (e.g. *Biantidæ*), interdum tubere mediano propinqui, sed non in eo positi (e.g. *Ere-cananiidæ*); in plurimis prope limbum anteriores scuti siti, interdum in medio cephalothorace, in *Stygnommate* prope sulcum posteriore cephalothoracis siti. Tuber saepe eminentia una (processu acuta vel obtusa, longa vel breve) vel tuberculis binis (acutis vel obtusis) præditum, interdum destitutum.

Cephalothorax limitibus segmentalibus destitutus. Segmenta dorsalia abdominis, praeter operculum anale, octo. In *Oncopodidis* cephalothorax et segmenta dorsalia abdominis I—VIII in scutum dorsale coalita, dum segmentum anale (= operculum anale) solum liberum est; in familiis ceteris cephalothorax et segmenta dorsalia abdominis I—V in scutum dorsale coalita, dum segmenta tria posteriores, praeter operculum anale, libera sunt. Scutum limbo anteriore, limbis lateralibus et limbo posteriore præditum. In *Assamiidæ* margo libera (anterior) limbi anterioris dentibus conicis quinque (rarissime septem) prædita, quorum unus medianus et bini (aut trini) in angulo exteriore positi sunt¹⁾. In descriptionibus sequentibus cephalothorax area I numeratus, area VI est limbus posterior scuti²⁾, et areæ scuti sulcis transversis quinque divisæ sunt. Interdum tamen sulcus secundus evanescit (e.g. *Epedanidæ*), aut sulcus quartus evanescit (e.g. *Gonyleptidæ*), et tunc solummodo areæ quinque et sulci transversi quatuor visibles sunt; in *Hernandaria* sulci secundus, tertius et quartus evanescunt, et tunc sulci transversi duo solummodo adsunt. Sulci priores duo transversi in generis quibusdam sulco longitudinale mediano aream II in partes duas laterales dividente conjuncti. Interdum (in generis quibusdam familiae *Gonyleptidarum*) etiam sulci mediani in segmentis pluribus adsunt. In area IV (et raro etiam in areis pluribus) eminentiae duæ altæ acutæ aut obtusæ aut grana interdum adsunt.

Eminentiae corporis (et membrarum) ob magnitudinem suam granula, grana, tubercula, processuli, processus appellantur. Spinas tales eminentias (majores aut minores) appollo, quæ setam seu aculeum apicalem gerunt.

¹⁾ ROEWER is right in laying stress upon this fact as being one of the most important characteristics for delimiting a certain group of genera, viz. the family *Assamiidæ*.

²⁾ ROEWER does not include cephalothorax in the numbering. Thus for instance Area III sensu ROEWER is = Area IV sensu SØRENSEN, which must be remembered when the descriptions of the two authors are compared.

Orificia glandularum foetidarum tuberi nunquam imposita, supra marginem anteriorem coxarum II aut in margine laterali scuti aut ad eum posita. Emissaria liquoris foetidi duobus modis instructa sunt: aut ex orificiis detectis glandularum foetidarum oriuntur canales (aperti) secundum partem inferiorem limbi lateralis, qui canaliculos breves excipiunt, ab orificiis manifestis vesicularum urinariarum orientes, pone orificia glandularum foetidarum positis; quo modo liquor foetidus et urina secundum limbos laterales scuti emittantur (in plurimis) — aut ex orificiis obtectis glandularum foetidarum et vesicularum urinariarum oriuntur canales, coxis primi et secundi paris formati et processibus coxarum plus minusve clausi; quo modo liquor foetidus et urina ad ventrem emittantur (in *Cosmetidis* et *Hernandariidis*).

Orificia vesicularum urinariarum post orificia glandularum foetidarum, prope marginem cephalothoracis posita.

Sternum longum, perangustum, raro (in *Triænonychidis*) pone dilatum. Labium sternale manifestum, molle, solum ad ipsam basin cum lobis maxillaribus coxarum I conjunctum.

Segmenta ventralia abdominis novem; saltem octavum et nonum coalitum, in *Oncopodidis* segmenta omnia coalita.

Spiracula duo, ad segmentum ventrale secundum pertinentia, aut processibus fulcientibus obtecta et in sulco saepe profundo inter coxas IV et abdomen sita, aut detecta et ipsi segmento imposta¹⁾; in plurimis maxima, lunata, cancellata, nivea quia cancelli tuberculis microscopicis ornati sunt; in *Zalmoxi australi* perpusilla (oculo nudo non percipienda), orbicularia, integra, margine ciliato.

Antennae²⁾ (*Chelicerae* auct.) tri-articulatae. Articulus primus saepe parte dorsale subgloboso prominente praeditus. Articulus secundus et tertius forcipem verum efficiunt.

Membrorum secundi paris segmentum basale (coxale) est mandibula²⁾ (*maxilla* auct.), in partem palpigeram (basalem, in parte apicali saepe productam, palpum gerentem) et partem manducatoriam (os versus directam, productam, in parte terminali mollem) divisa.

Palpi robusti, quinquearticulati (mandibulas continuentes) in partes trochantericam, femoralem, patellarem, tibialem et tarsalem divisa; pars tarsalis ungue valido, acuto, prehensile instructa. Pars trochanterica in plurimis spina inferiore praedita. Palpi *Oncopodidarum* præterea inermes. In *Phalangodidis* et *Gonyleptidis* palporum

¹⁾ ROEWER (1912 p. 4) in accordance with LOMAN (1906) emphasizes the fact that spiracula detecta et spiracula obtecta is of no consequence for separating the families ("wohl aber zur Unterscheidung der Genera"); within the family *Assamiidae* sensu ROEWER is found a series of genera having free, and another series having covered spiracles, as well as the intermediate "Stg. obwohl von Zeh. umstellt deutlich sichtbar" (e. g. *Metassamia*). — For the same reason the two Soerensenian families *Zalmoxiidae* and *Phalangodidae* cannot be maintained as separate families, as they are only distinguished by the said spiracular character.

²⁾ In this descriptive work I have not altered these easily intelligible terms, though I cannot accept the correctness of their morphological interpretation (see HENRIKSEN in Trans. 4th intern. Congr. of Entom. Ithaka 1928 p. 589).

partes tibialis et tarsalis spinis fortiter armata et etiam segmenta cetera spinis armata esse possunt. *Assamiidarum* palporum partes tibialis et tarsalis spinis tenuioribus armatae et pars femoralis ordinibus granorum vel processibus, quibus aculei vel setae laterales (non autem apicales) imposita sunt, vel denticulorum demonstrant. In *Triænonychidis* spinæ desunt, sed armatura est processus, quibus aculei vel setae laterales (non autem apicales) imposta sunt. In *Cosmetidis* spinæ etiam desunt; margines palporum denticulati seu setis gracilibus præditæ. In familiis quibusdam (e.g. *Erecananinis*) partes tibialis et tarsalis paullum oblique positæ, ita ut adductæ partem femoralem utroque margine attingant, et in *Assamiidis* atque *Stygnopsinis* manifesto oblique positæ, ita ut adductæ cruciatim partem femoralem margine exteriore attingant.

Coxæ pedum I mobiles, ceteræ immobiles, coalitæ. Lobus maxillaris coxae I per se immobilis motu coxæ movetur; pars dura lobi non partita. Lobus maxillaris coxae II immobilis, aut nodiformis rudimentarius (e.g. in *Gonglyptidis*), aut in laminulam angustam, discretam (i.e. sutura a coxa limitatam), porrectam formatus (e.g. in *Oncopodidis*¹⁾). Lobi maxillares coxarum III et IV omnino desunt. Processus fulcientes sunt, qui coxas II cum iisdem III, coxas III cum iisdem IV, coxas IV cum abdomine conjungunt; inter coxas IV et abdomen feminæ sæpe adsunt, etsi mari desunt.

Pedum partes liberæ sunt trochanter, femur, patella, tibia, metatarsus et tarsus. Femorum pars proxima trochanterem spurium formare possunt. Metatarsi sæpe spurie in partem proximalem (astragalum) et distalem (calcaneum) divisi; in *Triænonychidis* nonnullis astragalo breve et calcaneo longo, in *Laniatoribus* plurimis tamen calcaneus est parvus et astragalo oblique limitatus, in *Oncopodidis* metatarsi non divisi. Metatarsi calcaribus apicalibus binis instructi sunt (in plurimis) aut calcaribus destituti (in *Oncopodidis*), scilicet propterea quod tarsi in eundo latere inferiore toto (in plurimis) aut parte ulteriore lateris inferioris (in *Oncopodidis*) solum attingunt.

Tarsi *Oncopodis* sunt impartiti (uniarticulati), in generibus ceteris *Oncopodidarum* tarsi I et II bi-, III et IV triarticulati. In familiis ceteris tarsi I—II in duas partes (citeriorem et ulteriorem) divisi sunt, quarum pars ulterior tarsi I secundum subfamilias aut integer aut bi- aut tri-partita est. Pars ulterior tarsi II aut integer, aut bi-, aut tri-, aut quadri- aut etiam quinque-(*Zarax*) partita est, quod characterem generum præstat. Tarsi III et IV in partes tres divisi sunt, quarum pars media imparta et pars ulterior semper biarticulata est. Numerus segmentorum partis citerioris tarsorum I—II, quum 1 vel 2 vel 3 adsunt, characterem generum præstat, quum autem

¹⁾ Formerly SØRENSEN considered it an important character whether or not the maxillary lobus II were movable, and used it e.g. within the Phalangodins and allied groups (*Phalangodidae* in the Roewerian sense) for separating the families. Later on, however, SØRENSEN admitted that this lobus is always immovable, and only its size varies according to the (Roewerian) families: "discretus, porrectus" in *Oncopodidae* and *Triænonychidae*, "rudimentarius, non exsertus" ("als winziges Knötchen nur kaum noch bemerkt werden kann") in *Assamiidae*; in *Phalangodoidea*, comprising a handsome scale of varying characters, all sizes are established from "manifeste discretus subpronus" (in *Erecananidae*), "discretus subverticalis" (in *Sarasiniidae*, *Ibaloniidae* and *Epedanidae*), "discretus latus porrectus" (*Phalangodidae* incl. *Zalmoxins*, "deest" in *Stygnopsidae*, and "deest vel adest" in *Tricommatidae* and *Minuidæ*. In *Cosmetidae* and *Gonglyptoidæ*, finally, it is absent.

supra 3 adsunt, variabilis est in speciebus et etiam in individuis et in lateribus binis individui. Etiam numerus segmentorum partis citerioris III et IV, quum 3 non superat, characterem generum præstat¹⁾. — In familiis nonnullis *Phalangodoideorum* et *Gonyleptoideorum* (e.g. *Samoidæ*, *Stygnidæ*) scopula pilorum densorum longiorum, in apice dilatatorum et inter se æqualium in parte ulteriore (et interdum media) tarsorum III—IV adest. Scopulae huic pilorum (non rigidorum) setulae — in primis articulo pænultimo — rigidæ, apicem versus tenuiores semper immixtæ sunt. Quoad intelligere possum — nam tale animal vivum non inspexi — animalia scopula vestita solum planta partis ulterioris solius tangunt²⁾. — Processum terminalem tarsorum III et IV illum processum setas sensorias duas gerentem nominavi, qui in animalibus adultis supra unguiculos positus et inter unguiculos deorsum curvatus est; hic processus adest in *Cosmetidis* et *Gonyleptoideis* (America indigenis) atque in *Trionyxellinis* (Asia indigenis).

Unguiculi I—II singuli, integri; III—IV in *Triænonychidis* singuli, sed processibus aduncis lateralibus binis (utrinque singulis) muniti; unguiculi III et IV familiarum ceterarum bini, in plurimis integri, in generibus nonnullis tamen pectinati (e.g. *Selencia*) sive dente interiore magno instructi (e.g. *Asopella*)

Apertura genitalis operculo genitali mobili parvo clausa.

Penis plerumque longus, gracilis, musculos non continens, in *Triænonychidis* brevior et crassior, musculum continens, qui glandem movet. Glans semper manifesta, multis partibus brevior quam corpus, in partes duas divisa, quarum superior gracilis orificium vasis deferentis fert, et inferior laminam. Vagina vestita est stratis muscularibus internis duobus, quarum fibræ oblique inter se secant, et externo tenui præcipue longitudinali. Ipsum operculum genitale musculis duobus clauditur.

Ovipositor brevis, sat mollis, non annulatus; apex fissus non discretus, corona setarum incurvarum ornatus. Vagina simplex, musculis complanatis duobus instructa. Ipsum operculum genitale musculis duobus clauditur.

Differentia sexualis plerumque maxima, modo vario (secundum genera) demonstratur.

Metamorphosis in *Oncopodidis* haud memoria digna. Ceteris in familiis tarsi pullorum omnes biarticulati, in animalibus adolescentibus (sive junioribus) tarsi I et II biarticulati, III et IV tripartiti. In *Erecaananidis* etiam animalia adulta eundem numerum demonstrant, sed in Laniatoribus ceteris numerus segmentorum animalium adultorum augetur, ita ut segmenta (2, 2, 3, 3) in adolescentibus reperta in partes citeriorem et ulteriore tarsorum I—II et in partes citeriorem, medium et ulteriore tarsorum III—IV transeunt. *Triænonychidis* et *Oncopodidis* exceptis tarsi III—IV pullorum et animalium adolescentium arolio instructi sunt, qua organa in animalibus adultis semper dispereunt. Etiam scutum animalium adolescentium plus regulariter

¹⁾ SØRENSEN and ROEWER agree as to the importance and stress laid upon this secondary dividing of the primary (larval) tarsal joints.

²⁾ SØRENSEN and ROEWER agree in regarding the presence or absence of scopula as (Sub)Family-character.

divisum quam adultorum: limbus posterior segmentum manifestum format, et in animalibus, quorum adulti areas quinque scuti solum habent animal adolescens areas omnes sex demonstrat.

Geographical distribution: Opiliones Laniatores are found all over the world. Of the 5 main groups enumerated below, into which the Laniatores may be divided, *Oncopodidae* and *Assamiidae* only occur in the old world, *Cosmetidae* and *Gonyleptoidea* in America only, while *Triænonychidae* and *Phalangodoidea* occur in both parts of the world. The most generalized forms (i.e. *Oncopodidae* and some Phalangodoid groups) inhabit Australasia, from where the group has in a former period spread to the other places in the world where they now occur, thus also to America. That non-flying animals bound to the soil, like the Opiliones, have been able to spread even to America seems remarkable, and signifies that in past geological times some connection has existed between the 2 parts of the world.

It was to be expected that the long time which has elapsed since that connection was broken off might have caused an evolution in different directions in each of the 2 parts of the world, and therefore one might look out for fundamental distinguishing characters separating the American and the old world forms from each other. It has been supposed that a processus terminalis represents an American specialization (as it occurs within the American families *Cosmetidae* and *Gonyleptoidea*); ROEWER, however, has pointed out that a processus terminalis also occurs within the old world family *Assamiidae* (viz. subfamily *Trionyxellinae*), while several American forms (among the *Phalangodoidea*) do not possess a processus terminalis. On the other hand, it would seem that one of SØRENSEN's main characters, viz. the development of lobus maxillaris coxae II is more important, as a reduction of the lobus to the point of vanishing has only taken place in America (*Stygnopsidae*, *Minuidæ*, *Cosmetidae* and *Gonyleptoidea*), but as American Phalangodoid groups like *Tricomatidae* and *Phalangodidae* do possess a well developed lobus, this character, also, cannot be used for distinguishing all the American Laniatores from those of the old world. It has not been possible to divide the world-wide group *Phalangodoidea* (nor the *Triænonychidae*) in a natural way so that all the American forms could be separated off as a whole from the old world forms.

Conspectus familiarum.

- I. Scutum dorsale maximum, cephalothorax et segmentis abdominalibus octo compositum, dum segmentum anale solum liberum est, in latere inferiore corporis situm familia *Oncopodidae*.
- II. Scutum dorsale cephalothorace et segmentis abdominalibus quinque compositum, dum segmenta tria posteriora, praeter segmentum anale, libera sunt:
 - A. Unguiculi tarsorum III et IV singuli, in adultis processibus aduncis lateralibus binis (utrinque singulis) muniti..... familia *Triænonychidae*.
 - B. Unguiculi tarsorum III et IV bini, integri aut pectinati:
 1. Margo anterior scuti processibus (dentibus) quinque (rarissime

- septem) proceris, longe conicis instructus, quorum unus medius et bini (rarissime tres) extra antennas et palpos positi. (Palporum partes tibialis et tarsalis oblique positæ sunt, ita ut adductæ cruciæ liter gerentur et ne partem femoralem quidem margine suo exteriore attingant) familia *Assamiidæ*.
2. Margo anterior scuti dentibus talibus destitutum. Palporum partes tibialis et tarsalis parallelæ cum iis lateris alteris vel ut maxime paulum oblique positæ, ita ut adductæ partem femoralem utroque margine attingant (in *Stygnopsisidis* tamen ut in *Assamiidis* crucialiter geruntur):
- Processus terminalis tarsis III et IV deest: superfamilia *Phalangodoidea*.
 - Processus terminalis tarsis III et IV adest:
 - + Palporum tenuiorum partes femoralis, tibialis et tarsalis late compressæ, pars exterior parti femorali plane adpressa; margines palporum denticulati seu setis gracilibus præditæ, spinas carentes familia *Cosmetidæ*.
 - ++ Palporum validorum partes femoralis, tibialis et tarsalis rotundatæ (non compressæ), partes tibialis et tarsalis spinas robustas gerentes, non parti femorali adpressæ, sed plus minusve porrectæ superfamilia *Gonyleptoidea*.

Oncopodidæ Thor.

Cosmetoidæ oncopodinae Thorell, Ann. Mus. Genova. IX, 1876, p. 134.

Oncopodidæ Thorell, ibid. XXX, 1891, p. 375, 757.

Oncopodidæ Roewer Weberkn. d. Erde, 1923, p. 56. — Suppl.: Abh. Naturw. Ver. Bremen XXVI, 2, 1927, p. 267.

Tuber oculiferum deest aut, si adest, a parte cetera areæ primæ haud limitatum.

Scutum dorsale maximum, cephalothorace et segmentis abdominalibus octo compositum, dum segmentum anale solum liberum est, in latere inferiore corporis situm.

Segmenta ventralia omnia coalita.

Emissarium orificiorum glandularum foetidarum secundum marginem scuti dorsalis ductum.

Spiracula in sulco coxam IV et abdomen separante posita.

Mandibularum pars palpigera non producta (an etiam in *Gnomulo*?)

Palporum robustorum patella, tibia et tarsus neque processibus neque spinis armata; pars tarsalis parte tibiali manifesto longior.

Lobus maxillaris coxae II discretus porrectus, brevior seu longior.

Metatarsi calcaribus apicalibus inferioribus destituti, in apice ut patera excavati, in astragalos et calcaneos non divisi.

Tarsi delatati, aut integri (uniarticulati) aut anteriores in articulos binos et posteriores in articulos trinos divisi.

Scopula et processus terminalis desunt.

Unguiculi I—II singuli, III—IV bini; omnes integri, parvuli, graciles magnopere retractiles in excavatione apicis tarsi positi.

Species hujus familiae in Malacca et in insulis Sundaicis magnis indigenæ.

Structura tarsorum demonstrat hæc animalia modo plane differente a Laniatoribus ceteris pede ferire. Metatarsi ceterorum Laniatorum calcaribus apicalibus inferioribus binis instructi sunt, qui in pedibus I et præsertim II graciles, in III et præsertim IV robusti sunt; item tarsi angusti et plus minusve longi. Itaque ceteri Laniatores pede tali modo feriunt, ut apicem inferiorem metatarsi et plantam totam tarsi solo opprimant et solum calcaribus metatarsorum (in primis III et IV) et setulis sat rigidis, quibus planta tarsi vestita est, pellentes se moveant. Animalia autem *Oncopodidarum* calcaribus apicalibus metatarsorum destituta, apice metatarsorum solum non tangunt et oblique positam plantam et apicem quidem tarsi solo opprimunt et solum planta tali, perlata, pellentes se movent. Et, ut solum planta melius pellere possint, metatarsus in apice profunde excavatus est, ut basin tarsi excipiat et hunc firmius teneat. Structuræ et positioni tarsi ea res optime congruere mihi videtur, quod unguiculi (parvuli gracilesque) in apicem profunde et angustissime excavatum tarsi excipi possunt.

Adhuc venit, quod animalia hujus familiæ quasi imaginem graduum metamorphosis Laniatorum ceterorum (quoad structuram tarsorum) reddunt. Hac in re genus *Oncopodis*, adolescens et adultum, numerum articulorum tarsalium minorem præbet, quam pulli ceterorum Laniatorum, scilicet in omnibus pedibus articulos singulos; et metamorphosis huic generi fere nulla est: animali juniori plantula¹⁾ (apex tarsi) pedum III et IV ut in ceteris Laniatoribus producta ex incisura angusta emergens, sed arolium deest; saltem *Oncopodi Feæ* etiam pseudonychium deest. Secundum ill. THORELL tamen *Oncopodi truncato*²⁾ juniori præterea plantula (scapus) pseudonychio instructa est, et de *Oncopode Doriae*³⁾ juniori ill. THORELL dicit: "modo singulum unguiculum video, apice scapi [plantulæ] insertus et cum eo angulum obtusum formantem, qui unguiculus unguiculo 3° sive inferiori [pseudonychio] *O. truncati* et *Gnomuli Sumatrani* respondet: unguiculi superiores [veri] ad duo tubercula minuta ad basin hujus unguiculi inferiores sita redacti videntur!" — Sed mirabile dictu! *Oncopodi Feæ* juniori tarsi III et IV processu terminali (brevi) setulas duas, pilis tarsi crassiores neque longiores, gerente instructa, dum processus terminalis talis animali adulto plane deest (vide fig. 2). E contrario in Laniatoribus ceteris, animalibus non adultis hi tarsi processu terminali destituti semper sunt, dum in animalibus adultis (in multis familiis) eo instructi sunt.

¹⁾ Tarsi (III et IV) in animalibus junioribus unguiculos quidem singulos demonstravere, sed etiam mihi videtur me vestigium alterius defracti vidisse.

²⁾ Annali del Museo Civico di Storia naturale de Genova. Vol. 1891 p. 765.

³⁾ Ibid. p. 765.

Secundum ill. THORELL genus *Gnomuli* eundem numerum articulorum tarsalium quam juniores Laniatorum familiarum ceterorum demonstrat, i. e. 2, 2, 3, 3. Animali juniori *Gn. Sumatrani*¹⁾ articuli tarsales primum ("in exemplo minore") sunt 2, 2, 2, 2 — ut in pullis Laniatorum ceterorum — deinde (in exemplo majore) 2, 2, 3, 3 ("articulationibus modo spuriis separati" — quod verisimiliter indicat quod animal eo pervenit, ut articuli novi intra cutem priorem jam conditi sunt. Animalibus junioribus pseudonychium adest, arolium cutem deest. (Si processus terminalis adsit, ill. THORELL non commemorat).

Item secundum ill. THORELL "pullus" *Pelitni armillati*²⁾ articulos tarsales 2, 2, 2, 2 demonstrat; arolium magnum subglobosum adest.

Adhuc venit: In adultis *Oncopodidarum* segmentum liberum unicum est dorsale anale, dum cetera in scutum dorsale et scutum ventrale coalita sunt, in pullo *Pelitni armillati* "segmenta dorsalia tria vel quatuor ultima libera sunt et segmenta ventralia (6) libera, non in scutum ventrale coalita", quod etiam omnes Laniatores adulti et pulli familiarum ceterorum demonstrant.

In SØRENSEN's manuscripts descriptions of 2 species of Oncopodids were found, belonging to the genera *Oncopus* Thor. and *Pelitnus* Thor. respectively.

Oncopus Thor.

Oncopus Thorell. Ann. Mus. Genova. IX. 1876, p. 134.

Oncopus Roewer. Weberkn. d. Erde. 1923, p. 57.

Oculi (saltem in *feae*) basi tuberis impositi, a parte cetera areæ primæ non manifeste limitati, ex ipso margine anteriore scuti surgentis, convexi, ante versum conice producti.

Scutum dorsale longum, anguste lyriforme, adversus coxas III leniter sinuatum. Area prima (s. cephalothorax) a secunda sulco recurvo limitata, cuius pars media multo acutior est (i.e. segmentationem multo manifestius indicat) quam in ceteris Laniatoribus mihi cognitis, dum partes laterales hujus sulci evanescunt. Sulci ceteri lati, leves, manifesti autem (secundo tamen debili), ultimis exceptis, leviter procurvi.

Areæ priores saltem quinque eminentiis majoribus destituta.

Segmenta ventralia omnia coalita.

Orificia glandularum foetidarum ipsi margini scuti imposta, librata, labio superiore tumido. Coxæ II tubercula magna bina, scuto oppressa præstant, ante et post orificia posita, quibus liquor foetus in emissarium ducitur.

Antennarum articulus primus subito incrassatus; pars basalis angustior brevis, quare oculum facile effugit; digitus mobilis oblique movetur.

Mandibularum pars palpigera non producta tuberculo conico inferiore basali munita.

¹⁾ Ibid. p. 762—63.

²⁾ Ibid. p. 757 et 763 (animal adultum incognitum).

Palporum robustiorum partes trochanterica cylindrica, femoralis leviter compressa, patellaris et tibialis vix, tarsalis manifesto infra deplanatae.

Lobus maxillaris coxae II latus.

Coxae IV coxis III non dimidio latiores, cum abdomine processu magno exteriore conjunctae.

Pedes robusti, breves; II et IV subæque longi.

Tarsi omnes indivisi (uniarticulati), paullo longiores quam latiores.

III. THORELL, genus *Oncopodis* fundans, (de *O. Doriæ*) dicit: "Oculi duo, eminentiae amplæ humili prope marginem cephalothoracis anticum impositi", et (de *O. Feæ*) dicit: "elevatio illa oculigera", sed (ante descriptionem *Oncopodis truncati*) de toto genere dicit: "Oculi sessiles dicendi, in impressione longa levi laterum partis cephalothoracis positi, hac parte inter oculos fortius transversim convexa". *Oncopodis truncatum* mihi incognitum e genere movere non audeo, quamquam hac in re a ceteris speciebus sat multum differre videtur.

Six species, of which SØRENSEN has examined *O. Feæ* Thor., are now placed in this genus (vide ROEWER, p. 57).

Oncopus feæ Thor.

Oncopus Feæ Thorell. Ann. Mus. Genova. XXX. 1890, p. 375.

Oncopus Feæ Pocock. Ann. Mag. nat. Hist. (6) XIX. 1897, p. 288.

Oncopus Feæ Roewer. Weberkn. d. Erde. 1923, p. 58.

9,5 mm longus, fuscus; tubero culiferum ante versum conice productum; scutum dorsale paribus tribus (areis septimæ et octavæ et nonæ impositis) eminentiarum præditum, quorum postrema ambo tubercula sublibrata, a margine posteriore scuti paullo recessa; palporum pars femoralis tuberculo non sat amplio humillimo rotundato inferiore basali prædita, pars tibialis tuberculo inferiore-exteriore basali subprono armata; metatarsi in apice dorsali incrassati, ubi tarsis crassiores sunt.

Tuber oculiferum convexum, humile, latum, sublæve; pars producta obtusa.

Scutum dorsale levissime convexum. Limbus anterior non discretus. Limbus lateralis vix discretus. Pars manifesta sulci transversi primi in foveolas rotundas, sat profundas, utrinque singulas desinit. Areæ prima subtilissime irregulariter transversim plicata (s. impresso-striata), secunda et tertia et quarta in lateribus subtiliter oblique plicatæ; prima foveis utrinque binis, anterioribus levibus, prope marginem anteriorem positis et foveis utrinque binis prope marginem lateralem positis, prædita. Areæ 7 et 8 et 9 eminentiis posterioribus binis, latis, humilibus rotundatis ornatæ, quarum primæ duæ sunt grana magna, postremæ duæ tubercula sublibrata e margine posteriore scuti paullo recessa, inter se spatio majore quam ceteræ disjunctæ. Areæ (prima excepta) carinis transversis humilibus singulis præditæ; carinæ arearum 2dæ, 3tæ, 8væ, 9næ obsoletæ. Venter et omnes coxae sublævia; operculum genitale tamen manifesto transversim rugosum. Coxa III impressione transversa levi. Scutum ventrale carinas 5 transversas demonstrat manifestas subtilem, marginem lateralem pæne attingentes.

Antennarum articulus I in apice superiore conice productus, sublævis, tuberculo valido inferiore apicali prono trilatero instructus; pars producta superior robusta, obtusa. Articulus II ante sublævis, fovea tamen lata neque profunda ornatus, ante digitos posita, tuberculo posteriore exteriore subapicali prædictus. Digitus mobilis tuberculo parvo exteriore posteriore basali prædictus, in apice excavatus, adductus apicem digitii immobilis excipit; carina anteriore-inferiore integra instructus, ante medium incipiente, usque ad excavationem apicalem attingente. Digitus immobilis compressus, carina interiore posteriore prædictus, breviter extenuata, basin prope vix dentata.

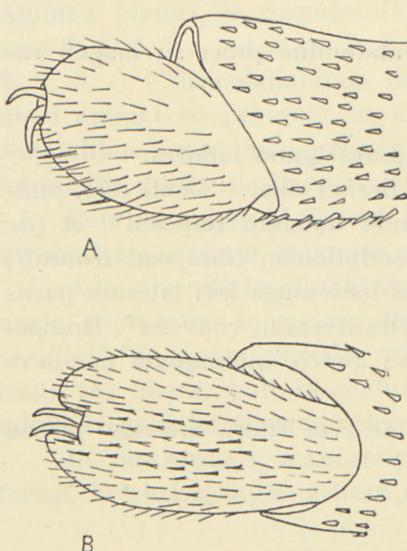


Fig. 1. *Oncopus Fée Thor.*

A Tarsus IV a latere inspecta, B intra inspecta.

(W. Sør. del.)

desuper inspecta parte patellari paullo brevior, tuberculo inferiore exteriore basali subprono conico, obtuso armata, et in apice utrinque leviter producta. Pars tarsalis partibus patellari et tibiali conceptis manifesto longior, parte femorali paullo longior, partibus femorali et trochanterica simul sumtis brevior; levissime curvata, supra convessa, in apice exteriore in tuberculum porrectum producta. Unguis brevis, robustus, vix curvatus.

Pedes breves robusti. Trochanter I tuberculis inferioribus pronis, obtusis, duobus, basilare et apicale instructus. Trochanteres spurii I et II tuberculis singulis dorsalibus et apicalibus prædicti. Femora leviter arcuata, in tubercula robusta apicalia lateralia utrinque bina porrecta, compressa, rotundata producta, quorum posteriora femorum I et II intersese non bene limitata. Patellæ in tubercula singula apicalia conica productæ. Tibiæ in tubercula robusta apicalia lateralia utrinque singula, porrecta, compressa, rotundata productæ. Metatarsi præsertim I in apice dorsali incrassati, tarsi crassiores. Tarsi latiores quam longiores. Metatarsi subtiliter dense granulati; partes ceteræ læves.

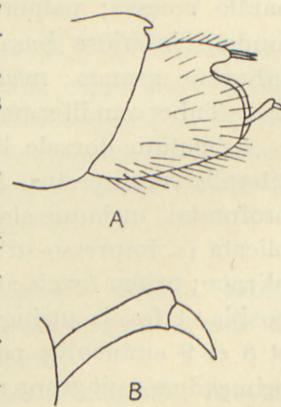


Fig. 2. *Oncopus Fée Thor.*
anim. juv.

A Tarsus IV, a latere inspecta, B tarsi IV apex.

(W. Sør. del.)

Long. corp. (= long. scuti) 9,5, lat. 5,5; palpi 6; pedes I 9, II 12, III 9,5, IV 13,5.

Color: fuscus. Venter rubicundo-fuscus. Membra fusco-brunnea. Pars tarsalis palporum et apices metatarsorum rubicundi. Tarsi testacei.

Patria: insula Penang. — Animalia adultum unum et junius unum (5 mm longum) vidi quæ ill. THORELL mihi ut viderem benevolentissime misit.

Pelitnus Thor.

Pelitnus Thorell. Ann. Mus. Genova. XXX. 1891, p. 757.

Pelitnus Roewer. Weberkn. d. Erde. 1923, p. 62.

Tuber oculiferum plus minusve forte, transversum, tuberculo uno præditum.

Corpus pæne inverse pyriforme, parum longius quam latius. Scutum dorsale post aream primam late sed non profunde sinuatum.

Areæ omnes scuti eminentiis majoribus destitutæ.

Orificia glandularum foetidarum forte curvata; parte superiore angusta margini scuti parallela, quare orificia minus manifesta. Tubercula duo coxæ II (dorsalia) ante et pone (majus) orificio imposita sunt.

Antennarum articulus I sensim crassior, articulus II (ad articulationem) paulo longior quam articulus III.

Mandibularum pars palpigera non producta, tuberculo interiore basali (semper?) munita.

Palpi robusti; pars femoralis manifesto crassior quam femur I, subteres (vix compressa), leviter curvata; partes trochanterica et femoralis interdum tuberculo inferiore munitæ; partes ceteræ inermes.

Pedes robusti breves; II et IV subæque longi.

Lobus maxillaris coxæ II subconica, oblique deorsum et prorsum directus, haud manifesto discretus.

Coxæ IV coxis III non dimidio latiores.

Tarsi I et II biarticulati, III et IV triarticulati.

In this genus 7 species are now placed (vide ROEWER). SØRENSEN recognized one further species, viz.

Pelitnus Thorelli n. sp.

Pelitno segnipedii affinis. — 6,5 mm longus, castaneus pedibus pallidioribus; tuber oculiferum fere duplo latius quam altius, fere a margine anteriore scuti surgens. Areæ II—VI linea angusta longitudinale singula impressa divisæ. Areæ II—IX (i. e. abdominales) carinis transversis elevatis singulis in partes binas divisæ. Palporum partes trochanterica et femoralis tuberculo inferiore munita, tuberculum femorale minus quam in *segnipede*.

Tuber oculiferum haud magnum, haud bene limitatum, manifesto latius quam

longius, fere duplo latius quam altius, triplo brevius quam area prima, vix granulatum. Eminentia apicalis est tuberculum haud bene limitatum, conicum, obtusum, in basi latius quam altius.

Scutum dorsale (i.e. corpus) perverse pyriforme. Area prima fere duplo latior quam longior, transversim subrectangula, pone sensim paullo latior. Limbus anterior haud bene discretus, rotundatus, laevis. Area ipsa (I) dense subtilissime granulata, post tumulum oculigerum in parte fere tertia media alte convexa, extra quam sat profunde impressa, et tuberculis ambobus mox ante suturam limitantem areae positis et æque late a limbo laterali ac ab parte media elevata separatis, humilibus, rotundatis. Margo posterior partis mediae elevatae anguste et sat profunde emarginatus. Area secunda paulo brevior quam area prima. Area III manifesto brevior quam II; IV, V, VI, VII subæque longæ paullulo breviores quam area III; VIII manifesto longior quam VII, IX dimidio fere longior quam VIII. Sulci transversi 2dus, 3tius leviter (angulate) procurvi, ceteri subrecti. Primo excepto omnes sulci laeves. Area II sulco levissimo anteriore subsemicirculari praedita. Areæ abdominales (i.e. II—IX) lineis transversis singulis in partes binas divisæ: partes anteriores acclives, partes posteriores fere duplo breviores. Areæ II—IX leviter reticulate aciculati et punctulis impressis ornatæ, quorum plurima in ordines singulos sat manifestos secundum lineas elevatas disposita sunt. Areæ II—VI et margo anterior secundæ lineis impressis singulis mediis angustis per medium ductis præditæ, quarum anteriores manifestæ, posteriores debiles. Limbus lateralis adversus sulcum I triangule introrsum dilatatus, posteriores versus sensim paullo latior ab areis sulco separatus, aream VIII attingente. Limbus irregulariter sculptus (impresse reticulatus). Emissaria liquoris foetidi ante manifestissima, pone evanescentia, secundum marginem posteriorem areæ IX inter se communicantia. Segmentum liberum (unicum) anale dorsale — quoad visible — multo latius quam longius. — In scuto ventrale sulci transversi 5 leviter arcuati (recurvi) ante marginem desinentes et ibi dilatati segmenta 6 indicunt. Area analis manifesto longius quam area II—V. Areæ ventrales subtilissime coriaceæ et punctulis parvulis densis ornatæ, ordinatim haud disjunctis. Operculum genitale subæque longum atque pone latum, punctis impressis ornatum. Spiracula in pariete posteriore sulci coxam IV ab abdomen separantis posita. Bulla spiraculorum leviter tumida.

Antennarum articulus primus tuberculo magno, apicali, dorsali, rotundato, elevato prorsum leviter et vix introrsum directo prædictus. Articulus 2dus (ad articulationem) paulo longior quam articulus 3tius.

Mandibularum pars palpigera non producta, tuberculo inferiore basali munita.

Palpi robusti, pars trochanterica duplo brevior, sed vix angustior quam articulus 1mus antennarum, a latere inspecta apicem versus multo crassior, tuberculo inferiore apicali rotundato; pars femoralis manifesto crassior quam femur I, subteres (vix compressa), vix arcuata, leviter curvata, tuberculo inferiore subbasali rotundato; pars patellaris brevis, desuper inspecta duplo longior quam latior, parte femorali non tenuior. Partes patellaris et tibialis vix, pars tarsalis manifesto infra deplanatae. Pars tibialis desuper inspecta parte patellari manifesto brevior, non

autem tenuior, apicem versus sensim tenuior; pars tarsalis æque longa ac pars patellaris + pars tibialis, in basi tenuior quam apex partis tibialis, apicem versus sensim tenuior et angustior. Unguis in basi æque crassus ac apex partis tarsalis, triplo fere brevior quam pars tarsalis.

Pedes breves, robusti, subtiliter coriacei et punctis impressis et densis ornatii. Processus articulares coxarum robusti, II et IV prominentes, posterior coxae II et anterior coxae IV compressi et profunde fissi (s. bigemini), posterior coxae IV abdomini coalitus; præter quos coxa I tuberculo anteriore submedio, rotundato producto prædicta. Trochanteres pyriformes. Trochanteres spurii sutura debili (vix manifesta) a femoribus vix limitati. Femora teretia, levissime compressa. Patellæ leviter clavatae. Tibiae et metatarsi subcylindrici. Astragali paullo longiores quam crassiores. Astragali et calcanei a sese sutura vix manifesta limitati; astragali ipsam basin metatarsorum efficiunt. Tarsis omnibus articulus primus in basi fortiter incrassatus. Tarsus I (a latere inspectus): articulus 2dus non duplo longior quam primus, subovatus, fere duplo longior quam crassior. Tarsus II: articulus 2dus deorsum leviter curvatus, quam articulus primus fere triplo longior, et fere triplo longior quam crassior. Tarsus III et IV: articulus primus quam 2dus manifesto et quam 3tius vix longior. Tarsi II et in primis I manifesto, III et IV non latiores quam apex metatarsi. Articulus 3tius tarsorum profunde, I et II anguste, III et IV late excavati. Ungues I et II pusilli, III et IV sat majores.

Differentia sexualis ignota.

Long. corp. (et scuti) 6,5; lat. max. 4,5; palpi 4,75; pedes I 7,2, II 9,6, III 7,8, IV 10,75.

Castaneus, infra vix dilutior. Membra fulvo-castanea. Tarsi fulvi. Pars tarsalis palporum et apices femorum et tibiarum manifesto dilutiores (subfulvi).

Patria: Java. — Specimina duo in Museo Hafniense asservantur.

Remark: This species is very nearly related to *P. segnipes* Loman, but is easily distinguished by the low eye tuber, the less strong femoral armature, and the relatively short palps and 2nd pair of legs.

Assamiidæ W. Sør.

Assamioideæ Sørensen. Naturh. Tidsskr. (3) XIV. 1884, p. 595.

Assamiidæ Roewer. Weberkn. d. Erde. 1923, p. 215. — Suppl.: Abh. Naturw. Ver. Bremen. XXVI, 2, 1927, p. 269.

Tuber oculiferum adest.

Scutum dorsale sulcis transversis quinque (interdum difficilibus visu) divisum. Sulci I et II conjuncti vel non conjuncti. Margo limbi anterioris scuti processibus quinque proceris, longe conicis instructus, quorum unus medius et bini extra antennas et palpos positi.

Emissaria liquoris foetidi secundum margines laterales scuti dorsalis ducta. Orificia glandularum foetidarum detecta.

Spiracula maxima, lunata, cancellata, nivea quia cancelli tuberculis microscopicis ornati, in foveola oblonga inter coxas IV et abdomen posita, processibus fulcientibus plus minusve obtecta, qui coxas IV cum abdomine conjungunt.

Mandibularum pars palpigera et pars manducatoria inter se non discretæ, (in generibus mihi cognitis) neque supra nec infra partem palpigeram non produc tam processus adest.

Palporum corpore breviorum partes armatae tibialis et tarsalis oblique positæ sunt (crucialiter geruntur), ita ut adductæ partem femoralem litteram S formantem margine exteriore attingant; pars femoralis tuberculis setas (sed non spinas) subapicales gerentibus prædita.

Lobus maxillaris coxae II rudimentarius, non exsertus.

Coxæ IV mediocriter aut paullo dilatatæ; cum abdomine processibus fulcientibus (jam dictis) conjunctæ.

Pedes omnes spinis destituti.

Femorum pars infima trochanterem spurium (præter trochanterem verum) format aut non.

Metatarsus in astragalum et calcaneum divisus.

Pars ulterior tarsi I bi- vel tripartita, II bi- ad septempartita.

Scopula deest. Processus terminalis deest vel adest.

Unguiculi I et II singuli, integri, III et IV bini, integri vel pectinati.

Differentia sexualis interdum in antennis, in palpis sive pede I demonstratur.

Animalibus adolescentibus spiracula detecta, quod processus fulcientes inter coxas IV et abdomen nondum adsunt.

Species hujus familie in Africa, Asia meridionali et Australasia dispersi.

ROEWER has divided this family into 3 subfamilies, viz. *Trionyxellinæ*, *Dampetrinæ* and *Assamiinæ* (ROEWER l. c. pag. 215, 220 and 236). In the manuscripts and material left by Dr. SØRENSEN 3 species were present, all belonging to the last-named subfamily (*Assamiinæ*), which is characterized by the missing processus terminalis and by pars ulterior tarsi I being 2-jointed.

One of these new species was an Indian one, named by SØRENSEN *Assamia variata*. As tarsus I is missing in the only specimen present, the number of joints in this latter cannot be stated, and thus it is uncertain whether it is to be placed in the genus *Assamia* W. Sør. or *Metassamia* Roewer, which latter was established in 1923; the number of joints still present in tarsi II and III (respectively 12 and 8—9) will, however, most probably refer it to *Metassamia*, and it is therefore described below under the name *Metassamia(?) variata* n. sp.

Some specimens representing another new species were collected in Australia and preserved in the Riksmuseum of Stockholm. SØRENSEN referred them to the genus *Dampetrus* as *D. atac* n. sp. As this species shows a distinctly 2-jointed pars ulterior I

it cannot be placed in the Dampetrin subfamily, in which (as pointed out by ROEWER) pars ulterior I is 3-jointed, but it must be placed among the Assamiins. Within this group it agrees in all essential features with the genus *Wintonia* (this genus moreover being the sole Assamiin genus hitherto known from Australia) in which it should thus be placed under the name of *Wintonia atar*.

Finally SØRENSEN has left a description of an Assamiin species which he has named *Seuthes* n. g. *Simonis* n. sp. The genus *Seuthes*, however, quite agrees with *Paraselencia* Roewer, established by ROEWER in 1923, and the species described below must then be named *Paraselencia simonis*.

Metassamia (?) variata n. sp.

Assamia variata Sørensen in manuscript.

4,5 mm longa, sordide olivacea, punctulis nigris partim confluentibus variegata; tuber oculiferum duplo latius quam altius, ordinibus granulorum æqualium præditum; sulci transversi scuti omnes manifesti; limbus anterior processibus quinque, quorum minimus suberectus; processuli areæ quartæ tuberibus minoribus impositi; palpi corpore longiores, pars trochanterica æque longa ac pars patellaris, pars femoralis tuberculo majore interiore, apici propinquu, armata, pars tarsalis spinis exterioribus duabus et interiore una; articuli tarsales: ?, 12, 8—9, ?.

Tuber oculiferum paullo latius quam longius, duplo latius quam altius, supra non excavatum, ordinibus ambobus granulorum æqualium (utrinque trinorum), inter se fere duplo latius quam ab oculis separatis. Oculi prominentes.

Scutum vix convexum, post coxas III subrectangulum, pone sensim paullulo latius. Sulci transversi omnes manifesti, secundus, tertius, quartus tamen leves. Limbus anterior discretus, ordine granulorum majorum et processibus quinque proceris, longe conicis instructus, quorum minimus medius in ordine granulorum positus, leviter proclinis, et ceteri porrecti, extra antennas et palpos positi, ante ordinem granulorum positi; exteriores maximi; supra palpos adsunt grana majora duo conica; anguli rotundati. Limbus lateralis vix discretus, lævis, punctis impressis dispersis ornatus. Emissarium liquoris foetidi angustissimum. Areæ secunda et tertia granulis parvulis paucis sat dispersis; ceteræ læves. Processuli areæ quartæ tuberibus, tubere oculifero minoribus, impositi, leviter reclines, subcylindrici, obtusi, late disjuncti. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granulorum ornata. Anale ventrale læve, impressione longitudinali media anteriore præditum; coxae (IV) et ventrale primum lævia; segmenta cetera ordinibus singulis granulorum pusillorum ornata.

Antennarum pars globosa articuli primi granulo interiore apicali supra prædita.

Palporum pars trochanterica æque longa atque pars patellaris, processulis inferioribus duobus armata, apici propinquuis. Pars femoralis ordine inferiore tuberculorum densorum acutorum (circiter 24) fere invicem majorum et minorum et tuberculo majore interiore apici propinquuo armata; latus exterius et dorsum granulis

parvis subacutis prædita. Pars patellaris tuberculis parvis (utrinque binis aut trinis) apicem articuli versus majoribus. Pars tibialis præter spinas tuberculis interioribus parvis (quatuor aut quinque) et (uno) exteriore apicali et granulis prædita; spina angulo exteriori imposta, robusta, longa. Pars tarsalis parte tibiali haud multo brevior, desuper visa oblique breviter fusiformis, parte tibiali vix minus lata; præter spinas exteriores duas et interiorem (an semper?) unam tuberculis utrinque circiter senis armata. Unguis parte tarsali parte tertia brevior.

Pedes longi, graciles. Coxæ II in lobum fixum magnum, subporrectum productæ. Trochanteres spurii vix manifesti. Femora subrecta, sublævia. Calcanei breves, II et III articulo tarsali primo breviores. Articuli tarsales: ?, 12, 8—9, ?. Unguiculi fortiter incurvi.

Differentia sexualis incognita.

Long. corp. 4,5; long. scut. 4, lat. scut. 3,25; palpi 6; pedes I ?, II 26, III 17, IV ?.

Sordide olivacea, punctulis nigris partim irregulariter confluentibus variegata. Segmenta dorsalia libera tria anteroria (præsertim tertium) fere nigra, dilute marginata. Venter (anali excepto) et membra (patellis exceptis) dilutiora.

Patria: India orientalis. — Specimen unicum vidi, ad urbem Calcutta a cl. Loczy in itinere cl. comitis BELA SZÉCHENYI per Asiam orientalem captum, in Museo nationali Hungarico asservatum.

Wintonia atar n. sp.

Dampetrus atar Sørensen in manuscript.

Mas 3,5 mm longus, fuscus; areæ secunda, tertia, quarta, quinta tuberculis parvis binis instructæ, eminentiis ceteris (granis magnis) manifesto majoribus; segmenta dorsalia libera: tertium ordinibus duobus manifestis granorum et anale granis minoribus densis dispersis ornata. Articuli tarsales: 4 (♀)—5 (♂), 8, 5, 6.

Tuber oculiferum plus quam duplo latius quam altius, longius quam altius, granis magnis subconicis (sex aut) octo præditum, ambas cristas formantibus. Oculi subbasales.

Scutum pone manifesto latius. Limbus anterior discretus, granis ornatus. Limbus lateralis latus, ordinibus duobus granorum prædictus. Areæ secunda, tertia, quarta, quinta tuberculis parvis conicis binis instructæ, eminentiis ceteris (granis magnis) manifesto (circiter duplo) longioribus; quæ grana in ordines binos haud manifestos disposita sunt; ordines ambo tuberculorum pone divergentes: tubercula areæ tertiae sibi manifesto propiora quam limiti interiori limbi lateralis. Segmenta dorsalia libera duo priora ordinibus singulis, tertium ordinibus manifesto duobus granorum ornata; anale dorsale granis minoribus densis dispersis. Coxæ et segmenta ventralia granis minoribus ornata.

Antennarum pars globosa articuli primi granis supra scabra.

Palporum graciliorum pars trochanterica processu inferiore robusto armata. Pars femoralis femore III vix crassior, ordine inferiore processuum circiter decem et processu robusto breviore interiore apicali armata. Pars patellaris tuberculis acutis

exterioribus quatuor et interioribus duobus (aut quatuor) armata. Pars tibialis præter spinas tuberculis acutis exterioribus quatuor et interioribus duobus (aut quatuor) armata. Unguis parte tarsali manifesto brevior.

Pedes sat robusti. Femora subrecta, ubique granulata. Calcanei I vix, II non longiores quam crassiores; III et IV crassiores quam longiores. Articuli tarsales: 4 (♀)—5 (♂), 8 (—9—10, saltem in maribus), 5, 6.

Differentia sexualis: Mas quam femina major. Antennæ maris paullo crassiores quam feminæ. Femur IV maris apicem versus sensim leviter crassius, processu inferiore exteriore subapicali, conico, subacuto, retrorsum (apicem femoris versus) curvato, patella paullo breviore et diametro femoris longiore, et ordine inferiore interiore subapicali tuberculorum parvorum, subcylindricorum, obtusorum, densorum trium aut quatuor instructum. Tarsus I maris quinque-, feminæ quadri-articulatus.

♂: Long. corp. 3,6; long. scut. 3,3, lat. scut. 2,5; palpi 3,25; pedes I 8, II 14, III 9,5, IV 16,5.

Scutum fuscum. Venter rubicundus, fusco-variegatus. Antennæ et palpi scuto dilutiores. Pedum trochanteres et partim tarsi testacei.

Patria: Queensland. — Exempla septem vidi, mares tres et feminas quatuor, ad oppidum Cardwell a cl. C. FRISTEDT collecta, in Museo Holmiense (duo in Museo Zool. Hafniense) asservata.

Remark: This species is easily distinguished from the sole *Wintonia*-species known so far, viz. *W. scabra* Roewer (ROEWER l. c. p. 248), having one pair of eminentiæ on each of the scutal areas II—V bigger (tubercula parva) than the other eminentiæ (grana magna) present on the same areas.

Paraselencia simonis n. sp.

Seuthes simonis Sørensen in manuscript.

4 mm longa, fusca, testaceo-variegata; tuber oculiferum eminentiis sex præditum, quarum ambæ processus; areæ (prima et quinta exceptis) et segmenta dorsalia libera duo anteriora processibus binis et areae tertia (præter processus) et quinta granis binis ornata; antennarum pars globosa articuli primi granulis dispersis. Articuli tarsales 5, 10—11, 6, 6—7.

Tuber oculiferum procline, manifesto latius quam altius, fere æque longum ac altum, supra non excavatum, eminentiarum paribus tribus ornatum, quorum medium processus proceros, conicos, acutos præstat, processibus arearum scuti longiores, altitudine tuberis paullo breviores; post quos tubercula ambo parva, et ante quos grana ambo parva. Oculi magni.

Scutum dorsale sat convexum, erga coxas III plane sinuatum, erga coxas IV sinu levi præditum, post coxas III non latius. Sulci (quinto excepto) leves. Limbus anterior haud discretus, processibus quinque libratis ornatus, quorum ambo maximi, juxta palpos positi. Limbus lateralis vix discretus, haud latus, ordine granorum

humilium ornatus. Areæ secunda, tertia, quarta processibus binis, brevibus, per robustis, late conicis, acutis, coriaceis; areæ tertia (præter processus) et quinta granis binis rotundatis; scutum totum coriaceum. Limbus posterior scuti tuberculis ambobus et ordine granorum; segmenta dorsalia libera duo anteriora ordinibus singulis granorum et processibus binis, ordines processuum scuti continuantibus, et tuberculis lateralibus binis; tertium ordine tuberculorum et granorum; anale dorsale ordinibus duobus granorum. Coxæ et pars anterior segmenti ventralis primi granis dispersis; anale ventrale ordinibus duobus, margo posterior segmenti primi et segmenta cetera ordinibus singulis granulorum. Processus fulcidentes, spiracula obtegentes, pauci, quorum unus maximus.

Antennarum pars globosa articuli primi granulis dispersis haud densis ornata.

Palpi non robusti; pars femoralis æque crassa ac pars media femoris IV, ordine inferiore processulorum densorum, robustorum, acutorum, et processulo interiore apicali robusto armata et ordinibus exteriore et superiore granorum ornata; pars patellaris processulis parvis interioribus, pars tibialis parte patellari parte tertia longior, processulis interioribus duabus et exterioribus parvis; pars tarsalis parte tibiali paullo brevior.

Spinæ partium tibialis et tarsalis omnes sat graciles, diametro articuli breviores. Unguis procerus, parte tarsali manifesto brevior.

Pedes longiores, sat robusti. Coxæ IV tuberculis exterioribus mediis (nec apicalibus) trinis, quorum sumnum maximum. Femora leviter arcuata, coriacea et vix granulata. Articuli tarsales: 5, 10—11, 6, 6—7. Unguiculi III et IV dentibus utrinque trinis aut quaternis aut quinibus; dentes robusti, sat breves.

Differentia sexualis?

Long. corp. 4; long. scut. 3, lat. scut. 2,5; palpi 3,5; pedes I 10, II 16, III 10, IV 14.

Scutum fuscum, lineis et maculis testaceis notatum. Pedes sordide fuscotestacei; coxæ testaceæ nebula apicali fusca notatae; trochanteres veri pallide testacei. Antennæ et palpi testacea.

Animalis junioris (3 mm longi) palpi 3,5 mm longi, processus arearum scuti multo longiores quam in animale adulto. Articuli tarsales 2, ?, 3, 3.

Patria: Africa occidentalis. — Specimina duo, in Sierre Leone capta, mihi a ill. SIMON data, vidi, in Museo Zoologico Hafniense asservata, alterum verisimiliter femina, alterum animal junius.

Remark: This species is nearly related to *Paraselencia aculeata* Roewer (ROEWER l. c. p. 284), but is easily distinguished from it, having no median furrow connecting the 1st and 2nd transversal furrows of scutum, and showing on scutum

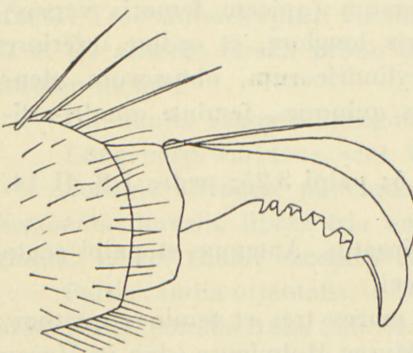


Fig. 3. *Paraselencia simonis* n. sp.
Tarsi IV apex, a latera inspecta.
(W. Sør. del.)

(besides a pair of processes on the 2nd, 3rd and 4th areas) a pair of lesser eminentiæ (granæ) on the 2nd and 4th areas.

Phalangodoidea.

In various papers (1884, 1886, 1896, 1910) Dr. SØRENSEN has described a number of Laniatores belonging to this series and referred them to the following families: *Phalangodidæ*, *Zalmoxioidæ*, *Epedanoidæ*, *Samoidæ*, *Biantoidæ*, and *Palpidoidæ* (this latter being later on renamed into *Erecananidæ* by STRAND).

As to these families it must be noted here that the family *Epedanoidæ* was erected (1886) by SØRENSEN as containing 3 new genera together with the old genus *Epedanus* Thorell, to which SØRENSEN thought they were related. Later on, however, he learned that the 3 genera differed essentially from *Epedanus* in having a scopula, while a scopula is missing in *Epedanus*, and therefore he removed them again and included them (1896) in the family *Biantoidæ* Thorell.

SØRENSEN only knew few Phalangodoid animals (11 genera with 16 species). Later on the number of forms belonging here has increased considerably through the extensive work of ROEWER; now 124 genera with 221 species are known, which are arranged by ROEWER into 12 subfamilies viz. *Samoinæ*, *Phalangodinæ*, *Tricommatinæ*, *Biantinæ*, *Stygnommatinæ*, *Ibaloniinæ*, *Podoctinæ*, *Erecananinæ*, *Acrobuninæ*, *Saracinicinæ*, *Epedaninæ*, and *Dibuninæ*.

In the present posthumous manuscripts of SØRENSEN were found descriptions of genera and species, referred to the following families: *Phalangodidæ*, *Olynthidæ* n. fam., *Epedanidæ*, *Biantidæ*, *Stygnopsidæ* n. fam. and *Minuidæ* n. fam.

Of the different groups, *Samoidæ* Sørensen is identical with *Samoinæ* Roewer, and *Palpidoidæ* (*Erecananidæ*) Sørensen is identical with *Erecananinæ* Roewer.

The editor agrees with ROEWER (1912, p. 110) in uniting the two Sørensenian groups *Zalmoxioidæ* and *Phalangodidæ* into a single group (= *Phalangodidæ* Roewer). The characters according to which SØRENSEN separated these two families in 1886 were not many, and since that time ROEWER has described so great a number of new forms which show a parallel variation of the features in both groups that their separation can only be established on a single point viz. "spiracula processibus fulcientibus obiecta" or "detecta" which at any rate is not enough for a separation of families, but — as both LOMAN (1905) and ROEWER (1912) maintain — is only of generic value. Furthermore SØRENSEN himself surely admitted that the two groups could not be maintained as separate groups; in his rough-draughts at my disposal all the descriptions of forms belonging hereto are kept together, and he has left several attempts at grouping all the forms known to him in common synopses.

The group *Olynthidæ* Sørensen differs only on a single point from the Roewerian subfamily *Tricommatinæ*, and it is therefore natural that the species in question (*Olynthus anomalis*) should be ranged within this latter group, which thus becomes synonymous with *Olynthoidæ*.

As to the forms referred by SØRENSEN to *Epedanidae* the following remarks may be made: In 1913 ROEWER established a new Phalangodid subfamily *Saracinicinæ*, closely related to *Epedaninæ*, and these two subfamilies are separated according to the number of joints in pars ulterior tarsi I: 2 joints in *Epedaninæ*, 3 in *Saracinicinæ*. As to the genus *Asopella* described below, SØRENSEN remarks: "Specimini unico *A. bicoloris* limes articulorum secundi et tertii partes ulteriores tarsi I tam leviter expressus est, ut oculum meum effugisset, nisi eum diligentissime investigavisse. Specimini unico *A. xanti* idem limes levis, quamquam haud difficilis visu. *Asopo borneensi* pars ulterior tarsi I vulgo manifeste tripartita, etiam tamen huic species speciei interdum fieri potest, eundem limitem vix manifestum esse". I have been able to re-examine the 2 specimens of *A. borneensis* present in the Copenhagen museum and can state that pars ulterior tarsi I is really very distinctly tripartite. This latter species is, however, identical with *Epedanus lutescens* Thorell, which species belongs to *Epedaninæ* ROEWER (with 2 joints in pars ulterior!). SØRENSEN has further compared *A. xanti* with *Epedanus javanus* Thor. and notes that they are probably identical, and that they agree at any rate in having 3 joints in pars ulterior. SØRENSEN recognized 3 joints in the two other species described below viz. *Epedanus prædo* and *E. (Metepedanus) veriator*. — Thus 3 joints in pars ulterior tarsi I may occur in *Epedaninæ* sensu ROEWER. According to the characteristics mentioned by ROEWER, no other real difference than this number of tarsal joints can be stated between the 2 subfamilies in question, and since this, as previously stated, does not hold good, it seems that the 2 subfamilies cannot be retained as separate groups. I do not, however, know by autopsy any of the forms referred by ROEWER to the *Saracinicinæ*, and therefore I dare not definitely unite the two groups, but leave the settlement of this question to a future investigator who knows by autopsy more forms than I.

On the other hand I agree with ROEWER in regarding *Biantinæ* and *Ibaloniinæ* sensu ROEWER as separate groups, which show differences in important characters. SØRENSEN (1886) only knew one genus (*Mesoceras*) within his group *Biantidae*, the only one then described (*Ibaloniinæ* was erected by ROEWER in 1912). Therefore it is no wonder that SØRENSEN did not substantiate that the genera included in *Biantidae* may most naturally be ranged into two groups corresponding to the Roewerian subfamilies *Biantinæ* and *Ibaloniinæ* (in SØRENSEN's system having family range). The sole species described below belongs to the genus *Acrobiantes* and is consequently a real Biantid.

Finally there are the 2 groups *Stygnopsisidæ* and *Minuidæ* novæ familiae described below: Within the Roewerian system they must form a part of the subfamily *Phalangodinæ* (*Stygnopsis valida* is furthermore de facto included there, as formerly described). In the main there is no doubt that SØRENSEN is right in regarding these two groups as separate and new families apart from the *Phalangodidæ*. It is beyond doubt that *Phalangodinæ* sensu ROEWER does contain a rather heterogeneous series of genera, and that some of the genera treated by ROEWER (especially those mentioned in Weberkn. p. 109—120) will — like *Stygnopsis* (and *Haehnelia*, see later on) —

prove to belong to *Stygnopsidæ* or *Minuidæ*; but as ROEWER gives no description of some of the characters used by SØRENSEN in limiting them, for instance the shape of the spiracles, I am not able to decide which.

ROEWER uses the occurrence of 4 or 5 transversal scutal grooves as a main character when separating the subfamilies within his family *Phalangodidæ*. Since among the 3 genera united by SØRENSEN in *Stygnopsidæ* 2 show 5 grooves, and one only 4, this character cannot be considered to be of such fundamental systematic importance — if the 2 new Sørensenian groups really are naturally limited, in which I agree with SØRENSEN.

Within his subfamily *Phalangodidæ* (in which *Stygnopsis valida* is placed by ROEWER) ROEWER makes use of the number of joints in pars ulterior tarsi II — whether 2 or 3 — for separating the genera. This distinctive mark does not hold good either. Among the 2 specimens of *Stygnopsis valida* which I have had for re-examination, the type specimen certainly possesses 4 joints in pars ulterior of the (12-jointed) left tarsus and likewise 4 in the (13-jointed) right tarsus II, but the other specimen has only 3 ulterior joints in the (12-jointed) right tarsus (the left tarsus is missing). I note that in each of the 3 cases pars ulterior consists of an apical joint and 3 or 2 inner joints respectively, these latter being in each case quite alike, showing that the 3rd joint, when present, cannot be interpreted as merely cut off from one of the other two. This agrees with the fact mentioned below, that the genera *Stygnopsis* (type with 4 ulterior joints) and *Haehnelia* (with 3 ulterior joints) which otherwise quite agree, are to be considered merely as synonyms.

Thus the families in question (subfamilies sensu ROEWER) need to be outlined through other characters than those hitherto used; I shall not try to characterize the many groups erected by ROEWER, not known to me by autopsy, the more so since I am not sure that SØRENSEN would accept them as families. In the following diagnostic survey I have, however, tried to rearrange those present in the material reinvestigated by me, together with those which I know only from ROEWER's descriptions.

Conspectus familiarum Phalangoideorum.

- I. Pars ulterior tarsi I impartita. (Lobus maxillaris coxae II discretus; tuber oculiferum deest; scutum sulcis 5 divisum; femur I spinis armatum; scopula deest)..... *Erecaananidæ*.
- II. Pars ulterior tarsi I bi- aut tripartita:
 - A. Scopula adest. (Pars ulterior tarsi I bipartita):
 1. Tuber oculiferum adest. (Femur I spinis setigeris destitutum):
 - a. Scutum dorsale sulcis 5 divisum. (Lobus maxillaris coxae II deest) *Samoidæ*.
 - b. Scutum dorsale sulcis 4 divisum *Acrobunidæ*.
 2. Tuber oculiferum bene limitatum deest. (Scutum dorsale sulcis 5 divisum; Lobus maxillaris coxae II discretus):
 - a. Scutum dorsale sulcis 5 divisum; Lobus maxillaris coxae II discretus; femur I spinis armatum; tuber oculiferum adest *Stygnopsidæ*.
 - b. Scutum dorsale sulcis 5 divisum; Lobus maxillaris coxae II discretus; femur I spinis armatum; tuber oculiferum deest *Minuidæ*.

- a. Femur I spinis setigeris armatum..... *Ibaloniidae*.
- b. Femur I spinis setigeris destitutum..... *Biantidae* (p. 214).
- B. Scopula deest:
 - 1. Tuber oculiferum adest:
 - a. Femur I spinis vel tuberculis setigeris armatum. (Scutum dorsale sulcis 4 vel 5 divisum; lobus maxillaris coxae II deest vel discretus sed parvus; pars anterior tarsi I bipartita)..... *Minuidae* (p. 217).
 - b. Femur I spinis vel tuberculis setigeris destitutum:
 - + Pars anterior tarsi I tripartita:
 - § Scutum dorsale sulcis 5 divisum. (Lobus maxillaris coxae II discretus vel deest) *Tricomatidae* (p. 240).
 - §§ Scutum dorsale sulcis 4 divisum. (Lobus maxillaris coxae II discretus)..... *Saracinicidae* (cf. p. 243).
 - ++ Pars anterior tarsi I bipartita:
 - § Lobus maxillaris coxae II discretus, latus, porrectus:
 - £ Scutum dorsale sulcis 4 divisum *Epedanidae* (p. 243).
 - ££ Scutum dorsale sulcis 5 divisum *Phalangodidae* (p. 251).
 - §§ Lobus maxillaris deest. (Scutum dorsale sulcis 4 aut 5 divisum) *Stygnopsidae* (p. 262).
 - §§§ Lobus maxillaris parvus. Scutum dorsale sulcis 5 divisum *Microminua* (genus *Minuidarum*) (p. 235).
 - 2. Tuber oculiferum deest. (Pars anterior tarsi I bipartita):
 - a. Femur I spinis setigeris armatum. (Scutum dorsale sulcis 5 divisum) *Podoctidae*.
 - b. Femur I spinis setigeris destitutum:
 - + Scutum dorsale sulcis 5 divisum *Stygnommatidae*.
 - ++ Scutum dorsale sulcis 4 divisum *Dibunidae*.

Biantidæ Thor.

Epedanoidæ pars Sørensen. L. Koch. Arachn. Austral. 2, 1886, p. 66.

Biantoidæ Thorell. Ann. Mus. Genova. XXVII. 1889, p. 670.

Phalangodidae *Biantinæ* Roewer. Weberkn. d. Erde, 1923, p. 128. — Suppl. Abh. Naturw. Ver. Bremen. XXVI, 2, 1927, p. 296.

Tuber oculiferum bene limitatum deest. Oculi inter se late disjuncti, sessiles aut uterque suo tumulo impositi, prope sulcum transversum primum retractum.

Scutum dorsale sulcis quinque transversis divisum. Sulci I et II non conjuncti.

Spiracula ovalia, in sulco inter coxas IV et abdomen sita, sed non processibus fulcipientibus detecta.

Mandibularum pars palpigera valida, porrecta.

Palporum longorum et gracilium partes tibialis et tarsalis spinis armatae.

Coxæ IV dilatatae.

Pedes longi et graciles. Femora I spinis setigeris destituta. Trochanteres spurii in I, II et III manifesti.

Lobus maxillaris coxae II discretus, porrectus.

Metatarsus in astragalum et calcaneum divisus.

Pars posterior tarsi I bipartita, II tripartita.

Scopula adest. Processus terminalis tarsorum (III—IV) deest.

Unguiculi tarsorum I et II singuli, III et IV bini, omnes integri.

Habitant in Africa (Abessinia, Kamerun, Kilimandjaro, Mombasa, Natal, Cap, Madagascar etc.) et Asia meridionali (India cum insulis).

Long ago SØRENSEN investigated a species which he then called *Hinzuanius hildebrandtii* n. sp. The species in question was later examined by ROEWER who described it (1912, p. 172) under the same name. When ROEWER later on (1915) established the genus *Acrobiantes*, the species *hildebrandtii* was placed within this. SØRENSEN too substantiated later that it could not be placed in *Hinzuanius*, and in his posthumous manuscript he noted that it ought to be placed in a separate genus.

Acrobiantes Roewer.

Acrobiantes Roewer. Arch. f. Naturgesch. LXXXI. A 3. 1915, p. 29.

Acrobiantes Roewer. Weberkn. d. Erde, 1923, p. 137.

Tuber oculiferum amplissimum, latissimum (tam latum et humile ut tuber oculiferum commune deesse facile videatur), tres partes areæ primæ excipiens, eminentia anteriore una præditum. Oculi inter se late dispersi.

Scutum mediocriter convexus, a basi antennarum non alte surgens.

Areæ quarta et quinta eminentiis majoribus binis.

Sulci transversi scuti omnes disjuncti, subparallelē.

Labrum (cum clypeo) late triangulum.

Antennarum articulus secundus oblique non positus; pars incrassata articuli I subcylindrica.

Mandibularum pars palpigera porrecta, valida, ordine superiore transverso basali granorum et tuberculo superiore humili instructa.

Palpi longi; partes femoralis longissima, cylindrica et patellaris leviter clavata, teretes inermes; pars tibialis compressa et pars tarsalis compresso-fusiformis, spinis armata; pars tarsalis præter spinas ordinibus ambobus setarum (processibus non impositarum) prædita, inferioribus, sibi propinquis, unguem adductum excipientibus.

Pedes breves. Coxæ IV coxis III duplo latores. Unguiculi integri.

Differentia sexualis armatura pedum IV demonstratur. Glans penis gracilis, corpore penis vix crassior; lamina (inferior) vix dilatata, ante vix lobata; processus duo superiores conici, sat crassi, lamina inferiore breviores.

Aerobiantes hildebrandtii (W. Sør. in man.) Roewer.

Hinzuanius hildebrandtii Sørensen in manuscript.

Hinzuanius hildebrandtii Roewer. Arch. f. Naturgesch. LXXVIII, 3, 1912, p. 172.

Acrobiante hildebrandtii Roewer, ibid. LXXXI. A 3. 1915, p. 27.

Acrobiante hildebrandtii Roewer. Weberkn. d. Erde, 1923, p. 138.

Tuber oculiferum subtiliter granulatum; eminentia anterior est tuber humile late conicum, rotundatum. Oculi suo tumulo parvulo impositi a margine anteriore scuti late remoti, limiti posteriori tuberis oculiferi propinquai, a linea media corporis duplo latius quam a margine laterali scuti remoti.

Scutum ante rotundatum, pone sensim paullo latius. Sulci transversi duo anteriores paullo angulate procurvi, duo posteriores recti. Limbus anterior non discretus. Limbus lateralis latus, ordine medio granorum densorum ornatus. Emissarium liquoris foetidi latissimum, pone semper (?) latius. Areæ granis densis ornatæ, quarta et quinta processulis binis sibi subæqualibus, cylindricis, acutis in rectangulum dispositis; præter quos interdum duo minores in area V adsunt. Limbus posterior et segmenta dorsalia libera tria anteriora granulis et ordinibus singulis processulorum conicorum acutorum (extus sensim minorum); segmentum anale dorsale ordinibus tribus haud manifestis granorum. Segmenta ventralia ordinibus singulis granulorum remotorum, anale ordinibus duobus granorum. Coxæ subtiliter granulatæ.

Spiracula tumulis imposta.

Antennarum pars incrassata articuli primi eminentiis superioribus basalibus utrinque singulis prædita, ceterum lævis. Articulus secundus pilis longis ante ornatus.

Mandibularum pars palpigera conica, æque longa ac articulus primus antennarum et eo crassior, præter tuberculum ordine superiore transverso basali granorum instructa.

Palporum pars trochanterica breviter clavata tuberculo setifero inferiore; pars femoralis æque longa ac femur II, femoribus tenuior; pars patellaris parte femorali vix dimidio brevior, parte tibiali duplo longior; pars tibialis basi crassior spinis exterioribus tribus, sibi æqualibus, diametro articuli triplo longioribus; pars tarsalis spinis utrinque binis, prima diametro articuli vix duplo longiore. Unguis procerus, valde incurvus.

Pedes robustiores. Coxæ IV granis, superioribus densis ornatæ. Trochanteres veri subpyriformes; trochanteres spurii manifesti. Femora subfusiformia, vix arcuata, ubique granulata. Patellæ III breves subglobosæ. Metatarsi III et IV spurie articulati. Articuli tarsales: 3, 5, 5, 5.

Differentia sexualis: Coxæ IV maris prominentes, processulo anteriore, conico suberecto (cujus vestigium apud feminam adest); trochanter IV processulo posteriore apicali. Femora IV ordine posteriore interiore eminentiarum trium, apici propinquarum, quarum prima processus procerus arcuatus, diametro articuli fere duplo longior, et ceteræ processuli illi similes, et processulis exterioribus duobus parvis,

eminentiis jam dictis propinquis. Tibiae IV ordinibus inferiore et interiore processu-
lorum, a basi ultra medium positorum.

Color: Scutum fuscum, eminentiis majoribus flavis; tuber oculiferum et limbi
laterales rubicundo-testacei; venter rubicundo-testaceus, passim infuscatus; membra
testacea, femoribus infuscatis, metatarsi I et tarsi I et II nigri.

Long. corp. 3; long. scut. 2,25, lat. scut. 2; palpi 5, pedes I 6, II 10, III 7, IV 9.

Patria: Madagascar. — Specimina tria, in museo Berolinensi asservata, vidi.

Remark: It is beyond doubt that this species is identical with that described
by ROEWER under the same name, though ROEWER says that (in contra-distinction
to the other species) it lacks an eminentia anterior on the carapax, although this
is mentioned in the description above.

Minuidæ n. fam.

Phalangodidæ Phalangodinæ pars Roewer. Weberkn. d. Erde, 1923, p. 69.

Tuber oculiferum adest.

Scutum dorsale sulcis quatuor vel quinque divisum. Sulci duo anteriores sulco
longitudinali conjuncti aut non conjuncti. Areæ scuti atque segmenta libera ordinibus
transversis granorum seu tuberculorum setigerorum ornata.

Emissarium orificiorum glandularum foetidarum secundum marginem lateralem
scuti ductum.

Spiracula detecta, cancellata.

Palporum articuli, partibus femoralibus patellaribusque interdum exceptis,
spinis armati.

Coxæ IV interdum non dilatatae, interdum paullum aut valde dilatatae.

Femora I (sæpissime) tuberculis setigeris armata sunt.

Lobus maxillaris coxarum II deest, vel adest, sed parvus.

Pars ulterior tarsorum I bipartita, II bi- vel tripartita.

Scopula et processus terminalis desunt.

Pedes I—II unguiculis singulis, III—IV binis, integris instructi.

Animalia in America meridionali præcipue Venezuela indigenæ.

All the genera and species of this new family, are, as far as I can make out,
new to science, none of them being mentioned or described by ROEWER, in whose
system they are to be placed in *Phalangodinæ*. The species are generally small or
even minute, and they were often collected by sifting. With the exception of *Phera*,
which was taken in Blumenau in Bresil, they were all collected in Venezuela.

In addition to the 7 genera, to the determination of which I have worked out
the analytical key below, SØRENSEN had examined an eighth genus, which he named
Statira, but I did not succeed in finding any description or material belonging to it;
according to a few lines of SØRENSEN it is characterized by: four sulci transversi,

tuber oculiferum with a single eminentia, area IV unarmed, and pars ulterior tarsi II tripartite; tarsal joints: 4, 8—9, 5, 5.

No doubt all the genera brought together by SØRENSEN within this family are really nearly related to each other — the Bresilian genus *Phera* being, however, morphologically rather distant from the others which are all inhabitants of Venezuela. The genera, however, differ mutually as regards each particular character of those used by ROEWER in his arrangement of genera and (sub)families, since exceptions are found from the common behaviour, but some forms deviate on one particular point, other forms on another, for instance: pars ulterior tarsi II bipartita in *Phera* and *Minua*, tripartita in the others; femur I spinis setigeris destitutum in *Microminua*, but armatum in the others; sulci transversi scuti 4 in *Minuides* and *Euminua convolvulus*, 5 in the others etc.). In spite of the fact that all the genera are really nearly related, it is therefore difficult to give a familiar diagnosis based on the generally accepted characters of taxonomic value in other families.

Conspectus generum.

- I. Pars patellaris palporum inermis. (Tuber oculiferum eminentia majore una præditum) *Phera* n. gen.
- II. Pars patellaris palporum spina interiore armata:
 - A. Tarsus I tripartitus, pars citerior non articulatus (Pars ulterior tarsi II tripartita):
 - 1. Tuber oculiferum cum eminentia una majore:
 - a. Tuber oculiferum tuberculo sat parvo præditum. Femora I tuberculis setigeris armata *Minuides* n. gen.
 - b. Tuber oculiferum processulo apicali præditum. Femora I sine tuberculis setigeris *Microminua* n. gen.
 - 2. Tuber oculiferum tuberculis duo præditum, vel sine tuberculis majoribus *Euminua* n. gen.
 - B. Tarsus I quatuorpartitus, pars citerior articulata:
 - 1. Pars ulterior tarsi II bipartita. Tuber oculiferum eminentia majore una præditum *Minua* n. gen.
 - 2. Pars ulterior tarsi II tripartita. Tuber oculiferum sine eminentia magna:
 - a. Coxa IV valde dilatata, apices scuti attingens. Differentia sexualis magna *Acanthominua* n. gen.
 - b. Coxa IV vix dilatata, apices scuti vix attingens. Differentia sexualis insignifica *Kalominua* n. gen.

***Phera* n. gen.**

Tuber oculiferum eminentia majore una prædita.

Scutum dorsale pone apices coxarum IV attingens, post sulcum transversum primum manifeste dilatatum, erga apices coxarum IV subito fortiter angustius. Sulci

transversi quinque, quorum duo anteriores sulco longitudinali conjuncti, primus manifesto procurvus.

Area IV sine eminentiis magnis.

Margines orificiorum urinariorum et emissarii eorum proprii breves elevati, quare cum orificio glandularum foetidarum confluunt, ferrum equinum angustum, irregulare formantes.

Palporum haud robustorum pars femoralis leviter compressa; pars patellaris inermis; partes tibialis et tarsalis vix compressæ, spinis gracilibus armati; pars patellaris curvata apicem versus crassior (modo in *Gonyleptidis*). Pars palpigera haud producta.

Lobus maxillaris coxis II deest.

Coxæ IV valde dilatatae, apices erga sulcum transversum tertium attingunt.

Pedes IV longissimi.

Pars anterior tarsorum II bipartita.

Differentia sexualis armatura pedum IV haud dubie demonstratur.

This genus, according to SØRENSEN, by the sulci transversi, the structure of pars patellaris and the sexual difference, shows great similarity to *Gonyleptidae* from which, however, it differs by the absence of processus terminalis of tarsus III and IV and of the two-segmented pars anterior of tarsus II.

Species unica adhuc reperta:

Phera pygmæa n. sp.

Mas 2 mm longus, fuscus; tuber oculiferum tuberculo præditum, pars media limbi anterioris conice elevata; areæ tertia, quarta, quinta granis ornatæ, quorum majora in ordinibus singulis disposita; palporum pars femoralis inermis. Articuli tarsales 3, 4, 5, 5. In mare coxæ IV processulo exteriore bicuspidato; trochanter IV processibus apicalibus duobus; femora IV (præter processulos apicales duos) processu inferiore subapicali.

Tuber oculiferum duplo longius a sulco transverso primo quam a margine anteriore scuti separatum, latius et longius quam altius, tuberculo uno acuto præditum, altitudine ipsius tuberis plus quam dimidio breviore. Tuberculum a tubere manifeste limitatum.

Scutum (saltem maris) levissime convexum. Sulci lati manifesti. Limbus anterior discretus, tumidus, coriaceus, pars media conice elevata, tubere oculifero haud multo minor, eminentiis non ornata. Limbus lateralis haud latus, ordine medio (vel interiore) granorum majorum et acutorum, usque ad apicem coxæ IV ducto. Emissarium liquoris foetidi distincte limitatum. Areæ coriaceæ, tertia, quarta, quinta granis ornatæ, quorum majora, partim acuta, in ordinibus singulis posterioribus disposita. Limbus posterior scuti et segmenta dorsalia tria anteriora ordinibus singulis granorum, anale dorsale, coxæ IV et ventrale primum granis minoribus dispersis.

Anale ventrale ordinibus duobus, segmenta ventralia cetera ordinibus singulis granorum parvorum sat remotorum ornata.

Antennarum pars globosa articuli primi sublævis, articulus secundus vix granulatus.

Palporum pars femoralis supra leviter convexa, æque crassa ac femur III, inermis. Pars tibialis spinis utrinque trinis, quarum secundæ ceteris longiores, interior secunda omnium longissima, diametro articuli brevior. Pars tarsalis spinis exterioribus 4, quarum prima et tertia ceteris duplo longiores, et interioribus 3, quarum secunda maxima. Unguis procerus æque longus ac pars tarsalis.

Pedes brevissimi, robusti. Femora arcuata, ordinibus singulis granorum ornata. Calcanei I et II manifeste longiores quam crassiores, III subæque longus ac crassus, IV brevior quam crassior. Articuli tarsales: 3, 4, 5, 5. Articulus ultimus tarsorum I et II penultimo triplo longior.

Differentia sexualis (femina ignota): In mare coxæ IV processulo exteriore robusto subrecto, bicuspidato (quia apex oblique incisus). Trochanter IV tuberculo exteriore basali obtuso, tuberculo interiore submedio robusto, vix curvato, et processulis apicalibus subacutis, superiore leviter curvato et interiore subrecto. Femora IV granis magnis, inferioribus majoribus, quorum alterum apici propinquum est tuberculum obtusum, et alterum est processus subapicalis, introrsum directus, arcuatus, acutus, et processulis superioribus apicalibus duobus rectis subacutis. Patellæ IV granis et processu inferiore, interiore subapicali, recto, acuto et tuberculo interiore apicali obtuso. Tibiæ IV granis, quorum inferiora majora, apicem articuli versus sensim longiora.

Long. corp. 2; long. scuti 1,75, lat. scuti 1,5; inter apices coxarum IV 2,5; pedes II 4,5, IV 5.

Scutum fuscum, sulcis dilutioribus (rufo-testaceis). Venter dilutior (brunneotestaceus), fusco-variegatus. Eminentiae majores pedum IV (processulo coxali excepto) testaceæ. Pedes corpore vix dilutiores.

Patria: Brasilia. Specimen unicum, marem, ad oppidum Blumenau captum, in collectione ill. comitis KEYSERLINGII asservatum vidi.

Minua n. g.

Tuber oculiferum fere ab ipso margine anteriore scuti surgens, eminentia majore una præditum.

Scutum dorsale sulco transverso primo constrictum, quare pars posterior ante subglobosa est; anguli anteriores limbi anterioris fortiter rotundati. Sulci transversi quinque, quorum primi duo non conjuncti, sulci recti II, III, IV in medio breviter sinuati (sinu ante aperto).

Area quarta eminentiis majoribus destituta.

Orificia glandularum foetidarum parva, processu coxali oppresso fere obiecta.

Palporum sat robustiorum pars femoralis leviter compressa, pars patellaris

apicem versus sensim crassior, intus armata; pars tibialis vix, tarsalis manifesto compressa. Pars palpigera conice producta usque ad apicem trochanteris I, tuberculo inferiore praedita.

Lobus maxillaris coxis II deest.

Coxæ IV dilatatae. Trochanteres spurii adsunt.

Tarsus I quadripartitus, pars citerior bipartita. Pars posterior tarsi II bipartita. Differentia sexualis (interdum magna) structura pedum demonstratur.

(Structura penis vide *M. dimorpha*).

To this genus SØRENSEN referred 4 species, all from Venezuela, to the determination of which I have worked out the following synoptic key (C. W.).

Conspectus specierum.

- I. Scutum scabrum granis magnis et minoribus dispersis. Femora pedum sine granis dorsalibus (Coxa IV ♂ sine tuberculo exteriore magno. 5,5 mm)

M. scabra n. sp.
- II. Scutum granis ordinatim dispositis praeditum. Femora pedum cum granis superioribus:
 1. Tuber oculiferum cum processu apicali granis ceteris valde majore:
 - A. Femora ordine dorsali granulorum acutorum; antennarum pars incrassata articuli I granis acutis apicalibus 3. Coxa IV ♂ tuberculo exteriore bicuspidato, trochanter IV ♂ processulo apicali procero. 5 mm *M. dimorpha* n. sp.
 - B. Femora tuberculo parvo dorsali; antennarum pars incrassata granis apicalibus duobus vel uno. Coxa IV ♂ sine tuberculo bicuspidato. Processus trochanteris IV unco navali subsimilis. 3 mm. . *M. insolens* n. sp.
 2. Tuberulum apicale tuberis eminentiis ceteris (granis sat magnis) haud multo majus. Femora granis dorsalibus setigeris duobus basalibus...

M. elias n. sp.

Minua scabra n. sp.

Tuber oculiferum magnum, transverse late conicum, manifesto latius quam altius, altius quam longius, granis conicis sat densis dispersis, acutis, et processulo apicali procurvo, subacuto, altitudine tuberis fere duplo breviore. Oculi subbasales, magni, prominentes.

Scutum alte convexum, sulco transverso primo constrictum, quare pars posterior ante subglobosa est. Sulci ceteri manifesti (non autem profundi) paralleli, sed II et III recurvi, ceteri subrecti (II, III, IV sinu medio parvo, ante aperto praeditus). Limbus anterior non discretus. Limbus lateralis sat latus ordinibus duobus granorum praeditus, quorum pauca (3, præsertim 1) ordinis exterioris adversus aream IV posita, ceteris majora, conica, post quæ eminentiæ ordinis exterioris sunt granula. Orificia glandularum foetidarum parva, processu coxali oppresso fere obtecta. Area II ceteris

manifesto major. Areæ granis magnis retroversis acutis, et minoribus densis, sat dispersis. Segmenta dorsalia libera tria anteriora ordinibus binis granorum, anteriore parvorum, posteriore magnorum, primum tuberculis marginalibus utrinque singulis, conicis (sexual character? C. W.). Analia granis magnis densis dispersis. Coxæ granis densis dispersis, medium adversum minoribus. Ventralia I ante sublævis, pone velut segmenta cetera ordine granorum inæqualium (extrorsum majorum). Ventræ I carinis ambabus, leviter obliquis, e angulo interiore-anteriore suorum spiraculorum, valde oblique positorum exeuntibus. Pars palpigera conice producta, tuberculo inferiore armata et superioribus basalibus duobus.

Pars globosa antennarum incrassata, lævis.

Palpi sat robusti. Pars femoralis femore III vix crassior, spinis inferioribus tribus, quarum maxima basalis, dum ceteræ seta (non aculeo) apicali instructæ sunt, et spina interna, apici propinqua diametro articuli duplo breviore. Pars patellaris spina interiore gracili, apici propinqua armata. Pars tibialis sat compressa, apicem versus angustior, spinis sat gracilibus exterioribus tribus, sensim longioribus, et interioribus duabus. Pars tarsalis parte tibiali manifesto brevior et multo tenuior, spinis gracilibus utrinque quaternis, quarum prima ceteris minor. Unguis procerus, parte tarsali paullo brevior.

Pedes breves, robusti. Coxæ IV valde dilatatae; scutum apices coxæ fere attinens; coxæ IV grano exteriore-superiore magno præditæ. Femora leviter arcuata; II granis, III granis superioribus et tuberculis inferioribus, I ordinibus inferiore et superiore processulorum, IV granis magnis densis et tuberculis posterioribus sat longis. Patellæ et tibiae I, II, III granis, infra majoribus, IV granis magnis densis et inferioribus tuberculis. Metatarsi IV granis, infra majoribus, ceteri granulisi. Trochanter IV tubculo posteriore apicali magno sat procero conico incurvo, obtuso (♂?). Calcanei I—II paullo longiores quam crassiores, III manifesto crassior quam longior, IV partem apicalem obliquam metatarsi format. Articuli tarsales 4, ?, 5, 6.

Differentia sexualis ignota.

Long. corp. 5,5; long. scuti 4,5, lat. scuti 4; palpi 5; pedes I 9, II (sine tarso) 13, III 9, IV 12,5.

Fusca, palpi paullo dilutiores, tarsi fusco-testacei.

Patria: Venezuela, Merida. Exemplum unicum, marem, in Mus. Zool. Hafniensi asservatum, examinavi.

Minua dimorpha n. sp.

Tuber oculiferum sat magnum, transversum, late convexum, latius quam altius, granis dispersis sat densis scabrum. Processus apicalis proclivis, acutus. Oculi basales magni, prominentes.

Scutum alte convexum. Sulci transversi profundi. Limbus anterior vix discretus; anguli tuberculis conicis acutis aut binis, quorum primum majus, aut trinus, quorum medium ceteris majus. Limbus lateralis latus, ordinibus duobus haud manifestis granorum parvorum densorum ornatus, quorum duo extra aream III posita,

ceteris manifesto majora. Areæ I granis paucis dispersis, ceteræ ordinibus binis granorum, longiorum quam latiorum, pone majorum et altiorum. Limbus posterior et segmenta dorsalia libera tria anteriora ordine singulo granorum magnorum similium densorum. Anale dorsale ordine anteriore granorum magnorum et posteriore granis similibus densis. Anale ventrale granis sat magnis densis, coxæ IV (infra) granis sat parvis, segmenta cetera ordine singulo granorum anteriorum parvorum, pone sensim majorum, primum extra apices coxarum IV granis majoribus paucis.

Antennarum pars incrassata articuli primi supra granis acutis apicalibus 3, in femina posteriore-exteriore uno, in mare posterioribus 3, quorum exterius maximum, prædicta est. Articulus secundus granis setiferis ornatus. Pars incrassata in femina grano interiore medio sæpe prædicta.

Palpi sat robusti. Pars trochanterica spinis inferioribus duabus (in femina una tres) et tuberculo superiore uno. Pars femoralis ordine dorsali granulorum acutorum ornata, femore I paullo (φ) vel dimidio (δ) crassior præter parvam basalem spinis inferioribus tribus, robustis, quarum subbasalis maxima, dum ceteris seta apicalis brevis imposita est, et interiore apici propinquæ una, diametro articuli fere duplo breviore. Spinæ interiores subapicales partis patellaris et partium tibialis et tarsalis graciles. Pars tibialis compressa apicem versus angustior et minus crassa, spinis subæqualibus exterioribus tribus et interioribus duabus. Pars tarsalis parte tibiali manifesto brevior et multo tenuior, spinis exterioribus quatuor et interioribus tribus armata. Unguis robustus, parte tarsali manifesto brevior.

Pedes breves sat robusti. In coxis differentia sexualis magna adest. Trochanteres granis conicis paucis. Femora I subrecta, II leviter, III sat fortiter, IV fortiter arcuata, granis acutis ubique prædicta; femur I ordine inferiore et superiore processulorum parvorum conicorum, quorum setæ subapicales robustæ inferiores seorsum inclinatæ, Patellæ et tibiæ et metatarsi IV granis prædicta, quæ in I et præsertim in IV magna sunt; IV processulo inferiore apicali acuto. Calcanei I—III æque crassi atque longi, IV crassiores quam longiores, anulum obliquum perbrevissimum (difficilem visu) formant. Articuli tarsales: in feminis 19: 4, (7)—8—(9), 5, 6, in maribus 20: 4, 9—10—(11), 5, 6.

Differentia sexualis: Eminentia tuberis oculiferi in mare processus proclivis, altitudine tuberis paullo longior, in femina processulus parvus acutus conicus, altitudine duplo brevior. Scutum altius convexum in mare quam in femina. Sulci transversi in femina II recurvus, ceteri recti, in mare recurvi sinu medio levi ante aperto prædicti. Limbus lateralis maris adversus aream III processulus (vel tuberculum) magnus conicus, retroversum curvatus acutus, ante quem tuberculum sæpe adest. Segmentum primum liberum maris processulis exterioribus singulis conicis obtusis extrosum directus. Coxæ IV in mare tuberculo exteriore compresso bicuspidato, setam subapicalem robustam gerente, in femina tuberculo exteriore parvulo prædictæ; trochanter IV in mare processulo interiore apicali procero acuto granulo interiore sive posteriore prope apicem prædicto, et in femina processulo parvo gracili interiore apicali acuto prædictus. Femora IV maris ordinibus inferioribus duobus tubercu-

lorum sive processulorum parvorum conicorum ornata; eminentiae inferiores femorum IV feminae majores acutae, quarum paucæ apicem prope tubercula majora dicendæ sunt. Differentiæ parvæ in structura antennarum et tarsorum adsunt.

Penis lamina inferior utroque seorsum curvata, ut partes ceteræ ea plane amplectantur et obtegantur, cujus margines laterales sese supra tangunt, sulco angusto tantum separati, et pone quidem coalescunt. Lamina aculeis destituta, sed carinis transversis angustis altis, ante leviter concavis quatuor, meatui cochleæ similibus, instructa, in latere inferiore orientibus; in latere superiore glandis posteriores tres desinunt, dum prima usque ad margines laterales (circumvolutos) extendit (vide fig. 4.). Processus medius deest. Processus superior (ejaculatorius) subrectus, cujus basis (solito tumida) in membranas dorsales ambas latae tenues producta, ipsum

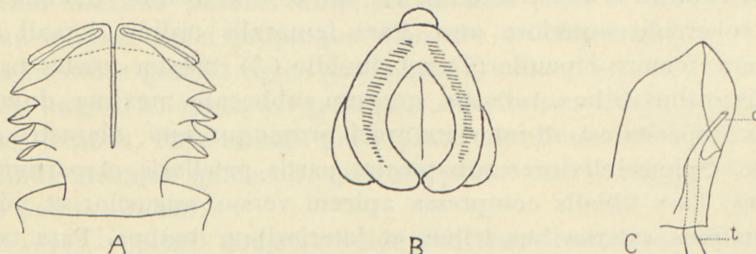


Fig. 4. *Minua dimorpha* n. sp.

A Glans penis, desuper inspecta, B ab apice inspecta. C Processus superior (a) in membranis situs (*t* = tunica intima ductus ejaculatorii).

(W. Sør. del.)

processum amplectantes et marginem anteriorem partis coalitæ laminæ attingentes. Membranæ, glande sub microscopo pressa, ut folia tenuia apparent. Nescio qui hæ membranæ infra coalescunt. Credo, processum ejaculatorium, in coitu, per sulcum marginis lateralis laminæ circumvolutæ apparere.

Long. corp. ♀ 4,75; long. scuti 3,5, lat. scuti 2,7; palpi 4; pedes I 6,7, II 10, III 7, IV 9,5. — Long. corp. ♂ 5,25; long scuti 4,3; lat. scuti 3,7; palpi 4,75; pedes I 9,2, II 16, III 9, IV 13,5.

Fusca; pedes dilutiores (brunnei), sæpe testaceo anulati; calcanei et tarsi testacei.

Variatio: Pars tibialis altera maris uni spinis exterioribus quatuor prædita; processulus trochanteris IV maris interdum leviter biramus, quia eminentia, solito granulum, longa est; patella IV in mare, in quo eminentiae majores limbi lateralis segmenti dorsali liberi primi et ventralis primi paullo prominentes sunt, processulis inferioribus duobus.

Development: The adolescent specimens (adolescentes: articuli tarsales 2, 2, 3, 3) have the ocular tubercle smaller, and the interior spine of the pars patellaris is minute, the sulci of the scutum are well developed. In two specimens all the dorsal somites were separated by broad articulate membranes, not furrows as usual,

showing plainly, that the *limbus posterior* is a real segment. A dorsal conical process was observed at the base as well as at the tip of the metatarsus. In the quite young animals (pulli: articuli tarsales 2, 2, 2, 2) *eminentia tuberis est granum parvum acutum, sculptura corporis totius debilis, pars patellaris palporum inermis est, metatarsus IV* as mentioned above. (C. W.).

Patria: Venezuela. MEINERT sifted numerous specimens during his collecting journey in 1891: La Moka (16 ♀¹), 18 ♂¹), 17 adolescentes and 8 pulli), Caracas in the month of July (3 ♀), Laguno di Espino in the month of June (1 ♂), Dos Caminos in the month of August (1 ♂, 1 adolesc.) — omnia in Museo Zool. Hafniensi asservata.

Remark: This description was rather difficult to work out from SØRENSEN's rough-draught in pencil, which consisted of two independent parts, one concerning the male and another the female, originally regarded by the author as two different species. The notes on the young ones were worked out from SØRENSEN's preliminary remarks in Danish. (C. W.).

Minua insolens n. sp.

Tuber oculiferum e margine anteriore scuti surgens, late et rotundate conicum, latius quam altius, paullo longius quam altius, granis acutis densis scabrum. Processus leviter proclivis, conicus, acutus, in mare altitudine tuberis non duplo brevior, in femina plus quam duplo. Oculi basales magni prominentes.

Scutum maris alte, feminæ minus alte convexum, sulco transverso primo constrictum. Sulci manifesti, II recurvus, et III sinu medio ante aperto præditus. Limbus anterior non discretus. Limbus lateralis haud latus, ordinibus duobus granorum, pone sensim majorum, quorum exteriora interioribus majora sunt. Orificia glandularum foetidarum parva, in ipso margine posita, processu coxali, oppresso, fere obtecta. Area I tuberculis lateralibus conicis, acutis tribus, quorum primum adversus palpum positum maximum, et granis posterioribus mediis sat densis, litteram M haud bene expressam formantibus. Areæ ceteræ ordinibus binis granorum magnorum elevatorum. Limbus posterior et segmenta dorsalia libera tria priora ordinibus singulis granorum magnorum. Anale dorsale ordine anteriore granorum majorum et granis dispersis minoribus densis. Coxæ granis parvis. Segmenti ventralis I maris margo in medio laevis, lateraliter tuberculis obtusis aliquot, segmenta ventralia II et III granulata, IV et V granis magnis mediis (5—7); anale ventrale maris ordine manifesto posteriore granorum magnorum, et anteriore in medio late interrupto granorum parvorum. In femina segmenta ventralia ordine singulo granorum parvorum, latera versus majorum. Lobus maxillaris coxae II sulco separatus, non autem mobilis. Pars palpigera maxillæ conice producta.

Antennarum pars incrassata articuli primi granulis acutis et processu interiore terminali, in mare majore, ornata.

¹) 3 having ovipositor protruded.

²) 1 having penis protruded.

Imia Palpi sat robusti; palporum pars trochanterica processulo superiore et spinis inferioribus duabus, quarum basalis parva. Pars femoralis tuberculo parvo dorsali ante mediano praedita, femore I dimidio crassior, supra convexa, spinis inferioribus tribus, quarum subbasalis maxima, setam longam gerens, dum ceteris seta (nec aculeus) apicalis brevis imposita est, et spina interior, apici propinqua, diametro articuli plus quam duplo brevior. Spinæ partium ceterarum graciles. Pars tibialis spinis subæqualibus exterioribus tribus et interioribus duabus. Pars tarsalis spinis utrinque tribus. Unguis parte tarsali manifesto brevior.

Pedes breves robusti. Trochanteres et femora I ordinibus inferiore et superiore processorum subacutorum, quorum setæ subapicales robustæ, superiores sensim inclinatae. Femora granis ubique, I subrectum, II leviter, III et IV fortiter arcuata. Patellæ, tibiæ, metatarsi IV granis praedita. Calcanei parvi, subæque crassi atque longi. Articuli tarsales ♀ 4, 6—(7), 5, 6; ♂ 4, (6)—7, 5, 6.

Differentia sexualis in processu apicali tuberis oculiferi adest; coxae IV tuberculo compresso exteriore; in mare oblique acuminato, aliquanto majori. Trochanter IV processu inferiore apicali in mare, unco navali subsimile, in femina multo minore in apice vix inciso sive eminentia perparvula interiore subapicali praedito. Femora IV maris manifesto, feminæ leviter clavatum, ordine inferiore eminentiarum, in mare manifesto majorum, apicem articuli versus majorum. Patella IV in mare processulo inferiore apicale, in femina tuberculo. Tibia IV maris manifesto, feminæ leviter fusiformis, ordine inferiore eminentiarum, in mare manifesto, in femina paullo majorum. Segmentum liberum primum maris tuberculo exteriore marginali conico praeditum; differentia sexualis in structura ventris descripta est.

Long. corp. ♂ 3; long. scuti 2,5, lat. scuti 2,1; palpi 2,7; pedes I 5, II 8,5, III 4,5, IV 6,5. — Long. corp. ♀ 2,5; long. scuti 2,2, lat. scuti 1,75; palpi 2,5; pedes I 4, II 6,2, III 4,3, IV 5,2.

Fusca aut fusco et ferrugineo variegata. Pedes et palpi fusco-testacei. Antennæ testaceo-fulvæ.

Patria: Venezuela. MEINERT sifted 3 ♂ and 3 ♀ at La Moka August 1st—12th, 1891. Specimina omnia in Museo Zool. Hafn. asservantur.

Minua elias n. sp.

Tuber oculiferum differs from that of the preceding species in having a "tuberculum apicale eminentiis ceteris granis sat magnis haud multo majus".

Scutum etc. scarcely differs from that of *M. insolens*, but the first area has anteriorly and laterally four teeth instead of three; the big grana of the posterior portion of the area is less regularly arranged. Segmentum anale ventrale ordinibus duobus granorum. The processus fulcientes of the coxae are better developed, and the pars palpigera maxillarum has a bigger ventral process.

The antennæ are scarcely different from those of the preceding species.

The palpi differ in the following features: The dorsal process of pars trochanterica is better developed; the femoral part has two small dorsal setigerous tubercles

in the proximal half; "pars tibialis spinis robustioribus exterioribus 4 et interioribus 2. Pars tarsalis spinis exterioribus 5 et interioribus 3. Unguis parte tarsali paullo brevior."

Pedes are like those of the preceding species but "trochanter IV eminentia inferiore apicale memoria dingo non instructus. Articuli tarsales 4, 7—8, 5, 6."

Differentia sexualis ignota.

Long. corp. 3,5; long. scuti 2,8, lat. scuti 2,2; palpi 3,5; pedes I 5, II 7,75, III 5, IV 7,25.

Colour blackish-brown with yellowish spots on the thorax and yellow articular membranes and furrows.

Patria: Venezuela. MEINERT sifted a single female at Hacienda De Elias, Las Trincheras December 19th, 1891. The specimen is preserved in Zool. Mus. Copenhagen.

Remark: SØRENSEN only left a few notes in pencil about this species; it is most easily distinguished from *M. insolens* by the short apical teeth of the ocular tubercle.

Minuides n. g.

Tuber oculiferum a margine anteriore scuti surgens, eminentia majore una apicali præditum.

Scutum dorsale sulcis transversis quatuor; sulcus secundus deest. Scutum sulco transverso constrictum, pars latissima ante ipsam partem posteriorem. Anguli anteriores limbi anterioris rotundati.

Area quarta eminentiis majoribus destituta.

Orificia glandularum foetidarum proclivia, detecta, plana.

Palporum robustorum pars femoralis compressa, pars patellaris spina anteriore armata, pars tibialis latior quam crassior. Pars palpigera mandibularum breviter (i.e. ultra coxam I paullo) producta, tuberculis superioribus basalibus duobus armata.

Coxæ IV non dilatatae. Trochanteres spurii adsunt.

Tarsus I tripartitus, pars cterior non articulata. Pars ulterior tarsi II tripartita. (Differentia sexualis ignota).

Only a single species belongs to this genus, which is most easily distinguished from *Minua* by the number of segments in tarsi I et II.

Minuides setosa n. sp.

Tuber oculiferum a margine anteriore scuti surgens, subconicum, magnum, altum, paullo altius quam latius, æque longum ac altum, ante erectum, pone rotundate declive, in processulum apicalem vix proclivem, conicum, obtusum, haud bene limitatum desinens. Oculi magni, basi propinquui.

Scutum convexum. Sulei debiles. Limbus anterior non discretus, supra palpos tuberculis parvis binis setigeris præditus. Limbus lateralis haud latus, ordine exteriore granorum parvorum rotundorum densorum ornatus, intra quæ grana posteriora

adsunt, ordinem haud manifestum efficientia. Area I ordine posteriore transverso granorum trium vel quatuor (the left side shows 4, while the exterior granum is wanting on the right side), Area II (i.e. II + III) ordinibus quatuor, ceteræ et limbus posterior et segmenta dorsalia libera tria priora ordinibus binis eminentiarum prædita; eminentiæ ordinis anterioris sunt grana haud magna, in limbo posteriore et segmentis liberis minuta; eminentiæ ordinis posterioris sunt conicæ acutæ, setas subapicales singulas gerentes, usque ad limbum posteriorem majores, deinde leviter minores, mediae quam laterales majores, quarum eminentiarum maximæ sunt tubercula minora, minimæ grana magna. Anale dorsale granis dispersis sat magnis. Coxæ granis densis; segmenta ventralia priora ordinibus granorum pone majorum, setas subapicales gerentium, anale anterioribus duobus et posteriore uno, segmenta cetera singulis.

Antennarum pars incrassata articuli primi sublævis, articulus II citra carinam transversam, prope digitos positam, depressam, ante digitum immobilem sinuatus lateraliter. Digihi retrorsum curvati, lateraliter carinati, immobilis dente compresso magno submedio præditus.

Palpi robusti. Pars trochanterica spinis gracilibus inferioribus duabus. Pars femoralis compressa, arcuata, femore IV crassior, ordine inferiore processuum duorum, spinam apicalem longam gerentium, et tuberculorum acutorum (dextra 3—4 et sinistra 2), setulam apicalem gerentium, et spina interiore subapicali, diametro articuli paullo breviore. Pars patellaris spina interiore subapicali simili. Pars tibialis spinis utrinque trinis armata, spinarum interiorum subæqualium tertia longissima; exteriorum secunda ceteris multo longior, diametro paullo longior, tertia parva. Pars tarsalis parte tibiali paullo brevior et multo angustior, spinis exterioribus 3, quarum (secunda et) prima quam spina longissima partis tibialis vix brevior, et tertia parva, et interioribus 4, quarum prima et quarta parvæ, dum secunda et tertia graciles longæ. Unguis fortiter incurvus, parte tarsali paullo brevior.

Pedes breves, robusti. Coxæ IV tuberculis brevibus exterioribus et interioribus. Femora omnia ordinibus binis tuberculorum minorum, setam subapicalem gerentium, munita, quæ in femore I majora sunt. Femora ceterum omnia et trochanteres et patellæ et tibiæ granis setigeris dense munita. Metatarsi IV granis haud densis, ceteri granulis setigeris. Femora arcuata, præsertim IV. Calcanei I æque crassi atque longi, II—III breves, IV brevissimus. Articuli tarsales 3, 5, 5, 5—6.

Differentia sexualis ignota.

Long. corp. 2,75; long. scuti 2,5, lat. scuti 2,2; palpi 2,5; pedes I 4,6, II 6, III 5,5, IV 6,1.

Fusca; antennæ, palpi, trochanteres, tarsi testacei.

Patria: Venezuela. MEINERT has found a single female (?) at Las Trincheras November 4th, 1891. The specimen is preserved in the Zool. Mus. Copenhagen.

Remark: The fourth pair of coxae are only slightly dilated and almost parallel with the preceding pair; they extend only slightly beyond the posterior margin of the scutum and scarcely to the posterior margin of the third abdominal somite. (C. W.)

Euminua n. g.

Tuber oculiferum non a ipso margine anteriore surgens; eminentia una major deest.

Scutum dorsale oblonge trapezoidale, adversum coxas III levissime sinuatum, apicibus coxarum IV sat longe prominens. Sulci transversi quinque vel quatuor, non conjuncti.

Area quarta sine eminentiis majoribus.

Orificia glandularum foetidarum parva in ipso margine posita.

Palporum sat robustorum pars femoralis leviter compressa; pars patellaris intus spina armata apicem versus sensim crassior; partes tibialis leviter, tarsalis non compressæ. Pars palpigera mandibulæ conice producta, longa.

Lobus maxillaris coxarum II sulco separatus, sed parvus.

Coxæ IV vix dilatatae. Trochanteres spurii sat manifesti adsunt.

Tarsus I tripartitus, pars citerior non articulata. Pars ulterior tarsi II tripartita (etiam in *E. convolvulo*?).

Differentia sexualis in structura pedum interdum magna est.

(Structura penis vide *E. longitarsus*.)

The generic diagnosis and the synoptic key are worked out by the editor (C. W.). The number of segments in the terminal part of tarsus II of *E. convolvulus* has not been ascertained with certainty, but according to SØRENSEN it is probably two.

Conspectus specierum.

- I. Tuber oculiferum granis ambobus majoribus præditum, limbo anteriori subcontiguum. Scutum sulcis quinque divisum. Tarsus II 6—7 articulatus:
 - A. Segmenta dorsalia libera tria tuberculis conicis acutis trinis ornata. Metatarsus IV ♀ longior, ♂ brevior quam patella *E. brevitarsa* n. sp.
 - B. Segmenta dorsalia libera tria sine tuberculis conicis acutis trinis. Metatarsus IV duplo longior quam patella *E. longitarsa* n. sp.
- II. Tuber oculiferum sine granis majoribus, limbo anteriori non subcontiguum. Scutum sulcis quatuor divisum. Tarsus II 8—18 (♀), 25—39 (♂) articulatus.
 - E. convolvulus* n. sp.

***Euminua brevitarsa* n. sp.**

Tuber oculiferum manifesto latius quam altius, limbo anteriori subcontiguum, pone magis declive quam ante, subtiliter coriaceum, præter grana posteriora subapicalia ambo parva granulis præditum. Oculi magni, prominentes, subbasales.

Scutum convexum, sulco primo manifeste depresso, totum subtiliter coriaceum, oblonge trapezoidale, ante rotundatum, adversus coxas III—IV levissime sinuatum, ultra apices coxarum sat longe prominens. Sulci transversi quinque, omnes disjuncti, manifesti, primus manifeste, ceteri leviter procurvi. Limbus anterior

vix discretus; anguli tuberculis trinis, quorum medium ceteris majus. Limbus lateralis haud latus ordine granorum minorum præditus. Area I magna, punctis magnis impressis lateralibus et granis parvis posterioribus ornata, areæ ceteræ et limbus posterior granis sat magnis in ordines singulos vix dispositis. Segmenta dorsalia libera tria priora tuberculis conicis acutis trinis ornata (in femina una in segmento tertio quatuor adsunt), quorum media lateralibus manifesto majora, dum lateralia interdum grana (segmenti liberi primi), non tubercula appellanda sunt. Anale dorsale granis sat magnis densis dispersis. E spiraculis carinæ singulæ ad operculum genitale exeunt. Ventralia analia ordinibus anteriore granorum, posteriore granulorum, cetera ordine singulo granorum minorum.

Antennarum pars subglobosa articuli primi lævis.

Palpi haud robusti. Pars trochanterica spinis inferioribus duabus. Pars femoralis leviter compressa, in mare femore II paullo crassior, in femina paullo tenuior, spinis inferioribus basi propinquis robustis duabus et processulo vel tuberculo inferiore subapicale et spina interiore subapicali, diametro articuli longiore. Spina interior subapicalis partis patellaris spina interiore partis femoralis vix brevior. Pars tibialis robusta, leviter compressa (i.e. paullo crassior quam latior), parte patellari manifesto longior (et multo crassior), spinis utrinque trinis, quarum interiores sensim paullo longiores, dum exterior tertia parva; omnium longissima exterior secunda, diametro articuli subæqualis. Pars tarsalis parte tibiali æqualis, saltem non brevior, et multo tenuior, spinis longis utriusque binis. Unguis parte tarsali manifesto brevior.

Pedes maris sat graciles, feminæ sat robusti. Coxæ IV non dilatatae, III dimidio latiores, muticæ. Trochanteres omnes tuberculis minoribus superioribus singulis, IV præterea duobus inferioribus. Trochanteres spurii manifesti. Femora ordinibus singulis inferioribus tuberculorum conicorum, quæ in femoribus I et præsertim IV feminæ magna et acuta sunt, dum in mare hæ tubercula modo in femore I bene expressa sunt; ordo superior femoris I deest. Femora et tibiæ granulata. Calcanei I paullo, II manifesto crassiores quam longiores, III et IV anulum apicalem articuli formant. Articuli tarsales 3, 6, 5, 5. Articuli 1—2 tarsi III manifesto breviores, tarsi IV vix breviores quam articuli 3—6. Pars ulterior tarsi II tripartita.

Differentia sexualis: Maris pedes præsertim II et IV longiores; pedes II et IV in femina æque longi, IV in mare quam II manifesto longiores. Femora IV in femina fortiter, cetera leviter arcuata; in mare omnia leviter arcuata. Tubercula superiora trochanteris IV in mare quam in femina majora. Metatarsi III maris manifesto in crassati, subclavati, metatarsi III—IV maris quam patella breviores, tarsi IV metatarso quincuplo brevior, III triplo brevior, metatarsi III—IV quam patellæ manifesto longiores in femina, tarsi IV metatarso duplo et dimidio, III duplo breviores.

Long. corp. ♂ 2; long. scuti 1,75, lat. scuti 1,5; palpi 1,5; pedes I 4, II 8,5, III 5,2, IV 11. — Long. corp. ♀ 2; long. scuti 1,75, lat. scuti 1,5; palpi 1,5; pedes I 2,5, II 4,25, III 3,25, IV 4,25.

Fusca, striis (sulcis latis) transversis luteo-testaceis notata; area I eodem colore

punctata; venter testaceus transverse fusco lineatus; antennæ et palpi (nec pedes) dilutiores (subtestacei); tarsi testacei.

Animal junius: long. 1,5, pedes IV 1,8, articuli tarsales 2, 2, 2, 2. Areæ II, IV, V tuberculis parvis binis armatæ, ceterum modo coriaceum. Segmenta dorsalia libera tria priora tuberculis trinis, setas gerentibus. Palpi eodem modo armati. Color testaceus.

Variatio: One of the two males was somewhat smaller (scutum 1,6 mm long) and the legs distinctly shorter (pes IV 4,25 mm long) (C. W.).

Patria: Venezuela. MEINERT sifted 2 males, 2 females and a young animal at Caracas in the month of July (1891). The specimens are preserved in the Zool. Mus. Copenhagen.

Euminua longitarsa n. sp.

Tuber oculiferum convexum, a fronte inspectum in media manifesto altius, limbo anteriori subcontiguum, ante subcurvatum, pone convexe declive, triplo latus quam altius, fere duplo longius quam altius, granis posterioribus subapicalibus manifestis duobus conicis acutis, ante et pone quæ granula adsunt. Oculi magni prominentes.

Scutum convexum sulco transverso primo manifeste depresso, totum subtiliter coriaceum; de forma scuti et sulci quinque vide *E. brevitarsa*. Limbus anterior discretus, manifestus; pars media tuber format, tubere oculifero duplo minus amplum, dense subtiliter granulatum; angnli tuberculis binis, quorum posterius majus. Limbus lateralis haud latus granulis paucis ornatus. Emissarium distincte limitatum. Areæ I magna punctis magnis impressis lateralibus, ceteræ præter grana pauca dispersa ordinibus singulis granorum magnorum reclinium, pone majorum sæpe acutorum. Limbus posterior et segmenta dorsalia libera tria priora ordine singulo granorum magnorum. Anale dorsale granis sat magnis densis dispersis. Anale ventrale vittis duabus, anteriore granorum sat magnorum et posteriore granulorum; coxae et ventrale I granulis paucis dispersis, cujus margo posterior et ventralia cetera ordine singulo granorum paucorum, medium versus minorum.

Antennarum pars subglobosa articuli primi lævis.

Palpi sicut in *E. brevitarsa*; eminentia inferior subapicalis partis femoralis, in mare tuberculum, in femina granum, interdum deest.

Pedes maris graciles, feminæ sat graciles. Coxæ IV non dilatatae, coxis III fere duplo latiores. Tubercula trochanterum minus manifesta quam in *E. brevitarsa*. Trochanteres spurii sat manifesti. Femora omnia ordinibus singulis granorum rotundorum (in mare minores quam in femina), præterea ut tibiæ granulata. Calcanei I articulo tarsali secundo æqualis, II manifesto longior quam crassior, III vix longior quam crassior, IV anulum obliquum apicalem articuli format. Articuli tarsales 3, (in femina una 6)—7, 5, 6 (in 12 ♂ + 22 ♀). Articulus primus tarsi III articulis ceteris æqualis, triplo longior quam articulus secundus; articuli duo proximales tarsi IV articulis ceteris manifesto longiores; articulus primus manifesto longior quam secundus. Pars ulterior tarsi II tripartita.

Differentia sexualis: Maris pedes præsertim II et IV longiores; pes IV maris pede II valde longiores. Femora IV in femina manifesto, in mare vix, cetera leviter arcuata. Metatarsi III maris leviter subclavati; metatarsi III—IV maris et feminæ patellis duplo longiores. Metatarsus IV tarsis duplo et dimidio in mare, dimidio in femina longior, metatarsus III tarsis in mare non duplo, in femina paullo longior.

Penis: The shaft is delicately curved twice; it is thickened twice and not visibly marked off from the glans penis. This is very big and consists of three portions viz. a ventral portion, a dorsal and a terminal process (see fig. 5 A): 1) The ventral portion is scarcely plate-shaped; along the free anterior margin four spines are found, of which

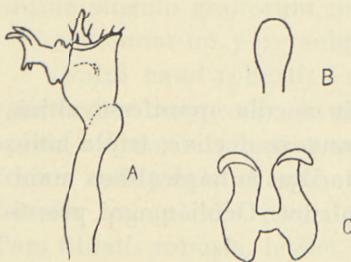


Fig. 5. *Euminua longitarsa* n. sp.
Penis.

A Penis; a latere dextra inspecta.
B Processus terminalis, desuper inspecta.
C Processus dorsalis,
desuper inspecta.

(W. Sør. del.)

the superior, slightly curved one is placed on a small process. 2) The dorsal process is basally thick and swollen, and bears anteriorly near the base a small tubercle; the process is well marked off from the remaining portion of the glans. The dorsal process terminates in a big plate, the posterior as well as, especially, the anterior margin of which is deeply clefted; the anterior and lateral processes which are established in this way, are curved upwards and backwards (see fig. 5 C). 3) The terminal process, which apically is curved somewhat downwards, has a single dorsal and two ventral spines beyond the curvature it is somewhat depressed and tongue-shaped (fig. 5 B). —

SØRENSEN was not able to make out in which process the ductus ejaculatorius discharges; it is certainly not

through the terminal process, but probably through the small cylindric process which is placed at the base of the dorsal one (C. W.).

Long. corp. ♂ 2,8; long. scuti 2,2, lat. scuti 1,8; palpi 2; pedes I 6, II 10,5, III 8,5, IV 16,5. — Long. corp. ♀ 3,3; long. scuti 2,5, lat. scuti 2; palpi 2,6; pedes I 4,5, II 8, III 6, IV 9.

Fusca, striis latis transversis (sulcis) fulvo-luteis; area I eodem colore punctata. Membra scuto manifesto dilutiora; trochanteres et tarsi pallide testacei. Venter fuscus striis transversis fusco-testaceis; coxae eodem colore punctatæ.

Animal junius: Pars tibialis palporum spinis interioribus duobus. This structure is also found in the "pulli" except in two very small ones from La Moka; one of these had one exterior as well as one interior spine in the tibial portion, while the other (perhaps an abnormality) had two on each side. From these facts SØRENSEN draws the conclusion that the "pulli" probably pass through at least one ecdysis. The colour is uniformly grey and the sculpture is less pronounced. In pullis haud raro eminentia inferior subapicalis partis femoralis palporum pâne aut plane deest; haud raro eminentiae inferiores parvulae adsunt.

Variatio: In femina una (ex Caracas) segmenta ventralia ordinibus binis granulorum præedita. In mare uno pars tibialis spinis interioribus duabus ornata.

Patria: Venezuela. MEINERT, June 14th—August 12th, 1891, collected numerous specimens namely by sifting: La Moka (10 ♂, 10 ♀, 18 jun., 7 pulli), Laguno di Espino (1 ♂, 1 ♀), Dos Caminos (1 ♀), Caracas (2 ♂, 4 ♀). The specimens are preserved in the Zool. Mus. Copenhagen.

Euminua convolvulus n. sp.

Tuber oculiferum margini anteriori propinquum, breviter conicum, paullulo longius et latius quam altius, ante subrectum, pone convexe declive, subtilissime coriaceum, ceterum lœve.

Scutum sat alte convexum, apicibus coxarum IV longe prominens, ante latum, adversus coxas III non angustius, deinde sensim latius, lateraliter leviter rotundatum ita ut pars latissima ante marginem posteriorem posita est; sulcis transversis quatuor divisum subrectis, quorum primus sat profundus, ceteri debiles. Limbus anterior non discretus; anguli leniter rotundati, tuberculis sibi propinquis porrectis conicis trinis. Limbus lateralis vix pone angustior granulis paucis remotis ornatus. Orificia glandularum foetidarum parva proclivia. Emissarium liquoris foetidi latum. Area I magna, granulis paucis dispersis, ceteræ granulis ordinatim vix dispositis. Limbus posterior et segmenta dorsalia vix granulata, item segmenta ventralia.

Antennarum pars incrassata grano posteriore supra ornata.

Palpi sat robusti. Pars trochanterica spinis inferioribus duabus setigeris et una dorsali. Pars femoralis femore IV crassior, inferioribus spinis, basi propinquis duabus longis et processulo acuto, ultra medium posito et interiore spina subapicali diametro articuli paullo breviore. Pars patellaris spina interiore submedia, spina interiore partis femoralis paullo minore. Pars tibialis leviter compressa, robusta, spinis exterioribus tribus, quarum apicalis parva, et interioribus sibi æqualibus tribus; omnium longissima exterior secunda, diametro articuli æqualis. Pars tarsalis parte tibiali non brevior, sed multo tenuior, æque crassa ac lata, spinis longis utrinque binis armata. Unguis parte tarsali manifesto brevior.

Pedes breves, sat robusti. Coxæ IV coxis III paullulo latores. Trochanteres omnes tuberculis minoribus superioribus singulis. Trochanteres spurii manifesti breves. Femora I, II, III leviter, IV valde arcuata, ordinibus singulis inferioribus tuberculorum acutorum, setas robustas (s. aculeos) subapicales singulas gerentium; quæ tubercula in femoribus I et IV magna, in II et III parva sunt; præter quæ femur I ordine dorsali tuberculorum similium minorum, II—IV ordine dorsali singulo minutiorum. Tibiae IV tuberculis similibus minoribus munitæ. Tibiae patellis I paullo, III et IV dimidio, II vix longiores. Calcanei I—II unæ tertiae astragalorum æquales,

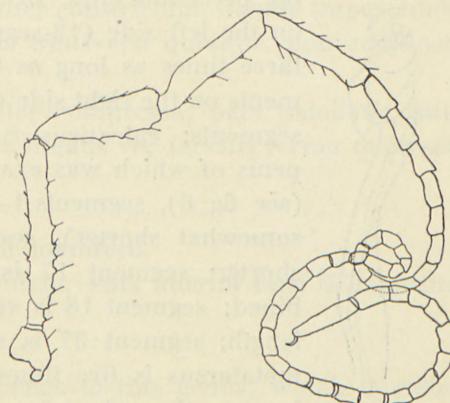


Fig. 6. *Euminua convolvulus* n. sp.
Tarsus II maris.

III æque crassus atque longus, IV crassior quam longior. Articuli tarsales ♀ 3, 8—18, 5, 5; ♂ 3, 25—39, 5, 5. Articulus tarsalis ultimus I—II perlongus, III—IV conice producti.

Diferentia sexualis: This species is very peculiar on account of the curious development of the tarsus in the second pair of legs; in five specimens, of which at least one (which was dissected) was a male, the tarsus II consisted of 25—39 segments with better developed articulation than is usually the case. In one specimen with 8 tarsal segments in tarsus II and in another showing 13 and 18 segments, which are probably females, the distal part apparently consisted of 2 segments; the calcaneus segment was twice as long as thick and the terminal one was three times as long as the preceding ones.



Fig. 7. *Eumi-
nia convol-
vulus* n. sp.
Penis, a la-
tere sinistra
inspecta.

In the last mentioned specimen the seventh segment on the left side (13-segmented) was twice, and the eighth segment was three times as long as the adjoining ones, while the corresponding segments on the right side (18-segmented) are scarcely longer than the other segments; calcaneus is scarcely longer than thick. In a male, the penis of which was examined, the right tarsus consisted of 38 segments (see fig. 6), segments 1—13 were of almost equal length (the distal one somewhat shorter), segments 14—16 are rather indistinct and much shorter; segment 17 is almost as long as the three preceding combined; segment 18 is very short and segments 19—36 of almost equal length; segment 37 is somewhat and segment 38 much longer. The metatarsus is five times as long as deep; the astragalus is 2.4 times as long as the calcaneus, which is 17 times as long as deep. In the four other males the comparative length of the segments was somewhat varying, in one specimen segment 17 was twice as long as the adjoining segments, in others it was segments 11 or 15.

Penis (fig. 7) which SØRENSEN has not examined, and the structure of which was not quite understood, shows some similarity to that of *E. longitarsus*. The glans, which is big and well separated from the shaft, consists of a ventral (?) portion, gradually merging into the shaft, a lateral dorsal portion on each side, encompassed by the free margins of the inferior portion, and a terminal prominent part. The inferior portion has in the middle laterally a short seta and along the anterior free margin three rather soft somewhat serrated eminences; on each side dorsally and laterally wingshaped membranes, directed somewhat backwards. In dorsal view the terminal is seen widened out distally rather suddenly and in lateral view is curved distinctly downwards. On each side of this organ an elongated structure is seen, the terminal portion of which is rather prominent and somewhat serrated; between these lateral dorsal portions at the base of the terminal portion a trapezoid excavation is seen, in which the ductus ejaculatorius (?) probably has its aperture in a delicate process, covered by a thin membrane, between the hinder portion of the two lateral dorsal organs. In lateral view at least one membranous process is seen under the terminal process.

Long. corp. 1,2; long. scuti > 1, lat. scuti 0,8; palpi 1,2; pedes I 1,9, II 5,5, III 2, IV 2,25.

Vitellina nigro adumbrata.

Patria: Venezuela. MEINERT collected 2 females and 5 males at Las Trincheras November 5th, 1891, in old wood-dust. The specimens are preserved in the Zool. Mus. Copenhagen.

Microminua n. g.

Tuber oculiferum a margine anteriore surgens, eminentia una majore præditum.

Scutum dorsale adversus coxas III mediocriter constrictum, deinde trapezoidale, apicibus coxarum IV sat longe prominens. Sulci transversi quinque, non conjuncti.

Area quarta granis permagnis binis.

Palporum robustorum pars femoralis leviter compressa; pars patellaris intus spina armata, apicem versus sensim crassior; pars tibialis vix, tarsalis leviter depressa. Pars palpigera mandibulæ breviter producta.

Lobus maxillaris coxarum II parvus.

Coxæ IV non dilatatae. Trochanteres spurii manifesti.

Tarsus I tripartitus; pars citerior non articulata. Pars ulterior tarsi II tripartita. Differentia sexualis insignifica.

(Structura penis vide *M. parvula*.)

Only a single species from Venezuela belongs to this genus, which is rather characteristic by its short legs and round body, æque crassum atque longum.

The genus shows some similarity to ROEWER'S *Paramitraceras*.

Microminua parvula n. sp.

Tuber oculiferum, a margine anteriore surgens, magnum, conicum, paullo latius quam longius, duplo altius quam latius, leviter proclive, granis densissimis dispersis ornatum. Processulus apicalis ab ipso tubere sat manifesto limitatus, proclivis, obtusus, altitudine ipsius tuberis duplo aut plus brevior. Oculi basales.

Scutum ante latum, rotundatum, adversus coxas III vix constrictum, deinde trapezoidale, alte convexum. Corpus æque crassum atque latum. Sulci transversi quinque obsoleti, primo excepto. Limbus anterior extrorsum discretus, tuberculis parvis conicis porrectis sat late disjunctis utrinque binis, quorum exterius majus. Limbus lateralis latus, densissime granulatus. Areæ granulis densissime ornatae, prima excepta granis permagnis (sive tuberculis parvis) binis rotundatis, setas breves gerentibus, area V præterea ordine granorum. Limbus posterior et segmenta dorsalia libera ordine singulo granorum magnorum; anale dorsale densissime granulatum. Ventralia ordine singulo granorum minorum, coxæ granis paullo majoribus ornatae.

Antennarum pars incrassata articuli primi lævis; articulus II granis anteriori-

bus paucis. — Mandibulæ pars palpigera breviter producta, tuberculis superioribus interioribus duobus et inferiore uno acutis.

Palpi crassi. Pars trochanterica tuberculo superiore munita, infra inermis. Pars femoralis femore IV vix dimidio crassior, leviter compressa, spinis inferioribus basin prope duabus longis, diametro manifesto longioribus, et interiore apici propinqua procera, diametro subæqualis, et tuberculis parvis dorsalibus apicalibus ambobus, exteriore minore. Spina interior media partis patellaris spinæ interiori partis femoralis æqualis. Pars tibialis robusta, paullo latior quam crassior, spinis exterioribus tribus, quarum tertia parva, et interioribus duabus, ulteriore longiore, ornata; omnium maxima exterior secunda, diametro articuli longior, spinis inferioribus partis femoralis æqualis. Pars tarsalis sat depressa, parte tibiale multo tenuior et non brevior, spinis longis utrinque binis armata. Unguis procerus æque longus atque spinæ partis tarsalis.

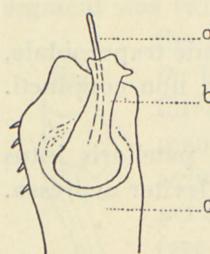


Fig. 8. *Microminua parvula* n. sp.
Apex penis, desuper inspecta.

a processus ejaculatorius, *b* lamina inferior, *c* tuber dorsale.
(W. Sør. del.)

longus, conicus, ultra laminam prominens. Tuber dorsale productum in processum longum trilobatum (fig. 8).

Long. corp. 1,1; long. scuti 1, lat. scuti 0,9; palpi 1,5; pedes I 2, II 2,4, III 2,2, IV 2,6.

Color vitellinus, unicolor. Pedes fulvi, apicem tarsi versus saturatius (brunnescentes).

Animal junius: Two rather big young animals with two segments in tarsi I-II, three in III-IV, were scarcely different from the adults except in the less robust palps.

Patria: Venezuela. MEINERT sifted 30 specimens (of which one female had the ovipositor and one male the penis protruded) at La Moka in the month of August 1891. The specimens are preserved in the Zool. Mus. Copenhagen.

Kalominua n. g.

Tuber oculiferum ab ipso fere margine anteriore surgens sine eminentia majore.

Scutum dorsale ante latum, rotundatum, adversus coxas III non angustius, deinde pæne usque ad partem postremam scuti haud paullo dilatatum. Sulei transversi quinque disjuncti, leves, secundus subrectus, tertius (et quartus) fortiter procurvi.

Area quarta interdum eminentiis duabus vel quatuor majoribus.
Orificio glandularum foetidarum sat magna, angusta, proclivia.
Spiracula plane detecta.

Palporum robustorum pars femoralis leviter compressa; pars patellaris apicem versus sensim crassior intus spina armata; partes tibialis et tarsalis leviter depressæ. Pars palpigera mandibulæ leviter producta.

Lobus maxillaris coxarum II brevis, rotundatus.

Coxæ IV vix dilatatae, apices scuti non attingentes. Processus fulciantes desunt. Trochanteres spurii manifesti.

Tarsus I quadri-partitus; pars citerior articulata. Pars ulterior tarsi II tri-partita.

Differentia sexualis insignifica.

(Structura penis vide *K. bicolor*.)

Species unica adhuc reperta.

***Kalominua bicolor* n. sp.**

Tuber oculiferum magnum, pone majus declive quam ante, altum, latius quam altius, paullo altius quam longius, ante sublæve, ceterum granis magnis. Oculi magni basales.

Scutum convexum, ante latum, rotundatum, adversus coxas III non angustius, deinde pâne usque ad partem postremam scuti haud paullo dilatatum. Sulci quinque leves disjuncti, secundus subrectus, tertius (et quartus) fortiter procurvi. Limbus anterior discretus, præter grana permagna conica porrecta, supra palpos posita, bina laevis. Limbus lateralis haud latus, ordinibus duobus granorum humilium densorum. Emissarium liquoris foetidi latum. Area II ceteris paullo major. Areæ I granis lateribus binis, quorum anterius magnum conicum supra orificio glandularum foetidarum positum, ceteræ ordinibus binis granorum sat magnorum, pone majorum ornatæ, quorum pauca media (in mare 4, in femina 2) ceteris paullo majora. Limbus posterior et segmenta libera primum ordine singulo granorum magnorum, secundum et tertium et anale binis haud manifestis. Coxæ granis parvis; anale ventrale granis parvis vix ordinatim dispositis; ventralia primum ordinibus duobus, cetera ordine singulo granorum paucorum.

Antennarum pars vix incrassata laevis.

Mandibularum pars palpigera breviter producta, eminentiis, memoriæ non dignis, inferioribus et superioribus.

Palpi robusti. Pars trochanterica tuberculo inferiore perrobusto obtuso et superioribus duobus munita. Pars femoralis leviter compressa, supra convexa, femore IV duplo crassior in mare, vix dimidio in femina, spinis longis inferioribus duabus, basi propinquis, et interiore apici propinqua (diametro articuli in mare breviore, in femina longiore) armata. Pars patellaris spina interiore submedia subprona armata, spina interiore partis femoralis vix minor. Pars tibialis latior quam crassior spinis

exterioribus tribus, quarum tertia minor, et interioribus duabus, ulteriore longiore armata, quarum exterior secunda longissima, diametro articuli longior (vide: differentia sexualis). Pars tarsalis subdepressa, parte tibiali paullo brevior et multo gracilior, spinis utrinque binis, longis armata. Unguis sat procerus, parte tarsali brevior.

Pedes breves robusti (maris perrobusti). Coxæ et trochanteres IV muticæ, trochanteres spurii manifesti; femora IV manifesto, cetera leviter arcuata, I—II infra, III—IV ubique granis armata; grana inferiora femoris I sunt tubercula setigerentia. Tibiae III—IV granulatæ. Calcaneus I parte citeriore tarsi vix brevior, ceteri paullo longiores quam crassiores. Articuli tarsales 4, (5—) 6, 5, 6; pars posterior tarsi II tripartita, articulus ultimus tarsorum III—IV non conice productus.

Differentia sexualis. Mas major et robustior; pedes maris multo robustiores quam feminæ. In mare pro spinis partium tibialis et tarsalis adsunt processuli breves acuti, aculeis longis subapicalibus instructi: utrinque bini in parte tarsali, interiores duo et exterior unus submedius in parte tibiali. Præter differentias jam dictas differentiam sexualem videre non potui; (the difference observed in the structure of the spines of pars tibialis and tarsalis is perhaps abnormal).

Penis. The lamina inferior is armed with numerous spines, laterally as well as ventrally; the lateral margins of the lamina are similarly as in *Minua dimorpha* turned upwards and inwards, in such a way that the processus superior, the tip of which is just visible beyond the anterior part of the lamina, is encompassed by the margins. (The penis was examined by SØRENSEN without dissection.)

Long. corp. 2,5; long. scuti 2,25, lat. scuti 2,1; palpi 3; pedes I < 4, II 6,75, III 5,5, IV 6,75.

Color citrinus maculis et striis nigris ornatus; tuber nigrum citrino punctatum; areæ ceteræ maculis mediis binis, partim confluentibus, et striis transversis, sulcos sequentibus, extra inter se partim confluentibus; limbus posterior et segmenta I—II libera maculis mediis singulis et maculis transversis lateralibus binis. Femora, patellæ, tibiæ anulis nigris binis basalibus et apicalibus; venter citrinus; segmentum I et anale striis transversis binis, cetera singulis; stria anterior analis lata, in medio interrupta.

Patria: Venezuela. In the month of July 1891 at Caracas MEINERT sifted a male (with penis protruded) and a smaller, darker specimen, which is probably a female. The specimens are preserved in the Zool. Mus. Copenhagen.

Acanthominua n. g.

Tuber oculiferum ab ipso fere margine oriente, sine eminentia majore.

Scutum dorsale ante latum, rotundatum, adversus coxas III leviter constrictum, deinde latius, denique subrectangulum, pone vix angustius. Sulci transversi quinque non conjuncti.

Area quarta sine eminentiis majoribus.

Orifia glandularum foetidarum non observata sunt.

Spiracula sub apice coxarum IV partim abscondita.

Palporum robustorum pars femoralis leviter compressa, pars patellaris apicem versus sensim crassior intus spina armata, partes tibialis et tarsalis leviter depressæ. Pars palpigera mandibulæ breviter producta.

Lobus maxillaris coxarum II brevis, rotundatus.

Coxæ IV valde dilatatae apicem scuti attingentes, processu fulciente uno, cum abdome junctæ. Trochanteres spurii manifesti.

Tarsus I quadri-partitus, pars citerior articulata. Pars ulterior tarsi II tripartita.

Differentia sexualis ignota, verisimiliter in structura antennarum et armatura trochanteris IV adest.

Species unica adhuc reperta:

Acanthominua tricarinata n. sp.

Tuber oculiferum e ipso fere margine anteriore oriens, magnum, tholiforme, ante plus quam pone declive, paullo latius quam longius, latius quam altius, granis minoribus densis partim acutis dispersis ornatum. Oculi magni basales. In exemplo majore grana majora dispersa, leviter conica acuta observata sunt.

Scutum sat convexum, ante latum, rotundatum, adversus coxas III leviter constrictum, deinde latius subrectangulum (pone vix angustius). Sulci transversi quinque non conjuncti. Limbus anterior non discretus. Limbus lateralis haud latus, ordinibus haud manifestis duobus granorum minorum densorum. Area II ceteris paullo major. Area I granis minoribus sat densis et tuberculis parvis anterioribus lateralibus porrectis conicis utrinque binis, ceteræ granis minoribus et ordine singulo granorum pone sensim majorum. Limbus posterior et segmenta tria priora libera granis minoribus et ordinibus singulis posterioribus granorum magnorum conicorum, anale dorsale ante et post impressionem transversam granis præditum. Coxæ infra granulis densissimis, IV majoribus; margo posterior segmenti primi et ventralia cetera ordine singulo granorum minorum, anale ordinibus duobus armata. Spiracula sub apice coxarum IV partim abscondita; a latere eorum carinæ singulæ secundum coxam IV exeunt.

Antennarum pars incrassata articuli primi granis acribus apicalibus duobus et subbasalibus minoribus 3—4, et supra basalibus 2—3 prædicta. Articulus secundus (saltem in altero sexu) tuberculis robustis bicuspidatis (rarius tricuspidatis) anterioribus plerumque setigeris duobus, quorum primum majus submedium, dum ultra secundum, digitis propinquum, grana conicæ acuta duo adsunt. (In specimine uno inter tuberculis bicuspidatis duobus majoribus tuberculum bicuspidatum minor unum adest).

Pars palpigera mandibularum breviter producta granis inferioribus et superiorebus paucis.

Palpi robusti vel perrobusti. Pars trochanterica spina inferiore et tuberculis minutis superioribus tribus et inferioribus tribus. Pars femoralis femore IV triplo cras-

sior, spinis longis duabus, basin prope et tuberculis parvis acutis, quorum ultimum ceteris manifesto majus inferioribus, et spina interiore apici propinqua robusta, diametro articuli paullo breviore; pars femoralis ordine irregulari superiore granorum praedita. Pars patellaris spina interiore procera, spina interiore partis femoralis tenuiore nec breviore. Pars tibialis latior quam crassior robusta, spinis exterioribus tribus, quarum secunda longa, tertia parva, et interioribus tribus sensim robustioribus et paullo longioribus. Pars tarsalis depressa parte tibiali paullo brevior et multo tenuior, spinis utrinque tribus, quarum primæ magnæ, tertiae parvæ. Unguis robustus, parte tarsali paullo (tamen manifesto) brevior.

Pedes graciles. Coxæ IV muticæ (saltem in sexu altero) valde dilatatae, anguste separatae, processu fulciente inferiore uno cum abdomine junctæ. Trochanter IV (saltem in altero sexu) processibus, subbasali interiore granis magnis conicis scabro, et apicali posteriore, sat procero, longiore, deorsum leviter curvato sublaevi subacuto. Trochanteres spurii manifesti. Femora IV arcuata, femora granis minoribus scabra; femora I tuberculis marginalibus inferioribus setigeris ornata. Calcanei I manifesto, II et III vix longiores quam crassiores, IV crassior quam longior. Articuli tarsales 4, 6, 5, 6; pars ceterior tarsi I articulata. Pars ulterior tarsi II tripartita. Articulus ultimus tarsorum III—IV conice productus.

Differentia sexualis ignota.

Long. corp. 3,2; long. scuti 2,6, lat. scuti 2; palpi 3,5; pedes I 6, II 11,5, III 7, IV 9,5.

Color: Fuscus, parte media longitudinali dorsi fusco-fulvescente. Area I fulvo punctata; Antennæ et palporum partes ceteriores fulvæ, fusco reticulatæ; palporum partes tibialis et tarsalis luteæ pallidæ. Tarsi obscure testacei, II nigricans.

Patria: Venezuela. In the month of December 1891 at Las Trincheras CHR. LEVINSEN (LØFTING) collected 3 specimens, probably all males (at least one which was paler was a male). The specimens are preserved in the Zool. Mus. Copenhagen.

Tricommatisidæ (Roewer).

Olynthoidæ W. Sørensen in manuscr.

Phalangodidæ Tricommatinæ Roewer. Arch. f. Naturg. LXXVIII, 1912, p. 157.

Phalangodidæ Tricommatinæ Roewer. Weberkn. d. Erde 1923, p. 121. — Suppl.: Abh. Naturw. Ver. Bremen, XXVI, 3, 1928, p. 536.

Tuber oculiferum adest, eminentia una præditum aut destitutum.

Scutum dorsale sulcis quinque divisum. Sulci I et II conjuncti aut non conjuncti.

Orificia glandularum foetidarum detecta; emissarium secundum marginem lateralem scuti dorsalis ductum.

Spiracula detecta vel obtecta, maxima, lunata, cancellata.

Mandibularum partes manducatoria et palpigera inter se non discretæ.

Palporum robustiores partes tibialis et tarsalis (et saepe partes omnes) spinis armatae.

Coxæ IV valde dilatatae.

Femur I spinis destitutum. Trochanteres spurii vix manifesti.

Lobus maxillaris coxarum II deest vel adest.

Metatarsus in astragalum et calcaneum divisus.

Pars anterior tarsorum I et II tripartita.

Scopula et processus terminalis desunt.

Unguiculi integri.

Habitant in America meridionali.

Dr. SØRENSEN originally established a new family, *Olynthoidæ*, for the species described below, viz. *Olynthus anomalis*, with the reservation that possibly it ought to be united with one of the other families. The lacking lobus maxillaris II, the compressed pars femoralis palporum as well as the shape of the frontal edge of scutum of *Olynthus* is in some degree reminiscent of the Old world family *Assamiidæ*, but the nearest relatives of *Olynthus* are, however, the Tricomatids of ROEWER. True, according to SØRENSEN "lobus maxillaris coxæ II deest" in *Olynthus*, while according to ROEWER (1912, p. 157) "Maxillarloben der II. Coxa an deren vorderen Innenecke deutlich erkennbar, durch eine deutliche Furche abgetrennt, aber unbeweglich" in *Tricomatids*. As, however, some genera of *Minuidæ* possess a fairly well marked lobus maxillaris while this is wanting in others, I scarcely think this character important enough to justify the establishment of a separate (sub) family for the genus *Olynthus*, since otherwise it agrees with the *Tricomatinæ* Roewer. The characters found in the armature of the palps are probably of generic value only.

Olynthus n. g.

Tuber oculiferum eminentia majore una (grano) præditum.

Scutum post coxas III manifeste latius, sulcis transversis quinque divisum, sulco transverso primo profunde impressum; sulci duo anteriores sulco longitudinali non conjuncti.

Nullæ eminentiæ magnæ areæ quartæ scuti dorsalis.

Palpi robustiores, partes femoralis et tibialis leviter compressæ. Palporum partes femoralis et patellaris inermes.

Lobus maxillaris coxæ II deest.

Pedes robustiores, III omnium brevissimi, II quam IV vix longiores.

Unguiculi integri.

Differentia sexualis armatura pedum (trochanterum) IV demonstratur.

This genus differs distinctly from all the genera mentioned by ROEWER by the absence of spines in the femoral part of the palpi. It seems to be related to *Pseudophalangodes* Roewer (Weberkn. p. 123), but is easily recognized from this latter in

having an unarmed pars femoralis of the palp and only one (unpaired) grain on tuber oculiferum. (C. W.)

Species unica adhuc reperta:

Olynthus anomalis n. sp.

(Mas) 2,5 mm longus, fulvus; tuber oculiferum conicum grano parvo præditum, limbus anterior tubere medio præditus, tubere oculifero paullo minore, limbus lateralis coriaceus tantum; areæ coriaceæ, quarta et quinta et limbus posterior et segmenta dorsalia tria anteriora libera granis prædita; pars femoralis palporum inermis; femora III arcuata, cetera subrecta; calcaneus I articulo tarsali primo paullo brevior; articuli tarsales 5, 7, 5, 6. Maris coxae IV processulo exteriore et tuberculo interiore, trochanter IV processu robusto interiore, granis anterioribus duobus prædicto.

Tuber oculiferum magnum, breviter conicum, latius quam altius, coriaceum, grano parvo apicali præditum. Oculi basi propinquii.

Scutum post sulcum transversum primum convexum, pone altius. Sulci manifesti, sat profundi. Limbus anterior discretus, coriaceus, granulatus, tuberculis exterioribus proclivibus utrinque binis, et tubere medio tubere oculifero paullo minore rotundato, leviter proclivi, granulato. Limbus lateralis sat latus coriaceus. Emissarium liquoris foetidi distincte limitatum. Areæ coriaceæ, quarta et quinta granis magnis præditæ, in ordines singulos vix dispositis. Limbus posterior et segmenta dorsalia libera tria anteriora coriacea, ordine singulo granorum magnorum prædita; anale dorsale granis paucis dispersis. Segmenta ventralis vix granulata. Coxæ IV coriaceæ, granis dispersis haud densis.

Antennarum pars globosa articuli primi laevis.

Palporum pars trochanterica paullo crassior quam longior, spina interiore et tuberculo superiore armata. Pars femoralis femore IV vix minus crassa, supra convexa, inermis. Pars tibialis æque crassa ac pars femoralis, spinis exterioribus tribus, interioribus quatuor, quarum prima et tertia ceteris longior, omnium longissima exterior secunda, in basi cum tertia confluens, diametro articuli duplo longior. Pars tarsalis latior quam crassior, spinis utrinque quaternis, quarum primæ et tertiae ceteris longiores. Unguis procerus, parte tarsali brevior.

Pedes robustiores. Femora III arcuata, cetera subrecta, IV ceteris multo crassiora, granis, (cetera granulis) prædita. Patellæ præsertim IV et II longæ, tibiis plus quam dimidio breviores. Calcanei I et II articulo tarsali primo paullo breviores, III manifeste, IV vix longiores quam crassiores. Articuli tarsales: 5, 7, 5, 6.

Differentia sexualis (femina ignota): In mare segmentum ventrale primum carinis lateralibus ambabus, in angulos singulos obtusos productis, erga apicem processus trochanteris IV positos. Coxæ IV processulo exteriore apicali recto, conico, acuto, et tuberculo interiore brevi robusto compresso, cuius margo posterior marginatus. Trochanter IV processu robusto interiore, levissime procurvo obtuso, granis magnis anterioribus duobus prædicto, quæ tuberculum coxale et angulum carinæ abdominalis ambiunt. Femora IV grano magno dorsali basali, conico.

Long. corp. 2,5; long. scuti 2, lat. scuti 1,75; palpi 2,5; pedes I 8, II 9,5, III 7,5, IV 9,5.

Unicolor fulvus; eminentiae scuti et processus interior trochanteris IV et femorum rufescentes. Antennae, palpi, pedes I, II, III lutei.

Patria: Brasilia, provincia Rio Janeiro. Specimen unicum vidi, quod mare judico, in Serra Vanizella ab ill. professore GOELDI captum, in collectione ill. comitis KEYSERLINGII asservatum.

Epedanidæ W. Sør. (et Saracinicidæ (Roewer)).

Epedanoidæ Sørensen, L. Koch, Arachn. Austral. 2, 1886, p. 66.

Phalangodidæ *Epedaninæ* Roewer, Arch. f. Naturg. LXXVIII A, 1912, p. 220.

Phalangodidæ *Epedaninæ* Roewer, Weberkn. d. Erde, 1923, p. 196. — Suppl.: Abh. Naturwiss. Ver. Bremen, XXVI, 2, 1927, p. 334.

Phalangodidæ *Saracinicinae* Roewer, Arch. d. Naturg. LXXIX, 10, 1913, p. 89.

Phalangodidæ *Saracinicinae* Roewer, Weberkn. d. Erde, 1923, p. 192. — Suppl.: Abh. Naturwiss. Ver. Bremen, XXVI, 2, 1927, p. 329.

Tuber oculiferum adest.

Scutum dorsale sulcis transversis quatuor omnibus disjunctis divisum.

Orificia glandularum foetidarum detecta. Emissaria liquoris foetidi secundum margines laterales scuti dorsalis ducta.

Spiracula detecta, maxima, lunata, cancellata, nivea (quia cancelli tuberculis microscopicis ornati sunt).

Mandibularum pars palpigera a parte maxillari restricta.

Palporum longorum partes tibialis et tarsalis paullum oblique positæ, ita ut adductæ partem femoralem utroque margine attingant.

Lobus maxillaris coxae II discretus, porrectus, subverticalis.

Coxæ IV paullum dilatatae.

Femur I tuberculis et spinis destitutum.

Metatarsus in astragalum et calcaneum divisus.

Pars anterior tarsi I bipartita (*Epedaninæ* Roewer) vel tripartita (*Saracinicinae* Roewer), tarsi II bi- vel tripartita.

Scopula et processus terminalis desunt.

Unguiculi I—II singuli, III—IV bini, omnes integri aut dentibus instructi.

Habitant in Asia orientali et meridionali (China, Japan, Formosa, Malacca cum insulis Sundaicis).

As to the sole difference between *Epedanidæ* and *Saracinicidæ*, viz. the number of joints in pars anterior tarsi I, see above. All the forms treated below show 3 joints

in pars ulterior i.e. do not belong to *Epedanidæ* sensu ROEWER but to *Saracinicidæ* Roewer, and this is the case also with the species referred to *Epedanus* and *Metepedanus* (!).

Metepedanus venator (W. Sør. in manuscr.) Roewer.

Epedanus venator Sørensen, in manuscr.

Epedanus venator Roewer, Arch. f. Naturg. LXXVII, I, 2, 1911, p. 184.

Metepedanus venator Roewer, ibid. LXXVIII, 3, 1912, p. 235.

Metepedanus venator Roewer, Weberkn. d. Erde, 1923, p. 204.

Under the name *Epedanus venator* Sørensen has given the following short notes upon a species which was fully described by ROEWER in 1911 under the name proposed by SØRENSEN; later on (1912) ROEWER referred it to the new genus *Metepedanus*.

Tuber oculiferum paullo longius a sulco transverso primo quam a margine anteriore cephalothoracis remotum, partem tertiam latitudinis cephalothoracis excipiens. Tuber duplo latius quam longius, lœve. Processus a tubero vix limitatus erectus, ipso apice proclivi, procerus, acutus, una cum tubere æque altus atque longitudo articuli II antennæ usque ad articulationem.

Scutum rectangulum, pone paullulo latius quam ante, sulcis transversis quatuor (separatis) divisum. Area prima (sub)æque longa atque pars cetera scuti. Limbus anterior discretus ordine granorum sat magnorum subconicorum rotundorum sat paucorum (10). Limbus lateralis manifesto discretus, latus, pone sensim latior, ordine granorum haud densorum, pone sensim paullo majorum.

Calcanos I et II discernere non potui, calcanei III et IV longitudine triorum segmentorum tarsalium.

Articuli tarsales: 14 (alter tarsus deest), > 27—> 34, 13 (alter tarsus deest), 14. Pars ulterior tarsi (unius) I tripartita. Unguiculi integri.

Long. corp. 6,1; long. scut. 5,3, lat. scuti 5; palpi 21; pedes I 26, II > 46, III 32, IV 42.

Area I et antennæ fulvæ. Areæ reliquæ et limbus lateralis, segmenta libera et sternum fusca. Mandibulæ, pars trochanterica et partes $\frac{4}{6}$ propiores partis femoralis fulva, pars sexta pallida, pars sexta apiculis nigra; pars patellaris pallida, basi et apice nigricantibus, partes tibialis et tarsalis nigricantes, apicibus et basibus brevibus pallidis. Pedum femora et patellæ fulva, apicibus femorum et basibus patellarum brevibus nigricantibus; tibiae I et II pallidæ, III et IV fulvæ; metatarsi et tarsi pallidi.

Patria: Irusan (an Borneo?). — Specimen unicum, in Museo Turinense assertum, vidi.

Epedanus prædo n. sp.

The following scanty notes upon an Epedanid species from Borneo do not allow of a sure reference to genus, though it seems most probable that it belongs to

the genus *Epedanus* s. str. At any rate it is of great interest in showing that a 3-jointed pars ulterior on tarsus I may occur in the *Epedanidae* sensu ROEWER.

Tuber oculiferum paullo longius a sulco transverso I quam a margine anteriore separatum, partem tertiam latitudinis cephalothoracis vix excipiens, circiter triplo latius quam altius et quam longius, lœve. Processus procerus, haud bene limitatus, leviter (tamen manifesto) reclinis, æque longus atque pars patellaris.

Scutum subrectangulum, pone paullo latius quam ante, leviter convexum. Limbus anterior leviter elevatus, ordine granorum conicorum subobtusorum paucorum (8) præditus. Limbus lateralis discretus, latus, pone sensim latior, ordine granorum procurvo-rotundato, pone sensim majorum præditus. Areæ et segmenta dorsalia et ventralia lœvia. Coxæ I granis magnis vel tuberculis conicis, II granis, III granulis, IV sublæves.

Calcanæ I $\frac{2}{3}$ longitudinis tarsi, II articulo tarsi primo duplo longior mihi videtur, III et IV non duplo breviores articulo tarsi primo.

Articuli tarsales: 12—13, 33—36, 7, 8. Pars ulterior tarsorum I et II tripartita, segmenta 2 et 3 partis ulterioris II tamen haud bene separata. Unguiculi longi, leviter curvati, integri.

Long. corp. 5,4; long. scut. 4, lat. scut. 3,4; palpi 9,75; pedes I 20, II 47, III 30, IV 35.

Fulvo-testaceus, fusco ornatus: linea obscura circulari, ante aperta, areæ primæ, vittis transversis singulis arearum ceterarum et segmentorum liberorum dorsalium; segmenta ventralia striis obscuris singulis transversis. — Pedes fulvo-testacei; apices sat longi tibiarum et bases breviores metatarsorum pallida; femora anulo angusto apicali, nigricante, tibiæ ad basin breviter, tibiæ ante apicem et metatarsi ceteri post basin haud breviter nigricantes; tibia et metatarsus et tarsus II nigricantes, apex tibiæ sat longus et basis brevis tarsi pallida. Tarsi reliqui pallida.

Long. corp. 5,4; long. scut. 4, lat. scut. 3,4, palpi 9,75; pedes I 20, II 47, III 30, IV 35.

Patria: Borneo. — Feminam unam, ad Simunjam captam, in Museo Turinense asservatam, vidi.

Asopella n. g.

Tuber oculiferum manifesto commune, sat magnum, eminentia magna, conica præditum.

Scutum dorsale subrectangulum (pone sensim paullo latius), ultra coxas IV prominens.

Sulci transversi quatuor, omnes disjuncti; primus procurvus, ceteri recti.

Area quarta scuti eminentiis majoribus destituta.

Antennarum magnarum articolus primus sat procerus, apicem versus sensim incrassatus; articolus secundus illo longior et multo crassior, articolus tertius incurvus, ordine anteriore (interiore) dentium armatus, quorum ultimus magnus et ipse apex articuli apicem digiti immobilis (inter se) excipiunt.

Pars palpigera mandibularum producta (ultra coxas I parte sua dimidia prominens) eminentiis superiore media et inferiore subapicali munita.

Palporum procerorum partes omnes spinis armatae, pars trochanterica brevis, subpyriformis; pars femoralis longa subcylindrica; pars patellaris clavata; partes tibialis et compressa tarsalis præter spinas marginales spinulis parvis (aut aculeis) inferioribus armatae.

Coxæ IV muticæ, coxis III paullo latores.

Pars anterior tarsi I tripartita, II etiam tripartita.

Unguiculi III et IV dentibus singulis interioribus magnis instructi.

Differentia sexualis (haud magna) magnitudine antennarum demonstratur.

Obs.: In specimine unico *A. bicoloris* limes articulorum secundi et tertii partis anterioris tarsi I tam leviter expressus est, ut oculum meum effugisset, nisi eum diligentissime investigavissem. In specimine unico *A. xanti* idem limes levis, quamquam haud difficilis visu. In *Asopo Borneensi [lutescente]* pars anterior tarsi I vulgo manifeste tripartita, etiam tamen huic speciei interdum fieri potest, eundem limitem vix manifestum esse.

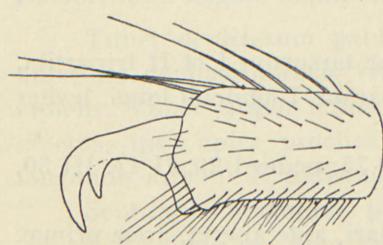


Fig. 9. *Asopella lutescens* Thor.
Tarsi IV apex cum unguiculo uno
(alter non delineatus).
(W. Sør. del.)

Asopella. It is easily recognized, having "unguiculi III et IV dentibus singulis interioribus magnis instructi" (fig. 9). A similar tooth is found as a juvenile character in several species of *Epedanus*, but it is present in the adult stage of all the present 3 species: *lutescens* Th., *bicolor* and *xanti*, and this feature is, I think, reason enough for keeping these three species in a common genus: *Asopella*.

To this genus SØRENSEN referred 3 species from Java and Borneo which may be separated according to the key below:

Conspectus specierum.

- I. Aculei inferiores (neque spinæ marginales) partis tarsalis palporum pauci dispersi; pars femoralis spinis interioribus duabus armata:
 - 1. Spina exterior quarta partis tibialis parva; pars femoralis ordinibus granorum tribus, exteriore et duobus dorsalibus..... *bicolor* n. sp.
 - 2. Spina exterior quarta partis tibialis quam tertia paullo tantum brevior; pars femoralis ordinibus dorsalibus duobus granorum ornata .. *xanti* n. sp.
- II. Aculei inferiores partis tarsalis palporum densissimi, in ordines duos dispositi; pars femoralis spina interiore unica armata *lutescens* Thor.

***Asopella bicolor* n. sp.**

5,25 mm longa, fulva, area prima in lateribus, pars posterior areæ secundæ, areæ tertia et quarta (et segmenta dorsalia libera partim) fuscæ, fere nigræ; tuber oculiferum a sulco transverso vix longius quam a margine anteriore scuti remotum; limbus anterior sublævis; limbus lateralis ordine granorum; areæ sublæves, prima impressionibus ambabus; limbus posterior scuti et segmenta dorsalia libera duo anteriora ordinibus singulis granulorum parvorum; pars palpigera mandibularum processulo robusto superiore adunco; palporum robustorum pars femoralis apicem versus vix crassior, spinis interioribus duabus longis armata et ordinibus tribus, dorsalibus duobus et exteriore, granorum densorum; pars tibialis parte patellari manifeste longior, nec ea neque parte femorali crassior, spinis exterioribus quatuor et interioribus tribus (exteriore apicali excepta) longis; aculei inferiores partis tarsalis pauci dispersi. Pedes II et IV subæque longi; calcaneus I articulo tarsali primo brevior; articuli tarsales 11, 26—31, 9, 10—11.

Tuber oculiferum sat magnum transversum, latius quam altius partem plus quam quartam latitudinis areæ primæ excipiens, a sulco transverso primo vix longius quam a margine anteriore scuti remotum, læve. Processus longus, rectus, erectus, procerus, conicus, subacutus.

Scutum dorsale (saltem maris) levissime convexum. Sulci transversi profundi. Sulcus lateralis (limbum lateralem abscidens) ante, adversus marginem posteriorem tuberis oculiferi, biramus; ramus exterior sulcum marginalem (qui limbum anteriorem abscidit) non attingit, dum ramus interior, incurvus, ante tuber oculiferum obsolescit. Limbus anterior manifeste discretus, sublævis; anguli rotundati. Limbus lateralis sat angustus, pone latior, ordine submedio granulorum haud densorum præditus. Orificia glandularum foetidarum longa, angusta; emissaria liquoris foetidi ante angusta, pone lata, limitibus obsoletis. Areæ sublæves, prima ceteris conjunctis (quarta parte) longior, impressionibus juxta tuber oculiferum positis prædita, carina transversa anteriore limitatis. Limbus posterior scuti et segmenta dorsalia libera duo anteriora ordinibus singulis granulorum parvorum, segmenta cetera (et ventralia quidem) sublævia. Coxæ IV granis paucis dispersis. Spiracula vix curvata.

Antennarum sartculus primus (saltem maris) vix seorsum directus, tuberculis superioribus multis leviter procurvis, conicis, acutis præditus. Articulus secundus primo dimidio longior, leviter elevatus, tuberculo posteriore submedio acuto et anterioribus tuberculis et granis acutis dispersis.

Mandibularum pars palpigera processulo superiore adunco obtuso et processulo procero inferiore recto, seta haud apicali prædicto.

Palpi robusti, corpore multo longiores. Pars trochanterica spinis inferioribus tribus, quarum media longissima, et tuberculis superioribus duobus, quorum posterius parvum. Pars femoralis femore III dimidio crassior, manifeste arcuata, vix curvata, apicem versus vix crassior, æque longa atque partes patellaris et tibialis conjunctæ, ordine inferiore spinarum septem procerarum, quarum ultima brevior, a sexta sat longe remota, ceteræ sibi subæquales, diametro articuli plus quam duplo longiores,

et spinis interioribus duabus apici propinquis, diametro articuli longioribus, armata; ordinibus tribus, exteriore et duobus dorsalibus, granorum densorum ornata. Pars patellaris spinis exteriore una et interioribus duabus, exteriore longioribus. Pars tibialis parte patellari manifesto (non dimidio) longior, nec ab ea parte femorali crassior, a latere inspecta fusiformis, spinis marginalibus exterioribus quatuor et interioribus tribus, quarum exterior apicalis parva, ceterae longae, omnium longissima exterior secunda ipso articulo paullo brevior, et aculeis inferioribus paucis dispersis armata. Pars tarsalis parte tibiali brevior et vix crassior, spinis utrinque quaternis armata, apicem articuli versus brevioribus, quartis parvulis; aculei inferiores pauci, dispersi. Unguis parte tarsali manifesto longior.

Pedes sat graciles. Femora I leviter arcuata, cetera subrecta, omnia laevia; III quam IV paulo crassiora. Patellae, praesertim III, femoribus crassiores. Astragali spurie articulati, calcanei breves (articulo tarsali primo breviores). Articuli tarsales: 11, 26 et 31 (sin. et dext.), 9, 10 et 11 (sin. et dext.). Unguiculi III et IV longi, levius curvati; dens interior ante medium positus, aequo longus atque diameter unguis.

Differentia sexualis (femina incognita): in mare digiti antennarum in basi hiantes.

Long. corp. 5,25; long. scuti 4,5, lat. scuti 3,75; palpi 9; pedes I 16, II 27, III 21,5, IV 26,5.

Fulva. Pars anterior areæ primæ in lateribus, pars posterior areæ secundæ, areæ tertia et quarta fuscae, fere nigrae. Segmenta dorsalia fusca, fulvo marginata; ventralia anale fuscum, cetera brunnea; coxae obscure fulvae. Pedes luteo-testacei, femora III fulvo-lutea.

Patria: Java. Specimen unicum (marem) vidi, ad Sindang-Laja a cl. XANTO captum, in Museo nationali Hungarico asservatum.

Asopella xanti n. sp.

?*Epedanus javanus* Thorell, Ann. Mus. Genova, IX, 1876, p. 131.

Femina 4 mm longa, fulvo-lutea, limbo posteriore scuti et segmentis dorsali libero primo et ventralibus plurimis fuscescentibus; tuber oculiferum a sulco transverso primo paulo longius quam a margine anteriore scuti remotum; limbus anterior tuberculis parvis proversis utrinque binis, prope angulos sitis; limbus lateralis ordine irregulari granulorum, granulis parvis arearum vix majorum; area prima impressionibus ambabus; palporum pars femoralis apicem versus non crassior, spinis interioribus duabus armata et ordinibus duobus dorsalibus granorum ornata; pars tibialis parte patellari manifesto longior nec ea neque parte femorali crassior, spinis exterioribus quatuor et interioribus tribus armata, quarum exterior quarta non parva; aculei inferiores partis tarsalis pauci dispersi. Pedes II et IV subæquales; calcaneus I articulo tarsali primo brevior; articuli tarsales 9, 22, 7, 8.

Tuber oculiferum sat magnum, latius quam altius, partem vix quartam latitudinis areæ primæ excipiens, a sulco transverso primo paulo longius quam a margine anteriore scuti remotum, vix subtilissime granulatum. Processus longus, rectus, erectus, subcylindricus, obtusus.

Scutum dorsale (saltem feminæ) leviter convexus. Sulci ut in *A. bicolore*. Limbus anterior discretus, ordine granulorum et tuberculis parvis (s. granis magnis) proclivibus utrinque binis, prope angulos rotundatos positis. Limbus lateralis angustus, pone latior, ordine irregulari granulorum, granulis arearum vix majorum. Emissarium liquoris foetidi ante angustum, a coxis III latissimum, pone sensim latius. Areæ granulis parvis ornatæ; prima ceteris conjunctis paullulo brevior, impressionibus ambabus, juxta marginem posteriore tuberis oculiferi positis, latis, manifestis, carina anteriore vix limitatis. Segmenta dorsalia libera et ventralia et coxæ IV sublævia. — Spiracula vix curvata.

Antennarum articulus primus anteversum et seorsum directus, eminentiis dorsalibus longis (septem), quarum plures sunt processuli subrecti, subcylindrici, subobtusi. Articulus secundus primo dimidio longior, geniculatus (nec elevatus), tuberculis conicis, subacutis, posteriore uno (aut duobus) et anterioribus aliquot, quorum duo ceteris manifesto majora.

Pars palpigera mandibularum tuberculis parvis duobus, superiore subbasali interiore, et inferiore subapicali exteriore.

Palpi robusti. Pars trochanterica eminentiis inferioribus et superioribus binis, quarum inferior prima et superior exterior, ceteris multo maiores, sunt processus minores. Pars femoralis femore III (circiter dimidio) crassior, partibus patellari et tibiali conjunctis paullo brevior, subrecta (non arcuata, vix curvata), apicem versus non crassior, ipso apice parte media paullulo quidem tenuiore, spinis inferioribus sex proceris, sibi æqualibus (ultima ceteris tamen paullo breviore), diametro articuli fere duplo longioribus, et interioribus duabus armata (quarum prima paullo major) æque longis ac inferioribus, et ordinibus duobus dorsalibus granorum haud densorum ornata. Pars patellaris spinis sibi subæqualibus, exteriore una et interioribus duabus. Pars tibialis a latere inspecta fusiformis, parte patellari manifesto longior, nec ea nec parte femorali crassior, spinis exterioribus quatuor et interioribus tribus armata, quarum exterior quarta quam tertia paullo brevior; omnium longissima exterior secunda diametro articuli fere quadruplo longior. Pars tarsalis parte tibiali brevior et crassior, spinis utrinque quaternis, apicem versus sensim multo breviribus; aculei inferiores pauci, parvi, dispersi. Unguis parte tarsali manifesto longior.

Pedes sat graciles. Femora lævia, I, II, III vix, IV leviter arcuata; III quam IV manifesto crassiora. Patellæ, præsertim III et IV, femoribus crassiores. Calcanei articulo tarsali primo breviores. Articuli tarsales 9, 22, 7, 8. Dens interior unguiculorum III et IV ultra medium positus, manifeste compressus, longus, parti ulteriori unguiculi subæqualis.

Differentia sexualis ignota (mare incognito).

Long. corp. 4; long. scuti 2,6, lat. scuti 2,5; palpi 5,5; pedes I 7,5, II 13, III 10, IV 12.

Obscure fulvo-lutea. Limbus posterior scuti, segmentum dorsale liberum primum, segmenta ventralia (primo et anali exceptis) fuscescentia. Pedes apicem versus dilutiores.

Patria: Java. Specimen unicum, feminam (ovipositore protruso) vidi, ad Sindang-Laja a cl. XANTO captam, in Museo nationali Hungarico asservatum.

Remark: Dr. SØRENSEN has compared the species with *Epedanus javanus* Thorell, and notes that they are probably identic.

Asopella lutescens Thor.

Epedanus lutescens Thorell, Ann. Mus. Genova, IX, 1876, p. 133.

Epedanus lutescens Roewer, Weberkn. d. Erde, 1923, p. 199.

Asopus borneensis Sørensen in manuscr.

5 mm longa, fulva, marginibus scuti saepe anguste infuscatis; tuber oculiferum a sulco transverso primo fere longius quam a margine anteriore scuti remotum; limbus anterior ordine granorum ornatus; scutum totum subtiliter granulatum; area prima impressionibus lunatis ambabus; palporum pars femoralis apicem versus manifesto crassior, spina interiore unica, apici haud propinqua, armata et ordine dorsali granorum ornata; pars tibialis parte patellari vix longior, spinis exterioribus quatuor et interioribus tribus armata, quarum exterior quarta parva; aculei inferiores partis tarsalis in ordines duos dispositi. Pedes II quam IV longiores; calcaneus I æque longus atque articulus tarsalis primus; articuli tarsales 9—11, 23—26, 7—8, 8.

Tuber oculiferum sat magnum, latius quam altius, partem quartam latitudinis areæ primæ excipiens, a sulco transverso primo duplo fere longius quam a margine anteriore scuti remotum, vix granulatum. Processus longus, erectus, subrectus (apice vix procurvo), procerus, conicus, acutus.

Scutum dorsale leviter convexum. Sulci ut in *A. bicolore*. Limbus anterior manifeste discretus, ordine granorum sat magnorum remotorum obtusorum ornatus; anguli rotundati. Limbus lateralis sat angustus, pone latior, subtiliter granulatus. Emissarium liquoris foetidi ante angustum, a coxis III latissimum, pone sensim latius. Area prima ceteris conjunctis vix brevior, impressionibus quatuor prædita, quarum anteriores, extra tuber oculiferum positæ, manifestæ, lunatæ, pone concavæ, dum posteriores, post tuber positæ, transversæ, subrectæ, debiles. Scutum totum, segmenta dorsalia omnia, ventrale anale subtiliter dense granulata; segmenta ventralia cetera sublævia. Coxæ IV apicem versus granis magnis ornatae. — Spiracula leviter modo curva.

Antennarum articulus primus anteversum et (præsertim in mare) seorsum directus, eminentiis haud multis lateralibus prædictus, quarum majores (superiores apicalis una et ultra medium positæ duæ) sunt tubercula majora conica, leviter proculta, subacuta. Articulus secundus supra articulationem basalem leviter elevatus, quam primus dimidio longior, granis piliferis anterioribus sat dispersis ornatus (pone muticus).

Mandibularum pars palpigera tuberculo parvo superiore humili obtuso et tuberculo setifero inferiore munita.

Palpi corpore multo longiores. Pars trochanterica spinis inferioribus duabus et superiore una (post quam altera parva interdum adest) armata. Pars femoralis leviter

curvata, vix arcuata, apicem versus manifesto crassior, æque crassa atque femur III, ordine inferiore spinarum gracilium (6—8), quarum aculei debiles, apicem articuli versus sensim breviorum, quarum longissima diametro articuli paullo longiores, et spina interiore unica, apici haud propinqua, diametro articuli duplo breviore, armata et ordine superiore granorum piliferorum (5—9) ornata. Pars patellaris parte tibiali vix brevior, spinis proceris apici propinquus, exteriore una et interioribus duabus (saltem) æque longis atque diameter articuli. Pars tibialis partibus femorali et patellari manifesto crassior, apicem versus sensim minus crassa, non crassior quam latior, spinis marginalibus exterioribus quatuor et interioribus tribus armata, quarum exterior apicalis parva et ceterarum exterior prima brevior, dum ceteræ diametro articuli dimidio longiores, et spinulis inferioribus dispersis. Pars tarsalis parte tibiali crassior et brevior, spinis marginalibus utrinque trinis sat longis, sibi æqualibus, et aculeis brevibus densis, in ordines duos sat late disjunctos dispositis. Unguis parte tarsali vix longior, ordinem interiore aculeorum adductus fere tangit.

Pedes graciles longiores. Femora vix arcuata, lævia, III quam IV paullulo crassiora. Patellæ, præsertim III, femoribus crassiores. Astragali spurie articulati. Calcanei breves, articulo tarsali primo I æqualis, II paullo brevior, III et IV breviores. Articuli tarsales 9—11(—13), sæpius 10, (20—)23—26(—28), 7—8(—9), 8(—9). Dens interior unguiculorum magnus, compressus, acutus.

Differentia sexualis: Maris antennæ majores; eminentiæ articulorum et primi et secundi haud multo majores. Digi forceps in basi hiantes, quod digitus mobilis valde incurvus est; dentes majores, basalis digitus mobilis magnus, retroversus; digitus immobilis dente, ultra medium posito, compresso, acuto munitus.

Long. corp. (♀) 5; long. scuti 3,75, lat. scuti 3,5; palpi 8; pedes I 15, II 26, III 17, IV 22. Tuber oculiferum una cum processu vix 2. Antennæ maris (ubi longissimæ) 7.

Fulva. Margines scuti sæpe anguste infuscati. Membra dilutiora; partes pedum a patellis luteo-testaceæ.

Patria: Borneo. Exempla quindecim, mares et feminas, vidi, ad Matang a cl. XANTO collecta, in Museo nationali Hungarico (tredecim) et in Museo zool. Hafniense (duo) asservata.

Remark: This species was called *A. borneensis* in the manuscripts of SØRENSEN. No doubt it is identic with *lutescens* Thorell.

Phalangodidæ Simon.

Phalangodidæ Simon, Arachnides de France VII, 1879, p. 148.

Phalangodidæ + Zalmoxidæ Sørensen, L. Koch, Arachn. Austral. 2, 1886, p. 63.

Phalangodidæ Phalangodinæ pars Roewer, Arch. f. Naturg. LXXVIII A 3, 1912, p. 108.

Phalangodidæ Phalangodinæ pars Roewer, Weberkn. d. Erde, 1923, p. 69. — Suppl. Abh. naturw. Ver. Bremen XXVI, 2, 1927, p. 269; XXVI 3, 1928, p. 529.

Tuber oculiferum adest.

Scutum dorsale sulcis quinque (interdum partim obsoletis) divisum. Sulci I et II conjuncti vel non conjuncti.

Orificia glandularum foetidarum detecta. Emissaria liquoris foetidi secundum margines laterales scuti ducta.

Spiracula aut obtecta aut detecta, vel perpusilla (oculo non percipienda) orbicularia, integra, margine ciliato (*Phalangodidæ* mihi olim), vel maxima, ovalia sive sublunata, cancellata, nivea, quia cancelli tuberculis microscopicis ornati sunt (*Zalmoxidæ* mihi olim).

Mandibularum pars maxillaris et pars palpigera inter se discretæ.

Palporum validorum aut robustiorum partes omnes spinis armatæ; partes tibialis et tarsalis vix oblique positæ sunt, ita ut adductæ partem femoralem utroque margine attingant.

Coxæ IV in plurimis vix dilatatae.

Femur I tuberculis vel spinis setigeris destitutum. Femorum pars infima trochanterem spurium (præter trochanterem verum) format.

Lobus maxillaris coxæ II discretus, latus, porrectus.

Metatarsus in astragalum et calcaneum sæpiissime divisus, astragalus (spurius) partem maximam metatarsi efficit.

Pars ulterior tarsi I bipartita, II bi-, tri- vel quadripartita.

Scopula et processus terminalis desunt. Articulus tarsalis ultimus pedum III—IV sæpiissime conice productus, quare efficitur, ut plantula et ungues non plane apicaliter, sed supra posita sunt.

Unguiculi tarsorum I—II singuli, III et IV bini, omnes integri.

Habitant in Asia meridionali (cum insulis), Australia (cum insulis Oceanicis). Africa occ. et sept., Europa mediterranea, America sept. et centrali.

To this subfamily SØRENSEN referred the following forms:

Cynortina Banks.

Malea Sørensen in manuser.

Cynortina Banks, Proc. Acad. Sci. Philad. LXI, 1909, p. 228.

Cynortina Roewer, Weberkn. d. Erde 1923, p. 120. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 3, 1928, p. 531.

Tuber oculiferum a margine anteriore scuti remotum, latius quam altius, granis ambobus præditum.

Scutum sulcis quinque transversis, primo manifesto, ceteris debilibus.

Area IV eminentiis magnis destituta.

Orificia glandularum foetidarum pæne librata, non obtecta; emissarium liquoris foetidi latissimum.

Spiracula detecta.

Antennarum articulus I parte incrassata læve.
 Mandibularum pars palpigera breviter conice porrecta.
 Pedes longiores, robustiores.
 Coxæ IV coxis III latiores.
 Unguiculi integri.
 Tarsus I triarticulatus. Pars anterior tarsi I bipartita, tarsi II tripartita.
 Differentia sexualis nulla (teste ROEWER).
 Palpi robusti, segmenta omnia spinis armata. Unguis parte tarsali brevior.
 Remark: SØRENSEN had created the name *Malea* n. gen. for the genus described above. In all essential points, however, it agrees with the genus *Cynortina* Banks and must consequently be regarded as synonymous with it.

Cynortina cerisea n. sp.

Malea cerisea Sørensen in manuscr,

3,5 mm longa, cerisea, palpis et trochanteribus pallidioribus, pedum partibus ceteris scuto obscurioribus. Tuber oculiferum a sulco transverso primo duplo longius quam a margine anteriore scuti remotum, granis ambobus præditum. Anguli limbi anterioris non discreti tuberculis parvis binis; limbus lateralis ordine exteriore tuberculorum compressorum; areæ (prima excepta) et segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum, præter quæ segmenta I et II tuberculis parvis binis lateralibus. Palporum partes femoralis et patellaris spinis interioribus singulis. Pedes longiores robustiores, IV quam II multo longiores; femoribus rectis patellæ (exceptis IV) manifesto crassiores. Articuli tarsales 3, 7, 5, 6.

Tuber oculiferum a sulco transverso primo duplo longius quam a margine anteriore scuti remotum, transversum, duplo latius quam altius, longius quam altius, convexum, granis ambobus præditum, ab oculis æque longe ac inter se separatis.

Scutum convexum pone sulcum transversum I alte convexus, post sulcum I dilatatum; sulci transversi quinque subrecti et (primo excepto) debiles. Limbus anterior non discretus, anguli tuberculis parvis binis subporrectis conicis subacutis. Limbus lateralis leviter discretus, angustus, ordine exteriore tuberculorum humilium compressorum pone majorum præditus. Orificia glandularum foetidarum pæne librata, ordine tuberculorum parvorum, coxis II impositorum, non obtecta; emissarium liquoris foetidi latissimum. Areæ prima vix convexa, sublævis, secunda magna; et ceteræ et segmenta dorsalia libera tria anteriora ordine singulo granorum parvorum, præter quæ eminentiæ extremæ segmentorum Imi et IIdi sunt tubercula humilia. Anale dorsale læve. Coxæ sublæves. Ventrale primum medium læve, ordine posteriore, intra spiracula interrupto, granorum magnorum; e spiraculis carinæ singulæ magnæ exeunt, inter se prorsus convergentes. Anale ventrale læve. Ventralia cetera ordine singulo granulorum. Spiracula detecta cancellata etc., vix lunata, lata, intra apicem coxarum posita.

Antennarum pars incrassata oblonga articuli primi lævis.

Pars palpigera mandibularum discreta, robusta, breviter conica, porrecta, tuber-

culo inferiore uno robusto brevi, apici propinquu (et granis superioribus duobus submediis) prædita.

Palpi paullo oblique geruntur; pars trochanterica?; pars femoralis femore I dimidio crassior, spinis armata inferioribus quatuor, quarum prima et secunda diametro articuli vix longior, tertia pusilla, quarta robusta brevis, et interiore una apici propinqua, æque longa ac diameter articuli. Pars patellaris vix duplo longior quam crassior, spina unica interiore, diametro articuli subæquali, armata. Pars tibialis robusta, paullo crassior quam latior, parte patellari vix dimidio longior, spinis utrinque trinis armata, quarum longissima exterior secunda apici propinqua, diametro articuli longior, exterior tertia parvula. Pars tarsalis manifesto latior quam crassior, parte tibiali vix brevior, spinis utrinque trinis armata, quarum ultima parvula. Unguis procerus, parte tarsali manifesto brevior.

Lobus maxillaris coxarum II parvulus adest.

Pedes longiores, robustiores, IV quam II multo longiores. Coxæ IV coxis III duplo latores, extra muticæ, tuberculo interiore apicali oppresso conico. Trochanteres I, II, III subglobosi, IV multo longiores quam crassiores, clavati. Femora recta, granis setiferis ornata; trochanteres spurii adsunt, breves, partem modo angustiorem femorum efficientes. Pedum I, II, III femoribus patellæ manifeste, tibiæ paullo crassiores. Calcanei I et II articulo tarsali primo subæquales, III manifesto longior quam crassior, IV anulum apicalem obliquum format. Articuli tarsales 3, 7, 5, 6. Articulus ultimus tarsorum III et IV non conum acutum format.

Differentia sexualis?

Long. corp. 3,25; long. scuti 2,75, lat. scuti 2,5; palpi 3; pedes I 6, II 11, III 8,5, IV 17,5.

Cerisea, dorsum umbris obscurioribus transversis. Venter dilutior, rubicundus. Palpi pallide lutei, pedum trochanteres (veri et spurii) pallide testacei; ceteræ partes scuto obscuriores, subfuscæ.

Patria: America centralis: C. R. Talamanca, Dulci. Specimen unicum, forsitan feminam, vidi, in Museo Holmiensi asservatum.

Remark: The present species is separated from the 2 species described, *tarsalis* Banks and *rectipes* Roewer by the following combination of characters: Femora III and IV recta; coxa IV extra mutica, tuberculo interiore apicali; limbus lateralis ordine tuberculorum præditus.

Timoleon n. gen.

Tuber oculiferum altum conicum, in summo sæpissime truncatum, ex ipso margine anteriore scuti surgens.

Scutum sulcis quinque transversis, quorum duo anteriores non conjuncti; sulcus I leviter arcuatus, II et III angulati, ceteri arcuati. Area II magna.

Area IV eminentiis magnis destituta.

Orificia glandularum foetidarum rima angusta, proclivis.

Antennarum articulus I parte globosa præditus.

Mandibularum pars palpigera breviter producta.
 Palpi robusti, segmenta omnia armata; unguis parte tarsali brevior.
 Pedes breves robusti.
 Coxæ IV coxis III duplo latiores.
 Calcanei non manifesti.
 Unguiculi integri.
 Pars anterior tarsi I biarticulata. (Pars anterior tarsi II verisimiliter triarticulata¹⁾).
 Articulus ultimus tarsorum III et IV verticaliter truncatus.
 Differentia sexualis femore et tibia IV (et segmento ventrali anali) demonstratur.

Habitat in America meridionali.

Remark: This American genus, the material of which I have not been able to reëxamine, according to the description shows great similarity to the (Indo-Australian) genus *Zalmoxis* (see ROEWER, Weberkn. p. 85), with which it agrees among other things in having the 2nd scutal area larger than the others and the 1st transversal furrow feebly arcuate, but the following ones distinctly angulate, all palpal joints armate, the 4th coxa twice as broad as the 3rd, 3—5—5 tarsal joints on the first 3 pairs of legs, and secondary sexual characters on the 4th leg.

It is, however, easily distinguished from *Zalmoxis* as it has only the 2nd and 3rd transversal furrow angulate, a rather high tuber oculiferum, 5 tarsal joints in the 4th leg, and the palpal claw shorter than the palpal tarsus.

Timoleon crassipes n. sp.

2 mm longus, coloratione variabilis; tuber oculiferum altum, ex ipso margine anteriore surgens; limbus anterior non discretus; limbus lateralis ordine exteriore granorum ornatus; areæ scuti secunda, tertia, quarta, quinta granulis dispersis; partes omnes palporum spinis armatae: partes femoralis et patellaris spinis interioribus singulis; pars tibialis spinis interioribus tribus, tibiæ anteriores patellis haud multo longiores. Articuli tarsales: 3, 5, 5, 5. Pars anterior tarsi I bipartita.

Tuber oculiferum ex ipso margine anteriore scuti surgens, altum, conicum, leviter proclive, in summo sæpissime truncatum, lœve. Oculi magni, subbasales.

Scutum convexum, post sulcum transversum primum manifeste latius. Sulci quinque manifesti, primus leviter arcuatus, secundus et tertius angulati, ceteri arcuati. Area II magna. Limbus anterior non discretus. Limbus lateralis sat latus, ordine exteriore manifesto granorum ornatus. Areæ prima lœvis, secunda, tertia, quarta, quinta granulis multis dispersis praeditæ; area sexta (= margo posterior scuti) et segmenta dorsalia libera tria anteriora et ventralia ordinibus singulis granulorum ornata; anale dorsale et coxae granulis dispersis; anale ventrale ordinibus duobus granulorum. Area IV eminentiis majoribus destituta.

¹⁾ SØRENSEN has not noted anything about this in his manuscript. As I have not seen the animal in natura, I have judged about this feature from the other genera among which SØRENSEN ranged *Timoleon*.

Antennarum pars globosa articuli primi lœvis.

Supra partem palpigeram mandibulæ breviter productam adest processulus scutum contingens.

Palpi robusti (nec validi) armatura sat gracili præditi. Pars femoralis femori IV crassitudine subæqualis, supra leviter convexa, spinis inferioribus tribus (duabus basi propinquis diametro articuli paullo longioribus; ultima apici propinqua parva) et spina interiore una apicali; pars patellaris spina unica interiore; pars tibialis parte patellari dimidio longior, robusta, spinis exterioribus duabus, apici propinquis, et interioribus tribus quarum exterior prima, ceteris major, diametro articuli brevior; pars tarsalis parte patellari vix longior, ovata, spinis utrinque trinis. Unguis robustus, parte tarsali dimidio fere brevior.

Pedes breves robusti. Coxæ IV coxis III duplo latiores, processu interiore oppresso præditæ. Femora arcuata, ordinibus singulis inferioribus granorum, IV tuberculorum. Tibiæ I, II, III patellis haud multo longiores. Tibiæ IV eminentia majore inferiore apici propinqua. Calcanei non manifesti. Articuli tarsales: 3, 5, 5, 5. Pars ulterior tarsi I bipartita. Articulus ultimus tarsorum III et IV verticaliter truncatus. Unguiculi integri.

Differentia sexualis: Maris pars anterior segmenti ventralis analis tuberculis ambobus, late separatis. Eminentiae femorum IV maris majores, quarum una, ultra medium posita, est processulus. Eminentia inferior subapicalis tibiarum IV in mare processulus, in femina tuberculum.

Long. corp. 2; long. scuti 1,5; lat. scuti 1,25; palpi 1,5; pedes II et IV circiter 4.

Coloratione variabilis. Testaceus aut fusco- et testaceo-variegatus aut fuscus, sulcis scuti dilutoribus; pedes pallentes aut testacei obsolete fuso anulati.

Patria: Columbia. Exempla sex vidi, quorum mares quatuor et feminæ duas, in collectione ill. comitis KEYSERLINGII asservata.

Philacarus n. gen.

Tuber oculiferum a margine anteriori scuti remotum, latius quam altius, inerme, granis densis dispersis ornatum.

Scutum dorsale sulcis quinque transversis, primo manifesto, ceteris debilibus. Area IV eminentiis magnis destituta.

Orificio glandularum foetidarum magna, proclivia; emissarium liquoris foetidi haud latum.

Spiracula obtecta.

Antennarum articulus I parte ovata præditus, articulus II ordine anteriore obliquo eminentiarum trium præditus.

Mandibularum pars palpigera conice producta.

Palpi robusti, corpore longiores, segmenta omnia spinis et processibus armata. Unguis parte tarsali brevior.

Pedes breves, robustiores.

Coxæ IV coxis III dimidio latiores.

Pars posterior tarsi I bipartita, tarsi II tripartita. Tarsi I et III quinquearticulati. Unguiculi integri.

Differentia sexualis in magnitudine, in antennis et metatarsis III demonstratur.

Habitat in America meridionali.

Remark: This genus shows some similarity to the Central-American genera *Pellobunus* Banks and *Metapellobunus* Roewer (Weberkn. p. 111) but it is easily recognized by the armature of the palps, by a different number of tarsal joints and by the scutal furrows (except the 1st) being almost obsolete.

Philacarus samooides n. sp.

2,5 mm longus, testaceus aut fusco-testaceus; limbus anterior scuti non discretus, acclivis; limbus lateralis leviter discretus granulis parvis ornatus; areæ granis densis dispersis; antennarum robustarum articulus II ordine anteriore obliquo eminentiarum trium præditus; palporum partes femoralis et patellaris spinis interioribus singulis, pars tibialis processibus magnis utrinque binis. Articuli tarsales 5, 7, 5, 6. Maris articulus secundus antennarum processulis, feminæ granis præditus; metatarsus III in mare compressus, in femina cylindricus.

Tuber oculiferum a margine anteriore scuti remotum, magnum, transverse conicum, latius quam longius, æque longum ac altum, granis densis dispersis ornatum. Oculi magni basales.

Scutum convexum, post coxas III sensim paullo latius. Sulci quinque (primo excepto) plus minusve debiles. Limbus anterior non discretus, tuber oculiferum adversus leviter acclivis. Limbus lateralis leviter discretus, granulis parvis ornatus. Orificia glandularum foetidarum magna proclivia; emissarium liquoris foetidi haud latum. Areæ scuti et segmenta dorsalia libera granis densis dispersis; segmenta ventralia ordinibus singulis, anale (ventrale) ordinibus duobus granorum ornata.

Antennarum robustarum pars incrassata articuli primi ovata, granis superioribus posterioribus acutis, quorum unum majus, et inferioribus paucis parvis; articulus secundus ordine anteriore obliquo eminentiarum trium.

Supra partem palpigeram mandibularum conice productam adest processulus brevis robustus.

Palpi validi, corpore valde longiores, pars trochanterica processibus inferiore uno et superioribus duobus; pars femoralis femore IV triplo crassior, supra et infra granulata, ordine inferiore eminentiarum (5—8) armata, quarum prima et secunda sunt spinæ, diametro articuli longiores, et ceteræ sunt processuli breves robusti acuti, quorum ultimus aut pænultimus ceteris major, et spina interiore apici propinqua; pars patellaris spina interiore apicali; pars tibialis parte patellari crassior et dimidio longior, processibus exterioribus quinque, interioribus quatuor, quorum utrinque secundus et quartus magni, aculeo longo instructi, ceteri parvuli; pars tarsalis parte tibiali paullo brevior, processibus exterioribus quatuor, interioribus tribus, secundo

et tertio magnis, aculeo longo instructis, ceteris parvulis. Unguis procerus, parte tarsali tertia parte brevior.

Pedes breves, robustiores; coxae IV coxis III dimidio latiores; trochanteres (veri) subglobosi. Femora arcuata, granulis parvulis ornata. Articuli tarsales: (4—)5, 7, 5, (5—)6. Pars ulterior tarsi I bipartita, II tripartita.

Differentia sexualis: Mas femina major et robustior, antennae maris robustiores, articulus secundus vix geniculatus processulis anterioribus robustis, acutis, in femina granis. Metatarsus III feminæ cylindricus, maris compressus, subtus convexus.

Long. corp. 2,5; long. scuti 2; palpi 3,5; pedes I 4, II 5,5, III 3,5, IV 5.

Color testaceus aut sordide fusco-testaceus, membra testacea.

Patria: Columbia. Specimina quinque vidi, marem unum, feminas tres in coll. ill. comitis KEYSERLINGII asservata, feminam unam in Museo zool. Hafniense.

Cleombrotus n. gen.

Tuber oculiferum a margine anteriori scuti remotum, latum, humillimum, inerme, læve.

Scutum dorsale sulcis quinque transversis, primo manifesto, ceteris debilibus.

Area IV eminentiis magnis destituta.

Emissarium liquoris foetidi latissimum.

Spiracula detecta.

Antennarum articulus I parte incrassata præditus.

Mandibularum pars palpigera non producta.

Palpi robusti, corpore longiores; pars trochanterica inermis, segmenta cetera spinis armata. Unguis parte tarsali vix brevior.

Pedes longi.

Coxæ IV coxis III dimidio latiores. Metatarsi I et II multiarticulati; calcanei I et II non manifesti.

Pars ulterior tarsi I bipartita. (Pars ulterior tarsi II verisimiliter tripartita¹⁾). Unguiculi integri magni.

Differentia sexualis verisimiliter in antennis demonstratur.

Habitat in America meridionali.

Remark: This genus too shows some similarity to *Pellobunus* Banks and *Metapellobunus* Roewer (Weberkn. p. 111) as well as to *Philacarus* treated above. The present genus is, however, easily recognized by the unarmed pars trochanterica of the palp.

Cleombrotus minutus n. sp.

1,5 mm longus, unicolor flavescens. Tuber oculiferum læve, oculi late disjuncti, duplo longius a margine anteriore scuti quam a sulco transverso primo remoti; palporum partes femoralis et patellaris spinis interioribus singulis, pars tibialis spinis

¹⁾ SØRENSEN does not mention anything about this in his manuscript. I have formed my opinion about it from a comparison with the other genera nearly related to it.

interioribus duabus. Pedes longi, femora III quam IV crassiora. Articuli tarsales 5, 7, 5, 5.

Tuber oculiferum latum, humillimum, transversum, eminentiis majoribus destitutum, triplo latius quam altius, læve, uterque oculus suo fere tumulo parvo impositus. Oculi magni, late disjuncti, a margine exteriore scuti dimidio longius quam inter se separati, inter se æque fere longe et a margine anteriore scuti duplo longius quam a sulco transverso primo remoti.

Scutum paullum convexum, pone vix latius. Sulci transversi quinque, primus manifestus, leviter arcuatus, ceteri debiles, recti. Limbus anterior extus discretus, sat tumidus, granis ornatus. Limbus lateralis leviter discretus ordine exteriore eminentiarum haud manifestarum. Emissarium liquoris foetidi latissimum. Area prima quam secunda haud multo major, ante tuber oculiferum granis ornata; areæ ceteræ, segmenta ventralia duo anteriora, segmentum dorsale liberum granulis multis et segmentum dorsale ultimum granulis paucis, ordinatim dispositis prædita. Area IV eminentiis majoribus destituta. Coxæ granis scabré.

Antennarum pars incrassata articuli primi granis posterioribus paucis ornata et granulis dispersis opaca.

Neque supra neque infra partem palpigeram mandibularum non productam adest processulus (s. tuberculum).

Palpi robusti corpore valde longiores; pars trochanterica inermis; pars femoralis femore IV duplo crassior, supra leviter convexa, spinis inferioribus quatuor, basali diametro articuli triplo longior, et spina interiore apicali una longa robusta prædita; pars patellaris spina interiore longa robusta armata, extus inermis; pars tibialis parte patellari longior, spinis exterioribus tribus et interioribus duabus, exteriore prima parva, ceteris robustis et longis; pars tarsalis depressa, parte patellari paullo longior, spinis utrinque binis. Unguis robusta, parte tarsali vix brevior. Pars propior (processus) spinarum partium patellaris, tibialis, tarsalis paene librata, pars ulterior (aculeus?) sub angulo pâne recto inclinata.

Pedes longi, III et IV quam I et II multo robustiores. Coxæ IV coxis III dimidio latiores. Femora leviter arcuata, III et IV granis acutis remotis ornata, III quam IV crassiora. Metatarsi I et II multiarticulati. Calcanei I et II non manifesti. Articuli tarsales 5, 7, 5, 5. Pars ulterior tarsi I bipartita. Unguiculi magni.

Differentia sexualis (?): Maris(?) antennarum articulus secundus ovatus, supra articulationem basalem alte, rotundate elevatus.

Long. corp. 1,5; long. et lat. scuti 1; palpi 2; pedes I 4,5, II 7, III 5, IV 6,5.
Unicolore flavescens.

Patria: Columbia. Specimen unicum, verisimiliter marem, vidi, in collectione ill. comitis KEYSERLINGII asservatum.

Chersobleptes n. gen.

Tuber oculiferum ex ipso margine scuti surgens, inerme, sublæve aut granis paullum eminentibus dispersis ornatum.

Scutum dorsale sulcis quinque transversis, primo manifesto, ceteris plus minusve debilibus præditum.

Area IV eminentiis magnis destituta.

Emissarium liquoris foetidi latum aut haud latum.

Spiracula detecta aut obtecta.

Antennarum articulus I parte incrassata prædita.

Mandibularum pars palpigera vix aut breviter producta.

Palpi vix robusti, corpore breviores; segmenta omnia armata (an etiam trochanter *crassi*?). Unguis parte tarsali brevior aut æqualis.

Pedes breves robusti.

Coxæ IV coxis III aut vix duplo aut dimidio latores. Femora arcuata.

Pars ulterior tarsi I bipartita, II tripartita.

Differentia sexualis in coxa et femore IV aut in parte femorali palporum et in granis arearum scuti verisimiliter demonstratur.

Habitat in America centrali et meridionali.

Remark: This American genus to which SØRENSEN has referred 2 species rather different inter se, viz. *crassus* and *bovallii*, shows some similarity to the Palearctic genus *Scotolemon* Lucas (ROEWER, Weberkn. p. 97), but it is easily recognized in having tuber oculiferum rising directly from the anterior margin of the scutum.

The two species included in this genus — judging from the descriptions alone — are rather different, and may be separated as follows:

Conspectus specierum.

Tuber oculiferum altius quam latius; pars palpigera mandibulae vix producta.

crassus n. sp.

Tuber oculiferum duplo latius quam altius, pars palpigera mandibulae breviter
producta *bovallii* n. sp.

Chersobleptes crassus n. sp.

2,25 mm longus, fusco et testaceo variegatus. Tuber oculiferum magnum ex ipso margine anteriore scuti surgens; limbus lateralis ordine exteriore granorum ornatus; palpi vix robusti, spinis armati; partes femoralis et patellaris spinis interioribus singulis; pars tibialis spinis magnis interioribus duobus; pedes robusti. Articuli tarsales: 3, 5, 5, 6.

Tuber oculiferum magnum, ex ipso margine anteriore scuti surgens, ante erectum, pone convexum, altius quam latius, duplo altius quam longius, granis paullum eminentibus dispersis ornatum. Oculi magni subbasales.

Scutum convexum ante latum, post coxas III latius, trapeziforme, lateribus leviter rotundatis. Sulci transversi quinque primo excepto debiles. Limbus anterior non discretus, anguli acuti, tuberculis singulis conicis acutis prædicti. Limbus lateralis leviter discretus, latus, ordine exteriore granorum densorum pone humiliorum. Emissarium liquoris foetidi haud latum. Scutum totum subtiliter coriaceum; area prima

granis dispersis, ceteræ ordinibus singulis granorum ornatæ; segmenta dorsalia libera tria anteriora ordinibus singulis granulorum, segmenta ventralia lævia.

Antennarum pars incrassata articuli primi lævis.

Supra partem palpigeram mandibularum vix productam adest tuberculum.

Palpi corpore breviores, vix robusti, pars femoralis femore I dimidio aut duplo crassior, spinis inferioribus duabus, basi propinquis, diametro articuli longioribus, et interiore una apicali diametro articuli æquali; pars patellaris spina unica interiore; pars tibialis crassa parte patellari dimidio longior, spinis utrinque quaternis, prima et tertia diametro articuli longioribus, ceteris parvulis; pars tarsalis parte patellari vix longior, spinis utrinque binis. Unguis parti tarsali longitudine æqualis.

Pedes breves, robusti. Coxæ IV coxis III dimidio latiores, non dilatatæ. Femora arcuata, ordine inferiore granorum ornata. Articuli tarsales 3, 5, 5, 6. Pars ulterior I bipartita, II tripartita.

Differentia sexualis: Maris (?) pars femoralis palporum femore I duplo, feminæ (?) dimidio crassior, arearum scuti (prima excepta) maris (?) grana media 4 aut 6 majora, quorum duo media magna, feminæ (?) omnia humilia.

Long. corp. 2,25; long. scuti 1,75, lat. scuti 1,5; palpi 1,5; pedes I 3,5, II 4,5, III 3,5, IV 4,5.

Fusco et testaceo variegatus, femora testacea, anulis fuscis trinis, plus minusve expressis notata.

Patria: Columbia. Specimina tria, unum verisimiliter marem, duas verisimiliter feminas, e collectione ill. comitis KEYSERLINGII vidi.

Chersobleptes bovallii n. sp.

2,25 mm longus, rubicundo-testaceus. Tuber oculiferum limbo anteriori contiguum, sublæve; limbus anterior discretus, pars media elevata, carinam latam efficiens; anale dorsale processu uno librato præditum; pars incrassata articuli primi antennarum globosa; palporum partes femoralis et patellaris spinis interioribus singulis, tibialis interioribus tribus; trochanteres (veri) subglobosi, patellæ et tibiæ femoribus manifeste crassiores. Articuli tarsales 3, 6, 5, 5.

Tuber oculiferum limbo anteriori scuti contiguum, transversum, duplo latius quam altius, longius quam altius, ante et pone convexum, sublæve, oculi magni, prominentes.

Scutum convexum, longius quam latius, post sulcum transversum primum sensim haud paullo latius, trapeziforme, lateribus leviter rotundatis, sulcis quinque præditum. Limbus anterior discretus, lævis, pars media elevata, tuberculum oculiferum adversus acclivis. Limbus lateralis haud latus, ordine medio granorum magnorum subovalium densorum ornatus. Orificia glandularum liquoris foetidi angulata (s. arcuata); emissarium liquoris foetidi latum. Areæ et segmenta dorsalia libera subtiliter coriacea, ordinibus singulis granulorum ornata; anale dorsale processu uno librato conico acuto præditum, æque longo ac anale ventrale; segmenta ventralia subtiliter coriacea, anale granulis ordinatim dispositis. Coxæ IV processulo interiore

apicali conico subacuto (non fulciente) præditæ, spiraculo prominente. Spiracula detecta.

Antennarum pars globosa articuli primi lœvis.

Mandibularum pars palpigera undique discreta, leviter producta, conica, tuberculo superiore subbasali.

Palpi vix robusti, corpore breviores, spinis sat gracilibus armati. Pars trochanterica spinis inferioribus duabus parvis; pars femoralis æque crassa ac femur II, spinis inferioribus quatuor, prima et secunda diametro articuli duplo fere longioribus, tertia pusilla, quarta brevi robusta, et interiore apicali diametro articuli longitudine æquali; pars patellaris spina unica interiore apici propinqua; pars tibialis parte patellari dimidio longior, robusta, spinis exterioribus duabus, interioribus tribus, quarum maxima exterior secunda diametro articuli longitudine æqualis; pars tarsalis procura, depressa, spinis utrinque binis armata. Unguis parte tarsali parte tertia brevior.

Pedes breves robusti. Coxæ IV coxis III vix duplo crassiores. Trochanteres (veri) subglobosi. Femora arcuata, I, II, III leviter; granis remotis prædita. Patellæ et tibiæ, præsertim II, femoribus manifeste crassiores. Articuli tarsales: 3, 6, 5, 5. Pars ulterior tarsi I bipartita, II tripartita.

Differentia sexualis(?): Maris(?) coxa IV processulo interiore apicali robusto; femora IV ordine inferiore eminentiarum majorum remotorum prædita, quarum apicales et pænultima sunt tubercula conica.

Long. corp. 2,25; long. scuti 1,75; lat. scuti 1,5; palpi 1,5; pedes I 3, II 5, III 4, IV 5.

Unicolore rubicundo-testaceus; femora dilutiora, patellæ, tibiæ (et metatarsi) obscuriores, II pæne fuscae.

Patria: America centralis. Specimen unicum, verisimiliter marem, vidi, in Costa Rica a cl. BOVALLIO captum, in Museo Holmiensi asservatum.

Stygnopsidæ n. fam.

Phalangodidæ Phalangodinæ pars Roewer, Weberkn. d. Erde, 1923, p. 69. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 2, 1927, p. 269.

Tuber oculiferum adest, eminentia una præditum.

Scutum dorsale sulcis transversis quatuor aut quinque divisum. Sulci duo anteriores sulco longitudinali non conjuncti.

Orificia glandularum foetidarum detecta, emissaria liquoris foetidi secundum margines laterales scuti dorsalis ducta.

Spiracula detecta maxima, lunata, cancellata, nivea, quia cancelli tuberculis microscopicis ornati sunt.

Mandibularum partes maxillaris et palpigera inter se non discretæ.

Palporum partes ulteriores valde armatae per oblique positae, ita ut adductae partem femoralem margine exteriore attingant.

Lobus maxillaris coxarum II deest.

Pars anterior tarsorum I bipartita, II tri- aut quadripartita.

Pedes I et II unguiculis singulis, III et IV unguiculis binis instructi. Unguiculi integri.

Scopula et processus terminalis desunt.

Species robustae hujus familiae in America meridionali indigenae.

In Stygnopsidae must certainly be included more than the 2 genera treated below; several of the Phalangodid genera treated by ROEWER (Weberkn. p. 109—120) will surely prove to belong here, but as ROEWER does not mention, for instance, the degree of crossing of the palps, the shape of the spiracles etc. I am not able to decide which.

The 2 genera treated below are separated in the following way:

A. Palporum pars patellaris armata:

1. Palporum pars patellaris intus armata *Stygnopsis*.

2. Palporum pars patellaris extus armata *Isaeus*.

B. Palparum pars patellaris inermis *Tachus*.

Stygnopsis W. Sør.

Stygnus Sørensen, Naturh. Tidsskr. (3) XIV, 1884, p. 644. — nec Perty.

Stygnopsis Sørensen, Ergebn. Hamb. Magalh. Sammelr. II, Gonyl. 1902, p. 4.

Stygnopsis Roewer, Arch. f. Naturg. LXXVIII A 3, 1912, p. 153.

Haehnelia Roewer, ibid. LXXXI A 3, 1915, p. 21.

Haehnelia + *Stygnopsis* Roewer, Weberkn. d. Erde, 1923, p. 114, 116.

Tuber oculiferum adest eminentia una (processu valido) praeditum.

Scutum dorsale pene rectangulum, ultra coxas IV longe prominens, sulcis transversis quinque divisum; sulci duo anteriores sulco longitudinali non conjuncti, primus levissime procurvus, ceteri subrecti.

Area quarta scuti dorsalis eminentiis majoribus ambabus praedita.

Palpi validissimi, pars femoralis compressa, non arcuata, ordinibus inferioribus duobus eminentiarum armata; pars patellaris intus armata; pars tibialis robusta latissima, valde armata; pars tarsalis late ovata, etiam valde armata.

Coxae IV coxis III vix duplo latiores.

Pedes II omnium longissimi.

Trochanteres spurii pedibus II adsunt.

Pars anterior tarsorum II tri- aut quadripartita.

Differentia sexualis magnitudine et structura antennarum verisimiliter demonstratur. Glans penis corpore penis, ante sensim crassiore, haud crassior.

ROEWER has established a genus, called *Haehnelia*, for an animal from Mexico having 3 joints in pars ulterior tarsi II, while ROEWER ranges *Stygnopsis* among the genera having 4 joints. One of the 2 specimens of *Stygnopsis valida* examined by me shows, however, 3 joints in the one tarsus II, and 4 in the other, the number is thus varying. As *Stygnopsis* and *Haehnelia* otherwise agree in all essential respects, and as the number of joints in pars ult. II does not form any hindrance to uniting the 2 genera, *Haehnelia* will fall as a synonym to *Stygnopsis*.

It is moreover most probable that the 2 species *Stygnopsis valida* and *Haehnelia mexicana* — both found in Mexico — will prove to be identical. I have not been able to examine the type of *Haehnelia mexicana*, but a comparison of the description and figure of this latter with the specimens of *Stygnopsis* shows but a single plastic difference besides some difference in the colour, viz.

Limbus posterior scuti (= 5th abd. area) — as well as the 3 free tergites — each with a median short spine. Colour fuscous with lighter eyes..... *valida* Sør.
Only the 3 free tergites each with a median short spine. Colour fuscous with lacteous-white spots on 5th scutal area and 1st and 2nd free tergites viz. 3, 4, 2 spots *mexicana* Roewer.

Moreover the colour difference is possibly not a real one. Perhaps *Stygnopsis valida* has also shown white spots in the fresh state, as one of the specimens seen by me (not the type) has a trace of a waxy-white spot on the left hind corner of the 5th area and a little larger one on the right side of the 2nd free area — the other spots have probably been worn off.

If this is right, which seems very probable, the difference in armature is so slight that it may very well represent only an individual variation, and therefore I note *Haehnelia mexicanum* (however with a query) as synonymous with *Stygnopsis valida*.

Stygnopsis valida W. Sør.

Stygnus validus Sørensen, Naturh. Tidsskr. (3) XIV, 1884, p. 645.

Stygnopsis validus Sørensen, Ergebn. Hamb. Magalh. Sammelr. II Gonyl. 1902, p. 4.

Stygnopsis validus Roewer, Arch. f. Naturg. LXXVIII A 3, 1912, p. 153.

? *Haehnelia mexicana* Roewer, ibid. LXXXI A 3, 1915, p. 21.

Stygnopsis validus Roewer, Weberkn. d. Erde, 1923, p. 116.

? *Haehnelia mexicana* Roewer, ibid. p. 114.

Mas 11 mm longus, fuscus, pedibus dilutioribus; tuber oculiferum permagnum pone¹⁾) limbum anteriorem scuti positum, a processu suo non limitatum; processus areæ quartæ spatio interapicali subæquales; limbus posterior scuti et segmenta dor-

¹⁾) SØRENSEN wrote "usque ad" which I have altered into "pone" as the limbus anterior runs unbroken in front of the tuber along the whole front edge of the scutum.

salia libera tria anteriora tuberculis singulis prædita; articuli tarsales 6, 12—13¹), 7,7. Maris saltem antennarum validorum articulus secundus alte sursum productus, coxae IV processulo exteriore præditæ.

Patria in descriptione prima (1884) Guinea esse dicitur. Species (et genus) autem non in Africa sed in America indigena est; marem alterum in rebus publicis Mexicanis ab ill. Dr. FRITSCHÆ collectum, examinavi. Specimina ambo in Museo zool. Hafniense asservantur.

Addenda et corrigenda: Tuber oculiferum cum suo processu (vix proclivi), conicum in apice procerum acutum, longius quam area prima et granis parvis paucis ornatum. — Scutum dorsale erga coxas III et IV haud leviter sinuatum. Limbus anterior discretus. Limbus lateralis ordine medio granorum densorum, intra quem grana minora ordinem propinquum interruptum haud manifestum formant. Areæ granis, prima duobus, secunda quatuor, tertia sex, quarta duobus et quinta duobus ornatae sunt. Animal Fritschei 2, 4, 5, 1, 2 demonstrat, quia in area III et IV in latere sinistra grana lateralis abest²). Processus areæ quartæ subrecti (leviter reclines, retrorsum vix recurvi), sat proceri, acuti, spatio interapicali subæquales. Limbus posterior et segmenta tria libera præter tubercula longa singula ordinibus singulis granorum magnorum, haud numerosorum, qui in limbo et segmentis duobus prioribus late interrupti sunt; anale dorsale granis duobus permagnis humilibus. Segmentum ventrale carinis ante latioribus ambabus præditum, e margine posteriore spiraculorum oblique prorsum exeuntibus.

Antennarum pars producta articuli secundi leviter compressa.

Palporum pars trochanterica præter tubercula parva pauca spina inferiore valida armata et tuberculis curvatis superioribus munita. Pars femoralis intus non plana, tubercula interiora 6—7 in ordine obliquo disposita, obtusa (in animali Fritschei minora quam in typo); pars femoralis intus eminentia humili setifera, memoria non digna, ornata; grana obtusa dorsalia partis femoralis in ordinibus duobus disposita; eminentiæ magnæ inferiores parti femorali 7—12 adsunt.

Pedes: Femora omnia granulata. Femora III et IV apicem versus ordinibus inferioribus binis processorum, quorum longissimus diametro manifesto brevior; tibiae III et IV apicem versus ordinibus inferioribus binis tuberculorum conicorum; calcaneus I astragalo duplo brevior; II articulo tarsali primo æqualis, III articulo tarsali primo vix, IV manifesto brevior, metatarsus II spurie multiarticulatus.

Isæus n. gen.

Tuber oculiferum eminentia una præditum.

Scutum dorsale subrectangulum, ultra coxas IV haud longe prominens, sulcis transversis quatuor divisum, primo fortiter, ceteris leviter arcuatis; sulci duo anteriores sulco longitudinali non conjuncti.

¹) One specimen showed 12 on one leg, 13 on the other — pars ulterior in both being 4-jointed, the other specimen had lost one tarsus, but the other tarsus showed 12 joints, pars ulterior being 3-jointed.

²) Thus in this side quite as in *mexicana* Roewer.

Area quarta scuti dorsalis eminentiis majoribus ambabus prædita.

Palpi validissimi, pars femoralis compressa, arcuata, ordine inferiore eminentiarum armata; pars patellaris extus armata; pars tibialis subdepressa; pars tarsalis depressa.

Lobus maxillaris coxae II deest.

Pedes II omnium longissimi.

Coxæ IV coxis III non duplo latiores.

Trochanteres spurii pedibus I adsunt.

Pars ultima tarsorum II tripartita.

Differentia sexualis magnitudine et structura antennarum verisimiliter demonstratur.

Species unica adhuc reperta:

Isæus mexicanus n. sp.

(Mas) 5,5 mm longus, fusco-brunneus; tuber oculiferum permagnum margini anteriori scuti subcontiguum, a processu suo limitatum; limbus lateralis post apicem coxarum IV lœvis; processus areæ quartæ spatio interapicali paullo breviores; segmentum anale ventrale granis anterioribus multis densis dispersis et ordine posteriore granorum ornatum, intervallo sublævi; palporum pars femoralis intus plana inermis, processibus inferioribus robustissimis armata et tuberculo superiore apicali porrecto instructa; calcaneus (spurius) I astragalo paullo brevior. Articuli tarsales: 6, 10—11, 7, 7. Maris saltem antennarum validarum articulus secundus alte sursum productus, coxae IV tuberculo exteriore præditæ.

Tuber oculiferum limbo anteriori scuti contiguum, altum, conicum, æque altum ac latum, altius quam longius, ante pene erectum; processus procerus conicus, acutus, ipso tubere dimidio brevior. Oculi basales (ipsi tuberi impositi).

Scutum convexum, erga coxas III et IV sinuatum. Limbus anterior leviter discretus, angustus, medius angustissimus, extus granis ornatus. Limbus lateralis, usque ad apicem coxarum IV ordine medio granorum densorum et granis interioribus dispersis ornatus, post coxas IV lœvis nitidus; emissarium liquoris foetidi latum, pone latius. Areæ prima et secunda longitrusus rugosæ, ceteræ granis et granulis densis, dispersis. Processus areæ quartæ proceri, conici, acuti, aliquantum reclines, processu tuberis oculiferi et spatio interapicali paullo breviores. Limbus posterior scuti et segmenta dorsalia libera duo anteriora ordinibus singulis tuberculorum parvorum densorum conicorum; tertium ordine posteriore tuberculorum similium et granis dispersis densis; anale dorsale granis conicis densis dispersis; segmenta ventralia ordinibus singulis granorum; anale ventrale granis anterioribus multis densis dispersis et ordine posteriore granorum ornatum, intervallo sublævi. Coxæ granis præditæ.

Spiracula lata; bulla tuber humile formans.

Antennarum (saltem maris) validarum pars subglobosa articuli primi granis superioribus et tuberculis leviter incurvis exterioribus paucis et superiore-interiore uno apici propinquo. Articulus secundus supra articulationem basalem sat alte seor-

sum productus; pars producta supra paullum compressa, rotundata. Digi validi, mobilis dentibus magnis tribus robustis, immobilis dentibus magnis duobus, ultra medium positis.

Palporum pars trochanterica spina inferiore valida et processibus superioribus paucis, ultimo maximo procurve; pars femoralis femore IV haud dimidio crassior, intus inermis plana, canali submedio instructa, glabra, extra et supra granis magnis rotundatis, ordinatim dispositis, quorum superius ultimum est tuberculum porrectum conicum, acutum, processibus inferioribus quinque robustissimis, diametro articuli æqualibus, setis subapicalibus debilibus instructis; pars patellaris granis supra ornata, processu exteriore (torsione articuli prono) armata; pars tibialis granis minoribus supra ornata, spinis robustis utrinque quaternis¹⁾ armata, tertii latitudine articuli brevioribus; pars tarsalis parte patellari paullulo brevior, supra lævis, spinis haud robustis utrinque quaternis, apicem articuli versus sensim brevioribus. Unguis procerus, parte tarsali vix brevior.

Pedes breves; I et II graciles, quibus III et IV multo robustiores. Coxæ IV (saltem maris) tuberculo exteriore apicali. Trochanteres IV tuberculis anteriore et posteriore, tuberculo coxali paullo longioribus. Femora arcuata, I et II leviter; I et II ordinibus inferioribus singulis granorum; femora, patellæ, tibiae III et IV ubique granis densis, quorum inferiores longi, acuti, ordines binos formantes; patellæ III et IV processulis inferioribus singulis apicalibus, conicis, acutis. Calcanei (spurii) I astragalo paullo brevior, IV brevissimus. Articuli tarsales: 6, 10—11, 7, 7.

Long. corp. 5,5; long. scuti 4,5, lat. scuti 3,5; palpi 7; pedes I 10, II 15, III 10, IV 14. Articulus secundus antennarum 4,5.

Unicolore fusco-brunneus.

Patria: Mexico. Specimen unicum vidi, quod marem habeo, ad oppidum Cordova captum, in collectione ill. comitis KEYSERLINGII asservatum.

Remark: I have not been able to reexamine this species in natura. It seems to be allied to *Metaconomma* Cambr. (ROEWER, Weberkn. p. 115).

Tachus n. gen.

Tuber oculiferum eminentia una præditum.

Scutum dorsale subrectangulum, ultra coxas IV pone prominens, sulcis transversis quinque divisum; sulcus primus procurvus, secundus leviter recurvus, parte media leviter ante concava, ceteri subrecti. Sulci duo anteriores sulco longitudinale non conjuncti.

Area quarta scuti dorsalis eminentiis majoribus destituta.

Palpi robusti; pars femoralis leviter compressa, arcuata, ordine inferiore eminentiarum armata; pars patellaris inermis; pars tibialis (paullum) compressa robusta; pars tarsalis vix compressa.

¹⁾ quarum exterior ultima in specimine meo unico aculeo accessorio anteriore prædita est.

Lobus maxillaris coxae II deest.
 Pedes IV omnium longissimi.
 Coxæ IV coxis III dimidio latiores.
 Trochanteres spurii I, II, III manifesti.
 Pars posterior tarsorum II tripartita.
 Differentia sexualis magnitudine et structura antennarum verisimiliter demonstratur.

Species unica adhuc reperta:
Tachus keyserlingii n. sp.

(Femina) 3,75 mm longus, fusco-brunneus; processus tuberis oculiferi ab ipso tubere leviter proclivi non limitatus, procurvus; palporum pars femoralis tuberculis inferioribus duobus et spina interiore armata; patellæ III et IV femoribus manifeste crassiores. Articuli tarsales: 3, 5, 5, 5.

Tuber oculiferum ex ipso margine anteriore scuti surgens, magnum altum conicum, leviter proclive, gradu anteriore præditum, granulatum; processus conicus procurvus. Oculi subbasales (ipsi tuberi impositi).

Scutum convexum post coxas III manifeste latius, lateribus deinde parallelis, erga coxas IV vix sinuatum. Sulei transversi, profundi. Limbus anterior non discretus; (a latere tuberis oculiferi impressio linearis transversa sat profunda exit). Limbus lateralis ordine granorum densorum ornatus; emissarium liquoris foetidi ordine exteriore granulorum limitatum. Area prima rugosa; secunda granis ambobus; areæ ceteræ, limbus posterior scuti, segmenta dorsalia libera duo anteriores ordinibus singulis, segmentum tertium ordinibus haud manifestis duobus, anale dorsale ordinibus tribus granorum ornata. Coxæ granis densis, segmentum anale ventrale ordinibus duobus, segmenta ventralia cetera ordinibus singulis granulorum prædita.

Spiracula leviter arcuata, sat lata; bulla elevata.

Antennarum pars globosa articuli primi sublævis; articulus secundus rotundate geniculatus (feminæ saltem) non elevatus.

Palporum pars femoralis femore IV crassior, supra convexa, apicem versus sensim fere latior, intus leviter convexa, tuberculis setiferis inferioribus duobus, brevibus, robustis, rotundatis (altero basali, altero medio), et spina interiore breviore sat robusta, apici propinqua; pars tibialis spinis utrinque quaternis, quarum tantum exterior tertia robusta, diametro articuli brevior, interiores prima et tertia ceteris parvis majores; pars tarsalis spinis utrinque trinis, apicem versus brevioribus. Unguis procerus, parte tarsali manifeste brevior.

Pedes breviores, sat robusti. Coxæ IV (saltem feminæ) eminentia exteriore apicali destitutæ. Femora I et II subrecta, III et IV arcuata, granis præsertim intra ornata. Patellæ III et IV femoribus manifeste crassiores. Articuli tarsales: 3, 5, 5, 5.

Differentia sexualis?

Long. corp. 3,75; long. scuti 3, lat. scuti 2,75; palpi 2,75; pedes I 7, II 12, III 8,5, IV 13.

Unicolore fuscō-brunneus; antennae, palpi, trochanteres pedum dilutiora. Calcanei (spurii) et tarsi testacei, articulus primus tarsi I fuscus.

Patria: Brasilia. Specimen unicum vidi, quod feminam habeo, ad oppidum Blumenau captum, in collectione ill. comitis KEYSERLINGII asservatum.

Remark: The editor has not been able to re-examine this species. It seems to be related to *Paramitroceras* Cambr. (ROEWER, Weberkn. p. 116) and *Brotasus* Roewer (Abh. nat. Ver. Bremen, XXVI, 1928, p. 532). It differs rather much from the two other Stygnopsisids, and in some particulars shows so much concordance with the *Minuidæ*, that the editor is inclined to believe that it must be included in this latter family.

Gonyleptoidea.

In his paper from 1884 SØRENSEN ranged all the forms belonging to the Gonyleptoidea series, then known to him, within 4 families which he called *Coelopygidæ*, *Gongleptoidæ*, *Pachyloidæ* and *Hernandarioidæ*. In 1902 SØRENSEN withdrew the *Pachyloidæ*, including the forms in question in the family *Gongleptoidæ*, as he perceived that the distinguishing character, viz. 4 or 5 dorsal sulci, is not reliable for separating them.

In his posthumous notes on the group he admits 3 families viz. *Hernandarioidæ*, *Stygnidæ* and *Gongleptidæ*, as he includes the *Coleopygidæ* in *Gongleptidæ*, and now (in contradistinction to his former view — 1884 p. 580) considers the *Stygnidæ* to be a well outlined family.

Hernandarioidæ, according to SØRENSEN, is easily recognized through the course of the emissaria ad ventrem coxarum, which latter feature, besides in the *Hernandarioidæ*, is only found in the *Cosmetidae*. On the contrary, he lays no stress upon the number of dorsal transversal sulci; the genera hitherto described certainly possess only 2, but below is described a form with 5 sulci, which SØRENSEN includes here.

The 2 other families are separated according to the presence or absence of a scopula (present in *Stygnidæ*, absent in *Gongleptidæ*).

The *Coelopygidæ* and the *Gongleptidæ* were united on account of the following facts noted by SØRENSEN on a rough-draught sheet: 1) the genus *Leptocnemus* Koch links the 2 genera (*Coelopygus* and *Amphères*) which form the *Coelopygidæ* with the (other) Gonyleptooids, and 2) the chelate shape of the palps, characterizing the Coelopygids, in other families (*Biantidae* and *Stygnidæ*) occurs in some genera but not in others, and cannot therefore be considered a family character.

ROEWER who had examined a much greater number of Gonyleptooid Laniatores of varying shape and characters, subdivided the group (familia *Gongleptidæ* sensu Roewer) into a number of subfamilies, viz. *Pachylinæ*, *Prostygninæ*, *Phareinæ*, *Stenostygninæ*, *Gonyleptinæ*, *Mitobatinæ*, *Coelopyginæ*, *Cranainæ*, *Heterocranainæ*, *Stygnocranainæ*, *Stygginæ*, *Heterostygninæ*, *Hernandariinæ*, and (see ROEWER, Abh. nat. Ver. Bremen, XXVII, 1929, p. 181) *Bourguyiinae*.

Of these groups *Pachylinæ* Roewer is identical with *Pachylidæ* Sørensen olim,

Gonyletidæ + Mitobatinæ Roewer is identical with *Gonyletidæ* Sørensen olim, *Coelopyginæ* Roewer with *Coelopygidæ* Sørensen olim, and *Hernandariinæ* Roewer with *Hernandariidæ* Sørensen¹⁾, while *Stygnidæ* Sørensen comprises *Stenostyggninæ*, *Prostygninæ*, *Stygninæ* and *Heterostyggninæ* Roewer.

As seen from the conspectus above, the family *Stygnidæ* Sørensen is separated from the other families by the presence of a scopula, but ROEWER does not ascribe a scopula to *Prostygninæ* and *Stygninæ*. Both authors have investigated representatives of the latter group, and their statements are therefore apparently incompatible. As to the genus *Stygnus* Sørensen, however, notes: "scopula vix densa; in parte media tarsorum III et IV adsunt pili spathulati pauci", and as to *Stygnus aggerum* (which species also is known by ROEWER — but referred to a group, *Stygninæ*, without scopula) SØRENSEN notes: "scopula tenuis, pili vix dilatati" i. e. having a rather reduced scopula. Therefore I think that ROEWER's term "ohne Scopula" as to *Prostygninæ* and *Stygninæ* means "without a well developed scopula", and that *Stygnidæ* Sørensen, which, it is true, forms a natural group, is really characterized by the Sørensenian character "scopula adest", though the scopula may be rather reduced in some forms. Therefore I still keep the forms united by SØRENSEN into the family *Stygnidæ* within this latter which, as said above, comprises the 4 subfamilies of ROEWER: *Prostygninæ*, *Stenostyggninæ*, *Stygninæ* and *Heterostyggninæ*.

According to ROEWER all the forms belonging to the two last-named subfamilies agree in having but 4 sulci transversi scuti. Among the genera which might belong to these 2 subfamilies, the genus *Stygnoplus* is characterized by SØRENSEN as having 5 sulci, of which, however, "sulcus quartus debilis", and also *Eutimesius* (also known by ROEWER and thus by him given 4 sulci) are rather intermediate, as the 4th sulcus is only visible in the middle, but otherwise obsolete "itaque sulcus quartus oculum faciliter effugit". This proves that SØRENSEN is right when he maintains (1902 p. 4) that "numeris sulcorum transversorum scuti dorsalis characterem familiarum non præbet"; one investigator may count 4, another 5 sulci in the same animal; and if the system is arranged with "4 or 5 sulci" as the leading character, the animal may be misinterpreted as to its systematic position.

It must also be mentioned that the genus *Nomoclastes* described below has 5 sulci, well-developed scopula, and simple claws, which do not fit in with any of the Roewerian subfamilies in question (see the key: Abh. naturw. Ver. Bremen, XXVII, 1929, p. 181).

Hernandariidæ W. Sør.

Hernandaroidæ Sørensen, Naturh. Tidsskr. (3) XIV, 1884, p. 598.

Gonyletidæ Hernandariinæ Roewer, Arch. f. Naturg. LXXIX, A 5, 1913, p. 460.

Gonyletidæ Hernandariinæ Roewer, Weberkn. d. Erde, 1923, p. 582.

¹⁾ The genus *Ariæus* described below must, however, be included in *Pachylinæ* Roewer.

Tuber oculiferum adest, eminentiis ambabus instructum.

Scutum dorsale sulcis transversis duobus vel quinque divisum.

Emissarium liquoris foetidi efficit canalis (apertus), coxis primi et secundi paris et processibus formatus, liquorem foetidum ad ventrem coxarum ducens. Orificia glandularum foetidarum obiecta aut detecta.

Spiracula maxima lunaria, cancellata, nivea, quia cancelli tuberculis microscopicis ornati sunt, post sulcum coxam quartam ab abdomen separantem posita.

Palporum partes tibialis et tarsalis spinis (aculeis suo processui impositis) armatae, minus manifeste oblique positae sunt, ita ut adductae partem femoralem margine utroque attingant.

Lobus maxillaris coxae II deest.

Coxae IV dilatatae.

Pedes breviores.

Pars ulterior tarsi I tripartita, II etiam tripartita.

Unguiculi pedum integri.

Scopula deest. Processus terminalis pedibus III et IV adest, sed parvus.

Species in America meridionali indigenæ.

SØRENSEN has left a description of the following new genus and species which differs from Hernandaria and the other forms hitherto known, in having not 2, but 5 sulci on the scutum; and further a most important character is found in the orificio glandulæ foetidæ. According to this latter difference SØRENSEN has separated the 2 genera known to him in the following way:

- | | |
|---|-----------------------|
| Orificia glandularum foetidarum processibus obiecta, in ipso margine scuti
dorsalis posita | <i>Hernandaria</i> . |
| Orificia glandularum foetidarum (et urinariarum) detecta, magna, infra lata;
margo posterior orificii in processum productus, qui processum superiorem
(medium) coxae II attingit | <i>Ariæus</i> n. gen. |

Ariæus n. gen.

Tuber oculiferum eminentiis majoribus ambibus instructum.

Sulci scuti dorsalis omnes manifesti, duo anteriores sulco longitudinali conjuncti.

Area quarta eminentiis majoribus ambibus instructa.

Orificia glandularum foetidarum (et urinariarum) detecta, magna, infra lata; margo posterior orificii in processum productus, qui processum superiorem (medium) coxae II attingit.

Coxæ IV dilatatae.

Pedes II omnium longissimi.

Unguiculi pedum integri.

Differentia sexualis?

Ariæus tuberculatus n. sp.

(Femina) 6,5 mm longa, brunnea, tuber oculiferum processulis ambobus; pars media limbi anterioris late elevata tuberculis ambobus; areæ scuti dorsalis tuberculis binis, segmenta dorsalia libera secundum et tertium tuberculis parvis binis; pars femoralis palporum intus inermis; calcaneus I astragalo plus quam dimidio brevior; articuli tarsales 6, 10, 7, 8; processus terminalis unguiculis dimidio brevior.

Tuber oculiferum sat magnum, latius et longius quam altius, supra excavatum, præter granula pauca processulis ambobus robustis, conicis acutis, spatio interapicali subæqualibus.

Scutum levissime convexum, post coxas III sat fortiter dilatatum, pone breviter coaretatum. Sulci sat lati. Limbus anterior discretus tumidus; pars media late elevata, supra late excavata, tuberculis ambobus leviter proclivibus, late separatis, graciliter conicis, acutis; pars cetera granis conicis acutis, paucis (utrinque trinis) densis, supra palpos positis. Limbus lateralis latus, granis parvis densis ornatus, ordinatim haud manifeste dispositis. Post orificia urinaria detecta permagna orbicularia adest processus (tertius) magnus coxae II. Areæ subtiliter coriaceæ, prima granulis, ceteræ granis parvis, densis dispersis ornatae. Areæ omnes tuberculis parvis rotundatis binis, quæ in area quarta sibi magis quam in area tertia propinqua. Limbus posterior scuti et segmenta dorsalia 3 anteriores ordine singulo granorum parvorum, secundum et tertium tuberculis parvis binis; anale dorsale granulis dispersis. Coxæ et segmenta ventralia (omnia) sublævia.

Spiraculorum bulla elevata.

Antennarum pars globosa articuli primi lævis.

Palpi graciles; pars femoralis (leviter compressa) æque crassa ac femur III, inermis; pars patellaris parte tibiali haud multo brevior, parte tarsali paullo longior; partes tibialis et tarsalis leviter compressæ; pars tibialis spinis utrinque quaternis, quarum secundæ et quartæ pârvæ, exterior quarta pusilla, omnium longissima exterior tertia, cum quarta in basi confluens, diametro articuli dimidio longior; pars tarsalis spinis utrinque quinis, quarum prima et tertia ceteris parvis duplo longiores. Unguis procerus, parte tarsali vix brevior.

Pedes graciles, breviore. Femora I et II subrecta, sublævia, III et IV leviter arcuata, granulata. Calcanei I astragalo plus quam dimidio brevior, II articulo tarsali primo vix longior, III et IV articulo tarsali primo breviore. Articuli tarsales 6, 10, 7, 8. Processus terminalis gracilis, unguiculis dimidio brevior.

Differentia sexualis (mare incognito): Feminae coxae, trochanteres, femora IV sine lunæ eminentia majore. Brunneus, eminentiae arearum scuti umbra fusciore cinctæ. Venter, antennæ, palpi, trochanteres pedum dilutiora.

Long. corp. 6,5; long. scut. 6, lat. scut. 6; palpi 6; pedes I 14, II 26, III 18, IV 25.

Patria: Brasilia. Specimen unicum, feminam, vidi, ad oppidum Blumenau caputum, in coll. ill. comitis KEYSERLINGII asservatum.

Remark: This form cannot be identified with any hitherto described, neither

in *Hernandaroidæ* nor in *Pachylinæ* Roewer, to which latter group it should possibly be referred in the Roewerian system.

Stygnidæ Simon.

Subfam. *Stygningæ* Simon p. p., Ann. Soc. Ent. Belg. XXII, 1879, p. 218.
Prostygninæ + *Stenostygninæ* + *Stygningæ* + *Heterostygninæ* Roewer, Arch. f. Naturg. LXXIX, A 4/5, 1913, p. 140, 162, 425, 444.
Prostygninæ + *Stenostygninæ* + *Stygningæ* + *Heterostygninæ* Roewer, Weberkn. d. Erde, 1923, p. 449, 459, 571, 576. — Suppl.: Abh. nat. Ver. Bremen, XXVII, 2, 1929 et XXVIII, 2/3, 1931.

Tuber oculiferum adest vel deest.

Scutum dorsale sulcis transversis quatuor aut quinque divisum; quorum duo anteriores sulco longitudinali conjuncti sunt.

Emissaria liquoris foetidi secundum margines laterales scuti dorsalis ducta. Orificia glandularum foetidarum (in generibus mihi cognitis) defecta.

Spiracula detecta, maxima, lunata, cancellata, nivea, quia cancelli tuberculis microscopicis ornati sunt.

Mandibularum partes maxillaris et palpigera inter se (plus minusve) discretæ.

Palporum partes tibialis et tarsalis paullum oblique positæ, ita ut adductæ partem femoralem utroque margine attingant.

Lobus maxillaris coxae II deest.

Coxæ IV (in generibus mihi cognitis) cum abdomine processibus fulcentibus non conjunctæ, sæpissime paullum dilatatae.

Pedes II (in speciebus mihi cognitis) omnium longissimi, pedibus IV saltem non breviores.

Femorum pars infima (in generibus mihi cognitis) trochanterem spurium (præter trochanterem verum) format.

Pars ulterior tarsorum I tripartita. Pars ulterior tarsi II (in generibus mihi cognitis) tripartita.

Tarsorum III et IV pars ultima (præsertim articulus ultimus) leviter resupinata, scopula sæpe lata densa pilis longis vestita, in apice (paullum) dilatatis. Processus terminalis pedibus III et IV adest.

Pedes I et II unguiculis singulis, III et IV binis instructis.

Species adhuc cognitæ in America et meridionali et septentrionali indigenæ.

Pullos duos speciei generis¹⁾ alicujus hujus familiæ vidi. Quorum tarsis III

¹⁾ Oculi late disjuncti, æque longe a linea media corporis ac a marginibus lateralibus separati, a margine anteriore scuti triplo longius quam a sulco transverso primo remoti; uterque suo tumulo impositus (dum tuber oculiferum deest) inter quos eminentia nulla adest. — Scutum sulcis transversis quinque divisum; areae secunda et quarta (non autem segmenta libera) eminentiis majoribus instructæ. — Spiracula latissima. — Articuli tarsales 2, 2, 2, 2. — 5 mm longi.

et IV scopula plane deest; pili inferiores tarsorum breves et pertenues quidem. Palpi structura et armatura a palpis animalium adultorum discrepare non videntur.

Genera et species omnes in America indigenæ.

Conspectus generum mihi cognitorum.

- I. Palpi corpore longiores; partes femoralis et patellaris (clavata) teretes, gracieles; aut omnino inermes aut vix armatae; tuber oculiferum commune non adest, oculi late disjuncti:
 - A. Unguiculi pedum III et IV integri:
 - 1. Inter (et ante) tumulos oculiferos eminentia magna adest... *Stygnus* Perty.
 - 2. Inter (et ante) tumulos oculiferos eminentia magna deest. *Ideostygnus* n. gen.
 - B. Unguiculi pedum III et IV pectinati:
 - (1. Area quarta scuti dorsalis eminentiis majoribus (teste ill. SIMON) destituta *Stenostygnus* Simon).
 - 2. Area quarta scuti dorsalis eminentiis majoribus ambabus instructa:
 - a. Area prima scuti eminentiis majoribus destituta... *Stygnidius* Simon.
 - b. Area prima scuti eminentia interoculari una instructa:
 - + Eminentia interocularis mutica; palporum pars femoralis inermis; pedes longissimi, graciles..... *Eutimesius* Roewer.
 - ++ Tuber interoculare eminentia majore unica præditum; palporum pars femoralis armata; pedes breviores, posteriores robusti *Stygnoplus* Simon.
- II. Palpi corpore breviores, robusti; partes femoralis (leviter) compressa, armata et patellaris robustæ:
 - A. Tuber oculiferum commune non adest; tumuli oculiferi late separati, sua crista eminentiarum prædicti..... *Nomoclastes* n. gen.
 - B. Tuber oculiferum commune sat magnum, eminentiis majoribus ambabus instructum *Tegyra* n. gen.

***Stygnus* Perty.**

Stygnus Perty p. p. + *Goniosoma* p. p., Delect. An. Artic. 3, 1832, p. 207, 202.

Stygnus p. p. Gervais Walckenaer Ins. Apt. III, 1844, p. 111.

Stygnus p. p. C. L. Koch, Übers. d. Arachnidensyst. fasc. II, 1839, p. 11.

Stygnus Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 220.

Stygnus + *Stygnellus* Roewer, Arch. f. Naturg. LXXIX, A 5, p. 427, 434.

Stygnus + *Stygnellus* Roewer, Weberkn. d. Erde, 1923, p. 572, 574.

Tuber oculiferum commune non adest, oculi inter se late disjuncti, uterque suo tumulo impositus, inter (et ante) tumulos eminentia (major) unica adest.

Scutum dorsale sulcis transversis quatuor divisum, sulci duo anteriores sulco

longitudinali conjuncti. Scutum subrectangulum ultra apices coxarum IV paullulo prominens.

Area quarta scuti dorsalis eminentiis majoribus ambabus prædita.

Supra partem palpigeram mandibularum porrectam conicam adest tuberculum basale; pars palpigera processu inferiore apicali robusto instructa.

Palpi corpore multo longiores, partes femoralis et patellaris teretes, graciles, inermes; pars patellaris clavata parte tibiali longior; pars tibialis robusta compressa, in basi crassior; pars tarsalis parte tibiali brevior, compresso-fusiformis, præter spinas ordinibus inferioribus duobus sibi propinquis setarum armata, unguem adductum excipientibus.

Coxæ IV coxis III fere triplo latiores, eminentia exteriore apicali magna præditæ.

Scopula vix densa; in parte media tarsorum III et IV adsunt pili spathulati pauci.

Unguiculi III et IV sat late divergentes, fortiter incurvi, integri.

Differentia sexualis (teste ill. SIMON et ROEWER) armatura femorum IV et struc-tura antennarum demonstratur.

Stygnus simonis n. sp.

Stygnus simplex E. Simon in schedula — nec Roewer.

5 mm longus, olivaceo-niger, figuris sordide flavis notatus; præter granula adsunt eminentiæ majores binæ: areæ quartæ processus; limbo scuti grana, segmentis dor-salibus liberis primo tubercula, secundo et tertio processuli; antennarum pars sub-globosa articuli primi sublævis; palporum pars tibialis spinis utrinque quinis armata. Articuli tarsales: 7, 14, ?, 7. Processus terminalis unguiculis haud multo brevior.

Tumuli oculiferi parvi lœves. Oculi a linea media corporis paullo longius quam a margine exteriore scuti separati, a margine anteriore scuti duplo longius quam a sulco transverso primo remoti. Tuber interoculare late conicum granulis dispersis ornatum, cuius processus ad marginem anteriorem tumulorum oculiferorum positus, erector, procerus, tubere ipso verisimiliter altior¹⁾.

Scutum convexum, adversus coxas III angustius, pone paullo latius. Sulci trans-versi primus et debilis quartus manifeste, ceteri leviter arcuati. Limbus anterior discretus, leviter tumidus, lœvis. Limbus lateralis sat angustus, ordine exteriore granulorum parvorum haud densorum præditus; emissarium sat latum, distincte limitatum. Areæ prima lœvis, secunda, tertia et quarta granis parvis (vel granulis) paucis (quaternis) ornatæ, area quarta processibus ambobus longis, spatio interapicali æqualibus, processu interoculari vix longioribus, vix divergentibus, subrectis, reclini-bus, conicis, acutis, sulco transverso quarto contiguis. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granulorum et eminentiis majoribus binis, anale dorsale granulis, in ordines tres minus manifeste dispositis. Segmentum anale ventrale ordinibus duobus haud manifestis granulorum. Coxæ granis dispersis.

¹⁾ The interocular spine is broken.

Spiracula magna.

Antennarum robustarum pars subglobosa articuli primi granulo exteriore pone ornata, ceterum lœvis; articulus secundus supra articulationem basalem paulum elevatus, rotundate conicus.

Palporum pars trochanterica brevis spinis inferioribus duabus parvis; pars femoralis æque crassa ac femur I, leviter arcuata, apicem versus paulo crassior; pars patellaris leviter arcuata, parte tibiali vix dimidio longior; pars tibialis spinis proceris utrinque quinis, quarum quartæ longissimæ diametro articuli plus quam duplo longiores, quintæ pusillæ; pars tarsalis parte tibiali manifesto brevior, spinis exterioribus quatuor et interioribus quinque, exteriore prima et interioribus prima et tertia ceteris longioribus. Unguis procerus, parti tarsali longitudine æqualis.

Pedes longiores, graciliores. Coxæ IV processulo exteriore subrecto, conico, acuto. Trochanteres IV processulo superiore parvo, conico, acuto. Femora subrecta granulis ornata, II tuberculis pusillis obtusis, apicalibus dorsalibus duobus, III?, IV processulis parvis acutis duobus. Calcanei I astragalo fere duplo longior, II et IV articulo tarsali primo breviores. Articuli tarsales: (?—)7, (?—)14, ?, 7. Processus terminalis unguiculis haud multo brevior.

Differentia sexualis?

Olivaceo-niger, apices processulorum scuti et processulorum segmentorum dorsalium liberorum et tumuli oculiferi sordide flavescentes; area prima vitta arcuata notata, extra et ante tumulos oculiferos et post processum interocularem posita, punctis sordide flavis formata; limbus lateralis lineis exteriore et interiore, sulcus transversus tertius maculis transversis tribus (vel potius vitta transversa interrupta) sordide flavis. Femora anulis binis dilutioribus, haud manifestis notata. Antennæ et palpi rufo-testacea; pars femoralis anulis fuscis duobus manifestis.

Long. corp. 5; long. scut. 4,25, lat. scut. 4; palpi 9; pedes I 13, II 25, III ?, IV 24.

Patria: America septentrionalis. Specimen unicum vidi, in republica Texas captum, quod ill. SIMON mihi benevolentissime dedit, quod feminam judico.

Remark: As ROEWER (1913, p. 437; Weberkn. p. 575) has described a species closely related to this, but not identical, under the name of *Parastygnellus simplex*, the editor has altered the name of the present species to *S. simonis*.

Stygnus aggerum n. sp.

Stygnus aggerum Sorensen in manuscr.

Stygnellus ferrugineus Roewer, 1913, p. 435 (nec PERTY).

Stygnellus ferrugineus Roewer, Weberkn. d. Erde, 1923, p. 574.

5,5 mm longus, castaneus spinis partim fulvo-testaceis; præter grana adsunt eminentiae majores binæ: areæ quartæ processus; limbus posterior granis binis majoribus et segmenta dorsalia libera processulis binis; antennarum pars globosa articuli primi granis acutis; palporum pars tibialis spinis utrinque quinis armata. Articuli tarsales 6, 9, 6, 7. Processus terminalis unguiculis paulo brevior.

Tumuli oculiferi parvi lœves, æque longe a margine exteriore quam a linea

media corporis separati; a margine anteriore scuti duplo latius quam a sulco transverso primo remoti. Tuber interoculare humiliter conicum, duplo latius quam altius granis parvis parce ornatum; processus a tubere ipso manifeste limitatus, leviter proclivis, procere conicus obtusus, ipso tubere paullo altior, cuius basis paullo ante marginem anteriorem oculorum sita est.

Scutum ante marginatum, sat alte convexum, in lateribus levissime arcuatum. Sulci transversi primus et quartus profundi, manifeste procurvi, secundus leviter recurvus. Limbus anterior antennis emarginatus, discretus, ordine granulorum sat densorum lateraliter ornatus. Limbus lateralis angustus sat manifesto, ante exteriore, granorum parvorum, ante densorum. Emissarium liquoris foetidi angustum. Areæ I lœvis, fossula posteriore in mare quam in femina majore, ceteræ irregulariter parce rugosæ, granis haud parce armatæ, quorum aliquot ordines singulos formantia, paullo tamen manifesto, præsertim in area tertia, ceteris majora. Processus areæ IV leviter divergentes, fortiter reclines, vix recurvi, subacuti, paullo longiores quam tuber interoculare et processus ejus conjuncta, distantia interapicali in femina duplo, in mare paullo breviores; pars basilaris leviter dilatata granis parvis ornata. Limbus posterior et segmenta dorsalia libera tria anteriora ordine singulo granorum densorum vicissim majorum et parvorum, quorum duo limbi posterioris ceteris majora; segmenta tria anteriora processulis binis (interdum trinis) conicis subacutis. Segmentum anale dorsale granis inæqualibus dispersis. Coxæ et ventrale primum granis dispersis sat densis; anale ordinibus duobus, limbus posterior ventralis primi et ventralia cetera ordinibus singulis granorum parvorum densorum.

Antennarum robustarum pars subglobosa articuli primi granis acutis tribus posterioribus supra prædicta. Articulus secundus supra articulum basalem vix conice elevatus.

Palporum pars trochanterica brevis spinis parvulis inferioribus duabus et tuberculo procurvo superiore. Pars femoralis femore I paullo tenuior, versus apicem subito leviter arcuata. Pars patellaris parte tibiali non dimidio longior, clavata. Pars tibialis spinis proceris utrinque quinis (interior tertia vulgo brevior in specimine uno deest), quarum longissimæ quartæ diametro articuli dimidio longiores. Pars tarsalis parte tibiali manifeste brevior, spinis exterioribus quatuor et interioribus quinque, quarum primæ et interior tertia proceræ, ceteris robustioribus duplo longiores. Unguis procerus parti tarsali subæqualis.

Pedes haud robusti. Coxæ IV (maris et feminæ) processulo exteriore apicali acuto bigemino (i. e. in basi cum tuberculo inferiore confluente). Trochanteres IV (maris et feminæ) processulis parvis apicalibus superiore et interiore et minore exteriore. Femora I—II subrecta, III et IV arcuata; femora omnia et patellæ et tibiæ granulis ubiqui, III—IV feminæ ordine inferiore granorum acutorum, II, III, IV processulis parvis apicalibus dorsalibus binis, II perparvis obtusis, III et IV acutis. Calcanei I astragalo plus quam duplo brevior, II paullo longior quam crassior, III et IV æque crassi atque longi. Articuli tarsales: 6, 9—10, 6, 7. Processus terminalis unguiculis paullo brevior et vix tenuior. Scopula tenuis, pili vix dilatati.

Differentia sexualis haud magna. Eminentiae scuti maris paullo robustiores quam feminæ. Antennæ maris quam feminæ robustiores, articulus secundus in mare quam in femina alteriore elevatus, pars chelata maris leviter compressa; digitæ maris in basi leviter hiantes, mobilis sat inclinis. Femora III et IV in mare robustiores quam in femina, in mare ordinibus inferioribus binis, III tuberculorum, IV processulorum apicem versus majorum, acutorum serrata. Patella IV maris processulorum acutorum corona apicali, tibia IV maris processulis apicalibus inferioribus duobus.

Castaneus, apices processuum areæ IV et processus interocularis et processulorum segmentorum liberorum fulvo-testacei. Pedes corpore paullo dilutiores; tarsi II nigrantes, ceteri fusco-testacei; antennæ et palpi sordide fulvo-testacei. Tuber interoculare punctulis dilutis densis (granulis), quæ in animale sicco non visa sunt.

Long. corp. ♀ 5,2; long. scut. 4,5, lat. scut. 4,2; palpi 7; pedes I 10, II 17,5, III 13, IV 18,5.

Long. corp. ♂ 4,5; long. scut. 4, lat. scut. 3,6; palpi 6,5; pedes I 9,5, II 17, III 13, IV 16,5.

Variatio: Spina interior tertia partis tibialis in specimine uno deest.

Patria: Venezuela. Animalia quatuor (feminas tres et marem unum) vidi, a Dr. F. MEINERT ad Las Trinchéras mense Novembre 1891 capta, et in Museo zool. Hafniense asservata.

Remark: This species is identical with a species from Guyana, which ROEWER mentions under the name of *St. ferrugineus* Perty. ROEWER certainly did not find any scopula in his material, but as the scopula is only slightly developed in SØRENSEN's specimens, I do not believe — as said above — that this difference is a real one. Otherwise the species agree perfectly. On the other hand, it is questionable if this species is really identical with *ferrugineus* Perty. This latter was redescribed by C. L. KOCH (Arachn. V. 7, p. 26—28, fig. 550), who among others things remarks: "Kopf, Vorder-, Mittel- und Hinterthorax durch tiefe Furchenrinnen getrennt", "auf dem Hinterthorax zwei kurze... spitze Dorne" and (about pars tibialis) "das vierte [Glied] kurz und dick, ziemlich gleichdick" — which characters do not quite agree with the present species. KOCH's description is rather insufficient for identifying the species, and therefore SØRENSEN and ROEWER — none of whom has seen either PERTY's or KOCH's specimens — do not agree in their interpretation. ROEWER regards the present species as identical with *ferrugineus* KOCH, while SØRENSEN, basing on the above-mentioned quotations from KOCH, thinks that it is not the same species, though, however, it is a near relative of it.

Ideostygnus n. gen.

Tuber oculiferum commune non adest; oculi inter se late disjuncti, uterque suo tumulo impositus; pars media areæ inter oculos posita, convexa, ante rotundata declivis eminentiis majoribus destituta.

Scutum dorsale sulcis transversis quatuor divisum, quorum anteriores duo in medio confluunt. Scutum rectangulum ultra apices coxarum IV prominens; area I sat alte convexa.

Area quarta scuti dorsalis eminentiis majoribus ambabus prædita.

Pars maxillaris tubere superiore basali granulato prædita; supra partem palpi-
geram porrectam conicam granis inferioribus præditam tubercula basalia duo adsunt.

Palpi corpore multo longiores; partes femoralis et patellaris teretes, graciles,
inermes; pars patellaris clavata parte tibiali longior; pars tibialis robusta compressa;
in basi crassior; pars tarsalis parte tibiali brevior, compresso-fusiformis, præter spinas
ordinibus inferioribus duobus sibi propinquis setarum gracilium armata, unguem
adductum excipientibus.

Coxæ IV non dilatatae inermes.

Scopula densa, pili vix spathulati.

Unguiculi III et IV sat late divergentes, fortiter incurvi, integri.

Differentia sexualis structura antennarum et armatura femorum IV demon-
stratur.

Ideostygnus lœvis n. sp.

6,5 mm longus, rubro-cinnamomeus; præter granula adsunt eminentiæ majores
binæ: areæ quartæ processus, areæ primæ grana; antennarum pars subglobosa articuli
primi lœvis; palporum pars tibialis spinis exterioribus sex et interioribus quinque
armata. Articuli tarsales 7—8, 18, 6, 7. Processus terminalis unguiculis suo dimidio
brevior.

Tumuli oculiferi parvi, rotundate conici, lœves, a linea media corporis plus
quam dimidio latius quam a margine laterali scuti separati, plus quam dimidio
longius a margine anteriore scuti quam a sulco transverso primo disjuncti.

Scutum: area prima altior quam quarta. Limbus anterior latus versus discretus et
hic granulis paucis. Limbus lateralis sat latus, carina submedia præditus, usque ad
sulcum transversum secundum ordine granorum remotorum parvorum, deinde lœvis
et hic et ibi punctis impressis ornatus. Orificia glandularum foetidarum parva oblique
angusta, orificia viarum urinariarum parva conspicua. Area prima lineola impressa
transversa, in medio interrupta, inter oculos posita; in mare lineis impressis duabus,
quarum anterior recurva non interrupta; area prima granis paucis parvis, quorum
ambo anteriores majora, secunda granulis pusillis ambobus (in femina grana minora
sunt, granula ambo areæ secundæ desunt). Area quarta processibus proceris, pera-
cutis, suberectis, spatio interapicali æqualibus. Dorsum ceterum et venter lœvia. Coxæ
ordinibus granorum ornatae quæ in coxa I partim conica sunt.

Antennarum articulus primus granis inferioribus tribus infra ornatus, ceterum
lœvis. Articulus secundus supra articulum basalem elevatus, pars elevata subconica,
rotundata, lœvis nitida.

Palporum pars trochanterica tuberculis parvis inferioribus duobus. Pars femoralis
femore I crassior, tuberculo inferiore basali simili munita, ceterum lœvis, apicem
versus crassior. Pars patellaris parte tibiali vix duplo longior. Pars tibialis spinis
proceris exterioribus sex et interioribus quinque, quarum longissimæ primæ, dia-
metro articuli aliquanto longiores, quibus secundæ, exterior quinta, interior quarta
paullo breviores sunt; exterior quarta parvula. Pars tarsalis parti tibiali æqualis

spinis exterioribus quinque et interioribus sex, quorum primæ et interiores tertia et quinta ceteris longiores sunt. Unguis parte tarsali vix brevior.

Pedes longi graciles, laeves (vide differentia sexualis). Femora I arcuatum, cetera recta, omnia eminentiis dorsalibus apicalibus destituta. Patella IV processulo inferiore apicali curvato (majore in mare quam in femina). Calcanei I astragalo plus quam duplo longior, II et III astragalo æqualis, IV astragalo triplo breviores. Articuli tarsales 7(♀—♂)—8(♂), 16(♂)—18—19(♀), 6, 7. Processus terminalis unguiculis sua dimidia brevior. Scopula densa e pilis mollibus rotundatis, vix spathulatis composita.

Differentia sexualis: Pars elevata antennarum articuli secundi maris parte cetera (usque ad articulationem articuli tertii) nec longior, nec tenuior, feminæ manifesto tenuior et triplo brevior; maris digitus mobilis digito immobili, dente magno subbasali armato, multo longior et dente magno, apicem prope sito, armatus. Trochanter IV processulis dorsali medio et intero-inferioribus duobus, quorum vestigia in femina adsunt. Femur IV maris leviter incrassatum, ordinibus superiore et extero-inferiore granorum humilium rotundatorum præditum et ordine intero-inferiore leviter arcuato processulorum serratum, femur IV feminæ cylindricum laeve.

Nitide rubro-cinnamomeus, areæ I et IV saturatores; antennæ maris subnigræ, palpi et pedes fulvo-testacei, fusco punctati; femur IV maris rubrum.

Long. corp. ♂ 6,5; long. scut. 5, lat. scut. 4,25; palpi 16; pedes I 20, II 36, III 28, IV 35.

Long. corp. ♀ 6; long. scut. 4,75, lat. scut. 4; palpi 17; pedes I 20, II 37, III 28, IV 36.

Variatio: Femur III maris unius processulo parvo, apice propinquuo intero-inferiore armatus. Processuli dieti femoris IV maris unius subacuti et diametro articuli paullo breviores, duorum obtusi et diametro dicto multo breviores.

Patria: Brasilia. Mares tres et feminas duas, in Para in nidis Termitidarum arboricorum captas vidi.

Remark: This genus and species has not been described by ROEWER. According to the description the genus seems to be related to *Fonteboatus* Roewer (ROEWER, Abh. nat. Ver. Bremen, XXVIII, p. 156), which, however, among other things lacks a scopula.

Stygnidius Simon.

Stygnidius Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 223.

Heterostygnus + *Stygnidius* Roewer, Arch. f. Naturg. LXXIX, A 5, 1913, p. 445, 455.

Heterostygnus + *Stygnidius* Roewer, Weberkn. d. Erde, 1923, p. 577, 580.

Tuber oculiferum commune deest; oculi inter se late disjuncti, uterque suo tumulo impositus; inter tumulos eminentiæ (majores) desunt.

Scutum dorsale sulcis transversis quatuor divisum, sulci duo anteriores sulco longitudinali conjuncti. Scutum rectangulum, ultra apices coxarum IV paullum prominens. Area prima ceteris permulto major.

Area quarta scuti dorsalis eminentiis majoribus ambabus prædita.

Orificia glandularum foetidarum leviter tantum arcuata.

Mandibularum pars palpigera porrecta, robusta, breviter conica, tuberculis basalibus superioribus duobus et inferiore uno instructa.

Palpi corpore multo longiores, partes femoralis et patellaris teretes, graciles, inermes; pars patellaris clavata, parte tibiali longior; pars tibialis robusta, compressa, in basi crassior; pars tarsalis parte tibiali brevior, compresso-fusiformis, præter spinas ordinibus inferioribus ambobus sibi propinquis setarum armata, unguem adductum excipientibus.

Coxæ IV coxis III duplo latiores, eminentia exteriore apicali (sat) magna prædita.

Unguiculi III et IV deplanati, marginibus acutis, (præsertim intus) pectinati.

Differentia sexualis magnitudine et structura antennarum (teste ill. SIMON) demonstratur.

Stygnidius guérinii n. sp.

Stygnidius inflatus Simon in schedula.

2,5 mm longus, flavo-rufescens; area quarta scuti processibus ambobus robustis, brevibus prædita; coxæ IV læves; antennarum pars incrassata articuli primi granulis superioribus acutis parce prædita; palporum pars tibialis spinis utrinque quinis armata; patellæ III femoribus multo crassiores. Articuli tarsales 6, 10—11, 6, 7. Processus terminalis sat brevis.

Tumuli oculiferi parvi læves. Oculi a linea media corporis fere duplo quam a margine exteriore separati; a margine anteriore scuti quadruplo longius quam a sulco transverso primo remoti.

Scutum sat convexum, erga coxas III non angustius. Sulci transversi primus leviter, ceteri vix arcuati. Limbus anterior discretus. Limbus lateralis sat angustus, ordine exteriore granorum sat densorum ornatus; emissaria liquoris foetidi latissima, pone semper latiora. Areæ prima granis et granulis dispersis, secunda, tertia et quarta granis paucis (quaternis) ornatae. Processus areæ quartæ breves robusti, conici, spatio interapicali triplo breviores. Limbus posterior scuti et margo posterior segmenti ventralis primi ordinibus singulis granorum densorum; segmenta dorsalia libera duo anteriora et segmenta ventralia ordinibus singulis granorum; segmentum anale et coxæ lævia.

Antennarum pars incrassata articuli primi granulis superioribus acutis parce prædita.

Mandibularum pars palpigera articulo primo antennarum (saltem in mare) manifeste brevior.

Palporum pars trochanterica brevis; pars femoralis æque longa et crassa ac femur I; pars tibialis parte patellari vix tertia parte brevior spinis utrinque quinis longis armata, quarum longissima, exterior quarta, diametro articuli triplo longior; pars tarsalis spinis exterioribus sex aut septem, secunda et quarta ceteris longioribus, et interioribus quinque aut sex, prima longissima et tertia ceteris longioribus. Unguis procerus, parti tarsali longitudine æqualis.

Pedes breviores, III et IV ceteris manifeste robustiores. Coxæ IV (in mare saltem) tuberculo parvo exteriore, trochanteres IV corona media granorum ornati. Femora arcuata, I, II, III leviter. Patellæ III femoribus multo crassiores. Astragali (spurii) I et II spurie articulati; calcanei I et II breviores, III et IV breves. Articuli tarsales: 6, 10—11, 6, 7. Processus terminalis unguiculis duabus partibus brevior. Unguiculi III et IV dentibus interioribus quinis longis pectinati. Scopula adest.

Differentia sexualis (femina mihi incognita): Maris antennæ validæ, articulus secundus supra articulationem basalem sat alte, rotundate cylindrice elevatus.

Unicolore flavo-rufescens, area prima scuti et pedes punctis (eminentiis parvulis) rufis ornata; antennæ et palpi dilutiora, nitida, tarsi leviter infuscata.

Long. corp. 2,5; long. scut. 2,25, lat. scut. 2; palpi 4,5; pedes I 7, II 13, III 8, IV 11.

Patria: Guyana. Specimen unicum, marem, vidi, mihi ab ill. E. SIMON benevolentissime datum, nunc in Museo zool. Hafniense asservatum.

Remark: The specimen upon which the above description of *St. guérinii* is based, was presented to Dr. SØRENSEN by E. SIMON under the label *Stygnidius inflatus* Sim., but this is due to a wrong determination of the specimen. The real *Stygnidius inflatus* Sim., which has been redescribed by ROEWER (see Weberkn. p. 580), is much bigger (5 mm), has much longer dorsal spines, a different armature of the proximal joints of pes IV and more than six tarsal joints in pes III. — *St. guérinii* is nearly related to ROEWER'S *Heterostygnus minutus* (Weberkn. p. 577) but it differs from this latter by the different armature of pes IV of the male.

Eutimesius Roewer.

Zmotus Simon in schedula.

Zmotus Sørensen in manuscr.

Eutimesius Roewer, Arch. f. Naturg. LXXIX, A 5, 1913, p. 453.

Eutimesius Roewer, Weberkn. d. Erde, 1923, p. 579.

Tuber oculiferum commune non adest; oculi inter se late disjuncti, uterque suo tumulo impositus; inter (et ante) tumulos eminentia (major) unica, mutica adest.

Scutum dorsale sulcis transversis quinque¹⁾ divisum, sulci paullum arcuati, duo anteriores sulco longitudinali conjuneti. Scutum subrectangulum, ultra apices coxarum IV pone longe prominens.

Area quarta scuti dorsalis eminentiis majoribus ambabus prædicta (quae eminentiae speciei solius mihi cognitæ sibi contiguæ eminentia unica esse prope videntur.

Orificio glandularum foetidarum sat longa, angusta, sublibrata.

Supra partem palpigeram mandibularum porrectam robustam, breviter conicam adest tuberculum exterius rotundatum.

¹⁾ Sulci quarti procurvi media pars sola sat manifesta, pars cetera obsoleta. Sulci ceteri profundi. Itaque sulcus quartus oculum facile effugit.

Palpi corpore multo longiores; partes femoralis et patellaris teretes, graciles, inermes; pars patellaris clavata, parte tibiali longior; pars tibialis robusta, compressa, in basi crassior; pars tarsalis parte tibiali brevior, compresso-fusiformis, præter spinas ordinibus inferioribus ambobus sibi propinquis setarum armata, unguem adductum excipientibus.

Pedes longissimi graciles, coxae IV coxis III dimidio latiores, (saltem feminæ) sine eminentiis mentione dignis.

Unguiculi III et IV marginibus acutis, deplanati, (præsertim intus) pectinati. Differentia sexualis in armatura pedum III et præsertim IV adest.

Remark: The diagnosis above is that given by SØRENSEN for the genus *Zmotus*, then new to science. There is no doubt that *Zmotus* is really identical with *Eutimesius* Roewer (described 1913).

Eutimesius miles n. sp.

Zmotus miles Simon in schedula.

Zmotus miles Sørensen in manuscr.

4,5 mm longus, læte dilute cinnamomeus, lineis et parvis maculis niveis ornatus; eminentia interocularis est tuber; area quarta scuti dorsalis processibus ambobus longis, sibi contiguis prædita; palporum pars tibialis spinis utrinque quinis armata; unguis parte tarsali haud paullo brevior; femora recta, III et IV processulis apicalibus singulis prædita. Articuli tarsales: 7, 17—22, 9, 11—12; processus terminalis unguiculis plus quam dimidio brevior.

Tumuli oculiferi prominentes, quamquam parvi, læves. Oculi a linea media corporis paullo longius quam a margine exteriore scuti separati, a margine anteriore scuti duplo longius quam a sulco transverso primo remoti. Eminentia interocularis, erga marginem anteriorem oculorum posita, est tuber paullum, transversum, late conicum, rotundatum, duplo latius quam altius, granis humilibus instructum.

Scutum convexum, erga coxas III non angustius, pone paullulo dilatatum. Limbus anterior discretus, leviter tumidus, laevis, angulis rotundatis. Limbus lateralis sat angustus, ordine exteriore granulorum parvorum remotorum ornatus; emissarium liquoris foetidi latissimum, pone latius. Areæ prima laevis, secunda et tertia granis binis. Processus areæ quarte longissimi, proceri, per totam longitudinem sibi contigui, aliquantum reclines, in basi granis ornati, sulco quarto contigui. Limbus posterior scuti et segmenta dorsalia libera duo anteriora ordinibus singulis granulorum; segmenta ventralia quinque anteriora ordinibus singulis, anale ventrale ordinibus duabus granulorum parvorum ornata. Coxæ granis scabrae.

Spiracula magna.

Antennarum robustarum pars subglobosa articuli primi granulo posteriore ornata.

Palporum pars trochanterica brevis; pars femoralis femore I crassior, recta; pars patellaris parte tibiali paulo longior, recta; pars tibialis spinis utrinque quinis, quarum longissimæ diametro articuli duplo longiores; pars tarsalis spinis utrinque septenis. Unguis procerus parte tarsali haud paullo brevior.

Pedes graciles. Trochanteres spurii III haud manifesti. Femora recta, III et IV granis manifestis et singulis processulis apicalibus praedita. Astragali (spurii) spurie articulati, I calcaneo subæqualis, II calcaneo dimidio, III duplo, IV triplo longiores. Fines astragalorum et calcaneorum I et II haud faciles visu. Articuli tarsales: 7(—8), 17—22, 9(—11), 11—12 (in specimine altero articuli IV alterius pedis 3: regenerati). Processus terminalis robustus, unguiculis plus quam dimidio brevior. Unguiculi III et IV dentibus interioribus quinque robustis longis pectinati.

Differentia sexualis? (mare adhuc incognito).

Læte dilute cinnamomeus, lineis (vel vittis angustis) et maculis parvis niveis notatus: limbus anterior scuti linea transversa in medio interrupta; area quinta linea procura; tumuli oculiferi orbiculo intus aperto cincti; area secunda maculis ambabus parvis, sibi propinquis; limbi laterales maculis oblongis trinis; segmentum

dorsale tertium linea una et segmentum anale ventrale lineis ambabus. Venter obscurior; antennæ, palpi, pedes I et II dilutiora, fere flavescentia.

Long. corp. 4,5; long. scut. 4, lat. scut. 3,5; palpi 10; pedes I 18, II 41, III 27, IV 37. (Processus areæ quartæ 2,5).

Patria: America septentrionalis. Specimina duo, feminas (alterius ovipositore protruso) vidi, in republica Texas collecta, quæ ill. SIMON mihi benevolentissime dedit et nunc in Museo zool. Hafniensi asservata sunt.

Fig. 10. *Eutimesius miles* n. sp.
A Tarsi IV apex. B Unguiculus tarsi IV
a latere mediali inspecta. (W. Sør. del.)

Remarks: This species from Texas is closely related to ROEWER'S *E. simonis*, which latter was caught in Bresil (Amazonas). As the interocular tubercle of *simonis* is higher than broad (not broader than high) and as the granulation of this tubercle, of the scutum (including the coalesced spines) and of the free abdominal somites is much better developed in *simonis* than in the present form, I think that they are different species. It may also be mentioned that the claw of the tarsal part is distinctly shorter than the joint itself in the present species, but distinctly longer in *simonis*.

The regenerated left pes IV consists of two rather long proximal joints of almost equal length, and of a much shorter terminal one without terminal process, but with scopula and a single very short and clumsy pectinate claw.

Stygnoplus Simon.

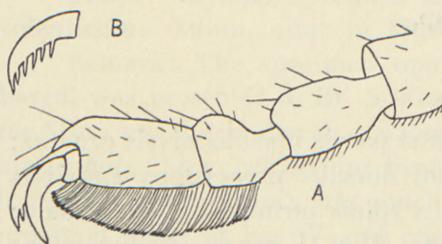
Stygnus p. p. C. L. Koch, Uebers. d. Arachnidensyst. fasc. II, 1839, p. 11.

Stygnoplus Simon, Ann. Soc. Ent. Belg., 1879, p. 222.

Stenostygnellus + *Stygnoplus* Roewer, Arch. f. Naturg. LXXIX A 4/5, 1913, p. 165, 448.

Stenostygnellus + *Stygnoplus* Roewer, Weberkn. d. Erde, 1923, p. 460, 578.

Tuber oculiferum commune non adest; oculi inter se late disjuncti, uterque suo tumulo impositus; inter (et ante) tumulos adest tuber eminentia unica instructum.



Scutum dorsale rectangulum, ultra apices coxarum IV longe prominens, sulcis transversis quinque divisum, quorum primus (fortiter) et quartus et quintus procurvi, tertius subrectus, secundus bipartitus, utraque parte per se sulcum primum attingente.

Area quarta eminentiis majoribus ambabus instructa.

Orificia glandularum foetidarum parva, angusta.

Pars palpigera mandibularum producta, breviter conica, undique sat dense granulata, eminentiis majoribus destituta.

Palpi corpore multo longiores; partes femoralis armata et patellaris inermis teretes, graciles; pars patellaris clavata, parte tibiali non longior; partes tibialis, in basi crassior, et tarsalis robustæ, non compressæ; pars tarsalis parte tibiali brevior, ordinibus inferioribus spinularum destituta.

Coxæ IV coxis III dimidio latiores.

Pedes breviores, I et II graciles, III et IV plus minusve robusti.

Unguiculi III et IV intus modo pectinati, late divergentes.

Differentia sexualis magnitudine antennarum et crassitudine (et armatura) femorum, patellarum, tibiarum (nec autem coxarum) III et IV demonstratur.

Remark: The present genus includes the two Roewerian genera *Stygnoplus* and *Stenostygnellus*. The latter includes but one species, viz. *flavolimbatus* Roewer, which together with the new species *marginalis* (described below) will form a natural group, possibly with generic range (*Stenostygnellus*).

Conspectus specierum hic descriptarum.

1. Palporum pars femoralis ordine inferiore processulorum parvorum armata; coxæ IV muticæ:
 - A. Cinnamomeus *forcipatus* C. L. Koch.
 - B. Nitide fusco-castaneus *meinerti* n. sp.
2. Palporum pars femoralis tuberculo inferiore basali munita; coxæ IV processulo instructæ *marginalis* n. sp.

Stygnoplus forcipatus C. L. Koch.

Stygnus forcipatus C. L. Koch, Arachniden XII, 1848, p. 19.

Stygnoplus forcipatus Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 222.

Stygnoplus forcipatus Roewer, Weberkn. d. Erde, 1923, p. 579.

5,5 mm longus, cinnamomeus, processus tuberis interocularis sublaevis altitudine ipsi tuberi subæqualis; sulcus quartus debilis; limbus anterior tuberculis suberectis ambobus; area quarta processibus ambobus, reclinibus, longis acutis; palporum pars femoralis femore III paullo tenuior, ordine inferiore processulorum parvorum armata, pars tibialis spinis utrinque quinis. Coxæ IV muticæ; femora II processulis parvis apicalibus singulis, III et IV binis; calcaneus I astragalo æqualis; articuli tarsales 6, 17, 7, 8.

Tumuli oculiferi sat magni, conici, lœves, a linea media corporis dimidio fere

longius quam a margine laterali scuti separati, a sulco transverso primo paullulum (non diametro sua) remoti, a margine anteriore scuti longe recessi. Tuber interoculare subconicum, latius quam altius, ante oculos positum, sublæve; processus ab ipso tubere manifesto limitatus, suberectus, rectus, altitudine tuberi subæqualis, conicus, subacutus.

Scutum sat alte convexum, ante leviter emarginatum, angulis anterioribus rotundatis. Sulcus quartus debilis. Limbus anterior discretus, sat tumidus, tuberculis ambobus, suberectis, conicis, obtusis, supra suum palpum positis. Limbus lateralis granulis parvis paucis ornatus. Emissarium liquoris foetidi latum, pone semper latius. Area prima granulis paucis dispersis, ceteræ ordinibus singulis granorum rotundorum paucorum prædictæ. Processus areæ quartæ divergentes, reclines, in basi dilatati, ceterum procere conici, acuti, longi, spatio interapicali pæne æquales. Limbus posterior scuti et segmenta dorsalia tria anteriora ordinibus singulis granorum minorum paucorum; anale dorsale impressione transversa præditum, ceterum læve. Coxæ et ventrale primum granis dispersis sat densis, anale ordinibus duobus, cetera ventralia ordinibus singulis granulorum.

Antennarum pars globosa articuli primi granis exterioribus parvis prædita, ceterum lævis.

Palporum pars trochanterica brevis processulo superiore uno et tuberculis inferioribus duobus munita. Pars femoralis subrecta, apicem versus manifesto incassata, deinde iterum angustata, femore II manifesto crassior, femore III paullo tenuior, granulis undique ornata et ordine inferiore processulorum parvorum (s. tuberculorum) armata conicorum, obtusorum, circiter octo, apicem articuli versus majorum. Pars tibialis quam pars patellaris subrecta vix longior, spinis utrinque quinis haud multum inæqualibus, quarum longiores diametro articuli æquales. Pars tarsalis spinis exterioribus octo et interioribus sex armata, quarum utrinque binæ ceteris robustis duplo longiores. Unguis procerus, parte tarsali paullo brevior.

Pedes I quam II manifesto graciliores, III et IV sat robusti. Coxæ IV muticæ. Trochanteres III et IV tuberculis conicis prædicti, quorum apicalia trochanteris IV ceteris majora. Femora II subrecta, cetera leviter arcuata, granulis ubique prædita, II processulis parvis apicalibus porrectis singulis posterioribus, III et IV binis, quorum posterior major. Calcanei I æque longus ac astragalus; II et III articulo tarsali primo manifeste, IV vix longiores. Articuli tarsales (modo in mare uno enumerati): 6, 17, 7, 8. Processus terminalis unguiculis duplo brevior. Dentes unguiculorum quinque longi, acuti, sensim longiores.

Differentia sexualis: Mas quam femina major. Scutum feminæ rectangulum, maris pone coxas III paullulo angustius, in lateribus levissime arcuatus. Antennarum articulus secundus feminæ geniculate elevatus, maris valde inflatus; pars elevata vix compressa, rotundata, nitida, præsertim ante impresse punctata, ceterum lævis, parte cetera manifesto brevior. Digi forcipis maris in basi hiantes, mobilis quam immobilis paullo longior, dentibus magnis duobus armatus. Processuli inferiores partis femoralis palporum maris quam feminæ majores. Femora III et IV feminæ ordinibus inferioribus

granorum, maris (præsertim IV) incrassata, ordinibus inferioribus binis eminentiarum robustarum, conicarum, leviter curvarum serrata, sensim longiorum, quarum ultiores sunt processuli acuti; quæ eminentiae in femore III remotæ, in femore IV densæ et majores, præter quas femora IV ordine superiore submedio tuberculorum similiūm prædicta sunt. Patellæ IV maris ordine superiore tuberculorum et processulis robustis apicalibus tribus. Tibiæ IV maris subfusiformes, ordinibus inferioribus duobus et superiore uno, ultra medium positis, processulorum conicorum, curvorum, acutorum, quorum superiores majores.

Cinnamomeus; limbus posterior cinnamomeo-luteus; segmenta dorsalia omnia luteo marginata. Antennæ olivaceo-testaceæ, digitis rufis; palpi olivaceo-testacei, nigropunctati; pedes obscure olivaceo-rubo-testacei; femora et tibiæ IV maris cinnamomea.

Long. corp. 5,5; long. scut. 4,75, lat. scut. 4,5; palpi 11; pedes I 13, II 25, III 18, IV 23.

Patria: Columbia. Exempla siccata quatuor, tres mares et feminam unam, in Museo Berolinensi vidi — quæ, quamquam "*Stygnus inflatus* Gerv." nominata, tamen exempla typica a C. L. Koch descripta, esse judico.

Stygnoplus meinerti n. sp.

6,5 mm longus, nitide fusco-castaneus, processus tuberis interocularis granulatus, ipso tubere altior; sulcus quartus ceteris debilior; limbus anterior tuberculis suberectis duobus vel tribus; area quarta processibus ambobus reclinibus, longis acutis; palporum pars femoralis femore III in femina tenuior, in mare crassior, ordine inferiore processulorum parvorum armata; pars tibialis spinis utrinque quinis. Coxæ IV submuticæ; femora II processulis apicalibus singulis, III et IV binis; calcaneus I astragalo paullo brevior; articuli tarsales 6, 15—16, 7, 8.

Tumuli oculiferi sat magni, conici, læves, a linea media corporis dimidio fere longius quam a margine laterali scuti separati, a sulco transverso primo paullulum (non diametro sua) remoti, a margine anteriore scuti longe recessi. Tuber interoculare ante tumulos positum, subconicum, latius quam altius, dense granulatum, processus ab ipso tubere manifeste limitatus, leviter, manifesto tamen, proclivis, rectus, ipso tubere altior, conicus acutus.

Scutum sat convexum, ante et pone sensim paullo angustius quam adversus coxas IV, angulis vix rotundatis. Sulcus quartus non tam latus et profundus quam ceteri, $\sim\sim$ -formis (δ obsoletus). Limbus anterior antennis emarginatus, discretus, sat tumidus, præter grana remota pauca tuberculis utrinque duobus vel tribus suberectis, subconicis, obtusis, supra palpos positis; pars media dense subtilissime granulata. Limbus lateralis haud latus ordine exteriore granorum, in mare parvorum, ante sat densorum et fossulis interioribus paucis ornatus. Emissarium liquoris foetidi sat latum pone sensim latius. Areæ leviter rugosæ, I impressionibus lunatis ambabus transversis ante suum tumulum oculiferum positis, in mare levibus; II, III, IV, V ordine singulo in medio late interrupto granorum sat magnorum in femina, haud magnorum in mare, rotundatorum; in area II utrinque 2—3, in area III

utrinque 3—4, in IV 2—3, in area V paullo minoribus 4—5. Processus areae IV divergentes, in femina fortiter reclines, conici, in basi vix manifesto dilatati, proceri acuti, longi, spatio interspinali ♀ paullo, in mare manifesto breviores. Limbus posterior et segmenta dorsalia libera omnia ordine singulo granorum minorum (in mare granulorum) haud densorum. Coxæ et ventrale primum granis sat magnis dispersis, sat densis; anale ventrale ordinibus duobus; margo posterior segmenti primi et cetera ventralia ordine singulo granorum parvorum densorum.

Antennarum robustarum pars incrassata granis exterioribus parvis, paucis, acutis praedita. Articulus secundus geniculate elevatus, granulis planis anterioribus armatus.

Palporum pars trochanterica brevis, processulo superiore uno et spinis inferioribus duabus, quarum pars apicalis est seta. Pars femoralis subrecta, apicem versus manifesto incrassata, deinde iterum angustata, femore II manifesto crassior, femore III tenuior in femina (in mare crassior), ubique granulosa (granulis ♀, granis ♂), et ordine inferiore processulorum parvorum (i.e. tuberculorum) armata, subconicorum, obtusorum, sex aut septem in femina, decem in mare, quorum apicalia paullo majora. Pars tibialis parte patellari subrecta paullo, sed manifesto longior, spinis utrinque quinis haud multum inaequalibus armata, quarum longiores diametro articuli subaequales. Pars tarsalis spinis exterioribus (7—)8, et interioribus 6, quarum binæ ceteris robustis duplo longiores. Unguis procerus, parte tarsali paullo brevior. Pars tarsalis vittis inferioribus duobus spinularum armata, spinulæ inferiores partis tarsalis perpusillæ, oculum facile effugiunt; pars tibialis similibus dispersis.

Pedes I quam II manifesto graciliores, III et IV sat robusti, coxæ IV (♂—♀) submuticæ (i.e. grano magno exteriore subapicali). Trochanter IV (♂—♀) processulo superiore subapicali et parvo interiore apicali rectis, conicis, acutis. Femora II—III recta, I et IV leviter arcuata, ubique granulata, processulis apicalibus dorsalibus parvulis, acutis, II unico (posteriore), III et IV binis (posterioribus majoribus). Calcaneus I astragalo paullo brevior, II—III astragalo subaequales, IV duplo fere brevior. Processus terminalis brevis, curvus, unguiculis duplo brevior, iisque crassitudine subaequales. Articuli tarsales 6, 15—16 (♀ pes unus), 7, 8. Scopula densa adest.

Differentia sexualis: Antennarum articulus secundus maris elevatus; pars elevata (desuper visa) trilateralis, ante dense impresse punctata; digitus in basi leviter hiantes, mobilis leviter inclinis. Femur IV maris ordine exteriore processulorum acutorum, densorum, apicem versus majorum, infra serratum. Patella IV corona apicali processulorum trium. Tibia IV apicem versus ordinibus inferioribus duobus processulorum parvorum acutorum serrata.

Nitide fusco-castaneus; apices processus interocularis et processus areae quartæ dilutiores (fulvo-testacei); pedes fulvo-testacei, nebulose nigro punctati; tarsi II nigricantes, ceteri partim infuscati. Antennæ et palpi testaceæ; pars femoralis nebulose nigro annulata. Tuber interoculare punetis dilutis (granulis) ornatum densis.

Long. corp. 4,6; long. scut. 4,5, lat. scut. 4,1; palpi 11; pedes I 11,5, II, 25,5, III 18, IV 23.

Patria: Venezuela. Specimina duo vidi, marem unum ad St. Estéban, et feminam unam ad Las Trincheras mense novembre 1891 a Fr. MEINERT capta et in Museo zool. Hafniensi asservata.

Remark: This species is closely related to *St. forcipatus*.

Stygnoplus marginalis n. sp.

5,5—6,5 mm longus, brunneo-rufus, parte posteriore limborum lateralium linea marginali lutea notata, in maculam pone dilatata; tuber interoculare processulo et granis deplanatis instructum; limbus anterior processulis suberectis ambobus; area quarta processibus ambobus, fortiter reclinibus, longis; sulcus transversus quartus acutus; palporum pars femoralis tuberculo inferiore basali armata; pars tibialis parte patellari vix longior; coxae IV processulo instructæ; femora II processulis apicalibus singulis, III et IV binis; calcaneus I astragalo duplo longior; articuli tarsales 7, 16, 8, 9.

Tumuli oculiferi parvuli, humiliter conici, læves, a linea media corporis haud multo longius quam a margine exteriore scuti separati, a sulco transverso paullum (vix longius quam diametrum suam) remoti, a margine anteriore scuti longe recessi. Tuber interoculare, ante oculos positum, magnum, conicum, granis deplanatis densis præditum. Processulus apicalis, ab ipso tubere manifesto limitatus, rectus, suberectus, procerus, subobtusus, altitudine ipsius tuberis duplo fere brevior.

Scutum convexum, præsertim pone; adversus coxas III et IV vix angustius. Limbus anterior discretus, processulis ambobus præditus, supra palpos positis, suberectis, conicis, processulo coxae IV brevioribus. Limbus lateralis granulis parvulis dispersis. Emissarium liquoris foetidi latum. Areæ granis parvis et granulis dispersis. Processus areæ quartæ fortiter reclines, vix divergentes, primum late, deinde procere conici, acuti, spatio interapicali longiores. Limbus posterior et segmenta dorsalia libera tria anteriors ordinibus singulis granorum magnorum; anale dorsale granulis paucis dispersis; anale ventrale granulis densis dispersis; coxae et ventrale primum granis et granulis, ventralia cetera ordinibus singulis granulorum.

Antennarum pars subglobosa articuli primi eminentiis posterioribus supra ornata, articulus secundus supra elevationem basalem elevatus.

Palporum pars trochanterica brevis, tuberculis inferiore et majore superiore munita. Pars femoralis recta, apicem versus sensim paullo crassior, femore II crassior, tuberculo inferiore basali armata, intus inermis. Pars tibialis parte patellari subrecta vix longior, spinis proceris, haud multum inæqualibus, exterioribus sex (aut septem, quum apicalis parvula advenit) et interioribus quinque. Pars tarsalis spinis inæqualibus, exterioribus (sex aut) septem et interioribus sex. Unguis procerus, parte tarsali paullo brevior.

Pedes I quam II manifesto brevior, III et IV perrobusti. Coxæ IV in utroque sexu processulo exteriore apicali procero, recto, obtuso. Trochanteres IV (præter grana) in utroque sexu processulo superiore et tuberculo inferiore, apicalibus, proceris, acutis. Trochanteres spurii I et II manifesti, III et IV obsoleti. Femora I leviter, II vix, III

et IV manifeste arcuata, II processulis apicalibus dorsalibus singulis (posterioribus), III et IV binis, quorum posterior major; I et II granulis, III et IV et tibia IV præter grana ordinibus inferioribus binis eminentiarum majorum, apicem articuli versus majorum. Metatarsi III et IV in utroque sexu tibiis multo tenuiores. Calcanei I astragalo saltem duplo longior, II astragalo subæqualis, III astragalo paullo brevior, IV articulo tarsali primo brevior. Articuli tarsales 7, (15—)16(—17), 8, 9. Processus terminalis unguiculis non duplo brevior. Dentes (interiores) unguiculorum III quinque et IV sex, proceri, teretes, acuti.

Differentia sexualis: Mas quam femina major. Antennarum maris validarum pars subglobosa articuli primi tuberculo exteriore apicali, magno, humili, rotundato. Articulus secundus feminæ levius elevatus, granis et granulis setiferis ante præditus, maris validus, inflatus, nitidus, præsertim ante impresse punctatus (ceterum lævis), cuius pars elevata, rotundata, vix compressa, parte altera paullo brevior. Digi maris in basi hiantes, mobilis quam immobilis plus quam dimidio longior, fortiter inclinatus. Femora, patellæ, tibiæ III et IV maris valde incrassata, eminentiis majoribus quam in femina prædicta, dum feminæ eminentiarum inferiorum ultimæ modo dicendæ sunt majores (processuli). Tibiæ III maris (neque feminæ) ordinibus inferioribus binis eminentiarum majorum præditæ.

Brunneo-rufus; sulci fusciores. Pars posterior limborum lateralium linea marginali lutea notata, in maculam pone dilatata.

Long. corp. ♀ 5,5 (<♂ 6,5); long. scut. ♀ 4,75 (<♂ 5,75), lat. scut. ♀ 3,75 (<♂ 5); palpi ♀ 9,5 (<♂ 11); pedes I ♀ 11, II ♀ 19, III ♀ 14 (<♂ 16), IV ♀ 18 (<♂ 20). Antennarum articulus secundus ♂ 5,75 longus, 3,5 crassus.

Patria: Columbia. Specimina quatuor vidi, marem unum et feminas duas (quorum patria incerta) in Museo Dresdenio asservata, marem siccatum in Museo Berolinense.

Remark: This species is nearly related to *Stenostygnellus flavolimbatus* Roewer (Weberkn. p. 460) but differs by the colour, by the armature of pars trochanterica and pes IV.

Nomoclastes n. gen.

Tuber oculiferum commune non adest; oculi inter se sat longe disjuncti, uterque suo tumulo impositus; inter tumulos sua crista eminentiarum ornatos eminentiæ majores desunt.

Scutum dorsale subrectangulum, sulcis transversis quinque divisum; sulcus primus valde procurvus sulco secundo parte sua media fere contiguus. Scutum ultra apices coxarum IV pone longe prominens. Area prima parte cetera scuti paullo brevior.

Area quarta scuti dorsalis eminentiis majoribus ambabus instructa.

Neque supra nec infra partem palpigeram mandibularum vix discretam, non productam, adsunt eminentiæ majores.

Palpi sat robusti, corpore breviore, partes femoralis (paullum) compressa, eminentiis armata, et patellaris (modo *Gonyleptis*) curvata, robustæ, sat breves; partes

tibialis, parte patellari longior, et tarsalis sat depressa oblique positæ, ita ut adductæ partem femoralem margine exteriore attingant.

Coxæ IV coxis III dimidio latiores, (saltem feminæ) sine eminentiis mentione dignis.

Articulus tarsalis ultimus III et IV in apice excavatus, quia apex plantæ alte bilobatus est. Scopula articuli tarsalis pænultimi III et IV sat rara, articuli tarsalis ultimi densissima.

Unguiculi III et IV magni, incurvi, integri.

Differentia sexualis incognita.

Remark: This genus shows similarity in some features to *Protimesius* Roewer (Weberkn. p. 575), but it differs from this latter e. g. in the well developed scopula, shorter palps, and 6 joints in the 1st leg.

Nomoclastes tædifer n. sp.

3,5 mm longus, lète rufo-testaceus; tumuli oculiferi crista granorum paucorum prædicti; limbus lateralis ordine submedio granorum et carinula exteriore ornatus; area quarta tuberculis ambobus humilibus; segmentum dorsale liberum tertium processibus ambobus; antennarum articulus primus tuberculis inferioribus duobus; pars femoralis palporum intus inermis. Pedes breves; femora arcuata, III et IV processulis apicalibus singulis prædita. Articuli tarsales 6, ?, 6, 7; processus terminalis unguiculis duabus partibus brevior.

Tumuli oculiferi humiles, rotundati, granis paucis ornati, cristam haud justam formantibus. Oculi duplo brevius inter sese quam a margine exteriore scuti separati; a margine anteriore scuti late, a sulco transverso primo tamen latius remoti.

Scutum convexum, erga coxas III et IV vix sinuatum, pone sensim manifeste latius. Sulci transversi manifesti, primus valde procurvus, sulco ----

formi pæne continuus, pars media areæ secundæ itaque brevissima; sulci ceteri recti. Limbus anterior vix discretus, tuberculis minoribus subrectis, conicis præditus, quorum utrinque aliquot sibi propinquæ. Limbus lateralis latus, ordine submedio granorum densorum et carinula exteriore ornatus; emissarium liquoris foetidi latum, pone latius. Area prima turbulis ambabus granorum paucorum ornata, post tumulos oculiferos positis, ceteræ ordinibus singulis granorum ornatae. Tubercula areæ quartæ humilia rotundata. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum densorum; tertium præterea processibus ambobus, reclinibus, rectis, conicis, subacutis, paullum divergentibus, spatio interapicali dimidio brevioribus. Segmentum anale (et dorsale et ventrale) læve; margo posterior segmenti ventralis primi et segmenta cetera ordinibus singulis granulorum. Coxæ granis magnis humilibus ornatae.

Spiracula (nec bulla) elevata; segmentum ventrale primum post spiracula tumidum.

Antennarum pars subglobosa articuli primi supra lævis, tuberculis exterioribus duobus pronis infra prædita, altero robusto conico acuto, altero subapicali minore.

Articulus secundus non geniculatus, ordine anteriore eminentiarum (granorum) ornatus.

Palporum pars trochanterica crassior quam longior, supra et infra alte convexa; pars femoralis femore IV haud paullo crassior, tuberculis setiferis inferioribus tribus brevibus robustis armata, uno subbasali, ceteris submediis; pars patellaris non duplo longior quam crassior, inermis; pars tibialis latior quam crassior, parte

patellari duplo fere longior, spinis utrinque quaternis sat robustis, sibi subæqualibus, diametro articuli longioribus; pars tarsalis parte patellari vix longior, spinis utrinque quaternis, primis et tertiosis ceteris longioribus. Unguis procerus, parte tarsali paullo brevior.

Pedes breves robustiores. Trochanteres IV intermes. Femora (saltem III et IV) arcuata, subtilliter coriacea, processulis apicalibus singulis exterioribus et granulis parvis remotis ornata. Calcani (spurii) I astragalo non dimidio brevior, III et IV sat breves, astragalis manifeste crassiores. Articuli tarsales 6, ?, 6, 7. Processus terminalis unguiculis duabus partibus brevior.

Fig. 11. *Nomoclastes tardifer* n. sp.
A Tarsi IV apex, a latere inspecta, B infra inspecta; C pili duo ex scopula.
(W. Sør. del.)

Differentia sexualis incognita (magnitudine et armatura antennarum forsitan demonstratur).

Unicolore læte rufo-testaceus.

Long. corp. 3,5; long. scuti 2,75; lat. scuti 2,5; palpi 2,75; pedes I 5, II ?, III 6, IV 8,5.

Patria: Columbia. Specimen unicum vidi, quod feminam judico, in collectione ill. comitis KEYSERLINGII asservatum.

Remark: The editor has not seen this species. It cannot be included in any of the Roewerian subfamilies.

Tegyra n. gen.

Tuber oculiferum commune manifestum adest, eminentiis majoribus ambabus (vel potius: cristis ambabus eminentiarum) præditum.

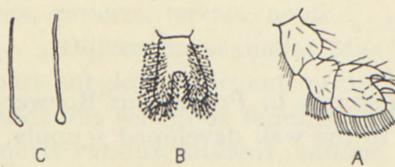
Scutum dorsale subrectangulum sulcis transversis quatuor divisum; sulcus primus manifeste procurvus, tertius leviter recurvus, ceteri subrecti; duo anteriores sulco longitudinali non conjuncti. Scutum ultra apices coxarum IV pone paullulo prominens.

Area quarta scuti dorsalis eminentiis majoribus ambabus prædita.

Orifia glandularum foetidarum sublibrata (processu magno compresso coxae II imposito partim obscondita).

Pars palpigera mandibularum non producta (ultra coxam I non prominens) tuberculis duobus conicis acutis instructa, altero superiore, altero inferiore.

Palpi sat robusti, corpore breviores; partes femoralis (paullum) compressa,



eminentiis armata, et patellaris (modo *Gonyleptis*) curvata robustæ, sat breves; partes tibialis, parte patellari longior, et tarsalis sat depressa oblique positæ, ita ut adductæ partem femoralem margine exteriore attingant.

Coxæ IV coxis III triplo fere latiores, eminentia exteriore præditæ.

Scopula quamquam manifesta, haud densa.

Unguiculi III et IV valde incurvi, integri.

Differentia sexualis armatura pedum IV verisimiliter demonstratur.

Remark: This genus is new to science, it has not been mentioned or described in ROEWER'S work. It cannot be included in any of his subfamilies.

Tegyra cinnamomea n. sp.

3,5 mm longa, unicolor cinnamomea; tuber oculiferum processibus ambobus et granis ambobus ornatum; area quarta scuti processibus ambobus; antennarum pars globosa articuli primi eminentiis duabus, altera inferiore, altera superiore; palporum pars femoralis intus inermis; coxæ I tuberculis singulis inferioribus apicalibus, robustis; femora II, III, IV tuberculis (vel processulis) apicalibus instructa. Articuli tarsales 6, 11—12, 7, 7. Processus terminalis robustus, unguiculis dimidio brevior.

Tuber oculiferum sat magnum, duplo latius quam altius, longius quam altius, supra excavatum, processibus ambobus, conicis, obtusis præditum, altitudine tuberis brevioribus; ante oculos medios magnos grana utrinque singula.

Scutum convexum, erga coxas III haud angustius, pone paullulum dilatatum. Sulci transversi manifesti. Limbus anterior leviter discretus, lœvis. Limbus lateralis latus, ordine exteriore granorum densorum ornatus, quorum unum postremorum ceteris majus, conicum; emissarium liquoris foetidi distincte limitatum, pone sensim latius. Area prima granis majoribus ambobus, quarta ordinibus duobus, ceteræ et segmenta dorsalia libera tria anteriora ordinibus singulis granorum, quorum ambo areæ secundæ ceteris majora. Processus medii areæ quartæ proceri, longe conici, acuti, leviter divergentes, leviter reclinæ, spatio interapicali paullo breviores. Segmentum anale, et dorsale et ventrale, sublæve; margo posterior segmenti ventralis primi et segmenta cetera ordinibus singulis granulorum. Coxæ granis magnis paucioribus ornatae.

Spiracula magna, paullum tantum arcuata.

Antennarum pars globosa articuli primi grano superiore (posteriore exteriore) uno conico acuto prædita, supra ceterum lœvis, et tubculo inferiore exteriore uno, vix procurvo, conico, acuto. Articulus secundus geniculatus (non autem elevatus).

Palporum pars trochanterica spinis inferioribus et superioribus binis; pars femoralis æque crassa ac femur IV, supra convexa, processulis (setula subapicali præditis) inferioribus quatuor (secundo parvulo) brevibus, robustis armata, intus inermis; pars patellaris dimidio longior quam crassior, inermis; pars tibialis robusta, parte patellari duplo fere longior, spinis utrinque quaternis, robustis, tertiiis diametro articuli dimidio longioribus; pars tarsalis parte tibiali paullo brevior, spinis

utrinque quaternis, primis et tertii ceteris multo longioribus. Unguis procerus, æque longus ac pars tarsalis.

Pedes breviores, haud graciles. Coxæ I tuberculis singulis inferioribus, apicalibus, robustis, conicis; IV processulo exteriore, apicali, conico, recto. Trochanteres IV tuberculis trinis ornati, subapicalibus. Femora leviter arcuata, sublaevia, II et III processulis apicalibus posterioribus singulis, IV binis (posteriore anteriore multo majore) proceris, leviter incurvis, acutis. Calcanei (spurii) I astragalo vix brevior, II astragalo spurie articulato triplo brevior, III astragalo plus quam duplo brevior, IV brevis. Articuli tarsales 6, 11—12, 7, 7.

Mas incognitus.

Unicolore cinnamomea. Limbus lateralis (partim) et membra dilutiiora.

Long. corp. 3,5; long. scuti 3,25, lat. scuti 3; palpi 3,25; pedes I 7, II 16, III 10,5, IV 14.

Patria: America septentrionalis. Specimen unicum vidi, in republica Texas captum, quod ill. SIMON mihi benevolentissime dedit, et quod feminam judico, nunc in Museo zool. Hafniensi asservatum.

Cosmetidæ C. L. Koch.

Cosmetides C. L. Koch, Uebers. d. Arachnidensyst. Fasc. II, 1839, p. 19.

Cosmetidae E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 189.

Cosmetoidæ W. Sørensen, Nat. Tidsskr. (3) XIV, 1884, p. 586.

Cosmetidae Roewer, Weberknechte d. Erde, 1923, p. 290. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 3, 1928, p. 546.

Tuber oculiferum (in generibus adhuc cognitis) eminentiis magnis destitutum.

Scutum dorsale sulcis transversis quinque (sæpissime primo excepto plus minusve obsoletis) divisum, quorum primus et secundus sulco longitudinali nunquam conjuncti sunt.

Emissarium liquoris foetidi efficit canalis (apertus) coxis I et II et processibus formatus dorso earundem coxarum impositis, liquorem foetidum ad ventrem dicens.

Spiracula maxima, lunaria, cancellata, nivea, quia cancelli tuberculis microscopis ornati sunt, post sulcum posita, coxam IV ab abdomen separantem.

Palporum pars femoralis percompressa; partes tibialis et tarsalis complanatae, aculeis parvis (aut setis robustis), marginibus extenuatis impositis, rarius spinis armatae; partes tibialis et tarsalis manifeste oblique positæ sunt, ita ut adductæ partem femoralem margine suo exteriore attingant. Unguis relative parvus.

Lobus maxillaris coxarum II deest.

Coxæ IV non aut vix dilatatae.

Femorum pars infima trochanterem spurium (præter trochanterem verum) non format (in generibus adhuc cognitis).

Astragali cum calcaneis sutura conjuncti.

Pars ultima tarsorum III et IV scopula destituta. Articulus ultimus tarsorum III et IV processu terminali præditus.

Pars ulterior tarsi I triarticulata.

Pedes I et II unguiculis singulis, III et IV unguiculis binis instructi sunt.

In pullis et animalibus adolescentibus palpi teretes et (parte trochanterica excepta) inermes; unguis vix prehensilis, subrectus, subulatus, in apicem tenuem productus. Quæ structura palporum animalium juniorum huic familiæ peculiaris.

Species, sæpissime discolores, in America, præsertim meridionali, indigenæ.

ROEWER has tried to subdivide this family (or more correctly the subfamily of the Cosmetinae) into natural groups and has accordingly established numerous genera using three main characters as the basis of his system, namely: 1) Tarsengliederung (und zwar ihrer Abschnitte), 2) Habitus und Stärke der III und besonders IV Beine, 3) Bewehrung des Dorsalscutums.

He justly criticizes the use of the sexual differences found in the structure of the antennae, in the enlargement of the basal segments of tarsus I, and in the armature of the basal segments of the fourth pair of legs, as leading principles.

ROEWER'S second character found in the difference in strength between the two first and the two last pair of legs may be of some value; as in many cases it is a matter of taste whether a given species must be referred to the one or to the other group I really think that only secondary value can be given to this character.

ROEWER regards the number of tarsal segments on pes I as the most important character and it is certainly of greater value than the two other characters, but SØRENSEN is probably right in rejecting it as a leading character and in placing species with a different number of tarsal segments within the same genus, e. g. *Rhaucus aurolineatus* and *togatus* with five and seven segments respectively, *Poecilæmula signata*, *Prasia fallax* and *clypeata* with seven and six, and *Cynorta ornata* and *dimorpha* with five to seven. If we accept ROEWER's point of view, we are obliged to separate species which in other respects seem nearly related; add to this that the number of tarsal segments, at least in species bearing five to six segments, sometimes varies from one specimen to another as well as within the sexes. In *Poecilæma muticum* and *punctatum* e. g. the number is six or seven, and in the males of *Poecilæma reticulatum* and *Cynorta dimorpha* the number is seven, while it is only six in the females. I think it worth mentioning that ROEWER uses the number of tarsal segments in a similar way to establish genera in his *Discosomatinae*; I think this subfamily, which comprises the first of SØRENSEN'S genera, is fairly natural.

ROEWER thinks that he has found a first rate character in the armament of the scutum and writes (1912 p. 4) "und so viele Arten einer Gattung und Individuen einer Art (bei viele Arten je 50—100 Stück) ich untersucht habe, habe ich die Bewehrung des Abdominalscutums — und das ist mit Nachdruck hervorzuheben — stets konstant und für dieselbe Species stets gleichartig gefunden und hielt mich deshalb für berechtigt in dieser Scutumbewehrung eines der besten genustrennenden Merkmale zu ersehen, welche ich daher konsequent für diese Trennung anwende.

Ich weise auch auf andere Gruppen der Opilionen (z. B. Gagrellinæ, Assamiidæ, Phalangodidæ etc.) hin, bei denen die Scutumbewehrung eines der wichtigsten genus-trennenden Merkmale ist."

Even if we accept ROEWER's just quoted statement of facts as correct, there are weighty reasons for not accepting his conclusions. I am inclined to think that we cannot hope to arrive at a good natural result by using the same characters to establish genera in different families and suborders. The fact that the armature of the scutum is serviceable as a generic character within the *Gagrellinæ*¹⁾ cannot be used as an argument for its value within the *Cosmetidæ*; even if the armature of the scutum is a good character to separate genera within a group with five tarsal segments in pes I, it is not at all evident that it should be so in a group with six tarsal segments in pes I. When the armature of the scutum varies from one species to another in different families within the same order, I should without further evidence be inclined to regard it as a character of specific and not of generic value, being — so to speak — latent within the species.

In this connection it might be useful to quote SØRENSEN's point of view on a similar question, namely the systematic value of the armature of the ocular tubercle (Gonyleptiden Hamb. Magalh. Sammelreise 1902 p. 5):

Jam C. L. KOCH propter numerum eminentiarum majorum — duarum, unius, nullius — tuberis oculigeri et areae quartæ scuti dorsalis ("Hinterbrust") genera distinxit. Quos characteres certo judico bonos, si numerus re vera differt. In eodem genere autem eminentia dictæ nunc magnæ, nunc parvæ sunt, nunc evanescunt. Si autem plane desunt, quot desunt? Una aut duo? Hanc rem, quod ad tuber oculigerum pertinet, puto me ipsum dijudicare posse. Quum duæ eminentia majores tuber ornant, tuber ad latera versus altius quam in medio est, aut saltem non altius in medio quam ad latera versus; sed tuber una eminentia ornatum, ut intelligitur, in medio altius quam ad latera versus. Itaque dicendum esse puto, tuber oculigerum una eminentia (majore) carere, si in medio, sed duabus, si ad latera versus altius sit. Quæ ratio momento hoc confirmatur: exemplum *Acanthoprocte pustulatae* ab ill. Loman descriptum eminentiis majoribus tuberis oculigeri, in medio altioris, caret; sed exemplum ejusdem speciei (processibus validis singulis limbi posterioris scuti et analis dorsualis insignis) jam diu cognovi, cuius tuber tuberculo uno ornatum est et quod in nullo modo a genere *Pachyli* differt. In *Pachyloide glabrione* Lom. forma tuberis oculigeri, eminentiis majoribus destituti, plane eadem est quæ in *Pachylo pustulato* et quum ceterum species dictæ generice non differre mihi videantur, non dubito, quin etiam *Pachyloides glabrio* generi *Pachyli* attribuendum sit.

Si area quarta scuti dorsalis eminentiis majoribus destituta est, nullam rationem cognovi, qua hæc res dijudicari potest, nisi fortuna duas species cui præstat, quarum, inter sese ceterum similium altera numerum eminentiarum præbet. Antea semel tantum tam felix fui: *Pucrolia (Pachylus) minuta* m. eminentiis dictis caret, sed *Pucrolia armata* m. eminentiam unam areae quartæ demonstrat.

¹⁾ With has (Boll. Mus. Zool. Torino XX Nr. 50. 9 1905 p. 3—4) shown that the characters found in the armature of the scutum in the *Gagrellinæ* are not of generic value, as they vary within the species. ROEWER (Abh. aus dem Gebiete der Naturwissenschaft. XIX Bd. 4. Heft 1910) in spite of this statement has established numerous genera on the old basis, and he has not quite grasped the general bearing of the above quotation of SØRENSEN.

But it must of course be admitted that it would be a great support for ROEWER'S system if he were really right in the above quoted passage, that the number of spines and grana of the scutum never vary within the genera and species. With the first presumption, however, I shall not deal since the definition of the genera is under discussion, but only with the second, which is not borne out by SØRENSEN'S material.

It is certainly correct that the number of spines and grana is usually constant within the species, but several exceptions are found. The size of the tubercles vary in the different specimens of *Cynorta Holmbergi*, *quadrimaculata*, *v-album*, *juncta*, *ambigua*, *Rhaucus obscurus* and *Discosoma cinctum*. The number differs in *Libitia argentinum* and especially in *L. paraguayensis*. Differences between males and females were found in *Prasia venezuelana* and *clypeata* as well as in *Cynorta leviarcuata*.

I think it must be admitted that the system which ROEWER has proposed is no natural one. But on the other hand, ROEWER'S system is probably the most practical one if we wish to find out whether a species is described or not, and where it has been described; his synoptic key and his tables are very useful; but a system is no mere catalogue of the species, but ought to be an expression of the true kinship between the species.

But even if we feel bound to reject ROEWER'S system as not natural, it is not evident that the system proposed by SØRENSEN is a first class one. SØRENSEN has unfortunately not written any general remarks about the system, but he always used the principle of arranging the genera, and within each genus the species, in an order corresponding to what he regarded as the natural relationship. When we compare the characters which are used for separating several of the genera, I am obliged to admit that the characters employed for separating e. g. *Poecilæma* and *Cynorta* are rather insufficient, the more important one being the slenderness of the legs. At the present, however, SØRENSEN'S system seems to be the most natural, in which we run no risk of mutually related species or even ♂ and ♀ of the same species being placed in different genera (C. W.).

The principal distinguishing character used in the following key (claws pectinate or simple) is also used by ROEWER for separating his two subfamilies, viz. *Cosmetinæ* and *Discosomaticinæ*. It must, however, be noted that the genus *Cosmetus* is reckoned by ROEWER as belonging to *Cosmetinæ*, while in SØRENSEN'S key it is included in the relationship which ROEWER calls *Discosomaticinæ*. As the present editor has not examined any specimen belonging to the genus *Cosmetus* he dare not decide whether SØRENSEN or ROEWER placed the genus correctly.

Conspectus generum.

- I. Unguiculi pedum III et IV (saltem intus) pectinati. (Pedes longi):
 - A. Orificia glandularum foetidarum detecta; quorum margines elevati, infra divergentes, foramen transversum formant; scutum ovale pone truncatum eminentiis majoribus destitutum *Protus* E. Simon p. 308.

- B. Orificia glandularum foetidarum obtecta (aut subobtecta) sunt foramina ovalia, in ipso margine scuti posita et margini parallela:
1. Scutum (suborbiculare, pone truncatum) eminentiis majoribus destitutum *Discosomaticus* Roewer p. 310.
 2. Scutum eminentiis majoribus præditum:
 - a. Scuti hexagoni pars media cubice elevata, gibbis quatuor ornata
Tetracyphus n. gen. p. 312.
 - b. Scutum trapezoidale eminentiis majoribus ambabus, sibi contiguis præditum, tuberi communi impositis *Cosmetus* Perty p. 314.
 - c. Scutum oblonge trapezoidale eminentiis ambabus separatis ornatum *Gryne* E. Simon p. 318.
- II. Unguiculi pedum III et IV integri:
- A. Pars ulterior tarsi II in articulos ultra tres partita *Zarax* n. gen. p. 321.
 - B. Pars ulterior tarsi II tripartita:
 1. Area quarta scuti dorsalis eminentiis magnis ambabus prædita:
 - a. Pedes longi, graciles:
 - + Orificia glandularum foetidarum fere detecta. Palporum pars tibialis intus sulco marginali angusto prædita. *Acritas* n. gen. p. 325.
 - ++ Orificia glandularum foetidarum plus minusve obtecta sunt foramina brevia, lata, in ipso margine scuti posita. Palporum pars tibialis intus sulco marginali angusto non prædita.
Poecilæma C. L. Koch p. 328.
 - b. Pedes longiores aut breviores, aut breves robusti; pars tibialis palporum robustorum utrinque fortiter dilatata; orificia glandularum foetidarum manifesta sunt rimæ transversæ longæ; corpus robustum *Rhaucus* E. Simon p. 347.
 - c. Pedes breviores; orificia glandularum foetidarum plus minusve obtecta sunt foramina brevia lata *Cynorta* C. L. Koch p. 377.
 2. Area quarta scuti dorsalis eminentiis magnis destituta (scutum aut muticum aut eminentiis majoribus præditum, areæ quintæ aut limbo posteriori impositis):
 - a. Pedes graciles, longi *Poecilæma muticum* n. sp. 329.
 - b. Pedes breves aut breviores *Libitia* E. Simon p. 411.

Præter hæc genera *Vonones* E. Simon (mihi ignotus) et “*Phalangium Fusco-Ferrugineum* supra flavo variegatum postice spinis duabus erectis armatum” Olivier (Actes d. l. soc. d'hist. nat. I, 1792, p. 125) ad hanc familiam pertinent.

Protus E. Simon.

Protus E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 193.

Protus Roewer, Weberkn. d. Erde, 1923, p. 390.

Tuber oculiferum eminentiis majoribus destitutum.

Corpus ovatum. Scutum dorsale, a latere inspectum, æque et sat alte convexum; pone truncatum, ante anguste truncatum, angulis rotundatis. Scutum extra antennas non productum, eminentiis majoribus destitutum.

Orificia glandularum foetidarum detecta; ipsa orificia sunt foramina magna orbicularia, quorum margines elevati, infra divergentes, foramen formant.

Palporum sat gracilium pars tibialis mediocriter extenuata; margo exterior primum sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est.

Pedes longi graciles. Coxæ IV submuticæ. Pars propior tarsi I parte ulteriore non crassior in femina.

Unguiculi III et IV pectinati.

Differentia sexualis (sec. ill. E. SIMON) crassitudine partis citerioris tarsi I demonstratur.

Two species belonging to this genus are known, one of which is present in the material and manuscripts left by SØRENSEN, viz.

Protus insolens E. Sim.

Protus insolens E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 193.

Protus insolens Roewer, Weberkn. d. Erde, 1923, p. 391.

6 mm longus, niger; scutum punctulis flavis notatum; tuber oculiferum humile, convexum, læve; scutum ordinibus quatuor granulorum binorum et quaternorum; palporum pars femoralis tuberculo interiore apicali armata; femora lævia; calcaneus I astragalo duplo brevior. Articuli tarsales 7, 17, 11, 12; processus terminalis æque longus et crassus ac unguiculi.

Tuber oculiferum latum humile, supra vix convexum, subtilissime coriaceum, ceterum læve.

Scutum erga coxas III sinu parvulo præditum. Sulci transversi primus leviter procurvus, levis, postremus manifestus; ceteri desunt. Limbus anterior vix discretus, leviter tumidus, coriaceus. Limbus lateralis non discretus. Scutum subtiliter coriaceum, post sulcum transversum primum ordinibus transversis haud manifestis quatuor granulorum paucorum ornatum; granula ordinum primi et tertii quaterna, quorum bina (interiora) ceteris paullo majora, ordinum secundi et quarti bina. Limbus posterior scuti, segmenta libera, dorsalia et ventralia, et coxæ lævia.

Antennarum pars globosa articuli primi grano apicali interiore acuto et granulis supra scabra.

Palporum pars trochanterica parte patellari longior, in ipso apice fortiter incrasata, tuberculis inferioribus duobus parvis munita, quorum interius majus. Pars femoralis supra alte convexa, plus quam duplo longior quam crassior, ordine inferiore tuberculorum acutorum piliferorum (circiter decem) et tuberculo interiore apicali armata, ultra carinam dorsalem lævem non crenulata. Partis patellaris margo interior

haud anguste extenuatus, in apice angulatus. Pars tibialis subaeque longa ac pars femoralis, triplo longior quam latior; margo interior sat latus, rectus, in apice rotundatus, exterior primum rectus, sensim paullo latior, deinde rotundate leviter angustior; anguli rotundati aculeis tenuibus singulis armati. Pars tarsalis parte tibiali plus quam duplo brevior, depressa, apicem versus angustior, marginibus non extenuatis; praeter setas robustiores aculeo interiore armata. Unguis parte tarsali parte tertia brevior.

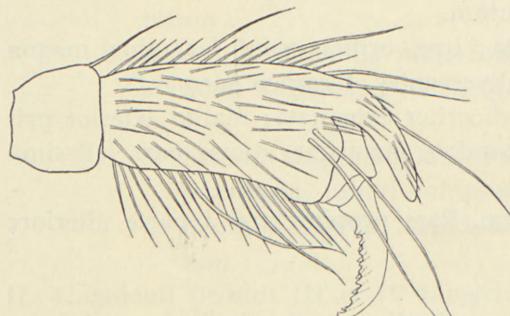


Fig. 12. *Protus insolens* Simon.

Tarsi IV apex, a latere inspecta, cum unguiculo uno (alter non delineatus).

tarsales: 7, 17, 11, 12; (sec. ill. E. SIMON 7, 16, 15, 11). Processus terminalis subaeque longus et crassus ac unguiculi. Unguiculi III et IV utrinque pectinati; dentes obtusi, interiores longi 6, exteriores breves 9—10.

Differentia sexualis (mihi alter sexus incognitus): Ill. E. SIMON dicit: "tarse I formée de 7 articles, presque égaux chez les femelles; chez le mâle les quatres premiers (pars propior) plus larges, le premier un peu plus long, atténué à la base".

Niger; scutum punctulis (granulis) flavis notatum, quorum quatuor ceteris paullo majora, rectangulum formantia. Pedes paullo dilutiores. Apices coxarum, trochanteres, partes propiores femorum flava. Tarsi obscure testacei.

Long. corp. 6; long. scuti 5,5; lat. scuti 4,75; palpi 5; pedes I 24, II 56, III 32, IV 44.

Patria: Brasilia. Specimen unicum (secundum descriptionem ill. E. SIMON feminam) vidi, ad oppidum Teffé in provincia Amazonas captum, quod ill. E. SIMON mihi benevolentissime dedit. Nunc in Museo Zoologico Hafniense asservatum.

Discosomaticus Roewer.

Discosoma Perty, Delectus animalium, III, 1833, p. 209 (nom. prooec.).

Discosomaticus Roewer, Weberkn. d. Erde, 1923, p. 388.

Tuber oculiferum eminentiis majoribus destitutum.

Corpus late ovatum, pæne orbiculare. Scutum dorsale, a latere inspectum, æque convexum, pæne truncatum, extra antennas productum, eminentiis majoribus destitutum.

Orificia glandularum foetidarum obiecta sunt foramina breviter ovalia (ante latiora) in ipso margine posita, margini parallela.

Palporum sat gracilium pars tibialis mediocriter extenuata; margo exterior pri-

mum sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est.

Pedes longi, graciles. Coxæ IV paullum dilatatae, submuticæ. Pars propior tarsi I parte ulteriore non crassior.

Unguiculi III et IV pectinati.

Differentia sexualis incognita.

Species unica adhuc reperta, in Brasilia indigena.

Discosomaticus cinetus Perty.

Discosoma cinctum Perty, Delectus animalium, 1833, p. 209.

Discosoma cinctum C. L. Koch, Die Arachniden, 1839, VII, p. 114.

Discosomaticus cinctus Roewer, Weberkn. d. Erde, 1923, p. 389.

4,5 mm longus, læte fusco-brunneus, vitta marginali lutea cinctus; scutum coriaceum granulis ambobus anterioribus; segmenta dorsalia libera tria anteriora granulis parvis remotis; palporum pars femoralis tuberculo interiore apicali armata; coxæ IV ordine granorum laterali anteriore transverso; calcaneus I astragalo tertia parte brevior. Articuli tarsales 6, 16, 10, 10—13; processus terminalis unguiculis paullo brevior.

Tuber oculiferum humillimum latum, supra late manifesteque excavatum, subtiliter coriaceum, ceterum læve.

Scuto dorsali sulci transversi plane desunt. Limbi anterior et lateralis et posterior non discreti. Tubercula extra (et intra) antennas posita parva, subcylindrica obtusa. Post tuber oculiferum impressio punetiformis adest. Scutum subtiliter coriaceum, granulis ambobus late disjunctis præditum, erga margines posteriores coxarum III positis. Segmenta dorsalia libera tria anteriora ordinibus singulis granulorum parvorum remotorum prædicta. Venter et coxæ sublaevia.

Antennarum pars globosa articuli primi granis marginalibus et granulis supra scabra.

Palporum pars trochanterica aequa longa ac pars patellaris, in apice incrassata tuberculis parvis inferioribus duobus munita, quorum interius majus. Pars femoralis plus quam duplo longior quam crassior, supra valde convexa, ultra carinam dorsalem, tuberculo apicali præditam, laevis; ordine inferiore tuberculorum minorum (circiter 8) et tuberculo interiore apicali armata. Partis patellaris margo interior angustissime extenuatus, in apice angulatus. Pars tibialis plus quam duplo longior quam latior, parte femorali paullo longior; margo interior angustus subrectus, exterior haud latus, primum rectus sensimque latior, deinde vix angustior, quare apex parte latissima vix angustior; angulus interior productus, exterior rotundatus, aculeis gracilibus singulis armati. Pars tarsalis parte tibiali vix duplo brevior, perdepressa (parte propiore marginum extenuata) apicem versus angustior, aculeis gracilibus exterioribus (circiter 7) et interiore unico armata. Unguis parte tarsali duplo brevior.

Coxæ IV coxis III triplo fere latiores, ordine granorum densorum laterali anteriore transverso et carina transversa superiore apicali humili rotundata, extus vix altiore. Femora recta lævia. Calcanei I astragalo tertia parte, II duplo breviores; III articulis tarsalibus primo et secundo et tertio conjunctis, IV articulo tarsali primo longitudine æquales. Articuli tarsales: 6, (14—)16, 10, 10—13. Processus terminalis sat robustus, unguiculis paullo brevior. Unguiculi III et IV intus tantum pectinati; dentes quatuor, longi, acuti.

Differentia sexualis incognita.

Læte fusco-brunneus, vitta marginali sat lata lutea cinctus, cujus pars posterior segmentis dorsalibus liberis secundo et tertio imposita. Spiracula alba a ventre pæne nigro valde discordant. Membra cinnamomea; tarsi obscure testacei, II infuscata.

Long. corp. 4,5; long. scuti 4,25; lat. scuti 3,75; palpi 3,75; pedes I 20, II 48, III 20, IV 38.

Patria: Brasilia. Exempla duo vidi, in provincia Amazonas capta, mihi ab ill. E. SIMON benevolentissime data, nunc in Mus. Zool. Hafniense asservata.

Variatio: Granula anteriora ambo scuti specimini alteri defuere. — Vitta marginalis secundum C. L. KOCH læte alba (“schön weiss”).

Remark: In the one specimen an indistinct suture was found between the first and second abdominal somites; the above-mentioned granules are placed in the first abdominal somite.

Tetracyphus n. g.

Tuber oculiferum eminentiis majoribus ornatum mentione vix dignum.

Scutum hexagonum, ante et pone truncatum, extra antennas productum; pars media cubice elevata et gibbis (quatuor) prædita. Scutum, a latere inspectum, a tubere oculifero ultra partem cubicam rectum sensimque paullo altius, deinde sat subito declive.

Orificia glandularum foetidarum obiecta sunt foramina breviter ovalia ante latiora in ipso margine posita, margini (sub)parallela.

Palporum sat gracilium pars tibialis intus angustissime extenuata recta, extus late extenuata, sensim latior, denique tam abrupte sub angulo angustata, ut apex pars latissima esse videatur.

Pedes longi, graciles. Coxæ IV paullum dilatatae, submuticæ. Pars propior tarsi I parte ulteriore non crassior.

Unguiculi III et IV pectinati.

Differentia sexualis incognita.

Species unica adhuc reperta, in Brasilia indigena.

Tetracyphus mirabilis n. sp.

Poecilæma mirabile Simon in schedula.

5,5 mm longus, brunneus, (dorso medio excepto) punctis majoribus (pustulis) flavo-çinereis notatus; tuber oculiferum supra leviter excavatum granulis ambobus;

pars media elevata vix coriacea, scutum ceterum (margine laterali excepto) pustulis planis densis; gibbæ posteriores reclines, perverse pyriformes; palporum pars femoralis spina interiore apicali armata; calcaneus I astragalo duplo brevior. Articuli tarsales: 8, 17, 10, 11; processus terminalis æque longi ac unguiculi.

Tuber oculiferum humile latum, supra leviter excavatum, quia oculi supra superficiem tuberis elevati sunt, coriaceum granulis ambobus præditum.

Scutum convexum. Sulcus transversus postremus tantum adest, debilis. Limbus anterior non discretus, leviter tumidus, coriaceus, ceterum laevis; tubercula extra antennas posita brevia (orrecta) obtusa. Limbus lateralis non discretus, ordine marginali granulorum destitutus. Pars media elevata vix coriacea punctis impressis remotis ornata; gibbæ laeves, nitidæ, anteriores subglobosæ, posteriores perverse pyriformes, reclines. Scutum ceterum pustulis planis (flavo-cinereis) densis ornatum. Segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum remotorum. Coxæ granis parvis densis præditæ; venter ceterum sublaevis.

Antennarum pars globosa articuli primi granulis supra et infra scabra, quorum superiora posteriora sunt grana magna.

Palporum pars trochanterica parti patellari subæqualis, sensim crassior, tuberculo inferiore brevi robusto rotundato. Pars femoralis plus quam duplo longior quam crassior, ordine inferiore tuberculorum obtusorum densorum (circiter 16) et tuberculo inferiore apicali armata, quod aculeo apicali instructum est; supra prope basin convexa, laevis (carina haud manifesta). Partis patellaris margo interior late extenuatus, tuberculis depressis confluentibus (4—5) rotundatis crenulatus, quorum ultimum ceteris majus. Pars tibialis plus quam duplo longior quam latior, parte femorali paullo longior; margo interior angustissime extenuatus, rectus, in apice non producto aculeo armatus, exterior latus sensimque latior, apicem versus fortiter dilatatus et spinulis (quarum pars basalis brevissima) brevibus robustis (7—8) munita, quare ipse apex pars latissima esse videtur. Pars tarsalis compressa, marginibus non extenuatis, apicem versus paullo angustior, æque longa ac diametros transversa apicalis partis tibialis, aculeis exterioribus 5—6 et setis interioribus armata. Unguis parvus, parte tarsali plus quam duplo brevior.

Fig. 14. *Tetracyphus mirabilis* n. sp.
Palpi partes patellaris,
tibialis et tarsalis.
(W. Sør. del.)

Coxæ IV coxis III plus quam duplo latiores, carina transversa superiore apicali humili rotundata instructæ. Femora recta granulis acutis remotis ornata, quæ in pedibus posterioribus majora sunt. Metatarsi II spurie articulati. Calcanei I et II astragalo

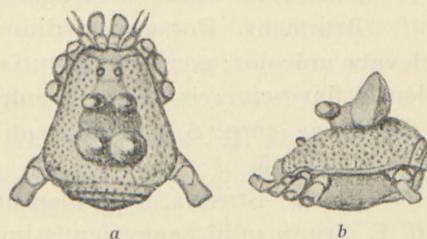
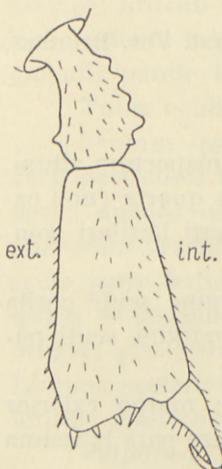


Fig. 13. *Tetracyphus mirabilis* n. sp.
a adsuper inspectus, b a latere inspectus.
(W. Sør. del.)



duplo breviores; articulo tarsali primo III longior, IV paullo brevior. Articuli tarsales: 8, 17, 10, 11. Dentes unguiculorum III et IV longi acuti; exteiiores 4, interiores 6. Processus terminalis æque longus ac unguiculi, quibus paullo est crassior.

Differentia sexualis incognita.

Brunneus. Dorsum medium usque ad marginem posteriorem partis cubice elevatae unicolor; pars cetera scuti et segmenta dorsalia tria anteriora punctis majoribus densis flavo-cinereis notata; venter brunneo-fuscus. Membra a femoribus dilutiora.

Long. corp. 5,5; long. scuti 5; lat. scuti 4,25; palpi 5,5; pedes I 21, II 53, III 31, IV 45.

Patria: Brasilia. Specimen unum vidi, ad Rio Vacantia, Cameta, captum, quod ill. E. SIMON mihi benevolentissime dedit, nunc in Mus. Zool. Hafniense asservatum. Praeterea specimina duo cognosco, ad Para capta (coll. Prof. GÖLDI).

Cosmetus Perty.

Cosmetus Perty, Delectus animalium, III, 1833, p. 209.

Cosmetus C. L. Koch, Übers. d. Arachnidensyst. fasc. II, 1839, p. 20.

Cosmetus E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 191.

Cosmetus Roewer, Weberkn. d. Erde, 1923, p. 376. — Suppl.: Abh. nat. Ver. Bremen, XXVI, 3, 1928, p. 609.

Tuber oculiferum eminentiis majoribus destitutum.

Scutum trapezoidale, extra antenas non productum; a latere inspectum altum, a tubere oculifero ad processus sensim altius, deinde declive. Area quarta (non expressa) eminentiis majoribus ambabus prædita, sibi contiguis et parti basilari communi alte conicæ, processiformi impositis.

Orificia glandularum foetidarum plane obtecta, in ipso margine scuti posita (NB. Ipsa orificia non vidi. Verisimiliter sunt foramina ovalia, margini scuti parallela).

Palporum sat gracilium pars tibialis mediocriter extenuata; margo exterior primum sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est.

Pedes perlongi, graciles. Coxæ IV paullum dilatatae, submuticæ.

Unguiculi III et IV intus pectinati.

Differentia sexualis incognita.

Remark: ROEWER refers the genus *Cosmetus* to his subfamily *Cosmetinae* which is recognized by having simple claws. He has examined C. L. KOCH's original specimens of *C. mesacanthus*. The present editor has not examined any specimen of this genus, so he dare not decide whether SØRENSEN'S or ROEWER'S view is correct.

Three species are known to belong to this genus: one from Central America and 2 from Brazil, of which SØRENSEN has examined the one, and he has added 2 more species.

Conspectus specierum hic descriptarum.

- A. Coxæ IV tubere laterali anteriore destitutæ *C. mesacanthus* C. L. Koch.
- B. Coxæ IV tubere laterali anteriore humili clypeato (luteo) præditæ:
 - a. Tuber oculiferum convexum *C. pleurostigma* n. sp.
 - b. Tuber oculiferum supra leviter excavatum *C. turritus* n. sp.

***Cosmetus mesacanthus* C. L. Koch.**

Cosmetus mesacanthus C. L. Koch, Übers. d. Arachnidensyst. Fasc. II, 1839, p. 20.

Cosmetus mesacanthus C. L. Koch, Die Arachniden, T. VII, 1839, p. 111.

Cosmetus mesacanthus Roewer, Weberkn. d. Erde, 1923, p. 377.

Vix 5 mm longus, viridi-flavus maculis parvis luteis partim confluentibus et punctis saturati viridibus notatus; tuber oculiferum convexum sublæve; limbus anterior lævis; limbus lateralis (non discretus) ordine exteriore granorum parvorum; pars basilaris processus dorsalis, a tubere oculifero vix duplo quam a margine posteriore scuti separati, granis et granulis prædita; coxæ IV granulis pusillis; palporum pars femoralis intus inermis, supra lævis; femora lævia; calcaneus I astragalo paullo brevior; articuli tarsales: 7, 21, 13—14, 15 (unius tantum exempli. Secundum C. L. Koch articuli tarsales in genere *Cosmeti* sunt 10, ?, 13, 15); processus terminalis unguiculis paullo brevior.

Tuber oculiferum parvum humile, duplo latius quam altius, convexum, sublæve.

Scutum quamquam trapezoidale, pone tamen iterum angustius. Sulci transversi postremus debilis, ceteri plane obsoleti. Limbus anterior vix discretus, tumidus, lævis, angulis obliquis. Limbus lateralis non discretus, ordine exteriore granorum parvorum prædictus. Scutum granis sat magnis humilibus dispersis. Processus validus, scuto parte tertia brevior, conicus, vix reclinis; a tubere oculifero vix duplo longius quam a margine posteriore separatus; pars basilaris granis et granulis dispersis ornata; processuli apicales cylindrici, obtusi, læves, parte basilari triplo breviores. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granulorum; anale dorsale granulis dispersis; ventralia sublævia. Coxæ granulis pusillis.

Palporum pars femoralis leviter arcuata duplo longior quam crassior, ordine inferiore tuberculorum minutorum remotorum (circiter 8) armata, intus inermis, supra lævis (nec carinata nec cristata). Partis patellaris margo interior carinatus. Pars tibialis duplo longior quam latior; margo interior sat angustus, apicem versus sensim paullo latior, in apice leviter productus et seta munitus, exterior primum angustus, deinde sat subito rotundate dilatatus iterumque leviter angustatus, setulis apici propinquis prædictus; apex articuli subtruncatus parte latissima paullo angustior. Pars tarsalis depressa; apicem versus angustior, marginibus non extenuatis, præter setulas seta interiore munita. Unguis procerus parte tarsali non dimidio brevior.

Coxæ IV coxis III duplo latiores, carina transversa superiore apicali crenulata præditæ. Femora recta, lævia. Calcanei astragalo I paulo, II vix duplo, III duplo breviores, IV tarso toto fere æqualis. Articuli tarsales: 7, 21, 13—14, 15. Processus

terminalis unguiculis paullo brevior et tenuior. Dentes unguiculorum III et IV quinque sat robusti.

Differentia sexualis incognita.

Viridi-flavus, maculis (sæpe anulis) parvis luteis partim confluentibus et punctis saturati viridibus notatus; processuli processus dorsalis brunnei. Pedes obscure olivacei; patellæ, apices femorum et tibiarum, bases metatarsorum flava.

Long. corp. 4,75; long. scuti 4,5; lat. scuti 4; palpi 5; pedes I 23, II 56, III 32, IV 45.

Patria: Brasilia. Exempla tria siccata in Museo Berolinense vidi, ad urbem Bahia a cl. BERG capta.

Cosmetus pleurostigma n. sp.

Cosmetus pleurostigma Mus. Berol. in schedula.

5,5 mm longus, rufo-flavus et rufescens, punctis sordide brunneis, scutum maculis parvis ambobus et punctis ambobus, coxæ IV maculis magnis singulis lateribus anterioribus luteis; tuber oculiferum convexum, leviter granulatum; limbus anterior granulis dispersis; limbus lateralis (non discretus) ordine exteriore granorum parvorum; pars basilaris processus dorsalis, a tubere oculifero triplo fere longius quam a margine posteriore scuti separati, granis prædita; coxæ IV granis et tubere laterali anteriore clypeato; palporum pars femoralis intus inermis, carina dorsali lœvi; femora III granulis, IV granis parvis; calcaneus I astragalo parte tertia brevior; articuli tarsales (exempli unius): 7, 21, 17—18, 18; processus terminalis unguiculis paullo brevior.

Tuber oculiferum parvum humile, plus quam duplo latius quam altius, convexum, leviter granulatum.

Scutum quamquam trapezoidale, pone tamen iterum angustius. Sulci transversi postremus debilis, ceteri plane obsoleti. Limbus anterior leviter discretus, tumidus, granulis dispersis ornatus. Limbus lateralis non discretus, ordine exteriore granorum parvorum. Scutum granis sat magnis dispersis. Processus validus, scuto non duplo brevior, conicus, vix reclinis, a tubere oculifero triplo fere longius quam a margine posteriore scuti remotus; pars basilaris granis tantum prædita; processuli apicales cylindrici, obtusi, lœves, parte basilari triplo breviores. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum; anale dorsale granis dispersis. Anale ventrale sublæve; coxæ et ventrale primum granis dispersis; ventralia cetera ordinibus singulis granorum parvorum.

Antennarum pars globosa articuli primi granulis scabra.

Palporum pars femoralis leviter arcuata, vix duplo longior quam crassior, ordine inferiore tuberculorum minutorum remotorum (circiter 8) armata, intus inermis, carina dorsali lœvi prædita. Partis patellaris margo interior carinatus, in apice vix productus. Pars tibialis triplo fere longior quam latior; margo interior sat angustus, apicem versus sensim paullo latior, in apice leviter productus et seta munitus, exterior primum angustus, deinde sat subito rotundate dilatatus iterumque

leviter angustatus, setulis apici propinquis et tuberculo apicali minuto conico; apex articuli substruncatus parte latissima paullo angustior. Pars tarsalis depressa, apicem versus angustior, marginibus non extenuatis, præter setulas seta interiore munita. Unguis procerus parte tarsali non dimidio brevior.

Coxæ IV coxis III duplo latores, carina transversa superiore apicali, granis tribus composita, munitæ et tubere laterali anteriore clypeato humili rotundo (luteo) præditæ. Femora recta, I et II sublaevia, III granulis, IV granis parvis. Calcanei astragalo I partè tertia, II vix breviores, III tarso subæqualis, IV manifeste brevior. Articuli tarsales: 7, 21, 17—18, 18. Dentes interiores unguiculorum III et IV quatuor longi, acuti. Processus terminalis unguiculis paullo brevior et vix tenuior.

Differentia sexualis incognita.

Sordide rufo-flavus, punctis (eminentiis) sordide brunneis notatus; pars anterior scuti, venter, pars basilaris processus dorsalis, palpi rufescentes; processuli apicales processus dorsalis nigri. Lutea sunt: maculae parvæ ambæ scuti rotundæ, mox pone et extra tuber oculiferum positæ; puncta ambo latius separata, inter maculas dictas et processum dorsalem posita; macula magna rotunda lateralis anterior coxæ IV. Pedes flavi; patellæ fuscæ; bases tibiarum infuscatæ.

Long. corp. 5,5; long. scuti 5; lat. scuti 4,5; palpi 4,5; pedes I 21, II 51, III 31, IV 42.

Patria: Brasilia. Exempla tria siccata in Museo Berolinense vidi, ad urbem Bahia capta.

Cosmetus turritus n. sp.

Cosmetus turritus Mus. Berol. in schedula.

5,5 mm longus, latericius, fusco punctatus; scutum vittis latis marginalibus et punctis ambobus, coxæ IV maculis magnis singulis lateralibus anterioribus citrinis notata; tuber oculiferum leviter excavatum, leviter granulatum; limbus anterior granulis dispersis; limbus lateralis (non discretus) in margine lævis; pars basilaris processus dorsalis, a tubere oculifero triplo longius quam a margine posteriore scuti separati, granis prædita; palporum pars femoralis intus inermis; coxæ IV granis magnis (inferioribus) et singulis tuberibus lateralibus anterioribus clypeatis; femora III granulis parvis, IV granis prædita; calcaneus I astragalo vix duplo brevior; articuli tarsales (unius exempli): 8, 25, 16, 19—20; processus terminalis unguiculis vix brevior.

Tuber oculiferum parvum humile, plus quam duplo latius quam altius, supra leviter excavatum, leviter granulatum.

Scutum quamquam trapezoidale, pone tamen iterum angustius. Sulci transversi postremus debilis, ceteri plane obsoleti. Limbus anterior leviter discretus, leviter emarginatus, granulis dispersis ornatus. Limbi lateralis non discreti margo lævis. Scutum granis sat magnis dispersis ornatum. Processus validus, scuto duplo brevior, conicus, vix reclinis, a tubere oculifero triplo longius quam a margine posteriore scuti separatus; pars basilaris granis tantum prædita; processuli apicales cylindrici,

obtusi, laeves, parte basilari triplo breviores. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum; anale dorsale granis dispersis. Anale ventrale ordine anteriore granulorum paucorum et posteriore granorum parvorum; coxae et ventrale primum granis magnis; ventralia cetera ordinibus singulis granorum parvorum ornata.

Antennarum pars globosa articuli primi granis dispersis scabra.

Palporum pars femoralis leviter arcuata duplo longior quam crassior, ordine inferiore tuberculorum minutorum (circiter 12) armata, intus inermis; carina dorsalis humilis vix crenulata. Partis patellaris margo interior carinatus, in apice oblique truncatus. Pars tibialis triplo fere longior quam latior; margo interior anguste extenuatus in apice vix productus, aculeo armatus, exterior haud late extenuatus, in apice leviter angustior; apex articuli subtruncatus parte latissima paullo angustior. Pars tarsalis deppressa, apicem versus angustior, marginibus non extenuatis, praeter setulas seta interiore munita. Unguis procerus parte tarsali non dimidio brevior.

Coxae IV coxis III vix duplo latiores, carina transversa superiore apicali humili, granis tribus composita, et tubere clypeato laterali anteriore humili, rotundo citrino praeditae. Femora recta; II sublævia; I et III granulis parvis; IV una cum patellis et tibiis granis praedita, infra tantum majoribus. Calcanei astragalo I et II vix duplo, III plus quam triplo breviores; IV articulo tarsali primo manifeste longior. Articuli tarsales: 8, 25, 16, 19—20. Processus terminalis unguiculis vix brevior et vix tenuior. Dentes unguiculorum III et IV quatuor, longi, acuti.

Differentia sexualis incognita.

Læte latericus, punctis (granis) fuscis notatus. Citrina sunt: vittæ latae marginales ambæ, ante et pone attenuatæ, marginem anteriorem scuti non attingentes, puncta rubra includentes; puncta ambo ante processum dorsalem posita; macula magna lateralis anterior coxae IV. Pedes obscure olivacei; trochanteres, patellæ, apices femorum et tibiarum flava.

Long. corp. 5,5; long. scuti 5,25; lat. scuti 4,75; palpi 5; pedes I 21, II 56, III 31, IV 42.

Patria: Brasilia. Specimina duo siccata in Museo Berolinense vidi, ad urbem Bahia a cl. GOMEZ capta.

Gryne Simon.

Gryne E. Simon, Ann. Soc. Ent. Belg. XXII, 1923, p. 193.

Gryne Roewer, Weberkn. d. Erde, 1923, p. 392. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 1928, p. 629.

Tuber oculiferum eminentiis majoribus destitutum dicendum est.

Scutum oblonge trapezoidale, post coxas III paullo latius, lateribus arcuatis; extra antennas leviter productum. Scutum, a latere inspectum, alte convexum; a tubere oculifero ad eminentias majores æquum sensimque altius, unde sat subito declive. Area quarta (non expressa) eminentiis majoribus ambabus munita.

Orifia glandularum obtecta sunt foramina breviter ovalia, ante latiora, in ipso margine scuti posita et margini parallela.

Palporum sat gracilium pars tibialis mediocriter extenuata; margo exterior primum sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est.

Pedes longi, graciles. Coxæ IV mediocriter dilatatae, submuticæ. Pars propior tarsi I parte ulteriore non crassior.

Unguiculi III et IV pectinati (aut crenulati).

Differentia sexualis (saltem in *G. oreensi*) forma metatarsi IV demonstratur.

Observatio: Speciem typicam hujus generis, *G. marginale* Perty non cognovi. Speciem novam sequentem ill. E. SIMON "Poecilæma leprosum" nominatam mihi misit; tamen credo, hanc speciem generi *Grynes* adscribendam esse.

Conspectus specierum.

- A. Unguiculi III et IV manifeste pectinati:
 - (a. Scutum fortiter et parce rugosum (sec. ill. E. SIMON)... *G. marginalis* Perty.)
 - b. Scutum præter granula sat densa granis tantum ambobus anterioribus
præditum *G. leprosa* n. sp.
- B. Unguiculi III et IV crenulati tantum (sub lente etiam forti integri videntur)
G. oreensis W. S.

Gryne leprosa n. sp.

Poecilæma leprosum E. Simon in schedula.

6 mm longa, brunnea, lineis sordide luteis reticulata, processibus scuti anulo basali cinctis; tuber oculiferum late excavatum, granulis paucis dispersis ornatum; scutum coriaceum præter granula dispersa sat densa granis anterioribus ambobus et processibus posterioribus ambobus divergentibus proceris præditum; palporum pars femoralis spina interiore apicali armata; calcaneus I astragalo duplo brevior; articuli tarsales 8, 17, 10, 11; processus terminalis unguiculis paullo brevior.

Tuber oculiferum humillimum transversum, supra late excavatum, subtiliter coriaceum, granulis paucis dispersis ornatum.

Scutum sat convexum. Sulci transversi omnes plane desunt. Limbus anterior discretus subtiliter coriaceus, ceterum lævis; tubercula extra antennas posita brevia obtusa. Limbi lateralis non discreti margo latus, præruptus lævis. Scutum ceterum subtiliter coriaceum granulis dispersis sat densis et granis anterioribus ambobus (areæ secundæ non expressæ impositis). Processus (areæ quartæ non expressæ) leviter reclines, divergentes, proceri, subobtusi, spatio interapicali longiores; pars inferior eorum granulis paucis ornata. Segmenta dorsalia libera et ventralia et coxæ granulis parvis prædita.

Antennarum pars globosa articuli primi granis marginalibus subacutis prædita, quorum posteriora majora.

Palporum pars trochanterica parte patellari longior in apice incrassata, tuber-

culis inferioribus duobus armata, quorum interius majus. Pars femoralis vix duplo longior quam crassior, ordine inferiore tuberculorum (circiter 10) et spina interiore apicali armata, ultra carinam dorsalem vix crenulatam lævis. Partis patellaris margo interior angustissime extenuatus, neque angulatus neque productus. Pars tibialis plus quam duplo longior quam latior, parte femorali manifeste brevior; margo interior anguste extenuatus, subrectus, exterior sat latus primum rectus sensimque latior, deinde prope apicem rotundate angustior; apex parte latissima paullo angustior; angulus exterior rotundatus aculeo sat gracile et minuto tuberulo, interior vix productus, aculeo simili armati. Pars tarsalis parte tibiali triplo fere brevior, sensim angustior, præter setas robustas aculeo interiore armata. Unguis sat procerus, parte tarsali non duplo brevior.

Coxæ IV coxis III triplo latiores, carina transversa superiore apicali vix manifesta, in medio altiore, rotundata munitæ. Femora subrecta, lævia. Calcanei astragalo I duplo, II plus quam duplo breviores; articulo tarsali primo III paullo longior, IV paullo brevior. Articuli tarsales: 8, 17, 10, 11. Unguiculi III et IV utrinque pectinati; dentes interiores 6 compressi, rotundati, exteriores 5 similes, sed breves. Processus terminalis æque crassus ac unguiculi, quibus paullo brevior.

Differentia sexualis mihi incognita.

Brunnea, post tuber oculiferum lineis sordide luteis reticulata; processus scuti unicolores, anulo basali luteo cincti. Patellæ et apices tibiarum fusca.

Long. corp. 6; long. scuti vix 5; lat. scuti vix 4; palpi 4,5; pedes I 19, II 42, III 27, IV 36.

Patria: Brasilia. Specimen unicum (feminam ovipositore protruso) vidi, ad Rio Vacantia, Cameta, captum, quod ill. E. SIMON mihi benevolentissime dedit, nunc in Museo Zool. Hafniense asservatum.

Gryne orensis W. Sør.

Cosmetus orensis W. Sørensen, Naturh. Tidsskr. (3), XII, 1879, p. 217.

Cosmetus orensis W. Sørensen, ibid. (3) XIV, 1884, p. 589.

Gryne orensis Roewer, Weberkn. d. Erde, 1923, p. 393.

Fig. 15. *Gryne orensis*
W. Sør. Palpus.
(W. Sør. del.)

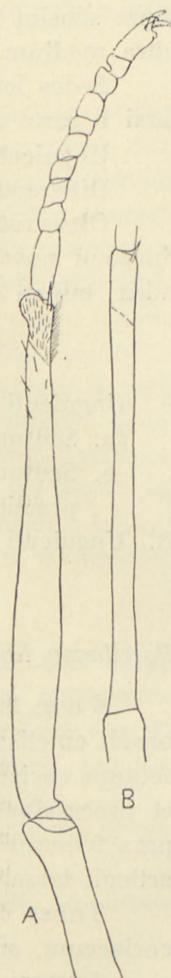
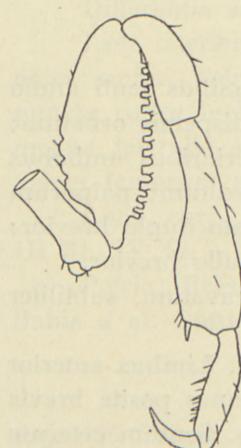


Fig. 16. *Gryne orensis* W. Sør.
Pes IV. A metatarsus et tarsus
mari. B metatarsus feminæ.

6 mm longa, fusca, scuto irregulariter citrino maculato; tuber oculiferum leviter excavatum, granulis pusillis dispersis ornatum; sulci transversi primus manifestus, ceteri obsoleti; scutum subtiliter coriaceum granulis pusillis dispersis ornatum; area secunda granis parvis ambobus, quarta processibus ambobus longis instructæ; pal-

porum pars femoralis intus pene inermis; calcaneus I astragalo duplo brevior; articuli tarsales: 7, 13, 9, 9; processus terminalis unguiculis crenulatis longitudine pene aequalis.
— Maris metatarsus IV compressus, brevis.

Patria: Respublicae Argentina (provincia El Gran Chaco) et Paraguay. Exempla decem in Paraguay a cl. ROHDE capta vidi, in Museo Berolinense asservata.

Addenda et Corrigenda: Tuber oculiferum humile, duplo latius quam longius, supra leviter lateque excavatum, granulis pusillis dispersis ornatum. Tubercula extra antennas posita robusta, brevia, subobtusa. — Scuti subtiliter coriacei et granulis pusillis multis dispersis ornati area secunda granis parvis ambobus praedita. — Palporum pars femoralis intus pene inermis (tuberculo pusillo rotundato munita) ultra carinam dorsalem granis crenulatam laevis. — Palporum partis patellaris margo interior angustissime extenuatus, leviter angulatus, ultra quem tuberculum parvum adest. — Palporum pars tibialis plus quam duplo longior quam latior; margo interior anguste extenuatus, subrectus, exterior primum sensim latior, deinde dilatatus, latere arcuato; anguli rotundati, exterior aculeo et minuto tuberculo, interior aculeo armati. — Palporum unguis dimidio partis tarsalis brevior. — Coxæ IV carina transversa superiore apicali humillima, rotundata, granis parvis praedita, munitæ. — Calcanei astragalo I duplo, II triplo fere breviores; III articulis tarsalibus primo et secundo conjunctis, IV articulo tarsali primo aequales. — Pulli scutum dorsale sulcis transversis manifestis quinque (nec quatuor) divisum, quorum quartus pone et prope processus areæ quartæ positus est. — Animalis adolescentis sulci transversi debiles.

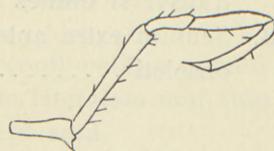


Fig. 17. *Gryne orensis*
W. Sør. Animal adolescentis. Palpus.
(W. Sør. del.)

Zarax n. gen.

Tuber oculiferum eminentiis majoribus destitutum.

Corpus robustum. Scutum dorsale ante latum, trapezoidale, adversus apices coxarum IV paullo latius et deinde sat prærupte angustius; sulco transverso primo manifeste depresso.

Area quarta scuti eminentiis majoribus ambabus instructa.

Orificia glandularum foetidarum parva, ovalia, librata, in ipso margine scuti posita, processulo (vel tuberculo) dorsali coxae II appresso plane obtecta.

Palporum sat robustorum pars tibialis mediocriter extenuata; margo exterior primum sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est.

Pedes sat longi. Coxæ IV paullum dilatatae (coxis III plus quam duplo latiores), carina exteriore apicali instructæ. Pars propior tarsi I parte ulteriore crassior. Pars ulterior tarsi II in articulos ultra tres (utrique speciei quinquearticulata) partita.

Unguiculi integri.

Differentia sexualis crassitudine partis propioris tarsi I demonstratur.

This genus is nearly related to *Poecilæmula* Roewer, but it is easily recognized by the 5-jointed distal part of tarsus II. Otherwise I should have ventured to identify *Zarax ænescens* described below with *Poecilæmula signata* Banks, in spite of its showing only 6 joints in tarsus I.

Conspectus specierum.

- A. Scutum extra antennas in tubercula singula porrecta productum; sulci transversi omnes manifesti *Z. devians* n. sp.
- B. Scutum extra antennas non productum; sulci transversi tertius et quartus obsoleti *Z. ænescens* n. sp.

***Zarax devians* n. sp.**

Femina 8 mm longa, fusco-castanea, lineis et punctis, partim confluentibus, olivaceis notata; tuber oculiferum humile, supra late excavatum; sulci transversi scuti omnes manifesti; tubercula extra antennas posita leviter resupinata; limbus lateralis pone sulcum transversum primum vix discretus, punctis et lineis impressis ornatus; areæ granulis parvis parce ornatæ, secunda tuberculis ambobus, quarta tuberculis permagnis ambobus obtusis; palporum pars femoralis tuberculo interiore apicali armata; astragali calcaneo, I dimidio longior, II duplo fere brevior; articuli tarsales 7, 20, 10, 12; processus terminalis unguiculis manifesto brevior et tenuior.

Tuber oculiferum humile, plus quam duplo latius quam altius, supra late excavatum, granulis ornatum, in vittas ambas haud manifeste dispositis.

Scutum convexum, totum subtiliter coriaceum. Limbus anterior non discretus, lœvis; tubercula extra antennas posita leviter resupinata. Limbus lateralis pone sulcum transversum primum vix discretus, lineis latis punctisque impressis ornatus. Areæ granulis parvis parce ornatæ, quæ in area secunda paullo majora sunt; secunda tuberculis ambobus, quorum bases granis parvis densis præditæ. Tubercula permagna (sive processus breves) areæ quartæ robusta, conica, obtusa, quorum pars basilaris granulis magnis parce ornata. Limbus posterior scuti et segmenta dorsalia libera tria anteriores ordinibus singulis granulorum; segmentum secundum (saltem hujus exempli) grano magno medio præditum; anale dorsale dense granulatum. Coxæ et segmenta ventralia primum et anale sublævia; cetera ordinibus singulis granulorum.

Antennarum pars subglobosa articuli primi granulis superioribus ornata, ordine dorsali anteriore granorum, introrsum majorum, aspera.

Palporum pars trochanterica subæque longa atque pars patellaris, in apice incrassata, tuberculo robusto inferiore munita. Pars femoralis valde compressa, ordine inferiore tuberculorum parvorum (circiter quindecim) et tuberculo interiore apicali armata; ultra carinam dorsalem brevem serratam non usque ad apicem serrata. Pars patellaris teres. Partis tibialis margo interior rectus, exterior leviter arcuatus; apex truncatus, aculeo interiore (ante quem aculeus alter adest) et tuberculo parvo et aculeo exterioribus armatus, ante quem aculei laterales pauci adsunt. Pars tarsalis parte tibiali plus quam duplo brevior, primum depressa, deinde leviter

compressa, spinula interiore media et aculeis parvis interiore subapicali uno et exterioribus circiter quinque munita. Unguis procerus parte tarsali vix duplo brevior.

Pedes sat robusti. Coxæ IV carina apicali humili instructæ. Femora vix arcuata, undique (in femina) granulata. Calcanei I astragalo parte sua dimidia brevior, II astragalo duplo fere longior; articulo tarsali primo III vix, IV manifesto breviores. Articuli tarsales: 7, 20, 10, 12. Pars ulterior tarsi II quinquepartita (tarsus II alter specimini unico defuit). Pars propior tarsi I parte ulteriore paullo, tamen manifesto, crassior. Processus terminalis unguiculis manifesto brevior et tenuior.

Differentia sexualis incognita.

Fusco-castaneus; limbus lateralis punctis olivaceis partim confluentibus notatus; sulci transversi omnes lineis angustis singulis, olivaceis, limbum lateralem non attingentibus, quæ (saltē priores tres) linea simili media conjunctæ sunt.

Long. corp. 8; long. scuti 6,5; lat. scuti 6; palpi 8,5; pedes I 23, II 43, III 29, IV 40.

Patria: Columbia. Specimen unicum, quod feminam judico, in Museo Vindobonense asservatum, vidi.

Zarax ænescens n. sp.

7 mm longus, obscure ænescens punctis pallidis notatus, area prima, parte exteriore limbi lateralis et membris brunneis; tuber oculiferum humillimum, vix excavatum; sulci transversi tertius et quartus obsoleti; scutum extra antennas in tubercula non productum; limbus lateralis vix discretus, granis parvis et foveis ornatus; areæ granis parvis sat densis; secunda granis ambobus, amplis, humilibus, quarta processulis ambobus obtusis; palporum pars femoralis tuberculo robusto interiore apicali armata; astragalus I calcaneo dimidio longior; articuli tarsali: 6, 18, 9, 10; processus terminalis unguiculis manifesto crassior neque brevior.

Tuber oculiferum humillimum, latum, supra vix excavatum, vittis latis ambabus granorum parvorum ornatum.

Scutum paullum convexum, subtiliter coriaceum, extra antennas in tubercula non productum. Sulci transversi tertius et quartus obsoleti. Limbus anterior vix discretus, laevis. Limbus lateralis vix discretus, granis parvis dispersis et foveis non profundis præditus. Areæ granis parvis sat densis dispersis; secunda granis ambobus amplis, humilibus, late separatis. Processuli areæ quartæ robusti, conici, obtusi, leviter reclinati, paralleli, spatio interapicali breviores; pars eorum multo major basalis granis parvis ornata. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum densorum; anale dorsale granis majoribus dispersis. Anale ventrale ordine posteriore granorum majorum; coxæ granis parvis dispersis; segmenta ventralia cetera ordinibus singulis granulorum densorum; primum ante modo coriaceum.

Antennarum pars globosa articuli primi granis obtusis densis supra ornata, quæ (præsertim ordinis posterioris) granis scuti multo majora sunt.

Palporum pars trochanterica aequa longa atque pars patellaris, in apice mediocriter incrassata, tuberculis humilibus inferioribus duobus munita. Pars femoralis

duplo fere longior quam crassior, ordine inferiore apicem fere attingente tuberculorum parvorum, sensim majorum (circiter quindecim) et tuberculo robusto (aculeum haud gracile, subapicalem gerente) interiore apicali armata; ultra carinam dorsalem brevem, prope apicem suum serratam, laevis. Partis patellaris margo interior sat anguste extenuatus. Pars tibialis parte femorali paullulo brevior, vix duplo longior quam latior; apex obliquus, angulis rotundatis; margo interior rectus, exterior leviter arcuatus, apicem prope aculeis brevibus circiter quinque densis, apicem versus robustioribus armatus. Pars tarsalis parte tibiali non duplo brevior, primum breviter depressa, marginibus anguste extenuatis, deinde leviter compressa; aculeis sat robustis armata, interioribus quatuor, exterioribus circiter septem. Unguis parte tarsali non duplo brevior.

Pedes haud robusti. Coxæ IV carina exteriore apicali instructæ, appressa, in medio manifeste altiore. Femora subrecta omnia et III et IV patellæ tibiæque granis et granulis ubique prædita. Calcanei I astragalo parte sua dimidia brevior, II astragalo vix longior; articulo tarsali primo III vix, IV manifesto breviores. Articuli tarsales: 6 (tarsus I alter biarticulatus, manifesto autem regenitus — fig. 18), 18, 9, 10. Pars ulterior tarsi II quinquepartita (tarsus II alter defuit). Processus terminalis æque longus ac unguiculi, iis autem manifesto crassior.

Differentia sexualis (femina incognita): In mare pars propior tarsi I parte ulteriore duplo crassior.

Brunnea sunt: area prima scuti, pars exterior limbi lateralis, coxae, segmentum ventrale primum; membra coxis paullo dilutiora. Areæ ceteræ scuti, pars interior limbi lateralis, segmenta dorsalia libera et cetera ventralia obscure ænescentia. Areæ punctis flavo-pallidis paucis notatæ; maculæ ambæ (punctis confluentibus formatæ), areæ primæ et parti propinquæ limbi lateralis impositæ, et lineæ ambæ parvæ fractæ, angulis posterioribus propinquæ, flavo-pallidæ.

Long. corp. 7; long. scuti 6; lat. scuti 5,5; palpi 6,5;

pedes I 17, II 35, III 23, IV 31.

Patria: Venezuela. Specimen unicum, marem, vidi, ad oppidum Merida captum, in Museo Hauniense asservatum.

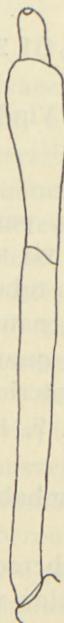


Fig. 18. *Zarax aene-scens* n. sp.
Pes I (calcaneus et tarsus rege-

niti).

Long. corp. 7; long. scuti 6; lat. scuti 5,5; palpi 6,5;

pedes I 17, II 35, III 23, IV 31.

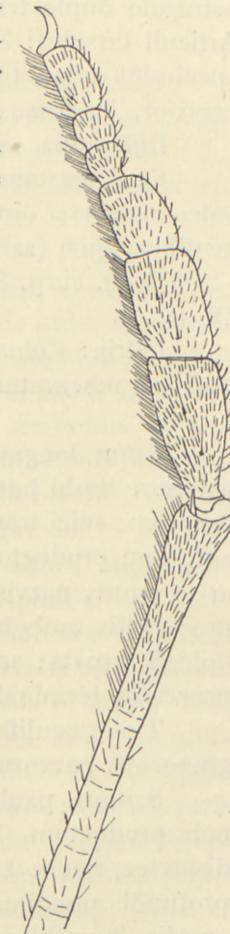


Fig. 19. *Zarax aene-scens* n. sp.
Maris calcaneus et tarsus (sinistri) I.

Acritas n. gen.

Tuber oculiferum eminentiis majoribus non ornatum est.

Pars latissima scuti dorsalis ante apices coxarum IV posita; scutum leviter convexum; a latere inspectum a sulco transverso primo usque ad marginem posteriorem æqualiter et leniter convexum, ita ut area III locum altissimum teneat; extra antennas in tubercula magna productum; sulci transversi, primo procurvo et postremo exceptis, obsoleti. Areae II—V granis sat magnis binis, ordines ambo, pone leviter convergentes, formantibus.

Orificia glandularum foetidarum in sinu parvo posita fere detecta.

Palporum sat robustorum pars tibialis lata, anguste extenuata, extus sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est; intus sulco marginali angusto (sive margine duplice, angustissime extenuato) prædita.

Pedes graciles. Coxæ IV dilatatae, margines posteriores scuti attingentes (♂) aut fere attingentes (♀). Pars propior tarsi I parte ulteriore crassior.

Differentia sexualis magna, structura segmenti analis dorsalis et armatura pedum demonstratur.

Species unica adhuc reperta in Venezuela indigena.

Acritas bilineatus n. sp.

5,75 mm longus, fusco-brunneus, lineis latis olivaceo-luteis obliquis, ex orificiois glandularum foetidarum usque ad marginem posteriorem euntibus, linea eodem modo colorata posteriore transversa conjunctis; tuber oculiferum granulis magnis dispersis, limbus anterior vix granulatus; limbus lateralis sat discretus, granulis magnis densis et impressionibus irregularibus; scutum granulis magnis densis; areae II—V granis sat magnis binis, ordines ambo pone leviter convergentes formantibus; pars femoralis tuberculo interiore apicali armata. Calcaneus I articulo tarsali primo subæqualis; articuli tarsales: 6, 9—12, 7, 7—8; processus terminalis æque longus ac unguiculi; anale dorsale maris processu inferiore et tuberculo superiore.

Tuber oculiferum humile, sat latum, supra fortiter excavatum, granulis magnis dispersis sat densis.

Scutum leviter convexum, a latere inspectum a sulco transverso primo usque ad marginem posteriorem æqualiter et leniter convexum, ita ut area III locum altissimum teneat. Sulcus transversus primus manifestissimus procurvus, quintus vix manifestus, ceteri obsoleti. Pars latissima scuti ante apices coxarum IV posita. Limbus anterior discretus, vix granulatus; pars media non elevata; tubercula extra antennas posita magna, depressa conica obtusa. Limbus lateralis sat discretus latus, granulis magnis densis dispersis extra majoribus, et impressionibus irregularibus plicatus. Orificia glandularum foetidarum in sinu parvo posita fere detecta. Areae granulis magnis densis dispersis, II, (III non semper), IV, V, non expressæ, granis sat magnis binis, ordines ambo pone leviter convergentes formantibus. Limbus posterior ordine

granulorum; segmenta dorsalia libera tria antiora granis inæqualibus (sexu differentibus). Coxæ granulis magnis; ventrale primum granis dispersis densis. Venter ceterum granulis ornatus.

Antennarum pars globosa granulis superioribus et granis marginalibus posterioribus et exterioribus, et apicali interiore.

Palporum pars trochanterica vix æque longa atque pars patellaris, tuberculo brevi robusto inferiore. Pars femoralis dimidio longior quam crassior, ordine inferiore tuberculorum, quorum sex (circiter) magna robusta, et tuberculo interiore armata; ultra carinam dorsalem altam, ultra medium articuli vix pertinentem, lævem tuberculis paucis serrata. Partis patellaris margo interior, peranguste extenuatus, apice angulatus, infra quem tuberculum parvulum adest. Pars tibialis non duplo longior



quam latior, lata anguste extenuata, extus sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est; intus sulco marginali angusto sive margine duplice angustissime extenuato prædita, quare palpi complicari possunt. Pars tibialis deorsum curvata; margo uterque anguste extenuatus, interior subrectus, exterior arcuatus; angulus interior (inferioris marginis) prominens, robustus, aculeo brevi armatus, exterior non productus, extra quem aculeus similis adest. Pars tarsalis parte tibiali duplo brevior, depressa, marginibus vix extenuatis, in ipso apice brevi paullum compressa, setis robustis exterioribus et aculeo angulo marginis imposito interiore medio armata. Unguis parte tarsali dimidio brevior.

Fig. 20. *Acritas bilineatus* n. sp. Maris femur IV (sinistra).

Pedes graciles. Coxa IV tuberculo anteriore laterali cylindrico conico major in femina quam in mare, et processulo robusto conico vix curvato obtuso. Femora I—II subrecta, III et IV levissime arcuata, omnia et patellæ et tibiæ subtilissime granulatae. Calcanei I—II articulo tarsali primo subæqualis, III et IV vix longior quam crassior. Articuli tarsales: 6, (9—)10(—11—12), 7, 7—8. Processus terminalis æque longus ac unguiculi et iisdem crassior. Unguiculi integri.

Differentia sexualis: Mas minus convexus quam femina. Sculptura maris paullo robustior quam feminæ. Anale dorsale feminæ granis paucis dispersis et impressione transversa profunda in medio interrupta; anale dorsale maris processu brevi robusto conico, obtuso, supprono, supra quem adest tuberculum magnum, juxta quod adsunt parva ambo (utrinque singulum). E spiraculis exeunt carinæ angustæ binæ obliquæ, maris manifestæ, feminæ obsoletæ. Coxa IV tuberculis in mari majoribus quam in femina; trochanter IV maris tuberculo parvo interiore apicali, quod in femina deest; femora IV maris tuberculis gracilibus interioribus paucis remotis. Tarsi primi pars citerior parte ulteriore paullo, tamen manifesto crassior in mare, non in femina.

Lamina inferior penis glande cetera vix latior, in apice vix emarginata, angulis subacutis, setis lateralibus apicalibus utrinque binis longis et uno brevi et basalibus utrinque binis; processus medius in fig. 21 demonstratus est.

Fusco-brunneus, lineis latis, ante sensim latioribus, olivaceo-luteis obliquis,

procul serratis, ex orificiis glandularum foetidarum usque ad marginem posteriorem scuti euntibus, in parte latiore anteriore pustulis brunneis notatis, et linea eodem

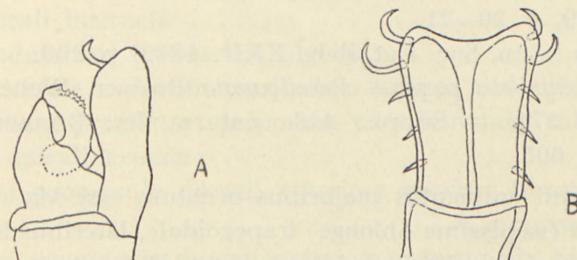


Fig. 21. *Acritas bilineatus* n. sp.
A Glans penis, a latere sinistro inspecta, B infra inspecta.

modo colorata posteriore marginella transversa conjunctis, mox ante quam ordo transversus punctorum olivaceo-luteorum adest. Tarsi brunneo-testacei.

Long. corp. 5,75; long. scuti 5,2; lat. scuti 4,4; palpi 4,7; pedes I 12, II 25, III 16, IV 22.

Patria: Venezuela. — E. SIMON collected 5 males and 2 females at San Esté-

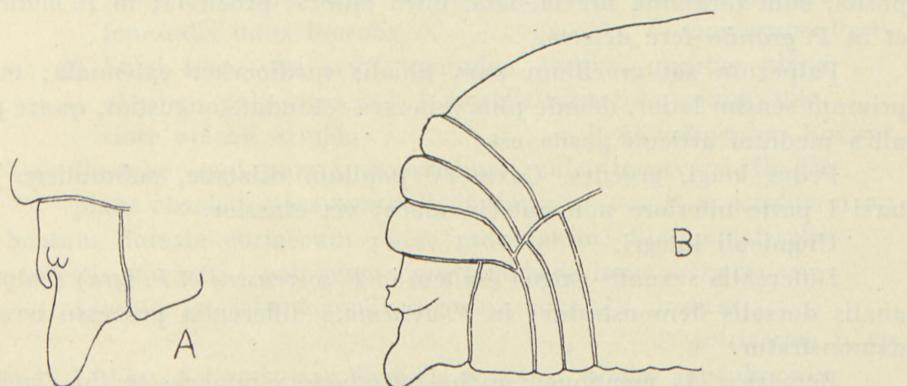


Fig. 22. *Acritas bilineatus* n. sp.
A Apex abdominis maris alterius, a latere inspecta, B maris normalis.

ban in the month of March 1888. They are preserved in the Zool. Museum of Copenhagen.

Remark: In a single male with the penis protruded the dorsal anal segment was as shown in fig. 22 A, distinctly different from that of the four other males (fig. 22 B), as the ventral process was much more clumsy; in the femora of the same specimen the armature was scarcely more developed than in the two females.

Poecilæma C. L. Koch.

Cosmetus p. p. Perty, Delectus Animalium III, 1833, p. 203.

Poecilæma + *Flirtea* p. p. + *Cynorta* p. p. C. L. Koch, Uebers. d. Arachnidensyst., fasc. II, 1839, p. 20—21.

Poecilæma E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 200.

Poecilæma p. p. + *Cynorta* p. p. + *Poecilæmula* Roewer, Weberkn. d. Erde, 1923, p. 364, 310, 374. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 3, 1928, p. 595, 554, 605.

Tuber oculiferum eminentiis majoribus ornatum esse vix dicendum.

Scutum dorsale (sæpissime oblonge) trapezoidale, lateribus leviter arcuatis, ante rotundatum, post locum altissimum, adversus coxas IV positum, manifesto angustius; a latere inspectum a tubere oculifero ad processus leviter altius, deinde declive (in *mutico* non declive), sulco transverso primo non aut vix depresso (in *mutico* manifestum); extra antennas in tubercula porrecta productum; sulcis transversis (primo et postremo exceptis) sæpissime plus minusve obsoletis ornatum.

Area secunda sive granis aut tuberculis ambobus prædita sive inermis.

Area quarta (non expressa) eminentiis ambabus, majoribus aut minoribus, instructa.

Orificia glandularum foetidarum plus minusve obtecta, in ipso margine scuti posita, sunt foramina brevia, lata, infra latiora, proclivia; in *P. mutico* vix detecta et in *P. granito* fere detecta.

Palporum sat gracilium pars tibialis mediocriter extenuata; margo exterior primum sensim latior, deinde plus minusve rotundate angustior, quare pars latissima ultra medium articuli posita est.

Pedes longi, graciles. Coxæ IV paullum dilatatae, submuticæ. Pars propior tarsi I parte ulteriore non aut (in mare) vix crassior.

Unguiculi integri.

Differentia sexualis exigua (saltem in *P. soerensenii* et *P. lyra*) sculptura segmenti analis dorsalis demonstratur; in *P. reticulato* differentia processu terminali pedum demonstratur.

Remarks: As mentioned in the introductory remarks to the family *Cosmetidae*, the finds of SØRENSEN do not allow a circumscription of the genera according to those characters which are used by ROEWER. This will result in another arrangement of the species; it will thus be seen that at any rate *Poecilæmula* Roewer and part of *Cynorta* will fall within the genus *Poecilæma* in the sense of SØRENSEN. — *P. muticum* is the most aberrant of the species referred to *Poecilæma*, but I think that it represents an extreme reduction of the eminentiæ within the same relationship, as *P. signata* Banks (according to the figure by ROEWER p. 374) has its eminentiæ considerably shortened as compared with the other species described.

Conspectus specierum hic descriptarum.

- I. Scutum dorsale sine processibus ambobus in area IV, cum granis parvis ambobus granulis scutu paullo aut vix majoribus *P. muticum* n. sp.

II. Area IV scuti processibus ambobus instructum:

- A. Orificia glandularum foetidarum fere detecta; labium anterius posterius prominet. Area II granis ambobus. Pars femoralis palpi tuberculo interiore apicali instructa *P. granitum* n. sp.
- B. Orificia glandularum foetidarum obtecta:
1. Scutum dorsale eminentiis majoribus tantum ambabus (processibus posterioribus) præditum; palporum pars femoralis tuberculo parvo interiore apicali armata:
 - a. Coxæ I processulo dorsali anteriore breviter biramo
P. soerensenii n. sp. (K. L. H.).
 - b. Coxæ I processulo dorsali anteriore robusto vix bifido. *P. lyra* n. sp.
 2. Scutum dorsale præter processus posteriores granis ambabus (anterioribus) præditum, ceteris paullo tantum altioribus
P. marginatum W. S.
 3. Scutum dorsale præter processus posteriores eminentiis majoribus (granis aut tuberculis) anterioribus ambabus præditum:
 - a. Scutum dorsale subtiliter coriaceum pustulis humillimis (coloratis) præditum:
 - + Pustulæ scuti magnæ:
 - § Sulci transversi scuti omnes manifesti; palporum pars femoralis intus inermis *P. conspersum* Perty.
 - §§ Sulci transversi scuti secundus, tertius, quartus plane obsoleti; palporum pars femoralis tuberculo minuto interiore apicali armata *P. albiadspersum* Roewer.
 - ++ Pustulæ scuti parvæ, densissimæ; sulci transversi II—IV plane obsoleti; pars femoralis inermis *P. punctatum* n. sp.
 - b. Scutum dorsale coriaceum parce granulatum; limbus lateralis scuti vix discretus; palporum pars femoralis intus armata:
 - + Limbus lateralis foveolis rugosus; coxæ IV muticæ
P. guttigerum n. sp.
 - ++ Limbus lateralis non foveolis rugosus; præter pustulas vix granulatus; coxæ IV non muticæ *P. reticulatum* n. sp.
 - c. Scutum dorsale coriaceum tantum; limbus lateralis scuti discretus:
 - + Limbus lateralis lœvis *P. marginale* Banks.
 - ++ Limbus lateralis punctis impressis ornatus
P. withi n. sp. (K. L. H.).

Observatio: *P. marginatum* huic generi adscripsi quamquam unguiculos pedum non vidi.

Poecilæma muticum n. sp.

5,2 mm longum, cinnamomeum, linea transversa posteriore submarginali scuti et vitta lageniformi, extra quam puncta et maculæ et intra quam ordo medius punc-

torum 4 luteorum; tuber oculiferum ordinibus ambobus granulorum parvorum; limbus lateralis non discretus; scutum coriaceum; area IV granis parvis ambobus; orificia glandularum foetidarum vix detecta; palporum pars femoralis tuberculo interiore apicali armata; calcaneus I astragalo triplo brevior; articuli tarsales: 6—7, 12—14, 7—8, 7—9; processus terminalis unguiculis paullo brevior.

Tuber oculiferum humile, supra excavatum, ordinibus ambobus granulorum parvorum, inter quos granula parva adsunt.

Scutum leviter convexum, a tubere oculiferum ad sulcum transversum primum vix, deinde sensim paullo altius, pone non declive. Sulci transversi primus leniter procurvus manifestus, ceteri vix manifesti. Limbus anterior discretus, coriaceus; pars media vix elevata, dense granulata; tubercula extra antennas posita subglobosa. Limbus lateralis perlatus, non discretus, praeter pustulas granulis, quorum exteriora ordinem submarginalem formant, præditus, et punctis et striis impressis ornatus, quarum aliquot ordinem prope marginem exteriorem formant (et interdum sulcum formare videntur). Orificia glandularum foetidarum vix detecta. Areæ coriaceæ, prima impressionibus transversis posterioribus; omnes granulis dispersis; area quarta granis parvis granulis paullo, vix aut non majoribus, ambobus late disjunctis. Limbus posterior ordine granulorum; segmenta libera dorsalia tria anteriora ordinibus singulis granorum inæqualium densorum; anale dorsale granis inæqualibus dispersis. Anale ventrale vitta posteriore granorum parvorum haud densorum et carina anteriore; coxae et segmenta ventralia cetera granulis ornata.

Antennarum pars globosa præter grana magna densa marginalia granis parvis supra ornata.

Palporum pars trochanterica parte patellari vix longior; in apice incrassata, tuberculo parvo subcylindrico obtuso inferiore apicali munita. Pars femoralis non triplo longior quam crassior; ordine inferiore tuberculorum minutorum (c. 14) et tuberculo interiore apicali robusto brevi rotundo munita; ultra carinam dorsalem leviter expressam, leviter crenulatam, æqualiter crenulata. Partis patellaris margo interior angustissime extenuata. Pars tibialis parte femorali vix brevior, non triplo longior quam latior; margo interior extenuatus, subæquus, in parte apicali paullo angustior; margo exterior primum subrectus, sensim latior, deinde prope apicem paullo (rotundate) angustior; angulus interior breviter productus et exterior rotundatus inermes. Pars tarsalis parte tibiali plus quam duplo brevior, in postico leviter depressa, deinde vix compressa, margines vix extenuati inermes. Unguis sat procerus parte tarsali non duplo brevior.

Pedes graciles. Coxa I processulo sive carina dorsali sat humili, processulum suum conicum vix proclivum, superiorem submuticum emittente. Coxa IV quam III triplo latior in apice submutica. Femora leviter arcuata granulata. Calcaneus I astragalo triplo brevior, II paulo plus quam duplo; articulo tarsali primo coxa III vix, IV duplo brevior. Processus terminalis æquus et crassus et paullo brevior quam unguiculi. Articuli tarsales: 6—7, 12—14, (7—)8, (7—)9.

Differentia sexualis. Mas quam femina major et minus convexus. Anale dorsale

maris tuberculis duobus (præter quæ tertium posterius sœpe adest) præditum; grana analis dorsalis in femina vix majora quam granula cetera. Pedes maris quam feminæ paullo crassiores. Pars propior tarsi I in mare leviter incrassata.

Cinnamomeum; scutum linea lutea transversa posteriore submarginali in medio sœpe late interrupta et vitta lageniformi lutea, extra quam puncta et maculæ parvæ irregulariter formatæ adsunt, et intra quam ordo medius punctorum 4 adest luteorum in sulcis transversis positus.

Long. corp. 5,2; long. scuti 4,7; lat. scuti 4,2; palpi 4,8; pedes I 17, II 39, III 23, IV 32.

Patria: Brasilia. — Prof. GÖLDI collected 4 males and 12 females in 1892 and 5 females in 1893, in Colonia Alpina near Theresopolis, 8 specimens of which are preserved in the Zool. Museum Copenhagen.

Poecilæma granitum n. sp.

6 mm longum, brunneum, eminentiæ scuti, exceptis processibus areæ IV, eminentiæ aliquot tuberis, eminentiæ laterales coxæ IV et maculæ anteriores subtriangulæ, vitellinæ; tuber oculiferum ordinibus ambobus granorum; limbus lateralis vix discretus; scutum granis parvis anterioribus et processibus posterioribus ambobus; orificia glandularum foetidarum fere detecta; labium anterius ultra posterius prominet; area II granis, area IV processibus ambobus; palporum pars femoralis tuberculo interiore apicali armata; calcaneus I astragalo haud multo brevior; articuli tarsales: 7, 14—16, 8, 9—10; processus terminalis unguiculis æqualis.

Tuber oculiferum latum, perhumile, manifeste excavatum, ordinibus ambobus granorum, quaternorum, paucorum, vitellinorum.

Scutum post sulcum primum sat alte convexum, post locum latissimum adversus apices coxarum IV positum paullulo angustius, lateribus levissime arcuatis. Sulci omnes manifesti. Limbus anterior vix discretus, ordine posteriore granorum quatuor præditus, pars media parva tumida; tubercula extra antennas posita parva, conica, obtusa, vitellina. Limbus lateralis vix discretus lœvis, præter partem marginalem declivem pone latiorem, granis præsertim ante densis præditus. Orificia glandularum foetidarum fere detecta; labium anterius ultra posterius prominet. Area prima ordine posteriore granorum 4—6, ceteræ granis densis dispersis, quorum aliquot ceteris majores, præsertim ambo areæ secundæ. Processus areæ quartæ leviter reclines magni, distantia apicali manifesto breviores; pars basilaris late conica, granulis brunneis scabra; pars apicalis cylindrica obtusa. Limbus posterior et segmenta dorsalia libera tria priora ordinibus singulis granorum inæqualium haud densorum; anale dorsale granis inæqualibus, quorum parva brunnea et ambo magna vitellina. Coxæ IV et ventrale primum granis minoribus densis; ventralia cetera ordinibus singulis granorum parvorum.

Antennarum pars globosa articuli primi granis densis prædita est.

Palporum pars trochanterica parte patellari longior, tuberculis inferioribus duobus quorum interius exteriore minus. Pars femoralis plus quam duplo longior

quam crassior, ultra carinam dorsalem brevem et humilem lævis, ordine inferiore tuberculorum parvorum circiter 12 et tumulo setifero robusto interiore apicali. Pars patellaris vix extenuatus; angulus interior rotundatus, exterior leviter productus, aculeo gracili armatus, intra quem aculeus similis adest. Pars tarsalis parte tibiale non duplo brevior, in postico leviter depressa, marginibus levissime extenuatis, deinde leviter compressa, præter setas aculeo interiore procero armata. Unguis procerus parte tarsali vix duplo brevior.

Pedes sat graciles; coxae I tuberculo breviter et obtuse bicuspidato, IV submuticæ. Femora subrecta, granis parvis prædita. Calcanei I astragalo haud multo, II non triplo brevior, III articulo tarsali primo æqualis, IV vix brevior. Pars cterior tarsi I æque crassa atque pars ulterior. Unguiculi integri. Processus terminalis æque longus et crassus ac unguiculi. Articuli tarsales: 7, 14(—15—16), 8, 9(—10).

Differentia sexualis ignota. Ventrale I (♀): carinæ obliquæ e spiraculis exeunte obsoletæ.

Brunneum; sulci transversi, eminentiæ scuti, exceptis processibus areæ IV, eminentiæ aliquot tuberis, eminentiae laterales coxae IV (apicalibus exceptis) et maculæ anteriores ambæ scuti (ad sulcum transversum primum et præsertim ante) subtriangulae, punctis impressis brunneis ornatae, vitellinæ. Trochanteres flavi, pedum partes ceteræ flavæ, dense nigro punctatæ, pars dimidia subbasalis femoris IV fulva.

Long. corp. 6; long. scuti 4,5; lat. scuti 4; palpi 5,5; pedes I 14, II 35, III 21, IV 30.

Patria: Venezuela. Specimina duo (♀) vidi, ad San Estéban ab ill. E. SIMON 3/1888 capta; nunc in Museo Zool. Hafniense asservata.

Poecilæma soerensenii n. sp. (K. L. Henr.).

Poecilæma limbatum Sørensen, in manuser. (nec KOCH).

3,5 mm longum, fusco-brunneum, vittis dorsalibus ambabus luteis, literam U formantibus notatum, partem medianam punctis (granis) luteis ornatam includentibus; tuber oculiferum haud latum ordinibus ambobus granulorum; limbi anterioris pars media dense subtiliter granulata; scutum coriaceum granulis dispersis et granis et ambobus processibus posterioribus præditum; segmenta dorsalia libera tria anteriora granis binis; palporum pars femoralis tuberculo parvo interiore apicali armata, pars tarsalis setis tantum munita; coxae I processulo dorsali anteriore breviter biramo; calcaneus I astragalo plus quam duplo brevior; articuli tarsales: 7, 15, 8, 9; processus terminalis æque longus ac unguiculi. — Maris anale dorsale granis magnis ambobus.

Tuber oculiferum humile, haud latum, supra excavatum, ordinibus ambobus granulorum, oculis non propinquis, inter quos granula minuta adsunt.

Scutum sat alte convexum, a tubere oculifero ad sulcum transversum primum vix, deinde manifeste altius, pone leniter declive. Sulcus primus leniter procurvus latus non profundus, quintus manifestus, ceteri desunt. Limbus anterior vix discretus

angustus coriaceus; pars media dense subtiliter granulata; tubercula extra antennas posita brevia, haud robusta, conica, obtusa. Limbus lateralis e sexu varius. Orificia glandularum foetidarum tota fere obiecta. Scutum coriaceum, granulis dispersis et (luteis) granis ornatum, quorum majora ambo extra (et ante) tuber oculiferum posita sunt, et tria media, a sulco transverso primo usque ad processus posita (quorum secundum et tertium sunt media sui ordinis transversi granorum paucorum), et ordinibus ambo bus granorum sat densorum, maculam dorsalem fuscum cingentibus, post processus inter se ordine brevi transverso conjunctis; extra quos grana minuta dispersa, minus densa adsunt. Area prima impressione posteriore media orbiculari parva. Processus leviter reclines subparalleli (primum conici granulati, deinde cylindrici obtusi) spatio interapicali subæquales. Margo posterior ordine, in medio interrupto, granorum densorum (luteorum); segmenta dorsalia libera tria anteriora ordinibus singulis granulorum et granis binis (luteis). Anale dorsale granulis dispersis et impressione transversa. Anale ventrale ordinibus duobus granulorum; coxae et ventrale primum granis parvis dispersis; ventralia cetera ordinibus singulis granulorum.

Antennarum pars globosa articuli primi granis marginalibus densis ornata, pone majoribus.

Palporum pars trochanterica parti patellari subæqualis, in apice incrassata, tuberculo inferiore armata. Pars femoralis plus quam triplo longior quam crassior, ordine inferiore tuberculorum multorum (15—20), in basi confluentum, et tuberculo parvo interiore apicali armata; ultra carinam dorsalem lœvem vix serrata. Partis patellaris margo interior angustissime extenuatus, in apice manifeste angulatus. Pars tibialis triplo longior quam latior, parte femorali vix brevior; margo interior sat anguste extenuatus rectus, in apice sensim angustior, exterior primum rectus sensimque paullo latior, deinde sensim angustior; anguli sat producti tuberculis singulis sat robustis armati. Pars tarsalis parte tibiali triplo fere brevior, angustus, sensim angustior, setis tantum munita. Unguis sat procerus parte tarsali vix tertia parte brevior.

Coxæ I processulo dorsali anteriore breviter biramo obtuso, IV coxis III plus quam duplo latiores, carina transversa superiore apicali humili. Femora recta, granulata. Calcanei astragalo I plus quam duplo, II duplo breviores; articulo tarsali primo III subæqualis, IV paullo brevior. Articuli tarsales: (6—)7, (13—)15(—17), (7—)8(—9), (8—)9(—10). Processus terminalis æque crassus et longus ac unguiculi.

Differentia sexualis: Mas quam femina minor et saturius coloratus. Sulcus transversus primus maris manifestus, feminae levis. Limbus lateralis maris non discretus, feminæ leviter discretus. Pedes maris paullo longiores. Anale dorsale maris granis magnis (fuscis) ambobus conicis, post impressionem transversam positis; feminæ granis parvis ambobus. Mas a femina non in femoribus IV discrepat.

Fusco-brunneum, vittis latis ambabus luteis ante concave acuminatis, literam U pone interruptam formantibus, partem medium dorsi includentibus, post processus scuti valde coarctatam, punctis (granis jam dictis) luteis notatam; margines lateralis

et posterior scuti et segmentorum dorsarium liberorum omnium sordide lutei. Pedes flavi, obsolete fusco anulati; patellæ et apices femorum et tibiarum infuscata.

Long. corp. 3,5 (♀, cuius abdomen fortiter extensem, 5); long. scuti 3,25 (♀ 3,75); lat. scuti 3 (♀ 3,25); pedes I 14, II 34 (♀ 33), III 19 (♀ 20), IV 27 (♀ 25).

Patria: Brasilia. Exempla decem, mares quatuor et feminas sex, vidi, in provincia Rio de Janeiro ab ill. Prof. GÖLDI quinque in Serra Veruzella capta et (uno in Museo Zool. Hauniensi excepto) in collectione ill. comitis KEYSERLINGII asservata, quinque ad Coloniam Alpinam (prope Theresopolin) in montibus.

Variatio: Carina dorsalis partis femoralis palporum interdum serrata, ultra quam articulus granis acutis interdum serratus est.

Remark: SØRENSEN believed that the species here described was identical with *Poecilæma limbatum* Koch as the pattern of the scutum is nearly the same, although he was well aware that great differences were present. It is, however, certain that this identity cannot be maintained. The species of SØRENSEN is quite another species, and clearly enough belongs to *Poecilæmula* Roewer. The species being thus in want of a new name, I propose to name it after Dr. SØRENSEN.

Poecilæma lyra n. sp.

4,25 mm longum, brunneum, vittis dorsalibus ambabus luteo-albidis ornatum, vitta angusta ante conjunctis, partem medianam punctis (granis) luteo-albidis notatam includentibus; tuber oculiferum haud latum, ordinibus ambobus granulorum et granulis pusillis dispersis; pars media limbi anterioris tumida, dense granulata; scutum coriaceum granulis dispersis et granis et ambobus processibus posterioribus; segmenta dorsalia libera tria anteriora granis binis; palporum pars femoralis tuberculo parvo interiore apicali armata, pars tarsalis setis tantum munita; coxae I processulo dorsali anteriore vix bifido; Calcaneus I astragalo triplo fere brevior; articuli tarsales: 7, 15—16, 8, 9; processus terminalis unguiculis paullo brevior. — Maris anale dorsale tuberculis ambobus.

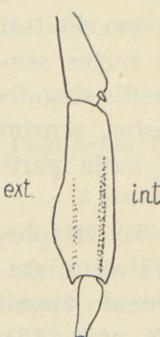


Fig. 23. *Poecilæma lyra* n. sp.
Palpi partes patellaris, tibialis
et tarsalis.
(W. Sør. del.)

Scutum sat convexum, æque latum ac longum, a tubere oculifero ad sulcum transversum primum vix, deinde manifesto altius, pone leviter declive. Sulci transversi primus procurvus et quintus debiles; ceteri desunt. Limbus anterior discretus coriaceus; pars media tumida, dense granulata; tubercula extra antennas posita brevia, robusta, obtusa. Limbus lateralis non discretus. Orificia glandularum foetidarum tota obiecta. Scutum coriaceum granulis dispersis sat densis et granis deplanatis (luteo-albidis) præeditum, quæ ante processus in ordines tres disposita sunt, quorum singula (media) ceteris majora, et ordinibus ambobus granorum remotorum (maculam dorsalem fuscarn cingentibus), post processus inter sese ordine transverso

brevi conjunctis, extra quos grana minuta dispersa adsunt. Areæ primæ impressio posterior media orbicularis haud profunda imposita. Processus vix reclines, paralleli, primum conici granulati, deinde cylindrici læves, obtusi spatio interapicali æquales. Limbus posterior scuti ordine granorum (luteorum) sat densorum; segmenta dorsalia libera tria anteriores ordinibus singulis granulorum et granis binis (luteis); anale dorsale ordine superiore granorum quatuor. Coxæ et ventralia primum et anale granulis dispersis, cetera ordinibus singulis granulorum, pone minorum.

Antennarum pars globosa articuli primi granis marginalibus supra prædita, quorum posteriora majora, densa.

Palpi descriptioni speciei precedentis congruunt; hac in re tantum discrepant, quod unguis parte tarsali plus quam parte tertia brevior est.

Coxæ I processulo dorsali anteriore robusto, vix bifido, obtuso. Coxæ IV coxis III plus quam duplo latiores, carina transversa superiore apicali brevi, humili, crenulata. Femora recta, granulis ubique prædita. Calcanei astragalo I triplo fere, II duplo breviores, articulo tarsali primo III subæqualis, IV manifeste brevior. Articuli tarsales: 7(—8, raro), (14)—15—16(—17), (7)—8, 9(—10). Processus terminalis unguiculis paullo brevior et tenuior.

Differentia sexualis: Mas quam femina paullo minor. Pedes maris paullo longiores quam feminæ. Anale dorsale maris tuberculis posterioribus ambobus conicis acutis; feminæ granis.

Brunneum, vitta angusta lyriformi (sive U-formi) luteo-albida pone interrupta, cuius partes anteriores vitta angusta transversa (sæpe integra, sæpe interrupta) conjunctæ sunt, extra quam puncta (eminentiæ) remota dispersa luteo-albida adsunt; macula dorsalis media brunnea punctis (granis jam dictis) luteo-albidis notata. Area prima punctis (granis) ambobus luteo-albidis, ante et extra tuber oculiferum positis; margines lateralis et posterior scuti flavi; segmenta dorsalia flavo-marginata, tria anteriores punctis (granis) binis luteo-albidis. Pedes apicem versus dilutiores; tibiae et metatarsi anguste fusco anulata; tarsi infuscata.

Long. corp. 4,25; long et lat. scuti 3,5; palpi 4; pedes I 14, II 34, III 20, IV 27.

Patria: Brasilia. Exempla duodecim vidi, in provincia Rio de Janeiro ab ill. Professore GÖLDI ad Monte Verde (4 ♂, 6 ♀, 1 pullum) et ad Facenda Calvario (1 ♀) capta, quorum duo in Museo Zool. Hafniensi, cetera in collectione ill. comitis KEYSERLINGII asservata.

Variatio: Palporum pars femoralis supra sæpe leviter serrata. Anale dorsale (in mare uno) eminentiis posterioribus quatuor præditum.

Pullus magnus: Long. corp. 2,75; long. scuti 2; palpi 6,5. Palporum pars trochanterica æque longa ac pars patellaris, tuberculo inferiore apicali munita; ceteræ partes inermes; pars femoralis partibus patellari et tibiali conjunctis æqualis; pars tibialis parte patellari duplo longior; pars tarsalis parte tibiali vix brevior. — Areæ leviter expressæ; secunda granis ambobus late separatis, quarta processulis ambobus. — Sculptura scuti cetera debilis. — Vitta anterior, partes anteriores lyræ conjungens, vix adest. Pedes fusci, pæne nigri; apices tibiarum et bases metatarsorum pallentes.

Remarks: The four proximal tarsal joints in the first pair of legs are slightly enlarged in the single male examined.

Like the preceding species, this also must be referred to the genus *Poecilæmula* of the Roewerian system. Both species in many respects (e.g. the shape of the spines on area IV and the patterns of scutum) show much resemblance to *P. peculiaris* Roewer.

Poecilæma marginatum W. Sør.

Cosmetus marginatus W. Sørensen, Naturh. Tidsskr. (3) XIV, 1884, p. 588.

Poecilæma marginatum Roewer, Weberkn. d. Erde, 1923, p. 373.

5,5 mm longum, rufo-brunneum, vitta laterali et pustulis scuti vitellinis notatum; tuber oculiferum latum, late excavatum, granulis ambobus parvis; scutum subtiliter coriaceum, pustulis (vitellinis) dispersis et anterioribus granis ambobus (fuscis), ceteris paullo tantum altioribus, et posterioribus processibus ambobus granulatis; palporum pars femoralis tuberculo interiore apicali armata; articuli tarsales: ?, 17, 10, ?; processus terminalis robustus, diametro articuli longior.

Patria: Brasilia.

Addenda et corrigenda: Limbus anterior scuti sat tumidus, pustulis ambabus deplanatis ornatus. — Orificia glandularum foetidarum plane obiecta. — Inter tuber oculiferum et processus scuti adsunt grana ambo fusca, ceteris (pustulis) non latiora sed paullo altiora. — Palporum pars femoralis tuberculo interiore apicali armata; ultra carinam dorsalem lævem, apicem versus evanescens, lævis. Partis patellaris margo interior anguste extenuatus, in apice oblique angulatus. — Coxæ IV coxis III triplo latores, carina transversa superiore apicali crassa rectangula. — Calcanei I ?, astragalo II vix dimidio, III triplo breviores, IV? — Pars citerior tarsi II 14-articulata. — Vitta lateralis scuti sordide vitellina, ante oblique acuminata, pone bifida, post coxas III recta, a margine remota.

Poecilæma conspersum Perty.

Cosmetus conspersus Perty, Delectus Animalium, III, 1833, p. 203.

Cynorta conspersa C. L. Koch, Die Arachniden, T. VII, 1839, p. 100.

Cynorta conspersa Roewer, Die Weberkn. d. Erde, 1923, p. 312.

4 mm longum, dilute cinnamomeum, lineis et maculis et punctis luteis notatum, quorum macula lata perverse cordiformis inter processus fusco-brunneos posita est; tuber oculiferum leviter excavatum, subtiliter coriaceum tantum; sulci transversi omnes manifesti; pars media limbi anterioris sat dense granulata; limbus lateralis leviter discretus; area secunda granis ambobus, quarta processibus ambobus; scutum totum pustulis amplis subplanis (luteis); palporum pars femoralis intus inermis, pars tarsalis setis tantum munita; coxæ I carina dorsali; calcaneus I astragalo parte tertia brevior; articuli tarsales: 6, 14, 8, 8; processus terminalis unguiculis æqualis.

Tuber oculiferum humile latum, supra leviter excavatum, subtiliter coriaceum tantum.

Scutum convexum. Sulci transversi omnes manifesti; primus procurvus haud profundus, ceteri læves. Limbus anterior discretus coriaceus; pars media sat dense granulata; tubercula extra antennas posita brevia, robusta, rotundata. Limbus lateralis leviter discretus, coriaceus, præter puncta et lineolas impressa vix manifesta lævis. Orificia glandularum foetidarum tota fere obtecta. Areæ subtilissime coriaceæ, granulis minutis dispersis; prima impressione media posteriore orbiculari sat profunda nec ampla; secunda granis ambobus obtusis late separatis. Processus areæ quartæ sat proceri, leviter reclines ac divergentes, spatio interapicali breviores, obtusi. Scutum totum pustulis amplis subplanis. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granulorum; anale dorsale granulis dispersis. Anale ventrale ordinibus duobus granulorum; coxæ et ventrale primum (ante sulcum latum et profundum) granulis parvis remotis; ventralia cetera ordinibus singulis granulorum remotorum.

Antennarum pars globosa articuli primi grano magno interiore apicali conico et granis exterioribus prædicta.

Palporum pars trochanterica parte patellari paullo longior (in apice incrassata) tuberculo inferiore armata. Pars femoralis triplo longior quam crassior, ordine inferiore apicem fere attingente tuberculorum minutorum (circiter 15) armata, intus inermis; ultra carinam dorsalem humilem lævem sensim evanescentem lævis. Partis patellaris margo interior angustissime extenuatus, non angulatus; ultra (et supra) quem tuberculum minutum adest. Pars tibialis plus quam duplo longior quam latior, parti femorali æqualis; margines sat late extenuati, interior rectus (qui — torsione palpi — "fast ein wenig ausgebogen" (C. L. KOCH) esse videtur), exterior primum rectus sensim paullo latior, deinde (ultra medium) rotundate angustior; anguli rotundati aculeis singulis armati. Pars tarsalis parte tibiali plus quam duplo brevior, sat angusta, apicem versus sensim angustior, setis tantum munita. Unguis sat procerus, parte tarsali dimidio brevior.

Coxæ I dorsali tuberculo compresso humili; IV coxis III duplo latiores, carina transversa superiore apicali humillima rotundata. Femora recta lævia. Calcanei astragalo I parte tertia, II parte vix tertia breviores, III et IV articulo tarsali primo manifeste (vix duplo) breviores. Articuli tarsales: 6, 14, 8, 8. Pars propior tarsi I parte ulteriore paullulo crassior. Processus terminalis æque longus atque unguiculi.

Differentia sexualis incognita.

Dilute cinnamomeum, lineis et maculis et punctis luteis notatum: limbus anterior lineis ambabus leviter obliquis; limbus posterior lineis ambabus, marginem attingentibus; macula lata perverse cordiformi, pone et inter processus fusco-brunneos areæ quartæ posita; maculis scuti, quarum utrinque ternæ oblongæ, limbis lateralibus impositæ, et quaternæ suborbiculares, ordines ambos arcuatos formantes; denique maculis parvis et punctis, quorum alia lineam medianam interruptam, alia (limbis lateralibus aut imposta aut propinqua) ordines ambos, alia ordinem transversum ante tuber oculiferum formant. Membra paullo dilutiora; patellæ infuscatae; astragali anguste nigro anulati.

Long. corp. 4; long. scuti 3,5; lat. scuti 3; palpi 3,5; pedes I 14,5; II 32; III 19; IV 28.

Patria: Brasilia. Specimen unicum vidi, ad Rio Vacantia, Cameta, captum, quod ill. E. SIMON mihi benevolentissime dedit, nunc in Museo Zool. Hauniensi asservatum.

Observatio: A descriptione, a C. L. KOCH data, his in rebus discrepat: "Der Augenhügel ziemlich hoch." — Grana areæ secundæ non commemoratur. — "Die drei oberen Hinterleibsringe.... ohne Körnchen." — Nullo modo tamen dubito, quin hæc species *Cynorta conspersa* Koch sit.

Remark: ROEWER has referred this species to *Cynorta* on account of the 6 joints in tarsus I.

Poecilæma albiadspersum (Roewer).

Poecilæma punctulissimum E. Simon in schedula.

Poecilæma punctulissimum Sørensen in manusc.

Cynorta albiadspersa Roewer, Abh. nat. Ver. Bremen, XXVI, 3, 1928, p. 573.

Vix 5 mm longum, fuscum pæne nigrum; limbus anterior vitta angusta olivacea, margo exterior limbi lateralis rufescens, scutum ceterum, segmenta dorsalia libera, coxae (in lateribus) maculis parvis (pustulis) olivaceis notata; tuber oculiferum coriaceum tantum; limbus lateralis non discretus; scutum subtiliter coriaceum pustulis amplis humillimis densis et tuberculis parvis anterioribus ambobus et processibus posterioribus ambobus; palporum pars femoralis tuberculo interiore apicali armata; coxae I processulo dorsali anteriore curvato; calcaneus I articulis tarsalibus primo et secundo conjunctis æqualis; articuli tarsales: 6, ?, 8, ?; processus terminalis unguiculis vix brevior.

Tuber oculiferum humillum transversum, supra manifesto (quamquam levius) excavatum, subtiliter coriaceum tantum.

Scutum sat alte convexum. Sulci transversi primus, impressionem latam haud bene expressam præstans, et quintus debiles; ceteri desunt. Limbus anterior leviter discretus; tubercula extra antennas posita conica, obtusa. Limbus lateralis non discretus. Orificio glandularum foetidarum vix obiecta. Scutum (margine exteriore limbi lateralis excepto) subtiliter coriaceum, pustulis amplis humillimis majoribus et magnis (olivaceis) dense præditum; area secunda (non expressa) tuberculis parvis ambobus humiliiter conicis. Processus procere conico-cylindrici, obtusi, erecti, leviter divergentes, spatio interapicali duplo fere breviores. Limbus posterior scuti et segmenta dorsalia libera subtiliter coriacea et (anali excepto) ordinibus singulis pustularum. Coxæ et segmenta ventralia subtiliter coriacea; coxae infra et ventrale primum subtiliter granulata. Coxæ IV pustulis magnis lateribus.

Antennarum pars globosa articuli primi granis robustis marginalibus prædita.

Palporum pars trochanterica parte patellari longior, in apice incrassata, tuberculo inferiore robusto obtuso. Pars femoralis non triplo longior quam crassior, ordine inferiore, ultra medium pertinente, tuberculorum parvorum (circiter 6) et tuberculo

interiore apicali armata; ultra carinam dorsalem, in apice serratam, granis parvis serrata. Partis patellaris margo interior sat anguste extenuatus in apice angulatus, ultra quem tuberculum parvum adest. Pars tibialis plus quam duplo longior quam latior, parte femorali paullo longior; margo interior anguste extenuatus subrectus, exterior sat latus, primum rectus sensimque latior, deinde prope apicem rotundate angustior; anguli rotundati exterior aculeo gracili, interior tuberculo armati. Pars tarsalis parte tibiali triplo fere brevior, primum depressa, marginibus extenuatis, deinde angustior leviter compressa, aculeis utrinque binis armata, quorum maximus est interior primus, haud robustus. Unguis haud robustus, parte tarsali vix duplo brevior.

Pedes sat gracieles. Coxæ I processulo dorsali anteriore anteversum curvato, acuto; IV coxis III plus quam duplo latiores, carina transversa superiore apicali humillima, brevi, rotundata. Femora leviter arcuata, laevia. Calcanei I æque longus atque articuli tarsales primus et secundus conjuncti, II ?, III æque longus atque articulus tarsalis primus. Articuli tarsales: 6, ?, 8, ?. Processulus terminalis procerus unguiculis vix brevior.

Differentia sexualis mihi incognita.

Fuscum pæne nigrum; scutum maculis parvis (et minimis) densis olivaceis; limbus anterior vitta angusta transversa olivacea; margo exterior latus limbi lateralis dilute rufescens; segmenta dorsalia libera tria anteriora ordinibus singulis macularum minimarum olivacearum; coxæ IV maculis similibus lateralibus. Pedes apicem versus haud multo dilutiores.

Long. corp. 4,75; long. scuti 4; lat. scuti 3,5; palpi 4; pedes I 16, (II sine metatarso et tarso 22), III 23, (IV sine metatarso et tarso 18).

Patria: Brasilia. Specimen unicum vidi, ad St. Paul Olivença captum, quod ill. E. SIMON mihi benevolentissime dedit, nunc in Museo Zool. Hafniensi asservatum.

Remark: This species, which was unknown, when SØRENSEN made his description, was described in 1928 by ROEWER on material likewise from St. Paul Olivença.

Poecilæma punctatum n. sp.

5 mm longum, fusco-brunneum; tuber oculiferum, scutum totum, segmenta libera tria anteriora punctis (pustulis parvis) luteis densissime ornata; tuber oculiferum pustulis et granulis ornatum; limbus lateralis non discretus; scutum subtilissime coriaceum, pustulis et granulis parvis densissime ornatum; area II granis parvis ambobus et IV processibus ambobus; palporum pars femoralis intra inermis; astragalus I calcaneo dimidio longior; articuli tarsales: 6—7, 13—16, 8—9, 9—10; processus terminalis unguiculis paullo brevior et crassior.

Tuber oculiferum humillimum transversum, supra manifesto excavatum, coriaceum, praeter pustulas parvas paucas granulis dispersis parvis mediis et ordinibus ambobus granulorum trinorum (quaternorum) infra et post suum oculum positis.

Scutum sat alte convexum. Sulci transversi primus manifestus (extus obsoletus) procurvus et quintus rectus manifestus; ceteri desunt. Limbus anterior leviter discretus, coriaceus, granulis parvis densis; tubercula extra antennas posita conica obtusa. Limbus lateralis non discretus. Orificio glandularum foetidarum vix obtecta. Scutum

totum (margine exteriore limbi lateralis excepto) subtilissime coriaceum, pustulis parvis (coloratis) et granulis parvis densis dispersis; area II non expressa granis ambobus sat parvis praedita; processus areæ IV (non expressæ) conici, robusti, obtusi reclines, paralleli, spatio interapicali paullo longius aut leviter divergentes, spatio interapicali subæquales parce granulati. Segmenta dorsalia libera subtiliter coriacea, tria anteriora ordinibus binis, anteriore pustularum parvarum (coloratarum) et posteriore granulorum majorum; anale præter granula granis. Coxæ IV infra et segmentum ventrale primum granulis dispersis haud densis suaæ impressioni parva impositis; anale ventrale ordinibus duobus; cetera ordinibus singulis granulorum remotorum extus majorum.

Antennarum pars globosa articuli primi granis superioribus dispersis praedita. Palporum pars trochanterica parte patellari longior, in apice incrassata, tuberculo inferiore, robusto obtuso. Pars femoralis duplo longior quam crassior, ordine inferiore, apicem non attingente, tuberculorum densorum parvorum (circiter 15), intra inermis; ultra carinam dorsalem, in parte media interdum serratum, laevis. Partis patellaris margo interior sat anguste extenuatus, in apice non angulatus, ultra quem tuberculum parvum adest. Pars tibialis vix duplo longior quam latior, parte femorali paullo longior; margo interior anguste extenuatus, subrectus, exterior sat latus, primum rectus, sensimque latior, deinde prope apicem rotundate angustior; anguli rotundati; exterior aculeo gracili et interior tuberculo armati. Pars tarsalis parte tibiali triplo fere brevior, primum leviter depresso, marginibus anguste extenuatis, deinde angustior leviter compressus. Unguis haud robustus, parte tarsali vix duplo brevior.

Pedes sat graciles. Coxa I processulo dorsali perobtuso bicuspido; coxa IV coxa III plus quam duplo latior, carina transversa, superiore, apicale humilliore, brevi, bicuspida. Femora leviter arcuata, laevia. Calcei I astragalo dimidio brevior, II astragalo vix duplo brevior, III articulo tarsali primo manifeste longior, IV manifeste brevior. Articuli tarsales: 6—7, (13—)14(—16), 8—9, 9—10. Processus terminalis unguiculis paullo brevior et crassior.

Differentia sexualis incognita.

Fusco-brunneum; tuber oculiferum et scutum totum, segmenta anteriora libera tria punctis (pustulis parvis) luteis densissime ornata; grana areæ II et processus

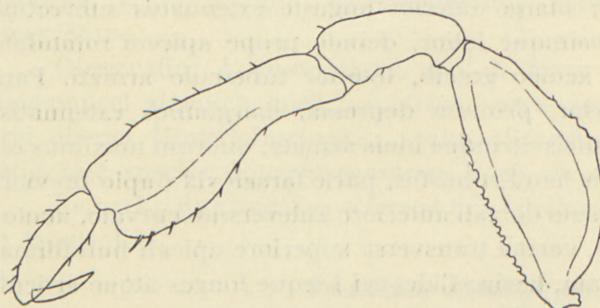


Fig. 24. *Poecilæma punctatum* n. sp. Palpus.

reclines, paralleli, spatio interapicali paullo longius aut leviter divergentes, spatio interapicali subæquales parce granulati. Segmenta dorsalia libera subtiliter coriacea, tria anteriora ordinibus binis, anteriore pustularum parvarum (coloratarum) et posteriore granulorum majorum; anale præter granula granis. Coxæ IV infra et segmentum ventrale primum granulis dispersis haud densis suaæ impressioni parva impositis; anale ventrale ordinibus duobus; cetera ordinibus singulis granulorum remotorum extus majorum.

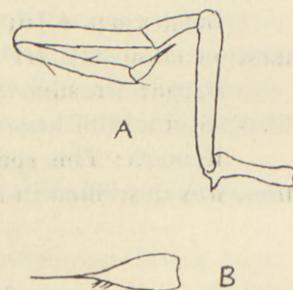


Fig. 25. *Poecilæma punctatum* n. sp.

Animal adolescens. A Palpus,
B pars unguicularis palpi.
(W. Sør. del.)

areae IV brunnea. Pedes olivaceo-brunnei; tibiae et metatarsi anguste pallido anulati; tarsi posteriores ceteris non dilutiores.

Long. corp. 5; long. scuti 4,5; lat. scuti 3,75; palpi 4,75; pedes I 13, II 29,5; III 18; IV 24,5.

Patria: Venezuela. The late Dr. MEINERT sifted 4 full grown and 2 young specimens in the month of August 1891. They are now preserved in the Copenhagen Zoological Museum.

Variatio: Granula coxae IV et segmenti ventralis I unius speciminis impressionibus non imposita.

Animal adolescens: Palpi teretes; pars trochanterica in apice leviter incrassata, tuberculo inferiore apicali; partes ceterae cylindricae, omnino inermes; pars tarsalis parte tibiali æqualis. Sulci transversi omnes, quamquam debiles, tamen manifesti (lutei), area II tuberculis ambobus conicis acutis; segmenta libera luteo marginata; tuber oculiferum pæne læve. Orificia glandularum foetidarum detecta (processus coxarum desunt) subrotundata. Metatarsus et tarsus pedum IV testacei.

Remark: As the number of tarsal joints vary (6 or 7), some specimens of the present species must be determined to belong to *Cynorta* within the Roewerian system, some others to belong to *Poecilæma* sensu ROEWER. The pattern of the scutum is just as in *P. sulphuratum* Roewer (Weberkn. p. 369). — At least one of the specimens examined with a 6-jointed tarsus I was a female (with visible ovipositor).

Poecilæma guttigerum n. sp.

Vix 5 mm longum, nigrum, margine anteriore et maculis magnis ellipticis ambobus, extra processus scuti sitis, luteis; tuber oculiferum granulis utrinque paucis; limbus lateralis vix discretus foveolis rugosus; scutum subtiliter coriaceum parce granulatum granis anterioribus ambobus et processibus posterioribus ambobus; palporum pars femoralis tuberculo interiore apicali armata; coxae IV muticæ; calcaneus I astragalo plus quam duplo brevior; articuli tarsales: 6, 17, 8, 9; processus terminalis unguiculis æqualis.

Tuber oculiferum humile latum, supra late et sat profunde excavatum, subtiliter coriaceum, granulis paucis (utrinque trinis) ornatum.

Scutum sat alte convexum, a latere oculifero ad sulcum transversum primum vix, deinde manifesto altius, pone leviter declive. Sulci transversi primus procurvus et postremus rectus sat manifesto; ceteri desunt. Limbus anterior discretus latus, rotundatus, lævis; tubercula extra antennas posita sat magna, subconica obtusa. Limbus lateralis vix discretus, subtiliter coriaceus, foveolis irregularibus rugosus. Orificia glandularum foetidarum plane obiecta. Areæ subtiliter coriaceæ, parce granulatae, prima impressionibus lineiformibus ambabus, extra tuber oculiferum positis, et posteriore media suborbiculari, haud profunda; secunda (non expressa) granis ambobus late separatis, humilibus, rotundatis. Processus leviter reclines, divergentes, spatio interapicali breviores, primum conici, granis prædicti, deinde subcylindrici obtusi. Segmenta dorsalia libera et anale ventrale coriacea tantum. Venter subtiliter

coriaceus; coxae granulis dispersis; ventrale primum punctis impressis dispersis; margo ejus posterior et ventralia cetera ordinibus singulis granulorum.

Antennarum pars globosa articuli primi granis marginalibus praedita, pone majoribus.

Palporum pars trochanterica parte patellari paullo brevior, in apice incrassata, tuberculo inferiore brevi robusto rotundato munita. Pars femoralis duplo longior quam crassior, ordine inferiore tuberculorum (circiter 6) parvorum obtusorum et tuberculo interiore apicali armata; ultra carinam dorsalem parce serratam eminentiae non adsunt. Partis patellaris margo interior haud anguste extenuatus (aeque late ac margo interior partis tibialis) et manifesto angulatus. Pars tibialis plus quam duplo longior quam latior, aeque longa ac pars femoralis; margo interior anguste extenuatus subrectus, exterior sat latus, primum rectus sensimque latior, deinde prope apicem rotundate angustior; anguli rotundati exterior aculeo, interior tuberculo parvo armati. Pars tarsalis parte tibiali plus quam duplo brevior, primum depressa marginibus anguste extenuatis, deinde leviter compressa, sensim angustior; aculeis gracilibus exterioribus sex et interioribus duobus armata, quorum interior primus ceteris robustior. Unguis haud robustus, parte tarsali vix dimidio brevior.

Coxæ IV muticæ. Trochanteres tuberculis basalibus conicis subacutis, I, II, III singulis (posterioribus), IV binis. Femora vix arcuata, vix granulata. Calcanei I astragalo plus quam duplo, II tarso duplo breviores; III et IV articulo tarsali primo subæquales. Articuli tarsales: 6, 17, 8, 9. Processus terminalis aeque longus atque unguiculi.

Differentia sexualis incognita.

Nigrum; margo exterior limbi lateralis et segmenta dorsalia libera tria anteriora manifeste dilutiora (sordide brunneo-rufescens) umbris singulis mediis nigris; limbus anterior scuti et maculae magnæ ellipticæ ambæ, extra processus scuti positæ, læte lutea. Coxæ IV punctis binis lateralibus anterioribus sordide luteis. Pedes brunneo-rufescentes; trochanteres et pars basalis femorum flavescentes; patellæ et apices tibiarum infuscata; tarsi pene nigri.

Long. corp. 4,75; long. scuti 4; lat. scuti 3,5; palpi 4; pedes I 17, II 41, III 24, IV 33.

Patria: Pars meridionalis Americæ septentrionalis. Specimina duo vidi, in re-publica Texas capta, quæ ill. E. SIMON mihi benevolentissime dedit, nunc in Museo Zool. Hauniensi asservata.

Variatio: In Exemplo uno impressio posterior media areæ primæ in ordinem foveolarum dissoluta.

Poecilæma reticulatum n. sp.

6,5 mm longum, cinnamomeum vittis latis reticulatis linearum vitellinarum ornatum; area I punctis vitellinis 6 notata; tuber oculiferum humile ordinibus ambobus granulorum majorum; limbus anterior discretus granulatus; limbus lateralis non discretus; scutum parce granulatum; area II granis magnis ambobus (♂) vel tuberculis conicis subacutis (♀); area IV processibus ambobus; pars femoralis palporum

spina interiore apicali armata; calcaneus I astragalo parte tertia brevior; articuli tarsales: 6(♀)–7(♂), 13–17, 10, 11–12; processus terminalis crassus, unguiculis (♂) duplo, (♀) triplo brevior.

Tuber oculiferum humile, latum, supra manifesto excavatum, ordinibus ambo-bus, oculis sat propinquis, granulorum majorum, inter quos granula parva dispersa adsunt.

Scutum convexum; a tubere oculifero ad sulcum primum transversum vix, deinde manifesto altius, pone sat abrupte declive. Sulcus transversus primus latus, non profundus, permanentius et quintus sat manifestus; secundus vix manifestus. Limbus anterior discretus tumidus, granulatus et pustulis (punctis vitellinis) praeditus; tubercula extra antennas posita brevia parva obtusa. Limbus lateralis non discretus, praeter pustulis (lineis vitellinis) vix manifesto granulatus. Orificia glandularum foetidarum plane obiecta. Areæ parce granulatæ, area secunda granis magnis (♂), vel tuberculis conicis subacutis (♀) obtusis late separatis. Processus areæ quartæ sat reclines, subparallelis, magni, conici, obtusi, parce granulati, spatio interapicali longitudine subæqualis. Limbus posterior et segmenta dorsalia libera tria anteriores ordinibus singulis granulorum (in ♂ minorum et remotorum); anale dorsale granulis paucis dispersis. Coxæ et ventrale primum granis et granulis dispersis sat densis.

Antennarum pars globosa articuli primi granulis superioribus et granis marginalibus posterioribus et exterioribus et granis magnis conicis apicalibus interioribus duobus supra armata.

Palporum pars trochanterica parte patellari manifesto longior, in apice incrassata, tuberculis setigeribus inferioribus duobus armata, quorum ulterius magnum est. Pars femoralis plus quam duplo longior quam crassior, ordine inferiore, apicem non attingente, tuberculorum parvorum obtusorum (viginti aut ultra), quorum ultima basalibus manifesto majora sunt, et spina brevi sat robusta interiore apicali armata; adest ordo dorsalis longus tuberculorum, quorum maxima quam tubercula inferiora vix aut manifesto majora sunt, aut minora, procurva acuta. Partis patellaris margo interior anguste extenuatus, in tuberculum setigerum apicale productum, supra quod tuberculum æquale adest. Pars tibialis æque longa ac pars femoralis, plus quam duplo longior quam latior; margines laterales sat anguste extenuati; exterior rectus est leviter curvatus; apex interior productus, seta sat robusta armatus, exterior rotundatus, tuberculo parvulo munitus, intra quod setæ sat robustæ paucæ adsunt. Pars tarsalis latitudine parti tibiali æqualis, primum depressa, marginibus extenuatis, deinde compressa, praeter setas aliquot seta robusta (sive aculeo gracili) una interiore media armata. Unguis sat robustus parte tarsali non duplo brevior.

Pedes longi graciles. Coxæ I processulo (sive carina) dorsali obtuse bicuspidato. Coxæ IV tuberculis lateralibus magnis obtusis sibi propinquis et carina apicali transversa rotundata in tuberculum parvum (granum) introrsus producta. Femora recta, II et III vix granulata; patellæ III et IV manifesto granulatae. Calcanei I astragalo tertia parte brevior, II duplo, III articulo tarsali primo subæqualis, IV brevior. Unguiculi integri. Articuli tarsales: ♂: 7, 16–17, 10, 12; ♀: 6, 13–15, 10, 11–12.

Differentia sexualis: Maris quam feminæ pedes longiores et manifesto crassiores. E spiraculis carina humilis, obliqua procurrit, cujus margines in mare acuti, in femina rotundati. Granula femorum majora in mare quam in femina. Pars propior tarsi I parte ulteriore in femina non et in mare distincte crassior. Processus terminalis crassus unguiculis in mare duplo, in femina triplo brevior, in mare leviter curvatus sat gracilis, in femina porrectus, subrectus, robustus, obtusus.

Cinnamomeum vittis latis reticulatis linearum vitellinarum ornatum: post tuber oculiferum, post processus areæ IV, secundum margines laterales; area I punctis vitellinis anterioribus 6, quorum 4 limbo anteriori impositis; tuber oculiferum puncto uno; areæ II et III punctis singulis mediis, sulci transversi II—III lineis vitellinis (singulis) in medio interruptis. Trochanteres et partes basales femorum (vix autem tarsi) corpore dilutiores.

Long. corp. ♂ 4,5; long. scuti 4,5; lat. scuti 3,8; palpi 6,3; pedes I 20, II 51, III 33,5, IV 46.

Long. corp. ♀ 5; long. scuti 4,7; lat. scuti 4,2; palpi 6,3; pedes I 19, II 47, III 30,5, IV 42.

Patria: Venezuela. E. SIMON has collected 2 males and a single female at St. Estéban in the month of March 1888. They are all preserved in the Zoological Museum of Copenhagen.

Remark: In the Roewerian system the female must belong to the genus *Cynorta*, the male to *Poecilæma* (!).

Poecilæma marginale Banks.

Poecilæma aurivillii Sørensen in manuser.

Cynorta marginalis Banks, Proc. Acad. Philad., 1909, p. 225.

Cynorta marginalis Roewer, Weberkn. d. Erde, 1923, p. 312.

5 mm longum, nigre rufo-brunneum, vittis ambabus anterioribus lateralibus sulphureis notatum; tuber oculiferum subtiliter coriaceum tantum; limbus anterior coriaceus; limbus lateralis discretus; scutum subtiliter coriaceum granis parvis anterioribus ambobus et processibus posterioribus ambobus; coxae IV et ventralia primum et anale coriacea tantum; palporum pars femoralis tuberculo interiore apicali armata; calcaneus I astragalo non duplo brevior; articuli tarsales: 6, 14, 9, 11; processus terminalis unguiculis paullo brevior.

Tuber oculiferum duplo latius quam altius, supra manifesto excavatum, subtiliter coriaceum tantum.

Scutum convexum. Sulcus transversus primus procurvus debilis, postremus sat manifestus; ceteri desunt. Limbus anterior leviter discretus, coriaceus; tubercula extra antennas posita brevia, robusta, obtusa. Limbus lateralis discretus, laevis; pars lata exterior pene erecta. Orificia glandularum foetidarum vix obiecta. Scutum ceterum subtiliter coriaceum, granis parvis anterioribus ambobus (in area secunda non ex-

pressis). Area prima impressione posteriore media suborbiculari, lata non profunda, lineam procurvam utrinque emittente. Processus leviter reclines, subparallelis, conici, obtusi, spatio interapicali duplo breviores. Limbus posterior scuti et segmenta dorsalia libera tria anteriora subtiliter coriacea, ordinibus singulis granulorum remotorum; anale dorsale subtiliter coriaceum, impressionibus ambabus latis, haud profundis. Coxæ et ventralia primum et anale subtiliter coriacea tantum; cetera ordinibus singulis granulorum remotorum.

Antennarum pars globosa articuli primi granulis et ordine granorum exteriorum et posteriorum supra ornata.

Palporum pars trochanterica æque longa ac pars patellaris, tuberculo inferiore apicali munita. Pars femoralis triplo longior quam crassior, ordine inferiore tuberculorum parvorum (circiter 16) sensim majorum et tuberculo setigero interiore apicali armata; ultra carinam dorsalem lævem crenulata. Partis patellaris margo interior sat anguste extenuatus, in apicē angulatus, supra quem tuberculum parvum adest. Pars tibialis triplo longior quam latior, parte femorali vix brevior; margines interior haud anguste, exterior haud late extenuati, primum recti, sensim paulo latiores, deinde rotundate paulo angustiores; apex parte latissima paulo angustior; anguli interior aculeo (sive seta robusta), exterior rotundatus aculeo gracili armati. Pars tarsalis depressa parte tibiali vix duplo brevior; pars propior marginum leviter extenuata, setis robustis aliquot utrinque munita, quarum maxima est interior submedia. Unguis parte tarsali plus quam duplo brevior.

Coxæ IV coxis III plus quam duplo latiores, carina transversa superiore apicali brevi, humillima, rotundata. Femora subrecta, sublævia. Calcanei I et II astragalo non duplo breviores; III articulis tarsalibus proximis tribus subæqualis; IV articulo tarsali primo æqualis. Articuli tarsales: 6, 14, 9, 11. Processus terminalis unguiculis gracilibus paulo brevior.

Differentia sexualis incognita.

Nigre rufo-brunneum; limbus lateralis vitta lata sulphurea (partem anteriores rem multo majorem limbi excipiente) notatus, punctis mediis, partim confluentibus rufo-brunneis ornata. Limbus posterior scuti et segmenta dorsalia tria anteriora lineis transversis singulis marginalibus sulphureis. Pedes rufo-testacei nigro punctati; apices breves femorum et tibiarum et patellæ totæ fuscæ.

Long. corp. 5; long. scuti 4,5; lat. scuti 4; palpi 5; pedes I 16, II 37, III 22, IV 32.

Patria: America centralis. Specimen unicum vidi, a cl. BOVALLIUS captum, in Museo Holmiensi asservatum.

Remarks: When SØRENSEN wrote his description it was new to science and SØRENSEN named it *Poecilæma aurivillii*. It is, however, certainly identical with the species *Cynorta marginalis* described by BANKS in 1909 from Costa Rica. — In the system of ROEWER it should be placed within the genus *Cynorta* on account of the 6-jointed tarsus I.

Poecilæma withi n. sp. (K. L. Henr.).*Poecilæma andreæ* Sørensen in manuscr. (nec PERTY).

4,5 mm longum, brunneo-nigrum, vittis sat angustis luteo-albis, anteriore Y-formi et posteriore transversa, pone concava et processibus areæ IV circumfusa; tuber oculiferum granulis sat dispersis ornatum; limbus lateralis manifeste discretus; scutum subtilissime coriaceum, granis parvis anterioribus ambobus et processibus posterioribus ambobus; coxæ IV granis parvis et granulis; palporum pars femoralis tuberculo interiore apicali armata; calcaneus I astragalo paullo longior; articuli tarsales: 7, 16, 9—10, 11; processus terminalis unguiculis æqualis.

Tuber oculiferum humile latum sat longum, late et sat profunde excavatum, subtiliter coriaceum, granulis sat dispersis ornatum.

Scutum sat alte convexum, post processus leniter declive. Sulci transversi primus procurvus latus et postremus rectus manifesti; ceteri plane desunt. Limbus anterior discretus, subtilissime coriaceus; tubercula extra antennas posita magna, brevia, rotundata. Limbus lateralis manifeste discretus, subtilissime coriaceus, punctis impressis (vel foveolis) præditus, ceterum laevis. Orificia glandularum foetidarum tota fere obiecta. Areæ subtilissime coriaceæ; prima impressione orbiculari sat profunda nec ampla prædita; secunda (non expressa) granis parvis ambobus. Processus graciles, subcylindrici, obtusi, leviter reclines et divergentes, spatio interapicali subæquales. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granulorum parvulorum; anale (et dorsale et ventrale) granulis pusillis haud ordinatim dispositis. Coxæ granis parvis et granulis; venter ceterum subtilissime coriaceus.

Antennarum pars globosa articuli primi granis exterioribus et posterioribus prædita.

Palporum pars trochanterica æque longa ac pars patellaris, in apice incrassata, tuberculo inferiore robusto, obtuso. Pars femoralis duplo longior quam crassior, extra carinata, ordine inferiore apicem fere attingente tuberculorum sat densorum (circiter 12) et tuberculo interiore apicali armata; ultra carinam dorsalem leviter serratam laevis. Partis patellaris margo interior anguste extenuatus, manifeste angulatus, ultra (et supra) quem tuberculum adest. Pars tibialis plus quam duplo longior quam latior, parti femorali subæqualis; margo interior anguste extenuatus, subrectus, exterior sat anguste extenuatus, primum rectus sensimque latior, deinde prope apicem rotundate angustior; anguli rotundati, exterior aculeo et tuberculo parvo, interior tuberculo setigero sat robusto. Pars tarsalis parte tibiali triplo fere brevior, primum depressa, marginibus anguste extenuatis, deinde angustior, leviter compressa; (præter setas) aculeis interioribus duobus, quorum primus robustior. Unguis procerus parte tarsali parte tertia brevior.

Coxæ IV coxis III plus quam duplo latiores, carina transversa superiore apicali humili, rotundata, laevi. Femora recta, laevia. Calcanei astragalo I paullo longior, II vix duplo, III parte tertia breviores; IV tarso duplo brevior. Articuli tarsales: 7, 16, 9—10, 11. Processus terminalis æque longus atque unguiculi.

Differentia sexualis incognita.

Brunneo-nigrum, vittis sat angustis luteo-albis notatum, quarum anterior Y-formis est, sulco transverso primo propinquus, ante in maculam dilatata; e qua vitta transversa exit, pone concava, processus includens, marginem lateralem attingens, sensim paullo angustior; vitta perangusta marginalis, ceteras conjungens, luteo magis tincta adest. (Post partes exterioreas vittae Y-formis adsunt puncta singula; pars media ejusdem vittae transversim breviter bis dilatata.) Pedes rufo-brunnei, apicem versus paullulo dilutiores; calcanei et tarsi sordide testacei.

Long. corp. 4,5; long. scuti 3,75; lat. scuti 3,5; palpi 4; pedes I 16, II 42, III 24, IV 33.

Patria: Brasilia. Specimen unicum vidi, ad São Paulo de Olivença captum, quod ill. E. SIMON mihi benevolentissime dedit, nunc in Museo Zool. Hafniensi asservatum.

Remarks: SØRENSEN considered this species identical with *P. andreae* Perty, though he was well aware that it differed from the description of this latter on several points e. g. in that the spines of area IV were placed within the posterior, pale, transversal band. There is no doubt that it is quite a new species, which I propose to name after the late arachnologist Dr. C. WITH who began the revision of the present paper.

Rhaucus (Simon).

Ortonia p. p. Wood, Trans. Amer. Philos. Soc. Philad. N. S., vol. XIII, 1869, p. 438.
Rhaucus + *Erginus* E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 200.

Metarhaucus + *Rhaucus* + *Flirtea* + *Pararhaucus* + *Neorhaucus* + *Meterginus* +
Poecilæma p. p. Roewer, Weberkn. d. Erde, 1923, p. 341, 349, 345, 378,
305, 379, 364. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 3, 1928, p. 588,
592, 595.

Corpus (plus minusve) robustum. Scutum subrectangulum vel oblonge trapezoidale, erga apices coxarum IV leviter latius (pone dilatationem sat prærupte angustius; extra antennas non productum).

Area quarta eminentiis majoribus ambabus instructa.

Orificia glandularum foetidarum manifeste magna sunt rimæ transversæ longæ, quarum labia leviter elevata (quare loci orificiorum clypeati sunt), præsertim anterius, ita arcuata sunt, ut orificia in medio fere occlusa supra autem orbiculariter fere hient.

Antennarum pars globosa articuli primi eminentia majore superiore, interiore apicali prædita.

Palporum robustorum pars femoralis fortissime compressa; pars tibialis utrinque fortiter dilatata, marginibus (etiam interiore) valde extenuatis, leniter orbiculariter fere arcuatis; pars tarsalis aculeis sat robustis armata, quorum maximus est interior primus (submedius).

Pedes sæpissime breves. Coxæ IV non dilatatae (coxis III duplo latiores), carina dorsali apicali transversa (manifesta) instructæ.

Unguiculi integri.

Differentia sexualis magna. Mas hisce notis insignis: parte propiore tarsi I manifeste incrassata; articulo secundo antennarum supra articulationem basilarem elevato, digitis in basi hiantibus; femoribus et tibiis (III et) IV ordinibus inferioribus eminentiarum manifeste majorum. — Glandis penis (*Rh. fuscī* et *alphæ*) lamina (inferior) apicem versus paullo latior; balanus (superior) primum cylindricus, deinde subito angustatus S-formis, deorsum curvatus; processus medius deest.

Conspectus subgenerum.

- I. Scutum a tubere oculifero usque ad eminentias magnas areæ quartæ (non expressæ) rectum; tuber oculiferum eminentiis vix præditum; pedes longi.

Ortonia Wood.

- II. Scutum sulco transverso primo manifeste depresso, deinde altius; tuber oculiferum vittis ambabus eminentiarum (granorum) præditum:

1. Eminentiae magnæ areæ quartæ in basi leviter tantum incrassatae; pedes longiores *Erginus* E. Sim.
2. Eminentiae magnæ areæ quartæ suo tuberi impositæ; pedes breves ...

Rhaucus E. Sim.

Subgenus *Ortonia* Wood.

Ortonia p. p. Wood, loc. cit.

Tuber oculiferum eminentiis vix præditum.

Scutum dorsale, a latere inspectum, a tubere oculifero usque ad eminentias majores posteriores rectum. Sulci transversi debiles aut desunt.

Pedes longi, vix robusti, II quam IV manifesto longiores.

Genus *Ortoniæ*, ut a Wood fundatum est, non valet, quod articulo secundo antennarum supra articulationem basalem elevato creatum est. Hæc nota autem marem tantum generum variorum familiarum diversarum demonstrat. Genus *Ortoniæ* sensu Wood duas species continet, quarum altera (*bilunata* Wood) ad familiam Cosmetidarum, altera (*ferox* Wood) ad familiam Gonyleptidarum pertinet. Quia autem mihi videtur, *Ortoniam bilunatam* speciei sequenti perpropinquam esse, nomen generis — quamquam haud aptum — adoptavi.

Rhaucus (Ortonia) vittatus n. sp.

Mas 4,5 mm longa, brunnea vittis latis ellipticis ambabus ornata; tuber oculiferum leviter excavatum; limbus lateralis non discretus, punctis impressis præditus; scutum coriaceum granis parvis anterioribus humillimis ambobus et processibus proceris posterioribus ambobus; palporum pars femoralis intus inermis, margo exterior partis patellaris vix extenuatus; calcaneus I astragalo parte tertia brevior; articuli tarsales: 8, 19, 10, 12; processus terminalis unguiculis paullo brevior.

Tuber oculiferum humile latum, supra late et leviter excavatum, subtilissime coriaceum et granulis perpusillis ornatum.

Scutum sat convexum æque latum ac longum. Sulci transversi primus debilis, punctis impressis ambobus (brunneis) praeditus, quintus manifestus, ceteri desunt. Limbus anterior discretus, subtiliter coriaceus. Limbus lateralis non discretus, punctis impressis (vel foveolis). Labium anterius orificiorum glandularum foetidarum ultra posterius prominens. Scutum ceterum coriaceum granulis perpusillis ornatum. Area prima impressione oblonga; secunda (non expressa) granis parvis humillimis ambobus. Processus reclines, leviter divergentes, granulis paucis praediti, longi, proceri, obtusi, spatio interapicali longiores. Limbus posterior scuti et segmenta dorsalia libera subtiliter coriacea; anale dorsale et ventrale granulis perpusillis. Venter coriaceus; coxae et ventrale primum granulis dispersis remotis; cetera ventralia ordinibus singulis granulorum.

Antennarum pars globosa articuli primi tuberculis conicis acutis, interiore apicali et exterioribus paucis.

Palporum pars trochanterica parte patellari manifeste longior, in apice leviter incrassata, in medio leniter coarctata, tuberculo inferiore sat magno armata. Pars femoralis duplo longior quam crassior, ordine inferiore tuberculorum (circiter 14) armata, quorum priora brevia, partim confluentia, cetera vicissim fere majora et minora sunt; intus inermis; ultra carinam dorsalem, tuberculis procurvis acutis serratam, laevis. Partis patellaris margo exterior vix, interior manifeste extenuatus, interior in apice acutangulus. Pars tibialis manifesto longior quam latior, parte femorali paullo brevior; apex leviter concavus parte latissima parte tertia angustior; angulus exterior sat acutus tuberculo perminuto et aculeo uno (praeter quem margo aculeis quatuor armatus est), interior rotundatus aculeo uno. Pars tarsalis parte tibiali vix duplo brevior, primum depressa, marginibus sat late extenuatis, deinde compressa; aculeis exterioribus octo et interioribus tribus armata. Unguis parte tarsali duplo brevior.

Coxæ IV coxis III parte tertia latores, carina transversa superiore apicali humili rotundata, Femora I et II subrecta, III et IV laevia; IV granulis ornata. Calcanei astragalo I parte tertia, II vix duplo breviores; tarso III vix duplo, IV plus quam duplo breviores. Articuli tarsales: 8, 19, 10, 12. Processus terminalis unguiculis paullo brevior.

Differentia sexualis (femina incognita): Maris antennarum articulus secundus incrassatus ante transversim leviter plicatus; pars elevata leviter compressa, parte cetera brevior; digiti in basi fortiter hiantes, mobilis incurvus immobili manifeste longior, dente basali magno robusto, brevi, leviter compresso, obtuso. Pars propior tarsi I parte ulteriore dimidio crassior. Femora III apicem versus ordine inferiore granorum conicorum acutorum; IV ordinibus inferioribus ambobus eminentiarum conicarum acutarum, apicem versus majorum, quarum ultimæ sunt tubercula minora.

Brunneus. Scutum inter tuber oculiferum et processus vittis latis ambabus notatum, in medio latioribus, intra serratis, luteis, fusco cinctis, puncto suo impresso brunneo ornatis. Segmenta dorsalia libera et venter fusciora. Palpi rufo-testacei. Antennæ et pedes fulva, tarsis infuscatis.

Long. corp. 4,5; long. et lat. scuti 4; palpi 6; pedes I 23, II 55, III 32, IV 45.

Patria: America septentrionalis. Specimen unicum, marem, vidi, in republica Texas captum, quod ill. E. SIMON mihi benevolentissime dedit, et quod nunc in Museo Zool. Hauniensi asservatur.

Remark: In ROEWER's system this species must belong to the genus *Poecilæma*.

Subgenus *Erginus* Simon.

Erginus E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 200.

Tuber oculiferum vittis ambabus eminentiarum (granorum) minorum præditum.

Scutum dorsale sulco transverso primo manifeste depresso, deinde usque ad eminentias majores areæ quartæ altius, adversus apicem coxarum IV leviter latius.

Area quarta eminentiis magnis ambabus instructa, in basi leviter tantum incrassatis.

Pedes longiores et robustiores.

Rhaucus (Erginus) simonis n. sp. (C. With).

Erginus serratus E. Simon in schedula.

Rhaucus (Erginus) serratus W. Sørensen in manusc.

5,5 mm longus, brunneus, vittis luteis, priore V-formi et posteriore transversa notatus, quæ lineis ambabus arcuatis, sibi propinquis aut confluentibus, conjuncti sunt; tuber oculiferum late et profunde excavatum, granis parvis ornatum; limbus lateralis vix discretus punctis impressis; areæ coriaceæ, II granis ambobus, IV processulis ambobus; palporum pars femoralis intus inermis; coxae IV ordine laterali anteriore granorum densorum trium; calcaneus I astragalo duplo brevior; articuli tarsales: 7, 17—19, 10, 12; processus terminalis unguiculis paullo brevior.

Tuber oculiferum sat magnum, latum, supra late et profunde excavatum, vittis ambabus granorum parvorum præditum.

Scuti sulci transversi secundus et tertius pæne obsoleti, quartus et quintus manifesti, extus obsoleti. Limbus anterior discretus, extus tumidus, lævis. Limbus lateralis vix discretus, leviter coriaceus, foveolis dispersis ornatus. Labium anterius orificiorum glandularum foetidarum posteriore altius, ultra id autem non prominens. Areæ coriaceæ, subtiliter oblique rugosæ; prima impressione posteriore media magna, sat profunda; secunda granis conicis ambobus. Processuli areæ quartæ reclinæ, paralleli, in basi late conici, parce granulati, deinde sat subito angustiores proceri, obtusi, spatio interapicali subæquales. Limbus posterior et segmentum dorsale liberum primum lævia; secundum et tertium ordinibus singulis granulorum; anale dorsale parce granulatum. Anale ventrale læve; coxae et ventrale primum ante transversim manifesto rugosa, subtiliter coriacea; cetera ventralia granulata.

Antennarum pars globosa articuli primi præter tuberculum interius apicale tuberculo exteriore medio et ordinibus exteriore et posteriore granorum magnorum

et majorum supra prædita — quæ eminentiæ omnes sunt conicæ subacutæ — et præterea supra granulata.

Palporum pars trochanterica parte patellari manifesto longior, apicem versus paullo crassior, tuberculo inferiore apicali conico munita. Pars femoralis duplo longior quam crassior, ordine inferiore, apicem fere attingente, tuberculorum obtusorum (circiter 12) armata, quorum ultima parva; intus inermis; ultra carinam dorsalem leviter et parce serratam sublævis. Partis patellaris margo interior angustissime extenuatus, in apicem angulatus, supra quem tuberculum perminutum apicale adest. Pars tibialis manifesto longior quam latior, æque longa ac pars femoralis; anguli producti, interior aculeo uno, exterior tuberculo et duobus aculeis armatus, præter quos margo exterior aculeo submedio armatus est. Pars tarsalis parte tibiali vix duplo brevior, primum depressa, marginibus sat late extenuatis, deinde leviter compressa; aculeis exterioribus septem ad novem et interioribus duobus et spina sat robusta, citra aculeos posita. Unguis parte tarsali duplo brevior.

Coxæ IV coxis III duplo latiores, carina transversa superiore apicali, in medio manifesto altiore, et ordine transverso lateralí anteriore granorum densorum (trium). Calcanei astragalo I duplo, II triplo breviores; articulo tarsali primo III longior, IV brevior. Articuli tarsales: 7, 17—19¹), 10, 12. Processus terminalis incurvus unguiculis paullo brevior, non autem tenuior.

Differentia sexualis: Antennarum articulus secundus feminæ geniculatus; maris validus, ante transversim plicatus, parte elevata æque longa ac parte cetera, vix compressa, supra leniter rotundata; digitæ breves in basi hiantes, mobilis fortiter inclinatus, dente subbasali longo robusto munitus. Pedes præsertim III et IV maris quam feminæ robustiores. Pars propior tarsi I parte ulteriore maris duplo, feminæ non crassior. Maris femora III et IV et tibiæ III et IV, leviter compressæ, ordinibus binis eminentiarum acutarum, apicem versus majorum, quarum proximæ sunt grana, ultimæ in pedibus III tubercula, in pedibus IV processuli, dum eminentiæ maximæ feminæ sunt grana.

Brunneus, vittis luteis duabus notatus; quarum prior V-formis ante sensim latior, puncta brunnea utrinque bina, margini laterali propinqua, includens, dum posterior, ante processus scuti posita, transversa undulata, extus paullo latior, in margine laterali anguste breviter procurrens, ante quam linea transversa brevis arcuata, et pone quam linea transversa brevis subrecta adest. Quæ vittæ et lineæ lineis ambabus arcuatis, sibi aut propinquis aut confluentibus, conjunctæ sunt. Limbus posterior scuti linea posteriore interrupta notatus. Palpi flavescentes; antennæ fulvæ; pedes fulvi, IV (et III) patellis et parte ulteriore femorum et tibiarum brunneis.

Long. corp. 5,5 (♀ 6); long. scuti 5; lat. scuti 4,5; palpi 7; pedes I 18, II ♀ 33, III 23, IV 31 (♀ 29).

Patria: Columbia. Specimina duo vidi, feminam in Museo Vindobonensi asservatam et marem, quem ill. E. SIMON mihi benevolentissime dedit et qui nunc in Museo Zool. Hafniensi asservata.

¹) tarsi II maris defuere.

Remarks. Dr. SØRENSEN gave this species the name *Erginus serratus*, but as ROEWER has used the name *Meterginus serratus* for a related species, I have altered the name to *E. Simoni*. It is very nearly related to *Meterginus prosopis* Roewer from Ecuador and Columbia; once I thought of referring the species of SØRENSEN to this latter, but the following differences are surely too great for that: ROEWER's species measures 8 mm, and its "Augenhügel... vollständig glatt und unbewehrt". The armature of the antennæ differs, as the first segment of *prosopis* "innen apical eine Gruppe aus 3 grösserer Zähnchen trägt", and so does the structure of the palps, as the pars trochanterica of *prosopis* is "unbewehrt" and as the dorsal margin of pars femoralis "mit einer vollständigen Körnchenlängsreihe besetzt". The characteristic colour differs only in small details. (With).

To the subgenus *Erginus* Sørensen further referred the following species described by E. SIMON, which he, however, did not know from autopsy:

- R. (E.) *devillei* E. Simon (Ann. Soc. Ent. Belg. XXII, 1879, p. 203) — in ROEWER's Weberkn. d. Erde (p. 342) referred to the genus *Metarhaucus*.
- R. (E.) *militaris* E. Simon (ibid. p. 203) — in ROEWER's Weberkn. d. Erde (p. 347) referred to the genus *Flirtea*.
- R. (E.) *serripes* E. Simon (ibid. p. 204) — in ROEWER's Weberkn. d. Erde (p. 348) referred to the genus *Flirtea*.
- R. (E.) *papilionaceus* E. Simon (ibid. p. 205) — in ROEWER's Weberkn. d. Erde (p. 347) referred to the genus *Flirtea*.
- R. (E.) *latesulphureus* E. Simon (ibid. p. 207) — in ROEWER's Weberkn. d. Erde (p. 383) referred to the genus *Meterginus*.
- R. (E.) *marginellus* E. Simon (ibid. p. 208) — in ROEWER's Weberkn. d. Erde (p. 382) referred to the genus *Meterginus*.
- R. (E.) *ventricosus* E. Simon (ibid. p. 209) — in ROEWER's Weberkn. d. Erde (p. 349) referred to the genus *Flirtea*.
- R. (E.) *granulosus* E. Simon (ibid. p. 211) — in ROEWER's Weberkn. d. Erde (p. 348) referred to the genus *Flirtea*.

Subgenus *Rhaucus* Simon.

Rhaucus E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 213.

Tuber oculiferum vittis ambabus eminentiarum (granorum) præditum.

Scutum dorsale sulco transverso primo manifeste depresso, deinde usque ad eminentias majores areæ quartæ (sæpiissime gradatim) altius; adversus apices coxarum IV leviter latius, pone quam dilationem sat prærupte angustius est.

Area quarta scuti eminentiis majoribus (sæpiissime tuberculis) ambabus instructa, quæ e basi sua plus minusve elevatæ, eminentiis (granis) densis ornatæ, imposita sunt.

Pedes breves et robusti, III et IV æque (aut subæque) longi.

Articuli partis ulterioris tarsi I manifeste gradatim crassiores. Feminæ pars propior tarsi I articulo ultimo partis ulterioris saltem non crassior.

Conspectus specierum hic descriptarum.

- A. Tarsus I in articulos quinque divisus. (Areae secunda et tertia granis magnis binis; coxae IV turba granorum laterali anteriore) *Rh. aurolineatus* Cambr.
- B. Tarsus I in articulos sex divisus:
 - I. Areae secunda et tertia eminentiis (granis) binis præditæ, ceteris paullo majoribus:
 - a. Niger, striis quinque sulcos transversos sequentibus sanguineis. Tuber leviter excavatum. Calcaneus I astragalo triplo brevior
Rh. vulneratus E. Sim. ♀.
 - b. Fuscus, fere niger, striis sulcos transversos primum et quartum, et limbum lateralem ante sequentibus, lineis sordide luteis. Tuber profunde excavatum. Calcaneus I astragalo non triplo brevior
Rh. trilineatus n. sp.
 - II. Areae secunda et quinta eminentiis majoribus (tuberculis) binis
Rh. tuberculatus n. sp.
 - III. Area tantum secunda (præter quartam) eminentiis ambabus ceteris manifesto majoribus:
 - a. Femora IV nec turba nec ordine granorum laterali anteriore prædicta
Rh. muticus n. sp.
 - b. Femora IV aut turba aut ordine granorum laterali anteriore prædicta:
 - 1. Calcaneus I astragalo parte tertia brevior *Rh. fuscus* n. sp.
 - 2. Calcaneus I astragalo duplo brevior:
 - + Carina transversa apicalis coxae IV humilis, in medio saltem non altior:
§ Coxæ I processulo dorsali anteriore obtuse bicupidato præditæ *Rh. tristis* n. sp.
 - §§ Coxæ I tuberculo dorsali anteriore humili obtuso præditæ
Rh. reticulatus n. sp.
 - ++ Carina transversa apicalis coxae IV granis prædicta in medio vix altior *Rh. vulneratus* E. Sim. ♂.
 - +++ Carina transversa apicalis coxae IV in medio altior:
 - § Tuber oculiferum leviter excavatum *Rh. alpha* n. sp.
 - §§ Tuber oculiferum late et profunde excavatum:
 - £ Articulus secundus antennarum ordinibus anterioribus tribus eminentiarum haud manifestarum, carinas non formantium *Rh. geographicus* n. sp.
 - ££ Articulus secundus antennarum prope basin carinis anterioribus longitudinalibus tribus *Rh. limbatus* n. sp.

C. Tarsus I in articulos septem (vel ultra) divisus:

- I. Eminentiae majores areæ quartæ sunt processuli suo tuberi magno conico impositi *Rh. togatus* n. sp.
- II. Eminentiae majores areæ quartæ sunt tubercula, suo tuberi conico imposita *Rh. obscurus* n. sp.

Rhaueus aurolineatus Cambr.

Rhaucus aurolineatus Sørensen in manuscr.

Neorhaucus aurolineatus, Cambridge Biol. Centr. Amer. Arach., vol. II, 1904, p. 572.

Neorhaucus aurolineatus Roewer, Weberkn. d. Erde, 1923, p. 305.

8 mm longus, fuscus, lineis sulcos transversos sequentibus et lineolis ambabus obliquis areæ primæ aut fulvis pæne auratis aut luteis notatus; tuber oculiferum late excavatum, granis præditum; areæ granis sat densis, secunda et tertia granis magnis binis, quarta tuberculis ambobus; palporum pars femoralis intus inermis, pars patellaris teres; coxæ IV tubere laterali anteriore granito; calcaneus I astragalo triplo brevior; articuli tarsales: 5, 10—13, 8—9, 9—10; processus terminalis unguiculis non duplo brevior.

Tuber oculiferum humillimum latum, supra late excavatum, præter vittas granorum læve.

Scuti sulci transversi secundus, tertius, quartus vix arcuati, extus obsoleti. Limbus anterior non discretus, lævis. Limbus lateralis leviter discretus, granis minoribus dispersis pone ornatus. Labium anterius orificiorum glandularum foetidarum ultra posterius prominens, quare orificio supra vix dilatatum est. Areæ granis sat densis, ordinatim vix dispositis; secunda et tertia granis magnis binis, quarta tuberculis sat parvis ambobus obtusis, suæ basi humillime conicæ impositis. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum; anale dorsale granis dispersis. Anale ventrale ordinibus duobus granorum minorum remotorum; coxæ (omnes) granis dispersis; ventrale primum granis parvis dispersis; ventralia cetera ordinibus singulis granulorum. Sulcus transversus posterior segmenti ventralis primi profundus.

Antennarum pars globosa articuli primi præter grana tuberculis interiore apicali magno et exterioribus duobus supra instructa.

Palporum pars trochanterica æque longa ac pars patellaris, in apice incrassata, tuberculis inferioribus et parvis superioribus binis. Pars femoralis dimidio longior quam crassior ordine inferiore tuberculorum robustorum (6—8) obtusorum armata, intus inermis; ultra carinam dorsalem tuberculis serratam brevem serrata; tubercula dorsalia inferioribus vix cedunt. Pars patellaris teres. Pars tibialis parte femorali vix longior; apex truncatus parte latissima haud multo angustior; angulus exterior tubculo uno et aculeis duobus, interior aculeo uno armatus. Partes patellaris et tibialis supra granulatae. Pars tarsalis parte tibiali paullo brevior, in basi leviter

depressa, marginibus non extenuatis; aculeis robustis exterioribus (3—)4 et interioribus (2—)3 armata. Unguis parte tarsali vix dimidio brevior.

Coxæ I processulo dorsali anteriore erecto robusto, obtuse bicuspidato; IV quam III duplo latiores, tubere laterali anteriore ampio, granis majoribus sat densis prædicto, et superiore apicali carina transversa robusta, sat magna, granis serrata. Femora leviter serrata; I (cum tibiis) granulis, cetera (cum tibiis) granis ornata. Calcanei I astragalo triplo brevior, II articulo tarsali primo multo longior, III incrassatus articulo tarsali primo æqualis, IV incrassatus paullo longior quam crassior. Articuli tarsales: 5, 10 (♀)—13 (♂), 8 (♂)—9 (♀), 9 (♂)—10 (♀). Processus terminalis robustus unguiculis non duplo brevior.

Differentia sexualis: Mas quam femina major et humilior et saturatius coloratus. Area prima quam quarta in mare altior, in femina humilior. Antennarum articulus secundus feminæ leviter geniculatus, maris validus, ante transversim plicatus, parte elevata leviter compressa rotundata parte cetera breviore; digitæ in basi hiantes, mobilis dente submedio robusto obtuso. Palporum pars tibialis maris æque latus ac longus, feminæ manifeste longior quam latior. Pedes maris multo crassiores quam feminæ. Pars propior tarsi I in mare parte ulteriore duplo fere crassior, in femina articulo ultimo paullo tenuior; articulus primus calcaneo maris brevior, feminæ subæqualis. Eminentiae pedum (præsertim III et IV) maris majores, ita ut femora et tibiae III et IV ordinibus inferioribus binis tuberculorum acutorum instructa sunt, apicem articuli versus sensim majorum.

Fuscus (mas fere niger), lineis sulcos transversos sequentibus notatus, sordide luteis (♀) aut læte fulvis pæne auratis, margines laterales non attingentibus; partes exteriores leviter dilatatae lineæ primæ a parte cetera separatae. Area prima lineolis obliquis (sive punctis) ambabus, extra tuber oculiferum positis, fulvis. Pedes aut brunnei (♀) aut (♂) scuto vix dilutiores; apicem versus vix dilutiores.

Long. corp. 8 (♀ 8); long. scuti 7 (♀ 6); lat. scuti 6 (♀ 5,5); palpi 8; pedes I 13 (♀ 12), II 21 (♀ 22,5), III 16, IV 21,5 (♀ 22).

Patria: Columbia. Specimina duo vidi, marem et feminam, in collectione ill. comitis KEYSERLINGII asservata.

Remarks: Cambridge's description is rather insufficient; but as the colour is quite identical and as no differences are found between the descriptions, I refer them to the same species. SØRENSEN, too, used the name *aurolineatus* for the species described here. The editor has not, however, seen SØRENSEN's specimens.

Rhaucus vulneratus Simon.

Rhaucus vulneratus E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 213.

Rhaucus vulneratus Roewer, Weberkn. d. Erde, 1923, p. 349.

Femina 8 mm longa, mas 6,5; niger striis quinque sulcos transversos sequentibus sanguineis; tuber oculiferum præter vittas granorum granis posterioribus præditum; limbus anterior leviter discretus laevis; limbus lateralis lineis et punctis impressis; scutum granis densis dispersis; areæ II—IV (♀) sive II et IV (♂) granis magnis binis;

palporum pars femoralis intus inermis; coxae IV tubere amplio laterali anteriore et carina transversa superiore apicali, in medio vix altiore granis præditæ; calcaneus I astragalo vix triplo brevior; articuli tarsales: 6, 11—12, 7—8, 8—9; processus terminalis unguiculis vix crassior et non duplo brevior.

Tuber oculiferum humile latum, supra leviter lateque excavatum, præter vittas granorum granis posterioribus perpaucis præditum.

Scuti sulci transversi secundus, tertius, quartus vix arcuati leves. Limbus anterior leviter discretus, laevis. Limbus lateralis latus, lineis et punctis impressis, ordine exteriore granorum minorum et adversus aream III granis minoribus dispersis. Labium anterius orificiorum glandularum foetidarum ultra posterius prominens, quare orificio vix dilatatum est. Area prima impressione levi media posteriore et granis inæqualibus posterioribus dispersis densis; ceteræ — in femina — granis densis inæqualibus ordinatim vix dispositis, — in mare — præter ordines singulos granorum majorum granis anterioribus minoribus; areæ secunda, tertia, quarta in duabus feminis granis magnis rotundis binis; in mare uno grana magna in area tertia desunt. Limbus posterior et segmenta dorsalia libera tria ordinibus singulis granorum majorum ornata; anale dorsale granis dispersis. Anale ventrale vittis duabus granorum parvorum; operculum genitale et coxae granis dispersis, anteversum et extrorsum majoribus; ventrale primum granulis dispersis; margo posterior ejusdem et ventralia cetera ordinibus singulis granulorum densorum. Sulcus transversus posterior segmenti ventralis primi profundus.

Antennarum pars globosa articuli primi præter tuberculum interius apicale granis sat densis supra ornata.

Palporum pars trochanterica tuberculo bigemino inferiore apicale, et tuberculo superiore medio et granis superioribus apicalibus ambobus. Pars femoralis dimidio longior quam crassior, ordine inferiore tuberculorum robustorum (6—8), et ordine dorsali tuberculorum (4—6) serrata; intus inermis. Partis patellaris margo interior anguste extenuatus. Pars tibialis parte femorali vix brevior; apex truncatus parte latissima haud multo angustior; anguli robusti, exterior tuberculo uno et aculeis duobus, interior aculeo uno. Pars tarsalis parte tibiali paullo brevior, ad basin leviter depressa, marginibus non extenuatis; aculeis robustis exterioribus 3—5 et interioribus 3—4. Unguis partis tarsalis suo dimidio brevior.

Coxæ I processulo dorsali anteriore brevi, breviter biramo; IV tubere amplio laterali anteriore, granis majoribus densis prædicto, et superiori apicali carina transversa robusta, in medio vix altiore, granis prædita. Femora granis, patellæ et tibiæ granulis, III et IV granis prædita; grana femorum et tibiarum III et IV in ordines disposita, magna acuta sunt. Calcanei I astragalo vix triplo brevior, II astragalo quadruplo brevior, III et IV paullo longiores quam crassiores. Articuli tarsales: 6, 11—12, 7—8, 8—9. Processus terminalis unguiculis vix crassior et non duplo brevior.

Differentia sexualis. Antennarum articulus secundus ante transversim plicatus, in mare fortiter, et in femina leviter granulatus, in mare leviter elevatus. Tarsi I pars propior in femina articulo ultimo paullo tenuior, in mare fere duplo crassior.

Niger striis quinque, sulcos transversos sequentibus, quarum prima latera versus sensim latior est, ceteris latior et manifestius procurva, et quinta ceteris brevior, sanguineis. Area I ornata est sanguineis punctis vel lineolis brevibus, orbes interruptos formantibus, ambos, extra tuber oculiferum positos. Membra fusca, tarsis vix dilutioribus.

Long. corp. 8 (δ 6,5); long. scuti 6,5 (δ 5,7); lat. scuti 5,5 (δ 5); palpi 6,5 (δ 6); pedes I 11 (δ 11,7), II 17,5 (δ 18,5), III 14,5 (δ 14), IV 18 (δ < 19).

Patria. SIMON's specimen is from Brazil, ROEWER has seen specimens from Columbia (Paramo) and from Ecuador. Dr. SØRENSEN has examined 3 specimens collected by Prof. BÜRGER in Venezuela and belonging to the Museum of Göttingen; one female was collected at Paramo Bogotá, another female at Monte rodondo Buena-vista, and the male was taken at Paramo Ubaque 3500 m.

Remarks. In SIMON's specimens only three spines were observed on each side of the tarsal segment of the palps. SIMON as well as SØRENSEN call the transverse stripes "sanguinei"; I think they are more properly termed bronze-coloured. As the second segment of the antennæ is only slightly elevated in the male, SØRENSEN rightly regards it as an abnormality. On account of the small differences in the granulation of the scutum, SØRENSEN does not exclude the possibility that the male and the females do not belong to the same species.

Rhaucus tuberculatus n. sp.

Femina 7,5 mm longa, rufo-fusca, lineolis obliquis anterioribus ambabus et lineis transversis quatuor luteis notata; tuber oculiferum leviter excavatum; limbus lateralis non discretus, ordine exteriore granulorum paucorum et lineis punctisque impressis praeditus; areæ (prima excepta) granis magnis, quorum plurima in ordines singulos disposita, secunda tuberculis minoribus, quarta tuberculis binis; palporum pars femoralis intus pæne inermis, coxae IV ordine transverso lateralí anteriore granorum; calcaneus I astragalo duplo brevior; articuli tarsales: 6, 18—19, 8, 9—10; processus terminalis unguiculis non duplo brevior.

Tuber oculiferum sat magnum, latum, supra leviter lateque excavatum, vittis ambabus granorum sat densorum ornatum.

Scutum alte convexum. Partes extérieures sulcorum transversorum secundi, tertii, quarti obsoletæ. Limbus anterior discretus, laevis. Limbus lateralis non discretus, erga coxas IV ordine granulorum paucorum praeditus, intra quæ adsunt impressiones irregulares, punctis et lineis formatæ. Labium anterius orificiorum glandularum foetidarum ultra posterius prominens, itaque orificio supra vix orbiculare. Area prima granis dispersis et impressione posteriore media irregulariter triangula; ceteræ granis magnis praeditæ, quorum plurima in ordines singulos disposita; secunda tuberculis minoribus ambobus; quarta tuberculis ambobus, reclinibus, obtusis. Tuberula areæ quartæ conica, subacuta, reclinia, suo tuberi magno conico imposita. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum; anale dorsale granis vix ordinatim dispositis. Coxæ et ventrale primum granis minoribus

sat parce; anale ventrale ordinibus duobus vix manifestis, cetera ordinibus singulis granorum minorum.

Antennarum pars globosa articuli primi (præter tuberculum interius apicale conicum) granis et granulis et posterioribus granis magnis supra scabra. Articulus secundus (num semper?) ante planus punctisque impressis ornatus.

Palporum pars trochanterica æque longa ac pars patellaris, in apice leviter incrassata, tuberculis inferioribus duobus, quorum interius majus, et superiore uno. Pars femoralis vix duplo longior quam crassior, ordine inferiore tuberculorum (circa 10) obtusorum armata et tuberculo minuto interiore subapicali munita; ultra carinam dorsalem serrata. Partis patellaris margo interior angustissime extenuatus, ultra medium paullo latior, angulatus, supra quem tuberculum procerum adest. Pars tibialis dimidio longior quam latior, æque longa ac pars femoralis; apex vix concavus parte latissima parte tertia angustior; anguli vix producti, interior aculeo uno, exterior tuberculo et duobus aculeis densis armatus. Pars tarsalis parte tibiali haud multo brevior, apicem versus angustata, marginibus non extenuatis; aculeis sat robustis exterioribus septem, sibi æqualibus, et interioribus tribus. Unguis parte tarsali vix duplo brevior.

Pedes minus robusti. Coxæ I tuberculo dorsali anteriore obtuso, prope basin anteversum producto; IV quam III duplo latores, carina transversa superiore apicali, granis prædicta, in latere anteriore leviter elevatæ et ordine granorum densorum ornatae. Femora arcuata, granis undique ornata, III et IV ordinibus inferioribus binis granorum magnorum, conicorum obtusorum, apicem articuli versus sensim majorum. Patellæ et tibiæ granulatae. Calcanei astragalo I duplo, II plus quam duplo breviores; articulo tarsali primo III manifesto, IV vix longiores. Articuli tarsales: 6, 18—19, 8, 9—10. Processus terminalis unguiculis non duplo brevior.

Differentia sexualis incognita (mare incognito). Feminæ pars propior tarsi I articulo ultimo vix tenuior.

Rufo-fuscus. Luteæ sunt: lineolæ obliquæ ambæ, inter tuber oculiferum et orificia glandularum foetidarum positæ; lineæ transversæ quatror, quarum prima, procurva brevis, sulcum transversum primum pone contingit; secunda et tertia, suo sulco congruentes, arcuatæ sunt; postrema brevis ante sulcum quintum posita est. Antennæ et palpi et pedes a metatarsis dilutiores.

Long. corp. 7,5; long. scuti 6; lat. scuti 5; palpi 7; pedes I 12, II 22, III 17, IV 22.

Patria: Columbia. Specimen unicum vidi, feminam, in collectione ill. comitis KEYSERLINGII asservatum.

Remarks. This species, which in the Roewerian system must belong to the genus *Flirtea*, is very much like *quinquelineatus* E. Sim., the differences being very slight, cfr. ROEWER'S Weberkn. d. Erde p. 346. As the editor has not seen the specimen described above, he dare not decide whether they are identical or not. Therefore he prefers to maintain the species as a new one, as proposed by SØRENSEN.

Rhaueus trilineatus n. sp.

7 mm longus, fuscus pæne niger, sulci transversi primus, quartus, quintus et limbus lateralis ante lineis sordide luteis notati; tuber oculiferum profunde excavatum; limbus lateralis sulcis longitudinalibus duobus et ordine exteriore granulorum; areæ granis magnis dispersis, secunda et tertia granis permagnis binis, quarta tuberculis parvis ambobus; palporum pars femoralis intus inermis; coxæ IV ordine transverso laterali anteriore granorum; calcaneus I astragalo plus quam duplo brevior; articuli tarsales: 6, 13, 9, 10; processus terminalis unguiculis parte tertia brevior.

Tuber oculiferum humillimum latum, supra late et profunde excavatum, vittis ambabus granorum haud regularibus præditum.

Scutum sat alte convexum. Sulci transversi secundus, tertius, quartus lati, leves, extus obsoleti. Limbus anterior leviter discretus, laevis. Limbus lateralis discretus latus sulcis longitudinalibus duobus, anteriore lato et posteriore exteriore, et ordine exteriore granulorum ornatus. Orificia glandularum foetidarum supra ovaliter dilatata. Areæ granis magnis dispersis sat densis (area quarta paullo minoribus), prima impressione posteriore media levi suborbiculari, secunda et tertia granis binis, ceteris paullo majoribus. Tubercula areæ quartæ parva, suo tuberi humiliter conico imposita. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum; anale dorsale granis parvis dispersis et impressione posteriore transversa interrupta. Coxæ granis sat magnis dispersis; ventrale primum granulis pusillis, cetera ordinibus singulis granorum parvorum. Impressio transversa ventralis primi profunda lata.

Antennarum pars globosa articuli primi tuberculis, interiore apicali magno conico obtuso et parvis exterioribus, et granis posterioribus prædata.

Palporum pars trochanterica æque longa ac pars patellaris, tuberculo robusto inferiore armata, supra inermis. Pars femoralis extra leviter convexa, plus quam dimidio longior quam crassior, a basi ultra medium ordine inferiore tuberculorum parvorum haud densorum armata, intus inermis; ultra carinam dorsalem humilem latam, itaque haud manifestam, eminentiis inæqualibus serratam, quarum maximæ sunt tubercula, inferioribus non minora, articulus leviter serratus. Pars patellaris intus vix extenuata et tibialis granulis supra ornata. Pars tibialis paullulo longior quam latior, parte femorali manifesto brevior; apex truncatus parte latissima haud multo angustior; angulus exterior tuberculo uno et aculeis duobus, interior aculeo uno armatus. Pars tarsalis parte tibiali paullo brevior, in basi leviter depressa, marginibus non extenuatis, aculeis exterioribus quatuor et interioribus tribus armata. Unguis parte tarsali plus quam duplo brevior.

Coxæ I tuberculo magno dorsali anteriore compresso, acute bicupidato; IV quam III non duplo latiores, lateraliter ante leviter elevatae et ordine transverso granorum densorum et tuberculo magno dorsali apicali brevi, robusto, vix conico, granis prædicto. Femora et patellæ et tibiae I et II vix, III et IV manifesto arcuata; I et II granulis, III et IV granis prædata. Calcanei astragalo I plus quam duplo, II triplo

breviores; articulo tarsali primo III longior, IV brevior. Articuli tarsales: 6, 13, 9, 10. Processus terminalis æque crassus atque unguiculi, quibus est parte tertia brevior.

Differentia sexualis (femina incognita). In mare: area prima quam quarta altior. Antennarum articuli secundi pars elevata parte cetera brevior, leviter compressa, supra rotundata, ante plicata; digiti in basi leviter hiantes, mobilis dente submedio robusto obtuso. Pars propior tarsi I parte ulteriore duplo longior et crassior. Femora III et IV ordinibus inferioribus binis tuberculorum conicorum acutorum; tibiæ III et IV ordinibus inferioribus binis granorum magnorum acutorum.

Fuscus pæne niger. Sulcus transversus primus linea angusta extus dilatata, quartus lineis ambabus late separatus, quintus linea media brevi; limbus lateralis ante sulcum transversum primum linea longitudinali haud bene circumscripta; quæ lineæ sordide luteæ sunt. Pedes I et II manifesto, III et IV vix dilutiores; metatarsi et tarsi luteo-testacei, metatarsi manifesto nigro anulati.

Long. corp. 7,25; long. scuti 6,25; lat. scuti 5,5; palpi 7,5; pedes I 13,5, II 23, III 18, IV 23.

Patria: Columbia. Specimen unicum, marem, vidi, in collectione ill. comitis KEYSERLINGII asservatum.

Remark: This species must in the Roewerian system be placed in or near the genus *Metarhaucus*.

Rhaucus muticus n. sp.

Femina 7 mm longa, fusco-castanea lineis transversis quinque luteis notata; tuber oculiferum late excavatum; limbus lateralis pone coxas III non discretus, granis parvis et granulis et impressionibus oblongis ornatus; areæ granis majoribus et minoribus, secunda granis magnis ambobus; palporum pars femoralis intus inermis; coxae IV in lateribus anterioribus muticæ; calcaneus I astragalo duplo brevior; articuli tarsales: 6, ?, ?, 10; processus terminalis unguiculis vix duplo brevior.

Tuber oculiferum latum, supra late excavatum, præter vittas granorum granis minoribus posterioribus paucis ornatum.

Scuti sat alte convexi sulci transversi arcuati, extus obsoleti. Limbus anterior non discretus, lævis. Limbus lateralis pone sulcum transversum primum non discretus, ordine exteriore granulorum remotorum et granis paryis dispersis et impressionibus oblongis irregularibus. Scutum totum subtiliter coriaceum. Areæ granis majoribus et minoribus dispersis; secunda granis magnis ambobus rotundatis; quarta tuberculis ambobus, subconicis, suæ basi conicæ, granis magnis densis asperæ, impositis. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum; anale dorsale granis densis dispersis. Coxæ granis dispersis; ventrale primum granulatis dispersis, anale ordinibus duobus, cetera ventralia ordinibus singulis granulorum.

Antennarum pars globosa articuli primi præter granula tuberculis interiore apicali et exteriore basali minore supra["] prædita.

Palporum pars trochanterica parte patellari longior, in apice incrassata, tuberculo inferiore apicali robusto. Pars femoralis dimidio longior quam crassior, ordine

inferiore tuberculorum obtusorum (circiter octo) armata, intus inermis; ultra carinam dorsalem longam, tuberculis serratam, sublævis. Pars patellaris intus angustissime extenuata. Pars tibialis parte femorali paullo brevior, parte tarsali dimidio longior; apex truncatus parte latissima haud multo angustior; anguli tuberculis singulis muniti, ante quæ ordo utrinque adest spinularum sat multarum, quarum præsertim interiores graciles. Partes patellaris, tibialis, tarsalis supra granulatæ. Pars tarsalis primum depressa, marginibus extenuatis, deinde compressa, spina interiore submedia robusta et aculeis interiore subapicali et (sex aut septem) exterioribus armata. Unguis parte tarsali non duplo brevior.

Coxæ I processulo dorsali anteriore biramo, obtuso; IV quam III duplo latiores, ante neque turba nec ordine granorum laterali anteriore præditæ, exteriore apicali carina transversa, granis serrata. Femora leviter arcuata, granis prædicta, quorum inferiora femorum III et IV majora et subacuta sunt. Patellæ et tibiæ I et II granulis, III et IV granis, quorum inferiora tibiæ IV majora et subacuta. Calcanei I astragalo duplo, II non triplo, III triplo breviore; IV articulo tarsali primo vix brevior. Articuli tarsales: 6, ?, ?, 10. Processus terminalis unguiculis non tenuior, vix duplo autem brevior.

Differentia sexualis incognita.

Fusco-castaneus, lineis quinque luteis notatus, sulcos sequentibus, limbos laterales non attingentibus, in lateribus anteversum curvatis; area prima scuti lineolis utrinque singulis luteis notata, irregularibus, angulatis. Pedes a tibiis dilutiores.

Long. corp. 7; long. scuti 6,5; lat. scuti 5,5; palpi 6; pedes I 13,5, II (sine tarso) 20; III (sine tarso) 16; IV 25.

Patria. Columbia. Specimen unicum, feminam (ovipositore protruso), vidi, in Museo Vindobonensi asservatum.

Remarks. This species seems to be nearly related to *R. quinquelineatus* E. Sim., which ROEWER referred to his genus *Flirtea* (Weberkn. d. Erde p. 346). However, it differs from this latter species in colour and in a few other features. SIMON's species has in addition to the five transverse yellow lines similar ones along the posterior margin of the three free somites. SIMON does not mention the two grana in the first abdominal somite. As ROEWER refers the species to his genus *Flirtea*, in which this structure is found, this character probably is not found in all specimens of *R. quinquelineatus*.

Rhaueus fuscus n. sp.

7 mm longus, fuscus, lineolis obliquis in area prima ambabus et vittis angustis transversis brevibus ambabus et linea posteriore sordide luteis notatus; tuber oculiferum late et sat profunde excavatum; limbus lateralis vix discretus ordine haud manifesto granulorum; areæ granis haud manifesto ordinatim dispositis, secunda granis magnis ambobus; palporum pars femoralis tuberculo setigero interiore munita; coxæ IV turba granorum magnorum laterali anteriore; calcaneus I astragalo parte tertia brevior; articuli tarsales: 6, 14, 9, 10; processus terminalis unguiculis vix duplo brevior.

Tuber oculiferum latum sat humile, supra late et sat profunde excavatum, vittis ambabus granorum densorum.

Scutum sat alte convexum. Sulci transversi secundus, tertius, quartus leves. Limbus anterior discretus laevis. Limbus lateralis vix discretus, secundum coxam IV ordine haud manifesto granulorum. Labium anterius orificiorum glandularum foetidarum ultra posterius prominens. Area prima, secunda, quarta granis dispersis, tertia et quinta ordinibus singulis haud manifestis granorum, secunda granis magnis ambobus. Tubercula areæ quartæ obtusa, suo tuberi conico imposita. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum; anale dorsale granis parvis dispersis. Coxæ granis; ventrale primum granis parvis, anale ordine posteriore granulorum et granulis parce dispersis, cetera ventralia ordinibus singulis granulorum.

Antennarum pars globosa articuli primi (præter tuberculum interius apicale conicum) granis exterioribus et posterioribus prædita, supra ceterum sublaevis.

Palporum pars trochanterica æque longa ac pars patellaris, in apice leviter incrassata, tuberculo inferiore obtuso armata. Pars femoralis plus quam duplo longior quam crassior, extra manifesto convexa, ordine inferiore tuberculorum sat majorum (ca. 8) et tuberculo setigero interiore apicali munita; ultra carinam dorsalem serratam crassam (itaque haud manifestam) serrata. Partis patellaris margo interior peranguste extenuatus, in apice angulatus. Pars tibialis parte tertia longior quam latior, parti femorali æqualis; apex vix excavatus parte latissima vix parte tertia angustior; anguli singulis tuberculis et aculeis armati, quorum aculeorum interior robustior. Pars tarsalis parte tibiali vix parte tertia brevior, primum depressa, marginibus vix extenuatis, deinde vix compressa; aculeis exterioribus 5—7 et interioribus 3 armata. Unguis sat robustus parte tarsali non duplo brevior.

Coxæ I tuberculo dorsali anteriore obtuso, prope basin graciliter producto; IV quam III duplo latores, carina transversa superiore apicali, granis prædita, in medio altiore, et turba laterali anteriore granorum magnorum præditæ. Femora arcuata, II vix; I et II et omnes patellæ et tibiæ granulis, III et IV granis, infra majoribus et acutis. Calcanei astragalo I parte tertia, II plus quam duplo breviores, articulo tarsali primo III manifesto, IV paullo longiores. Articuli tarsales: 6, (12—)14(—15), (8—)9, (9—)10. Processus terminalis æque crassus atque unguiculi, quibus vix duplo brevior est.

Differentia sexualis. In mare: antennarum pars elevata articuli secundi ante parce plicati crassior quam altior, rotundata; digiti in basi leviter hiantes, mobilis dente submedio robusto munitus. Pars propior tarsi I parte ulteriore vix dimidio crassior. Femora et tibiæ III et IV ordinibus inferioribus binis granorum magnorum conicorum acutorum, apicem versus sensim paullo majorum. Lamina (inferior) glandis penis in apice leviter emarginata, aculeis apicalibus arcuatis utrinque trinis et posterioribus utrinque binis.

Fuscus. Sordide luteæ sunt: lineolæ ambæ obliquæ extra tuber oculiferum positæ, vittæ angustæ transversæ breves ambæ, erga apices coxarum IV positæ, ante quas

ipse margo limbi lateralis brevis est, et linea transversa limbi posterioris. Membra dilutiora; pedes apicem versus dilutiores.

Long. corp. 7; long. scuti 6,25; lat. scuti 5,5; palpi 7; pedes I 13,5, II 24, III 20, IV 24.

Patria: Columbia. Exempla quatuor vidi, duos mares et duas feminas, in collectione ill. comitis KEYSERLINGII asservata.

Variatio: In femina altera: vittae transversae in limbo laterali prorsus non productæ; area secunda et quarta vittis angustis transversis singulis, late interruptis; area quinta linea transversa media. — In mare altero: palporum pars femoralis spinula tenui interiore armata; pars patellaris intus vix extenuata; vittæ (lineæ) ambæ areæ primæ majores, quia pone tuber oculiferum attingunt; limbi lateralis margo vix coloratus.

Remark: This species must in the Roewerian system be referred to the genus *Flirtea*.

Rhaucus tristis n. sp.

Femina 8 mm longa, fusca aut cinnamomea, flavis vittis angustis in area prima, punctis limbi lateralis partim confluentibus, linea flava in quoque sulco transverso notata; tuber oculiferum late excavatum; limbus lateralis ante discretus, foveolis vel punctis impressis praeditus; areæ (prima excepta) granis, quorum majora in ordines singulos disposita, secunda tuberculis minoribus ambobus; palporum pars femoralis spina debili interiore subapicali armata, pars tibialis duplo fere longior quam latior; coxae processulo dorsali anteriore obtuso bicuspidato, IV ordine transverso laterali anteriore granorum; calcaneus I astragalo duplo brevior; articuli tarsales: 6, 15—16, 8, 9; processus terminalis unguiculis parte tertia brevior.

Tuber oculiferum sat magnum latum, supra late excavatum, vittis ambabus (vix manifeste expressis) granorum.

Scutum alte convexum. Limbus anterior discretus sat tumidus, laevis. Limbus lateralis ante discretus, foveolis vel punctis impressis et adversus coxam IV granulis paucis dispersis praeditus. Area prima anterior oblique plicata, et impressione posteriore media haud manifeste triangula, extra quam grana parva pauca adsunt; ceteræ granis praeditæ, quorum majora in ordines singulos disposita; secunda tuberculis minoribus ambobus obtusis. Tubercula areæ quartæ conica, manifesto reclinia, suo basi humiliter conicæ, granis densis praeditæ, imposita. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum; anale dorsale granis dispersis. Coxæ et ventrale primum granis (in ventrali minoribus); anale ordinibus duobus haud manifestis, cetera ordinibus singulis granulorum.

Antennarum pars globosa articuli primi (præter tuberculum magnum interius apicale) tubculo exteriore apicali et granis supra praedita, quorum exteriora et posteriora majora.

Palporum pars trochanterica æque longa ac pars patellaris, in apice leviter incrassata, tuberculis inferioribus duobus armata, quorum interius majus. Pars femoralis vix duplo longior quam crassior, extra leviter convessa, ordine inferiore

tuberculorum inæqualium obtusorum (circiter decem) et spina debili interiore subapicali armata; ultra carinam dorsalem serratam brevem granis paucis ornata. Partis patellaris margo interior manifeste extenuatus, supra quem tuberculum apicale adest. Pars tibialis duplo fere longior quam latior, parti femorali æqualis; apex truncatus parte latissima paullo angustior; anguli exterior tuberculo et interior aculeis singulis armati. Partes patellaris et tibialis supra granulatæ. Pars tarsalis parte tibiali parte tertia brevior, apicem versus angustior, marginibus non extenuatis; aculeis exterioribus sex et interioribus tribus, interdum quatuor, armata. Unguis parte tarsali vix duplo brevior.

Coxæ I processulo dorsali anteriore robusto, obtuse bicuspidato (sive ante breviter producto); IV quam III duplo latiores, carina transversa magna superiore apicali, granis crenulata, et ordine transverso laterali anteriore brevi granorum. Femora II recta; I leviter, III, IV arcuata; femora I et II et patellæ et tibiæ III et IV granulis, III et IV granis prædicta, infra magnis acutis. Calcanei astragalo I duplo, II plus quam duplo breviores, articulo tarsali primo III manifeste, IV paullo longiores. Articuli tarsales: 6, 15—16, 8(—9), 9. Processus terminalis unguiculis parte tertia brevior.

Differentia sexualis (mare incognito). Feminæ pars propior tarsi I articulo ultimo paullo tenuior.

Fuscus aut cinnamomeus. Flava sunt: vittæ angustæ ambæ anteriores laterales angulatæ areæ primæ; puncta partim confluentia limbi lateralis erga apicem coxæ IV posita; lineæ arcuatae omnium sulcorum transversorum, quarum prima (extra interdum bifida) et quinta breves; lineæ laterales singulæ, in medio interruptæ, limbi posterioris et segmentorum dorsalium liberorum trium anteriorum. Membra (præter femora III et IV) dilutiora.

Long. corp. 8; long. scuti 5,5; lat. scuti 5; palpi 6,5; pedes I 13,5, II 25, III 19,5, IV 25.

Patria: Columbia. Exempla vidi, feminas tres, in collectione ill. comitis KEYSERLINGII asservata, quarum una nunc in Museo Zool. Hafniensi asservata.

Remarks: In addition to these three females, Dr. SØRENSEN also has determined several others but has apparently not finished his studies; they belong to Professor GÖLDI's collections; they were collected in the following three localities:

- 1) Alto Sibaté, in the month of February 1897, at a height of 2800 m — two females and a single male,
- 2) Paramo Ubaque, in the month of February, at a height of 3200 m — a single female (collected by E. BAY); ibidem at a height of 3800 m — a single male.
- 3) Paramo Bogotá, in the month of January 1897 — 14 females and 2 males.

Variatio. Limbus lateralis adversus coxam IV punctis flavis aut nonnullis partim confluentibus, aut duobus, aut uno ornatus, aut plerumque destitutus. Lineæ transversæ flavæ prima et secunda linea aut lineis interdum conjunctæ.

The yellow spots near the anterior lateral corner of the first area always seem to be present, but their development varies from one specimen to another; in some

specimens we observe as many as six more or less fused spots, forming a reticulated structure; in others only a few small spots are found. As previously stated, the yellow marginal spots in front of the fourth pair of coxae are often wanting e. g. in the 16 specimens from Paramo Bogotá. The first and the fifth yellow transverse stripes are distinctly shorter than the others, sometimes very short. In one specimen a transverse row of yellow spots was found between the second and the third line; and in another between the fourth and the fifth stripe. In some specimens the fifth stripe was dissolved into yellow spots, and in a single female it consisted of two spots only; in the same animal all the other stripes were divided by a longitudinal darker narrow line. — With the exception of a single cinnamon-coloured female, one of the three originally examined by Dr. SØRENSEN, all the other 20 specimens were more or less dark brown.

Abnormality. In a single female from Paramo Bogotá an abnormality was observed which is similar to "the split segment" found in other Arthropods. The first and the second abdominal tergites were apparently quite normal; the third, however, showed a marked asymmetry. On the left side the structure was rather regular, but on the right side the usual spine was represented by a short obtuse tubercle; the yellow stripes along the front margin of the third and fourth abdominal somites are, as seen in figure 26, very irregular. The fifth tergite is apparently longer than usual; the hinder margin is somewhat irregular and the two yellow spots not quite symmetrical. The first free abdominal somite consists of a left portion, extending somewhat beyond the middle, and a right much shorter portion. The two following tergites are slightly asymmetrical as far as the yellow stripes are concerned, but in other respects scarcely abnormal. The abnormality described is probably due to traumatism before the last ecdysis.

In the Arachnids a similar structure was first noticed and figured in *Stylocellus sumatrana* Westw., one of the *Cyphophthalmi* (HANSEN & SØRENSEN: On two Orders of Arachnids 1904, p. 97, pl. II fig. 2a); WITH later on found the same abnormality in insects as well as in three Chelonethi (WITH Ann. Mag. Nat. Hist. (7) XV 1905, p. 136—141, and WITH Trans. zool. Soc. London XVIII 1908, p. 307); it has not yet been described in Crustaceans or in Myriopods.

Remarks. Behind the operculum genitale connecting the two spiracula a low but distinct transverse keel is found in the male; the operculum and the area between the fourth pair of coxae is distinctly more slender in the males than in the females, a sexual difference which, as far as I know, has not previously been observed, but nevertheless is rather common among these animals. The second segment of the antennulae is strongly produced upwards in the male. The armature of the fourth pair of femora is distinctly more developed in the male and the three proximal tarsal segments in the fifth pair of legs are strongly dilated.

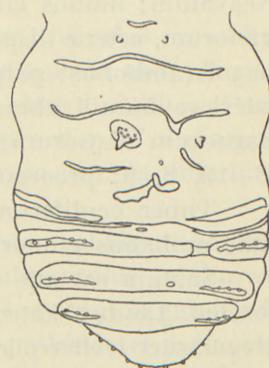


Fig. 26. *Rhaucus tristis* n. sp.
Abnormal female.

In several specimens larvæ of mites, attached to the limbs or trunk by their proboscis, were found.

In the Roewerian system this species is to be referred to the genus *Flirtea*.

Rhaucus reticulatus n. sp.

7 mm longus, fuscus, maculis reticulatis areæ primæ et singulis mediis limborum lateralium, sulphureis, lineis sordide flavis sulcorum (quinto excepto), anulo compresso transverso, ante aperto areæ quintæ notatus; tuber oculiferum levius excavatum; limbus lateralis vix discretus, irregulariter plicatus; area quinta ordine granorum, ceteræ dispersis granis majoribus et minoribus et granulis, secunda granis magnis ambobus; palporum pars femoralis intus inermis; coxæ I tuberculo dorsali anteriore humili obtuso, IV ordine dupli transverso laterali anteriore granorum magnorum densorum; calcaneus I astragalo vix duplo brevior; articuli tarsales: 6, 18—19, 8, 9; processus terminalis unguiculis duplo brevior.

Tuber oculiferum humile latum, supra levius lateque excavatum, coriaceum, vittis ambabus granorum præditum.

Scutum sat alte convexum. Sulci transversi secundus, tertius et quartus extus obsoleti. Limbus anterior non discretus, lævis. Limbus lateralis vix discretus, latus, irregulariter leviter plicatus, ceterum lævis. Labium anterius orificiorum glandularum foetidarum ultra posterius prominens; orificium itaque supra leviter tantum dilatatum. Area prima granis magnis et parvis dispersis et impressione posteriore media, subovali, profunda, cum sulco transverso primo sulco sat profundo conjuncta, lineolas utrinque singulas arcuatas emittente; secunda et tertia granis paucis et granulis dispersis; quarta granis majoribus et minoribus; quinta ordine brevi interrupto granorum densorum; secunda granis magnis ambobus. Tubercula areæ quartæ suo tuberi conico imposita. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum densorum; anale dorsale granis parvis dispersis. Coxæ et ventrale primum granis dispersis; anale ventrale ordinibus duobus granulorum, anteriore paucorum, posteriore densorum; cetera ordinibus singulis granorum. Impressio transversa ventralis primi profunda et lata.

Antennarum pars globosa articuli primi tuberculis apicalibus, interiore et exteriore, conicis, sat magnis, et granis exterioribus et posterioribus ornata.

Palporum pars trochanterica æque longa ac pars patellaris, in apice incrassata, tuberculo inferiore robusto armata, supra lævis. Pars femoralis extra leviter convexa, dimidio longior quam crassior, ordine inferiore a basi usque ad medium tuberculorum densorum robustorum (circiter septem) armata, intus inermis; ultra carinam dorsalem humilem robustam, crenulatam sublævis. Pars patellaris intus carinata. Partes patellaris et tibialis supra granulatae. Pars tibialis paullo longior quam latior, parti femorali æqualis; margo exterior apicem versus aculeis quatuor, anguli exterior tuberculo uno et interior aculeo uno armati; apex truncatus parte latissima parte tertia angustior. Pars tarsalis parte tibiali parte tertia brevior, prope basin depressa;

aculeis exterioribus septem et interioribus tribus armata. Unguis parte tarsali duplo brevior.

Coxæ I tuberculo dorsali anteriore humili obtuso; IV quam III vix duplo latiores, carina transversa superiore apicali, crenulata, (saltem in specimine unico) in medio humiliore; in latere anteriore leviter elevatæ et ordine dupli transverso granorum magnorum densorum ornatae. Femora I manifesto, II vix, III et IV leviter arcuata, granis prædita. Patellæ et tibiae I et II granulis, III et IV granis ornatae. Calcanei astragalo I vix duplo, II duplo, III plus quam duplo breviores; IV articulo tarsali primo longior. Articuli tarsales: 6, 18—19, 8, 9. Processus terminalis æque crassus ac unguiculi, iisdem autem duplo brevior.

Differentia sexualis (femina incognita). Mas: antennarum articulus secundus validus; pars elevata parte cetera brevior, compressa, supra subungulata, ante plicata; digiti in basi leviter hiantes, mobilis dente submedio robusto obtuso munitus. Pars propior tarsi I parte ulteriore duplo crassior. Femora III et præsertim IV ordinibus inferioribus binis tuberculorum parvorum conicorum acutorum. Grana inferiora tibiarum III et IV apicem versus majora.

Fuscus. Area prima maculis reticulatis ambabus, extra tuber oculiferum positis; pars media limbi lateralis macula oblonga reticulata; quæ maculæ sordide sulphureæ sunt. Lineis sordide flavis notata sunt: sulci transversi primus (breviore), secundus et tertius (angustis), quartus (in medio late interrupta); limbus posterior et segmenta dorsalia libera tria anteriora (in medio late interruptis). Area quinta anulo compresso transverso ante aperto sordide flavo. Palpi et pedes fusco-brunnei; metatarsi olivacei, irregulariter obsolete nigro reticulati. Calcanei et tarsi infuscati.

Long. corp. 7; long. scuti 6; lat. scuti 5,5; palpi 8; pedes I 14, II 24, III 19, IV 24.

Patria: Columbia. Specimen unicum vidi, marem, in collectione ill. comitis KEYSERLINGII asservatum.

Remarks. Like *tristis* and *muticus* this species also — which in the Roewerian system belongs to the genus *Flirtea* — is related to *quinquelineatus* E. Sim.; possibly they are all to be referred to one species.

Rhaucus alpha n. sp.

7 mm longus, fuscus; area prima punctis confluentibus olivaceis, literam A plerumque formantibus, limbus lateralis punctis confluentibus olivaceis reticulatus; tuber oculiferum leviter excavatum granis præditum; areæ (prima excepta) ordinibus singulis granorum, secunda granis magnis ambobus; palporum pars femoralis intus inermis, partis patellaris margo interior vix extenuatus; coxæ IV turba granorum magnorum laterali anteriore et carina apicali, in medio altiore; calcaneus I astragalo vix duplo brevior; articuli tarsales: 6, 13, 9, 10; processus terminalis unguiculis duplo brevior.

Tuber oculiferum latum humile, sat leviter excavatum, præter vittas granorum ambas granis posterioribus dispersis ornatum.

Scutum post sulcum transversum primum non gradatim altius. Sulci transversi secundus, tertius et quartus debiles. Limbus anterior discretus, subtiliter coriaceus, granulis parvis remotis praeditus. Limbus lateralis leviter discretus, erga coxam IV granis parvis dispersis ornatus, quorum exteriora ordinem formant. Labium anterius orificiorum glandularum foetidarum ultra posterius prominens. Area prima granis minoribus dispersis; ceterae granis minoribus et parvis sat dispersis et ordinibus singulis granorum majorum remotorum; secunda granis magnis ambobus. Tubercula areae quartae subconica rotundata, suo tuberi conico, granis densis ornato, imposita. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum, ante magnorum, pone minorum; anale dorsale ordinibus duobus haud manifestis granorum minorum. Anale ventrale ordine posteriore et vitta anteriore parca granorum parvorum; coxae granis minoribus; margo posterior segmenti ventralis primi et segmenta cetera ordinibus singulis granorum parvorum. Sulcus transversus segmenti ventralis primi profundus et latus.

Antennarum pars globosa articuli primi tuberculis apicalibus, interiore et exteriori, conicis, et granis exterioribus et posterioribus, ceterum granulis praedita. Articulus secundus granulis ante ornatus, quae in ordines tres haud manifestis disposita sunt.

Palporum pars trochanterica æque longa ac pars patellaris, in apice leviter incrassata, tuberculis inferioribus duobus armata, quorum interius multo majus est. Pars femoralis extra leviter convexa, vix duplo longior quam crassior, ordine inferiore tuberculorum densorum (circiter undecim) armata, intus inermis; ultra carinam dorsalem manifestam serratam sublævis. Partis patellaris margo interior vix extenuatus. Partes patellaris et tibialis granulis parvis supra ornatae. Pars tibialis parte tertia longior quam latior, parti femorali æqualis; apex truncatus parte latissima paullo angustior; angulus exterior tubculo et exteriore aculeo, interior aculeo armatus. Pars tarsalis parte tibiali parte tertia brevior, sat angusta, marginibus prope basin leviter extenuatis, deinde sensim paullo angustior; aculeis exterioribus sex et interioribus tribus armata. Unguis parte tarsali duplo brevior.

Coxæ I tuberculo robusto dorsali anteriore obtuso, ante subconice producto; IV quam III vix duplo latiores, carina transversa superiore apicali, obliqua, in medio altiore, granis parvis serrata, et turba minore laterali anteriore granorum magnorum paucorum densorum, cuius basis leviter elevata est. Femora II vix, cetera leviter arcuata; I et II (et tibiæ III et IV) granis parvis, III et IV granis magnis praedita. Calcanei astragalo I vix duplo, II plus quam duplo, III fere triplo breviores; IV articulo tarsali primo paullo longior. Articuli tarsales: 6, (12—)13(—14), 9, 10. Processus terminalis unguiculis duplo brevior.

Differentia sexualis. Mas: antennarum articulus secundus robustus, ante pliatus; pars elevata vix compressa, rotundata, parte cetera manifesto brevior; digiti sat leviter hiantes, mobilis sat fortiter inclinatus dente magno subbasali armatus. Femora III et fusiformia IV et tibiæ III et IV ordinibus inferioribus binis tuberculorum parvorum subacutorum. Pars propior tarsi I parte ulteriore duplo fere crassior.

Lamina (inferior) glandis in apice manifesto emarginata, aculeis apicalibus arcuatis utrinque trinis, et posterioribus utrinque binis multo majoribus.

Fuscus. Area prima maculis ambabus lateralibus, lunatis, duplicibus (literæ A plerumque similibus) olivaceis; limbus lateralis erga coxam IV punctis olivaceis reticulate confluentibus, vittam angustam extenuatam brevem in aream tertiam emittebantibus; limbus posterior linea transversa, late interrupta, olivacea; segmentum dorsale primum plerumque linea simili, in mare perlevi. Palpi et pedes dilutiores; pedes aream versus dilutiores; metatarsi et tarsi rufo-testacei. Coloratio olivacea scuti interdum tam debilis est, ut tantum lineæ parvæ arearum primæ et tertiae et limbi lateralis remaneant. Apud feminam unam omnes areæ punctis olivaceis confluentibus et sulci transversi lineis indeterminatis ornata.

Long. corp. 7; long. scuti 6,25; lat. scuti 6; palpi 7,5; pedes I 17, II 30, III 22, IV 29.

Patria: Columbia. Specimina duo vidi, mares, in collectione ill. comitis KEYSERLINGII asservata, alterum ad urbem Sta Fé de Bogotá captum.

In addition to the above-mentioned two males Dr. SØRENSEN has examined several specimens from Columbia, all belonging to Professor GÖLDI's collections, viz.

- 1) two females and one male from Paramo Bogotá,
- 2) two females and one male from Alto Sibaté, collected February 2nd, 1897, at a height of 2800 m.,
- 3) a single male from Paramo Monserrata, collected January 31st, 1897, at a height of 2800 m.

Remarks. In the specimens examined a pair of grana bigger than the others were found in the fifth (the fourth abdominal) somite; a similar pair was sometimes seen in the sixth (fifth abdominal) somite. The two grana of the first abdominal tergite are only slightly bigger than the other grana of the somite, but more pointed and situated on a small, low tubercle. As pointed out by Dr. SØRENSEN, the coloration of the scutum varies from one specimen to another.

The male is very characteristic by its very robust, distally enlarged and serrated fourth pair of femora. The operculum genitale between the coxae is slightly excavated from one side to the other in the males, but slightly vaulted in the females.

To the trunk and limbs of several specimens larvae of acari were attached.

This species must certainly be referred to the Roewerian genus *Flirtea*. The species, however, also bears some similarity to *Metarhaucus reticulatus* Roewer (Weberkn. d. Erde p. 343), which possesses bigger grana in the first as well as in the second abdominal somite.

Rhaucus geographicus n. sp.

7 mm longus, fuscus, olivaceo-luteis fusco punctatis notatus: maculis ambabus areæ primæ, vittis dorsalibus ambabus arcuatis, lineas introrsum emittentibus, cum vitta brevi limbi lateralis vitta transversa conjunctis; tuber oculiferum late et profunde excavatum; limbus lateralis non discretus, ordine granorum parvorum; areæ

granis densis dispersis, secunda granis magnis ambobus; palporum pars femoralis tuberculo parvo interiore apicali armata; coxae IV turba granorum laterali anteriore et carina apicali, in medio altiore; calcaneus I astragalo fere triplo brevior; articuli tarsales: 6, 15—16, 10, 12; processus terminalis unguiculis duplo brevior.

Tuber oculiferum latum, late et sat profunde excavatum, vittis angustis ambabus granorum magnorum ornatum.

Scutum æque latum ac longum, post sulcum transversum primum non gradatim altius. Sulci transversi secundus, tertius et quartus leves. Limbus anterior discretus lævis. Limbus lateralis non discretus, erga coxam IV ordine granorum præditus. Labium anterius orificiorum glandularum foetidarum ultra posterius manifeste prominens; oricia supra leviter dilatata. Area prima granis dispersis sat densis et impressione posteriore media manifesta parva haud profunda subtriangula; ceteræ granis dispersis densis; secunda granis magnis ambobus rotundatis. Tubercula areæ quartæ robusta, suo tuberi late conico imposita. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum sat densorum; anale dorsale impressionibus destitutum, granis superioribus densis dispersis. Ventrale primum ante sublæve, cuius margo posterior et segmenta cetera et pars interior coxarum (IV) granulis ornata sunt.

Antennarum pars globosa articuli primi præter tuberculum interius apicale conicum granulis superioribus dispersis et ordine exteriore posteriore granorum ornata, quorum exteriora basale et apicale ceteris multo majora sunt.

Palporum pars trochanterica æque longa ac pars patellaris, procera, in apice leviter incrassata, tuberculis inferioribus duobus, quorum interius majus est, et superiore uno. Pars femoralis dimidio longior quam crassior, extra leviter convexa, ordine inferiore tuberculorum robustorum subæqualium, sensim majorum (circiter novem), et tuberculo parvo interiore subapicali truncato setigero armata; ultra carinam dorsalem serratam sat longam sublævis. Partis patellaris margo interior anguste extenuatus, in apice vix productus. Pars tibialis paullo longior quam latior, parti femorali æqualis; apex angulatus parte latissima articuli parte tertia angustior; anguli vix producti, exterior tuberculo et duobus aculeis densis, interior aculeo uno, armati. Pars tarsalis parte tibiali parte tertia brevior; margines prope basin leviter extenuati, quare articulus apicem versus manifesto angustior est; aculeis exterioribus quinque (aut sex) et interioribus tribus armata. Unguis parte tarsali parte tertia brevior.

Coxæ I processulo dorsali anteriore robusto, in apice leviter inciso; IV quam III duplo fere latiores, carina transversa apicali, in medio multo altiore pæne acute triangula, præditæ, in latere anteriore elevatæ et turba granorum ornatae. Femora I subrecta, cetera leviter arcuata; I et II granulis, III et IV granis, quorum inferiora majora conica sunt. Patellæ et tibiæ III et IV granulis superioribus et granis inferioribus ornatae. Calcanei astragalo I et II duplo et dimidio breviore; articulo tarsali primo III manifesto, IV vix longiores. Articuli tarsales: 6, (13—)15—16(—17), 10(—11), 12(—13). Processus terminalis fortiter incurvus, unguiculis duplo brevior.

Differentia sexualis. Mas: antennarum articulus secundus robustus, ante vix

plicatus; pars elevata vix compressa, rotundata, parte cetera manifesto brevior; digitæ in basi vix hiantes, mobilis sat fortiter inclinatus dente haud magno subbasali armatus. Femora III et (cylindrica) IV et tibiæ III et IV ordinibus inferioribus binis tuberculorum parvorum subacutorum; tibia III processulis (eminentiis ceteris multo majoribus) inferioribus apicalibus destituta. Pars propior tarsi I parte ulteriore duplo fere crassior (feminae articulo ultimo crassior).

Fuscus. Olivaceo-luteæ sunt: maculæ magnæ ambæ, irregulares, reticulatæ areæ primæ; vittæ binæ arearum secundæ, tertiae, quartæ, arcuatæ, confluentes; linea similis tenuis areæ quintæ; vitta brevis limbi lateralis, erga partem posteriorem coxae IV posita, cum arcu areæ tertiae vitta transversa conjuncta. Quæ figuræ omnes fusco punctatæ, quia eminentiæ (anulo cinctæ) fuscæ sunt. Limbus posterior scuti et segmenta dorsalia libera tria anteriora lineis singulis late interruptis olivaceo-luteis. Pedes dilutiores; femora I et II luteo punctata; metatarsi sordide flavi, anguste nigro anulati.

Long. corp. 7; long. et lat scuti 6; palpi 7; pedes I 13,5, II 26, III 21, IV 26.

Patria: Columbia. Exempla quatuor vidi, feminas tres et marem unum, in collectione ill. comitis KEYSERLINGII asservata, quorum femina una nunc in Museo Zool. Hafniensi asservata est.

In addition to the four above-mentioned specimens Dr. SØRENSEN examined two males, forming part of Professor GöLDI's collection, the one from Lagune Ubaque and the other from Pacho & Zipaquirá taken at a height of 2000—2200 m, March 27th; the editor has seen a third male from La Onion, Chingusa, collected at a height of 1000—2400 m, and scarcely examined by Dr. SØRENSEN.

Remarks. In the last mentioned male the gaping of the antennæ was only slightly pronounced, but in the two others it was well marked and the tooth at the base of the movable finger was well developed. In the specimen from Pacho all the yellowish spots were fused to a reticulated system. In the last mentioned specimen the exterior ventral process of the trochanterical portion was wanting on the right side and very small on the left side; the proximal portion of the left tarsus I consisted of 4 segments and that of the right as usual of 3 only.

The species belongs to the genus *Flirtea* in the Roewerian system.

Rhaucus limbatus n. sp.

Femina 7,5 mm longa, fusca pâne nigra; partes exteriores areæ primæ et limbus lateralis olivaceo-luteo reticulata; area secunda et tertia vittis transversis singulis olivaceo reticulatis; tuber oculiferum late et profunde excavatum; limbus lateralis non discretus, ordine granorum parvorum; areæ granis densis dispersis, secunda tuberculis ambobus; antennarum articulus secundus prope basin carinis anterioribus longitudinalibus tribus; palporum pars femoralis tuberculo interiore apicali munita; coxae IV carina transversa apicali in medio altiore, et tubere granis praedito, lateralí anteriore; calcaneus I astragalo duplo brevior; articuli tarsales: 6, 12—14, 10, 12; processus terminalis unguiculis parte tertia brevior.

Tuber oculiferum latum et humile, late et profunde excavatum, vittis ambabus latis granorum densorum.

Scutum manifesto longius quam latius. Sulcus transversus quartus debilis. Limbus anterior discretus, laevis. Limbus lateralis non discretus, erga coxas IV ordine granorum parvorum ornatus. Labium anterius orificiorum glandularum foetidarum ultra posteriorius manifeste prominens; oricia supra leviter dilatata. Area prima granis dispersis sat densis et impressione posteriore transversa, $\sim\sim$ -formi; ceterae granis dispersis densis; secunda tuberculis ambobus rotundatis. Tubercula areæ quartæ subglobosa, suæ basi humiliter conicæ imposita. Limbus posterior scuti et segmenta dorsalia libera tria anteriora ordinibus singulis granorum sat densorum; anale dorsale impressionibus transversis, anteriore interrupta et posteriore (media), et ordinibus duobus granorum. Coxæ granis dense dispersis; pars anterior ventralis primi granulis paucis dispersis; anale ordinibus duobus, cetera ventralia ordinibus singulis granorum minorum.

Antennarum pars globosa articuli primi (præter tuberculum interius apicale conicum) granulis superioribus dispersis et ordine exteriore superiore granorum ornata, quorum exteriora basale et apicale ceteris multo majora sunt. Articulus secundus (in femina geniculatus) prope basin carinis anterioribus tribus, per longitudinem ductis.

Palporum pars trochanterica æque longa ac pars patellaris, procera, in apice leviter incrassata, tuberculis inferioribus duobus, quorum interius majus est, et superiore uno. Pars femoralis non duplo longior quam crassior, extra leviter convexa, ordine inferiore tuberculorum (circiter novem) vicissim majorum et minorum, armata et tuberculo interiore apicali conico munita; ultra carinam dorsalem serratam, brevem humilem, itaque haud manifestam, serrata. Partis patellaris margo interior anguste extenuatus, in apice leviter productus. Partes patellaris et tibialis supra granulatae. Pars tibialis parte vix tertia longior quam latior, parte femorali manifesto brevior; apex angulatus parte latissima articuli parte tertia angustior; anguli manifesto producti, exterior tuberculo et duobus aculeis densis, interior aculeo uno, armati. Pars tarsalis parte tibiali haud multo brevior, apicem versus vix angustior, marginibus non extenuatis; aculeis exterioribus sex et interioribus tribus armata. Unguis parte tarsali vix duplo brevior.

Coxæ I processulo dorsali anteriore robusto, in apice leviter inciso; IV quam III duplo fere latiores, carina transversa in medio altiore superiore apicali et tubere laterali anteriore, granis prædicto. Femora II recta, cetera arcuata; I et II granulis, III et IV granis ornata, quorum inferiora majora conica sunt. Patellæ et tibiae III et IV granulis superioribus et granis inferioribus prædictæ. Calcanei astragalo I duplo, II triplo breviores; III et IV articulo tarsali primo longiores. Articuli tarsales: 6, 12—14, 10, 12. Processus terminalis unguiculis parte tertia brevior.

Differentia sexualis? (mare incognito). Feminæ pars propior tarsi I articulo ultimo vix tenuior.

Fuscus pâne niger. Area prima extra et post tuber oculiferum et limbus lateralis usque ad apicem coxae IV olivaceo-luteo reticulata; areæ secunda et tertia vittis latis

transversis reticulatis sordide olivaceis (vitta areæ secundæ interrupta). Limbus posterior et segmenta dorsalia libera tria anteriora lineis singulis interruptis olivaceis. Pedes brunneo-rufescentes; tibiæ rufo-testaceæ nigro punctatæ; metatarsi testacei dense anguste nigro anulati.

Long. corp. 7,5; long. scuti 6,5; lat. scuti 5,5; palpi 7; pedes I 13, II 25, III 18, IV 24.

Patria: Columbia. Specimen unicum vidi, feminam, in collectione ill. comitis KEYSERLINGII asservatum.

Species tres nuper descriptæ, *Rh. alpha*, *Rh. geographicus*, *Rh. limbatus*, sibi magnopere affines sunt.

Remark. This species must likewise in the Roewerian system be referred to the genus *Flirtea*.

Rhaucus togatus n. sp.

6 mm longus, læte fusco-cinnamomeus, vittis latis ambabus sulphureis notatus; tuber oculiferum late et profunde excavatum; limbus lateralis vix discretus, punctis impressis ornatus; areæ parce granulatæ, secunda tuberculis ambobus, quarta processulis ambobus suo tuberi magno conico impositis; limbus posterior et segmenta dorsalia libera sublævia; pars femoralis palporum intus inermis; coxæ IV turba granorum densorum laterali anteriore; calcaneus I astragalo duplo brevior; articuli tarsales: 7, 19—20, 10—11, 12; processus terminalis procerus, unguiculis paullo brevior.

Tuber oculiferum limbo anteriori contiguum, sat magnum, late et profunde excavatum, vittis ambabus granorum parvorum paucorum.

Scutum sat alte convexum, post sulcum transversum primum non gradatim altius. Sulci transversi secundus, tertius, quartus leves. Limbus anterior (præsertim in medio) leviter discretus, lævis. Limbus lateralis vix discretus, punctis impressis sat densis ornatus, ceterum lævis. Areæ disperse et parce granulatæ; prima impressione posteriore media orbiculari; secunda tuberculis ambobus humilibus, sat amplis, rotundatis; partes areæ, quibus tubercula imposita sunt, leviter sed ample elevatae. Processuli areæ quartæ suo tuberi magno conico impositi sunt. Limbus posterior scuti et segmenta dorsalia libera vix granulata. Coxæ granulis; ventralia primum et anale sublævia; margo posterior primi et segmenta cetera ordinibus singulis granulorum. Sulcus transversus segmenti ventralis primi arcuatus, profundus, latus.

Antennarum pars globosa articuli primi tuberculis conicis subacutis, anteriore apicali et exterioribus apicali et minore basali, item granis marginalibus prædita.

Palporum pars trochanterica parte patellari manifeste longior, in apice leviter incrassata, tuberculis inferioribus duobus armata, quorum interius majus; supra lævis. Pars femoralis vix duplo longior quam crassior, extus leviter convexa, ordine inferiore, partes duas articuli excipiente, tuberculorum (circiter octo) apicem articuli versus sensim majorum, armata, intus inermis (seta parva sat appressa, apici propinqua, munita); ultra carinam dorsalem humilem serratam sublævis. Partis patellaris margo interior angustissime extenuatus, in apice vix angulatus. Pars tibialis paullo

longior quam latior, parte femorali paullulo brevior; margines valde extenuati, interior subtiliter crenulatus, exterior (præter setas) aculeis medio uno et apici propinquis tribus, præter quos angulus exterior tuberculo et aculeo, interior aculeo armatus; apex vix concavus parte latissima articuli duplo fere angustior. Pars tarsalis parte tibiali parte tertia brevior; margines prope basin anguste extenuati, ante quos articulus sat subito angustior est; aculeis exterioribus septem (aut octo) et interioribus tribus armata. Unguis sat procerus, parte tarsali non duplo brevior.

Pedes breviores, sat robusti. Coxæ I processu dorsali anteriore humili, vix inciso, in summo anteversum conice producto; IV quam III non duplo latores, carina transversa superiore apicali, granis fortiter crenulata, in latere anteriore leviter elevata et turba granorum densorum ornatae. Femora IV leviter, cetera vix arcuata; I et II granulis superioribus et granis inferioribus, III granis, infra apicem versus majoribus. Tibiae IV tuberculis parvis superioribus. Calcanei astragalo I vix duplo, II triplo fere breviores; III et IV articulo tarsali primo manifesto longiores. Articuli tarsales: 7, (18—)19—20(—23), 10—11, (11—)12(—13). Processus terminalis procerus unguiculis paullo brevior.

Differentia sexualis. Mas: articulus secundus antennarum ante plicatus; pars elevata compressa, rotundata, subæque longa ac pars cetera; digitus mobilis sat fortiter inclinatus, dente subbasali magno armatus. Pars propior tarsi I parte ulteriore plus quam duplo crassior (in femina: articulo ultimo tenuior). Femora (et tibiae) III et IV ordinibus inferioribus binis eminentiarum conicarum acutarum, apicem articuli versus majorum, quarum ultimæ sunt tubercula.

Læte fusco-cinnamomeus, vittis latis ambabus sulphureis, ante acuminatis, extra et intra serratis, a marginibus lateribus recessis, erga apicem coxarum IV lineam prorsam emittentibus; pars media scuti vittis paullo angustior, post processulos areæ quartæ subito angustata, deinde sensim latior. Segmenta dorsalia libera tria anteriora lineis transversis singulis, interruptis. Membra dilutiora; pedes I et II et trochanteres et bases breves femorum III et IV et metatarsi et tarsi III et IV testacea. Metatarsi anguste nigro anulati.

Long. corp. 6; long. scuti 5; lat. scuti 4,75; palpi 6,5; pedes I 19, II 38, III 26, IV 36.

Patria: Columbia. Exempla septem vidi, mares quinque et feminas duas, in collectione ill. comitis KEYSERLINGII asservata, quorum quinque ad urbem Sta. Fé de Bogotá capta sunt. Mas unus nunc in Museo Zool. Hafniensi asservatus.

Variatio. In femina altera: limbus anterior manifeste discretus; area secunda clypeate elevata, ubi tubercula imposita sunt; area prima et limbus lateralis (parte exteriore angusta excepta) sordide sulphureo reticulata, dum in areis ceteris tantum

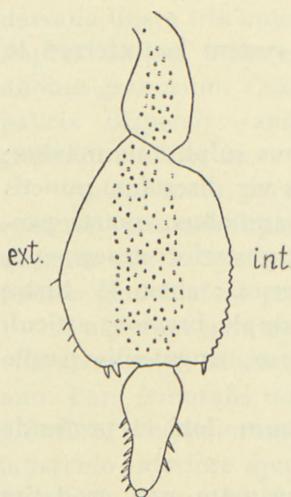


Fig. 27. *Rhaucus togatus* n.sp.
Palpi partes patellaris, tibialis et tarsalis.
(W. Sør. del.)

lineæ arcuatae (partes exteriores sulcorum sequentes) sulphureæ adsunt. — In mare uno: articulus secundus antennarum non elevatus; limbus posterior scuti et segmenta dorsalia libera et ventralia omnia manifesto granulata.

Animal junius (certe generis *Rhauci*, et fortasse *Rh. togati*), ad Sta. Fé de Bogotá captum): Long. corp. 4; long. scuti 3,5; palpi 7,5; pedes IV 28. Palpi (relative) sat robusti; pars trochanterica parti patellari subæqualis; pars femoralis partibus patellari et tibiali conjunctis vix longior, femore III paullo minus crassa; pars tibialis parte tibiali duplo fere longior; pars tarsalis parte tibiali manifesto (parte tertia) brevior; partes omnes teretes, trochanterica tuberculo inferiore apicali munita, ceteræ inermes; unguis subulatus. — Tuber oculiferum latum, late et profunde excavatum, in tumulos ambos, sat late separatos, pæne divisum. — Area scuti secunda processulis ambobus parvis; quarta processibus ambobus longis, conicis, acutis, reclinibus, sublaevibus. — Fuscum, lineis dilutis ornatum: media et transversis, sulcos sequentibus; limbi anterior et lateralis et posterior diluti.

Remark. This species must be referred to the genus *Meterginus* in the Roe-werian system.

Rhaucus obscurus n. sp.

7 mm longus, fuscus; area prima lineolis obliquis sordide flavis, sulci transversi (excepto primo) lineis sordide flavis notata; tuber oculiferum late et leviter excavatum; limbus lateralis leviter discretus, lineolis et punctis impressis et ordine exteriore granulorum ornatus; areæ granulis dispersis et granis ordinatim dispositis, secunda granis magnis ambobus, quarta tuberculis ambobus, suo tuberi conico impositis; palporum pars femoralis spinula interiore subapicali armata; coxæ IV turba granorum laterali anteriore; calcaneus I astragalo vix duplo brevior; articuli tarsales: 7, 19, 9, 10; processus terminalis unguiculis longis duplo brevior.

Tuber oculiferum humile latum, supra late et leviter excavatum, vittis ambabus granorum minorum paucorum ornatum.

Scutum sat alte convexum. Limbus anterior leviter discretus, laevis. Limbus lateralis leviter discretus, lineolis et punctis impressis et ordine exteriore granulorum prædictis. Labium anterius orificio glandularum foetidarum ultra posterius leviter prominens. Area prima impressione posteriore media haud profunda (aut orbiculari aut \sim -formi et granis dispersis); secunda granis magnis ambobus et granulis sat dispersis; tertia præter granula sat dispersa ordine granorum; quarta granis dispersis; quinta ordine brevi interrupto granorum densorum. Tubercula areæ quartæ suo tuberi conico haud magno, granis parce prædicto, imposita. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum densorum; anale dorsale granis minoribus dispersis. Ventrale primum (parvis) et coxæ granis dispersis sat densis; anale ordinibus duobus, cetera ordinibus singulis granorum parvorum. Impressio transversa ventralis primi profunda lataque. E marginibus spiraculorum carinae binæ obliquæ exeunt, leviter convergentes.

Antennarum pars globosa articuli primi tuberculis conicis, interiore apicali magno et exterioribus basali et apicali, et granis exterioribus et posterioribus prædita.

Palporum pars trochanterica æque longa ac pars patellaris in apice leviter incrassata, tuberculis inferioribus duobus armata, quorum interius majus. Pars femoralis duplo fere longior quam crassior, extra leviter convexa, ordine inferiore tuberculorum (circiter 6) magnorum, sensim majorum et spinula interiore subapicali armata; ultra carinam dorsalem serratam humilem brevem leviter serrata. Partis patellaris margo interior angustissime extenuatus, subtiliter crenulatus, supra quem tuberculum parvum apicale adest. Partes patellaris et tibialis supra granulatae. Pars tibialis dimidio longior quam latior, parte femorali manifeste brevior; apex vix concavus parte latissima parte tertia angustior; anguli vix producti, exterior tuberculo et aculeis lateralibus (3—4), interior aculeo robusto armati. Pars tarsalis parte tibiali parte tertia brevior, apicem versus angustata, aculeis exterioribus sex aut septem et interioribus tribus aut quatuor armata. Unguis parte tarsali duplo brevior.

Coxæ I processulo dorsali anteriore conico, ante leviter producto; IV quam III vix duplo latiores, carina transversa superiore apicali, crenulata, et turba granorum densorum laterali anteriore. Femora II vix, I leviter, III et IV manifesto arcuata; omnia granis prædita. Patellæ et tibiæ I et II granulis, III et IV granis ornatæ. Calcani astragalo I vix duplo, II plus quam duplo breviores; articulo tarsali primo III manifesto, IV vix longiores. Articuli tarsales: 7, (17—)19, 9, (9—)10(—11). Processus terminalis æque crassus atque unguiculi longi, quibus autem duplo brevior est.

Differentia sexualis. Mas: articulus secundus antennarum robustus; pars elevata parte cetera brevior, leviter compressa, supra rotundata, ante plicata; digiti in basi leviter hiantes, mobilis dente submedio robusto obtuso munitus. Pars propior tarsi I parte ulteriore triplo longior et duplo crassior (in femina articulo ultimo vix tenuior). Femora III et præsertim IV ordinibus inferioribus binis tuberculorum parvorum (in femina granorum magnorum) conicorum acutorum, apicem articuli versus sensim majorum.

Fuscus. Area prima lineolis obliquis angulatis ambabus sordide flavis, pone extenuatis. Sulci transversi secundus, tertius, quartus, quintus lineis angustis singulis sordide flavis notati; limbus posterior et segmenta dorsalia libera duo anteriora lineis singulis interruptis. Membra brunnea; metatarsi testacei irregulariter anguste nigro reticulati; tarsi infuscatae.

Long. corp. 7,5 (♀ 7); long. scuti 5,75 (♀ 6); lat. scuti vix 5; palpi 7,5 (♀ 7); pedes I 15 (♀ 13), II 24 (♀ 23), III 19 (♀ 18), IV 24 (♀ 23).

Patria: Columbia. Exempla tria vidi, mares duos et feminam unam, in collectione ill. comitis KEYSERLINGII asservata.

Variatio: In specimine uno eminentiae magnæ areæ quartæ sunt: tubercula parva obtusa, suo tuberi parvo granis parce ornato imposita. In specimine altero linea sulci quarti bipartita. In femina area prima lineis curvis utrinque binis notata.

Remarks. This species must be referred to the genus *Meterginus* in the Roe-werian system.

Cynorta Simon.

Cosmetus p. p. Perty Delectus animal, III, 1833, p. 208.

Flirtea + *Gnidia* C. L. Koch, Übers. d. Arachnidensyst. 1839. Fasc. II, p. 20, 21.

Cynorta E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 195.

Cynorta e. a. Roewer, Weberkn. d. Erde, 1923, p. 310 etc. — Suppl.: Abh. naturw. Ver. Bremen, XXVI, 3, 1928, p. 554 ff.

Tuber oculiferum eminentiis parvis sæpissime ornatum, in ordines (aut vittas) ambos sæpe distributis.

Scutum dorsale sæpissime leviter convexum, pone coxas III manifesto latius.

Area quarta (interdum non expressa) eminentiis majoribus ambabus instructa.

Orificia glandularum foetidarum sunt foramina brevia, lata, infra latiora (leviter proclivia), supra processum coxalem non aut vix visibilis.

Antennarum articulus primus in apice interiore superiore muticus.

Palporum sat gracilium pars tibialis sat fortiter dilatata; margo interior minus dilatatus, subrectus, exterior a basi usque ad apicem leniter arcuatus, nec apicem versus angustior, (in *Cynorta holmbergi* tamen margo exterior apicem versus sat subito angustior, quare in latere leniter angulatus est.)

Pedes breviores. Coxæ IV vix dilatatae, aut (sæpissime) eminentia majore conica aut carina transversa instructæ. Pars propior tarsi I parte ulteriore aut non aut paulo crassior (in mare vix crassior quam in femina) aut in mare manifesto crassior.

Unguiculi integri.

Differentia sexualis aut (in subgenere *Prasiæ*) structura articuli secundi antennarum demonstratur aut (in subgenere *Cynortæ*) parva crassitudine (et interdum armatura) femorum IV aut (in subgenere *Abriae*) crassitudine partis propioris tarsorum I, III, IV. — Penis (*C. dimorphæ*) lamina (inferior) sat crassa, in apice sat profunde incisa, aculeis utrinque senis munita, quorum bini apicales perlungi, curvati, processum (medium) laminæ oppressum amplectentes; balanus (superior) deplanatus.

Tarsi I articulus primus secundo in *C. quadrimaculata* non, in *C. V-albo* paullo, speciebus ceteris longior.

Nomen *Cynortæ*, a C. L. KOCH datum, servavi, etsi species ab hoc autore descriptæ, altera certe, altera verisimiliter, ad genus *Poecilæmatis* pertinent.

Conspectus specierum hic descriptarum.

A. Differentia sexualis magnitudine articuli secundi antennarum demonstratur.

Pars femoralis intus inermis. Subgenus *Prasia*:

I. Tarsus I in articulos ultra sex divisus. Areae quarta processulis binis, ceteræ (prima excepta) granis binis..... *C. (Pr.) fallax* n. sp.

II. Tarsus I in articulos sex divisus. Area IV tuberculis binis:

a. Grana parva bina in areis II—III adsunt... *C. (Pr.) venezuelana* n. sp.
b. Grana parva bina in areis II—III desunt..... *C. (Pr.) clypeata* n. sp.

B. Differentia sexualis parva, crassitudine (et interdum armatura) femorum IV demonstratur. Subgenus *Cynorta*:

I. Tarsus I in articulos quinque divisus:

a. Palporum pars femoralis intus inermis:

+ Pedes II æque longi ac pedes IV *C. (C.) sayi* E. Sim.

++ Pedes IV pedibus II manifesto longiores... *C. (C.) depressa* n. sp.

b. Palporum pars femoralis tuberculo magno interiore apicali armata

C. (C.) ambigua n. sp.

II. Tarsus I in articulos sex divisus:

a. Scutum eminentiis magnis ambabus (areæ quartæ) instructum:

+ Palporum pars femoralis intus armata:

§ Coxæ IV tuberculo exteriore apicali conico instructæ:

£ Scutum manifesto longius quam latius. *C. (C.) leviarcuata* n. sp.

££ Scutum paullo longius quam latius:

& Coxæ IV coriaceæ tantum; tuber oculiferum leviter excavatum; palporum pars patellaris non angulata ..

C. (C.) vidua n. sp.

&& Coxæ IV granulis pusillis; tuber oculiferum non excavatum; palporum pars patellaris in apice utrinque angulata *C. (C.) gervaisii* n. sp. ♂.

§§ Coxæ IV in apice muticæ *C. (C.) dimorpha* n. sp. ♀.

++ Palporum pars femoralis intus inermis ... *C. (C.) centralis* n. sp. ♀.

b. Scutum eminentiis magnis, quatuor:

+ Eminentiae magnæ scuti areis secundæ et quartæ impositæ:

§ Palporum pars femoralis intus armata:

£ Scutum granulatum:

& Sulcus transversus primus depresso. *C. (C.) koelpeli* Roewer.

&& Sulcus transversus primus obsoletus. *C. (C.) modesta* n. sp.

££ Scutum coriaceum:

& Tuber oculiferum subtilissime coriaceum, ceterum læve; livide cinnamomeum, vittis angustis flavis.....

C. (C.) calycina n. sp.

&& Tuber oculiferum supra oculos ordine singulo granorum; cinnamomeum maculis densis flavis

cfr. *C. (Abria) innominata* n. sp.

§§ Palporum pars femoralis intus inermis:

£ Scutum granis densis præditum..... *C. (C.) holmbergi* W. S.

££ Scutum coriaceum *C. (C.) quadrimaculata* Gerv.

++ Eminentiae magnæ scuti areis quartæ et quintæ impositæ

C. (C.) V-album E. Sim.

c. Scutum eminentiis magnis sex instructum:

+ Scutum granis dispersis et densis ornatum. cfr. *C. (C.) V-album* E. Sim.

- ++ Scutum coriaceum *C. (C.) cubana* Banks.
 +++ Arearum partes media et posterior granis inæqualibus haud
 densis ornatae *C. (C.) caraibica* n. sp.
 III. Tarsus I in articulos septem (vel ultra) divisus... *C. (C.) dimorpha* n. sp. ♂.
 C. Pars propior tarsi I et partes proximæ tarsorum III—IV parte ulteriore mani-
 festo crassior in mare. Subgenus *Abria* *C. (A.) innominata* n. sp. ♂.

Subgenus **Prasia** n.

Cynorta pp. + *Eucynorta* pp. + *Metarhaucus* pp. + *Flirtea* pp. + *Euerginus* pp.
 Roewer, Weberkn. d. Erde, 1923, p. 310, 328, 341, 345, 359.

Scutum a latere inspectum a tubere oculifero usque ad eminentias magnas
 (areæ quartæ) subrectum, sulcis transversis undulatum.

Orifia glandularum foetidarum sunt foramina brevia, lata, verticalia (in et
 brevi supra marginem posita), processu coxali plane fere abscondita.

Differentia sexualis magnitudine articuli secundi antennarum demonstratur.

***Cynorta (Prasia) fallax* n. sp.**

4,5 mm longa, fulva, lineis transversis luteis quatuor notata, linea media inter-
 rupta conjunctis; tuber oculiferum late et profunde excavatum, granis utrinque
 trinis; areæ coriaceæ et (prima excepta) granis binis præditæ, quarta processibus
 ambobus; pars femoralis palporum intus inermis; coxae IV turba laterali anteriore
 granorum paucorum; calcaneus I astragalo haud multo brevior; articuli tarsales: 7,
 15, 9, 10; processus terminalis unguiculis longis paullo brevior.

Tuber oculiferum humile, latum, late et profunde excavatum, coriaceum, ordi-
 nibus ambobus granorum trinorum ornatum.

Scutum convexum, pone altius, sulco transverso primo vix profundius quam
 sulcis ceteris divisum; erga coxas IV manifesto latius. Sulcus transversus primus mani-
 festus, ceteri lati leves, partibus exterioribus obsoletis. Limbus anterior discretus
 coriaceus; tubercula extra antennas posita robusta, breviter conica, subacuta. Limbus
 lateralis pone non discretus, coriaceus. Areæ coriaceæ; prima impressione posteriore
 media, orbiculari, levi; secunda granis, tertia et quinta et limbus posterior granis
 magnis binis conicis obtusis. Processus areæ quartæ reclines, paralleli, conici, sub-
 acuti, spatio interapicali longiores; extra quos grana utrinque singula adsunt. Seg-
 menta dorsalia libera tria anteriores ordinibus singulis granorum sat densorum; anale
 dorsale granis et impressione transversa lata, non profunda. Coxæ et ventrale primum
 laevia; ventralia cetera vix granulata.

Antennarum pars globosa articuli primi ordine marginali granorum supra
 prædita.

Palporum pars trochanterica parte patellari manifesto longior, tuberculo inferiore
 armata. Pars femoralis plus quam duplo longior quam crassior, ordine inferiore
 tuberculorum sat procurvorum majorum et minorum (circiter duodecim) armata,

intus inermis; supra carinam dorsalem lævem lævis. Partis patellaris margo interior angustissime extenuatus, in apice angulatus. Pars tibialis dimidio longior quam latior, parte femorali paullo brevior; margines valde extenuati, leniter arcuati, interior leviter, exterior sat fortiter; apices producti, exterior tuberculo conico et aculeo uno (citra quem setæ robustæ adsunt) et interior aculeo uno armati. Pars tarsalis parte tibiali non duplo brevior, primum leviter depressa, deinde leviter compressa, præter setas aculeo uno interiore submedio armata. Unguis sat procerus, parte tarsali vix duplo brevior.

Pedes breviores graciliores; III et IV anterioribus manifesto robustiores. Coxæ IV coxis III plus quam duplo latiores, carina transversa superiore apicali, sat crassa, subquadrata, et turba laterali anteriore granorum haud densorum prædictæ. Femora leviter arcuata, granulis superioribus, I et II granis inferioribus ornata. Calcanei astragalo I haud multo, II haud duplo breviores; articulo tarsali primo III subæqualis, IV brevior. Articuli tarsales: 7, 15, 9, 10. Processus terminalis unguiculis longis gracilibus paullo brevior.

Differentia sexualis (femina incognita). Mas: Pars elevata articuli secundi antennarum parte cetera multo brevior, leviter compressa; digitæ robusti in basi leviter hiantes, mobilis dente subbasali compresso conico munitus. Pars propior tarsi I parte ulteriore paullulo crassior. Femora III et IV ordinibus inferioribus binis eminentiarum sat acutarum, apicem articuli versus majorum, quarum ulteriores in pedibus IV sunt tubercula.

Obscure fulva, lineis transversis luteis quatuor notata, quarum anterior, sulco transverso primo propinquæ, procurva est, et quarta (pone processus posita) procurva, arcuata, margines laterales attingentes; secunda et tertia (suo sulco congruentes) latitudinem scuti fere dimidiæ excipientes; secunda extus procurva, lineam primam pæne attingens. Quæ lineæ linea interrupta media conjunctæ sunt. Venter, palpi, trochanteres pedum dilutiores. Articulus secundus antennarum vittis anterioribus testaceis ambabus — num semper? — notatus.

Long. corp. 4,5; long. et lat. scuti 4; palpi 5,25; pedes I 11, II 21,5; III 14; IV 19,5.

Patria: India occidentalis. Specimen unicum vidi, marem, quod ill. E. SIMON mihi benevolentissime dedit, nunc in Museo Zool. Hafniense asservatum.

Remarks. This species cannot be referred to any of ROEWER's genera.

Cynorta (*Prasia*) venezuelana n. sp.

Prasia striata Sørensen in manuscr.

5,25 mm longa, castanea, macula media in areis I—II sordide flavo-olivacea, punctis castaneis armata, unde exeunt striæ obliquæ adversus coxas II et linea media posterior, et lineis transversis notata; tuber oculiferum late et profunde excavatum, granulis armatum; areæ coriaceæ; secunda et tertia granis binis, quarta tuberculis parvis; pars femoralis palporum intus inermis; coxæ IV turba laterali anteriore grano-

rum paucorum; calcaneus I astragalo plus quam duplo brevior; articuli tarsales: 6, 12—13, 8, 9; processus terminalis unguiculis paullo brevior.

Tuber oculiferum humillimum, latum, late et profunde excavatum, granulis paucis dispersis et vittis ambabus granulorum magnorum, intra et supra suum oculum positis.

Scutum convexum, pone paullulo altius, adversus coxas IV manifesto latius. Sulci primus et quintus manifesti, ceteri obsoleti. Scutum totum coriaceum, granulis pusillis sat densis dispersis. Limbus anterior discretus; pars media dense granulata; tubercula extra antennas posita robusta, leviter conica, obtusa. Limbus lateralis latus impressionibus irregularibus. Area secunda et tertia granis parvis binis, quarta tuberculis parvis, breviter conicis, manifesto brevius quam grana areæ primæ separatis; area quinta ordine transverso granorum parvulorum. Limbus posterior et segmenta dorsalia libera tria anteriores ordinibus singulis granorum densorum conicorum acutorum; anale dorsale granis paullo minoribus, dispersis obtusis. Coxæ et ventrale primum granulis parvis dispersis; anale ventrale ordinibus duobus; ventralia cetera ordinibus singulis granulorum, pone majorum.

Antennarum pars globosa articuli primi granis superioribus conicis obtusis densis et inferioribus paucis scabra; maris grana marginalia manifesto majora sunt.

Palporum pars trochanterica parte patellari vix brevior, tuberculo inferiore armata. Pars femoralis non duplo longior quam crassior (in femina non dimidio) ordine inferiore tuberculorum parvorum obtusorum densorum (circiter 15); intus inermis; ultra carinam dorsalem prope basin peraltam, in femina crenulatam, medium articuli attingentem, in mare lævem paullo ante apicem sensim evanescens, lævis. Partis patellari margo interior anguste extenuatus, in apice angulatus. Pars tibialis dimidio longior quam latior, parti femorali æqualis; margines valde extenuati, leviter arcuati, interior leviter, exterior sat fortiter; apices rotundate producti, aculeis gracilibus singulis muniti. Pars tarsalis parte tibiali non duplo brevior, primum depressa, marginibus extenuatis, deinde leviter compressa, præter setas aculeo haud robusto uno interiore submedio armata. Unguis procerus parte tarsali non duplo brevior.

Pedes breviores sat robusti; pedes III—IV in mare quam I—II manifesto, in femina vix crassiores. Coxæ IV quam coxis III duplo latiores, turba sive ordine breviore transversa laterali anteriore granorum trium sive quatuor et carina transversa apicali tri- aut bicuspidata. Femora arcuata, II leviter, et granulata. Calcanei astragalo I—II plus quam duplo breviores; articulo tarsali primo III subæqualis, IV paullo longior quam crassior. Articuli tarsales: 6, (11—)12—13(—15¹), 8, 9. Processus terminalis æque crassus atque unguiculi et his paullo brevior.

Differentia sexualis. Articulus secundus antennarum maris robustus, supra articulum basale elevatus; pars elevata leviter compressa, parte cetera duplo brevior; digiti in basi leviter hiantes. Pars propior tarsi I parte ulteriore in mare paullo, in femina non crassior. Femora IV feminæ vix, maris manifesto adversus apicem in-

¹⁾ In a single female 15 joints were found on the left side, while the right leg had 12 joints.

crassata; in femina granulis, in mare granis infra majoribus vel tuberculis prædita; tibiæ IV in femina granulis pusillis, in mare lateraliter granis ornatæ.

Opacæ castaneæ. Sordide flavo-olivaceæ sunt: 1) macula media areæ primæ et secundæ, punctis castaneis ornata, unde exeunt vitta lata in tuber oculiferum inter oculos (partem anteriorem vix attingens), striae obliquæ, ante sulcum transversum primum positæ, adversus coxas II, linea media posterior (sæpe interrupta, punctis formata), 2) lineæ transversæ, sæpe punctis formatæ, sulcos anteriores ceteros manifestantes, quæ autem sæpe desunt, exceptis illis, quæ post tubercula scuti positæ sunt, post quæ lineolæ breves transversæ adsunt. Membra corpore dilutiora; apices pedum testacei.

Long. corp. (♂) 5,25; long. scuti 4,75; lat. scuti 4,20; palpi 5,75; pedes I 10,5, II 18, III 13, IV 16,5.

Pulli et adolescentes. Junius (e Zorozal). Pars trochanterica palporum tuberculo acuto apicali inferiore armata. Area secunda tuberculis binis, tertia granis et quarta processulis acutis binis armata. Articuli tarsales: 2, 2, 3, 3.—Pulli (e La Moka). Sulci transversi omnes manifesti. Area secunda et quarta tuberculis binis, tertia granis ambobus. Palporum pars trochanterica sine tuberculo inferiore. Pedes pallide rosacei, fusco anulati. The colour is according to SØRENSEN in other respects scarcely different from that of the adults, but somewhat lighter. Long. corp. 3,2; long. scuti 2,7; lat. scuti 1,8; palpi 5,5; pes II 12. One specimen, which was scarcely 1 mm long, had according to SØRENSEN hardly increased in size since it left the egg, and would surely pass a first ecdysis before the tarsal segments 2, 2, 3, 3, would appear.

Patria: Venezuela. The late Dr. MEINERT sifted a single male at Caracas July 5th—12th, 1891, and 2 males, 4 females and 3 pulli at La Moka. SIMON has collected 3 females at Caracas and a single female and a young animal at Zorozal.

Variatio. Eminentiae majores areae tertiae desunt in femina, quam ill. SIMON apud oppidum Caracas legit; in femina altera macula anterior scuti in puncta dissoluta. In femina (e Zorozal) ordines singuli granorum adsunt in area tertia et quarta, et macula anterior scuti vix adest.

Remarks. This species is certainly related to the different species for which ROEWER has erected the genus *Metarhaucus*, and in several respects, especially the colour, it shows great similarity to *M. ohausi* ROEWER (Weberkn. d. Erde p. 344). As it differs in the following features the 2 species are scarcely identical. In *venezuelana* the tubercles of the 5th area (4th abdominal) are wanting, the tubercula extra antennas are much larger, the armature of coxa IV is less developed, the proximal segments of tarsus I are less thickened in the male, and the armature of the fourth femur differs distinctly in the male, as the ventral surface is adorned with an inner, better developed as well as an outer, less developed distal row of teeth, and as the dorsal surface bears a row of 12 distal teeth.

Cynorta (Prasia) clypeata n. sp.

6,8 mm longa, fusca, macula media clypeata in area prima sordide lutea, punctis fuscis notata, armata; sulcus quartus eodem modo ornatus; tuber oculiferum latum

et vix excavatum, ordinibus ambobus granorum paucorum ornatum; scutum coriaceum et granulis paucis armatum; area quarta tuberculis binis acutis armata; pars femoralis intus inermis; coxae IV turba laterali anteriore granorum paucorum; calcaneus I astragalo triplo brevior; articuli tarsales: 6, 12—13, 7, 8; processus terminalis unguiculis paullo brevior.

Tuber oculiferum perhumile latum, supra vix excavatum, coriaceum, subtiliter granulatum, ordinibus ambobus granorum prope oculum suum positis notatum.

Scutum convexum, pone paullo altius; adversus coxas IV manifesto latius. Sulcus primus manifestus; ceteri leves, extus obsoleti. Scutum totum coriaceum et granulis parce ornatum; granulae in areis quarta et quinta ordines singulos formant. Limbus anterior sat discretus, coriaceus; tubercula extra antennas posita magna, robusta, conica, rotundata. Limbus lateralis pone non discretus, coriaceus, impressionibus posterioribus, saepe longis, densis et impressionibus magnis supra coxas II et III singulis positis. Area quarta tuberculis binis leviter conicis acutis. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum conicorum acutorum densorum; anale dorsale granis sat densis. Coxae et ventrale primum granulis dispersis densis; anale dorsale ordinibus duobus, cetera ordinibus singulis granorum rotundorum, pone sensim paullo majorum, ita ut posteriora grana tamen minora sunt.

Antennarum pars globosa articuli primi granis minoribus, leviter conicis supra densis, et tuberculo exteriore apicali conico uno aut duobus.

Palporum pars trochanterica parte patellari dimidio fere longior, tuberculo inferiore armata. Pars femoralis in mare plus quam (in femina vix) duplo longior quam crassior, ordine inferiore tuberculorum humilium rotundorum (c. 16); intus inermis; ultra carinam dorsalem brevem, in mare humilem, in femina sat altam, in mare vix, in femina vix aut leviter crenulatam, laevis. Partis patellaris margo interior anguste extenuatus, in apice leviter angulatus. Pars tibialis paullo, tamen manifesto longior quam latior, parte femorali paullo brevior; margines valde extenuati, leniter arcuati, interior leviter, exterior fortiter; apices producti, exterior tuberculo parvo at aculeo haud robusto, citra quem setae adsunt. Pars tarsalis parte tibiali duplo brevior, primum leviter depressa, deinde leviter compressa; praeter setas multas aculeo gracili uno interiore submedio armata. Unguis parte tarsali duplo brevior.

Pedes breves robusti, III—IV manifesto robustiores. Coxae IV coxis III plus quam duplo latiores, carina transversa superiore apicali serrata (dens medius hujus in mare ceteris major est), et ordine transverso anteriore laterali granorum magnorum; grana maris majora et plura sunt. Calcanei I astragalo triplo, II paullo quam duplo breviores; III (paullo), et IV articulo tarsali primo breviores; IV longior quam crassior. Articuli tarsales: 6, (11—)12—13(—14¹), 7(—8), 8. Processus terminalis unguiculis paullo brevior neque tenuior.

Differentia sexualis. Pars elevata articuli secundi antennarum parte cetera multo

¹⁾ This latter number only in two males and a single female.

brevior, leviter compressa; digitæ feminæ leviter hiantes, maris fortiter hiantes, mobilis in basi dente submedio munitus. (A rather great difference is observed in the different males, as the elevated portion in some specimens is about one third of the remaining portion, but in others only one fourth or one fifth). Femora IV feminæ apicem versus ordine inferiore granorum magnorum, maris clavatum granis magnis ubique, quorum majora (apicem versus posita) superiora et præsertim inferiora tubercula sunt; patellæ IV in femina granis, in mare granis magnis et interioribus tuberculis parvis. (The lower interior row of femur IV consists of ca. 17 rather strong teeth, of which the middle ones are somewhat hooked with the point directed towards the end, and the lower exterior row consists of ca. 15 obtuse teeth, of which the four apical ones are much the longer). Pars citerior tarsi I in mare parte ulteriore manifesto, in femina vix crassior.

Fusca; area prima macula media clypeata magna sordide lutea, punctis brunneis ante et pone notata, ornata, cujus pars anterior producta partem medianam tuberis oculiferi occupat. Sulcus quartus linea eodem modo colorata notatus; sulci II—III lineis brevibus, in puncta pauca sæpissime dissolutis, notati; linea interrupta maculam areæ primæ et lineam sulci quarti conjungit, sæpissime in punctula pauca dissoluta. Area quinta sæpe, tertia raro ordinibus singulis transversis punctulorum ornata.

Long. corp. 6,8; long. scuti 5,7; lat. scuti 4,8; palpi 6; pedes I 12, II 21, III 14,5; IV 18.

Patria: Venezuela. Cand. mag. CHR. LEVINSEN (LØFTING) has collected 16 females and 8 males at Las Trinchéras December 22nd, 1893.

Variation. In a single male small but distinct grana were observed in the first and second abdominal somite corresponding to the median pair of other species.—In mare uno area quinta ordine granorum conicorum densorum ornata, subæque magnorum ac granorum limbi posterioris; scutum sæpe subtiliter reticulate sulcatum. In femina una areæ I—V ordine singulo granorum minorum ornatae, dum eminentiæ magnæ areæ quartæ modo grana sunt.

Abnormality. According to SØRENSEN, tarsus IV in a specimen which I have not seen, showed the following abnormality: On the one side the proximal portion was five-segmented, the middle portion was not marked out and the terminal portion undivided without terminal process; on the other side with eight segments, the proximal portion was six-segmented and the middle as well as the terminal portion undivided, the terminal process of the latter was rudimentary. In a single female tarsus IV consisted on the right side of a long basal segment, shorter than the remaining five segments, but longer than the two following and the three terminal ones; the following five segments decrease somewhat towards the sixth; the seventh is very short; the eighth is rounded, as long as the two following and without claws and terminal process; the tarsus on the left side is quite normal. In a single specimen with eight segments in tarsus IV the terminal segment on the right side was abnormal.

Remarks. In the Roewerian system this species must be referred to the genus *Euerginus* and is nearly related to *E. australis* Roewer (Weberkn. d. Erde, p. 363).

It is also in colour and general appearance similar to *C. (Pr.) venezuelana* W. Sør. described above.

To the subgenus *Prasia* Sørensen further referred the following three species viz.
Cynorta (Prasia) picta Perty (*Delectus animalium*, 1833, p. 208, tab. XL fig. 5)
— in ROEWER's Weberkn. d. Erde referred (p. 346) to the genus *Flirtea*.

Hanc speciem in Museo Berolinensi vidi. — Tuber oculiferum supra late et sat profunde excavatum, granulis prope oculos positis ornatum. Tubercula scuti, extra antennas posita, magna vix conica, obtusa. Coxæ IV tuberculo superiore apicali magno compresso, bifido. Coxæ (IV) et ventrale primum sublævia; ventrale anale ordinibus duobus, ventralia cetera ordinibus singulis granorum minorum. Tarsus I in articulos sex divisus.

Cynorta (Prasia) phalerata C. L. Koch (*Die Arachniden* vol. VII, 1839, p. 117, fig. 591) — in ROEWER's Weberkn. d. Erde (p. 319) referred to the Genus *Cynorta*.

Hanc speciem in Museo Berolinensi vidi. — Tubercula scuti, extra antennas posita, parva conica, acuta.

Cynorta (Prasia) quadripustulata E. Simon (*Ann. Soc. Ent. Belg.* XII, 1879, p. 196) — in ROEWER's Weberkn. d. Erde (p. 328) referred to the genus *Eucynorta*.

Subgenus *Cynorta* m.

Libitioides + *Metacynorta* + *Gnidia* + *Eucynorta* + *Eucynortula* + *Cynorta* + *Cynortula* + *Cynortellana* + *Cynortoides* + *Erginulus* + *Euerginus* Roewer, Weberkn. d. Erde, p. 296, 304, 308, 328, 332, 310, 322, 321, 335, 350, 359.

Cynorta sayi Simon.

Gonyleptes ornatum Wood (nec Say), *On the Phalangeæ of the Unit. States of America*, 1870, p. 37.

Cynorta Sayi Simon, *Ann. Soc. Ent. Belg.* XXII, 1879, p. 200.

Cosmetus albolineatus Sørensen, *Naturh. Tidsskr.* (3) XIV, 1884, p. 592.

Libitioides ornata Roewer, Weberkn. d. Erde, 1923, p. 296.

5 mm longa, lœte fulva, lineis albis ornata; sulci transversi primus manifestus, ceteri obsoleti; tuber oculiferum granulis parvis dispersis; areæ subtilissime granulatæ, secunda et quinta granis binis, quarta tuberculis ambobus; palporum pars femoralis intus inermis; pedes breves, II saltem æque longi ac IV; coxæ IV tuberculo majore (aut processulo in mare) subrecto; calcaneus I æque longus atque articulus tarsalis primus; articuli tarsales: 5, 8, 6, 6; processus terminalis unguiculis brevior. — Patria: America septentrionalis.

Addenda et corrigenda: Scutum, a latere inspectum, a tubere oculifero usque ad tubercula areæ quartæ lœvissime arcuatum; tubercula extra antennas posita per brevia, rotundata. Orificia glandularum foetidarum processu coxali (non oppresso)

vix detecta. Limbus posterior scuti ordine granorum præditus. Palporum pars femoralis vix duplo longior quam crassior, intus inermis, ultra carinam dorsalem leviter crenulatam lœvis. Partis patellaris margo interior leviter extenuatus, crenulatus. Pars tibialis duplo longior quam latior, parte femorali vix longior. Calcaneus I articulo tarsali primo æqualis, ceteri manifesto breviores. Articuli tarsales: 5, (7—)8(—9), 6, 6. Pars propior tarsi I parte ulteriore non crassior; articulus primus secundo longior.

Variatio. Exempla quatuor, mares duo et feminæ duæ, e republica Texas, in Museo Holmiensi asservata, et femina e republica Carolina septentrionali, quam ill. E. SIMON mihi benevolentissime dedit, brunneo-rufa sunt et linea transversa media interrupta carent. Exempla in Museo Holmiensi asservata partem tantum parvam, V-formem, lineæ Y-formis demonstrant; quæ in exemplo uno plane deest.

Remarks. The grana of the fourth abdominal somite in one of the three specimens examined are represented by three grana, in another a few somewhat smaller ones are present in addition to the two bigger ones, and in a third specimen two very small grana are found.

SØRENSEN thought that *Cosmetus albolineatus* described by himself in 1884 was identical with *Gonyleptes ornatus* Say 1821 — but not with *Gonyleptes ornatum* Wood 1868, the name of which was altered by SIMON 1879 to *Cynorta sayi*. ROEWER, however, identified *albolineatus* with the latter species and in this I quite agree with him. (HENRIKSEN).

Cynorta depressa n. sp.

5,25 mm longa, rufescenter testacea, lineis duabus sordide albo-luteis notata, anteriore brevi procurva, posteriore undulata; tuber oculiferum humile, supra pæne sulcatum; scutum subplanum granis magnis quatuor præditum, areis secundæ et quartæ impositis; anale ventrale granis posterioribus; coxae IV lœves; palporum pars femoralis intus inermis; pedes breves, IV quam II manifesto longiores; coxae IV processulo subconico, trochanteres IV tubculo parvo interiore apicali; calcaneus I articulo tarsali primo brevior; articuli tarsales: 5, 8, 6, 6; processus terminalis unguiculis duplo brevior.

Tuber oculiferum non latum, duplo latius quam altius, supra anguste (non autem profunde) excavatum, pæne sulcatum, ordinibus ambobus granulorum præditum.

Scutum subplanum, a latere inspectum a tubere oculifero usque ad eminentias areæ quartæ leviter arcuatum; sulco transverso primo tamen leviter depresso; post coxas III dilatatum, ultra apices coxarum IV paullulo prominens. Sulcus transversus primus manifestus procurvus, ceteri lati, pæne obsoleti. Limbus anterior discretus, subtiliter granulatus; tubercula extra antennas posita brevia, obtusa. Limbus lateralis discretus, pone sensim latior, præsertim pone carinatus, granis exterioribus dispersis ornatus. Orificio glandularum foetidarum processu coxali non appresso vix obtecta. Areæ subtiliter granulatæ; secunda et quarta granis magnis binis rotundatis ornatae, quorum posteriora anterioribus majora sunt. Area quinta ordine brevi granorum,

quorum ambo s^epe majora sunt; limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum praeedita; anale dorsale granis dispersis sat densis. Anale ventrale granis posterioribus; coxae et ventrale primum laevia; segmenta cetera (saltem extus) ordinibus singulis granorum minorum.

Antennarum pars globosa articuli primi granis marginalibus et granulis superioribus ornata.

Palporum pars femoralis vix duplo longior quam crassior, ordine inferiore sub-medio tuberculorum subaequalium paucorum (5—6) munita, intus inermis; ultra carinam dorsalem brevem crenulatam laevis. Partis patellaris margo interior anguste extenuatus, saepissime leviter crenulatus. Pars tibialis duplo longior quam latior, parte femorali vix parte tertia brevior; margo interior sat angustus levissime arcuatus in apice productus, exterior prope basin saepissime crenulatus, in apice vix angulatus, quare apex vix truncatus est. Pars tarsalis apicem versus leniter angustior, marginibus non extenuatis. Unguis parte tarsali vix duplo brevior.

Pedes breves, robustiores. Coxae IV coxis triplo latiores, processulo apicali, in basi depresso, ceterum subconico, vix curvato, subobtuso. Trochanteres IV tuberculo parvo interiore apicali, conico, obtuso. Femora arcuata, II leviter, IV sat fortiter; femora omnia et patellae et tibiæ IV granulis praeedita, infra majoribus. Calcanei I, II, III articulo tarsali primo breviores; IV manifesto brevior quam crassior. Articuli tarsales: 5, (7—)8(—9), 6, 6. Tarsi I articulus primus secundo longior. Processus terminalis unguiculis duplo brevior et vix minus crassus.

Differentia sexualis exigua: Mas quam femina paullo major et robustior. (Pars propior tarsi I parte ulteriore in mare vix, in femina non crassior).

Rufescenter testacea, lineis duabus sordide albo-luteis notata, quæ oculum sat facile effugiunt, quarum anterior procurva, sulco primo propinqua, brevis, æque longa ac latitudo tuberis oculiferi, et posterior post grana majora posteriora scuti posita est, in medio saepissime late interrupta, undulata, limbos (nec margines) laterales saepissime attingens. Pedes paullo dilutiores.

Long. corp. 5,25; long. scuti 4,75; lat. scuti 4,5; palpi 3,75; pedes I 8,5, II 13,5, III 11, IV 15,5.

Patria: America centralis. Exempla septem vidi, in Museo Dresdenensi assertata, quorum quatuor mares et tres feminas esse judico.

Variatio: Exemplum unum unicolor.

Remarks. This species is nearly related to *C. ornata* Wood, described above, and is thus to be referred to the genus *Libitoides* in the Roewerian system — in spite of the different armature of the third and fourth abdominal somites.

Cynorta ambigua n. sp.

5 mm longa, fusca p^ene nigra; luteæ sunt striæ angustæ longitudinaliter per aream secundam usque ad quintam ductæ et margo limbi posterioris; tuber oculiferum latum et granis parvis dispersis parce ornatum; scutum inter lineas luteas granis parvis dispersis et in areis II et IV granis ambobus, ceteris majoribus aut vix majori-

bus præditum; limbus posterior granis ambobus majoribus; pars femoralis palporum tuberculo magno subacuto interiore apicali armata; unguis parte tarsali suo dimidio brevior; coxae IV carina serrata apicali superiore; calcaneus I articulo tarsali primo paullo brevior; articuli tarsales: 5, 9—10, 6, 6; processus terminalis unguiculis tenuior et duplo fere brevior.

Tuber oculiferum humillimum latum, supra subplanum, coriaceum, granis parvis et granulis parce dispersis ornatum.

Scutum totum subtilissime coriaceum, a sulco transverso primo leviter et aequaliter convexum, post coxas III haud paullo latius et post coxas IV haud paullo angustius. Sulcus transversus primus procurvus manifestus, quintus levis, ceteri extra strias luteas deleti. Limbus anterior latus, manifesto discretus, in parte media subtiliter granulatus; tubercula extra antennas posita brevia, robusta, obtuse truncata. Limbus lateralis latus, libratus, vix discretus, adversus coxas IV punctis impressis et granis parvis sat dispersis haud densis. Orificia glandularum foetidarum plane obiecta. Area prima foveola rotunda sat profunda, post tuber oculiferum posita, et granis parvis posterioribus sat parce prædita, ceteræ intra strias luteas granis parvis sat densis præditæ, extra eas læves aut sublæves. Areæ secunda et quarta granis magnis aut sat magnis binis rotundatis præditæ inter se magis separatis in area secunda quam in area quarta. Limbus posterior præter ordinem granorum parvorum granis majoribus ambobus; segmenta dorsalia libera tria anteriora ordinibus singulis granorum, granis scuti majorum; anale dorsale granis minoribus densis. Coxæ IV infra granis parvis; segmentum ventrale primum granis sat parvis; anale vitta posteriore et ordine anteriore granorum sat parvorum, cetera ventralia ordinibus singulis.

Antennarum pars globosa articuli primi granis parvis paucis.

Palporum pars trochanterica in apice fortiter incrassata et tuberculo inferiore subapicali brevi subrotundato prædita. Pars femoralis dimidio longior quam crassior, ordine inferiore longo tuberculorum obtusorum circiter decem, quorum submedia circiter quinque ceteris manifesto majora sunt; supra ultra carinam crenulatam, in medio altam, vix serrata; tuberculo interiore apicali magno subacuto. Partis patellaris margo interior sat late extenuatus, crenulatus vel serratus, in apice productus. Pars tibialis duplo longior quam latior, in apice subtruncati anguli leviter armati. Pars tarsalis in parte basali leviter depressa, spinis exterioribus 3—4 et interioribus 1—2. Unguis parte tarsali sua dimidia brevior.

Pedes breves. Coxæ IV coxis III triplo latiores, carina apicali superiore serrata; granis magnis lateralibus anterioribus tribus sibi propinquis. Trochanter IV tuberculo interiore apicali subacuto. Femora arcuata et patellæ et tibiae granis prædita. Grana ordinis inferioris et interioris femoris IV in femina paullo, in mare manifesto majora quam cetera. Calcaneus I articulo tarsali primo paullo brevior, II vix brevior; III paullo longior quam crassior, IV crassior quam longior. Articuli tarsales: 5, 9—10, 6, 6. Processus terminalis unguiculis tenuior et duplo fere brevior.

Differentia sexualis. Eminentiae majores arearum II et IV maris granis magnis, feminæ sat magnis, ceteris haud multo majoribus; eminentiae majores limbi posterioris

granis segmentorum dorsalium liberorum in mare sæpe, in femina manifesto maiores sunt.. Spinæ partis tarsalis in mare multo robustiores quam in femina. Pars propior articulo ultimo tarsorum I maris dimidio fere, feminæ non, III maris paullo, feminæ non crassior. Pedes robustiores in mare quam in femina.

Fusca pæne nigra, striis nigris angustis, interdum interruptis luteis per longitudinem arearum secundæ, tertiae et quartæ ductis, sulcos transversos primum et quartum non attingentibus, adversus sulcum secundum et tertium breviter introrsum arcuatis, sibi subparallelis (pone vix convergentibus), subæque longe a sese atque a marginibus lateralibus separatis. Trochanteres I—III brunnescente testacei; membra cetera corpore paullo tantum dilutiora.

Long. corp. 5; long. scuti 4,3; lat. scuti 4; palpi 4; pedes I 7,8; II 13,2; III 19,3; IV 13.

Patria: Venezuela. Dr. SØRENSEN has examined 2 males and 2 females collected at Pacho and Zipaquirá (near Bogotá) at a height of 2000—2200 m on March 27th, 1897, by Professor BÜRGER, as well as a male and a female from Tequendama in old wood. All the specimens belong to the Museum of Göttingen.

Variation. In a single male a pair of bigger grana was observed in the second abdominal somite, in the female from Tequendama not only a pair of bigger grana was observed in the second, but also a single big granum on the left side of the fourth somite.

Remarks. According to Dr. SØRENSEN this species is an intermediary form between *Cynorta* and *Libilitia*. In the Roewerian system it will form a new genus near to *Libilitoides* and *Eulibilitia*. It seems related to and is in several respects, especially in colour, similar to *Eulibilitia maculata* Roewer (Weberkn. d. Erde, p. 298) from Columbia and Ecuador, but it differs by the granular tuber oculiferum and the areae which are only granular in the middle with a very characteristic difference between the central and the lateral portion, while *E. maculata* has the scutum "überall mit winzigen Körnchen regellos bestreut"; add to this that ROEWER does not mention the inner apical tubercle of the femoral part of the palps and that his species has no big granules in the first and the third somites, and the fourth somite "mit einem mittleren Paare deutlicher, wenn auch sehr niedriger Tuberclen".

To the fourth femur of the female from Tequendama a larva of a mite was found attached on the left side.

Cynorta leviareuata n. sp.

Cynorta arcuata Sørensen in manuscr.

6—7 mm longa, rufo-cinnamomea, lineis cinereo-luteis notata; tuber oculiferum humillimum, late excavatum, granulis dispersis ornatum; scutum longius quam latius, læve, eminentiis quatuor præditum, quarum anteriores parvæ; limbus lateralis non discretus, lævis; anale ventrale vitta posteriore granulorum; coxae (IV) læves; pars femoralis palporum spinula interiore subapicali armata; apex partis tibialis

truncatus; coxae IV tuberculo apicali procero; calcaneus I astragalo duplo brevior; articuli tarsales: 6, 12, 8, 9; processus terminalis unguiculis parte tertia brevior.

Tuber oculiferum humillimum, transversum, supra manifeste lateque excavatum, quare oculi elevati sunt, granulis densis dispersis ornatum, intra oculos positis.

Scutum convexum; a latere inspectum a tubere oculifero usque ad eminentias areæ quartæ rectum, pone non altius; longius quam latius; inter coxas III et IV manifesto latius. Sulci transversi quinque sat manifesti. Limbus anterior leviter discretus, alte emarginatus, lævis; tubercula extra antennas posita parva, conica, subacuta. Limbus lateralis non discretus, lævis. Orificia glandularum foetidarum vix obiecta. Areæ læves; secunda granis parvis humilibus ambobus; quarta eminentiis ambabus obtusis. Segmenta dorsalia libera tria anteriora ordinibus singulis granorum, pone majorum, in segmento tertio conicorum, subacutorum. Anale dorsale granis sat densis dispersis. Anale ventrale vitta posteriore granulorum majorum; coxae et venterale primum lævia; segmenta cetera ordinibus singulis granulorum pusillorum.

Antennæ robustæ; pars globosa articuli primi granis superioribus, quorum marginalia majora densa conica sunt, et inferioribus conicis prædita. Articulus secundus (in utroque sexu) manifesto geniculatus, lævis.

Palporum pars femoralis vix duplo longior quam crassior, in latere exteriore manifesto convexa, ordine inferiore tuberculorum (circiter octo) sensim majorum et spinula (sive grano setigero) interiore subapicali armata; ultra carinam dorsalem leviter serratam lævis. Partis patellaris margo interior vix extenuatus. Pars tibialis duplo longior quam latior, parte femorali vix brevior; margines ultra medium parallelis, aculeis utrinque binis aut trinis armati, interior rectus angustus, exterior leviter rotundatus, quare apex truncatus parte latissima paullulo angustior est. Pars tarsalis longa, parte tibiali non duplo brevior; margines non extenuati aculeis haud robustis exteriorebus sex et interioribus tribus armati. Unguis parte tarsali non duplo brevior.

Pedes breves, robustiores. Coxæ IV tuberculo exteriore procero, conico, obtuso, leviter curvato, appresso. Femora leviter arcuata, I et II granulis acutis ornata. Calcanei I astragalo duplo brevior; II articulis tarsalibus primo et secundo conjunctis subæqualis; III articulo tarsali primo brevior; IV vix longior quam crassior. Articuli tarsales: 6, (11—)12(—13), 8, (8—)9. Tarsi I articulus primus secundo longior. Processus terminalis recessus, unguiculis parte tertia brevior, vix autem minus crassus.

Differentia sexualis. Pedes, præsertim III et IV, maris robustiores. Pars ceterior tarsi I parte ulteriore in mare vix (articulo ultimo non), in femina non crassior. Femora III et IV feminæ granulis ubique ornata. Maris femora III ordine inferiore tuberculorum parvorum gracilium conicorum, acutorum, remotorum; IV ordine superiore tuberculorum parvolorum robustorum, conicorum, remotorum, et ordine inferiore processorum conicorum acutorum, sibi contiguorum pectinata, quorum medii longissimi diametro articuli longiores sunt. Patellæ et tibiæ IV maris granulis ornatæ, quorum inferiora majora sunt.

Rufo-cinnamomea. Lineæ cinereo-luteæ: anterior V-formis (sulco transverso primo propinquæ) interrupta, margines laterales non attingens; posterior (sulco

quarto congruens) fortiter undulata, marginibus lateralibus subcontigua. Quæ lineæ tribus lineis conjunctæ sunt: media interrupta debili et lateralibus ambabus integris, quæ arcubus trinis subcircularibus formatae sunt, in lineas breves, sulcos transversos secundum, introrsus productis; quæ lineæ ambæ partes fere duas latitudinis scuti excipiunt. Ante partem exteriorem lineæ sulco transverso quarto subcongruæ adsunt puncta utrinque singula. Area quinta linea transversa notata, cum præcedente lineis brevibus tribus conjuncta. Limbus posterior scuti linea late interrupta. Pedes paullo dilutiores; metatarsi et tarsi late fusco anulati; tarsi I et II infuscati.

Long. corp. 6 (φ 6,75); long. scuti 5,5 (φ 6); lat. scuti 4,75 (φ 5,5); palpi 5,5; pedes I 12, II 21 (φ 22), III 15, IV 19.

Patria: Mexico. Specimina duo vidi, marem et feminam, ad oppidum Vera Paz capta, in collectione ill. comitis KEYSERLINGII asservata.

Variatio: Specimini alteri (feminæ) grana ambo areæ secundæ et ordo granorum limbi posterioris defuere. — Eminentiae majores ambæ areæ quartæ affuerunt: feminæ grana magna humilia, maris processuli conici, leviter reclinæ, paralleli.

Remarks. In the Roewerian system this species must belong to the genera *Euerginus* or *Erginulus*. It is interesting that the male possesses processuli on the 4th area (as *Erginulus*), the female grana (as *Euerginus*). In both Roewerian genera there are several species that show a similar pattern to this new species. — Dr. SØRENSEN has proposed the name *C. arcuatus* for this species, but as ROEWER has already used this specific name (for an *Erginulus*) I have altered it to *leviarcuata*.

Cynorta vidua n. sp.

6,5 mm longa, nigra; scutum præter punctula lineis anteriore V-formi et posteriore undulata et lateralibus ambabus cinereis notatum; pedes lutei maculis et striis nigris notati; tuber oculiferum leviter excavatum; limbus lateralis leviter discretus, impressionibus irregularibus præditus; scutum paullo longius quam latius; areæ coriaceæ tantum, quarta (non expressa) processibus parvis ambabus; coxae IV et segmenta ventralia coriacea tantum; palporum pars femoralis tuberculo interiore apicali, pars patellaris intus anguste extenuata; coxae IV tuberculo parvulo conico; calcaneus I æque longus atque articulus tarsalis primus; articuli tarsales: 6, 11, 7, 7; processus terminalis æque longus atque unguiculi.

Tuber oculiferum plus quam duplo latius quam altius, supra late et leviter excavatum, subtilissime coriaceum, ordinibus ambibus granorum parvorum ornatum.

Scutum convexum; a latere inspectum, totum æqualiter sat alte arcuatum; inter coxas III et IV latius. Sulci transversi primus procurvus et postremus rectus sat debiles; ceteri plane obsoleti. Limbus anterior leviter discretus, subtilissime coriaceus; tubercula extra antennas posita parva, conica, obtusa. Limbus lateralis leviter discretus impressionibus irregularibus præditus. Orificia glandularum foetidarum perlata, plane obiecta. Areæ subtilissime coriaceæ, ceterum læves, prima post tuber oculiferum impressione orbiculari lata haud profunda. Processus parvi (areæ quartæ) suberecti, paralleli, robusti, breviter conici, acuti. Limbus posterior et seg-

menta dorsalia libera tria anteriora ordinibus singulis granulorum humilium; anale dorsale praeter granula dispersa impressione transversa interrupta sæpiissime præditum. Anale ventrale ordine posteriore granulorum parvorum; ventralia cetera et coxae (IV) subtilissime coriaceæ, ceterum lævia.

Antennarum pars globosa articuli primi grano interiore apicali et ordine posteriore granorum; pars superior cetera leviter granulata; granis conicis inferioribus prædita.

Palporum pars femoralis fortiter compressa, dimidio longior quam crassior, ordine inferiore tuberculorum densorum, sensim paullo majorum et tuberculo interiore apicali armata; ultra carinam dorsalem vix crenulatam vix crenulata. Partis patellaris margo interior anguste extenuatus, in apice angulatus. Pars tibialis duplo longior quam latior, æque longa ac pars femoralis; margo interior angustus, exterior leviter arcuatus, quare apex parte latissima paullo angustior et basi paullo latior est; apex interior in tuberculum productus, exterior muticus. Pars tarsalis parte patellari paullo longior, depressa; margines propiores extenuati; setis tantum munita. Unguis parte tarsali duplo brevior.

Pedes robustiores. Coxæ IV tuberculo parvulo exteriore apicali conico appresso. Trochanteres IV grano interiore apicali. Femora leviter arcuata, granulis parvis vix aspera. Calcanei I et II articulo tarsali primo æqualis; III et IV subæque crassi ac longi. Articuli tarsales: 6, (10—)11, 7, 7(—8). Tarsi I articulus primus secundo longior. Processus terminalis æque longus atque unguiculi, quibus dimidio fere crassior est.

Differentia sexualis exigua: Pars propior tarsi I parte ulteriore in mare paullo, in femina vix crassior. Femora IV maris quam feminæ paullo crassiora, in apice feminæ vix, maris manifesto crassiora; eodem modo granulata. In exemplo unico virili tuberculum coxale multo majus quam in femina, cuius tuberculum oculum facile effugit.

Nigra, lineis et punctulis cinereis notata: linea V-formi anteriore (sulco primo propinquâ), e qua lineæ ambæ breves laterales (non autem marginales) pone interruptæ, retrorsus exeunt; linea tenuissima, acute undulata, post processus scuti posita, ante quam linea transversa interrupta sæpe adest. Scutum ordinibus transversis tribus (duobus ante, uno post processus positis) punctulorum; limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis punctulorum. Antennæ luteæ, luteo notatae; palpi nigri. Pedes lutei; trochanteres maculis binis nigris; femora maculis singulis basalibus nigris et striis quaternis, in apice confluentibus, quare apices nigri sunt. Patellæ nigræ; partes basalis brevissima et ulterior tibiarum nigræ; metatarsi et tarsi nigro-lutei.

Long. corp. 6,5; long. scuti 5,5; lat. scuti 5; palpi 5,5; pedes I 12, II 22, III 16, IV 21.

Patria: America centralis. Exempla quatuor vidi, marem unum et feminas tres, in Costa Rica a cl. BOVALLIO capta, in Museo Holmiensi asservata, exemplum unum tamen nunc in Museo Hafniensi.

Variatio: In femina una processus terminalis pusillus.

Remarks: I have examined the single female in the Copenhagen Museum. In this it may be correct to speak about rows of grana in femora III—IV. The colour

was more brown; corresponding to the sulci between the first and second, and between the third and fourth abdominal somite on each side, semicircular yellowish lines facing forwards and inwards were observed; behind the fourth abdominal somite a transverse yellowish line was seen.

In the Roewerian system this species must belong to the genus *Eucynorta* since legs III—IV are but very little thicker than I—II. The colour does not allow of a reference to any described species though the patterns are formed as commonly in the genera *Eucynorta* and *Eucynortula*.

Cynorta gervaisii n. sp.

7 mm longa, fulva, maculis magnis quatuor et lineis ambabus dilute flavis notata; tuber oculiferum non excavatum, lăeve; limbus lateralis non discretus; scutum tuberculis ambobus posterioribus præditum; coxae (IV) granis pusillis; palporum pars femoralis spina interiore subapicali armata, pars patellaris tuberculis apicalibus utrinque singulis; coxae IV processulo exteriore conico; calcaneus I articulo tarsali primo paullo longior; articuli tarsales: 6, 9, 7, 8; processus terminalis robustus, unguiculis paullo brevior.

Tuber oculiferum humile latum, supra non excavatum (potius levissime transversim convexum) leviter reticulatum, ceterum lăeve.

Scutum leviter convexum, a tubere oculifero usque ad tubercula rectum, pone non altius, post coxas III haud paullo latius. Sulci transversi primus procurvus et quintus manifesti; ceteri desunt. Limbus anterior vix discretus lăevis; tubercula extra antennas posita magna, brevia, vix conica, rotundata. Limbus lateralis non discretus, punctis impressis sat latis in parte latissima sua præditus. Orificio glandularum foetidarum supra breviter detecta. Scutum totum leviter reticulatum, ceterum lăeve; tubercula ambo posteriora (areæ quartæ non expressæ imposta) humilia, breviter conica, obtusa; intra et post maculas posteriores adsunt impressiones ambæ amplæ. Area prima post tuber oculiferum impressione sat profunda. Limbus posterior et segmenta dorsalia tria anteriores ordinibus singulis granulorum prædicta, ante paucorum, pone densorum. Anale dorsale granulis dispersis; anale ventrale ordine posteriore granulorum et granulis anterioribus paucis dispersis. Ventræ primum lăeve, cetera ordinibus singulis granulorum. Coxæ granulis pusillis.

Antennarum pars globosa articuli primi granulis et ordine posteriore granorum conicorum acutorum et granulo simili interiore apicali supra et granis acutis infra ornata. Articulus secundus geniculatus, glaber.

Palporum pars femoralis triplo fere longior quam crassior, extra manifesto convexa, ordine inferiore longo tuberculorum sibi æqualium (circiter decem) et spina (cujus aculeus tenuis est) interiore subapicali armata; ultra carinam dorsalem leviter serratam lăevis. Pars patellaris tuberculis apicalibus conicis utrinque singulis munita; margo interior sat late extenuatus vix crenulatus. Pars tibialis dimidio longior quam latior, parte femorali vix parte tertia brevior; margo interior anguste extenuatus, subrectus, in apice leviter rotundatus, exterior a basi usque ad apicem

arcum magnum describens, quare apex manifeste angustatus est; apex exterior in tubercula duo productus. Partis tarsalis pars citerior marginum paullum extenuata; aculeis interioribus gracilibus tribus et exterioribus adhuc gracilioribus quinque aut sex armata. Unguis parte tarsali duplo brevior.

Pedes breves robusti. Coxæ IV coxis III duplo latiores, processulo exteriore conico, leviter curvato, acuto. Trochanteres IV tuberculo parvo interiore apicali conico. Femora arcuata; II sublævia, cetera granulis ubique præditæ. Calcanei I articulo tarsali primo paullo longior; II articulis tarsalibus primo et secundo conjunctis æqualis; III paullo longior quam crassior; IV manifesto crassior quam longior. Articuli tarsales: 6, 9, 7, 8. Pars citerior tarsi I parte ulteriore paullo crassior; articulus primus secundo longior. Processus terminalis unguiculis paullo brevior.

Differentia sexualis (femina incognita). Mas: Femora IV ordine inferiore granorum, apicem versus majorum. Patellæ IV ordine interiore tuberculorum. Tibiæ IV (præter grana) ordinibus integris interiore et exteriore processulorum densorum, conicorum, obtusorum, et ordine superiore a basi usque ad medium tuberculorum sensim breviorum. Metatarsi IV ordine superiore granorum acutorum, ceterum granulis prædicti.

Fulva, maculis magnis quatuor dilute flavis, puncta fulva includentibus ornata, quarum anteriores areæ primæ impositæ irregulariter quadrangulæ, lateribus undulatis, et posteriores limbis lateralibus erga apices coxarum IV impositæ suborbiculares, intra serratæ sunt. Item adsunt lineæ ambae dilute flavæ angulatæ, extra tubercula scuti positæ.

Long. corp. 7,25; long. scuti 6,5; lat. scuti 6; palpi 6; pedes I 11,5, II 21,5, III 15,5, IV 19,5.

Patria: America centralis. Specimen unicum vidi, marem, in Yucatan captum, in collectione ill. Comitis KEYSERLINGII asservatum.

Remark: In the Roewerian system this species must be referred to the genus *Euerginus* and is related to the species *E. serrotibialis* Cambr. (ROEWER, Weberkn. d. Erde, p. 362) from which, however, it differs as to colour and in the structure of femur IV.

Cynorta dimorpha n. sp.

6—7 mm longa, fusca, luteis vitta anteriore reticulata et linea posteriore transversa notata, lineolas emittente; tuber oculiferum humillimum, late excavatum, vittis ambabus granulorum; limbus lateralis granulis dispersis et plicis longitudinalibus; areæ granulatæ, secunda granis ambobus, longe remotis, amplis, non magnis, quarta tuberculis ambobus; limbus posterior et segmenta dorsalia libera granis parvis ornata; coxæ granulatæ; pars femoralis palporum tuberculo interiore apicali armata; coxæ IV muticæ; calcaneus I astragalo duplo brevior; processus terminalis unguiculis vix brevior. — In mare paullo robustiore pedes longiores; articuli tarsales maris: 7, 16, 9, 10, feminæ: 6, 12—15, 8, 8—9.

Tuber oculiferum humillimum, multo latius quam altius, supra late excavatum, coriaceum vittis ambabus granulorum et granulis pusillis dispersis ornatum.

Scutum convexum, a latere inspectum a sulco transverso primo ad tubercula scuti altius; inter coxas III et IV latius. Sulci transversi primus procurvus et quintus rectus manifesti, lati, ceteri obsoleti. Limbus anterior vix discretus, laevis. Limbus lateralis vix discretus granulis dispersis et plicis longitudinalibus praeditus. Orificia glandularum foetidarum plane fere obiecta. Scutum totum coriaceum. Areæ granulis dispersis, secunda granis longe separatis, ambobus humilibus, rotundatis; quarta tuberculis ambobus sat parvis, humilibus, rotundatis, quorum basis a parte apicali manifeste limitata est. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum densorum; anale dorsale granis parvis dispersis; coxae granulis dispersis; ventralia omnia ordinibus singulis granulorum.

Antennarum pars globosa articuli primi præter granula ordine posteriore et interiore granorum vix conicorum.

Palporum pars trochanterica tuberculo robusto inferiore apicali obtuso. Pars femoralis dimidio longior quam crassior, ordine inferiore tuberculum parvorum densorum (circiter duodecim), quorum submedia maxima sunt, et tuberculo, manifesto majore, interiore apicali obtuso armata; ultra carinam dorsalem crenulatam laevis. Pars patellaris supra apicem productum marginis interioris anguste extenuati, basin versus angustioris, tuberculo minuto munita. Pars tibialis duplo longior quam latior, æque longa ac pars femoralis; margo interior sat late extenuatus; anguli in tubercula producti, interius aculeo armatum, exterius muticum; margo exterior prope apicem aculeis parvis (circiter quatuor aut quinque). Pars tarsalis parte tibiali duplo brevior; margines non extenuati aculeis aliquot muniti, quorum modo interior submedius sat robustus est. Unguis parte tarsali non duplo brevior.

Pedes breves, sat robusti. Coxæ IV submuticæ (carinula transversa, vix manifesta). Femora vix arcuata, ubique granulata; patellæ et tibiae III et IV supra granulatæ; pedes IV a basi femorum usque ad apicem metatarsorum ordine interiore granorum subcylindricorum. Calcanei I astragalo duplo, II triplo breviores, III et IV manifesto longiores quam crassiores. Articuli tarsales: 6—7, (11—)12—16(—18), 8—9, (8—)9—10. Tarsi I articulus primus secundo longior. Processus terminalis unguiculis vix brevior.

Differentia sexualis: Mas quam femina paullo robustior; scutum feminæ quam maris convexius; pedes maris quam feminæ longiores. Articuli tarsales maris: (6—)7¹⁾,

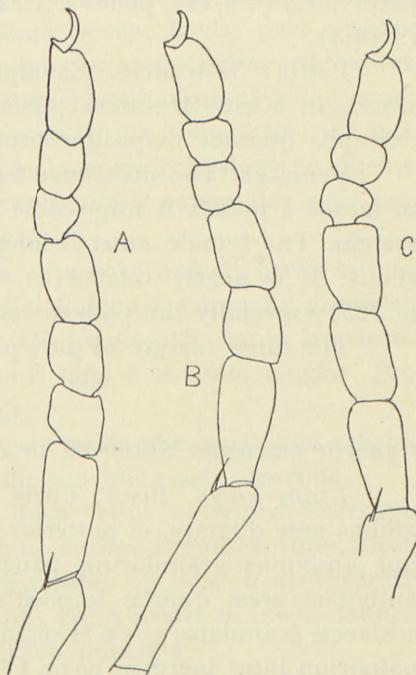


Fig. 28. *Cynorta dimorpha* n.sp. Tarsus I (dexter).

A maris normalis, B maris abnormis, C feminæ.

¹⁾ Mari uni tarsus I alter sextpartitus (Fig. 28 B), alter septempartitus.

(15—)16(—18), (8—)9, (9—)10; feminæ 6, (11—)12—15(—17), 8(—9), 8—9(—10). Tarsi I pars propior parte ulteriore paullo crassior, in mare quam in femina vix magis.

Fusca. Luteæ sunt vitta anterior lata, reticulata, sulcum transversum primum sequens, lineolas ambas retrorsum emittens, et linea late $\sim\sim$ -formis, post tubercula scuti posita, lineolas laterales et posteriores, reticulate inter se conjunctas, emittens. Dorsum medium punctis luteis interdum ornatum. Membra obscure olivacea; pedes testaceo punctati.

Long. corp ♂ vix 6 (φ 7); long. scuti ♂ 5 (φ vix 5); lat. scuti ♂ 4,5 (φ 4,25); palpi ♂ 4,5 (φ 4,25); pedes I ♂ 12 (φ 9,5), II ♂ 24 (φ 17,5), III ♂ 18 (φ 13), IV ♂ 23,5 (φ 16,5).

Patria: Venezuela. Exempla quindecim, ad oppidum Merida capta, perlustravi, in Museo Hafniensi asservata, septem mares¹⁾ et octo feminas, quarum in exemplis quatuor ovipositor protrusus erat.

Remarks: The difference between male and female as to the number of joints in tarsus I makes it impossible to refer this species to a single genus in ROEWER's system. The female must belong to *Cynortula*, the male cannot be referred to any genus. It is nearly related to *Cynortula venezuelensis* Roewer (Weberkn. d. Erde p. 325) especially the patterns are almost identical.

The inner margin of pars patellaris is distinctly crenulated, with four processes.

Cynorta centralis n. sp.

Cynorta mexicana Sørensen in manuscr.

7 mm longa, fusca, lineis albo-luteis notata, anteriore Y-formi, in maculas ambas ante dilatata, et posteriore undulata; tuber oculiferum non excavatum, ordinibus ambobus granulorum paucorum; scutum æque latum ac longum, tuberculis ambobus areæ quartæ impositis; limbus lateralis non discretus, coriaceus; areæ coriaceæ granulatæ; coxae et segmenta ventralia coriacea, vix granulata; pars femoralis palporum intus inermis; coxae IV carina transversa humili apicali; calcanei astragalis manifesto crassiores, I articulo tarsali primo æqualis; articuli tarsales: 6, 11, 7, 7; processus terminalis brevis.

Tuber oculiferum perhumile, latum, supra non excavatum, coriaceum, granulis paucis (octo) ornatum, ordines ambos formantibus, inter se duplo fere longius quam ab oculo vicino separatos.

Scutum leviter convexum a tubere oculifero usque ad tubercula leviter arcuatū; æque latum ac longum, pone coxas III dilatatum, post coxas IV angustius. Sulci transversi primus procurvus et quintus rectus manifesti; ceteri debiles, extrorsum obsoleti. Limbus anterior vix discretus, coriaceus; tubercula extra antennas posita magna, robusta, subcylindrica, leviter depressa, rotundata. Limbus lateralis non discretus, coriaceus. Orificia glandularum foetidarum supra detecta. Areæ impresse reticulatæ, ante fortius; coriaceæ, granulis dispersis ornatae. Tubercula areæ quartæ

¹⁾ In nullo mare penis protrusus. Ex uno exemplo penem autem secui.

leviter reclinia, conica, obtusa. Segmenta dorsalia libera tria anteriora ordinibus singulis granulorum; anale dorsale granulis, in ordines duos haud manifestos dispositis. Coxæ et ventrale primum coriacea, vix granulata; segmenta cetera vix granulata (anale ordinibus duobus, cetera ordinibus singulis granulorum pusillorum vix manifestorum).

Antennarum pars globosa articuli primi granis magnis posterioribus duobus supra prædita.

Palporum pars femoralis vix duplo longior quam crassior, ordine inferiore ultra medium ducto tuberculorum minutorum (sive granorum) densorum inæqualium armata, intus inermis; ultra carinam dorsalem altam lævem lævis; pars propior parte ulteriore multo crassior. Partis patellaris margo interior angustissime extenuatus, apicem versus non latior. Pars tibialis plus quam duplo longior quam latior, æque longa ac pars femoralis; margo exterior, apicem versus leniter rotundatus, sat late, interior anguste extenuati; uterque in tuberculum apicale breve robustum productus. Pars tarsalis latior quam crassior, margine exteriore manifeste extenuato; setis tantum munita. Unguis robustus parte tarsali duplo brevior.

Pedes sat robusti. Coxæ IV carina transversa superiore apicali brevi humili, in lateribus declivi. Femora leviter arcuata, sublævia. Calcanei astragalis manifesto crassiores; articulo tarsali primo I et II æquales, III paullo, IV duplo breviores. Articuli tarsales: 6, 11, 7, 7, Articulus tarsalis primus tarsi I secundo longior. Processus terminalis unguiculis triplo brevior.

Differentia sexualis? — Feminæ pars propior tarsi I parte ulteriore vix et articulo ultimo non crassior; femora IV apicem versus paullulum incrassata, inermia.

Fusca, maculis et lineis albo-luteis notata: linea tenui anteriore interrupta Y-formi (suleo primo propinquæ), in maculas magnas ambas rhombi-formes, fusco punctatas ante dilatata, et linea post tubercula scuti posita, sat lata, in medio interrupta, undulata, margines laterales scuti vix attingente, cujus partes in medio latiores sunt. Membra sordide rufo-testacea, irregulariter fusco punctata.

Long. corp. 7; long. et lat. scuti 5,5; palpi 5; pedes I 11, II 19, III 14,5, IV 19.

Patria: Mexico. Specimen unicum vidi, quod feminam esse judico, ad Presidio captum, ab ill. E. SIMON benevolentissime mihi datum, nunc in Museo Zool. Hafniensi asservatum.

Remarks: This species is nearly related to the Roewerian genus *Euerginus* — or rather to *Eucynortula*, even though femora III—IV are somewhat thicker than I—II. The patterns show relationship to *Eucynortula metatarsalis* Roewer (Weberkn. d. Erde p. 334).

The species was treated in the manuscript of SØRENSEN as *mexicana* n. sp. However, since this name has become preoccupied in the meantime (by BANKS) I have altered it into *centralis*.

Cynorta koelpeli Roewer.

Cynortula Koelpelii Roewer, Arch. f. Naturg. LXXVIII A, 1912, p. 47.

Cynortula Koelpelii Roewer, Weberkn. d. Erde, 1923, p. 324.

7,5 mm longa, fulva, maculis marginalibus ambabus areæ primæ et linea posteriore transversa luteis notata; tuber oculiferum humillimum, leviter excavatum, granulis præditum; scutum granulatum ad sulcum transversum primum depresso; area secunda granis magnis, quarta tuberculis, binis instructæ; coxæ IV (infra) et ventrale primum lævia; palporum pars femoralis tuberculo interiore subapicali armata; pedes longi; coxæ IV tuberculo exteriore; calcaneus I astragalo plus quam duplo brevior; articuli tarsales: 6, 10—12, 7, 7; processus terminalis unguiculis vix brevior.

Tuber oculiferum humillimum, latum, supra leviter lateque excavatum, præter vittas granulorum ambas granulis posterioribus ornatum.

Scutum leviter convexum, a latere inspectum usque ad sulcum transversum primum vix humilius, deinde altius; a margine anteriore usque ad apices coxarum IV dilatatum, adversus coxas III leviter sinuatum. Sulci transversi primus et quintus sat profundi, ceteri leves. Limbus anterior vix discretus, granulatus; tubercula extra antennas posita robusta, non conica, subtruncata. Limbus lateralis granulis densis dispersis majoribus. Orificia glandularum foetidarum supra detecta. Areæ coriaceæ et reticulate rugosæ, granulis dispersis sat densis; secunda granis magnis ambobus rotundatis, quarta tuberculis haud robustis ambobus rotundatis. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum parvorum; anale dorsale granis parvis densis. Coxæ (IV infra) et ventrale primum lævia, ventralia cetera omnia ordinibus singulis granulorum majorum ornata.

Antennarum pars globosa articuli primi granulis densis supra scabra.

Palporum pars femoralis dimidio longior quam crassior, ordine inferiore tuberculum minorum (circiter decem) et tuberculo interiore subapicali armata, ultra carinam dorsalem brevem lævem lævis. Partis patellaris margo interior sat anguste extenuatus. Pars tibialis plus quam dimidio longior quam latior, æque longa ac pars femoralis; margines interior subrectus anguste, exterior leviter crenulatus late extenuati, inermes; anguli in tubercula singula robusta producti; apex truncatus. Pars tarsalis parte tibiali non duplo brevior, vix latior quam crassior, marginibus non extenuatis, aculeis gracilibus interiore una et exterioribus circiter quatuor munita. Unguis parte tarsali duplo fere brevior.

Pedes longi, graciliores. Coxæ IV tuberculo exteriore apicali obtuso. Trochanteres IV tuberculo procero interiore apicali. Femora leviter arcuata, granulis aspera. Patellæ et tibiæ granulis parvis præditæ. Calcanei I astragalo plus quam duplo brevior; II et III articulo tarsali primo manifesto longiores; IV æque crassus ac longus. Articuli tarsales: 6, 10—12, 7, 7(—8). Articulus primus tarsi I secundo longior. Processus terminalis unguiculis vix brevior.

Differentia sexualis incognita.

Fulva. Area prima scuti maculis ambabus marginalibus irregularibus luteis, maculam fulvam includentibus; post tubercula areæ quartæ adest linea lutea transversa arcuata in medio interrupta, margines laterales pæne attingens, e cujus parte altissima utrinque retrorsum exit lineola brevis, in lineolam transversam desinens.

Area secunda punctis ambobus luteis notata, extra grana magna positis. Membra corpore dilutiora.

[The length of the animal and its parts is not mentioned in the manuscript of SØRENSEN.]

Patria: America centralis. Specimina tria, quæ feminas judico, ad oppidum Granada capta, in Museo Vindobonensi asservata.

Remarks: In the Sørensenian manuscript this species bears the name *koelpeli* n. sp. There is no doubt that it is quite identical with the species described by ROEWER in 1912 under the same name; moreover it is the same material (from the Museum of Vienna) on which the descriptions of both authors have been based, and the name *koelpeli* is due to SØRENSEN's labelling.

Cynorta modesta n. sp.

4,8 mm longa, sordide fusca, lineis luteo-albidis ornata: ambabus areæ primæ et ambabus areæ quartæ; tuber oculiferum humile latum lateraliter granis parvis præditum; scutum disperse et sat dense granulatum; area secunda granis magnis, quarta tuberculis humilibus ambibus instructæ; pars femoralis palporum tuberculo robusto interiore apicali armata; coxa IV elevatione apicali superiore humili lata armata; calcaneus I astragalo duplo et dimidio brevior; articuli tarsales: 6, 9—10, 7, 7—8; processus terminalis unguiculis brevior.

Tuber oculiferum humile latum, triplo latius quam altius, supra anguste et sat profunde excavatum; in medio sublæve, ceterum granis parvis et granulis densis ornatum.

Scutum a margine anteriore usque ad tubercula areæ quartæ (non expressæ) æqualiter et leviter altius; pone coxas III latius, pone coxas IV paullo angustius. Sulci transversi quintus manifestus, primus obsoletus, foveolis rotundis sat magnis ambabus prædictis; ceteri plane desunt. Limbus anterior leviter discretus, granulis paucis ornatus; tubercula extra antennas posita brevia, latiora quam longiora, obtuse truncata. Limbus lateralis non discretus, per longitudinem plicatus et vix granulatus. Scutum totum coriaceum, disperse et sat dense granulatum; areæ (non expressæ) secunda granis magnis humilibus ambibus, et quarta tuberculis humilibus obtusis ambibus. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum sat magnorum; anale dorsale granis parvis dispersis. Coxæ et segmenta ventralia posteriora granulis parce dispersis; anale ventrale ordinibus duobus, et margo posterior segmenti primi et segmenta cetera ordinibus singulis granulorum.

Antennarum pars globosa articuli primi granis parvis densis supra scabra.

Palporum pars trochanterica in apice valde incrassata, tuberculo rotundato prædicta. Pars femoralis dimidio longior quam crassior, ordine inferiore, apicem non attingente, tuberculorum subcontiguorum (circiter decem), ultra carinam dorsalem sat altam non crenulatam lævis, tuberculo robusto interiore apicali armata. Partis

patellaris margo interior sat late extenuatus, prope apicem angulatus. Pars tibialis duplo longior quam latior, in apice subtruncata, vix armata. Pars tarsalis in basi leviter dilatata, vix armata. Unguis duplo brevior quam pars tarsalis.

Pedes sat longi, sat graciles; coxae IV coxis III triplo latores elevatione apicali superiore humili lata rotundata præditæ. Grana lateralia coxae IV vix majora quam inferiora; in femina altera granum singulum prope apicem tuberculum parvum est. Femora leviter arcuata, granis paucis ornata. Calcaneus I astragalo duplo et dimidio brevior, II astragalo triplo longior, III et IV articulo tarsali primo manifesto breviores. Articuli tarsales: 6, 9—10, 7, 7—8. Processus terminalis unguiculis brevior.

Differentia sexualis ignota.

Sordide fusca, lineis luteo-albidis ornata: ambabus areæ secundæ obliquis, e margine laterali post orificia glandularum foetidarum orientibus, et sulcum transversum primum attingentibus, vix autem sequentibus, binis areæ secundæ et tertiae retrorsum et extrorsum directis, ambabus areæ quartæ, subangulariter fere curvatis, tubercula itaque fere amplectentibus, a sese pone breviter separatis, extra quas puncta singula adsunt.

In the female with ovipositor protrusus the described yellowish stripes of the first abdominal somites are connected by and continued into light-brown curved lines, in such a way that the whole is seen to form an undulated system of yellowish and brown with the concavities facing inwards. In the other female a short T-shaped line was found just behind the first groove; the undulated system of the first and second abdominal somite is just indicated by a few yellow short lines, and corresponding to the fourth groove on each side a yellow slightly curved line with concavity facing forwards and almost touching the corresponding in the middle is seen; the yellow spot on each side near lateral margin better developed than in the other specimen.

Long corp. 4,8; long. scuti 4, lat. scuti 3,5; palpi > 4; pedes I 9,2, II 18,5, III 13, IV < 18.

Patria: Trinidad. The description is worked out at the base of two females (one with ovipositor protrusus) from Port of Spain, belonging to the Museum of Göttingen.

Remarks: This species seems to be nearly related to *Cynorta granulata* Roewer (Weberkn. d. Erde p. 323) from Trinidad, but it differs as to the granulation of the scutum, to the inner apical tubercle of the femoral part, and to the colour.

Cynorta calycina n. sp.

Vix 6 mm longa, lurido-cinnamomea, vittis angustis flavis notata; tuber oculiferum late excavatum, subtiliter coriaceum; scutum æque latum ac longum, totum subtiliter coriaceum, sulco transverso primo levi non depresso, eminentiis quatuor (anterior granis acutis et processulis posterioribus) ornatum; coxae IV et ventrale primum granis minoribus; pars femoralis palporum tuberculo interiore apicali armata; pedes longi; coxae IV tuberculo parvo exteriore; calcaneus I astragalo duplo

brevior; articuli tarsales: 6, 13—14, 8—9, 9; processus terminalis unguiculis vix brevior.

Tuber oculiferum humile latum, triplo latius quam altius, supra late excavatum, subtiliter coriaceum, ceterum lœve.

Scutum paullulum convexum, a latere inspectum a tubere oculifero usque ad processulos subrectum, pone paullo altius; æque latum ac longum, post coxas III manifesto latius. Sulcus transversus primus levis; ceteri plane desunt. Limbus anterior leviter discretus, subtiliter coriaceus, ceterum lœvis; tubercula extra antennas posita brevia, vix conica rotundata. Limbus lateralis vix discretus, subtiliter coriaceus. Orificia glandularum foetidarum plane obiecta. Scutum totum subtiliter coriaceum, eminentiis quatuor præditum, trapezium pone vix angustius formantibus, quarum anteriores (areæ secundæ non expressæ) sunt grana acuta et posteriores (areæ quartæ non expressæ) processuli conici, obtusi, subrecti, paralleli, spatio interapicali duplo fere breviores. Segmenta dorsalia libera tria anteriora ordinibus singulis granulorum parvorum remotorum; anale dorsale ordinibus tribus granulorum. Coxæ et ventrale primum granis minoribus sat densis, dispersis; anale ventrale ordine tantum posteriore granulorum; cetera ventralia lœvia.

Antennarum pars globosa articuli primi granulis densis superioribus et inferioribus.

Palporum pars femoralis plus quam duplo longior quam crassior, ordine inferiore tuberculorum minorum subacutorum densorum (circiter sedecim) et tuberculo interiore apicali armata; ultra carinam dorsalem crenulatam lœvis. Partis patellaris margo interior anguste extenuatus et prope apicem tuberculo munitus. Pars tibialis vix duplo longior quam latior, parte femorali vix parte tertia brevior; margines valde extenuati, leviter rotunde serrati; anguli non producti, exterior tuberculo et aculeis duobus, interior aculeo uno armata; apex truncatus. Pars tarsalis parte tibiali duplo brevior, vix latior quam crassior, marginibus non extenuatis; aculeis exterioribus gracilioribus quatuor et interiore sat robusto uno armata. Unguis parte tarsali vix duplo brevior.

Pedes longi, graciliores. Coxæ IV tuberculo exteriore apicali parvo obtuso. Femora subrecta, sublœvia. Calcanei astragalo I duplo, II duabus partibus breviores; articulo tarsali primo III paullo longior, IV paullo brevior. Articuli tarsales: 6, 13—14, 8—9, 9. Articulus primus tarsi I secundo longior. Processus terminalis unguiculis paullo crassior et vix brevior.

Differentia sexualis: In mare patellæ IV femoribus manifesto crassiores, granulis superioribus (in femina femoribus vix crassiores); tibiæ IV in apice manifesto (in femina vix) crassiores, ordine superiore granorum, in apice majorum; pars cterior tarsi I parte ulteriore paullo (etiam feminæ) crassior.

Lurido-cinnamomea, vittis angustis flavis notata: Y-formi, sulco primo propinqua, quæ vittam angustam transversam, leviter undulatam, margines laterales scuti attingentem, post processulos scuti positam, pone attingit. E vitta posteriore exit utrinque vitta angusta, intra limbum marginalem posita, arcuata, quæ lineam Y-for-

mem ante attingit. Pone vittam posteriorem adest anulus transversus, fere ∞ -formis, partem tertiam latitudinis scuti excipiens; post quem linea transversa adest. Limbi laterales minus manifesto flavo punctati.

Long. corp. 5,75; long. et lat. scuti 5,25; palpi 5; pedes I 14,5, II 32, III 21, IV 28.

Patria: México. Specimina duo vidi, marem et feminam, ad urbem Cordova capta, in collectione ill. comitis KEYSERLINGII asservata.

Remarks: This species seems to be nearly related to *Cynorta vestita* Roewer (Weberkn. d. Erde p. 315).

Cynorta holmbergi W. Sør.

Gnidia bipunctata Holmberg, Solpugidos Argentinos, 1878, p. 74.

Cosmetus Holmbergii W. Sørensen, Naturh. Tidsskr. (3), XIV, 1884, p. 590.

Gnidia Holmbergii Roewer, Weberkn. d. Erde, 1923, p. 309.

6 mm longa, flavo-rufescens, maculis magnis ambabus sulphureis notata, ambitu fusco cinctis; tuber oculiferum late excavatum, granis minoribus densis ubique præditum; limbus lateralis (haud manifesto) discretus; scutum granis densis et tuberculis anterioribus ambobus et processulis posterioribus ambobus; sulcus transversus primus manifestus, ceteri indistincti; pars femoralis palporum intus inermis; pedes longiores; coxae IV tuberculo præditæ; calcaneus I articulo tarsali primo brevior; articuli tarsales: 6, 9—10, 6, 6; processus terminalis unguiculis triplo brevior.

Addenda et corrigenda: Scutum post sulcum transversum primum sat convexum. Tubercula extra antennas posita magna, brevia, lata, rotundata. — Orificio glandularum foetidarum plane obiecta; labium anterius leviter inflatum, ultra posterius prominens; quare orificium angustatum est. — Palporum pars femoralis intus inermis, vix duplo longior quam crassior, ultra carinam dorsalem altam lævem sublævis; granis extra prædita. Partis patellaris margo interior manifesto extenuatus, apicem versus non latior, in apice non angulatus. Pars tibialis triplo fere longior quam latior, parte femorali paullo longior; anguli producti, exterior aculeo lateralí armatus. Pars tarsalis desuper visa longe subtriangula, parte propiore marginum extenuata, præter setas aculeis brevioribus exterioribus tribus et interiore robustiore uno armata. — Calcanei articulo tarsali primo breviores; IV vix, ceteri manifesto longiores quam crassiores. Pars propior tarsi I ulteriore non crassior; articulus primus secundo duplo longior.

In the examined specimens the first pair of "tuberles" may sometimes rightly be termed spines, in others, however, they are only tubercles. The spines of the third somite are always bigger than those of the first somite, but are nevertheless in some specimens rather short and obtuse.

Cynorta quadrimaculata Gerv.

Cosmetus quadrimaculatus Gervais, Walckenaer Ins. Apt. T. III, 1844, p. 116.

Cynorta quadrimaculata E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 196.

Cynortellana quadrimaculata Roewer, Weberkn. d. Erde, 1923, p. 322.

5 mm longa, rufo-fusca, maculis flavis quatuor notata; tuber oculiferum late excavatum, coriaceum; limbus lateralis vix discretus ordine granorum; scutum pone alte convexum, vix longius quam latius, tuberculis anterioribus ambobus et processibus posterioribus ambobus; coxae IV granis dispersis; pars femoralis palporum intus inermis; pedes longiores; coxae IV carina transversa apicali; calcaneus I articulo tarsali primo paullo longior; articuli tarsales: 6, 13—15, 8, 9; processus terminalis procerus unguiculis parte tertia brevior.

Tuber oculiferum humile, transversum, supra late et manifesto excavatum, coriaceum, ceterum læve.

Scutum vix longius quam latius, convexum, pone alte; post coxas III latius. Sulcus transversus primus manifestus latus; partes exteriore ceterorum sat manifestorum obsoletæ. Limbus anterior discretus, coriaceus; tubercula extra antennas posita magna, conica, obtusa. Limbus lateralis vix discretus, ordine submedio granorum prædictus. Orificia glandularum foetidarum perlata (ut sinus desuper manifestus est) vix obiecta. Scutum totum coriaceum; area secunda tuberculis ambobus, conicis obtusis, quarta processibus leviter reclinibus, vix divergentibus, longis, rectis, conicis obtusis, spatio interapicali subæqualibus, in parte basali granulis paucis ornatis. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum remotorum; anale dorsale granis dispersis. Coxæ IV et ventrale primum granis dispersis; anale ventrale ordinibus duobus, cetera ordinibus singulis granulorum pusillorum ornata.

Antennarum pars globosa articuli primi granulis acutis dispersis supra ornata.

Palporum pars femoralis triplo fere longior quam crassior, ordine inferiore tuberculorum parvorum densorum (circiter viginti) armata, intus inermis; ultra carinam dorsalem humilem lævem lævis. Pars patellaris margo interior vix extenuatus. Pars tibialis plus quam duplo longior quam latior, parte femorali paullo brevior. Pars tarsalis vix latior quam crassior, marginibus non extenuatis; aculeis gracilibus exterioribus quatuor et interiore uno armata. Unguis parte tarsali (saltem) duplo brevior.

Pedes longiores, sat graciles. Coxæ IV carina transversa superiore apicali humili. Femora subrecta, sublævia. Calcanei I articulo tarsali primo paullo longior; II articulis tarsalibus primo et secundo et tertio coniunctis æqualis; articulo tarsali primo III paullo, IV vix breviores. Articuli tarsales (exemplis tantum duobus tarsi II defuere): 6, 13—15, 8(—9), 9. Articulus tarsalis primus tarsi I secundo non longior. Processus terminalis procerus, unguiculis parte tertia brevior.

Differentia sexualis: Mas quam femina paullo major. Pars ceterior tarsi I parte ulteriore in mare paullo, in femina vix crassior. Femora IV maris in apice sat subito incrassata et granis ubique prædicta, feminae in apice non subito incrassata, sublævia. Patellæ et tibiæ IV maris granis ornatae, feminae sublæves.

Læte rufo-fusca, maculis flavis quatuor notata, quarum anteriores marginales, erga coxas II et III positæ, irregulariter subquadratae sunt, puncta rufo-fusca includentes, dum posteriores ante sulcum quintum positæ, submarginales, ferro equino irregulari

similes sunt (in latere exteriore aperto). Item figura T-formis sæpissime adest, lineis angustis composita, inter et post processus areæ quartæ posita. Membra testacea.

Long. corp. 5,25; long. scuti 5, lat. scuti 4,5; palpi 5; pedes I 15, II 28, III 18, IV 27.

Patria: India occidentalis. Exempla octo vidi, mares quatuor et feminas quatuor, in insula Cuba capta, in collectione ill. comitis KEYSERLINGII septem asservata et unum in Museo Zool. Hafniensi. — Ill. E. SIMON dicit: "Espèce très-répandue dans toutes les Antilles".

Observatio: Ill. E. SIMON (loc. cit.) hac de specie dicit: "Segmenta libera, scutum anale, coxae, saltem posteriores, vix granulosa".

Remarks: The tubercles of the first abdominal somite may be termed short spines in the male examined, but not "schlanke spitze Kegeldörnchen". The character probably differs from one specimen to another.

Cynorta V-album Simon.

Cynorta V-album p. p. E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 198.

Cynortoides haitiensis Roewer, Weberkn. d. Erde, 1923, p. 336.

? *Cynorta V-album* Banks, Proc. Acad. Philad., 1903, p. 342.

nec — — Banks, II. Rep. Centr. Exper. Stat. Repub. Cuba, 1909, p. 169.

nec — — Roewer, Weberkn. d. Erde, 1923, p. 315.

5,5 mm longa, lâete brunneo-rufa, lineis vitellinis anteriore V-formi et transversis duabus, inter se linea media conjunctis, notata; tuber oculiferum humillimum, vix excavatum, granulis dispersis ornatum; limbus lateralis non discretus granulis, in ordinem exteriorem partim dispositis; scutum tuberculis quatuor, areis quartæ et quintæ impositis; coxae IV granis parvis; pars femoralis palporum intus inermis; coxae IV tuberculo compresso; calcaneus I crassus, æque longus atque articulus tarsalis primus; articuli tarsales: 6, 15, 7—8, 8; processus terminalis unguiculis vix brevior.

Tuber oculiferum humillimum latum, supra vix excavatum, granulis dispersis ornatum, quorum media pauca.

Scutum convexum, a tubere oculifero usque ad tubercula areæ quintæ leviter arcuatum; pone coxas III latius, pone coxas IV angustius. Sulci transversi quinque manifesti, extrorsum tamen obsoleti. Limbus anterior totus discretus, granulis parvis perpaucis ornatus, ad antennas emarginatus; tubercula extra antennas posita minora, conica, subacuta. Limbus lateralis non discretus, granulis parce dispersis ornatus, quorum exteriora ordinem manifestum formant. Margines orificiorum plane detectorum glandularum foetidarum in labia elevati, quæ in medio leviter producta rimam brevem, in medio coaretatam, formant. Areæ per latitudinem totam granis dispersis densis ornatae; secunda granis rotundis haud multo majoribus ambobus; quarta et quinta tuberculis reclinibus binis, trapezium pone paullulo angustius formantibus, quorum posteriora anterioribus obtusis longiora, conica, acuta. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum conicorum; anale dorsale granis dispersis sat densis. Segmenta ventralia anale ordinibus duobus gra-

norum minorum, cetera omnia ordinibus singulis granulorum; coxae granis parvis dispersis.

Antennarum pars globosa articuli primi granis densis supra scabra; articulus secundus robustus geniculatus, supra articulationem basalem autem non elevatus.

Palporum pars femoralis paullo plus quam duplo longior quam crassior, ordine inferiore tuberculorum vix acutorum (circiter duodecim) armata, intus inermis; ultra carinam dorsalem longam (apicem articuli fere attingentem) crenulatam laevis. Partis patellaris margo interior anguste extenuatus, leviter crenulatus, in apice leviter angulatus. Pars tibialis perlata, parte tertia longior quam latior, parte femorali parte sua quarta brevior; margines valde extenuati, exterior a medio leniter rotundatus, interior in apice inermi oblique truncatus, quare apex oblique truncatus parte latissima duplo fere angustior est. Pars tarsalis? (specimini meo defuit).

Pedes breves sat robusti; coxae IV coxis III plus quam duplo latiores, tuberculo compresso granulato. Femora I et II vix, III leviter, IV plus arcuata, granis ubique ornata, quae in femoribus IV majora sunt. Femora IV ordine inferiore interiore tuberculorum (num in altero sexu?). Patellæ et tibiæ III et IV granis ornatae. Calcaneus I crassus æque longus atque articulus tarsalis primus; II triplo brevior quam astragalus, III et IV vix longiores quam crassiores. Articuli tarsales: 6, 15, 7—8, 8. Articulus primus tarsi I secundo paullo longior. Processus terminalis unguiculis vix brevior.

Differentia sexualis: Ill. E. SIMON tantum dicit: “♀ semblable au mâle, seulement tubercles postérieurs de l’abdomen beaucoup plus petits”.

Læte brunneo-rufa, lineis vitellinis notata: tribus transversis, quarum prima, sulco transverso primo propinquæ, V-formis est; secunda sulco secundo congruens, interrupta brevis, margines laterales non attingens; postrema inter tubercula scuti posita (sulco quarto partim congruens) levissime undulata. Quæ lineæ omnes linea longitudinali media interrupta conjunctæ sunt. Membra obscure testacea, nigro reticulata.

Long. corp. 5,5; long. scuti 4,5, lat. scuti vix 4,5; palpi?; pedes I vix 10, II 19, III 13, IV 17.

Patria: India occidentalis; secundum ill. E. SIMON insulæ St. Domingo et Tortuga. The specimens of ROEWER (*C. haitiensis*) are from Haiti. — Specimen unicum, verisimiliter marem, vidi, quod ill. E. SIMON mihi benevolentissime dedit et quod nunc in Museo Zool. Hafniensi asservatum est.

Variatio: Ill. SIMON dicit: “scutum visiblement plus long que large”.

Remarks: The three proximal segments of the first tarsus are distinctly thicker than the three terminal ones. Along the inner lower margin of the fourth femur in the male examined about 20 longer and shorter teeth were found, they are wanting terminally.

I think SØRENSEN is completely right in referring this animal to SIMON's *C. V-album*; the armature of the scutum as well as that of the fourth femur of the male are identical. SIMON writes (p. 18): “fémurs, patellas et tibias garnis de fortes rugosités, denses, disposées en lignes longitudinales peu régulières, plus fortes aux fémur IV”.

BANKS has, however, described a male referred by him to *C. V-album* Sim., characterized by rows of teeth in the distal fourth of the femur of the fourth leg. ROEWER seems to have found the same characteristics in SIMON's (type-)specimens from St. Domingo, preserved in the museum of Paris. ROEWER, however, refers his species to *Cynorta*, which in the sense of ROEWER has no tubercles or spines in the fourth abdominal somite, although SIMON writes: "en arrière deux paires de tubercules: les premiers petits, arrondis, assez écartés, les seconds plus longs, coniques, sub-aigus, a peine plus resserrés". ROEWER does not mention the contradiction between his and SIMON's statements; thus most probably 2 species have been present in the material of Simon.

ROEWER has described a new species called *Cynortoides haitiensis* which is identical with the species which formed the basis of SIMON's description as well as with that described here. The only difference between our specimen and ROEWER's description of *haitiensis* consists in the short legs and the armature of the scutum. The first abdominal somite of our specimen had a pair of grana scarcely bigger than the other grana of the somite; in the third somite two tubercles and in the fourth two short spines were found, while ROEWER writes about *haitiensis*: "die I Area... mit einem mittleren Paare niedriger, stumpfer, aber deutlich erkennbarer Tuberkele, die III und IV Area mit je einem mittleren Paare spitzer Kegeldornen, die zueinander im Quadrat stehen". These differences are certainly due to individual variations.

I think it is most correct to regard those specimens which formed the base of SIMON's description and of which one was given to Dr. SØRENSEN, as the real types of SIMON's *C. V-album*. *C. haitiensis* must accordingly be regarded as a synonym, and a new name must be given to BANKS' and ROEWER'S *C. V-album*; I propose *Roeweri* n. nom. the synonymy of which latter species will be as follows:

- Cynorta V-album* p. p. E. Simon, Ann. soc. Ent. Belg. XXII, 1879, p. 198.
- ? — — Banks, Proc. Acad. Philad. 1903, p. 342.
- — Banks, II. Rep. Centr. Exper. Stat. Rep. Cuba, 1909, p. 169.
- — Roewer, Weberkn. d. Erde, 1923, p. 316.
- *Roeweri* n. nom.

Cynorta cubana Banks.

Cynorta anchorata Sørensen in manuscr.

Cynorta cubana Banks, II Rep. Centr. Exper. Stat. Rep. Cuba, 1909, p. 169.

Cynortoides cubana Roewer, Weberkn. d. Erde, 1923, p. 335.

5 mm longa, rufo-tastacea, lineis albis anteriore V-formi et posteriore transversa notata; tuberoculiferum late, non autem profunde, excavatum, granulis utrinque binis; limbus lateralis vix discretus, praeter foveolas ordine exteriore granorum humilium; scutum paullulo longius quam latius, eminentiis magnis sex (areis secundæ, quartæ, quintæ impositis); areæ coriaceæ; coxæ IV (infra) et ventrale primum coriacea tantum; pars femoralis palporum supra vix crenulata, intus inermis; coxæ IV carina

transversa apicali sat alta et turba granorum anteriore laterali; calcaneus I astragalo duabus partibus brevior; articuli tarsales: 6, 13, 8, 9; processus terminalis unguiculis paullo brevior.

Tuber oculiferum humile latum, late, non autem profunde, excavatum, subtiliter coriaceum; supra utrumque oculum granula bina subacuta adsunt.

Scutum convexum, paullulo longius quam latius, post coxas III leviter latius, post coxas IV leviter angustius; a tubere oculifero usque ad eminentias areæ quintæ leviter arcuatum. Sulcorum pars media manifesta, partes exteriore obsoletæ. Limbus anterior discretus tumidus lævis; tubercula extra antennas posita parva, conica, obtusa. Limbus lateralis vix discretus ordine exteriore granorum humilium et foveolis dispersis ornatus. Labium anterius orificiorum glandularum foetidarum superne manifesto inflatum. Areæ coriaceæ; secunda, quarta, quinta eminentiis majoribus binis præditæ, quarum anteriores minimæ sæpissime sunt tubercula, mediæ sunt processuli leviter reclinæ, conici, obtusi, spatio interapicali breviores, dum postremi sæpissime sunt processuli similes. Limbus posterior et segmenta dorsalia libera tria anteriores ordinibus singulis granorum, quorum maxima limbo posteriori imposita sunt; anale dorsale granis dispersis. Coxæ IV (infra) et ventrale primum coriacea tantum; ventralia cetera (etiam anale) ordinibus singulis granulorum.

Antennarum pars globosa articuli primi granis supra scabra.

Palporum pars femoralis vix duplo longior quam crassior, ordine inferiore granorum (sive tuberculorum minimorum) haud densorum (circiter duodecim) armata, intus inermis; ultra carinam dorsalem vix crenulatam lævis. Partis patellaris margo interior sat anguste extenuatus, in apice non angulatus. Pars tibialis duplo longior quam latior, æque longa ac pars femoralis; margo interior subrectus, prope apicem sensim paullo angustior; anguli non producti, exterior tuberculo minuto armatus, præter quod setæ tantum adsunt. Pars tarsalis latior quam crassior; pars propior dimidia marginum levissime extenuata, setis sat robustis tantum munita. Unguis parte tarsali duplo brevior, vix curvatus.

Pedes haud robusti. Coxæ IV coxis III duplo latiores, carina transversa superiore apicali sat alta, leviter bifida, et turba laterali anteriore granorum præditæ. Femora vix arcuata, granulis pusillis ornata. Calcanei I et II astragalo duabus partibus breviores; articulo tarsali primo III vix, IV manifesto breviores. Articuli tarsales (tarsi multis exemplis defuere. Tarsus II alter exemplo tantum uni adfuit): 6, 13, 8, (8—)9. Articulus primus tarsi I secundo duplo longior. Processus terminalis unguiculis tenuior et paullo brevior.

Differentia sexualis: Pars propior tarsi I parte ulteriore in mare paullo, in femina vix crassior. Femora IV maris in apice leviter incrassata, obliqua, pectinibus superiore et exteriore processorum densorum prædita, quorum medii longiores.

Læte rufo-testacea, lineis albis notata, quarum anterior V-formis (sulco primo propinquæ), in apicibus paullum dilatata est, posterior transversa inter eminentias posteriores quatuor posita, leviter undulata. Quæ lineæ linea media conjunctæ sunt. Venter obscurior. Pedes paullo dilutiores.

Long. corp. 5,25; long. scuti 4,5, lat. scuti 4,25; palpi 4,75, pedes I 12, II (sine tarso) 21, III 17, IV 22.

Patria: India occidentalis. Exempla quatuor vidi, tres mares et feminam unam, in insula Cuba a cl. OTTO capta, in Museo Berolinensi asservata.

Variatio: Eminentiae areæ quintæ interdum tubercula, sæpissime processuli sunt, eminentiis areæ quartæ in exemplo uno majores, sæpissime breviores. In mare uno eminentiae femorum IV parvæ.

Remarks: This species, of which SØRENSEN has seen specimens in the Museum of Berlin, was first named *anchorata* n. sp. by him. Later on he altered the name in the manuscript and referred the species here in question to *juncta* Gervais without, however, stating why he believed that it was identical with that species.

ROEWER has rightly referred the specimens labelled *anchorata* by SØRENSEN in the Museum to *C. cubana* Banks which in the system of ROEWER — together with *C. V-album* (= *haitiensis* Roew.) — form his genus *Cynortoides*.

Cynorta caraibica n. sp.

5 mm longa, castanea lineis vitellinis anteriore V-formi et posteriore undulata, sulcum quartum partim congruente, notata; tuber oculiferum humillimum, leviter excavatum granis prope oculos ornatum; pars media arearum granis dispersis densis; area secunda granis magnis binis, quarta et quinta processulis binis acutis; coxae IV granis dispersis haud densis, irregularibus et carina posteriore; calcaneus I æque longus atque articulus tarsalis primus; articuli tarsales: 6, 13—15; 7—8, 8—9; processus terminalis unguiculis brevior.

Tuber oculiferum humillimum, latum, supra leviter excavatum, granis parvis dispersis ornatum, quorum media pauciora sunt.

Scutum convexum, a tubere oculifero usque ad tubercula areæ quintæ leviter arcuatum, post coxas III latius, post coxas IV angustius. Sulci transversi quinque manifesti, extrorsum tamen obsoleti. Limbus anterior, parte media excepta, discretus, granulis perpaucis præditus, ad antennas emarginatus; tubercula extra antennas posita minora conica obtusa. Limbus lateralis non discretus, ordine granulorum subexteriore, in medio interrupto, ornatus, intra quem granula posteriora pauca et lineolæ aut puncta irregularia impressa adsunt. Orificia glandularum foetidarum supra tantum detecta. Arearum pars media et posterior granis inæqualibus haud densis ornata; partes anterior brevis et exterior læves; area secunda granis magnis ambobus conicis; quarta et quinta eminentiis magnis, reclinibus, binis, conicis, rectangulum formantibus, quarum posteriores acutæ, processuli sive processus parvi, duplo longiores sunt quam anteriores subacutæ, tubercula sive processuli. Scutum ceterum coriaceum. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis granorum conicorum, quorum unum in limbo posteriore ceteris paulo majus est. Anale dorsale granis dispersis sat densis. Segmenta ventralia et anale ordinibus irregularibus granorum minorum; anteriora duo lævia, cetera ordinibus singulis granulorum anteriora versus minorum. Coxæ III—IV infra parce granulatæ.

Antennarum pars globosa articuli primi granis minoribus sat densis prædita; articulus secundus robustus, geniculatus, supra articulum basalem autem non elevatus.

Palporum pars trochanterica clavata, tuberculo obtuso apicali ornata. Pars femoralis plus quam duplo longior quam crassior, ordine inferiore tuberculorum obtusorum (circiter 12) armata, intus inermis; ultra carinam dorsalem longam (apicem articuli fere attingentem) leviter crenulatam, laevis. Partis patellaris margo interior manifesto extenuatus, rectus. Pars tibialis non duplo longior quam latior, parte femorali parte sua quarta brevior; margines extenuati, exterior in parte ultima tertia rotundata; interior in apice leviter productus, inermis; exterior in apice vix productus, tuberculo parvo armatus. Partis tarsalis margines prope basin leviter extenuati; aculeis minutis (vel setis robustis) exterioribus quatuor et longioribus interioribus duobus. Unguis parte tarsali duplo brevior.

Pedes breves, haud robusti; coxae IV coxis III plus quam duplo latores, carina transversa apicali humili granis ornata, et granis majoribus lateralibus præditæ, quorum anteriora nonnulla magna densiora sunt. Trochanter IV tuberculo interiore apicali armatus. Femora II rectum, I vix, III et IV leviter arcuata; femora omnia et patellæ et tibiae III—IV granis minoribus armata. Calcanei I—III manifesto longiores quam articulus tarsalis primus; IV brevior; calcaneus I dimidio brevior quam astragalus, II vix duplo aut duplo brevior, III manifesto, IV vix longiores quam crassiores. Articuli tarsales: 6, (12)—13—15(—16), 7—8, 8—9. Processus terminalis paullo tenuior et brevior quam unguiculi.

Differentia sexualis pere exigua. Pars propior tarsi I parte ulteriore in mare paullo, in femina non crassior. Articulus secundus antennarum paullulo elevatus.

Castanea, lineis duabus vitellinis notata: prima, sulco transverso primo propinqua V-formi, lineam posteriorem medium per aut in aream secundam emittente, et posteriore, sulco quarto partim congruente, levissime undulata, marginem lateralem attingente et hic lineola vitellina anteriore; in individuis nonnullis lineolæ transversæ ambæ sulcum secundum sequentes adsunt. In femina una (e St. Thomas) lineola sinistra ante sulcum quartum deest.

Long. corp. 5; long. scuti 4,7, lat. scuti 4,2; palpi 4,5; pedes I 8,5, II 21, III > 14, IV < 18.

Patria: West Indies. Dr. SØRENSEN has seen 6 males and 6 females from St. Domingo, one female from St. Thomas, and two females from Puerto Cabello at the sea-coast, all belonging to the museum of Göttingen.

Remark: This species must be referred to the genus *Cynortoides* of the Roewerian system, and is nearly related to *C. V-album*, described above.

Subgenus *Abria* n.

SØRENSEN established this new subgenus, sufficiently characterized in the synoptic key, for the species treated below. The sole species belonging to the subgenus had not yet been baptized by SØRENSEN, and very few notes were left about it.

Cynorta (Abria) innominata n. sp.

4 mm long; light cinnamon brown with irregular and densely placed, partly confluent, whitish spots; tuber oculiferum low, deeply and widely excavated; above each eye a row of small grana; area II with two small grana and area IV with two short, black spines; femoral part of the palp with an apical, interior, clumsy process; coxae IV laterally and anteriorly with a turba consisting of three small tubercles; calcaneus I is almost three times shorter than astragalus; tarsal segments: 6, 10—11, 7, 8; processus terminalis as long as the claws.

Tuber oculiferum low, deeply and widely excavated, showing a row of small grana above each eye.

Scutum convex, first transversal furrow distinct, the other scarcely discernible. Scutum horny, the entire surface set with dispersed grains. Limbus anterior present, in the median part very finely granulated, the tuberculæ exterior to the antennæ rather pointed. Limbus lateralis rather narrow. Area secunda with a pair of larger grains, area quarta with a pair of small tubercles (or large grains) which are placed at a distance from one another just as the grains on the 2nd area. Limbus posterior and the first 3 free tergites set with each a transversal row of granules of the same size as the granulation of the scutum. Anale dorsale without granulæ. Coxæ, ventrale primum and anale ventrale without granulæ, the other ventralia each with a single row of granules.

The globose part of the first antennal joint above set with some few granulæ of the same kind as scutum, and posteriorly a row of 4—5 larger grana.

The palp has a pars femoralis about double as long as broad, the upper margin with 3 grana set closely together, the lower margin with a row of ca. 10—12 rather long grana (or teeth), apically a small, interior, clumsy process. Pars tibialis about as long as pars femoralis, nearly double as long as broad, the margins without teeth or grana, the lower margin angular, the angle about at the distal third. The pars tarsalis half as long and half as broad as pars tibialis, set with some valid bristles. Unguis about 2 thirds as long as pars tibialis, distinctly curved.

Legs: Coxæ IV more than double as broad as Coxæ III, laterally and anteriorly with a turba consisting of three small tubercles. All trochanters smooth. Only femur III slightly arcuate. All femora with small granula. Calcaneus I a little longer than the 1st tarsal joint and about a third of astragalus, calcaneus II about as long as the 1st tarsal joint and only a fourth the length of astragalus. Calcaneus III a little longer than thick, IV a little shorter than thick. Articuli tarsales: 6, 10—11, 7, 8. Pars ulterior tarsi II tripartite. Processus terminalis nearly as long as the claws.

Differentia sexualis: Pars propior tarsi I et partes proximæ tarsorum III et IV parte ulteriore manifesto crassior in mare (non autem in femina); articulus primus articulo ultimo tarsi I duplo, III—IV dimidio crassiores.

Colour: Light cinnamon-brown with irregular white spots which are usually confluent to a reticulate pattern, but sometimes rather reduced.

Long. corp. 4,7; long. scuti 4, lat. scuti 3,7; palpi 4; pedes I 7,5, II 17, III 11, IV 15.

Patria: Venezuela. 3 males and 5 females were collected at Towar by E. SIMON and given to Dr. SØRENSEN by him.

In the Roewerian system this species must belong to the genus *Cynorta*.

Libitia Simon.

Libitia E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 216.

Libitia + *Metalibitia* + *Paralibitia* etc. Roewer, Weberkn. d. Erde, p. 293, 294, 295 etc. — Suppl.: Abh. nat. Ver. Bremen. XXVI, 3, 1928, p. 552 ff.

Tuber oculiferum latum, inerme aut eminentiis parvis ornatum.

Scutum totum aequaliter et leviter arcuaturn, extra antennas in tubercula singula productum.

Area quarta scuti dorsalis eminentiis magnis destituta; areæ quintæ aut limbo posteriori scuti autem eminentiæ magnæ interdum impositæ sunt.

Orificia glandularum foetidarum sunt foramina brevia, perlata, infra latiora, suberecta (i. e. leviter proclivia).

Antennarum articulus primus eminentia majore superiore, interiore, apicali destinatus.

Palporum pars tibialis primum leviter, deinde (ultra medium) sat fortiter dilatata, apicem versus sat subito angustata.

Pedes breves aut breviores. Coxæ IV leviter dilatatae (coxis III triplo fere latiores) processulo aut carina transversa extus producta munitæ.

Unguiculi integri.

Remark: According to SØRENSEN *Cynorta* ambigua is related to *Libitia*.

Conspectus specierum hic descriptarum.

- I. Differentia sexualis exigua, crassitudine femorum (III et) IV vix demonstratur..... Subgenus *Messa* W. Sør.
- A. Tarsus I quinquepartitus; scutum dorsale eminentiis ambabus instructum, margini posteriori propinquus (areæ quintæ impositis):
 - 1. Tibia II et metatarsi omnes anulis dilutis ornata... *M. argentina* W. Sør.
 - 2. Tibia II et metatarsus II anulis non ornata ... *M. paraguayensis* W. Sør.
- B. Tarsus I sexpartitus; limbus posterior (non autem area quinta) scuti dorsalis tuberculo aut tuberculis instructus:
 - 1. Calcaneus I articulo tarsali primo brevior; limbus posterior scuti tuberculis ambobus prædictus *M. scalaris* n. sp.
 - 2. Calcaneus I astragalo vix duplo brevior; limbus posterior scuti tuberculo uno prædictus *M. castanea* n. sp.
- II. Differentia sexualis magna, partibus proprioribus tarsorum I, III, IV in crassatis demonstratur; scutum muticum..... Subgenus *Libitia* (E. Sim.).

- A. Tarsi III et IV sexpartiti ♀, quinquepartiti ♂; area secunda striolis ambabus obliquis notata *M. bipunctata* n. sp.
- B. Tarsi III et IV quinquepartiti: macula alba media aream secundam et tertiam excipiente ornata *M. cordata* Gerv.

Subgenus **Messa** n.

Messa Sørensen in manuscripto.

Metalibitia + *Paralibitia* etc. Roewer, Die Weberkn. d. Erde. — Suppl.: Abh. nat. Ver. Bremen, XXVI, 3, 1928, p. 552.

Scutum dorsale eminentiis majoribus instructum, limbo posteriori aut propinquis aut impositis (sulcis non divisum).

Differentia sexualis exigua crassitudine femorum (III et) IV demonstratur.

Remark: I agree with SØRENSEN in considering the following 4 species as closely related mutually, only representing one subgenus (genus acc. to ROEWER).

Libitia (Messa) argentina W. Sør.

Cosmetus argentinus Sørensen, Naturh. Tidsskr. (3) XIV, 1884, p. 593.

Paralibitia argentina Roewer, Weberkn. d. Erde, 1923, p. 295.

3,5 mm longa, sordide testacea, vittis sordide brunneis ornata; tibia secunda et metatarsi omnes anulis dilutis notata; tuber oculiferum obsolete excavatum, læve; tubercula extra antennas posita, utrinque bina sibi propinqua, sat magna, conica, acuta; limbus lateralis non discretus; scutum coriaceum levissime arcuatum processulis parvis ambobus, areæ quintæ impositis; pars femoralis palporum vix duplo longior quam crassior, tuberculo magno interiore apicali armata; coxa IV processu conico; calcaneus I articulo tarsali primo duplo fere brevior; articuli tarsales: 5, 7, 5, 6; processus terminalis unguiculis duplo brevior.

Patria: Respublica Argentina et Paraguay.

Addenda et Corrigenda: Scutum (a latere inspectum) a tubere oculifero usque ad eminentias magnas areæ quintæ subrectum vel levissime arcuatum. — Sulci obsoleti striis claris tamen demonstrantur (quod integumentum subcutaneum pigmento ibi caret). Orificia glandularum foetidarum plane obtecta. — Segmenta dorsalia libera tria anteriora granulis et ordinibus singulis granorum prædita, præter quæ dorsale tertium tuberculo uno medio acuto sæpiissime instructum est; anale dorsale granis densis; anale ventrale ordine posteriore granorum. — Palporum pars femoralis vix duplo longior quam crassior, tuberculo magno interiore apicali armata; ultra carinam dorsalem altam leviter crenulatam subito desinentem leviter crenulata. Partis patellaris margo interior sat late extenuatus, in apice angulatus. Pars tibialis vix duplo longior quam latior, parte femorali paullo longior. Pars tarsalis depressa, marginibus præsertim exteriore prope basin extenuatis, præter setas aculeis brevibus robustis armata, interioribus 2, exterioribus 3. — Calcanei sat crassi, articulo tarsali

primo manifesto (I duplo fere) breviores; IV anulum apicalem obliquum formans. Tarsi I pars propior ulteriore non crassior; articulus primus secundo longior.

Remarks: According to ROEWER "I—III Area mit je einem mittleren Paare niedriger, stumpfer aber deutlich hervortretender Tuberkeln", but they are not found in the specimens examined. The posterior margin of the third abdominal somite possesses a median well-developed process, consisting of a median bigger and on each side a smaller obtuse tooth; laterally on each side two tubercles. The tubercula extra antennas are bifurcate, the exterior tubercle being shortest.

On account of the different number of tarsal segments ROEWER refers this species to another genus than *M. paraguayensis*, viz. to *Paralibitia*.

Libitia (Messa) paraguayensis W. Sør.

Cosmetus paraguayensis Sørensen, Naturh. Tidsskr. (3) XIV, 1884, p. 594.

Metalibitia paraguayensis Roewer, Weberkn. d. Erde, 1923, p. 294.

4 mm longa, sordide fusca, pictura sordide testacea ornata; metatarsi tertius et quartus anulis dilutis angustis ornati; tuber oculiferum rotundatum granulis subtilibus densis; tubercula extra antennas posita utrinque bina sibi propinqua; limbus lateralis non discretus; scutum granulis subtilibus densis levissime arcuatum processulis parvis ambobus, areae quintae impositis; pars femoralis palporum vix dimidio longior quam crassior, tuberculo magno obtuso interiore apicali munita; coxa IV processulo conico; calcaneus I brevior quam crassior; articuli tarsales: 5, 6, 5, 5; processulus terminalis unguiculis plus quam duplo brevior.

Patria: Republica Paraguay, Brasilia (Porte Allegre), Argentina (Bahia Blanca).

Addenda et corrigenda: Scutum (a latere inspectum) a tubere oculifero usque ad processulos scuti subrectum vel levissime arcuatum. — Tuber oculiferum et scutum granulis subtilibus densis ornata. — Sulci obsoleti scuti striis claris tamen demonstrantur. — Orificia glandularum foetidorum plane obtecta. — Areae secunda, tertia, quarta granis perhumilibus binis interdum ornatæ. Limbus posterior scuti et segmenta dorsalia libera tria anteriora granulis et ordinibus singulis granorum; anale dorsale granis densis; anale ventrale ordine posteriore granorum; coxae et ventrale primum sublaevia; ventralia cetera ordinibus singulis granulorum. — Palporum pars femoralis vix dimidio longior quam crassior, tuberculo magno obtuso interiore apicali munita; ultra carinam dorsalem leviter crenulatam subito desinentem leviter crenulata. Partis patellaris margo interior sat late extenuatus, in apice angulatus. Pars tibialis vix duplo longior quam crassior, parte femorali manifesto longior. Pars tarsalis depressa, marginibus praesertim exteriore prope basin extenuatis; praeter setas aculeis utrinque binis armata. — Calcanei breviores quam crassiores; III et IV anulum



Fig. 29. *Libitia (Messa) paraguayensis* W. Sør. Palpi partes patellaris, tibialis et tarsalis.
(W. Sør. del.)

obliquum apicalem formantes. Tarsi I pars propior ulteriore non crassior, articulus primus secundo longior.

Remarks. Tubercula extra antennas consist of two slender branches of which the inner one is the longer. The number of abdominal grana were, as pointed out by SØRENSEN, who examined about 90 specimens, very variable; they are generally present, but in some specimens minute or wanting especially in the two first abdominal somites; in two specimens they were rather indistinct even in the fourth abdominal somite.

Libitia (Messa) scalaris n. sp.

6 mm longa, dilute cinnamomea, scalis dorsalibus et linea transversa limbi posterioris luteis notata; tuber oculiferum cristis ambabus granorum (aut granulorum); scutum leviter convexus pars saltem media sulcorum transversorum manifesta; tubercula exteriora limbi anterioris coriacei obtusa; limbus lateralis ordine granulorum; areæ secunda et quarta granis binis; limbus posterior scuti tuberculis ambobus; pars femoralis palporum tuberculo magno interiore apicali armata; unguis parte tarsali non duplo brevior; coxae IV turba anteriore-superiore granorum; calcaneus I articulo tarsali primo brevior; articuli tarsales: 6, 10—11, 6—7, 7; processus terminalis unguiculis duplo brevior.

Tuber oculiferum humillimum latum, supra leviter excavatum, coriaceum, cristis ambabus oculis propinquis granorum aut granulorum conicorum (utrinque binorum, trinorum, quaternorum).

Scutum leviter convexus, a sulco transverso primo leviter et æqualiter arcuatum; post coxas III manifeste dilatatum, deinde post coxas IV angustatum. Sulci transversi primi procurvi pars media manifesta, exterior interrupta; secundi, tertii, quarti pars media debilis, exterior obsoleta; sulcus quintus manifestus. Limbus anterior discretus coriaceus, ante emarginatus, extra palpos fortiter obtuse productus. Limbus lateralis vix discretus latus, irregulariter rugosus, coriaceus, ordine subexteriore granulorum prædictus. Orificia glandularum foetidarum plane obtecta. Areæ coriaceæ, granulis pusillis prædictæ, in area quarta in ordinem transversum dispositis, in ceteris dispersis; prima granis dispersis, secunda et quarta granis binis. Area prima impressione vix manifesta, plana, post tuber oculiferum posita. Limbus posterior tuberculis ambobus reclinibus, conicis, sibi propinquis et granis conicis remotis ornatus. Segmenta dorsalia libera tria anteriora ordinibus singulis irregularibus granorum; anale dorsale granulis dispersis densis et impressione linearis transversa. Coxæ et ventrale primum coriacea (granulis perpusillis, vix manifestis); anale ventrale ordinibus duobus, posteriore granorum, anteriore granulorum; segmenta cetera ordinibus singulis granulorum.

Antennarum pars globosa articuli primi præter granula granis inferioribus marginalibus et uno anteriore interiore superiore ornata.

Palporum pars femoralis duplo longior quam crassior, ordine inferiore tuberculorum parvorum (circiter octo) et tuberculo magno interiore apicali robusto conico setigero armata; ultra carinam dorsalem vix crenulatam, leviter evanescentem, cre-

nulata. Partis patellaris margo interior anguste extenuatus, in apice leviter angulatus. Pars tibialis triplo longior quam latior, parte femorali paullo longior; pars latissima basi haud multo latior, quia margines extenuati, interior angustus, exterior apicem versus rotundatus, in apice leviter producti sunt. Pars tarsalis (persecta) rectangula, marginibus non extenuatis. Unguis parte tarsali non duplo brevior.

Pedes breves, robusti. Coxæ IV coxis III triplo fere latiores, turba (aut ordine brevi) anteriore superiore transversa granorum magnorum, et carina transversa exteriore apicali, robusta, crassa, granis ornata, extus producta. Trochanter IV grano magno apicali acuto. Femora leviter arcuata, eminentiis acutis ornata, quæ in femoribus I et II sunt grana minora, in III et præsertim IV grana majora. Patellæ et tibiae granulis acutis ornatae. Metatarsi lœves. Calcanei articulo tarsali primo breviores; I paullo, II duplo longiores quam crassiores; III et IV crassiores quam longiores. Articuli tarsales 6; 10—11; 6—7¹); 7. Tarsi I pars propior ulteriore (in utroque sexu) non crassior; articolus primus secundo longior. Processus terminalis pæne pronus, fortiter incurvus, robustus, unguiculis duplo fere brevior.

Differentia sexualis: Maris (cujus penem vidi) femora III et IV robustiora, ordinibus granorum magnorum conicorum acutorum undique prædita.

Dilute cinnamomea, scalis dorsalibus et linea transversa limbi posterioris, pone tubercula posita, luteis notata. Scalæ lineis formatæ sunt, quarum ambæ longitudinales, subparallelæ (ante introrsus leviter curvatæ) a sulco transverso primo exeentes, lineis transversis tribus conjunctæ, parti mediae sulcorum secundi, tertii, quarti congruentibus.

Long. corp. 6; long. scuti vix 5,5; lat. scuti 5; palpi 4; pedes I 8,5; II 16; III 12; IV 14.

Patria: Columbia. Exempla quatuor vidi, duos mares et duos feminas, in collectione illustris comitis KEYSERLINGII asservata, quorum tria ad urbem St. Fé de Bogotá capta.

Variatio: In specimine uno lineæ transversæ scalarum dorsalium in medio interruptæ sunt.

Remark: This species has not been described by ROEWER, and moreover cannot be referred to any genus in ROEWER's system, and must consequently, within this system form a new genus, near *Cocholla* and *Cynortellula* Roewer (Abh. nat. Ver. Bremen, XXVI, 3, 1928, p. 617 & 623).

Libitia (Messa) castanea n. sp.

7 mm longa, unicolore castanea; tuber oculiferum coriaceum; scutum leviter convexum; pars saltem media sulcorum transversorum (saltem vix) manifesta; tubercula exteriora limbi anterioris obtusa; limbus lateralis coriaceus tantum; limbus posterior tuberculo uno præditus; pars femoralis palporum tuberculo magno interiore apicali armata, unguis parte tarsali plus quam duplo brevior; pedes II pedibus IV

¹) Tarsi III specimini tantum uni adfuere.

vix longiores; calcaneus I astragalo vix duplo brevior; articuli tarsales 6, 11, 6, 7; processus terminalis unguiculis duplo fere brevior.

Tuber oculiferum humillimum, latum, supra vix excavatum, coriaceum, ceterum lœve.

Scutum leviter convexum, a tubere oculifero leviter et æqualiter arcuatum, post coxas III manifesto dilatatum, deinde post coxas IV angustatum. Sulcus transversus primus procurvus manifestus, quintus et pars media ceterorum debilis; partes exteriore obsoletæ. Limbus anterior vix discretus, coriaceus, ante emarginatus, extra palpos fortiter obtuse productus. Limbus lateralis leviter discretus, latus, tantum coriaceus. Orificia glandularum foetidarum plane obtecta. Areæ coriaceæ, prima impressionibus manifestis tribus ornata, quarum ambæ juxta tuber oculiferum positæ sunt; tertia post idem posita, magna, orbicularis, sat profunda. Limbus posterior scuti tuberculo parvo medio obtuso prædictus. Coxæ IV et segmentum ventrale primum coriacea; segmenta libera et dorsalia et ventralia coriacea (et granulis perpusillis ornata).

Antennarum pars globosa articuli primi granis inferioribus et granulis posterioribus superioribus prædita.

Palporum pars femoralis triplo fere longior quam crassior, a basi ultra medium ordine inferiore granulorum densorum subcylindricorum, sensim majorum (circiter decem), et tuberculo magno interiore apicali subconico obtuso armata; ultra carinam dorsalem parce crenulatam vix crenulata. Partis patellaris margo interior angustissime extenuatus, vix crenulatus, in apice leviter angulatus. Pars tibialis triplo fere longior quam latior, æque longa ac pars femoralis; pars latissima basi haud multo latior, quia margines extenuati, interior angustus, exterior apicem versus rotundatus, in apice leviter producti sunt. Pars tarsalis (persecta) rectangula, marginibus non extenuatis. Unguis parte tarsali plus quam duplo brevior.

Pedes breves, graciliores. Coxæ IV coxis III triplo fere latores, in lateribus lœves, carina transversa exteriore apicali crassa, extus manifesto producta. Trochanter IV grano magno interiore apicali obtuso. Femora II subrecta, cetera arcuata; femora, patellæ, tibiæ ubique granulata; metatarsi lœves. Calcanei astragalo I vix duplo, II plus quam duplo breviores; III diametro apicis sui fortiter incrassati vix longior; IV æque crassus ac longus. Articuli tarsales: 6, 11, 6, 7. Tarsi I pars propior ulteriore non crassior; articulus primus secundo longior. Processus terminalis pæne pronus, fortiter incurvus, robustus, unguiculis duplo fere brevior.

Differentia sexualis: Mas incognitus.

Unicolore castanea, opaca. Membra apicem versus dilutiora.

Long. corp. 7,25; long. scuti 6, lat. scuti 5; palpi 5,5; pedes I 11, II 20, III 14,5, IV 19,5.

Patria: Columbia. Specimina duo, feminas ovipositore protruso, vidi, ad urbem Sta. Fé de Bogotá capta, in collectione illustris comitis KEYSERLINGII asservata.

Remark: This species has not been described by ROEWER, and must according

to ROEWER's scheme be referred to a new genus, i. a. characterized by a scutum only armed with a single tubercle placed on limbus posterior.

Subgenus **Libitia** (Simon).

Scutum dorsale muticum, (sulcis divisum).

Differentia sexualis magna crassitudine partium propiorum tarsorum I, III, IV demonstratur.

Libitia bipunctata n. sp.

5 mm longa, fusca; area secunda punctis (striolis obliquis) notata; tuber oculiferum granulis praeditum; pars media sulcorum transversorum scuti sat alte convexi manifesta; tubercula exteriora limbi anterioris coriacei truncata; limbi laterales parce subtiliter granulati; area prima post tuber oculiferum impressione orbiculari; granula limbi posterioris et segmentorum dorsarium liberorum granulis scuti non majora; pars femoralis palporum (saltem feminæ) dimidio longior quam crassior, tuberculo interiore apicali armata, crista dorsalis ejus in apice leniter rotundata; unguis parte tarsali parte tertia brevior; calcaneus I vix longior quam crassior; articuli tarsales 5, 6—7, 5(♂)—6(♀), 5(♂)—6(♀); processus terminalis unguiculis duplo brevior.

Tuber oculiferum humillimum, latum, supra vix excavatum, coriaceum, granulis dispersis ornatum.

Scutum leviter convexum, post coxas III manifeste latius, deinde post coxas IV angustius. Sulci transversi primi pars media manifesta, in impressionem desinens, procurva; secundus leviter recurvus; tertii, quarti pars media manifesta angusta partes exteriores obsoletæ. Limbus anterior discretus, coriaceus, ante emarginatus, extra palpos in tuberculum robustum truncatum productus. Limbus lateralis leviter discretus, latus, coriaceus, parce subtiliter granulatus, punctis magnis et lineis impressis irregulariter intra et ante dispersis ornatus. Orificia glandularum foetidarum processu coxali haud appresso vix obtecta. Areæ coriaceæ, granulis parvis dispersis sat densis. Area prima impressionibus tribus, sat latis, quarum una, post tuber oculiferum posita, orbicularis, sat profunda, et ambæ, juxta tuber positæ, haud profundæ sunt. Limbus posterior et segmenta dorsalia libera tria anteriora granulis densis, vix ordinatim dispositis; anale dorsale impressione transversa debili et granulis pusillis. Coxæ IV et ventrale primum coriacea, coxæ granulis parvulis, segmentum primum punctis impressis dispersis parce ornata; anale vittis duabus granulorum parvulorum remotorum; segmenta cetera ordinibus singulis granulorum parvulorum densorum.

Antennarum pars globosa articuli primi granulis superioribus præsertim pone prædita. Articulus secundus leviter geniculatus.

Palporum pars femoralis valde compressa, supra fortiter convexa, (saltem feminæ) dimidio longior quam crassior, ordine inferiore submedio tuberculorum

(circiter octo) densorum, apicem versus majorum, obtusorum, et tuberculo interiore apicali conico armata; ultra carinam dorsalem altam, in suo apice leniter rotundatam, lœvis. Partis patellaris margo interior sat anguste extenuatus (plerumque vix crenulatus). Pars tibialis duplo longior quam latior, parte femorali paullo longior; margines extenuati, in apice leviter producti, interior angustus rectus, exterior apicem versus rotundatus, quare pars latissima articuli basi dimidio latior est. Pars tarsalis (persecta) rectangula, marginibus non extenuatis. Unguis parte tarsali parte tertia brevior.

Pedes brevissimi, sat robusti. Coxæ IV coxis III triplo fere latores, in lateribus lœves, carina transversa superiore apicali rotundata, in tuberculum minutum exterius conicum, vix curvatum, obtusum producta. Trochanter IV muticus. Femora arcuata et patellæ et tibiæ granulis densis ornata, quæ in pedibus IV majora sunt. Metatarsi IV vix, ceteri non granulati. Calcanei breves; I et III vix, II vix duplo longiores quam crassiores; IV manifesto crassior quam longior. Articuli tarsales: 5, 6—7, 5(♂)—6(♀); 5(♂)—6(♀). Tarsi I pars propior ulteriore non crassior; articulus primus secundo longior. Processus terminalis robustus, fortiter incurvus pâne pronus, unguiculis duplo brevior.

Differentia sexualis: Granula limbi posterioris et segmentorum dorsalium liberorum trium anteriorum in mare (nec in femina) majora quam granula scuti. Tuberula inferiora partis femoralis maris sat parva, feminæ sat magna. Articuli tarsales III et IV maris 5, feminæ 6. Partes propiores parte ulteriore maris tarsorum I paullo, III et IV vix dimidio, feminæ non crassiores. Tarsi I articulus primus articulo secundo in mare vix, in femina manifesto longior.

Fusca; area secunda striolis ambabus obliquis (ante divergentibus) olivaceo-luteis notata. Trochanteres pedum manifesto dilutiores.

Long. corp. 5; long. scuti 4,5, lat. scuti 3,75; palpi 3,25; pedes I 7,25, II 11,5, III 9,5, IV 10,5.

Patria: Columbia et Venezuela. Specimina septem vidi, feminas duas in Columbia captas, in collectione illustris comitis KEYSERLINGII asservatas, et mares tres et duas feminas a cl. Prof. BÜRGER in Venezuela (inter La Union et Chingusa, in altitudine 1000—2400 m) capta, in Museo Goettingensi asservata.

Variatio: Feminæ unius striola lutea altera parvula, altera defuit; in mare uno area tertia scuti in latere altero puncto olivaceo-luteo ornata. — Variatio insolita: in mare uno tarsus IV alter quinque-, alter sex-partitus.

Remarks: This species, which is characterized by having a different number of tarsal joints in the male and the female, for which reason the female cannot be recognized as a *Libitia* sensu ROEWER, is nearly related to *Libitia fusca* Sim. but it differs by the colour, as SIMON's species is without lighter spots, by the limbus lateralis, which has not "une large bande marginale de granulations plus fortes et plus serrées", and by coxa IV which is not "pourvue d'une pointe assez courte et conique au-dessus de l'articulation du trochanter" (Ann. Soc. Ent. Belg. XXII, 1879, p. 217).

Libitia cordata Gervais.

Cosmetus cordatus Gervais, Walckenaer Insectes Apteris III, 1833, p. 117.

Libitia cordata E. Simon, Ann. Soc. Ent. Belg. XXII, 1879, p. 216.

Libitia cordata Roewer, Weberkn. d. Erde, 1923, p. 293.

Ca. 5 mm longa; fusca, macula alba media magna, aream secundam et tertiam excipiente ornata; tuber oculiferum granulis dispersis praeditum; pars media sulcorum transversorum scuti sat alte convexi sat manifesta; tubercula exteriora limbi anterioris truncata, in apice leviter bifurcata; areæ granulatæ; granula limbi posteriorum et segmentorum liberum trium ceteris majora; pars femoralis palporum paulo plus quam dimidio longior quam crassior, tuberculo interiore apicali armata; unguis parte tarsali duplo brevior. Calcaneus I vix longior quam crassior. Articuli tarsales: 5, 6, 5, 5; processus terminalis unguiculis paulo brevior.

Tuber oculiferum humillimum perlatum, supra vix excavatum, coriaceum, granulis parce dispersis.

Scutum leviter convexum, post coxas III paulo latius, post coxas IV angustius. Partes mediae sulcorum primi procurvi, secundi et tertii leviter et quarti distincte recurvorum manifestæ; sulcus quintus in medio manifestus. Limbus anterior discretus, coriaceus, ante emarginatus, supra palpos in tuberculum robustum, truncatum, in apice leviter bifurcatum, productum. Limbus lateralis latus, non discretus, coriaceus, punctis impressis et paucis granulis dispersis, et supra coxas I impressione magna sat profunda. Orificia glandularum foetidarum processu coxali vix obiecta. Areæ granulatæ, partes mediae dense; impressiones adsunt: in area prima posterior, in area II ambae anteriores magnæ, puncta bina in area quinta et in limbo posteriore. Limbus posterior et segmenta dorsalia libera tria anteriora ordinibus singulis irregularibus granulorum densorum. Anale dorsale granulis dispersis; ventrale anale granulis parvis dispersis. Coxæ et ventrale primum coriaceæ granulatæ; ventralia cetera ordinibus singulis irregularibus granulorum; ventrale primum interdum punctis impressis inter granula ornatum.

Antennarum pars globosa articuli primi granis posterioribus praedita et exterioribus.

Palporum pars femoralis paulo plus quam dimidio longior quam crassior, ordine exteriore granorum, et inferiore tertiam partem apicalem attingente tuberculorum (circiter 10) quorum ultima quatuor ceteris manifeste majora sunt, tuberculo interiore obtuso apicale armata; ultra carinam dorsalem humilem lævem lævis. Partis patellaris margo interior anguste extenuatus, leviter crenulatus. Pars tibialis duplo longior quam latior, parte femorali paulo longior; margines extenuati, in apice leviter producti; interior angustus rectus, tamen apicem versus pæne subangustior, exterior apicem versus rotundatus, quare pars latissima articuli basi dimidio latior est. Pars tarsalis in parte basale utrinque extenuata. Unguis duplo brevior.

Pedes sat robusti. Coxæ IV coxis III triplo fere latiores, lateraliter granulatæ,

carina transversa humili, granulis crenulata, in tuberculum exterius parvum interdum (1 ♂, 1 ♀) producta.

Femora omnia arcuata et patellæ et tibiae omnes granis densis ornata. Metatarsi I et II vix, III et IV manifesto granulati. Calcanei I vix longior quam crassior, II et III crassior quam longior, IV duplo crassior quam longior. Articuli tarsales 5, 6, 5, 5. Processus terminalis unguibus paullo brevior.

Differentia sexualis: Partes propiores tarsorum I, III, IV in femina non crassiores quam partes ulteriores, in mare I dimidio crassior, III duplo et IV dimidio crassior. Processus terminalis unguibus paullo crassior in femina, manifesto crassior in mare.

Fusca aut fusco dilutius variegata, macula magna, partem medium arearum secundæ et tertiae excipiens et aream quartam invadens, alba, luteo tincta, utrinque bis procura. Venter brunneus. Antennæ et palpi flavo-testacea aut leviter fuscescentia; trochanteres et tarsi pedum I, III, IV flavo-testacei aut leviter fuscescentes; tarsus II fuscus.

♂: Long. corp. 4,75; long. scuti > 4, lat. scuti < 3,5; palpi 4,4; Pedes I 7,5, II 10,7, III 9, IV 11,5.

♀: Long. corp. 5,3; long. scuti 4,5, lat. scuti 3,6; palpi 3,8; pedes I 7, II 10,5, III 8,5, IV 10,75.

Patria: Dr. SØRENSEN has examined one male and three females, collected by Prof. BÜRGER in Venezuela 29.1.1897 at Paramo Boydla (road to Choact) and belonging to the Museum of Göttingen. The species has previously been recorded from Columbia, Guyana and Brazil.

Abnormitas: In one of the females the right tarsus II, which was scarcely shorter than the corresponding one of the left side, consisted of four segments; the two basal segments were comparatively long, the first segment of the terminal portion was very short, while the fourth segment was the longest.

Remarks: The species described here is certainly identical with SIMON's *L. cordata* in spite of the presence of a few differences of minor importance. According to SIMON, the scutum should be "finement chagriné, nullement granuleux" and pars femoralis palporum "pourvu en dessous, dans la seconde moitié, d'une série de quatre fortes granulations égales".

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