

MARIE HAMMER

INVESTIGATIONS
ON THE ORIBATID FAUNA OF
NEW ZEALAND

With a Comparison between the Oribatid Fauna of
New Zealand and that of the Andes Mountains, South America

PART III

Det Kongelige Danske Videnskabernes Selskab
Biologiske Skrifter 16, 2



Kommissionær: Munksgaard

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Synopsis

The present paper is Part III of my investigations into the oribatid fauna of New Zealand. A hundred species are mentioned here, mainly within the genus *Oppia* and the group Galumnoidea. Through all the investigations (Parts I-III) the number of species of oribatids recorded from New Zealand has risen from 7 to 312. On the basis of these it has been tried to give an account of the origin of the oribatid fauna of New Zealand, as well as its connexion with the oribatid fauna of South America. 39 species have a wide distribution over large regions of the earth. They must be assumed to have existed before New Zealand became an isolated area. Their age can be estimated at about 100 million years. 17 species are common to New Zealand and South America. Some of these, within the genus *Trimalaconothrus*, show some special morphological characters which suggest Transantarctic relationships. The number of presumably endemic species constitute 82 per cent. This percentage is lower than the percentage of insects and must be due to the fact that a number of New Zealand oribatids arose before the connexion between New Zealand and South America was finally broken off.

Preface

The present paper constitutes Part III of my Investigations on the Oribatid Fauna of New Zealand. A hundred species have been described or mentioned, mainly belonging to the genus *Oppia* in the widest sense of the term and to the group Galumnoidea. Furthermore, eight species have been described which have been found at a revision of the material and which belong in Parts I–II. I shall here take the opportunity of thanking the large number of colleagues with whom I have collaborated for many years, by naming species within “*Oppia*” after them. Prominent deceased research workers have also been commemorated in this way.

For permission to use material collected in birds’ nests in New Zealand I am most obliged to Dr. J. L. GRESSITT, Bernice P. Bishop Museum, Honolulu, Hawaii. The Forest Research Institute, Whakarewarewa, Rotorua, New Zealand, has also placed a few species at my disposal, for which I offer the Institute my best thanks.

Furthermore, I offer my most cordial thanks to the Directors of the Carlsberg Foundation, who have continued granting me economic support during the working up of the material.

I owe an immense debt of gratitude to the Royal Danish Academy of Sciences and Letters, who has undertaken the printing of my many papers on the distribution of the oribatids, a debt which I shall never be able to pay, even with my warmest thanks.

I am also much obliged to the Rask-Ørsted Foundation for paying the translation.

I also most cordially thank Mr. NIELS HANSLUND, Cand. mag., who has translated part of the manuscript and revised the rest and always has assisted me in cases of doubt.

Fredensborg, June 1967.

MARIE HAMMER

Introduction

The publication of Part III of the *Investigations on the Oribatid Fauna of New Zealand* for the time being concludes the great investigations of the distribution of the oribatids which I started in East Greenland in 1933. In the first publication proper, *Studies on the Oribatids and Collemboles* (1944) I showed that the microfauna of Greenland (oribatids and collemboles) mainly was of European origin, and that presumably it had to a great extent survived the Glacial Age in Greenland. Greenland was considered part of a European faunal area which at the continental shift had drifted towards the west.

My investigations in Arctic Canada corroborated that the microfauna of Greenland on the whole is of European origin, although a few more continental species have later immigrated from North America (HAMMER 1952–53).

The investigations into the oribatids of the Andes Mountains showed no relationship with Arctic or North European ones, but some genera, which besides from the Andes Mountains are also known from the Pacific area, directed my attention to that area. It seems increasingly convincing to me that the oribatids, which have very poor possibilities of spreading, by their pattern of distribution may make it probable that there was formerly a land connexion on the southern hemisphere, as they had done on the northern hemisphere in my first investigations. At first, it was impossible to carry through such investigations, as our knowledge of the oribatids (their taxonomy and distribution) when I started 35 years ago was extremely poor, and the information available was not reliable. When an oribatid found e.g. in Chile or another South American country had been recorded under a European name, but no description or drawing was available and the individual had been lost, the information about its presence in the country in question was worth nothing. In the case of each country I therefore had to start afresh with a description of the large number of species collected by me. Such investigations, which e.g. in the case of a group of insects, which usually are fairly well known in a systematic respect, might be made at a desk in comparatively short time, have, because of the huge work: the collecting, the sorting out, the preparation, the work of drawing, and the descriptions, including the descriptions of some 600–700 new species, taken about 35 years. This large number of new species, of course, only constitutes a small part of the existing number, but they are

sufficient to give an impression of the oribatid fauna of the countries in question so that comparisons are justifiable. For instance, it may be stated that New Zealand when the present investigations started, had seven described species. Now about 330 species are known. South America showed the same picture. Only after a number of years' work there was a basis of investigation. A comparison between the oribatid fauna of these two territories is now possible. The result of the investigations during this long period shows that the oribatid faunas of South America and New Zealand are closely related, which must mean that these areas once were connected by land. The comparison, however, suffers by our very defective knowledge of the oribatid fauna in the Pacific area (see below).

The recent oribatids of New Zealand have so far been mentioned only in the following papers: MONIEZ (1894), a species which, because of the brief description, it has not been possible to identify. MICHAEL (1908), 6 species, 4 of which have been found again at the present investigations. They have been mentioned in the introduction to Part I.

LAMB (1952), no new species.

WOOLLEY (1965), one species, which has been found again and is mentioned in Part I, p. 72.

RAMSAY (1966), two species: *Multoribates schelorbitoides* and *Zygoribatula magna*, the former seemingly identical with *Setobates minor* Ham. mentioned in Part II, p. 35 (1967). As Ramsay's species, which belongs to the species *Setobates*, has priority over *S. minor* Ham., this species must be termed *Setobates schelorbitoides* (Ramsay). *Zygoribatula magna* seems to be very similar to *Z. connexa* (Berl.), although a little larger. The latter is mentioned in Part II, p. 47. (In 1962 RAMSAY described 25 species from The Brothers in Cook Strait, 5 of which have been found in New Zealand and described in Part I, 2 in Part II. I have not found the other 18 species or been able to recognize them from the paratypes sent to me by RAMSAY. They had been prepared differently from my method, which made it impossible to distinguish the large number of details. RAMSAY's manuscript has not yet been published).

In HAMMER (1966) Part I 90 new species were described.

In HAMMER (1967) Part II 65 new species were described.

In the present work, Part III, 10 new genera have been set up and 89 new species have been described.

About 330 species are known from New Zealand, among them some species with a wide distribution over the earth.

Again I want expressly to state that I have never intended to give a detailed description of all species, which would have required several generations. The descriptions of the large number of species are so detailed that probably it will always be possible to recognize the species. My chief purpose has been to obtain a certain knowledge of the oribatid faunas of the areas investigated so that it would be possible for me to carry through a comparison between the oribatid faunas in South America and New Zealand.

List and Descriptions of the Species Found

In order to keep in order the great material of “*Oppia*” *sensu lato* from New Zealand, more than 80 species, it is necessary to set this chaos which the genus “*Oppia*” represents, to rights. The point has almost been reached when any oribatid of a definite small size and with an appearance which “reminds” of “*Oppia*” is without further circumstances denoted by this name. In the *Investigations on the Oribatid Fauna of the Andes Mountains II. Peru* (1961) and *III. Chile* (1962) I set up some new genera under the genus *Oppia* in the widest sense of the name. In the present work I have taken a step further and set up a good number of new genera. *Oppia* proves to be an extraordinarily complicated genus, in which many characters must be taken into consideration. Important characters are the number of notogastral hairs, their position, the appearance of the pseudostigmatic organ, the structure of the pseudostigma, the presence or absence of lamellae, chitinous structures on the transition between the propodosoma and the hysterosoma, the number of hairs on the propodosoma, furthermore the shape of the hysterosoma, the breadth of its anterior margin, the number of genital hairs, of aggenital hairs, the situation of the fissure iad, the length of the legs, the shape of the segments, the length of the solenidia, etc. All these characters offer an infinitude of possible combinations. When several species show the same combination of a good number of the characters mentioned here, it seems a safe guess that these species constitute a genus, as distinct from the species which together form another well-defined combination of characters. On the basis of this view I have set up the *Oppia* genera listed below. In cases in which a single species is decidedly characteristic and different from other species, it has been set up as an independent genus, the diagnosis of which perhaps must later be changed or supplemented with more character. The genus *Lancetoppia*, which in New Zealand is represented by numerous species, shows a large range variation, especially as regards the appearance of the pseudostigmatic organs. Perhaps some species must later be referred to subgenera or new genera. In spite of my efforts to divide “*Oppia*” into more genera, I have not been successful. It has not been possible for me to place a certain number of species in the system. These species still pass by the name of *Oppia* in spite of the fact that they do not belong to the genus *Oppia*, the type of which is *O. nitens* C. L. Koch 1836.

In the key below the page and volume of the generic diagnoses from South America (S.A.) and New Zealand (N.Z.), respectively, are indicated on the extreme right.

		S.A.	N.Z.
		p. vol.	p. vol.
1.	13 pairs of notogastral hairs..... 2		
	10 pairs of notogastral hairs, by reduction 7-8 pairs ... 4		
2.	Branched pseudostigmatic organs 3		
	Not branched pseudostigmatic organs <i>Polyoppia</i> 9/III		
3.	Iad obliquely to anal field <i>Gittella</i> 63/II		
	Iad parallel to anal field <i>Multioppia</i> 61/II		
4.	One pair of aggenital hairs 5		
	Three pairs of aggenital hairs <i>Tripiloppia</i> 10/III		
5.	Complicated chitinous structures between the propodosoma and the hysterosoma 6		
	No chitinous structures 9		
6.	Pseudostigmatic organs club-shaped, hairy <i>Oppiella</i> Jacot 1937 33/III		
	Pseudostigmatic organs ball-shaped 7		
7.	Rostrum tripartite 8		
	Rostrum not tripartite, Hysterosoma with two broad anterior tubercles and longitudinal ridges <i>Quadroppia</i> Jacot 1939 33/III		
8.	Very complicated structures, 5 genital hairs..... <i>Belloppia</i> 15/III		
	Only a broad bridge on the hysterosoma <i>Miropia</i> 18/III		
9.	Tibia I with a long distal process <i>Paroppia</i> 19/III		
	Tibia I without a long distal process..... 10		
10.	Small mites. Solenidia of Tibiae I-II, Tarsi I-II short and very broad <i>Solenoppia</i> 20/III		
	Solenidia not short and broad 11		
11.	Pseudostigmatic organs branched..... 20		
	Pseudostigmatic organs not branched, club-shaped to faintly globular..... 12		
12.	Pseudostigma with a lid, 4 genital hairs..... <i>Operculoppia</i> 22/III		
	Pseudostigma without a lid, 4 genital hairs..... 13		
13.	Pseudostigma with a narrow bridge, 6 genital hairs <i>Membranoppia</i> 25/III		
	Pseudostigma without a narrow bridge, 6 genital hairs.. 14		
14.	Pseudostigmatic organs tiny balls, 6 genital hairs <i>Globoppia</i> 44/III		
	Pseudostigmatic organs lanceolate, thread-shaped 15		
15.	A hook behind Acetabulum II, pseudostigmatic organs thread-shaped <i>Hamoppia</i> 28/III		
	No hook behind Acetabulum II 16		
16.	All femora with broad lamina, 4 genital hairs <i>Laminoppia</i> 30/III		
	No lamina on femora 17		
17.	Interlamellar hairs absent <i>Amerioppia</i> 54/II		
	Interlamellar hairs present 18		
18.	Air-filled hairs posteriorly on the hysterosoma <i>Aeroppia</i> 65/II		
	No air-filled hairs posteriorly on the hysterosoma 19		
19.	Pseudostigmatic organs lanceolate <i>Lancetoppia</i> 42/III		
	Pseudostigmatic organs club-shaped, broadest distally ... <i>Oppia</i> C. L. Koch 1936		
20.	Lamellae present 21		
	Lamellae absent <i>Brachioppia</i> 51/II		
21.	Rostral hairs feathered proximally, bent and smooth distally <i>Ramusella</i> 50/III		
	Rostral hairs normal..... <i>Brachioppiella</i> 47/III		

In what follows the genera are arranged in the same order as in the key.

Polyoppia n. gen.

This new genus like *Multioppia* has 13 pairs of notogastral hairs. Rostral, lamellar, and interlamellar hairs are present. No lamellae. Pseudostigmatic organs are rod-shaped to club-shaped. No bridge on the anterior margin of the hysterosoma. Five (? sic) pairs of genital hairs. One pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad situated obliquely to the lateral side of the anal field. Femora short and broad.

Polyoppia Baloghi n. sp.; fig. 1.

Colour brown. Length about 0.83 mm.

The propodosoma is about half as long as the hysterosoma, rather narrow, conical in its anterior half. The mite is slender at the transition between the propodosoma and the hysterosoma. The rostral hairs, which are more than twice as long as their mutual distance, thin, parallel, and slightly uneven, reach by half their length beyond the tip of the rostrum. The lamellar hairs, which are approximately half as long as the rostral hairs and as long as their mutual distance, are thin and smooth. The interlamellar hairs are short and smooth. The exopseudostigmatic hairs are as long as the lamellar hairs and smooth. The integument of the propodosoma is smooth except on the posterior half of the lateral sides, which are set with small tubercles. The pseudostigmatic organs, which in a curve are bent backwards and outwards, are almost equally thick throughout, though pointed at the tip. They are slightly serrate in their distal half and approximately as long as their mutual distance. Along the posterior border of the propodosoma four rounded tubercles can be seen, the two middle ones are directed backwards, the lateral ones, which are set behind the pseudostigmata, are directed laterally. Behind the latter similar tubercles on the anterior border of the hysterosoma can be seen. In the middle of the propodosoma and behind the lamellar hairs there is at a deeper level a "cup"-shaped figure.

The hysterosoma is broadest across the middle. There are 13 pairs of notogastral hairs. Ta is situated on the anterior border and is minute. The remainder are very long and smooth, all of them except ti reaching the base of the following one.

The ventral side is shown in fig. 1 a. The genital field is very small as compared with the anal field. There are 5(? 6) pairs of genital hairs, one pair of aggenital hairs, two pairs of anal hairs, and three pairs of adanal hairs. Ad3 is situated off the anterior border of the anal field, ad2 obliquely behind iad, which is short and set obliquely to the anal field. Ad1 is postanal. Many of the hairs of the ventral side are slightly curved.

The legs are remarkable by having femora, which are very broad for most of their length, the proximal part being short and thin. Some of the hairs of the legs are curly.

BALOGH (1966, p. 71, fig. 4) figures a mite *Multioppia problematica* n. sp., which in many characters is very similar to *P. Baloghi*. It is, however, much smaller (0.392 mm), the rostral hairs are barbed, the interlamellar hairs are absent. The pseudo-

stigmatic organs are short, rather broad clubs. It has 12 pairs of long notogastral hairs, and a tiny ta. *Polyoppia Baloghi* and *Multioppia problematica* may be congeneric in spite of the above-mentioned differences. Unfortunately BALOGH does not figure the ventral side and for that reason its position in the system cannot be decided. This species is named after Dr. J. BALOGH, Hungary.

Pauatahanui: Two specimens in dead moist leaves in forest soil (Cypresses).

Tripiloppia n. gen.

Oppiidae with three pairs of aggenital hairs (hence the generic name). Rostrum tripartite. Rostral and interlamellar hairs well developed, lamellar hairs minute. Exopseudostigmatic hairs long. Lamellae present. Pseudostigmatic organs branched. Usually a bridge on the anterior margin of the hysterosoma. 10 pairs of notogastral hairs, ta well developed. 4 pairs of genital hairs. The lyrifissure iad parallel to the lateral side of the anal field.

Tripiloppia Aokiï n. sp.; fig. 2.

Colour light brown. Length about 0.34 mm.

The anterior half of the propodosoma is long and narrow, widening considerably off Leg I. The tip of the rostrum is tripartite, the medial part is much narrower than the lateral parts. The rostral hairs, which are parallel and set on the dorsal surface, are thin and smooth. They scarcely reach beyond the tip of the rostrum. The lamellae, which are set on the posterior third of the propodosoma, have almost the same appearance as those of *Oppiella nova* (Oudms.), consisting of two anterior forward directed parallel ridges and two posterior auriculate ridges. The former do not reach the pseudostigmata, but after a bend a little in front of the latter they run backwards along the outer side of the interlamellar hair. The auriculate ridges are S-shaped, the anterior curve surrounding the interlamellar hair, the posterior part ending in a small knob corresponding to a tooth on the anterior border of the hysterosoma. The lamellar hair is minute, set on the medial side of the lamella in a loop formed by the anterior tip of the lamella bending medially and backwards. The interlamellar hairs, which are strong and smooth, are about as long as their mutual distance. The exopseudostigmatic hair is as long as the interlamellar hair, smooth, and curved. Laterally to the lamellae some chitinous scales can be seen. On the lateral sides of the propodosoma there are similar scales or tubercles. The field within the auriculate ridges is a greyish colour, bordered anteriorly by an indistinct line. A little further anteriorly there is one or two indistinct lines and in the middle of the propodosoma a few similar short transverse lines. The pseudostigmatic organ has long slender branches issuing from a flat and rather broad stem. The numbers of branches, which are almost equally long, vary from 5 to 8. Those with 8 branches have a tendency to have shorter notogastral hairs.

The hysterosoma is oval apart from the straight anterior border. The latter has four teeth, which continue as narrow keels along the dorsum. The size of the teeth

varies a good deal. The lyrifissure ia can be seen behind the outer tooth. The hair ta, which is long and curved, is set on the medial keel. The remaining notogastral hairs are smooth, thin, slightly curved, and moderately long.

The ventral side is shown in fig. 2 a. Epimeres I are separated by a narrow sternal plate, Epimeres II are fused or separated by so faint a line that it can scarcely be seen. The fused Epimeres III–IV are separated from those on the opposite side by a very narrow line. The sejugal apodemata are connected by a broad band. The genital field is much smaller than the anal field. There are 4 pairs of genital setae, i. e. one pair on the anterior border, one at a short distance behind the first and two along the lateral border. There are three pairs of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. All hairs of the ventral side are short, smooth and hyaline, the hair pores are bright. The fissure iad is long and parallel to the lateral side of the anal field.

The legs are rather long (see fig. 4) with soft and mostly smooth hairs. The solenidion of Tibia II is short. The tip of the maxillae can often be seen in front of the rostrum. Mandibles of the chelicere type, slender. This species is named after Dr. JUN-ICHI AOKI, Japan.

Puketi: One specimen in thick moist moss on the ground in native forest.

Waitakere: One individual in slightly moist moss under *Manuka* shrub.

Rotorua: Many specimens in thick, slightly moist moss under *Manuka* shrub in the thermal area.

Lake Rotoiti: One specimen in very thick moist moss on the ground; three specimens in wet moss and liverworts on a vertical slope above a brook, both localities in *Nothofagus* forest.

Fox Glacier: One individual in moist to wet moss or liverworts on a thick trunk covered by mosses in native forest.

Tripiloppia Trägårdhi n. sp.; fig. 3.

Colour light brown. Length about 0.49 mm.

As the following species in most characters resemble the type species only the differences will be mentioned. The lamellae are not so distinct as in the preceding species. They are strongly curved. The anterior part of the lamellae incline a little, then they bend laterally in a big curve and finally they turn backwards, reaching the pseudostigmata on the outer side of the latter. In their whole length they are tongued on their lateral border. The anterior part is apparently covered by a thin more or less hyaline plate, which almost invisibly continues backwards laterally to the auriculate ridge. The latter consists of a strong posterior lobe, which is set opposite a rounded tooth on the anterior border of the hysterosoma. Its anterior part almost disappears on the medial side of the interlamellar hair. The lamellar hair, which is short and smooth, is set at a short distance behind the tip of the lamella. The interlamellar hair is short and thick. The pseudostigmatic organs have thin, delicate

branches in a number of 5 to 6. The tip of each branch is hook-shaped. At a short distance behind the hook a short, secondary branch can be seen.

The anterior border of the hysterosoma is narrow and straight with rounded corners. There are only two teeth or rather round knobs which are set on either end of a bridge, the lateral sides of which continue backwards for a short distance. The hair *ta* is set behind the tooth. The fissure *ia* is long and very distinct. The notogastral hairs, 10 pairs, are rather short and smooth.

The ventral side agrees with that of the type species. This species is named after the late Dr. IVAR TRÄGÅRDH, Sweden.

Keri-Keri: 8 individuals in moss on a steep slope above a brook in deep shadow; one specimen in moss on a mouldering trunk in the same locality.

Tripiloppia Forsslundi n. sp.; fig. 4.

Colour light brown. Length about 0.55 mm.

The tip of the rostrum looks very peculiar as if covered by two round, hyaline lobes carrying the short, smooth rostral hairs. In fact I am unable to tell how the rostrum is built. The anterior part of the lamellae are parallel, smooth on the lateral side, and thus different from the lamellae of *T. Trägårdhi*. They continue almost invisibly backwards along the lateral side of the auriculate ridges. The latter have a strong posterior lobe and forwards directed ridges, which reach the posterior part of the proper lamellae. Within the auriculate ridges there is a greyish field. The lamellar hairs, which are set almost in the middle of the parallel lamellae, are very short and smooth. The interlamellar hairs are rather long and thick. The branches of the pseudostigmatic organ are unequally long, the two distal ones being rather short, though varying in length, number three not much more than half as long as the proximal one, which is approximately as long as the stem between the proximal branch and the pseudostigma.

The hysterosoma differs from that of the two preceding species by the absence of teeth on its anterior border. The latter forms a faint arch within which the hairs *ta* are set. There are 10 pairs of thin and smooth notogastral hairs, *ta* being considerably longer and stronger than the remaining hairs.

The ventral side agrees with that of *T. Aokii*, fig. 2 a. This species is named after Dr. KARL-HERMAN FORSSLUND, Sweden.

Keri-Keri: 4 specimens in a river valley (STAGAARD coll.).

Tripiloppia Tarras-Wahlbergi n. sp.; fig. 5.

Colour light brown. Length about 0.49–0.50 mm.

The lamellae are almost parallel in most of their length, faintly S-shaped. Their anterior end medially turns almost so as to encircle the tiny lamellar hair. Their posterior end reaches beyond the base of the interlamellar hair. A membranous plate issuing from the posterior end of the lamella seems to cover the medial part of the pseudostigma. The auriculate ridges have a distinct posterior lobe and a more faintly

developed anterior part, which in a curve reaches the lamella. The interlamellar hairs are stronger than all other hairs. The pseudostigmatic organs have 5–6 slender, delicate branches, the distal ones being the shorter.

The hysterosoma has on its anterior border a low arch, which in a lateral view stands out like a keel. The hair *ta* is rather long and much stronger than the remaining notogastral hairs, which are tiny. The ventral side agrees with that of the preceding species. This species is named after Dr. NILS TARRAS-WAHLBERG, Sweden.

Pu Pu Springs: Two specimens in almost dry mosses under *Manuka* shrub.

Tripiloppia Dalenii n. sp.; fig. 6.

Colour brown. Length about 0.63 mm.

The rostral hairs reach beyond the tip of the rostrum and are longer than those of the preceding species. The tip of the rostrum, when seen in a slightly oblique lateral view, looks like the sketch, fig. 6 a. The lamellae incline, tapering distally. The lamellar hairs are set on the lateral side of the lamellae near the tip. Posteriorly the lamellae disappear off the interlamellar hair. Of the auriculate ridges only the posterior lobe is present. Extremely faint lines indicate the anterior part of the auriculate ridges. The interlamellar hairs are very long. The pseudostigmatic organ has 4–5 rather short branches, the proximal one always being short (see details fig. 6 b).

The anterior border of the hysterosoma forms a broad low arch, immediately behind which the long hairs *ta* are placed. The remaining hairs are not much more than one third as long as *ta*, hyaline and difficult to see.

In this species Epimeres II in some individuals are separated posteriorly by a short ridge issuing from the band which connects the sejugal apodemata. This species is named after Dr. PER DALENIUS, Sweden.

Fox Glacier: Three specimens in mouldering leaves among dead trunks in native forest; two individuals in moss on a tree in the same locality.

Oppiella nova (Oudem.) 1902; fig. 7.

Colour greyish to light brown. Length varying from 0.22 to 0.30 mm.

Oppiella nova is the commonest oribatid in New Zealand and has been found everywhere both in more open land and in native forest. It is most abundant in thick moist mosses.

Oppiella dubia Ham. 1962; fig. 8.

Colour light brown. Length varying from 0.30 to 0.34 mm.

Keri-Keri: Many individuals in moss and grass under *Eucalyptus* trees, a few in grass and *Hieracium* by the roadside; one specimen in dead, moist *Selaginella* vegetation on forest soil.

Waitakere: A few individuals in moss and a little grass in native forest.

Rotorua: Five specimens in moss and liverworts on the bank of Lake Tara-vera, under trees.

Waitomo: One specimen in thin moss and liverworts on a slope behind the hotel.

New Plymouth: Several specimens in moss and grass on a lawn under tall trees.

Oppiella suramericana (Ham.) 1958; fig. 9.

Colour light brown. Length about 0.24 mm.

O. suramericana has been found almost everywhere, thus in the following localities: Keri-Keri, Waitakere, Rotorua, Pauatahanui, Pu Pu Springs, Lake Rotoiti, Christchurch, Hokitika, Fox Glacier, and Milford. It is most abundant in Pu Pu Springs, where numerous individuals were found in soaking wet *Leucobryum*, grass, and water cress at the edge of the swamp with the well, under *Manuka* shrub.

Oppiella fallax var. *obsoleta* (Paoli) 1908; fig. 10.

Colour pale ochre to light brown. Length about 0.31–0.32 mm.

Keri-Keri: One specimen in a thin layer of moss and liverworts on an overgrown road, under trees.

Oppiella Bulanovae n. sp.; fig. 11.

Colour greyish to yellowish. Length about 0.24 mm.

The tip of the rostrum is tripartite, the middle part being broad anteriorly. The rostral hairs are thin and hyaline. They reach by half their length beyond the tip of the rostrum. The lamellae are narrow, curved ridges, which reach the pseudostigmata. At their anterior end the tiny lamellar hair is set. In front of the posterior part of the lamella another curved ridge, which is stronger and shorter than the lamella, can be seen. The auriculate ridges halfway encircle the interlamellar hairs, which are longer than their mutual distance. The exopseudostigmatic hair is moderately long. The pseudostigmatic organs are very long and branched. There are 5–8 anterior branches and fewer posterior ones issuing from rather a flat stem, the middle branches being the longest. On the pseudostigma there are both a posterior lobe and a lateral crest or lobe.

The hysterosoma is only a little longer than broad. On its anterior border the tiny hair *ta* is situated. The remaining notogastral hairs are very thin, hyaline, and long. R3 and r1 are absent.

The ventral side is shown in fig. 11 a. All the hairs of the ventral side are very long. *1c* is set on a longitudinal ridge. There are 5 pairs of genital hairs, the position of which, viz. one on the anterior border, two in a transverse row and two near the posterior border, is not common. The aggenital hair and *ad3* are located rather close together. *Ad2* is situated off the anterior anal hair, i. e. in front of *iad*, which is parallel to the lateral side of the anal field. All the legs are long and slender, Femur IV being especially long. The solenidia of Tibia I and Tibia IV, and of Genus I–II are long

and thin; they are short and broad in Tibia II and Genu III. This species is named after Dr. ELISAVETA BULANOVA-ZACHVATKINA, U.S.S.R.

ROTORUA: Several specimens in luxuriant ?*Leucobryum* under *Manuka* shrub in the thermal area.

Quadroppia quadricarinata (Mich.) 1885; fig. 12.

Colour pale ochre. Length about 0.17 mm.

Found at Keri-Keri, New Plymouth, Pauatahanui, Pu Pu Springs, Nelson district, and Lake Rotoiti.

Quadroppia circumita (Ham.) 1961; fig. 13.

Q. circumita may be only a variety of *Q. quadricarinata*. The forms mainly differ in the shape of the chitinous ridges on the anterior part of the propodosoma and the long curved ridge on the dorsum of the hysterosoma. In *Q. circumita* this issues from the lateral part of the anterior knob, in *Q. quadricarinata* from a more laterally situated ridge.

Keri-Keri: One specimen in moss and liverworts on an overgrown road under trees.

Milford: One specimen in thick moss, white clover, and grass by the roadside.

Belloppia n. gen.

Small beautiful Oppiidae with a complicated lamellar and chitinous structure at the transition between the propodosoma and the hysterosoma. Rostrum tripartite. Rostral, lamellar, and interlamellar hairs usually present. Pseudostigmatic organs club-shaped. 10 pairs of notogastral hairs. 5 pairs of genital hairs, one pair of ag-genital hairs. The fissure iad is parallel to the anal field.

Belloppia Wallworki n. sp.; fig. 14.

Colour pale ochre. Length about 0.22–0.23 mm.

The propodosoma is rather narrow, conical. The tip of the rostrum is tripartite with deep incisions, which are rounded at the bottom. The middle is pointed at the tip. The rostral hairs, which are smooth, project by half their length beyond the tip of the rostrum. The lamellae are situated in the posterior two fifths of the propodosoma. They are narrow, slightly S-shaped and almost parallel ridges, which posteriorly reach the pseudostigmata. The lamellar hair is minute and is set within a loop formed by the end of the lamella bending medially. Behind the lamella there is a V-shaped ridge in which the interlamellar hair is set. The posterior end of this ridge is a well chitinized lobe, which fits into an incision on the lateral edge of a chitinous bridge, that covers the transition between the propodosoma and the hysterosoma. The interlamellar hairs are thicker and longer than the lamellar hairs and smooth. The exopseudostigmatic hair is proportionately long. The pseudostigma has on its

posterior border a lobe opposite a strong, lateral tooth on the anterior border of the hysterosoma. It has moreover a short ridge directed medially. The pseudostigmatic organ is a longish club, fig. 14 a, which is broadest across the middle. In a dorsal view it is ball-shaped. It is apparently set with tiny hairs or scales. In front of the pseudostigma there is a semicircular ridge.

The hysterosoma is oval. In the middle of the anterior border there is a narrow arch, which anteriorly projects beyond the lobe of the V-shaped ridges. Its anterior border is rounded apart from the incision for the above-mentioned lobe. Its lateral margins continue as distinct keels across the dorsum as far as the hair *ta*, indistinctly beyond *ta*. On either side of the arch there is a very strong tooth set behind the pseudostigma. It also continues as a faint keel over the dorsal surface. Behind the arch an indistinct structure with two parallel lines can be seen. Anteriorly the lines give way, forming a ring round two distinct bright holes. The notogastral hairs, 10 pairs, are short, thin, and smooth.

The ventral side is shown in fig. 14 b. A well chitinized narrow sternal ridge separates Epimeres I. Farther backwards the sternal plate is faintly chitinized, forming a broad plate between Apodemata II and between the sejugal apodemata. The genital field, which is smaller than the anal field, has five pairs of hairs, viz. one on the anterior border, one immediately behind the first, one at a short distance behind the second and a little more laterally, and two near the posterior border. The aggenital hairs are set on a line with *ad3* and halfway between the genital and the anal field. *Ad2* is located approximately off *an1* and *ad1* behind the anal field. All legs are slender with soft, short, smooth hairs. The solenidion of Tibia II is short. Mouth parts have not been studied. This species is named after Dr. JOHN WALLWORK, England.

Lake Rotoiti: Three specimens in moist to wet ?*Leucobryum* on a slope, probably a spring locality; many in thick moist moss on a dead trunk; one specimen in dripping wet moss and liverworts in oozing water from a brook; many individuals in moss and liverworts on a vertical slope above a brook in shadow, all localities in *Nothofagus* forest.

Belloppia Evansi n. sp.; fig. 15.

Colour light brown to ochre. Length about 0.20 mm.

The lamellae in this beautiful little mite consist of a well chitinized lower part attached to the dorsal surface and an upper part, which is a more or less hyaline, vertical blade. The lamellae are parallel in most of their length. Posteriorly they widen before they reach the pseudostigmata. Their medial border is straight and smooth, whereas their lateral border is furnished with deep incisions, which can be seen as round holes through the upper vertical part. The latter are broadest or highest immediately before the lamellae bend towards the pseudostigmata. Another and smaller vertical blade can be seen in continuation of the first further posteriorly on a narrow longitudinal ridge, which runs to an arch on the anterior border of the hysterosoma. Lamellar hairs have not been observed. Their pore may be set at a short distance

behind the tip of the lamellae. The interlamellar hair is set laterally to the second vertical blade. It is short and smooth. The pseudostigmatic organ is club-shaped, fig. 15 a.

In the middle of the anterior border of the hysterosoma there is an arch with a straight anterior border, sharp lateral edges, and almost parallel sides. The whole structure is more or less hyaline and it is difficult to see whether the sharp lateral edges fit into the curve behind the second vertical blade or they form one straight line with the anterior border of the structure. The lateral part of the lateral sides are apparently also vertical. The lateral sides are more strongly chitinized. They continue as keels over the dorsal surface running at the same time laterally. Behind the straight anterior border a small rounded arch can be seen and on either side of the latter the rounded, well chitinized shoulders. The hysterosoma is much narrower anteriorly than posteriorly. The hair *ta* is located in the middle of the retroverse keels. The notogastral hairs are short and smooth.

The ventral side agrees with that of the preceding species in all essential characters. Ad3 is, however, placed a little further posteriorly than ag; ag and ad3 more laterally and closer together than in *B. Wallworki*. This species is named after Dr. G. OWEN EVANS, England.

Keri-Keri: One specimen in thin moss on wet soil near a brook in a deep cleft with trees; one individual in moss on the ground in deep shadow.

Belloppia Shealsi n. sp.; fig. 16.

Colour pale ochre. Length about 0.19 mm.

The lamellae in this very small species incline strongly and only their distal third are parallel. They are almost equally broad throughout though tapering distally. The tiny lamellar hair is situated at some distance behind the tip of the lamella. Between the lamellae there are two short S-shaped ridges, in the anterior curve of which the interlamellar hair is situated. It is longer and thicker than the lamellar hair and smooth. The pseudostigmatic organ is club-shaped, in a dorsal view ball-shaped. The posterior end of the S-shaped ridge reaches the anterior border of an arch set on the anterior margin of the hysterosoma. The anterior border of this arch is apparently straight, but in front of it a rounded arch set at a deeper level can be seen. The sides of the arch continue backwards over the dorsal surface of the hysterosoma as slightly diverging keels on which the hair *ta* is situated. On either side of the arch the slightly protruding shoulders can be seen. The notogastral hairs are smooth and rather short.

Ag and ad3 from the two sides are set in a broad curve, the distance ag-ad3 being shorter than the distance ag-ag. This species is named after Dr. J. G. SHEALS, England.

Puketi: Four specimens in thick moist to wet moss on the ground in native forest.

Waitakere: One individual in moist moss on the ground under *Manuka* shrub.

Pauatahanui: One specimen in thick moist moss under a tree-fern in native forest.

Milford: Numerous in thick moist moss on dead branches in a tree-fern forest.

Miropia n. gen.

A peculiar *Oppia* (*mirus* 'peculiar') with arched hysterosoma covering the insertion of Legs III–IV. Rostrum tripartite. True costulae absent, replaced by chitinous folds. Lamellar hairs absent. Interlamellar hairs very long. Pseudostigmatic organs spherical. Anterior part of the hysterosoma a broad arch on either side of which the extremely long hair *ta* is situated. 8 pairs of notogastral hairs. Sternal plate broad, faintly chitinized. The lateral hairs of the epimeres set more medially than usual. 5 pairs of genital hairs. One pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad parallel to the anal field. All legs rather long. One claw, which is extremely pointed, sickle-shaped.

Miropia zealandica n. sp.; fig. 17.

Colour light brown. Length about 0.33 mm.

The tip of the rostrum is divided into three parts the middle one of which apparently is broader than the lateral ones. The rostral hairs, which are set on the dorsal surface behind the two incisions, are thin, ?smooth, and they reach by most of their length beyond the tip of the rostrum. Lamellar hairs are absent. There are no lamellae, but a few curved folds issuing from the anterior border of the pseudostigmata run forwards for a short distance. Between these folds there is a greyish field, which ends posteriorly in two faint edges medially to the interlamellar hairs, fig. 17 a. Near the edge a light spot can be seen. The interlamellar hairs, which are smooth and very thin towards the tip, are about twice as long as their mutual distance. The exopseudostigmatic hair is rather long. The pseudostigmatic organ has a ball-shaped head on a very short stem. On the posterior border of the pseudostigma there is a small tubercle. The sides of the propodosoma behind Leg I have strong chitinous keels, and Tectop. I projects like a broad crest.

The hysterosoma is arched and not much longer than broad. It is broadest across the middle, slightly tapering towards either end. The anterior margin forms a broad arch, the sides of which continue as short keels on the dorsal surface of the hysterosoma. The latero-anterior borders of the hysterosoma are broad shoulders. There are 8 pairs of notogastral hairs, of which the anterior one, *ta*, which is set on the side of the arch, differs from the rest by being extremely long, as long as the interlamellar hair. It is smooth and very thin. The remaining hairs, which are situated as shown in fig. 17, are thin, smooth, and rather short. P1 and r3 are missing.

Fig. 17 b shows the ventral side. There is a broad, faintly chitinized, sternal plate between Epimeres I–II. Between the fused Epimeres III–IV from the two sides the sternal ridge is scarcely discernible. The sejugal apodemata are dark brown and broad. The hair 1 c is displaced rather medially, the same is the case with 4 c. The

genital field, which is proportionately big, is anteriorly surrounded by a ridge, which laterally to the anterior margin is divided into two ridges running more or less parallel to Acetabulum IV. There are five pairs of long, smooth genital hairs. The aggenital hairs are exceptionally long. Also the anal and the adanal hairs are long, all are smooth. Ad3 is preanal, ad2 is located off iad, which is parallel to the anal field. Ad1 is postanal. There is no sculpture to be seen anywhere. The legs are long and thin with soft, smooth hairs. Fig. 17 c shows Leg I. The genu and the tibia have a very long solenidion. The claw, which is situated on a short stalk, is sickle-shaped and extremely thin towards the tip, figs. 17 d–e. Near its base there is a pointed ventral tooth. Tibia II has a proportionately short solenidion, Genu II a very long one. Tibiae III–IV both have a similar long solenidion as Tibia I.

Lake Rotoiti: Two specimens in wet moss and liverworts on a vertical slope above a small brook in *Nothofagus* forest.

Paroppia n. gen.

This genus deviates from other Oppiidae by the shape of Tibia I being drawn out into a long process on the end of which Solenidion I is placed. The tip of the rostrum with a broad hyaline "lip". Lamellae absent. Lamellar and interlamellar hairs present. Pseudostigmatic organ sickle-shaped, serrate. A lateral keel issuing from the pseudostigma ends in a tubercle. No bridge between propodosoma and hysterosoma. 10 pairs of notogastral hairs. Ta on the anterior border. Ventral side with a broad sternal plate. The curved ridge in front of the genital field ends laterally in front of Acetabulum IV. Four pairs of genital hairs, one pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad parallel to the anal field. The legs with short swollen joints.

Paroppia Lebruni n. sp.; fig. 18.

Colour yellowish to white. Length about 0.27 mm.

The tip of the rostrum appears swollen due to a broad hyaline lip. The rostral hairs, which are placed rather close together, reach by about one third of their length beyond the tip of the rostrum. They are slightly barbed. The lamellar hairs are located in the middle of the propodosoma. They are thin and short, about as long as their mutual distance. The interlamellar hairs are about as long as the lamellar hairs. The exopseudostigmatic hairs are tiny. Between the interlamellar hairs there are eight small light spots in two rows. The pseudostigmatic organs, which are as long as their mutual distance, are sickle-shaped, the distal third coarsely serrate, especially on the posterior border. Issuing from the side of the pseudostigma there is a short ridge with a furrow. The ridge ends in a retroverse tubercle, which corresponds to a small tubercle or tooth on the anterior border of the hysterosoma. Round this ridge the integument is covered with small tubercles.

The hysterosoma is a little longer than broad. Its posterior end is rounded, its anterior end arched. The arch is rather pointed with sloping lateral sides. Laterally

to the arch there are on either side two teeth, one opposite the tubercle on the ridge, the other corresponding to the posterior part of the side of the propodosoma, which ends in a free tip. The hair ta is missing, but its hair pore can be seen behind the medial tooth on the anterior border of the hysterosoma. The notogastral hairs are strong, stiff, and rough. The lyrifissure im is located near r3.

The ventral side is shown in fig. 18 a. The sternal plate, which is faintly chitinized, is expanded between Epimeres II, the hairs 2 a from the two sides separated by a correspondingly long distance. The sejugal apodemata are connected by a broad plate. The curved ridge following the anterior border of the genital field is faint. It reaches the side of the hysterosoma in front of Acetabulum IV. The genital plate has four long hairs, viz. one on the anterior border, the second behind the first, but more laterally, and two in their usual position in the latero-posterior corner. The distance between ag and ad3 is only half as long as the distance ag-ag. Ad2 is located off the middle of the side of the anal field and off iad, which is parallel to the anal field. Ad1 is postanal. The legs are rather short and most of the joints are swollen distally. Fig. 18 b shows Tibia and Tarsus I. Solenidion I of Tibia I is set on the end of the process, Solenidion II further proximally at the base of the process. The Solenidia of Tarsus I are different, one being short and broad, the other longer, curved, and thin. Near the base of the claw, there is a retroversely curved hair. This species is named after Dr. Ph. LEBRUN, Belgium.

Lake Rotoiti: A few specimens in moist moss on the ground; one in wet moss and liverworts on a vertical slope above a small brook, both localities in *Nothofagus* forest.

Fox Glacier: Many individuals in dead leaves between logs in native forest.

Milford: One specimen in thick, moist moss on the ground in *Nothofagus* forest.

Solenoppia n. gen.

A very small *Oppia* with broad and short solenidia of Tarsi I-II, Tibiae I-III, and Genu III. Faint lamellar ridges. Lamellar and interlamellar hairs present. Short ridges between the interlamellar hairs. Pseudostigmatic organs hairy clubs. 10 pairs of notogastral hairs. Four pairs of genital hairs, one pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad situated obliquely off the anterior margin of the anal field. Legs short with swollen joints as in *Suctobelba*.

Solenoppia Grandjeani n. sp.; fig. 19.

Colour pale ochre. Length about 0.18 mm.

The rostrum is very broad. The rostral hairs, which are situated on the dorsal surface on a dark band, are short, curved, and ?barbed. The dorsal side of the rostrum and the space between the lamellae are wrinkled. The lamellae are distinct only distally, where they, together with a slightly curved translamella, form a semi-circular ridge. Their posterior end runs partly towards the pseudostigma, partly to-

wards the interlamellar hairs, in front of which a reticulate or wrinkled pattern can be seen. The lamellar and the interlamellar hairs are very short and thin. Between the interlamellar ridges there are two short J-shaped ridges, which open medially. Their anterior end encircles a light spot, their posterior end reaches the anterior border of the hysterosoma. The exopseudostigmatic hairs are tiny. The pseudostigmatic organs are broad clubs with three hairs on their distal ends and about 4–5 ?short hairs on their lateral borders, fig. 19 a. Due to their minute size the exact appearance of the organs is difficult to tell.

The hysterosoma is considerably longer than broad. It is broadest posteriorly. Its anterior dark border projects, forming an arch with sloping sides. On the latter a short tooth can be seen behind the pseudostigma. There are 10 pairs of notogastral hairs, which are set as shown in fig. 19. The hair *ta* is missing, but its hair pore can be seen medially to the pseudostigma. The hairs are more or less erect, ?smooth, and fairly strong. *Ti* is set farther anteriorly than *te*.

Fig. 19 b shows the ventral side. The sternal plate is broadest between Epimeres I, and narrowest between Epimeres II. The genital field is small as compared with the anal field. There are four pairs of genital hairs, viz. two in a longitudinal row behind the anterior border and two at the latero-posterior border. The genital field is surrounded on all sides by a broad dark band. *Ad3* is preanal, *ad2* is set at a short distance behind *iad*, which is set obliquely off the anterior border of the anal field. The latter is also surrounded by a dark frame. *Ad1* is postanal. Tectop. IV ends in a blunt tooth.

All legs are short and the joints are swollen, figs. 19 c–d. Fig. 19 c shows Leg I, fig. 19 d Leg II. As I have been unable to dissect the mite and to lay bare the legs, the legs are drawn in situ in a lateral view and consequently not all the hairs could be studied. Figs. 19 c–d, however, show the extremely broad solenidia of Tarsi and Tibiae I–II. In Tarsus I only one of the solenidia is broad, the other of ordinary appearance, in Tarsus II both solenidia are broad. In Tibia I only the distal solenidion is broad. A similar broad and short solenidion is found also in Genu III and Tibia III, but not in Leg IV. This species is named after Dr. FRANCOIS GRANDJEAN, France.

Waitakere: One specimen in liverworts and small ferns on a log in native forest.

Pauatahanui: One specimen in moist liverworts on wet clay on a vertical slope by the roadside in a forest; four individuals in thick moss, grass, and small plants at the foot of a tree-fern in native forest.

Solenoppia Travéi n. sp.; fig. 20.

Colour pale ochre. Length about 0.23 mm.

S. Travéi is very similar to *S. Grandjeani*. It is, however, bigger. The lamellar ridges form an irregular oval, which posteriorly ends in two V-shaped ridges. The pseudostigmatic organs of the two species are apparently alike, fig. 20 a. The anterior border of the hysterosoma is more pointed than in the preceding species and forms a

semicircular ridge at either end of which the hair *ta* can be seen. The notogastral hairs have a position different from that of *S. Grandjeani*. Thus *te* and *ti* from the two sides are situated on a transverse line.

On the ventral side *iad* is situated a little further posteriorly, i.e. behind the anterior border of the anal field. The broad solenidia of Tarsi I–II, Tibiae I–III, and Genu III are perhaps not quite so broad as in the preceding species. This species is named after Dr. J. TRAVÉ, France.

Lake Rotoiti: Four individuals in moist to wet ?*Leucobryum* on a slope (?spring locality); one specimen in wet liverworts and moss on a vertical slope above a small brook, both localities in *Nothofagus* forest.

Fox Glacier: One specimen in thick moist moss in native forest on Lake Matheson.

Milford: Three individuals in luxurious moss on dead branches in tree-fern forest; one specimen in wet moss on a stone in *Nothofagus* forest.

Solenoppia Taberlyi n. sp.; fig. 21.

Colour whitish to very pale ochre. Length about 0.17 mm.

This tiny mite has a broad, regular, lamellar arch, which posteriorly reaches the pseudostigmata. Lamellar hairs have not been observed. Between the interlamellar hairs there is a faint W-shaped figure, the tip reaching the anterior border of the hysterosoma. Within the W-shaped figure there are two light spots and in front of these there are on either side two smaller ones in an oblique row. The pseudostigmatic organ is a pointed club on the posterior border of which there are 6 fairly long radiating branches, fig. 21 a. Exopseudostigmatic hairs have not been observed.

The hysterosoma is an oval apart from the anterior border, which is slightly angular, being slightly pointed behind the W-shaped figure, and having a small edge behind the pseudostigmata. The hair *ta* is missing. The notogastral hairs are apparently shorter than those of the two preceding species, perhaps due to their more erect position. *te* and *ti* from the two sides are situated in a line.

On the ventral side the fissure *iad* is set obliquely off the anterior border of the anal field. It is long and very distinct. This species is named after Dr. GEORGES TABERLY, France.

Keri-Keri: Two specimens in moss on a slope above a small brook, shaded by tall trees.

Operculoppia n. gen.

The generic name refers to a lid (*operculum*), which covers the opening of the pseudostigma. The rostral hairs are situated laterally. Lamellae are more or less indistinct. Interlamellar and exopseudostigmatic hairs tiny or absent. Tutorium present only on the sides. Posterior part of the sides of the propodosoma straight. Pseudostigmatic organs club-shaped, not branched. 10 pairs of notogastral hairs, *ta* tiny. Four

pairs of genital hairs. The hair 1 a far anteriorly. Legs with short, lumpy joints. All solenidia rather short. Tarsi usually with two distal tips.

Operculoppia Kunsti n. sp.; fig. 22.

Colour brown. Length about 0.60 mm.

Unfortunately the only specimen found is a little crushed, so its exact size and shape perhaps are not quite correct.

The rostral hairs are set rather laterally. They are barbed, bent medially, and they meet in front of the tip of the rostrum. The lamellar hairs, which are set in a greyish, densely punctate middle field, are thin, barbed, and shorter than their mutual distance. Lamellae are not present, but a dark shade or frame surrounds the middle field. Interlamellar and exopseudostigmatic hairs are absent. The light spots in the posterior part of the propodosoma are very distinct and crowded. In front of them there is a light curved line with a dark border. The opening of the pseudostigma is covered by a lid situated on the top of a tall hyaline cylinder, fig. 22 a. There is no posterior lobe on the pseudostigma. The pseudostigmatic organ has a disk-shaped head on a comparatively long and thin stalk. The posterior part of the sides of the propodosoma, when seen in a dorsal view, is straight, ending in a posterior blunt tooth. This part of the propodosoma is covered with very small granules. A tutorium is not present on the dorsal surface, only laterally.

The hysterosoma is circular. The anterior border is slightly arched in the middle. Ta is scarcely discernible. The notogastral hairs are short, stiff, and barbed. The integument is extremely finely punctate. Part of the ventral side is shown in fig. 22 b. The hair 1 a is set far anteriorly. Behind the sejugal apodemata there are two small crests (the hair 3 b, which in the following species, *O. Jelevae*, is set behind this crest, cannot be seen). There are four pairs of genital hairs. The lyrifissure iad is located obliquely to the anal field. When preserved, the legs are highly bent (see figs. 22 and 23). The joints are short and broad. All solenidia are rather short, the ordinary hairs, i. e. a medial hair on Genu I and Tibia I are very long. The tarsi have two small distal tips, see figs. 23 c, 24 b. This species is named after Dr. MIROSLAV KUNST, Czechoslovakia.

Waitakere: One specimen in liverworts and *Leucobryum* on a log in native forest.

Operculoppia Jelevae n. sp.; fig. 23.

Colour brown. Length varying from 0.61 to 0.65 mm.

A rather lumpy species with highly arched propodosoma, the rostrum being at a much lower level than i. a. the lamellar hairs. The rostral hairs, which are situated on the sides, are bent medially and reach by half their length beyond the tip of the rostrum. They are distinctly barbed. In a dorsal view a middle field bordered by dark parallel lamellae and an anterior translamellar ridge cover most of the propodosoma. The middle field is finely punctate. The lamellar hairs, which are located at a short

distance behind the transverse ridge, are about two thirds as long as their mutual distance. They are barbed and bent medially. Interlamellar hairs are absent, but their long pores, which are broadest laterally, can be seen. Between the latter there are crowded, light spots, at least eight, the posterior ones of which lie close together, whereas there is some distance between the anterior ones. Exopseudostigmatic hairs are absent. The pseudostigmatic organ is lanceolate. It seems very short because it is bent backwards, upwards, and forwards. When laid bare it is long and slender, the head pointed, fig. 23 a. Whereas the anterior part of the propodosoma is broad, dome-shaped, the posterior part has parallel sides. There are no tubercles on the sides of the propodosoma.

The hysterosoma is a little longer than broad. It is rounded at either end. The anterior border is a broad, dark rim. The hair *ta* is scarcely discernible. The notogastral hairs are moderately long, curved, barbed, and very thin towards the tip. The fissure *im* is set immediately laterally to *r3*. The integument is finely punctate.

The ventral side is shown in fig. 23 b. The hairs 1 a and 1 b are rather close together, 1 a unusually far anteriorly. 3 b is set on the posterior border of the sejugal apodema protected by a small dark crest. There are four pairs of genital hairs, the two posterior ones of which are close together. Ad3 is set at a level a little in front of the anal field. Iad is placed obliquely to the anal field. The anal hairs are set unusually far laterally.

The legs are rather short. The femora are edged and swollen distally, fig. 23 c. The hairs of the legs are barbed and rather long. All the tarsi have two distal short tips. All solenidia are short. Tibia IV has a medial, distal, brush-shaped hair, Tarsus IV two medial, shovel-shaped hairs.

Some specimens differ from the type specimen by being slightly bigger, more distinctly punctate both in the middle field and on the hysterosoma, by having stronger lamellar hairs, and *ta* a little longer. This species is named after Dr. MARA JELEVA, Bulgaria.

Keri-Keri: Several individuals in a cleft with water (STAGAARD coll.); a few specimens in thin moss on the ground near a brook in shadow.

Waitakere: Two specimens in moss and grass under bushes in a garden.

Fox Glacier: Three specimens in thick moss and dead leaves in native forest; a few individuals in grass and low plants by the roadside in a mixed *Nothofagus* forest.

Milford: One specimen in thick moss on the ground in *Nothofagus* forest; several individuals in dead *Nothofagus* leaves.

Operculoppia crassiseta n. sp.; fig. 24.

Colour brown. Length about 0.82 mm.

The rostral hairs, which are situated on the dorsal surface, but rather laterally, are barbed, curved, and they almost meet in front of the tip of the rostrum. The lamellar hairs, which are set at a short distance behind the anterior part of the tall

lamellar arch, are parallel, thick, stiff, straight, and densely barbed. They are approximately one and a half times longer than their mutual distance. The lamellae are parallel, and the arch is as long as two thirds of the propodosoma. The interlamellar hairs, which are situated laterally in a short transverse pore, are very short. A hyaline lid covers the opening of the pseudostigma. The pseudostigmatic organ is lanceolate, the distal third being directed forwards. The tip is set with tiny bristles. Exopseudostigmatic hairs have not been observed. The distance between the light spots, which are located between the interlamellar hairs, is longer than the width of the spots.

The hysterosoma is an oval, the anterior end perhaps being slightly narrower than the posterior end and projecting as far as the posterior border of the pseudostigmata. There are two pores on the anterior border, but I am unable to tell whether they represent ta or ia. The notogastral hairs are short, stiff, and smooth.

The ventral side is shown in fig. 24 a. There are four pairs of genital hairs. Ad3 are preanal and are situated rather laterally. Iad is situated obliquely to the anal field; ad2 is located obliquely behind iad, i.e. further laterally, ad1 is postanal. Tectop. IV ends in a sharp tooth. The femora have distally a thick, rough or barbed hair, which is equally thick throughout. All the solenidia are rather short. The claw is extremely strong, fig. 24 b. Ventrally on Tarsus II there are two short and thick hairs, a similar one on Tibia II. At the base of the claw two short conical tips can be seen.

Arthur's Pass: One specimen in *Nestor notabilis* nest (C. MITCHELL, Bish. Mus. Honolulu coll.).

Membranoppia n. gen.

Characteristic by having a narrow membrane, which lies across the pseudostigma like a narrow bridge. The notogastral hairs te, ti, ms, r3, and r2 are located behind each other. Very long solenidion on Tibiae I and IV and on Genus I–II. Lamellae present only in their anterior part. Rostral hairs inserted laterally. Lamellar and interlamellar hairs present. Pseudostigmatic organs club-shaped. The genital field with six pairs of hairs. One pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad set obliquely to the anal field.

Membranoppia Krivoluzkyi n. sp.; fig. 25.

Colour pale ochre to light brown. Length about 0.245 mm.

The rostral hairs, which are inserted far laterally, reach by half their length beyond the tip of the rostrum. In the middle of the propodosoma there is a lamellar arch, the posterior part of which is faintly developed only. The translamella is almost straight. The lamellar hairs, which are set on the lamellae and a little behind the translamella, are a little shorter than their mutual distance. The interlamellar hairs are scarcely discernible. Across the pseudostigma there is a thin membrane issuing from the posterior border of the propodosoma. It is broadest posteriorly and across the pseudostigma it is like a narrow bridge. The pseudostigmatic organs are short, broad clubs, fig. 25 a. Exopseudostigmatic hairs are absent. Between the pseudo-

stigmata there are four light spots and in front of these, there is a faint transverse line, which separates the posterior part of the middle field from the anterior part.

The anterior end of the hysterosoma is a little narrower than the posterior end. The anterior border is darker than the surroundings, broad, and well chitinized. Two small pores for ta can be seen on it. The notogastral hairs are smooth, rather thin, and short. The hair pores are distinct. Te is set far anteriorly, ti behind it. Together with ms, r3, and r2 they form a longitudinal row. Laterally to r3 there is a distinct gland.

The ventral side is shown in fig. 25 b. The sternal plate and the apodemata are dark along all sides and have a bright furrow through them. There are six pairs of genital hairs, which are set almost in a longitudinal row. Ad3 is situated off the anterior border of the anal field. The lyrifissure iad is located obliquely to the anal field, rather far anteriorly. The legs are not very long. The solenidia of Tibiae I, IV and of Genus I–II are extremely long. That of Tibia II is proportionately long and thin. This species is named after Dr. D. KRIVOLUZKY, U.S.S.R.

Lake Rotoiti: Four individuals in thick ?*Leucobryum* in *Nothofagus* forest.

Milford: Three specimens in thick moss on dead branches in tree-fern forest.

Membranoppia Sitnikovae n. sp.; fig. 26.

Colour light brown. Length about 0.38 mm.

M. Sitnikovae shows a great similarity to *M. Krivoluzkyi*. The rostral hairs are set far laterally. The lamellar hairs, which are set on the end of short lamellar ridges, which do not reach the pseudostigmata, are strong and about one and a half times longer than their mutual distance. A shade of a translamella can be seen. The interlamellar hairs are scarcely discernible. Between the latter there are four light spots. The posterior part of the middle field is more greyish than the anterior part. A faint line indicates the two parts. Across the pseudostigma there is, as in the preceding species, a narrow membranous bridge coming from the posterior part of the propodosoma. On the posterior margin of the pseudostigma there is a lobe. The exopseudostigmatic hair is moderately long. The pseudostigmatic organ is a longish club, fig. 26 a.

The hysterosoma is slightly arched anteriorly, broader posteriorly. Its anterior margin is very broad and dark brown. The hair ta is missing. Ti is located behind te, which is situated rather close to the anterior margin of the propodosoma.

The ventral side agrees with that of the preceding species. The solenidia of Tibiae I and IV are very long, those of Tibiae II–III somewhat shorter. Distally on Tibia IV there is a very long, stiff hair. This species is named after Dr. L. SITNIKOVA, U.S.S.R.

Rotorua: Two specimens in moss on a vertical slope grown with ferns, near Mirror Lake.

New Plymouth: One specimen in moist to wet *Selaginella* in native forest.

Fox Glacier: A few specimens in dead leaves in native forest.

Milford: Three individuals in wet moss in *Nothofagus* forest.

Membranoppia Karppineni n. sp.; fig. 27.

Colour pale light brown. Length about 0.26 mm.

This species, which has most characters in common with *M. Krivoluzkyi* can be distinguished by the absence of a translamellar ridge, the short and narrow lamellar ridges, but especially by the shape of the pseudostigmatic organ, which is a slender club set with minute hairs on the distal border, which make it appear fringed (cp. fig. 25 a with fig. 27 a, which shows different views of the pseudostigmatic organ). The solenidia of Tibia II is shorter and broader than in *M. Krivoluzkyi*. This species is named after Dr. *E. Karppinen*, Finland.

Nelson district: Many individuals in moist moss by the roadside in *Nothofagus* forest at Upper Takaka.

Globoppia sp.; fig. 28.

Colour brown. Length about 0.68 mm.

As the length of the notogastral hairs within the *Globoppia* species is very variable and the hairs ti and ms in the only specimen found are missing, this species will not be established as a new species.

It is a typical *Globoppia* with a tiny globular pseudostigmatic organ, barbed lamellar hairs, short interlamellar hairs, and a well developed exopseudostigmatic hair. The hysterosoma is globular and ta is tiny. The notogastral hairs, which are of different length, are barbed.

There are six pairs of genital hairs. The aggenital hairs are located midway between the genital and the anal field. Ad3 is placed off an1, ad2 off an2. The fissure iad is set obliquely to the anal field a little in front of ad2. All the legs are long and slender. The solenidia are rather long. That of Tibia II is short and broad. Coxa III with five short teeth.

Christchurch: One specimen in a thin layer of moss on a slope by the roadside, in shadow.

Globoppia nidicola n. sp.; fig. 29.

Colour brown. Length about 0.57 mm.

The rostral hairs, which are longer than their mutual distance, are thin, slightly barbed, and they reach by almost half their length beyond the tip of the rostrum. The lamellar hairs, which are situated in the middle of the propodosoma, are thin, slightly barbed, and as long as the rostral hairs. Their mutual distance is the same as that of the rostral hairs. The interlamellar hairs are very small. The exopseudostigmatic hairs are moderately long. The pseudostigmatic organ is a tiny ball on a short, thin stalk. The light spots between the interlamellar hairs are indistinct. There are apparently three close together on either half. On the posterior border of the pseudostigma there is a tubercle opposite a brown curved ridge behind the pseudostigma.

The hysterosoma is circular. Ta is distinct. The remaining hairs are very thin,

slightly barbed, and of different length, te, ti, ms, r3, and r2 being equally long and much longer than those on the posterior border.

There are six pairs of genital hairs. Ad3 is placed off the anterior border of the anal field at a distance almost as long as the width of the latter. Ad2 is set behind iad, which is located obliquely to the anal field. The hairs ad1 are situated on either side of a short triangular ridge behind the anal field. All legs are long and slender. Coxa III has only one tiny tooth on its anterior border.

Greymouth: One specimen in *Puffinus griseus* nest (C. MITCHELL, Bishop Mus. coll.).

Hamoppia n. gen.

Immediately behind the proximal part of Femora II there is a small hook (*hamus*). Lamellae indistinct. Pseudostigmatic organs lanceolate. Pseudostigma with a very big posterior lobe situated opposite a small rounded tubercle below the anterior margin of the hysterosoma. 10 pairs of notogastral hairs, ta tiny. Six pairs of genital hairs, one pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad set obliquely to the anal field.

Hamoppia Lionsi n. sp.; fig. 30.

Colour light brown to brown, the propodosoma being considerably darker than the hysterosoma. Length about 0.46 mm.

The propodosoma is rather long; the rostrum is pointed. On the dorsal surface of the rostrum there is a V-shaped light spot. The rostral hairs, which are set on the dorsal surface, are long, curved, and unilaterally barbed. They reach by one third of their length beyond the tip of the rostrum. The lamellae form a long regular arch, which is a little broader anteriorly. The part which is set between the lamellar hairs is faintly developed. The lamellae are strongest immediately behind the lamellar hairs. These are thin and as long as their mutual distance. The interlamellar hairs, which are situated very close to the posterior part of the lamellae, are scarcely discernible. The light spots between the interlamellar hairs are very indistinct. The exopseudostigmatic hairs are very thin. On the posterior margin of the pseudostigma a broad, brown lobe can be seen. It corresponds to a dark brown, round knob hidden by the anterior border of the hysterosoma, and it can be seen through the latter laterally to the hair ta. The pseudostigmatic organs are slender, lanceolate, and set with minute bristles along their posterior border. They are a little shorter than their mutual distance. Laterally to the pseudostigma a number of short teeth can be seen, in front of which there is a long hook with its tip directed upwards. It is situated behind Leg II. A similar hook can be seen at the base of Leg I. Laterally to the exopseudostigmatic hairs the integument is covered with very small dark granules. The middle field within the lamellae is densely punctate.

The hysterosoma, which is longer than broad, is broadest across the middle. The anterior margin is only faintly chitinized. The hair ta is tiny. It can be seen

behind the pseudostigma. The notogastral hairs are rather long, very thin towards the tip, and slightly barbed. *Te* and *ti* from the two sides are set on a transverse line. The fissure *im* is set at a good distance in front of *r3*. The integument is densely punctate.

The ventral side is shown in fig. 30 a. It does not show any characteristic features. The sternal plate is well developed. Between Apodemata II there is a broad plate with two bright holes. There are six genital hairs on each plate, one pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. The lyrifissure *iad* is situated obliquely to the anal field. The legs are slender and rather long. The solenidion of Tibia II is rather long and it is thin at the tip. This species is named after Dr. J.-C. LIONS, France.

Lake Rotoiti: One specimen in thick moist ?*Leucobryum* near a spring in *Nothofagus* forest.

Hamoppia Thamdrupi n. sp.; fig. 31.

Colour light brown. Length about 0.50 mm.

Behind the tip of the rostrum there is a V-shaped fissure. The rostral hairs, which are slightly barbed, reach by more than half their length beyond the tip of the rostrum. They are situated rather close together. The middle field of the propodosoma is bordered laterally by curved greyish faint chitinizations. They are distinct only in the middle. The lamellar hairs, which are placed unusually close together, are thin and about twice as long as their mutual distance. In front of them several transverse wrinkles can be seen. The interlamellar hairs, which are situated off the anterior pair of the light spots, are very thin and rather short. The pseudostigmatic organs are long, lanceolate, slightly broader in their distal half, then tapering towards the tip. They are slightly serrate, especially along the posterior border. They are at least as long as their mutual distance. On the posterior margin of the pseudostigma there is a broad, brown lobe and opposite it a longish, brown tubercle, which is partly hidden by the anterior border of the hysterosoma. The exopseudostigmatic hair is tiny. The chitinous tubercles laterally to the pseudostigmata are very small. The integument of the middle field is finely punctate.

The hysterosoma is a little longer than broad. The hair *ta* is very short and located over the brown tubercle opposite the lobe on the pseudostigma. The notogastral hairs are long, flexible, and very thin towards the tip. They are slightly barbed. The integument of the hysterosoma is extremely finely punctate.

The ventral side agrees with that of *H. Lionsi*, fig. 30 a. There are six pairs of genital hairs; the aggenital hairs, the adanal hairs, and the fissure *iad* are set like those of *H. Lionsi*. Behind Leg II there is a tiny hook. There is none behind Leg I. Several of the joints of the legs have yellow light spots arranged symmetrically on corresponding legs. This species is named after Dr. H. M. THAMDRUP, Denmark.

Waitakere: One specimen in moss and grass in native forest.

Laminoppia n. gen.

All femora with broad laminae. The lamellae form a long arch. Pseudostigmatic organs rod-shaped. The hysterosoma is circular, with a well chitinized broad anterior margin. 10 pairs of notogastral hairs, ta not different from the remaining hairs. Four pairs of genital hairs, one pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. Iad set obliquely to the anal field.

Laminoppia Blocki n. sp.; fig. 32.

Colour brown. Length about 0.35 mm.

The propodosoma is short, broad, and highly arched, the rostrum being at a much lower level than the lamellae. The rostral hairs, which are situated on the sides, are very thin and rather short. They just reach beyond the tip of the rostrum. The lamellae and the translamella form an even arch with parallel sides. It reaches across two thirds of the length of the propodosoma. The lamellar hairs, which are situated at a short distance behind the anterior margin of the arch, are very short and thin. Interlamellar and exopseudostigmatic hairs have not been observed. The pseudostigma has on its posterior border a broad lobe corresponding to a blunt tooth below the anterior border of the hysterosoma, fig. 32 a. The pseudostigmatic organs are equally thick throughout, the end set with minute bristles. They are probably almost as long as their mutual distance. The integument is smooth, i.e. without small chininous tubercles laterally.

The hysterosoma is circular. The anterior margin is very broad and dark. The hair ta is developed like the remaining 9 pairs of notogastral hairs, all of them being small and thin. The lyrifissure im is situated laterally to r3.

The ventral side is shown in fig. 32 b. It is characteristic of this species that the hairs 1 b, 3 b, and 4 b are displaced further medially than usually found within Oppiidae. There are four pairs of genital hairs, one pair of aggenital hairs, three pairs of adanal hairs, and two pairs of anal hairs. The aggenital hair is found much nearer to the anal field than to the genital field. Ad3 is situated approximately off the anterior margin of the anal field, ad2 close behind iad, which is located obliquely to the anal field. On the posterior part of the anal plates there is a curved ridge, the posterior part of which more or less follows the posterior margin of the anal field, whereas the anterior ends turn forwards and medially.

The legs are rather short and provided with chitinous crests and laminae. Figs. 32 c–d show Genu, Tibia and Tarsus I and Leg IV, respectively. All the femora have broad laminae or keels, in Femora I–II they are distal, in Femora IV there is a keel along the whole ventral side, figs. 32 d. Also the coxae and the tibiae are furnished with keels although much narrower (see the figures). The tarsi end in two short tips, one on either side of the claw. This species is named after Dr. W. BLOCK, England.

Lake Rotoiti: A few specimens in mouldering *Nothofagus* leaves.

Milford. One specimen in wet moss in *Nothofagus* forest.

Amerioppia longiclava Ham. 1962; fig. 33.

Colour light brown. Length about 0.30 mm.

Waitakere: A few individuals in slightly moist moss and grass under bushes in a garden; several in moss and grass in the wood.

Rotorua: Several specimens in dry moss on the ground; numerous in many samples from moist dead leaves and moss, all in the thermal area; a single one at Lake Tarawera in moist moss and liverworts on a slope to the lake.

Pu Pu Springs: Numerous in almost dry moss under *Manuka* shrub.

Nelson: Two specimens in thin, moist moss on the ground in deep shadow at the water reservoir of the town.

Lake Rotoiti: Four specimens in thick moss and bone-dry lichens and *Lycopodium* in open *Manuka* shrub a few hundred feet above lake level.

Dunedin: Two specimens in moist penguin dung mixed with grass in a penguin's nest.

Amerioppia Woolleyi n. sp.; fig. 34.

Colour brown. Length about 0.34 mm.

The species within the genus *Amerioppia* can be distinguished almost exclusively by their size, the shape of the pseudostigmatic organs, the length and the position of the notogastral hairs. The pseudostigmatic organ is in *A. Woolleyi* a slender club, fig. 34 a, which is broadest distally. It is set with minute scales in transverse rows. The hair *ta* has not been observed. The notogastral hairs, 10 pairs, are of different length, *te*, *ti*, *ms*, *r3*, and *r2* being considerably longer than those on the posterior border, and a little longer than *r1*. They are slightly barbed. *R3* and *ms* from the two sides are situated almost in a transverse row. The distance *ms*–*ms* is at least twice as long as the distance *ms*–*r3*. The distance *r2*–*r1* is more than twice as long as *r1*–*r1*.

A. Woolleyi differs from almost all species of *Amerioppia* described so far by having pseudostigmatic organs, which are broadest distally; most species have lanceolate pseudostigmatic organs. *A. chilensis* Ham. 1962 (0.32 mm) in many ways reminds of *A. Woolleyi*, having club-shaped pseudostigmatic organs; the notogastral hairs are, however, much shorter, and it is a little smaller in size. *A. hexapilis* Ham. 1961 (0.45 mm), which also has club-shaped pseudostigmatic organs, has six long notogastral hairs, viz. *te*, *ti*, and *ms* from the two sides, and the notogastral hairs are much stronger; it is moreover considerably bigger. This species is named after Dr. *T. Woolley*, U.S.A.

Puketi: One specimen in thin dry moss and small plants scraped from the bark of a tree in native forest.

Waitakere: One specimen in moist moss and liverworts on the ground in native forest.

Rotorua: A few individuals in moist moss and dead leaves; several in thick moist *Leucobryum*, both localities in the thermal area.

New Plymouth: A single individual in thin moss on a trunk in native forest.

Pauatahanui: One specimen in moist dead leaves in ?cypress forest.

Hokitika: One individual in luxurious green moss under trees on a river bank.

Fox Glacier: A few individuals in luxurious moss on a log in native forest.

Lancetoppia Sellnicki n. sp.; fig. 35.

Colour brown. Length about 0.60–0.62 mm.

The rostral hairs, which are a little longer than their mutual distance, are slightly serrate. The lamellar hairs, which are situated on two dark chitinous scales, are about one and a half times longer than their mutual distance. Lamellae are absent, but in this species and perhaps in most *Lancetoppia* species a shadow of a transverse ridge between the lamellar hairs can be seen and likewise a dark shadow in the usual position of the lamellae. In front of the transverse ridge this species has two other transverse ridges. The interlamellar hairs are short. The exopseudostigmatic hair is tiny. The pseudostigmatic organs, which are bent backwards and outwards in a curve, are about equally thick throughout, pointed at the tip and slightly rough. Very characteristic of this species are numerous small dark chitinous tubercles laterally and in front of a smooth middle field located between the lamellar and the interlamellar hairs. Similar tubercles along the sides both in front of and behind Leg 1 can be seen. They give the outlines a serrate appearance.

The hysterosoma is as broad as it is long. On its anterior border there are two indistinct tubercles opposite a lobe on the posterior border of the pseudostigmata. The hair *ta* is distinct. *Te*, *ti*, *ms*, and *r2* are equally long, *r3* slightly shorter. They are almost smooth. *Te* and *ti* from the two sides are situated on a transverse line. This species is named after Dr. M. SELLNICK, Germany.

Puketī: Several specimens in dead Kauri leaves and wet mosses on the ground in native forest.

Keri-Keri: Two specimens in thin moss on the ground close to a brook in a cleft, in deep shadow.

Lancetoppia Strenzkei n. sp.; fig. 36.

Colour light brown. Length about 0.47–0.49 mm.

L. Strenzkei differs from the preceding species, besides by its lighter colour and its smaller size, first and foremost by its very long pseudostigmatic organ, which is swollen in the middle, fig. 36 a. The chitinous scale at the base of the lamellar hair is less distinct and the many small tubercles laterally to and in front of the lamellar hairs are smaller and lighter. There are no tubercles on the anterior border of the hysterosoma opposite the lobe on the pseudostigmata, rather slight incurvations, but not always present and perhaps only an occasional appearance.

Fig. 36 b shows the ventral side, which agrees with that of *L. hexapili* Ham. (1962, p. 42, fig. 31 a), except that the fissure *iad* is longer. Thus a short *iad*, as mentioned in the generic diagnosis, cannot any longer be a generic character. The

aggenital hair is situated rather far posteriorly, closer to the anal field than to the genital field. This species is named after the late Dr. K. STRENZKE, Germany.

Keri-Keri: Several individuals in thick mosses, grass, and small ferns on the ground close to a brook in a deep cleft, in shadow.

Waitomo: A few specimens in dead leaves in shadow by the roadside.

Lake Rotoiti: A few individuals in thick dry mosses, lichens, and *Lycopodium* in mixed *Manuka-Nothofagus* forest a few hundred feet above lake level.

Lancetoppia Willmanni n. sp.; fig. 37.

Colour light brown to yellowish. Length about 0.53–0.57 mm.

Easily recognizable by the shape of the hysterosoma, which is longer than broad, by the very long and strong lamellar hairs, which reach the tip of the rostrum, and the long retrorse interlamellar hairs. The latter are approximately as long as their mutual distance. In front of the base of the lamellar hairs a transverse ridge can be seen, though it is not always equally distinct. There are no small tubercles in the surroundings of the lamellar hairs as in the two preceding species, only on the posterior part of the sides. The pseudostigmatic organs, which are slightly thicker in the middle, are distinctly barbed. The exopseudostigmatic hairs are moderately long.

On the anterior border of the hysterosoma there is behind the pseudostigmata a low rounded tubercle. The anterior chitinized border of the hysterosoma is broader, rounded, i. e. not so straight as that of the two preceding species. The hair *ta* is missing. The notogastral hairs are distinctly barbed.

On the ventral side, which in most characters agrees with that of *L. Strenzkei*, *ad3* is set in front of the anal field and very laterally, *ad2* off *iad*. The aggenital hairs are directed forwards and are set closer to the anal field than to the genital field. This species is named after Dr. C. WILLMANN, Germany.

Christchurch: Three specimens in moist *Polytrichum* and low plants on a vertical slope near oozing water.

Fox Glacier: One specimen in thick moist moss at the foot of a giant tree in native forest; several individuals in moss and dead leaves in the same locality.

Milford: Three individuals in dead leaves in *Nothofagus* forest.

Lancetoppia van der Hammeni n. sp.; fig. 38.

Colour brown. Length about 0.62 mm.

This species is rather similar to *L. Willmanni*, but can be distinguished from the latter among other characters by its very long lamellar hairs, which in a dorsal view reach beyond the tip of the rostrum, crossing off the base of the rostral hairs. The lamellar hairs are strong and barbed. Two faint parallel longitudinal lines can be seen running between the lamellar and the interlamellar hairs. The posterior third of the middle field thus formed is cut off by a transverse line. The middle field, which

is rather narrow, not much broader than the distance between the lamellar hairs, is punctate. In front of the lamellar hairs there is a faint transverse band. The interlamellar hairs are a little longer than their mutual distance and in the preparation always retroverse. The exopseudostigmatic hairs are tiny. The chitinous ring, which dorsally covers Acetabulum I ends in a free posterior tip. In a dorsal view a strong lateral tooth immediately in front of Leg II can be seen. The tooth lateral to the pseudostigma is likewise strong. Small tubercles are present only on the posterior part of the sides. The pseudostigmatic organs, which in a dorsal view are proportionately short, are almost equally thick throughout and slightly rough, fig. 38 a.

The hysterosoma is longer than broad. Its anterior margin is rounded. The hair *ta* has not been observed. The notogastral hairs are long and slightly barbed. On the anterior border of the hysterosoma there are two low tubercles set behind the pseudostigmata.

The aggenital hairs are directed forwards and located midway between the genital and the anal field. Ad3 is preanal and is set far laterally, ad2 off or behind iad. The hairs of the legs are strong and barbed. This species is named after Dr. L. VAN DER HAMMEN, Holland.

Keri-Keri: Found in small number in several samples collected in mosses, ferns, and low plants forming a green carpet on the ground close to a brook in a deep cleft with tall trees, always in deep shadow; also in grass, moss, and dead leaves on the slope of the cleft.

Lancetoppia Märkeli n. sp.; fig. 39.

Colour light brown. Length about 0.33 mm.

The rostrum is broad and the distance between the rostral hairs is long. The lamellar hairs, which are situated on the end of faint ridges, are very thin and not half as long as their mutual distance. In front of the lamellar hairs a short transverse ridge can be seen. The interlamellar hairs are very small. Exopseudostigmatic hairs cannot be seen. The pseudostigmatic organs, which are longer than their mutual distance, are thickest a short distance behind the tip. They are slightly rough.

On the anterior border of the hysterosoma and behind the posterior lobe on the pseudostigmata, there are two low brown rounded tubercles, which are more distinct than those in *L. Willmanni*. The anterior border of the hysterosoma is rounded, narrow in the middle. The hair *ta* is missing. The femora are very broad for most of their length.

Ad3 is situated off the anterior border of the anal field, ad2 behind iad. This species is named after Dr. K. MÄRKEL, Germany.

Waitakere: One specimen in moss and dead leaves in native forest.

Lake Rotoiti: One specimen in mouldering *Nothofagus* leaves.

Fox Glacier: One specimen in grass and low plants by the roadside in mixed forest between the glacier and the coast.

Lancetoppia Becki n. sp.; fig. 40.

Colour light brown. Length about 0.36 mm.

The lamellar hairs are rather thin and longer than their mutual distance. A transverse ridge can be seen in front of their base. There are several longitudinal rows of small tubercles between the lamellar hairs and the pseudostigmata. There are also some tubercles in front of the base of the lamellar hairs and laterally to the pseudostigmata. The interlamellar hairs and the exopseudostigmatic hairs are very small. Between the interlamellar hairs there are two short parallel retroverse scales. The pseudostigmatic organs, which are slightly rough, are broadest in the middle.

The anterior margin of the hysterosoma is a dark brown band. The hair ta is tiny. The notogastral hairs are long and slightly barbed.

Ad3 is situated off the anterior border of the anal field, ad2 behind iad. This species is named after Dr. L. BECK, Germany.

Puketū: One specimen in dead moist to wet leaves and moss under a Kauri tree.

Lancetoppia Knüllei n. sp.; fig. 41.

Colour pale ochre to yellowish-white. Length about 0.31 mm.

The rostral hairs are long and their mutual distance big, approximately as long as the hairs. The lamellar hairs are thin and about half as long as their mutual distance. Laterally to their base a faint oblique ridge can be seen. In front of the lamellar hairs there is a faint transverse line and two longitudinal lines directed obliquely backwards. The interlamellar hairs are scarcely discernible. The same holds good of the exopseudostigmatic hairs. The pseudostigmatic organs are very long, longer than their mutual distance. They are thickest a short distance behind the tip. They are slightly rough.

Behind the pseudostigmata there are on the anterior border of the hysterosoma two distinct brown tubercles, between which the anterior border is narrow and straight. The hysterosoma is not much longer than broad. The hair ta is missing. In a dorsal view only six pairs of notogastral hairs can be seen. In a ventral view the tiny hairs p1-p3 can be seen. The notogastral hairs are slightly barbed. Ad3 is preanal. This species is named after Dr. W. KNÜLLE, Germany.

Fox Glacier: One specimen in luxurious liverworts on the forest soil in native forest.

Lancetoppia Poppi n. sp.; fig. 42.

Colour brown. Length about 0.53 mm.

The rostral hairs reach only a little beyond the tip of the rostrum. They are approximately as long as their mutual distance. The lamellar hairs, which almost reach the base of the rostral hairs, are a little longer than their mutual distance. In front of their base a faint ridge can be seen. A shadow of a ridge runs obliquely

backwards from the lamellar hairs. Interlamellar and exopseudostigmatic hairs are missing. The pseudostigmatic organs are rather club-shaped than lanceolate, being broadest near the tip. Their distal two fifths, i.e. the head, is set with minute hairs. The integument is covered with small tubercles on the sides of the propodosoma.

On the anterior border of the propodosoma there are no tubercles corresponding to the lobe on the posterior border of the pseudostigmata. The hair *ta* is very small. The distance r_2-r_2 is unusually long. Ad3 is situated off the anterior margin of the anal field. This species is named after Dr. E. POPP, Germany.

Pauatahanui: One specimen in wet moss and liverworts in a depression grown with low *Scirpus* by a brook in native tree-fern forest.

Lancetoppia Schusteri n. sp.; fig. 43.

Colour light brown. Length about 0.46 mm.

The rostrum is slightly pointed. The rostral hairs are rather strong, barbed, and longer than their mutual distance. The faint lamellae or shadows of lamellae surround a middle field, the shape of which is very characteristic of this species, being broadest in the middle and bordered anteriorly by a curved band or ridge, which at either end reaches the base of the lamellar hairs. The integument of the middle field is more greyish than the surroundings, probably due to a fine punctation. The lamellar hairs, which are longer than their mutual distance and cross in front of the curved ridge, are slightly barbed. The interlamellar hairs, which are set in the posterior corner of the middle field, are as long as their mutual distance. The exopseudostigmatic hairs are moderately long. The pseudostigmatic organs are very long, smooth flagellants, which are directed backwards and after a strong bend outwards. On the posterior border of the pseudostigmata there is a rounded lobe. Faint wrinkles can be seen laterally to the middle field, especially anteriorly. Farther backwards the integument is furnished with small dark tubercles. The tooth laterally to the pseudostigma is very strong.

The hysterosoma is only a little longer than broad. Its anterior margin is rounded. The hair *ta* is missing. The notogastral hairs are long and slightly barbed. Tectop. IV is very short and ends in a strong tooth.

Fig. 43 a shows the ventral side. A characteristic feature is the broad sternal plate between Apodemata II with two light holes. Otherwise the ventral side agrees with that of other *Lancetoppia* species. Ad3 is placed off the anterior margin of the anal field, ad2 a short distance behind iad. Ad1 are set behind the anal field at either end of a short curved ridge. Between the dorsal and the ventral shield there is an oblong bladder, but it may be due to the preparation. The legs are long and slender. Tibiae and Tarsi III-IV are especially thin. This species is named after Dr. R. SCHUSTER, Austria.

Keri-Keri: One specimen in low ferns and mosses on wet soil close to a brook in a deep cleft with tall trees; three individuals in moss and needles under a dead fir tree; one specimen in wet *Selaginella* under trees.

Waitakere: Four specimens in moist moss and liverworts on the ground in native forest.

Waitomo: One specimen in dead leaves under trees in deep shadow by the roadside.

Pauatahanui: One specimen in moist moss and liverworts on the forest (?cypress) soil.

Hokitika: One individual in luxurious moss and liverworts under trees on the river bank.

Lancetoppia Ramsayi n. sp.; fig. 44.

Colour light brown. Length about 0.38 mm.

The faint transverse band, which is situated in front of the lamellar hairs, is located on a level with the anterior end of the tutorium. This band forms the anterior margin of a quadrangle, which reaches the anterior border of the hysterosoma. The lamellar hairs, which are set at a short distance behind the transverse band at the end of faint oblique lamellar shadows, are thin and as long as their mutual distance. The interlamellar hairs are minute. Exopseudostigmatic hairs have not been observed. The pseudostigmatic organs like those of *L. Poppi* (fig. 42) are thickest distally, and the head is set with a few minute hairs. Fig. 44 a shows the tip of the organ seen in different views. The lateral sides of the propodosoma are covered with small tubercles.

The hysterosoma is a little longer than broad. Its anterior margin, which is dark and heavily chitinized, is rounded. The hair *ta* is tiny. The notogastral hairs are moderately long and very thin. *Ti* and *ms* are directed medially.

Ad3 is situated off the anterior margin of the anal field, *ad2* a short distance behind *iad*. This species is named after Dr. G. RAMSAY, New Zealand.

Keri-Keri: A few individuals on a rotten bridge and a few in a cleft with water (STAGAARD coll.).

Waitakere: One specimen in moist liverworts and mosses on a trunk in native forest.

Christchurch: Several individuals in a thin layer of moss at a vertical roadside, in shadow; two specimens in moist *Polytrichum* and small plants on a slope near oozing water.

Fox Glacier: Several individuals in thick mosses on a big tree in native forest.

Milford: Many specimens in thick moss, grass, and white clover by the roadside.

Lancetoppia Luxtoni n. sp.; fig. 45.

Colour pale ochre to light brown. Length about 0.30 mm.

The dark shadows or bands which surround the middle field, are more distinct than in the preceding species. The transverse band is located on a level farther post-

eriorly than the anterior end of the tutorium (cp. *L. Ramsayi*, fig. 44). Immediately in front of the transverse band a light line can be seen. The lamellar hairs are thin and shorter than their mutual distance. The interlamellar hairs are very thin, too. Between the latter there are four light spots and in front of them a faint transverse, light line. Exopseudostigmatic hairs have not been observed. The pseudostigmatic organs are spindle-shaped, when laid bare they are much thinner than in fig. 45. They are no longer than their mutual distance. The sides of the propodosoma are almost smooth with few and very small tubercles.

The hysterosoma is considerably longer than broad. Its anterior border is rounded, brown and well chitinized. Ta is missing. The notogastral hairs are thin and moderately long. Ti is located almost behind te, a position characteristic of this species. The lyrifissure im is found at a very short distance in front of r3. This species is named after Dr. M. LUXTON, New Zealand.

Keri-Keri: A few individuals in thick wet mosses on the ground by a brook in a deep cleft with dense trees and shrubs; a few in moss on a mouldering trunk; a few in *Selaginella* vegetation and in dead leaves and debris.

Waitomo: One specimen in moss, liverworts, and dead leaves in a tree-fern forest between huge rocks.

Fox Glacier: Several individuals in thick moss on Lake Matheson in native forest.

Lancetoppia Moritzi n. sp.; fig. 46.

Colour pale ochre to greyish. Length about 0.28 mm.

The rostrum is narrow. The rostral hairs, which are situated on the dorsal surface reach by half their length beyond the tip of the rostrum. They are slightly barbed. The translamellar ridge, which can be seen in the middle of the propodosoma, is narrow and very distinct. Where it joins the lamellae there is a tiny sideways directed tip. The lamellae incline a little. They are as broad as the translamellar ridge, but faintly developed proximally. The lamellar hairs, which are set at a short distance behind the translamellar ridge, are very thin and about half as long as their mutual distance. The interlamellar hairs are short, the exopseudostigmatic hairs tiny. On the posterior border of the pseudostigmata there is a very small lobe corresponding to a small edge behind the pseudostigmata and hidden by the anterior border of the hysterosoma. The pseudostigmatic organs have on rather a long stalk a club-shaped broad head, which is directed medially. Between the interlamellar hairs eight light spots in two oblique rows can be seen.

The hysterosoma, which is longer than broad, is almost truncate at the posterior end, the anterior end narrow and slightly arched. Ta is missing, but its pore can be seen immediately behind the pseudostigmata. The notogastral hairs are thin and short. The fissure im is located in front of r3.

The ventral side is shown in fig. 46 a. It does not show any special characters, except that the aggenital hairs and ad3 are situated at the same mutual distance.

The legs are short with swollen joints. The solenidion of Tibia II is short. Tibiae I–II have medially an unusually long feathered hair. Taken as a whole the hairs of the legs are long and distinctly feathered. This species is named after Dr. M. MÖRITZ, D.D.R.

Lake Rotoiti: Four specimens in wet moss and liverworts on a vertical slope above a small brook in *Nothofagus* forest.

Lancetoppia Woodringi n. sp.; fig. 47.

Colour light brown. Length about 0.40 mm.

The rostral hairs are situated rather close together. They are barbed and three to four times longer than their mutual distance. The lamellar hairs are thin, slightly barbed, and about as long as their mutual distance. In front of them there is a faint transverse ridge the ends of which join very faint longitudinal lines or rather shades running to the pseudostigmata. The middle field within these lines is greyish due to a dense punctation. In its posterior part there are four light spots in two rows separated by a long distance. The interlamellar hairs are thin and probably half as long as their mutual distance, but due to their erect position their exact length is difficult to tell. The exopseudostigmatic hair is very thin and moderately long. The pseudostigma has a posterior lobe corresponding to a blunt tooth on the anterior border of the hysterosoma. The pseudostigmatic organs are almost as long as their mutual distance. They are equally thick throughout, blunt at the tip, which is set with extremely small scales. On the latero-posterior sides of the propodosoma there are small, round tubercles.

The hysterosoma is longer than broad. Its anterior border is slightly arched and narrowest in the middle. The hair ta is missing. The notogastral hairs are thin, curved, and slightly barbed. The fissure im can be seen laterally to r3, but further anteriorly. The integument is densely punctate.

The ventral side agrees with that of other *Lancetoppia* species. Ad3 is situated off the anterior margin of the anal field. The fissure iad is set obliquely to the anal field. Tectop. IV ends in a blunt tooth. The legs are long and slender. The solenidion of Tibia II is short and thick. This species is named after Dr. J. WOODRING, U.S.A.

Puketi: One specimen in a thin layer of moss and small plants scraped from the trunk of a big tree in native forest.

Lancetoppia Menkei n. sp.; fig. 48.

Colour light brown, darker than *L. Luxtoni*. Length about 0.33 mm.

This species, which is a little darker and a little bigger than *L. Luxtoni*, has many characters in common with the latter.

In front of the lamellar hairs there is rather a strong ridge. The lamellae are narrow and usually more distinct than the longitudinal folds or bands found in most *Lancetoppia* species. The lamellae converge more than in *L. Luxtoni*, fig. 45. The lamellar hairs are as long as their mutual distance. The interlamellar hairs are tiny.

Exopseudostigmatic hairs have not been observed. Between the interlamellar hairs there are four light spots in front of which a very faint line can be seen. The pseudostigmatic organs are bent medially. They are almost equally broad throughout, lanceolate, very pointed at the tip. On the posterior border of the pseudostigmata there is a broad lobe. Very small tubercles can be seen posteriorly on the sides of the propodosoma.

The hysterosoma is a little longer than broad. Its anterior margin is rounded, well chitinized and brown. The hair *ta* is missing. The notogastral hairs are set almost as in *L. Luxtoni* with *ti* behind *te*, and *te* and *r3* directed outwards. The hairs are equally long. The fissure *im* is situated in dark surroundings and located behind *r3*, in *L. Luxtoni* always in front of *r3*. This species is named after Dr. H. MENKE, Germany.

Lake Rotoiti: One individual in moist moss on the ground in *Nothofagus* forest.

Christchurch: One specimen in wet liverworts, moss, and grass on a slope with oozing water.

Fox Glacier: One specimen in thick moss at the foot of a giant tree in native forest; a few in dead leaves in the same locality; one in more open forest in moss, plants, and grass by the roadside.

Lancetoppia Mahunkai n. sp.; fig. 49.

Colour light brown. Length about 0.43 mm.

A very characteristic species, which perhaps should not be placed within the genus *Lancetoppia* due to its long hairy, filamentous pseudostigmatic organs, but as these within this genus vary from broad clubs to long and very thin lanceolate organs, I shall until more is known about the taxonomy of the *Oppia* group, establish it within the genus *Lancetoppia*.

The lamellar hairs, which are about twice as long as their mutual distance, are slightly barbed. In front of them there is a faint transverse ridge on a level with the anterior end of the tutorium. The interlamellar hairs are tiny. Also the exopseudostigmatic hairs are extremely small. The pseudostigmatic organs, which are as long as the width of the propodosoma where it is broadest, are slightly bent at two places and therefore appear undulating. They are for most of their length set with small scales and they are almost equally thick throughout, though slightly tapering from the distal bend towards the tip. On the posterior border of the pseudostigmata there is a small lobe.

The hysterosoma is no longer than broad. Its anterior margin is straight in the middle. *Ta* is missing. The notogastral hairs are very thin and slightly barbed. The ventral side agrees with that of other *Lancetoppia* species. *Ad3* is found off the anterior border of the anal field. All the legs are long and slender. Some of the hairs of the legs are very long. Femora I–II and Tibia I with a strong keel. This species is named after Dr. S. MAHUNKA, Hungary.

New Plymouth: One specimen in *Selaginella* vegetation and dead leaves under tree-ferns in native forest.

Lancetoppia Schweizeri n. sp.; fig. 50.

Colour light brown. Length about 0.40 mm.

The lamellar hairs, which are as long as their mutual distance, are very thin. The interlamellar and the exopseudostigmatic hairs are short. In front of the lamellar hairs there is a curved ridge, which posteriorly reaches beyond the base of the lamellar hairs, becoming more and more indistinct. This ridge is situated further posteriorly than the end of the tatorium. The pseudostigmatic organs are rather club-shaped than lanceolate, though pointed at the tip. The head is almost one third as long as the whole organ (see fig. 50 a). Fig. 50 a shows the anterior part of the mite in a lateral view. Behind the small lobe on the posterior border of the pseudostigma a dark fold can be seen, and under the fold there is a small tubercle.

The hysterosoma is only a little longer than broad. Its anterior margin is straight. The hair ta is tiny. The hairs te, ti, and ms are longer than the rest. They are all very thin and slightly barbed.

The ventral side agrees with that of other *Lancetoppia* species in all essential characters. In the sternal plate between Apodemata II two holes can be seen (see fig. 43 a). Tectop. IV ends in an extremely pointed tooth. The legs are moderately long; Leg IV reaches a little beyond the posterior end of the hysterosoma. This species is named after the late Dr. J. SCHWEIZER, Switzerland.

Lake Rotoiti: Several individuals in thick, moist moss on the ground in *Nothofagus* forest.

Fox Glacier: One specimen in thick moss at the foot of a giant tree in native forest.

Milford: A few specimens in thick moss on dead trunks and branches in *Nothofagus* forest; two specimens in luxurious moss under ferns, in shadow.

Lancetoppia Csiszarae n. sp.; fig. 51.

Colour light brown. Length about 0.28 mm.

This small mite can among other characters be distinguished by its small size, by its very short and thin lamellar hairs, which are about half as long as their mutual distance, and by its spindle-shaped to lanceolate pseudostigmatic organs. There is no transverse band in front of the lamellar hairs, only a very faint line and the longitudinal bands are just as indistinct as the transverse one apart from a short part behind the base of the lamellar hairs. This part is dark and curved and not equally distinct in the two specimens found. The interlamellar and the exopseudostigmatic hairs are tiny. The pseudostigmatic organ is spindle-shaped to lanceolate, broadest near the tip, which is pointed. The organs are about as long as their mutual distance. Behind the pseudostigma there is on the anterior border of the hysterosoma a short tooth on a brown, rounded tubercle.

The hysterosoma is circular apart from the anterior border, which is straight and fairly broad. Ta is missing. Te and ti from the two sides are situated almost on a transverse line. The hairs are thin and slightly barbed. Tectop. IV ends in a blunt tooth. The fissure iad is situated approximately off the anterior margin of the anal field, i. e. rather far anteriorly, and it is dark. This species is named after Mrs. J. CSISZAR, Hungary.

Keri-Keri: Two specimens in mouldering leaves and debris on a slope above a brook under tall trees and shrub.

Lancetoppia Vaneki n. sp.; fig. 52.

Colour brown. Length about 0.80 mm.

The propodosoma is narrow as compared with the hysterosoma. The latter is almost circular. The rostral hairs are thin, slightly barbed, and twice as long as their mutual distance. The lamellar hairs, which are situated in the middle of the propodosoma, are very thin and about as long as their mutual distance. In front of them a faint line can be seen, and issuing from the base of the lamellar hair there is a shade of a ridge running posteriorly. The interlamellar hairs are short, but distinct. The exopseudostigmatic hairs are well developed. The pseudostigmatic organs, which when stretched out are as long as their mutual distance, are about equally thick throughout, though slightly tapering at the tip, and rough. Two more or less hyaline scales are located behind the interlamellar hairs. They are directed backward and their posterior border is rounded.

The hysterosoma is as broad as it is long. Its anterior margin is dark and the tiny hairs ta are scarcely discernible. The notogastral hairs are very long and strong, and all of them reach beyond the base of the following one, some of them by more than half their length. They are slightly barbed. Ti is set unusually far anteriorly, te almost directly behind ti. The distance $r1-r1$ is unusually short and about the same as $p1-p1$.

The ventral side agrees with that of other *Lancetoppia* species. The fissure iad is located obliquely to the lateral border of the anal field off ad3, which is set approximately off the anterior margin of the anal field. The solenidion of Tibia II is short. Tibiae I-II have a short longitudinal ventral ?crest off the solenidion. This species is named after Dr. J. VANEK, Czechoslovakia.

New Plymouth: Two specimens in mouldering leaves, debris, and ferns on swampy ground in native forest.

Lancetoppia Seydi n. sp.; fig. 53.

Colour light brown. Length about 0.33 mm.

The most characteristic feature of this species is the extremely pointed rostrum, which ends in a small tip. The rostral hairs do not differ from those of other *Lancetoppia* species. In front of the lamellar hairs there is a faint transverse ridge set on a

level with the anterior end of the tutorium. A shade of a longitudinal ridge running obliquely backwards from the base of the lamellar hair is present as is the case in most *Lancetoppia* species. The lamellar hairs are thin and about as long as their mutual distance. The interlamellar hairs are tiny. The exopseudostigmatic hairs are short. The pseudostigmatic organs are lanceolate, broadest in the distal fourth and pointed at the tip. They are set with minute hairs. On the posterior border of the pseudostigma there is a small tubercle and opposite it a small knob on the anterior border of the hysterosoma can be seen.

The hysterosoma is almost as broad as long. The hair ta is absent. The notogastral hairs are very thin and slightly barbed. Te and ti from the two sides are situated on a transverse line.

The lyrifissure iad is located obliquely to the lateral side of the anal field, off an1. Ad3 is set laterally to iad off the anterior margin of the anal field. This species is named after Dr. E. SEYD, England.

Keri-Keri: One specimen in a thin layer of moist moss on the ground near a brook in a deep cleft with shrubs and tall trees.

Lancetoppia Jacoti n. sp.; fig. 54.

Colour from dark brown to almost light brown varying according to size. Length varying from 0.65 mm to 0.80, the biggest specimens being the darker.

The rostral hairs, which are parallel and almost twice as long as their mutual distance, are distinctly barbed. They reach by half their length beyond the tip of the rostrum. The lamellar hairs, which are situated almost in the middle of the propodosoma, reach beyond the base of the rostral hairs, sometimes they reach the tip of the rostrum. They are unilaterally barbed. In front of them a faint transverse shade can be seen. The interlamellar hairs seem very short due to their erect position, but in a lateral view their exact length can be seen, fig. 54 a. The exopseudostigmatic hair is moderately long. The pseudostigma has a small posterior lobe, but there does not seem to be any corresponding tooth on the anterior border of the hysterosoma. The pseudostigmatic organ in a dorsal view is very short, being bent and thus shortened. The short lanceolate head is set with minute bristles. In a lateral view it appears rather long, fig. 54 a. The head is merged into the stalk and is not much thicker. The latero-posterior part of the propodosoma is covered with numerous small tubercles. Small tubercles can be seen also in front of the lamellar hairs.

The hysterosoma is longer than broad. Ta is short but distinct. The remaining notogastral hairs are long, slightly curved, very thin towards the tip, and faintly barbed. Those on the posterior border are shorter.

The ventral side is typical of *Lancetoppia*, see fig. 36 b. The hair 2a is set a little more laterally than in fig. 36 b and the aggenital hair is longer. The adanal hairs and iad are located as in fig. 36 b.

The bigger specimens are dark brown and often their notogastral hairs are a little shorter. They have been found together with the smaller specimens, i.e. at

Keri-Keri and Waitakere, but not at Rotorua, and Lake Rotoiti. This species is named after the late Dr. A.P. JACOT, U.S.A.

Keri-Keri: Two individuals in a thin layer of moss on wet soil; one in lichens and moss on a mouldering branch; two specimens in moss and needles under a fir tree.

Waitakere: One specimen in moss and liverworts on the ground; a few in moss and small ferns on a log, both localities in native forest.

Rotorua: Several individuals in moss, liverworts, and tiny ferns; many in luxurious ?*Leucobryum*, both localities under *Manuka* shrub in the thermal area.

Lake Rotoiti: One individual in dead *Nothofagus* leaves.

Lancetoppia Berlesei n. sp.; fig. 55.

Colour brown. Length about 0.81 mm.

The rostral hairs, which are situated on the sides and far anteriorly, are slightly barbed. The lamellar hairs are located at a short distance behind a faint transverse band. They are thin, slightly barbed, and almost twice as long as their mutual distance, i. e. so long that in a dorsal view they reach the tip of the rostrum. The interlamellar hairs are tiny. They are situated very close to the light spots. The exopseudostigmatic hair is a little longer than the interlamellar hair. The pseudostigmatic organs, which are bent first backwards, then forwards, are considerably shorter than their mutual distance; the distal half is slightly broader than the stalk, lanceolate, and set with tiny bristles. The integument of the middle field is densely punctate, and appears finely striped.

The hair *ta* is distinct. The remaining notogastral hairs are fairly long and slightly barbed. *Ti* is located almost behind *te*, *ms* behind *ti* (the latter has been lost on both sides).

The ventral plate is densely and distinctly punctate. *Ad3* is situated off the anterior border of the anal field, *ad2* obliquely behind *iad*, which is almost parallel to the anal field. *Ad1* is postanal. The aggenital and the adanal hairs are rather long. All the legs are long and slender. Femora I–II are, however, rather thick clubs. Coxa III has on its anterior border four strong teeth. This species is named after the late Dr. A. BERLESE, Italy.

Keri-Keri: One specimen in a thin layer of moss on the ground near a brook in a deep cleft with tall trees.

Lancetoppia Banksi n. sp.; fig. 56.

Colour dark brown to mahogany red. Length about 0.80 mm.

The rostral hairs are situated rather laterally and far anteriorly. They are strong and slightly barbed. The lamellar hairs, which are situated in the middle of the propodosoma, are very long and reach the tip of the rostrum. They are slightly uneven, almost smooth. The interlamellar hairs are tiny and are found off the anterior border

of the light spots. Exopseudostigmatic hairs are missing. The pseudostigmatic organs, which are short and bent, have a short lanceolate to club-shaped head set with tiny bristles. There is no lobe on the posterior border of the pseudostigma. Behind the latter a dark spot can be seen at a deeper level.

The hysterosoma is almost circular. Its anterior margin is faintly chitinized, i.e. paler than the latero-anterior border. Ta is distinct. The notogastral hairs are fairly long and slightly barbed. Ti is set almost behind te; ms, which is missing on both sides on the only specimen found, is located behind ti.

Ad3 is placed off the anterior border of the anal field, ad2 behind iad, which is set obliquely to the anal field. Ad1 is postanal. This species is named after the late Dr. N. BANKS, U.S.A.

Bay of Islands: One specimen at a stub in a pine wood (STAGAARD coll.).

Lancetoppia Ewingi n. sp.; fig. 57.

Colour brown. Length about 0.80 mm.

Behind the tip of the rostrum there is a V-shaped fissure. The rostral hairs, which are situated on the dorsal surface and rather close together, are slightly barbed. They reach by half their length beyond the tip of the rostrum. The lamellar hairs are situated rather close together at a short distance behind a broad transverse ridge. A dark shade runs from their base obliquely backwards. The lamellar hairs are barbed, rather strong, and so long that when crossed they reach the tip of the rostrum. The interlamellar hairs, which are situated close to a chitinized band between the pseudostigmata, are strong and as long as their mutual distance. The exopseudostigmatic hair is well developed. The pseudostigmatic organs are as long as their mutual distance, lanceolate, though slightly broader in the middle. They are set with small prominent scales or bristles. On the posterior border of the pseudostigma there is a very long tubercle, which reaches the anterior border of the hysterosoma and fits into an incision in the latter. The integument of the middle field is densely punctate. The chitinous tubercles on the lateral sides of the propodosoma are very small.

The hysterosoma is slightly arched, and its anterior border is narrowest in the middle. Ta is absent. The notogastral hairs are long, stiff, strong, and slightly barbed. Te and ti from the two sides are set almost on a transverse line, ti a little further anteriorly. The same holds good of r3 and ms. The integument is densely punctate.

The aggenital hairs and the adanal hairs are fairly long. Ad3 is situated at a level a little in front of the anterior border of the anal field at a distance from the latter as the length of the anal plate. Ad2 is set obliquely behind iad, which is located obliquely to the anal field. The hairs ad1 are postanal and are situated one at either side of the triangular posterior end of the ventral plate. The legs are long and slender. Femora I-II have a short narrow club on a long thin stalk. The hairs of the legs are thick and barbed. This species is named after the late Dr. H.E. EWING, U.S.A.

Waitomo: One specimen in mouldering leaves under trees in a cleft.

?*Lancetoppia Thori* n. sp.; fig. 58.

Colour mahogany red. Length about 0.81 mm.

The propodosoma is short and broad. The tip of the rostrum ends in a small snout. The rostral hairs, which are situated on the dorsal surface, are thin and almost smooth. The lamellar hairs, which are situated at rather a short mutual distance, are stiff, uneven, and more than twice as long as their mutual distance. They are equally thick throughout. The interlamellar and the exopseudostigmatic hairs are tiny. The interlamellar hairs are set rather close to the pseudostigmata. The pseudostigmatic organs are long, thin, and slightly thicker towards the tip, which is rounded. The base of the pseudostigmatic organ is surrounded by a hyaline membrane strengthened by radiating ribs. By this special character it differs from other *Lancetoppia* species and it is rather doubtful whether it belongs to *Lancetoppia*. The chitinous tubercles laterally to the pseudostigmata are very small.

The hysterosoma is circular. The hair ta is tiny. The remaining notogastral hairs are of different length, being longest anteriorly. Only te, ti, and ms are moderately long, the rest are short and thin.

The ventral side. There are six pairs of genital hairs. Ad3 is situated off an1, ad2 off an2, ad1 is postanal. The fissure iad is set obliquely to the anal field between ad3 and an1. All the legs are short. The hairs of Femora I–II are of different length and thickness. This species is named after the late Dr. S. THOR, Norway.

Keri-Keri: One specimen in a thin layer of moss on wet soil close to a brook, in deep shadow.

Waitakere: One specimen in moss and liverworts in native forest.

Waitomo: One specimen in mouldering leaves in a small cleft, in shadow.

Lake Rotoiti: Several individuals in mouldering *Nothofagus* leaves.

Fox Glacier: One specimen in moss on a stone in a rushing brook from Fox Glacier.

Lancetoppia Bertheti n. sp.; fig. 59.

Colour brown. Length about 0.80 mm.

The rostral hairs, which are set on the dorsal surface, are barbed and at least twice as long as their mutual distance. The lamellar hairs, which are set at a short distance behind a brown transverse ridge, are thin, barbed, and more than twice as long as their mutual distance. They cross and reach in a dorsal view the tip of the rostrum. The interlamellar hairs are set at a short distance in front of the dorso-sejugal band. They are very thin and about half as long as their mutual distance. The exopseudostigmatic hair is fairly long. The pseudostigmatic organs are almost as long as their mutual distance, lanceolate, slightly tapering towards the tip, which is set with minute scales, and a little rough. The dorso-sejugal band has two large, dark swellings on its posterior border.

The hysterosoma is circular, apart from the anterior border, which is straight in the middle and very narrow. Ta is tiny, but distinct. The notogastral hairs are long,

rather thick, stiff, and barbed. Te and ti from the two sides are situated almost on a line, the same holds good of r3 and ms.

The ventral side. The hairs are long and barbed, 3b especially long and curved. There are six pairs of long, stiff genital hairs. The aggenital hair is as long as the length of the genital plate. Ad3 is situated far laterally off the anterior border of the anal field, ad2 off an2. The fissure iad is located obliquely to the anal field off an1. The hairs ad1 are situated at the latero-posterior corner of the anal field at either end of a triangular ridge. Coxa III has on its anterior border about five short spines. Femora I–II are slender clubs with thick barbed hairs. This species is named after Dr. P. BERTHET, Belgium.

Keri-Keri: One specimen in a thick carpet of mosses and small ferns near a brook in a deep cleft with tall vegetation.

?*Lancetoppia rigidiseta* n. sp.; fig. 60.

Colour brown. Length about 0.78 mm.

The anterior part of the propodosoma is arched and the tip of the rostrum is at a much lower level than the lamellar hairs. The rostral hairs are set on the sides. They are barbed, bent medially, and they almost meet at some distance in front of the tip of the rostrum. The lamellar hairs, which are a little longer than their mutual distance and which in a dorsal view reach the base of the rostral hairs, are rather thin and ?smooth. The interlamellar hairs are tiny. Exopseudostigmatic hairs have not been observed. The pseudostigmatic organs are lanceolate and short. The distal half, which is set with tiny bristles, is bent forwards and outwards. The tooth lateral to the pseudostigma is very broad.

The hysterosoma is broadest across the middle. Ta is absent. The notogastral hairs are short, stiff, smooth, and hyaline (hence the specific name).

The ventral side is shown in fig. 60 a. It agrees with the general appearance of that of *Lancetoppia*. Tectop. IV ends in a broad, sharp tooth. The legs are long and slender. All the femora have distally a somewhat thicker, unilaterally serrate hair.

Arthur's Pass: One specimen in *Nestor notabilis* nest (C. MITCHELL, Bishop Mus. Honolulu coll.).

Lancetoppia Piffli n. sp.; fig. 61.

Colour light brown. Length about 0.38 mm.

The rostral hairs are rather close together, lyrate, barbed, and about three times longer than their mutual distance. The lamellar hairs are very thin and about as long as their mutual distance. The interlamellar hairs are as long as the lamellar hairs and likewise very thin. They are situated close to the dorso-sejugal ridge. The exopseudostigmatic hair is only half as long as the interlamellar hair. The pseudostigmatic organs, which are longer than their mutual distance, have a long thin stalk,

which becomes only slightly broader in its distal third. The tip is pointed. The distal part is set with minute scales. On the posterior border of the pseudostigmata there is a broad, brown lobe, but there does not seem to be any tubercle opposite it.

The hysterosoma is a little longer than broad. Its anterior margin is arched in the middle. Ta is tiny and set at either end of the arch. The notogastral hairs are thin, moderately long, and slightly barbed. Te and ti from the two sides are set on a line. The ventral side is in every detail typical of *Lancetoppia*. This species is named after Dr. E. PIFFL, Austria.

Waitakere: One specimen in liverworts and small ferns on a log in native forest.

Oppia Feideri n. sp.; fig. 62.

Colour light brown. Length about 0.27 mm.

The anterior part of the propodosoma is a long cone. The rostrum is slightly pointed. The rostral hairs, which are set rather close together, are strong, barbed, and one and a half times longer than their mutual distance. They reach by only one third of their length beyond the tip of the rostrum. There are no lamellae. Faint shades surround a middle field, in the anterior part of which the lamellar hairs are placed. They are thin and less than half as long as their mutual distance. The posterior border of the middle field is a darker ridge, the ends of which form two small, more or less erect scales. The tiny interlamellar hairs are situated in front of the latter. Exopseudostigmatic hairs are absent. The pseudostigmatic organs, which always are retroverse and then bent medially are lanceolate and dark, probably due to minute hairs. They are serrate on their posterior border, fig. 62 a.

The hysterosoma is semicircular in its posterior half, whereas the anterior half is narrowing towards the anterior border. The middle of the latter forms a tongue-shaped arch, on either side of which there is a small tooth set opposite the lobe on the posterior border of the pseudostigmata. The hair ta is missing; its pore can be seen medially to the tooth. The notogastral hairs are very short and thin. The fissure im is located more medially than in most *Oppia* species.

Fig. 62 b shows the ventral side. In Epimeres II a faint band runs from the sternal ridge obliquely backwards and laterally. There are six pairs of genital hairs, set in the usual position with four in a longitudinal row and two near the posterior border. Ad3 is preanal. The fissure iad is located obliquely to the anal field. Ad2 is situated behind iad. All the hairs are short. All the epimeres are distinctly reticulate. Legs III–IV are inserted rather close together and Tectop. IV is set immediately behind Coxa III. It ends in a blunt tooth. All the legs are rather short with swollen joints. This species, which has many characters in common with *Lancetoppia*, is named after Dr. Z. FEIDER, Rumania.

Waitakere: Two specimens in liverworts and *Leucobryum* on a log in native forest.

Lake Rotoiti: One specimen in moist to wet ?*Leucobryum* on a slope (spring

locality ?); a few in mosses on the ground and on a log; in wet moss and liverworts above a small brook, all in *Nothofagus* forest.

Oppia Haarlovi n. sp.; fig. 63.

Colour light brown. Length about 0.285 mm.

The rostrum has on either side of the tip, which is slightly pointed, a narrow hyaline border. On the dorsal surface it has a V-shaped fissure. The rostral hairs, which are set laterally, on the end of a dark ridge, are thin, slightly barbed. They reach by less than half their length beyond the tip of the rostrum. The lamellar hairs, which also are barbed and thin, are set at some distance behind a curved ridge, which is located at a level with the anterior end of the tutorium. There are no lamellae, but a middle field is indicated by a more greyish colour. The interlamellar hairs are tiny like the exopseudostigmatic hairs. The pseudostigmatic organ is a slender club, fig. 63 a, set with minute bristles distally. The organs are almost as long as their mutual distance. Behind the pseudostigmata there is a small dark knob. There are only very small tubercles on the latero-posterior sides of the propodosoma.

The hysterostoma is a little longer than broad. Its posterior half is semicircular, whereas the anterior end tapers towards an anterior fold into which it fits. Immediately behind this fold a small round gland at either side can be seen, and laterally to the gland the pore for ta, which is absent. The notogastral hairs are very thin, ?barbed, and curved. The distances ti-ti, ms-ms are equally long, the distance r2-r2 considerably longer.

The ventral side is shown in fig. 63 b. It is not characteristic in any way. There are six pairs of genital hairs. Ad3 is set laterally at a level a little in front of the anal field. The distance between the aggenital hairs is much shorter than that of ad3. The fissure iad is located obliquely to the anal field at a good distance in front of ad2. The legs are rather short, the hairs thin and barbed. This species is named after Dr. N. HAARLØV, Denmark.

Waitomo: Two specimens in mouldering leaves in native forest.

Oppia Perez-Inigoi n. sp.; fig. 64.

Colour light brown. Length about 0.26 mm.

The rostral hairs are situated far laterally and a good distance behind the tip of the rostrum. They are very thin and almost as long as their mutual distance, but in spite of this they just reach beyond the tip of the rostrum. The lamellar hairs, which are set at the anterior end of short oblique ridges, are thin, slightly barbed, curved, and shorter than their mutual distance. Behind the oblique ridges there are on either side two other ridges, parallel to the former and indistinct. Interlamellar hairs are absent. The exopseudostigmatic hair is scarcely discernible. The four light spots, two small posterior ones and two bigger anterior ones are separated by a distance which is longer than the width of the anterior spots. The pseudostigma has a small posterior lobe.

The pseudostigmatic organs are longer than their mutual distance. The stalk is very thin, the head narrow, lanceolate, and set with minute bristles. There are only extremely small chitinous tubercles on the latero-posterior sides of the propodosoma.

The hysterosoma is almost circular. Its anterior border is narrow in the middle. In front of the anterior border two brown swollen ridges can be seen. *Ta* is absent. The other notogastral hairs are very short and thin. The fissure *im* is placed far from *r3*, almost halfway between *ti* and *ms* but further laterally.

The ventral side is shown in fig. 64 b. The sternal plate, which has dark contours, is broad between Epimeres I. The hair 1 a is situated far anteriorly. There are six pairs of genital hairs. The fissure *iad*, which is long, is set obliquely to the anal field. The legs are slender and proportionately long. The solenidion of Tibia II is short and broad, whereas those of Tibiae I, IV, Genus I–II are extremely long. Tibia IV has a distal brush-shaped hair, Tarsus IV two shovel-shaped hairs on the medial side. Fig. 64 a shows Leg I with its extremely long solenidion of the tibia and the genu.

This species has many characters in common with species of *Membranoppia*, i.e. the rostral hairs' lateral position, the lamellae only developed anteriorly, the anterior notogastral hairs in two longitudinal rows, the sternal plate with dark contours, and the very long solenidia. It does not, however, have a membranous bridge across the pseudostigma, and the pseudostigmatic organs differ, too. This species is named after Dr. D. PÉREZ-IÑIGO, Spain.

Waitakere: Three individuals in moss and liverworts on the ground in native forest.

Oppia Pletzeni n. sp.; fig. 65.

Colour brown. Length about 0.5–0.6 mm, difficult to measure as the only specimen found is crushed.

This species is very characteristic. The rostral hairs, which are rather thick, lyrate, and barbed, are set rather close together and reach by most of their length beyond the tip of the rostrum. The lamellae, which incline, are slightly undulating, rather broad, and brown. Their anterior end is turned medially, forming the beginning of a translamella. The lamellar hairs are stiff, rough, and a little longer than their mutual distance. They are set on the rounded anterior end of the lamellae. The interlamellar hairs are a little shorter and thinner than the lamellar hairs, but also stiff and rough. The exopseudostigmatic hairs are as long as the interlamellar hairs. On the posterior border of the pseudostigma there is a broad lobe corresponding to a round knob hidden by the anterior border of the hysterosoma. The pseudostigmatic organs are sickle-shaped, long, thin, and serrate on their posterior border. The organs are as long as their mutual distance. A very fine punctation can be seen in the middle field and in front of the latter on the dorsal side of the rostrum. On the latero-posterior sides of the propodosoma the integument is covered with small chitinous tubercles.

The hysterosoma has a broad, rounded anterior border. The hair *ta* is missing.

Its pore can be seen behind the pseudostigma. The remaining hairs are curved, stiff, and unilaterally serrate; ms has been lost on both sides. The integument has a very fine and dense punctation.

The ventral side is shown in fig. 65 a. There are six pairs of long and thin genital hairs. The aggenital hairs, the adanal hairs, and the anal hairs are rather long and serrate. The fissure iad is set obliquely to the anal field. The ventral plate is densely punctate. Tectop. IV ends in a long, pointed tooth. The legs, which are rather long and slender, have long, stiff, and serrate hairs, especially long on Coxa III. The solenidion of Tibia II is shorter than the ordinary hairs of the joint in question. The solenidia of all the tibiae and all the genus are likewise unusually short. Tibia IV has distally on its medial side a brush-shaped hair, Tarsus IV proximally two shovel-shaped hairs. This species is named after Dr. R. VAN PLETZEN, South Africa.

Keri-Keri: One specimen in mouldering leaves and debris on a slope above a brook in deep shadow.

Oppia Turki n.s.; fig. 66.

Colour light brown. Length about 0.31 mm.

The propodosoma is long as compared with the hysterosoma. Behind the tip of the rostrum there is a light spot with a short lobe on its posterior border. The rostral hairs, which are situated dorsally, reach by more than half their length beyond the tip of the rostrum. They are thin, barbed, and one and a half times longer than their mutual distance. The lamellar hairs, which are much thinner than the rostral hairs, are about two thirds as long as their mutual distance. They are set on the end of well developed lamellae. These are slightly curved, inclining. Their anterior ends are connected by a faint line or ridge, and in front of the latter an arched line can be seen, running to the end of the lamellae. The interlamellar hairs, which are set in the latero-posterior corner of the middle field, cut off from the latter by an oblique line, are very short. The exopseudostigmatic hairs are rather long and thin. On the posterior border of the pseudostigma there is a broad lobe opposite a small tubercle hidden by the anterior border of the hysterosoma. The pseudostigmatic organs are lanceolate, very pointed at the tip.

The hysterosoma is circular. The middle of the anterior border is greyish as far as the pore for the hair ta. The latter is missing. The notogastral hairs are thin and slightly barbed. They are in the only specimen found arranged unsymmetrically, especially as regards ms.

Fig. 66 a shows the ventral side. Unfortunately I am unable to tell the number of the genital hairs as the plates are open. The fissure iad is located rather far anteriorly off an 1, ad 2 a short distance behind iad. Ad 3 is preanal. The legs are moderately long. The solenidion of Tibia II is short and thick. This species is named after Dr. F. TURK, England.

Pauatahanui: One specimen in moss and liverworts in cypress forest.

Oppia Tuxeni n. sp.; fig. 67.

Pale ochre to very light brown. Length about 0.23–0.28 mm.

The rostrum is broad. The rostral hairs, which are situated rather far from the lateral sides, are barbed and almost twice as long as their mutual distance. They reach by half their length beyond the tip of the rostrum. The lamellar hairs, which are situated behind a transverse ridge, are thin and a little longer than their mutual distance. The lamellae, which are distinct and narrow, proceed for a very short distance beyond the transverse ridge. Posteriorly the lamellae are divided into two parts, one running to the pseudostigma, the other to the posterior border of the propodosoma. The interlamellar hairs are longer than their mutual distance, thin, and smooth. The exopseudostigmatic hair is fairly long and smooth. On the posterior border of the pseudostigma there is a small lobe, apparently corresponding to a small tooth hidden by the anterior border of the hysterosoma. The pseudostigmatic organ has a round head on rather a long, thin stalk.

The hysterosoma is a little narrower at the anterior end than at the posterior one. Ta is missing. The remaining notogastral hairs, which are equally long, are stiff and smooth. The pores are distinct. The hairs ti, ms, and r1, which are set directly behind each other, have the same mutual distance. The fissure im is located close to r3.

The ventral side is shown in fig. 67 a. There are six pairs of genital hairs. The distances ag–ag and ad3–ad3 are equally long. The fissure iad is set obliquely to the anal field. The legs are rather short. The solenidion of Tibia II is very short. Those of Tibia I and Genus I–II long and thin, but not so well developed as in *Membranoppia*. This species is named after Dr. S. L. TUXEN, Denmark.

Lake Rotoiti: Two specimens in thick moist ?*Leucobryum* in *Nothofagus* forest.

Oppia Covarrubiasi n. sp.; fig. 68.

Colour brown. Length about 0.48–0.50 mm.

The anterior part of the propodosoma is long and narrow, the posterior part is much broader. The tip of the rostrum is narrow like a snout. The rostral hairs, which are situated rather close together, are lyrate, barbed, and twice as long as their mutual distance. They project by one third of their length beyond the tip of the rostrum. In front of the rostral hairs and covering the tip of the rostrum two membranous lobes can be seen, I am uncertain of their exact shape. Lamellae are missing. The lamellar hairs, which are set on the posterior third of the propodosoma, are thin, barbed, and shorter than their mutual distance. In front of them a very faint line can be seen. The interlamellar hairs, which are set close to the posterior border of the middle field, are tiny. The light spots between the interlamellar hairs are scarcely discernible. The exopseudostigmatic hair is short. The pseudostigmata have a large posterior lobe and behind it a small tubercle can be seen. The pseudostigmatic organ is almost equally thick throughout, slightly broader at the tip, which is set with

minute hairs. On the latero-posterior sides of the propodosoma there are small tubercles.

The hysterosoma is as broad as it is long (in fig. 68 it is shown a little from the anterior end and the hysterosoma is for that reason slightly shortened). It is broadest in the anterior half. Ta is tiny. The notogastral hairs are short and barbed. Immediately behind the anterior border there is a large quadrangular field, lighter in colour than the surroundings and more greyish. It can be seen at a deeper level stretching forwards to the camerostome, tapering.

The ventral side is shown in fig. 68 a. It is heavily chitinized. There are six pairs of genital hair pores. The hairs could not be seen. Ad3 is set off the anterior border of the anal field. The fissure iad is located obliquely to the anal field. An1 is set rather far anteriorly. The legs are long and slender. Tibia IV has a distal brush-shaped hair, Tarsus IV two shovel-shaped hairs, as often present in long-legged *Oppia* species. This species is named after Dr. B. COVARRUBIAS, Chile.

Dunedin: One specimen in moist penguin dung mixed with grass in a penguin's nest.

Oppia Newelli n. sp.; fig. 69.

Colour light brown. Length about 0.45 mm.

The rostral hairs, which are situated rather close together, are barbed and twice as long as their mutual distance. Between the lamellar hairs there is a faint translamella. The translamella form together with the narrow lamellae and the posterior border of the propodosoma a rectangular field, on the anterior border of which the short and thin lamellar hairs are situated. The lamellae are broken. At about one third from their anterior end they turn medially for a short distance, then disappearing. The posterior part of the lamellae is separated from the anterior part by a short distance, and the two parts do not meet as the posterior half turns laterally, where the anterior part turns medially. The interlamellar hairs are about as long as their mutual distance. The exopseudostigmatic hair is as long as the interlamellar hair. On the posterior border of the pseudostigma there is a small tubercle and opposite it on the anterior border of the hysterosoma there is a small edge. The pseudostigmatic organs are as long as their mutual distance. They are thick, spindle-shaped, with about five prominent spines on either side in the distal half.

The hysterosoma is a regular oval apart from the straight anterior border. Ta is tiny. The remaining notogastral hairs are thin, barbed, and so long that they almost reach the base of the following one. Te and ti from the two sides are set more or less on a transverse line. The same holds good of r3 and ms.

Fig. 69 a shows the ventral side. It deviates definitely from every other *Oppia* by having a transverse band behind the genital field. The usual curved ridge following the anterior border of the genital field can just be guessed. The genital field is surrounded by a frame, from the posterior margin of which there is a slight connection to the transverse band. There are six pairs of genital hairs. Ad3 is placed off the

anterior border of the anal field, ad 2 off an 2. Between ad 1, which are postanal, there are four light spots. The fissure iad is located obliquely to the anal field. The legs are long and slender. The solenidion of Tibia II is short. Some of the hairs distally on Tibiae III–IV and Tarsi III–IV are spine-shaped. This species, which is named after Dr. I.M. NEWELL, U.S.A., probably constitutes a separate genus, which cannot be established until more species have been found.

Pauatahanui: One specimen in moss and liverworts on the forest soil; one in moss on dead branches, both biotopes in native forest.

Oppia Oudemansi n. sp.; fig. 70.

Colour light brown. Length about 0.38 mm.

The rostral hairs, which are situated on the dorsal surface, are barbed and they reach only a little beyond the tip of the rostrum. The lamellar hairs are barbed and as long as the rostral hairs. They are set at a short distance behind the anterior border of a long lamellar arch. The latter is formed more by folds than by ridges and it can be seen only in profile. The interlamellar hairs are tiny. The pseudostigmatic organs are lanceolate and finely serrate on their posterior border. The exopseudostigmatic hair is missing. Laterally to the exopseudostigmatic hair pore there are small tubercles.

The ventral side. There are four pairs of genital hairs. The aggenital hair is situated halfway between the genital and the anal field. It is moderately long and barbed. Ad 3 is situated far laterally off the anterior border of the anal field or a little farther anteriorly. Ad 2 is located behind iad, which is set obliquely to the anal field. Ad 1 is postanal. All the hairs are moderately long. The most characteristic feature of this species is a fairly big protuberance or spur ventrally on Femora I–II. It does not end in a tip, but it is cut off broadly and straight distally with a hair in its middle. The one on Femur II has a retroverse tip. The solenidion of Tibia II is rather short, but thin distally. This species is named after the late Dr. A.C. OUDEMANS, Holland.

New Plymouth: One specimen in mouldering leaves on a slope in native forest.

Oppia Baderi n. sp.; fig. 71.

Colour light brown. Length about 0.36 mm.

The rostrum is a little pointed. The rostral hairs, which are situated rather close together, are barbed and about three times longer than their mutual distance. There are no lamellae. The lamellar hairs, which are set on the posterior third of the propodosoma, are as long as their mutual distance and barbed. In front of them a faint curved ridge can be seen. Several very indistinct wrinkles run as more or less broken transverse bands across a good deal of the anterior part of the propodosoma. The middle field bordered anteriorly by the transverse ridge, laterally by a dark shade is greyish, probably due to a dense punctation. In the middle field there are four very

bright spots. The interlamellar hair is tiny. Also the exopseudostigmatic hair is very small. On the posterior border of the pseudostigma there is a small lobe, and opposite it on the anterior border of the hysterosoma a very distinct rounded tubercle can be seen. The pseudostigmatic organ is a flat, pointed club with short radiating hairs on the posterior border.

The anterior half of the hysterosoma is as broad as the posterior one, but whereas the posterior border is broadly rounded, the anterior border projects in the middle, forming a small tongue-shaped arch, on either side of which the tiny hair *ta* is located. The notogastral hairs, which are barbed proximally, are extremely thin towards the tip. *Te* and *ti* from the two sides are set on a transverse line.

Fig. 71 a shows the ventral side, which is heavily chitinized. There are four pairs of genital hairs. *Ad3* is preanal; *ad2* is behind the fissure *iad*, which is located obliquely to the anal field. Between the hairs *ad1* there is a small V-shaped ridge. The legs are moderately long. The hairs of the legs are strong and barbed. The solenidion of Tibia II is short. This species is named after Dr. C. BADER, Switzerland.

Fox Glacier: One specimen in moss, liverworts, grass, and low plants by the roadside in mixed *Nothofagus* forest.

Oppia Mihelcici n. sp.; fig. 72.

Colour light brown to brown. Length about 0.36 mm.

The rostrum is broad. The rostral hairs, which are set rather far laterally, reach by about one third of their length beyond the tip of the rostrum. They are distinctly barbed. The lamellae are slightly undulating and so long that they reach across two thirds of the length of the propodosoma. They incline a little. The lamellar hairs are curved, barbed, and longer than their mutual distance. In front of them there is an almost semicircular ridge, which forms the anterior border of the middle field between the lamellae. The lamellar hairs reach beyond this ridge and beyond a faint transverse band in front of the ridge. The interlamellar hairs are tiny. The exopseudostigmatic hairs are scarcely discernible. On the medial border of the pseudostigma a ? keel runs backwards, ending opposite a blunt tooth on the anterior border of the hysterosoma. The pseudostigmatic organs are long, almost filamentous, though tapering towards the tip, which is very thin. They are uneven on the posterior border.

The hysterosoma, which is only a little longer than broad, is rounded at either end. Its anterior border is well chitinized. *Ta* is missing, its pore can be seen behind the pseudostigma. The notogastral hairs, which are moderately long, are thin and slightly barbed.

The ventral side is shown in fig. 72 a. The sternal ridge is equally thick throughout. It is dark brown. The same is the case with Apodemata II, the sejugal apodemata, and the curved ridges lateral to the genital field. The hair *3 b* is set more posteriorly than is usually the case; *4 a* more medially. There are four pairs of genital hairs. *Ad3* is preanal. The fissure *iad* is located obliquely to the anal field. The legs are rather short. The solenidion of Tibia II is very short and broad. Tibia II and Tarsus

II have respectively one and two strong, serrate, ventral hairs. This species is named after Dr. F. MIHELČIČ, Austria.

Keri-Keri: Four specimens in moss and grass near a brook in a deep cleft with tall vegetation; a few in moss, needles, and dead leaves under a fir tree.

New Plymouth: A few specimens in mouldering leaves under oak trees.

Pauatahanui: One specimen in thick moss, grass, and low plants under a tree-fern.

Christchurch: One specimen in *Polytrichum* and low plants on a vertical slope with oozing water.

Oppia ? minus Paoli 1908; fig. 73.

Colour pale ochre to light brown. Length about 0.205 mm.

The only specimen found agrees with the description and the figure of WILLMANN 1931, p. 132, fig. 149, but not with those of PAOLI 1908, Table III, fig. 11, which shows a short semilunar ridge in front of two short tips issuing from the anterior border of the hysterosoma. These tips are present also in *Oppia minutissima* Selln.. Fig. 73 a shows a sketch of the ventral side drawn from the dorsal side, thus not being quite correct. PAOLI does not show the ventral side, and therefore it is not possible to decide whether this species is *O. minus* Paoli. WILLMANN'S species and the present one may be a different species.

Lake Rotoiti: One specimen in moist moss on a mouldering log in *Nothofagus* forest.

Oppia minutissima Selln. 1950; fig. 74.

Colour pale ochre. Length about 0.185 mm.

Rotorua: Many specimens in moist liverworts and moss on the bank of Lake Tarawera, under trees.

Christchurch: One specimen in a thin layer of moss on a vertical roadside in shadow.

Oppia arcualis Berl. 1913; fig. 75.

Colour light brown to brown. Length about 0.42 mm.

Keri-Keri: One specimen in a valley with a river (STAGAARD coll.); one individual in moss on a mouldering log; one in a thin layer of moss and liverworts on a grown-over road in deep shadow; several individuals in dead *Selaginella* vegetation under tall trees and shrub.

Waitakere: Three specimens in moss and small ferns on a log in native forest.

Oppia Winkleri n. sp.; fig. 76.

Colour light brown. Length about 0.38 mm.

This species has many characters in common with the preceding one and they probably constitute a separate genus. The tip of the rostrum is not cut so deeply

into three parts as in *O. arcualis*, and the parts are not so distinct. There is no lamellar arch on the propodosoma, scarcely a shade of it. The lamellar hairs are very thin. The interlamellar hairs are set laterally to the anterior light spots. The exopseudostigmatic hair is shorter than that of the preceding species. The pseudostigmatic organs have apparently almost the same appearance as those of *O. arcualis*, but only apparently. Fig. 76 a shows that the distal long thread merges into the swollen head, whereas the organ in *O. arcualis* is club-shaped with two long distal threads, the posterior one of which is twice as long as the anterior one, fig. 75 a. The long distal thread is in *O. Winkleri* as long as the remaining part of the organ. Besides this long thread there are two shorter proximal ones and several very short ones set on the distal thread. Behind the four light spots between the interlamellar hairs three indistinct spots in dark surroundings can be seen. They are present also in *O. arcualis*, but scarcely discernible.

The hysterosoma is a little longer than broad. Its anterior margin is rounded. Ta is well developed. The fissure ia can be seen immediately behind ta. The lyri-fissure im is located medially to r3, not in front of r3 as in *O. arcualis*. The notogastral hairs are moderately long. Te and ti from the two sides are set on a transverse line. This species is named after Dr. J. R. WINKLER, Czechoslovakia.

Keri-Keri: Three specimens in moist grass and *Hieracium* by the roadside.

Rotorua: Five individuals in a thin layer of moist moss and small ferns under *Manuka* shrub in the thermal area.

Brachioppia Higginsi n. sp.; fig. 77.

Colour pale orange to light brown. Length about 0.29 mm.

The propodosoma is very long as compared with that of most *Oppia* species. The rostrum is rounded. The rostral hairs, which are barbed, reach by only one third of their length beyond the tip of the rostrum. The lamellae are indicated only by faint shades. The lamellar hairs, which are set in a greyish middle field, are, when seen in a dorsal view, a little shorter than their mutual distance. Between the pseudostigmata there are six light spots, which appear bright in dark greyish surroundings. Along their lateral sides a grey band continues beyond the posterior border of the middle field. On the posterior border of the propodosoma they appear like small erect scales. The interlamellar hairs, which are set laterally to these dark bands off the posterior spots, are thin and short. The exopseudostigmatic hairs are tiny. The pseudostigmatic organs have on a slender flat club 6–7 radiating branches, the proximal ones of which are the longest, becoming evenly shorter towards the distal end. The organs are a little longer than their mutual distance. On the posterior border of the pseudostigma there is a small tubercle corresponding to a tiny tubercle on the anterior part of the hysterosoma.

The hysterosoma is longish. Its posterior end is broad, its anterior end tapers slightly, ending in a low, narrow arch on either side of which the pore for ta can be seen. The fissure ia is very distinct and is displaced far medially in front of te. The

anterior part of the hysterosoma is a yellowish-orange colour. The notogastral hairs are short and thin. The lyrifissure im is found immediately in front of r3.

The ventral side. There are five pairs of genital hairs, viz. three along the anterior border and two near the latero-posterior border. Ad3 is preanal. The fissure iad is set obliquely to the anal field, ad2 is off iad. Tibia II has a strong, serrate spine distally, Tibia IV and Tarsus IV a stiff, spine-shaped hair. This species is named after Dr. H. G. HIGGINS, U.S.A.

Keri-Keri: Three individuals in a green, moist to wet carpet of mosses and low ferns close to a brook in a deep cleft with shrubs and tall trees; several specimens in moss on the ground above a small brook in deep shadow.

Pauatahanui: One specimen in thick, moist moss, grass, and small plants at the foot of a tree-fern in native forest.

Brachioppia Hartensteini n. sp.; fig. 78.

Colour very light brown. Length about 0.43 mm.

Like the preceding one this species is longish, about twice as long as broad. The rostral hairs, which are set rather far posteriorly, are barbed. There are no lamellae. The lamellar hairs, which are set at a short distance behind a very faint transverse line, are very thin and a little longer than their mutual distance. The interlamellar hairs are much stronger than the lamellar hairs and as long as the latter. The exopseudostigmatic hairs are short and thin. The six light spots between the pseudostigmata are close together with a narrow distance only between the two anterior ones. The pseudostigma has a small posterior tubercle. The pseudostigmatic organ is a flat, slender club, which on its posterior border has four branches, the shortest one distally. The club gradually becomes narrower for each branch towards the tip. The integument is covered with small round tubercles laterally to the pseudostigmata.

The hysterosoma is longish, broadly rounded at the posterior end, at the anterior margin with a low arch. The latter is marked well off laterally by a posterior indentation at either end. The hair ta is set in front of the indentation. The remaining notogastral hairs are equally long and slightly barbed. This can be seen best in profile. Ti is set directly behind te and ms behind ti, all in a longitudinal row. P3 and r2 from the two sides are situated almost on a transverse line. The fissure im is situated close to the medial side of r3.

The ventral side. There are four or ? five pairs of genital hairs. The curved ridge surrounding the anterior border of the genital field is very prominent. Ad3 is preanal, ad2 is situated laterally to iad, which is located obliquely to the anal field. Ad1 is postanal. All the tibiae have a stiff, strong, distal spine. Tarsi III–IV with similar, though smaller spines. This species is named after Dr. R. HARTENSTEIN, U.S.A.

Waitakere: One specimen in moss and liverworts along a trail in dark native forest.

Brachioppia Walkeri n. sp.; fig. 79.

Colour very light brown. Length about 0.43 mm.

This species is longish like the preceding ones. The rostral hairs, which are set rather laterally, are densely barbed. On the dorsal surface of the rostrum there is a U-shaped fissure. Across the posterior part of the rostrum several transverse wrinkles can be seen. The middle field is bordered by faint grey bands or ridges. The lateral ones are more or less replaced by small dark tubercles. The lamellar hairs, which are as long as their mutual distance, are barbed. The interlamellar hairs are likewise barbed and at least as long as their mutual distance. Between the interlamellar hairs there are six light spots in two rows. The four posterior ones are placed close together, whereas the two anterior ones are separated by a distance twice the width of the spots. From these more laterally situated spots a dark membrane runs backwards, reaching beyond the posterior border of the middle field, then turning laterally, forming a round lobe (cp. *Br. Higginsi* fig. 77). The exopseudostigmatic hair is rather long. On the posterior margin of the pseudostigma there is a small tubercle opposite a blunt tooth on the anterior border of the hysterosoma. The pseudostigmatic organ has a narrow flat head with 3–5 radiating branches on its posterior border. The head is broadest off the proximal branch, which is the longer.

The hysterosoma is longish. The posterior end is broad, rounded. The anterior end tapers, forming a narrow arch, which projects beyond the posterior border of the pseudostigmata. On either side of the arch there is a strong, blunt tooth. Ta is scarcely discernible. Its pore is located on the latero-anterior edge of the arch. The fissure ia is distinct. The notogastral hairs, which are soft and flexible, are barbed proximally, very thin and smooth distally. The lyrifissure im is placed at some distance in front of r3.

The ventral side. There are five pairs of genital hairs, viz. two behind each other at the antero-medial border, one near the middle of the lateral border, and two in the latero-posterior corner. Ad3 is preanal. Ad2 is set behind iad, which is located obliquely to the anal field. Ad1 is postanal. Tibia II has a long, distal spine. Tibiae III–IV have each two long, distal spines, and Genu III one long, stiff spine. Tarsus III has several very long spines. This species is named after Dr. N.A. WALKER, U.S.A.

Keri-Keri: Five individuals in a thick, green carpet of mosses, ferns, etc., close to a small brook in a deep cleft with tall vegetation; many specimens in thick, moist moss on a log and on the ground, in the same locality.

Waitakere: Three specimens in moist moss on the ground in native forest.

?*Brachioppia Suciui* n. sp.; fig. 80.

Colour very light brown. Length about 0.29 mm.

The rostrum is long, rounded at the tip. The rostral hairs, which are set rather close together, are slightly barbed. They are set rather far posteriorly and reach by

only one third of their length beyond the tip of the rostrum. There are no true lamellae, but a faint rectangular frame surrounds the grey middle field. Posteriorly the frame does not quite reach the pseudostigmata. The lamellar hairs are set at some distance behind the transverse line. They are thin and shorter than their mutual distance. The interlamellar hairs are tiny. The exopseudostigmatic hairs are unusually long and strong. Between the interlamellar hairs there are six light spots. The pseudostigmatic organ is a long, flat club with eight to ten radiating branches on its posterior border, fig. 80 a. The branches become gradually longer towards the tip; the two distal ones are, however, rather short. On the posterior border of the pseudostigma there is a lobe, which apparently corresponds to a small knob hidden by the anterior border of the hysterosoma. Small dark tubercles can be seen on the posterior part of the lateral sides of the propodosoma.

The hysterosoma is circular. It has a very broad chitinized anterior border. The two small knobs just mentioned can be seen through it. Ta is minute. It is set farther laterally than usual, laterally to the knob. The notogastral hairs are short and thin. R3 and ms from the two sides are set on a transverse line. The lyrifissure im is located at a short distance in front of r3.

The ventral side is shown in fig. 80 b. The sternal plate is well chitinized and rather broad, especially between Apodemata II. The genital field is narrow. There are five pairs of genital hairs, viz. three in an oblique anterior row and two in the latero-posterior corner. Ad3 is preanal. Ad2 is located laterally to the fissure iad, which is parallel to the lateral side of the anal field. Ad1 is postanal. Tectop. IV ends in a tiny, pointed tooth. All the legs are slender. Femora I–II have a ventral keel. Tibiae and Tarsi III–IV have long, spine-shaped hairs. Due to the position of iad being parallel to the anal field this species does not belong to *Brachioppia*; it has been placed within this genus only for the time being until more species with the same characters have been found. It is named after Dr. I. SUCIU, Rumania.

Waitakere: Several specimens in moist moss and grass under bushes in a garden on the edge of native forest.

Brachioppiella Rajskii n. sp.; fig. 81.

Colour light brown. Length about 0.28 mm.

The rostral hairs, which reach by only half their length beyond the tip of the rostrum, are slightly barbed. The lamellae, which are well developed, are winding, being concave both anteriorly and posteriorly on the lateral side. There is no trans-lamella, but a faint line indicates the anterior border of a grey middle field. The lamellar hairs, which are located off the middle of the anterior concave part, are thin and shorter than their mutual distance. The interlamellar hairs are very short. Behind them two retroverse small lobes can be seen, and between them there are four light spots, the two anterior ones being separated by a distance one and a half times longer than the width of the spots. The exopseudostigmatic hair is tiny. On the posterior

margin of the pseudostigma there is a tubercle corresponding to a blunt tooth on the anterior border of the hysterosoma. The pseudostigmatic organs have a long and narrow, flat head with three radiating branches on the posterior border. The head is a little thicker proximally to the proximal branch. The two proximal branches are the longest. The pseudostigmatic organs taper towards the tip. The latero-posterior sides of the propodosoma are covered with a greyish (?) secretion.

The hysterosoma is almost circular. Its anterior chitinized border is narrow in the middle, forming a faint arch at either side of which the pore for ta can be seen. The notogastral hairs are very short and thin. Te and ti from the two sides are set almost on a transverse line. The fissure im is located at some distance in front of r3.

The ventral side. There are five pairs of genital hairs. Ad3 is preanal and set rather far laterally. The fissure iad is set obliquely off the anterior part of the anal field, ad2 a short distance behind iad. Ad1 is postanal. The legs are slender; there are no long spines as often present in *Brachioppia*. Genu III has a curved, dorsal, distal spine. This species is named after Dr. A. RAJSKI, Poland.

Pauatahanui: A few specimens in dead leaves in ?cypress forest.

Brachioppiella Rafalskii n. sp.; fig. 82.

Colour light brown. Length about 0.28 mm.

The rostral hairs, which reach by about one third of their length beyond the tip of the rostrum, are faintly barbed. The lamellae are rather long, narrow, and slightly inclining. At their anterior end they are connected by a curved translamellar ridge, which is very faint. The lamellar hairs, which are found immediately behind the curved ridge, viz. in the middle of the propodosoma, are very thin and shorter than their mutual distance. The interlamellar hairs are at least as long as the lamellar hairs. Exopseudostigmatic hairs have not been observed. The latero-posterior corners of the middle field are cut off by oblique lines. Between the interlamellar hairs there are four indistinct light spots separated by a distance twice their width. The pseudostigma has on its posterior border a tubercle opposite a small tooth on the hysterosoma. The pseudostigmatic organ has a flat, club-shaped head with five radiating branches on its posterior border, the branches being approximately equally long.

The hysterosoma is a little truncate posteriorly and not much longer than broad. Its anterior chitinized margin is narrow. The hair ta is proportionately long. The remaining notogastral hairs are moderately long and slightly barbed.

The ventral side. There are six pairs of genital hairs, viz. four in a longitudinal row and two in the latero-posterior corner. Ad3 is preanal. The fissure iad is set obliquely to the anal field, ad2 is located behind iad. Ad1 is postanal. *B. Rafalskii* is closely related to *B. petrohuensis* Ham. 1962, p. 48, fig. 39, but differs by its longer and inclining lamellae. This species is named after Dr. J. RAFALSKI, Poland.

Lake Rotoiti: Three specimens in thick, moist ?*Leucobryum* in *Nothofagus* forest.

Ramusella Sengbuschi n. sp.; fig. 83.

Colour pale ochre to light brown. Length about 0.24 mm.

Ramusella was established 1962, the type species being *R. puertomonttensis* Ham. 1962 a, p. 50, fig. 42. The new species corresponds in all important characters to the type species.

The rostral hairs, which are set close together in a dark band, are densely feathered proximally, whereas the distal part is smooth and bent medially. The lamellar hairs, which are situated in a greyish middle field at a short distance behind a faint transverse ridge and removed from the narrow lamellar ridges, are thin and approximately as long as their mutual distance. The interlamellar hairs are perhaps as long as the lamellar hairs. They are more or less erect. The light spots are distinct. The three spots in each row are situated close together and the rows are separated by a distance, which is longer than the width of the spots. The exopseudostigmatic hair is short. The pseudostigmatic organs differ from those of the type species by being more branched. The flat, club-shaped head has on its posterior border 10–13 radiating branches of different lengths, viz. a few short proximal ones, some very long in the middle becoming evenly shorter distally, fig. 83 a.

The hysterosoma is a regular oval with a broad chitinized anterior border. The hair ta cannot be seen, but its pore behind the pseudostigma can. The remaining hairs are thin and slightly barbed, moderately long.

The ventral side agrees with that of the type species (HAMMER 1962 a, fig. 42 a). The fissure iad is parallel to the lateral border of the anal field and situated off ad2. Ad3 is preanal. The legs, which are comparatively short, have no spines, although Tibia IV has a long, stiff, ventral hair distally. Tectop. IV ends in a pointed tooth. This species is named after Dr. H. G. SENGBUSCH, U.S.A.

Keri-Keri: Three specimens in a little moist moss and grass under a hedge of *Eucalyptus* trees; two individuals in moist moss and grass on a lawn.

Neoribates barbatus n. sp.; fig. 84.

Colour mahogany red. Length about 0.95 mm.

The rostral hairs, which almost meet at some distance in front of the tip of the rostrum, are barbed, the secondary bristles being rather long and scattered. The lamellar hairs, which are set near the end of the narrow inclining lamellae, are parallel, rather thin, and furnished with prominent scattered secondary bristles. They reach by most of their length beyond the tip of the rostrum and far beyond the rostral hairs. The lamellae are connected by a faint line forming a broad arch across the propodosoma, fig. 84 a. The interlamellar hairs are longer than the lamellar hairs and, like these, thin and with scattered bristles. They are very thin towards the tip, as is the case also with the lamellar hairs. The pseudostigmatic organs are more or less lanceolate, thinnest at the tip, and along their whole length set with outstanding bristles, fig. 84 b.

Along the anterior border of the hysterosoma there is a long area porosa dorso-

sejugalis. The position of the sacculi is shown in fig. 84. The hair pores are very indistinct.

Fig. 84 c shows the ventral side. There are four pairs of genital hairs. Ad3 is preanal, situated close to the anterior border of the anal field. The fissure iad is parallel to the anal field, near the anterior border of the latter. Ad2 is located off the latero-posterior corner of the anal field, and ad1 is postanal.

Waitomo: Two species in moss, liverworts, and mouldering leaves.

Lake Rotoiti: Two individuals in thick *Sphagnum*; one in wet moss and liverworts on a vertical slope above a small brook, both biotopes in *Nothofagus* forest.

Fox Glacier: One specimen in thick moss at Lake Matheson in native forest.

Milford: Four specimens in liverworts on a rotten log under trees.

Galumna scaber n. sp.; fig. 85.

Colour brown. Length about 0.62 mm.

The rostrum is conical. The rostral hairs, which are set laterally, are apparently smooth. The lamellae project beyond the side of the propodosoma; their medial border continues on the dorsal surface. Fig. 85 a shows the lamella and the sublammella. Both the lamellar and the interlamellar hairs are very long and reach far beyond the tip of the rostrum. They are extremely thin towards the tip, which is curved, and smooth. Medially to the base of the interlamellar hairs there is a big pore. The pseudostigmatic organs are filamentous to lanceolate, being slightly thicker towards the tip, which is pointed. Within the thickened part a light line can be seen. Behind the interlamellar hairs a small round area porosa dorso-sejugal is can be seen.

The propodosoma and the hysterosoma are separated by a distinct line, the dorso-sejugal suture. The integument of the hysterosoma is rough (= *scaber*) being set with chitinous tubercles in more or less regular oblique lines. These are most distinct between Aa–Aa. Aa is oval and at least twice as long as A1. A2 is the smaller and A3 is as long as A1. The pteromorphae have dark radiating ribs with holes or pores surrounded by ribs.

Fig. 85 b shows the ventral side. The hairs are all distinct but very thin. The area porosa postanalis is short and oval.

Fox Glacier: One specimen in thick moss on a log in native forest.

Galumna rugosa n. sp.; fig. 86.

Colour brown to mahogany red. Length about 0.66 mm.

The rostral hairs are moderately long, thin, and barbed. The lamellar hairs, which also are barbed, reach halfway to the tip of the rostrum. The lamellae project beyond the side of the propodosoma and the lamellar line is distinct in young individuals in a dorsal view. Fig. 86 a shows the lines S and L. Interlamellar hairs are absent. The integument of the propodosoma from the tip of the rostrum to the dorso-sejugal suture is densely furrowed, being furnished with undulating dark chitinous

ribs, which make the outlines rough. The pseudostigmatic organ is a slender rough club, which is set with tiny scales for most of its length.

The dorso-sejugal suture is distinct. Behind the interlamellar hair pore there is a small round area porosa dorso-sejugalis. The pteromorphae have dark radiating ribs, being thinner and denser towards the distal border. In young individuals similar undulating ribs as those on the propodosoma can be seen on the pteromorphae, the ribs often running across the pteromorphous ribs. The pore for ta looks like a dark key-hole, or like the figure 8. Aa is rounded and about twice as big as A2. A3 is a little bigger than A2, and A1 is only half as big as A3. All the hair pores are double and look like the figure 8.

Fig. 86 b shows the ventral side. The hair pores of the ventral side are not double. An area porosa postanalis has not been observed.

Keri-Keri: Two specimens in a thick carpet of mosses and small ferns near a brook in a deep cleft with shrubs and tall trees; one in lichens and moss on a dead trunk.

Bay of Islands: Several individuals in a forest hang; in a pine wood, and in a *Citrus* plantation (STAGAARD coll.).

Rotorua: Two individuals in wet *Scirpus* close to the warm water called Soda Spring at Lake Rotoehu, 23 miles north east of Rotorua.

Galumna microfissum n. sp.; fig. 87.

Colour mahogany red to black, the propodosoma, however, lighter. Length about 1.12–1.14 mm.

The rostrum, which is conical, is at a lower level than the posterior part of the propodosoma. The rostral hairs are short, thin, and smooth. The lamellar line is well developed and the lamellar hair is as short and thin as the rostral hair. Fig. 87 a shows the lamella and the sublamella. The interlamellar hairs have the same appearance as the lamellar and the rostral hairs. The dorso-sejugal suture is very indistinct. Area porosa dorso-sejugalis is oblong. The pseudostigmatic organ is a very thin thread, which becomes extremely thin towards the tip. It is smooth.

The pteromorphae are covered with short, dark ribs, in older individuals moreover with brown chitinous patches in the neighbourhood of the fissure (shown on the left pteromorpha). The fissure is very short and surrounded by a dark frame. The hair pore ta is very small. On the posterior border of the hysterosoma there are two low indentations. Aa is shaped like a broad funnel, being broad and rounded laterally and with a fairly long and narrow medial part. A1 and A2 are situated rather close together. A1 is round, A2 and A3 oblong. The last two are equally large.

Fig. 87 b shows the ventral side. There are five pairs of genital hairs. All the hairs of the ventral side are thin and moderately long. Ad3 is located behind iad. An area porosa postanalis has not been observed. The three claws are equally strong.

Keri-Keri: Two specimens in a thin layer of lichens and moss on a dead branch, and in moss on the ground.

Waiuku Forest: One specimen in the litter (STYLES coll.).

Rotorua: Numerous in moist mosses and small ferns on a slope under *Manuka* shrub in the thermal area.

New Plymouth: One individual in mouldering leaves under oak trees.

Lake Rotoiti: One specimen in dead mouldering *Nothofagus* leaves.

Milford: One specimen in thick moss, grass, and white clover by the roadside.

Acrogalumna longiplumus (Berl.) 1904; fig. 88.

Colour brown. Length about 0.77 mm.

The specimens from New Zealand differ a little from the figures in WILLMANN 1931, fig. 289, and in BALOGH 1965, fig. 3, Plate 23. The interlamellar hairs thus do not reach beyond the tip of the rostrum as shown by WILLMANN. Aa is triangular in the specimens from New Zealand, A2 and A3 oblong. BERLESE does not show the areae porosae. According to WILLMANN Aa is small and round, according to BALOGH Aa is a little longish, and bigger than shown by WILLMANN. The specimens from New Zealand agree with a few specimens collected in the mushroom *Oudemansiella radicata* near Fredensborg and in Grib wood in North Eastern Zealand. These Danish specimens have a triangular Aa, a longish A2 and A3, A2, however, a little shorter than A1. The pseudostigmatic organ is in the Danish specimens very thin and slightly thicker in the distal third, which is very slender, lanceolate. In the specimens from New Zealand the pseudostigmatic organ is rather thick and rough. This species thus seems to be very variable.

Fig. 88 a shows the propodosoma in a lateral view. The male has a group of bright pores on the posterior part of the hysterosoma.

Keri-Keri: Numerous in many samples collected in a thin layer of lichens and moss on a rotten branch on the ground; in moss and grass on a lawn, but also in moist to wet moss in a kind of bog.

Waitomo: One specimen in moss and *Medicago* by the roadside.

Nelson: One specimen in a thin layer of moss on a slope at the water-reservoir of the town.

Allogalumna novazealandica n. sp.; fig. 89.

Colour light brown. Length about 0.40–0.41 mm.

The rostral and the lamellar hairs are very short, thin, and smooth. Interlamellar hairs are missing. The area porosa dorso-sejugalalis is oblong. The dorso-sejugal suture is scarcely discernible. The colour of the propodosoma is a little more greyish than that of the hysterosoma. The lamellar line is absent. Fig. 89 a shows the sublamella and the hairs of the propodosoma. The pseudostigmatic organ, which is rather short, is straight and almost equally thick throughout, perhaps slightly thicker in the distal third, and smooth.

The pteromorphae are light in colour and have only very faint ribs. The pore for ta has a long, light furrow running medially in greyish-yellow surroundings. Aa is oval and very large, A1 is circular and only half as big as Aa. A2 is also circular and smaller than A1. A3 is oval and perhaps as big as A1. In front of Aa some light spots can be seen. In the middle of the posterior part of the hysterosoma there is a small pore.

Fig. 89 b shows the ventral side. Hairs have not been observed. The area porosa postanalis is fairly big and oval.

Waitomo: Five specimens in mouldering leaves under trees in a cleft by the roadside.

Allogalumna remota n. sp.; fig. 90.

Colour brown. Length about 0.67 mm.

The rostrum is a little pointed, conical, and at a lower level than the middle of the propodosoma. The rostral hairs are rather long and slightly barbed. The lamellar hairs are as long as the rostral hairs and likewise barbed. The interlamellar hairs are perhaps a little shorter and directed straight forwards. Fig. 90 a shows the sublamella and the hairs of the propodosoma. The dorso-sejugal suture is scarcely discernible. At a short distance in front of the intermellar hairs a faint transverse line can be seen. The area porosa dorso-sejugal is missing, but in some specimens something like a pore can be seen laterally to the long gland behind the interlamellar hairs. The pseudostigmatic organ is a long, very thin thread set with secondary bristles.

The middle of the hysterosoma is a mahogany red colour, the anterior border of which is indicated by a broken line. The pteromorphae have broad, brown ribs separated by yellow, narrow furrows. Aa is removed (= *remota*) from its usual position near the base of the pteromorpha to the middle of the hysterosoma. Aa is rather small and round. A1 is also round and a little bigger. A2 is absent, and A3 as big as A1. The middle pore is as big as Aa.

Fig. 90 b shows the ventral side. The genital and the anal field are light brown in dark brown surroundings. Also the anterior part of the ventral side as far as the ventro-sejugal apodemata is light, though with a darker band between Apodemata II. The hairs are fine, geniculate at their base. The area porosa postanalis is indistinct. All the legs have three claws of which the middle claw is the strongest.

Keri-Keri: Numerous in a thick carpet of mosses and low ferns near a brook on wet soil in a deep cleft with tall vegetation; in luxurious moss on the ground; in lichens and moss on dead branches, etc.

Waitakere: Several specimens in many samples collected in moss, liverworts, and dead leaves in native forest; also in moss in the drier part of the forest under a *Manuka* shrub.

Rotorua: Three individuals in thin, almost dry moss on the ground under a *Manuka* shrub in the thermal area; numerous in moist moss and small plants under a *Manuka* shrub in the thermal area.

Pergalumna reniformis n. sp.; fig. 91.

Colour light brown. Length about 0.50–0.51 mm.

The rostrum is pointed. The rostral hairs, which are situated halfway between the tip of the rostrum and the projecting lamellar tip, are rather long and strong. The lamellar and the interlamellar hairs are much shorter and much thinner, both are smooth. Fig. 91 a shows the position of the lamellar hairs between the two lamellar lines. The lamellar line can be seen also in a dorsal view. The area porosa dorso-sejugalis is narrow, oblong. The pseudostigmatic organs are lanceolate, the head being only slightly thicker than the stalk. The organs are set with minute bristles, which make them slightly rough, fig. 91 b. The dorso-sejugal suture is a distinct straight line. The glands behind the interlamellar hairs are branched.

The pteromorphae have only faint, light ribs on an ochre ground, but medially there is a large light field into which the proximal ribs reach. The fissure is short and indistinct. Aa is big, reniform with the concave side directed anteriorly. Aa from the two sides are not equally big in the only specimen found. A1 is round and less than half as big as Aa. A2 is round, too, but much smaller than A1. A3 is longish and as big as A1.

Fig. 91 c shows the ventral side. It is a light brown colour. There is a faint line between the ventro-sejugal apodemata. All the hairs are short and thin. The area porosa postanal is oblong.

Rotorua: One specimen in thin moss on the ground under a *Manuka* shrub in the thermal area.

Pergalumna silvestris n. sp.; fig. 92.

Colour light brown. Length about 0.43 mm.

The propodosoma is pointed and only slightly arched. The rostral hairs are absent or not discernible. The lamellar hairs, which are set close to the lamellar line, fig. 92 a, are extremely small. The same holds good of the interlamellar hairs. The lamellar line is developed in its whole length. At the lateral side of the propodosoma it projects like a small keel. The dorso-sejugal suture is indistinct. The area porosa dorso-sejugalis is guttiform, being narrowest laterally. The gland behind the interlamellar hair is composed of small round tubercles. The pseudostigmatic organs have a long thin stalk, widening distally into a short, flat club, which is serrate at the tip or set with minute bristles.

The pteromorphae have rather a sharp carina at a short distance in front of the fissure and parallel with the latter. Aa is twice as long as it is broad. It is set at almost right angles to the pteromorpha. A1, A2, and A3 are approximately of the same size, all being small and round. The shape of Aa is variable, fig. 92 b.

Fig. 92 c shows the ventral side. The area porosa postanal is round.

Fox Glacier: Five individuals in thick moss at the foot of a giant tree in native forest; many specimens in thick moss and dead leaves also in native forest.

Addenda

At a revision of the material the following eight new species were found, which have been described below; *Zeasuctobelba arcuata* n. sp.; *Machuella pyriformis* n. sp.; *Schelorbates maoriensis* n. sp.; ?*Xylobates sicafer* n. sp., *Lauritzenia acutirostrum* n. sp., *L. rotundirostrum* n. sp., *Totobates capitus* n. sp., and *T. microseta* n. sp. In Table I, p. 74, which shows the occurrence of the species in New Zealand, they are arranged together with species of the same genera, or, in cases in which the genus has not previously been recorded, in their respective place in the series.

Zeasuctobelba arcuata n. sp.; fig. 93.

Colour light brown. Length about 0.27 mm.

This new species is number four belonging to the genus *Zeasuctobelba* of which three were described in Part I (figs. 74–76) of this work. *Z. quinquenodosa* and *Z. trinodosa* have both two tubercles or broad teeth in the middle of the anterior border of the hysterosoma. These are missing in *Z. nodosa* and in *Z. arcuata*. Instead of the tubercles *Z. arcuata* has a low broad arch and on either side of the latter there is a long tooth. A similar arch is not present in *Z. nodosa*.

The rostrum has on either side a forward directed, fairly long tooth. On the dorsal side of the rostrum there are two long, tongued ridges, which run from the tip of the rostrum to the tectopedial field. Between them there is a row of small chitinous tubercles, but I am unable to tell how many, and also whether the posterior ones, which are only dark shades, have the exact shape as shown in fig. 93. The lamellar knob is open posteriorly. The lamellar hairs, which are situated off the posterior border of the knob, are longer than the latter. The interlamellar hairs, which are short and thin, are set laterally to the anterior part of the interpseudostigmatic ridge. The pseudostigmatic organ is club-shaped, the head being rather narrow, rounded at the tip. On the posterior border of the pseudostigma there is a very broad lobe corresponding to the pointed lateral tooth on the anterior border of the hysterosoma.

The notogastral hairs are thin and moderately long.

Waitakere: One specimen together with a huge number of *Z. nodosa* in moss and liverworts along a trail in native forest.

Machuella pyriformis n. sp.; fig. 94.

Colour yellowish to grey. Length about 0.22 mm.

The rostral, the lamellar, and the interlamellar hairs agree with those of the two previously described species (HAMMER 1961 a, fig. 59; HAMMER 1961 b, fig. 3). In the posterior part of the propodosoma there is in this species a structure consisting of very faint lines forming an arch from the anterior border of which short lines run anteriorly. Similar faint lines run from the pseudostigmata obliquely to the interlamellar hairs. These are very thin. Also the exopseudostigmatic hairs are extremely thin. Across the opening of the pseudostigma there is a narrow furrow bounded by narrow ridges, both of which end in a tooth laterally to the pseudostigma.

The shape of the hysterosoma differs from that of the two species previously described by being more pointed posteriorly, broadest in its anterior half. The anterior border is very narrow in the middle and straight, but only for a short distance. The very thin line which in the two other *Machuella* species runs from the anterior border of the hysterosoma to the hair *te* is much longer here, and there are two of them. The lateral one can be seen as far as *r3*, the medial one as far as *ti*. In front of the anterior border of the hysterosoma some faint lines can be seen in the shape of small triangles, but it is probably only due to a sheet of secretion.

A sketch of the ventral side is shown in fig. 94 a. I am unable to see how many hairs carry the middle layer of secretion and even to tell the length of the anterior ones. Details are extremely difficult to see, but I can see with certainty that there are eight hairs on a line immediately in front of the genital field.

Waitomo: One specimen in dead leaves in a cleft with tall trees.

Schelorbates maoriensis n. sp.; fig. 95.

Colour yellow. Length about 0.42 mm.

An easily recognisable species due to its yellow colour, the very long rostral, lamellar, and interlamellar hairs and the withdrawing pteromorphae. The pseudostigmatic organs are club-shaped, and the head is set with tiny bristles in longitudinal oblique rows, fig. 95 a. The sides of the pteromorphae are slightly striped and are a yellowish-grey colour. The notogastral hairs are tiny, slightly hook-shaped.

The hairs of the ventral side are fairly long. The anterior pair of the genital hairs are especially long and cross in front of the genital field. Ad3 is situated at a short distance in front of the anal field, off the latero-anterior corner. Iad is parallel to the anal field. Ad2 is located in front of the latero-posterior corner and ad1 is postanal. All tarsi have three claws, the middlemost of which is the strongest.

Rotorua: Numerous in thick green moss under *Manuka* shrubs in the thermal area.

?*Xylobates sicafer* n. sp.; fig. 96.

Colour light brown. Length about 0.55 mm.

The tip of the rostrum, which is rounded, projects a little in front of the sides of the rostrum. The rostral hairs, which are thin and barbed, are almost as long as their mutual distance. The lamellae, which are broadest in their middle, taper distally, ending, bending medially, in a faint translamellar line, which together with the lamellae forms a regular arch. Where the lamellae are broadest, a "window" at the medial border can be seen. The lamellar hairs are set at a short distance behind the tip of the lamellae. They are as long as their mutual distance, thin and slightly barbed. The interlamellar hairs, which are more or less erect, are perhaps as long as the lamellar hairs and barbed like these. The pseudostigmatic organs are long, thin threads, which are almost equally thick throughout. For most of their length they are set with short outstanding scales or branches.

The hysterosoma is a little longer than broad. Its anterior margin is a broad arch. The pteromorphae, which are movable, do not reach quite so far anteriorly as the anterior margin of the hysterosoma. The notogastral hairs, 10 pairs, are scarcely discernible, but their pore is bright. Aa is a little longer than the remaining areae porosae. From the posterior border of the hysterosoma two proportionately long hairs project. They represent ad1.

Part of the ventral side is shown in fig. 96 a. The sternal ridge is represented by oblique wrinkles. There are probably six pairs of genital hairs. They are extremely difficult to see and I am uncertain of the anterior one. Ad3 is set within the frame of the anal field on its anterior border. Ad2 and ad1 are set on a faint curved ridge behind the anal field. The fissure iad is parallel to the lateral side of the anal field.

The legs are unusual, having branched dagger-shaped hairs on several joints (dagger: sica). In fig. 96 these hairs are shown on Femora I–II. They are present also distally on Tarsi I–III. Femora II–III are broad and have a big distal tooth. All the tarsi have three claws, the middlemost of which is much stronger than the very thin lateral ones.

Due to the strong dagger-shaped hairs, which I do not know from *Xylobates*, I have put a question mark in front of the generic name.

Keri-Keri: Six specimens in luxurious moss and grass on a lawn.

Lauritzenia acutirostrum n. sp.; fig. 97.

Colour light brown. Length about 0.43 mm.

The rostrum ends in a pointed tip. The rostral hairs, which are situated laterally in front of a free tip of the tutorium, are thin and barbed. They just reach beyond the tip of the rostrum. The lamellae seem to be rather complicated and the distal half immediately behind the lamellar hair has apparently a broad plate along the medial thickening. The lower part of the lamellae seems to continue to the dorsal surface of the rostrum. The lamellar hairs are thin, distally barbed, and reach beyond the tip of the rostrum. The interlamellar hairs are barbed and apparently shorter than the lamellar hairs, but as they are erect, their length is difficult to tell. Round the base of the interlamellar hairs there is a plate within which there is a small extra pore. Also the notogastral hairs are surrounded by a plate with a pore. This extra pore can be seen in *L. longipluma* Hammer (1958, fig. 102), too. The pseudostigmatic organ is a long thread, which is thinnest in the middle. The distal end is slightly thickened and the tip is rounded. Along its distal half it is set with tiny hairs on the posterior border.

The hysterosoma is longer than broad. Its anterior border is a broad regular arch. The pteromorphae are rather short, movable. The notogastral hairs are equally long. They are extremely thin, slightly curly and rather short. Sa is narrow and very long, S1 is much shorter, S2 broader than Sa and a little shorter, S3 is as narrow as Sa but shorter. S3 is surrounded by a dark plate. The integument is without any sculpture.

The ventral side agrees with that of *L. longipluma* Hammer (1958, fig. 102 a),

except that there are one or two genital hairs more, in all five or six pairs. Those on the anterior border are extremely difficult to see. The adanal hairs are situated as in *L. longipluma*. Iad is parallel to the side of the anal field. The tarsi have three claws the lateral ones of which are very thin.

Keri-Keri: One specimen in lichen and moss on a rotten branch under trees.

Lauritzenia rotundirostrum n. sp.; fig. 98.

Colour light brown to brown. Length about 0.70 mm.

The rostrum is rounded. The rostral hairs are set laterally in front of a short pointed free tip of the tutorium. They are stiff, unilaterally barbed, and rather short. They just reach beyond the tip of the rostrum. The lamellar hairs, which are densely barbed, are about one and a half times longer than their mutual distance, and they reach by half their length beyond the tip of the rostrum. The interlamellar hairs are broken, so nothing can be told about their length. The lamellae are built like those of the preceding species. The pseudostigmatic organs consist of a very slender stalk that ends in a tiny lanceolate head, which is pointed distally. The stalk is thinnest close to the head. It reaches beyond the pteromorphae.

The hysterosoma is rather broad. Its anterior border is a regular arch. The pteromorphae are short and movable. The notogastral hairs are of different lengths, ta being bent and much shorter than the remaining hairs, which are rather long, very thin, and smooth. At the hair base an extra pore can be seen. Sa is rather long, S1 short, S2 broad and short, and S3 rather narrow. The fissure im is indistinct with a bright hole close to it.

The ventral side. There are five (? six) pairs of genital hairs. The adanal hairs are located like those of the preceding species. The fissure iad is parallel to the anal field, off its anterior half. The integument is without any sculpture. The legs are rather slender. Femur II has a ventral keel, which ends in a distal tooth. The tarsi have three claws, the middle one of which is only twice as strong as the lateral ones.

Puketi: One specimen in a thin layer of moss and small plants scraped from the bark of a big tree.

Totobates capita n. sp.; fig. 99.

Colour yellow to light brown. Length about 0.31 mm.

This small species bears a close resemblance to *Totobates minimus* Hammer (1967, p. 56, fig. 75), but it can easily be distinguished from the latter by the following diagnosis. The rostral hairs and the lamellar hairs are very long and distinctly barbed. Also the interlamellar hairs are considerably longer than those of *T. minimus*, and they are slightly barbed. The pseudostigmatic organs are very characteristic because in all the *Totobates* species so far described, in this one alone the head and part of the stalk project beyond the anterior border of the hysterosoma. The head is moreover very big, round, with small round dots inside, and set with tiny bristles.

The hysterosoma has slightly withdrawn pteromorphae. The hysterosoma is

narrowest at the posterior end, broadest anteriorly and apart from the pteromorphae it is pear-shaped. The notogastral hairs are proportionately longer than in the previously described species (HAMMER 1967). Those on the posterior border are curved. The distance p1-p1 is no longer than the length of p1.

On the ventral side the hairs 1 a are set as on *T. antarcticus* Wallw. (HAMMER 1967, fig. 74 b), i.e. rather close together and with the same mutual distance as the hairs 2 a. The hairs 3 a are very close together. The aggenital hair is located as in *T. antarcticus*, i.e. at a short distance behind the genital field. Ad3 is a little farther anteriorly than in *T. antarcticus*.

Keri-Keri: Several individuals in thick moss and lichens on a log under trees; one in moss and liverworts on a grown-over road in deep shadow.

Waitakere: Several specimens in moss and grass under bushes in a garden on the edge of Waitakere forest.

Totobates microseta n. sp.; fig. 100.

Colour yellow to light brown. Length about 0.35 mm.

The tip of the rostrum ends in a tiny tip. The rostral hairs, which are situated laterally, are thin, stiff, ?smooth, and no longer than their mutual distance. The lamellar hairs are unusually short and very thin. In no other *Totobates* species described so far are the lamellar hairs so short. The interlamellar hairs are proportionately short like those of *T. antarcticus* and *T. minimus* (HAMMER 1967, figs. 74-75). The head of the pseudostigmatic organ is free.

The pteromorphae are withdrawn and their distal tip is bent ventrally. The curved line across the pteromorphae is very distinct. The hysterosoma is more or less pear-shaped, being broadest anteriorly. The notogastral hairs are very thin and rather short. On the ventral side the hairs 2 a are set close together. Also the hairs 3 a are set close together.

Christchurch: One specimen in moist, brown *Polytrichum* and small plants on a vertical slope near oozing water.

At the revision of the material, besides the eight species just described, some species which were described or mentioned in Parts I-II were found in localities from which they have not previously been registered. The new localities are added in Table I of the occurrence of the species in New Zealand. The above-mentioned species are listed below with statement of the new localities.

Part I.

Machuella ventrisetosa Ham. New Plymouth, Pauatahanui, Nelson.

Part II.

Magnobates flagelliger n. sp. Puketi

Zealandobates grandis Ramsay Puketi

<i>Setobates medius</i> n. sp.	Waitakere, Waitomo
– <i>scheloribatoides</i> (Ramsay)	Rotorua, Waitomo
– <i>discors</i> n. sp.	Puketi, Waitakere
<i>Grandjeanobates novozealandicus</i> n. sp.	Keri-Keri, Puketi
<i>Scheloribates anzacensis</i> n. sp.	Keri-Keri, Puketi
– <i>zealandicus</i> n. sp.	Puketi, Rotorua
– <i>aequalis</i> n. sp.	Keri-Keri, Waitakere
<i>Incabates angustus</i> n. sp.	Keri-Keri, Puketi
<i>Ingella bullager</i> n. sp.	Milford
<i>Maculobates luteomarginatus</i> n. sp.	Christchurch, Milford
– <i>longus</i> n. sp.	Keri-Keri
– <i>minor</i> n. sp.	Keri-Keri, Waitakere
<i>Totobates antarcticus</i> Wallw.	Puketi
– <i>communis</i> n. sp.	Keri-Keri
<i>Angullozetes rostratus</i> n. sp.	Keri-Keri

The species of the group Ptyctima or box mites found in New Zealand have been submitted to Dr. N. A. WALKER, Kansas, U.S.A., for working them up, as Dr. WALKER is a specialist within this group and collected these mites in New Zealand simultaneously with me.

General Remarks on the the Oribatid Fauna of New Zealand

In Table I all the species found are listed in the order in which they have been published in Parts I–III. The species added in the Addenda, however, are inserted in their respective places, i. e. beside closely related genera or species. The localities in New Zealand have been arranged from north to south, beginning on the left. The columns on the extreme right indicate from left to right the possible occurrence of the species in South America, Europe, and other localities. After the table the number of species, the number of samples, the number of individuals, and the total figures are indicated for each locality.

The highest number of species was found on the North Island (to the left in table I), viz. 232 species. On the South Island only 178 species were found in almost the same number of samples. It appears from Table I that the highest number of species was found at Keri-Keri, viz. 119 species in 32 samples. At Rotorua 91 species were found in 16 samples, only, in Waitakere forest 81 species in 12 samples. Fox Glacier and Milford had 78 and 76 species in 22 and 25 samples, respectively.

It is remarkable that a number of the presumably endemic genera are represented by a astonishingly large number of species, which must mean that a quick development of species has taken place. Of *Nesutegaeus* 5 species have been found so far, of *Tumerozetes* 5, of *Pseudoceratoppia* also 5, and of *Parahypozetes* 8 species.

TABLE I.

Species	Puketi	Keri-Keri	Waitakere	Rotorua	Waitomo	New Plymouth	Pauatahanui	Pu Pu Springs - Pakawau	Nelson district ×	Lake Rotoiti	Christchurch	Hokitika, Whataroa, Waitangi	Fox Glacier	Milford	Queenstown	Dunedin	South America	Europe	Other localities
<i>Nanhermannia acutisetosa</i> n. sp.	×				×	×	×												
— <i>tenuicoma</i> n. sp.			×	×	×			×		×					×				
<i>Hypochthonius luteus</i> Oudms.			×																
<i>Eniochthonius minutissimus</i> (Berl.)		×	×					×										×	
<i>Brachychthonius jugatus</i> Jac. v. <i>suecica</i> Forssl.				×														×	
— <i>novazealandicus</i> n. sp.				×									×					×	
<i>Liochthonius fimbriatissimus</i> (Ham.)										×								×	
— <i>altimonticola</i> (Ham.)			×							×	×							×	
— <i>altus</i> (Ham.)				×				×					×					×	
— <i>idem</i> n. sp.				×									×					×	
— <i>saltaensis</i> (Ham.)				×														×	
<i>Cosmochthonius semiareolatus</i> n. sp.										×									
<i>Thrypochthonius excavatus</i> (Willm.)		×		×			×	×							×			×	×
<i>Mucronothrus nasalis</i> (Willm.)								×	×	×					×			×	×
<i>Fossonothrus novaezealandiae</i> n. sp.		×							×						×			×	×
<i>Trimalacomothrus opisthoseta</i> n. sp.			×										×		×				
— <i>platyrhinus</i> Ham.					×	×												×	
— <i>oxyrhinus</i> Ham.													×					×	
— <i>angustirostrum</i> n. sp.			×																
— <i>longirostrum</i> n. sp.	×																		
— <i>novus</i> (Selln.)																×		×	×
— <i>crispus</i> Ham.		×				×											×		
— <i>sacculus</i> n. sp.		×							×					×					
<i>Zeanothrus elegans</i> n. gen. n. sp.				×															
<i>Malacothonrus keriensis</i> n. sp.		×																	
— <i>zealandicus</i> n. sp.				×			×		×					×					
— <i>indifferens</i> n. sp.					×				×						×				
<i>Camisia segnis</i> (Herm.) v. <i>nova</i> n. var.				×													×	×	×
<i>Nothrus biciliatus</i> C. L. Koch.		×	×	×	×													×	×
— <i>silvestris</i> Nic. v. <i>anauniensis</i> C & F. .		×																×	×
<i>Novonothrus flagellatus</i> n. gen. n. sp.	×		×												×				
— <i>pupuensis</i> n. sp.								×											
<i>Heminothrus traversus</i> n. sp.			×	×	×	×	×				×								
— <i>microclava</i> n. sp.										×									
<i>Platynothrus major</i> n. sp.								×		×									
— <i>tenuiclava</i> n. sp.		×	×	×					×										
— <i>peltifer</i> (C. L. Koch).		×	×	×		×	×				×					×		×	×

× Including Upper Takaka.

(×) Concerning localities not listed in the table: these localities are inserted in their approximate place in the table, but not included in the mention of species for the localities in question.

TABLE I (cont.).

Species	Puketi	Keri-Keri	Waitakere	Rotorua	Waitomo	New Plymouth	Pauatahanui	Pu Pu Springs Pakawau	Nelson district ×	Lake Rotoiti	Christchurch	Hokitika, Whataroa, Waitangi	Fox Glacier	Milford	Queenstown	Dunedin	South America	Europe	Other localities
<i>Acronothrus cophinarius</i> (Mich.)			×	×	(×)														
— <i>brachyrostrum</i> n. sp.		×		×						×			×	×					
— <i>caudalis</i> n. sp.											×		×	×					
<i>Austronothrus curviseta</i> n. gen. m. sp.		×		×		×	(×)												
<i>Holonothrus pulcher</i> n. sp.	×		×																
<i>Hermanniella clavasetosa</i> n. sp.					×														
— <i>microsetosa</i> n. sp.		×																	
— <i>longisetosa</i> n. sp.		×	×																
— <i>diversisetosa</i> n. sp.						×													
<i>Phyllhermannia foliata</i> n. sp.		×	×			×													
— <i>mollis</i> n. sp.			×			×													
— <i>rubra</i> n. sp.	×					×		×					×						
— <i>phyllophora</i> (Mich.)	×	×			×	×													
<i>Liodes nigricans</i> (Ramsay)		×																	
<i>Scapheremaeus ? patella</i> (Berl.)				×														×	
— <i>insularis</i> n. sp.		×																	
— <i>emarginatus</i> n. sp.				×										×					
<i>Scutovertex minutus</i> (C. L. Koch)		×		×	×	×			×									×	×
<i>Metabelba obtusa</i> n. sp.		×		×	×	×													
<i>Pedrocortesia rotoruensis</i> n. sp.				×															
— <i>luteomarginata</i> n. sp.														×					
<i>Pedrocortesella gymnonotus</i> (Ramsay)														×					
— <i>sexpilosus</i> (Ramsay)		×				×								×					
— <i>cryptonotus</i> (Ramsay)										×				×					
— <i>latoclava</i> n. sp.														×					
? — <i>nigroclava</i> n. sp.		×																	
? — sp.						×													
<i>Fosseremus quadripertitus</i> Grdj.		×	×	×	×		×							×	×		×	×	×
<i>Eremulus flagelliger</i> Berl.		×		×	×													×	
— <i>serratus</i> n. sp.				×	×								×						
<i>Suctobelba falcata</i> Forssl.			×	×			×			×								×	
— <i>subcornigera</i> Forssl.		×		×				×			×			×	×			×	
— <i>nasalis</i> Forssl.		×		×	×									×	×			×	
— <i>longicurva</i> n. sp.	×	×	×	×	×		×	×					×	×	×				
— <i>plumata</i> n. sp.			×	×									×						
— <i>nondivisa</i> n. sp.		×	×	×	×	×	×	×					×	×	×				
<i>Zeasuctobelba quinquenodosa</i> n. gen. n. sp. . .									×	×			×	×					
— <i>trinodosa</i> n. sp.		×																	
— <i>nodosa</i> n. sp.			×																
— <i>arcuata</i> n. sp.			×																
<i>Suctobelbilla dentata</i> (Ham.)																	×		

TABLE I (cont.).

Species	Puketi	Keri-Keri	Waitakere	Rotorua	Waitomo	New Plymouth	Pauataniwha	Pu Pu Springs - Pakawau	Nelson district ×	Lake Rotoiti	Christchurch	Hokitika, Whataroa, Waitangi	Fox Glacier	Milford	Queenstown	Dunedin	South America	Europe	Other localities
<i>Machuella ventrisetosa</i> Ham.		×		×		×	×		×								×		×
— <i>pyriformis</i> n. sp.					×														
<i>Hydrozetes lemnae</i> (de Coggi)		×		×				×							×		×	×	×
<i>Carabodes ornatissimus</i> n. sp.	×		×							×									
— <i>variabilis</i> n. sp.													×	×					
<i>Austrocarabodes maculatus</i> n. gen. n. sp.		×	×			×				×				×	×				
— <i>elegans</i> n. sp.		×								×			×	×					
— <i>nodosus</i> n. sp.		×											×	×					
<i>Nodocephus dentatus</i> Ham. v. <i>barbatus</i> n. var.		×	×	×			×		×	×			×	×	×		×*)		
<i>Pseudotocephus foveolatus</i> n. sp.		×		×				×											
— <i>punctatus</i> n. sp.														×					
— <i>tenuiseta</i> n. sp.													×						
— <i>curtiseta</i> n. sp.		×																	
<i>Plenotocephus mollicoma</i> n. gen. n. sp.		×																	
— <i>delicatissimus</i> n. sp.		×																	
<i>Neotocephus colliger</i> n. gen. n. sp.	×																		
<i>Eulegaeus membraniger</i> n. sp.													×	×					
— <i>curtiseta</i> n. sp.					×								×	×					
— <i>radiatus</i> n. sp.			×																
— <i>stylei</i> n. sp.				(×)															
— <i>pinnatus</i> n. sp.				×															
<i>Neseutegaeus spinatus</i> Woolley										×			×	×					
— <i>consimilis</i> n. sp.																			
— <i>latus</i> n. sp.	×																		
— <i>angustus</i> n. sp.	×			×									×						
— <i>distentus</i> n. sp.	×												×	×					
<i>Bornebuschia peculiaris</i> n. gen. n. sp.										×			×						
<i>Compactozetes roloruensis</i> n. gen. n. sp.				×															
— <i>niger</i> n. sp.	×	×	×			×				×			×	×					
<i>Pterozetes novazealandicus</i> n. gen. n. sp.				×															
<i>Topalia velata</i> n. sp.		×	×																
— <i>clavata</i> n. sp.	×					×							×						
— <i>granulata</i> n. sp.													×						
<i>Tumerozetes bifurcatus</i> n. gen. n. sp.			×										×	×					
— <i>circularis</i> n. sp.							×				×								
— <i>pumilis</i> n. sp.			×																
— <i>parallelus</i> n. sp.														×					
— <i>indistinctus</i> n. sp.													×						
<i>Adhaesozetes Barbarae</i> n. gen. n. sp.				×															
<i>Clavazetes decorus</i> n. gen. sp.											×			×					
<i>Bulleremaeus reticulatus</i> n. gen. n. sp.							×			×									

*) Main form.

TABLE I (cont.).

Species	Puketi	Keri-Keri	Waitakere	Rotorua	Waitomo	New Plymouth	Pauatahamui	Pu Pu Springs Pakawau	Nelson district	Lake Rotoiti	Christchurch	Hokitika, Whataroa, Waitangi	Fox Glacier	Milford	Queenstown	Dunedin	South America	Europe	Other localities
<i>Bulleremaeus tuberculatus</i> n. sp.																			
<i>Capillibates Stagaardi</i> n. gen. n. sp.				x			x			x			x	x					
<i>Halozetes otagoensis</i> n. sp.																			
<i>Sellnickia caudata</i> (Mich.)				x															x
<i>Austrogneta multipilosa</i> Balogh.....				x															
— <i>quadridentata</i> n. sp.....								x											
<i>Cultroribula lata</i> Aoki.....				x															x
<i>Cuspitegula stellifer</i> n. gen. n. sp.	x	x																	
? <i>Physobates monodactylus</i> n. sp.	x		x	x			x		x				x	x					
<i>Pelops punctatus</i> Ramsay		x	x	x					x	x				x					
— <i>monodactylus</i> n. sp.....	x				x		x												
<i>Maorizetes ferox</i> n. gen. n. sp.	x	x	x	x	x	x					x			x					
<i>Neotrichozetes spinulosa</i> (Mich.)		x			x									x			x		
<i>Tikizetes spinipes</i> n. gen. n. sp.													x						
<i>Pseudoceratoppia sexsetosa</i> n. gen. n. sp. ...				x									x						
— <i>microsetosa</i> n. sp.....				x															
— <i>asetosa</i> n. sp.										x				x	x				
— <i>clavasetosa</i> n. sp.									x										
— <i>diversa</i> n. sp.		x																	
<i>Tectocephus velatus</i> (Mich.) v. <i>sarekensis</i>																			
— — — — — Trgdh.	x	x	x	x	x	x	x	x	x					x		x	x	x	x
— — — — — <i>minor</i> Berl. . .	x	x				x											x	x	x
— — — — — <i>novus</i> n. var .	x					x													x
<i>Lamellobates palustris</i> Ham.				x													x		x
<i>Parahypozetes grandis</i> n. gen. n. sp.	x	x		x	x	x				x			x	x					
— <i>bidentatus</i> n. sp.	x		x	x		x	x						x						
— <i>quadridentatus</i> n. sp.										x									
— <i>furcatus</i> n. sp.			x		x	x													
— <i>lobatus</i> n. sp.													x						
— <i>giganteus</i> n. sp.																			
— <i>macrodentatus</i> n. sp.....				x												(x)			
— <i>maximus</i> n. sp.																			
<i>Edwardzetes novaezealandicus</i> n. sp.		x		x	x	x	x			x		x	x	x					
<i>Parafurcobates cuspidatus</i> n. gen. n. sp.										x			x	x					
<i>Macrogena rudentiger</i> n. sp.	x		x										x	x	x				
— <i>crassa</i> n. sp.			x					x		x			x	x	x				
<i>Pedunculozetes andinus</i> Ham.		x	x	x	x	x	x	x				x	x	x	x		x		
— <i>minutus</i> n. sp.								x											
<i>Tutorozetes termophilus</i> n. gen. n. sp.				x															x*)
<i>Magellozetes clathratus</i> n. sp.														x					
<i>Ceratozetes gracilis</i> (Mich.)	x	x	x			x											x	x	x

*) See p. 86.

TABLE I (cont.).

Species	Pukeli	Keri-Keri	Waitakere	Rotorua	Waitomo	New Plymouth	Pauatahanui	Pu Pu Springs - Pakawau	Nelson district ×	Lake Rototoi	Christchurch	Hokitika, Whataroa, Waitangi	Fox Glacier	Milford	Queenstown	Dunedin	South America	Europe	Other localities
<i>Protoribates capucinus</i> Berl.		×															×	×	×
<i>Liebstadia similis</i> (Mich.).....							×					×						×	×
<i>Maculobates luteomarginatus</i> n. sp.....											×		×	×					
— <i>magnus</i> n. sp.....													×						
— <i>vulgaris</i> n. sp.				×			×												
— <i>luteus</i> n. sp.					×														
— <i>longus</i> n. sp.		×										×							
— <i>longipilosus</i> n. sp.		×		×										×					
— <i>minor</i> n. sp.	×	×	×		×		×	×					×	×					
? — <i>acutissimus</i> n. sp.											(×)								
<i>Totobates ovalis</i> n. sp.		×	×	×	×	×	×		×				×	×					
— <i>latus</i> n. sp.			×							×			×	×					
— <i>antarteticus</i> Wallw.	×	×	×			×	×			×			×	×					×
— <i>minimus</i> n. sp.													×						
— <i>macroonyx</i> n. sp.....										×									
— <i>communis</i> n. sp.		×	×		×					×									
— <i>capita</i> n. sp.....		×	×																
— <i>microseta</i> n. sp.											×								
<i>Angullozetes rostratus</i> n. gen. n. sp.		×											×	×					
<i>Andacarus ligamentifer</i> n. sp.			×	×	×					×			×	×					
<i>Polyopopia Baloghi</i> n. gen. n. sp.							×												
<i>Tripiloppia Aokii</i> n. gen. n. sp.	×		×	×						×			×						
— <i>Trägårdhi</i> n. sp.		×																	
— <i>Forsslundi</i> n. sp.		×																	
— <i>Tarras-Wahlberghi</i> n. sp.								×											
— <i>Dalenii</i> n. sp.													×						
<i>Oppiella nova</i> (Oudms.)	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
— <i>dubia</i> Ham.		×	×	×	×	×				×	×	×	×	×			×	×	×
— <i>suramericana</i> Ham.		×	×	×			×	×		×	×	×	×	×			×	×	×
— <i>fallax</i> v. <i>obsoleta</i> Paoli		×																×	×
— <i>Bullanovae</i> n. sp.				×															
<i>Quadropopia quadricarinata</i> (Mich.).....		×				×	×	×	×	×								×	×
— <i>circumita</i> Ham.		×												×			×		
<i>Belloppia Wahlworki</i> n. gen. n. sp.....										×									(×*)
— <i>Evansi</i> n. sp.		×																	
— <i>Shealsi</i> n. sp.	×		×				×							×					
<i>Miropopia zealandica</i> n. gen. n. sp.										×									
<i>Paroppia Lebruni</i> n. gen. n. sp.										×			×	×					
<i>Solenoppia Grandjeani</i> n. gen. n. sp.			×				×						×	×					
— <i>Travéi</i> n. sp.....										×			×	×					
— <i>Taberlyi</i> n. sp.	×																		

*) See p. 87.

TABLE I (cont.).

Species	Puketi	Keri-Keri	Waiakere	Rotorua	Waitomo	New Plymouth	Pauatahanui	Pu Pu Springs – Pakawau	Nelson district ×	Lake Rotoiti	Christchurch	Hokitika, Whataroa, Waitangi	Fox Glacier	Milford	Queenstown	Dunedin	South America	Europe	Other localities
<i>Oppia Haarlovi</i> n. sp.					×														
— <i>Perez-Inigo</i> n. sp.			×																
— <i>Pletzeni</i> n. sp.		×																	
— <i>Turki</i> n. sp.							×												
— <i>Tuxeni</i> n. sp.										×									
— <i>Covarrubiasi</i> n. sp.																×			
— <i>Newelli</i> n. sp.							×												
— <i>Oudemansi</i> n. sp.						×													
— <i>Baderi</i> n. sp.													×						
— <i>Mihelcici</i> n. sp.		×				×	×				×								
— ? <i>minus</i> Paoli										×								×	
— <i>minutissima</i> Selln.				×							×						×		×
— <i>arcualis</i> (Berl.)		×	×								×							×	
— <i>Winkleri</i> n. sp.		×		×															×
<i>Brachioppia Higginsi</i> n. sp.		×					×												
— <i>Hartensteini</i> n. sp.			×																
— <i>Walkeri</i> n. sp.		×	×																
? — <i>Suctui</i> n. sp.			×																
<i>Brachioppiella Rajska</i> n. sp.							×												
— <i>Rafalskii</i> n. sp.										×									
<i>Ramusella Sengbuschi</i> n. sp.		×																	
<i>Neoribates barbatus</i> n. sp.					×					×			×	×					
<i>Galumna scaber</i> n. sp.													×						
— <i>rugosa</i> n. sp.		×		×															
— <i>microfissum</i> n. sp.		×	(×)	×		×				×				×					
<i>Acrogalumna longiplumus</i> Berl.		×			×				×									×	×
<i>Allogalumna novazealandica</i> n. sp.					×														
— <i>remota</i> n. sp.		×	×	×															
<i>Pergalumna reniformis</i> n. sp.				×															
— <i>silvestris</i> n. sp.													×						
Number of species for each locality . . .	40	119	81	91	43	47	43	24	21	63	18	13	78	76	16	7	34	33	30
— - samples for each locality . .	8	32	12	16	13	12	14	9	3	10	11	7	22	25	10	5			
— - individuals for each locality	218	6809	966	3907	473	553	470	844	58	714	142	91	1472	1391	579	86			
Total 312 species																			
— 209 samples																			
— about 19000 individuals																			

The richness in forms of the species is amazing and exceeds by far what is known from the Andes Mountains. MICHAEL (1908), who knew oribatids from the whole world, on the basis of a material from New Zealand could immediately see that the

oribatids because of their size belonged under temperate conditions. He published six of the largest and in his opinion most interesting species and in connexion with the size and appearance of these species stated "that the temperate characteristics seem exaggerated, as if they run wild, giving many of the species a very singular appearance." The reason why there are so many large species, is perhaps rather the fertile biotopes than the temperate conditions. Indeed, it is known from forests in Northern Europe, that the rich mould has a few large species, while the poor soil consisting of raw humus harbours many small species. The oribatid fauna of New Zealand is rich in large as well as small species.

The distribution of the species in New Zealand seems to be rather casual, which must be explained as a result of a defective collecting and consequently defective knowledge of their distribution. Most species occur evenly distributed all over the country. Few species are markedly attached to the North or the South Island, but this fact, too, may be accidental.

The Origin of the Oribatid Fauna of New Zealand and a Comparison with the Oribatid Fauna of the Andes Mountains

As has often been pointed out (HAMMER 1944, 1965), the possibilities of spreading of the oribatids over seas and long distances are very restricted, mainly because of the slight tolerance of these animals of drying-up, of salt water, due to their lack of bearing surfaces in case of possible air transport, etc. As has often been laid down, they are "earth-bound", just as e.g. wingless beetles, and on the whole are only spread in connexion with the moss, the leaves, or the soil in which they live.

In order to form an idea of the origin of the New Zealand oribatid fauna it is necessary to know something about the occurrence of the various species outside New Zealand. It appears from Table 1 that 56 species out of the 312 species found are known out of New Zealand. These species can be divided into two groups: (1) species with a wide distribution on earth, Table II, and (2) species which, apart from New Zealand, are mainly known from South America, only (p. 84).

Australia and Africa have been left out of the survey made here, Australia because, as regards research into oribatids, it is a completely unknown territory, Africa because on the whole no information about known species is available from there, whether this is due to the fact that such species have not been found or the fact that investigators have restricted themselves to the description of new species, of which a large number have been described.

As appears from Table II, most species have a very wide distribution. Thus *Eniochthonius minutissimus*, *Camisia segnis*, *Tectocephus velatus*, *Ceratozetes gracilis*, and *Oppiella nova* are known among other localities from South America, Europe, and Japan. Other species are recorded from South America and from several localities

TABLE II.

Species	South America	North America	Alaska	Canada	Greenland	Europe	U. S. S. R.	Jordan	Nepal, Himalaya	Thailand	Sunda Islands	Japan	Antarctica
<i>Hypochthonius luteus</i> Oudms.						×	×					×	
<i>Eniochthonius minutissimus</i> (Berl.)	×	×		×		×	×		×			×	
<i>Brachythionius jugatus</i> Jac. v. <i>suecica</i> Forssl.				×	× ¹	×	× ¹						
<i>Thrypochthonius excavatus</i> (Willm.)	×	×				×		×					
<i>Mucronothrus nasalis</i> (Willm.)	×					×	×						
<i>Trimalaconothrus novus</i> (Selln.)	×		×	×	×	×	×						
<i>Camisia segnis</i> (Herm.)	×					×	×					×	
<i>Nothrus biciliatus</i> C. L. Koch			×			×	×		×			×	
— <i>silvestris</i> Nic. v. <i>anauniensis</i> C & F		× ¹				×	× ¹						
<i>Platynothrus peltifer</i> (C. L. Koch)		×	×	×	×	×	×		×			×	
<i>Scapheremaeus ? patella</i> (Berl.)						×							
<i>Scutovertex minutus</i> (C. L. Koch)						×	×						
<i>Fosseremus quadripertitus</i> Grdjn.	?					×	×			×		×	
<i>Eremulus flagelliger</i> Berl.						×	×						
<i>Suctobelba falcata</i> Forssl.						×							
— <i>subcornigera</i> Forssl.						×							
— <i>nasalis</i> Forssl.						×							
<i>Machueella ventrisetosa</i> Ham.		?											
<i>Hydrozetes lemnae</i> (de Coggi)	×					×	×	×					
<i>Sellnicka caudata</i> (Mich.)											×		
<i>Cultroribula lata</i> Aoki							×			×		×	
<i>Tectocepheus velatus</i> (Mich.) v. <i>sarekensis</i> Trgdh.	×	×	×	×	×	×	×	×				×	
— — — — <i>minor</i> Berl.	×	×				×	×						
<i>Lamellobates palustris</i> Ham.	×									×			
<i>Ceratozetes gracilis</i> (Mich.)	×	×	×			×	×					×	
— <i>mediocris</i> Berl.		×				×	×					?	
<i>Punctoribates punctum</i> (C. L. Koch)		×				×	×					×	
<i>Rostrozetes foveolatus</i> Selln.	×										×		
<i>Zygoribatula connexa</i> (Berl.)	×					×							
<i>Protoribates capucinus</i> Berl.	×					×	×	×					
<i>Liebstadia similis</i> (Mich.)			×	×	×	×	×						
<i>Totobates antarcticus</i> Wallw.													×
<i>Oppiella nova</i> (Oudms.)	×	×	×	×	×	×	×				×	×	
— <i>fallax</i> v. <i>obsoleta</i> Pauli					×	×	×					×	
<i>Quadroppia quadricarinata</i> (Mich.)		×	×	×	×	×	×					×	
<i>Oppia ? minus</i> Paoli		×				×	×						
— <i>minutissima</i> Selln.	×		×			×							
— <i>arcualis</i> (Berl.)									×	×		?	
<i>Acrogalumna longiplumus</i> Berl.						×							

¹ Main form. ² ? = *saltaensis* Ham. ³ Wahlwork (not published). ⁴ ? = *japonicus* Aoki.
⁵ v. *sumatrensis* Willm. ⁶ Main form. ⁷ ? = *viperea* Aoki 1959.

in the northern hemisphere but not from Japan so far. These are *Thrypochthonius excavatus*, *Mucronothrus nasalis*, *Trimalaconothrus novus*, *Hydrozetes lemnae*, *Zygribatula connexa*, *Protoribates capucinus* and *Oppia minutissima*.

Several species are, beside from New Zealand, only known from the northern hemisphere. These are *Hypochthonius luteus*, *Brachychthonius jugatus* var. *suecica*, *Nothrus biciliatus*, *Nothrus silvestris* var. *anauniensis*, *Platynothrus peltifer*, *Punctoribates punctum*, *Scutovertex minutus*, *Eremulus flagelliger*, three *Suctobelba* species, *Liebstadia similis*, *Oppia fallax* var. *obsoleta*, *Quadroppia quadricarinata*, and *Oppia minus*.

A few species are recorded only from more southern regions, i.e. *Sellnickia caudata*, *Lamellobates palustris*, and *Rostrozetes foveolatus*.

The spreading of all these species has probably taken place by the animal's own active movements. The spreading must be supposed to have taken place by a gradually wider distribution through millions of years at so early a time in the history of the earth that the continents still constituted a whole.

Group (2), species which besides in New Zealand are so far known from South America, comprises the following 17 species:

<i>Liochthonius fimbriatissimus</i> (Ham.)	<i>Austrogneta multipilosa</i> Balogh
– <i>altimonticola</i> (Ham.)	<i>Neotrichozetes spinulosa</i> (Mich.)
– <i>altus</i> (Ham.)	<i>Pedunculozetes andinus</i> Ham.
– <i>saltaensis</i> (Ham.)	<i>Punctoribates manzanoensis</i> Ham.
<i>Trimalaconothrus platyrhinus</i> Ham.	<i>Oppiella suramericana</i> (Ham.)
– <i>oxyrhinus</i> Ham.	– <i>dubia</i> Ham.
– <i>crispus</i> Ham.	<i>Quadroppia circumita</i> Ham.
<i>Suctobelbida dentata</i> (Ham.)	<i>Amerioppia longiclava</i> Ham.
<i>Nodocephus dentatus</i> Ham.	

Even though we should make reservations as regards a small number of these species which may be doubtful, such as *L. saltaensis*, the characters of which are very indistinct, and *Nodocephus dentatus*, and *Punctoribates manzanoensis*, which have close relatives in Africa (see p. 87), there are here a number of species which so far have only been found in South America and New Zealand. The cause why these species have not been found e.g. in Europe, which has been comparatively closely investigated, is probably in the case of some species that they do not live there. The species in question have certain characters which indicate that it can be said with the very highest degree of probability that these species do not occur in Europe. *Trimalaconothrus platyrhinus* and *T. oxyrhinus*, e.g., have on the genital plates four pairs of hairs, the three anterior ones of which are on the anterior part of the genital plates and are retroverse, whereas the fourth is located on the posterior edge of the plates separated from the three anterior ones by a considerable distance and is antorse (Part I, figs. 16 a, 19 a). This peculiar position of the hindmost pair of hairs, which these two species share with *T. opisthoseta* Ham. and *T. angustirostrum* Ham.,

both from New Zealand, is not known from European species, on which all the hairs (usually more than four) are set at fairly the same distance and all are retrorse. Nor is it known from the *Trimalaconothrus* species from the Sunda Islands described by WILLMANN (1931 a).

These four *Trimalaconothrus* species, which belong to the primitive oribatids, are very closely related. Furthermore there are in *T. platyrhinus* and *T. opisthoseta* all possible combinations of certain characters in individuals found at Milford, which would seem to indicate that a development of species continually takes place. We have here an example of part of a group of species (and in part the same species) having been found in New Zealand as well as in Chile, South America. This can only mean that the two regions have been direct connected by land.

New Zealand has a total of 33 species so far recorded in common with South America. This comparatively high number does not, however, tell very much about the actual relationship, which is only evident in species with common special morphological features such as the species of the *Trimalaconothrus opisthoseta* group mentioned above.

After this discussion of Group 1, species with a wide distribution on the earth, and Group 2, species which besides in New Zealand also occur in South America, the whole huge complex of New Zealand species is left. This group consists of two species described by MICHAEL 1908 (*Acronothrus cophinarius* and *Phyllhermannia phyllophora*), seven species described by RAMSAY, but not published (*Liodes nigricans*, *Pedrocortesella gymnotus*, *P. sexpilosus*, *P. cryptonotus*, *Pelops punctatus*, *Zealandobates grandis*, and *Peloribates magnisetosus*), one species described by WOOLLEY 1965 (*Neseutegaeus spinatus*), one species described by RAMSAY 1966 (*Setobates scheloribatoides*), and 244 new species. Together they constitute 82 per cent. A very large number of them are presumably endemic species, perhaps most of them.

An investigation of the oribatid fauna of South Eastern Australia will, however, most probably show some relationship with the oribatid fauna of New Zealand and some of the presumably endemic species of New Zealand will probably appear to be common with Australia.

A Comparison with the Oribatid Fauna in Antarctica, Australia, Africa, and the Pacific Area

The close relationship between the oribatids in New Zealand and those in South America having been illustrated, there is reason to investigate the problem whether there is any connexion between the oribatid fauna of New Zealand and that of the surrounding areas. If from the relationship of the New Zealand fauna with the oribatid fauna of South America it is assumed that South America and New Zealand before the Tertiary Period were connected by land, it must have been by way of Antarctica

and the Subantarctic islands. Antarctica, which today is completely glaciated and hardly harbours life, must be left out of consideration. On the Subarctic islands Dr. J.L. GRESSITT has in recent years been extremely active. Many species have been brought home and the oribatids have been determined and described, mainly by WALLWORK (1963, 1964, 1966).

The Subantarctic islands, which include Macquarie Island, Campbell Island, the Auckland Islands, and others, were in the case of some islands (thus Macquarie Island) glaciated during the Glacial Age. Therefore we can only on the non-glaciated islands expect to find remnants of the fauna from the connexion between South America and New Zealand. In Table I a species is recorded, *Totobates antarcticus* (Wallw.), which outside New Zealand is known only from Campbell Island, from where it has been described (WALLWORK 1964 a). From Campbell Island we furthermore know two *Globoppia* species, three *Oppia* species, and one *Campbellobates* (WALLWORK 1964 c), as well as (WALLWORK 1966) *Acronothrus brevicornutus* n. sp., *Holonothrus concavus* n. sp., *Pedrocortesia ? australis* Ham., *Andacarus campbellensis* n. sp., *Macrogena monodactyla* n. sp., *Halozetes plumosus* n. sp., *H. macquariensis* (Dalenius), *H. crozetensis* (Richt.), *Eutegaeus bostocki* (Mich.), and *Schelorbitates flagellatus* n. sp. Through these recent finds a closer connexion is formed partly with South America, with which Campbell Island apparently has *Pedrocortesia ? australis* in common, partly with New Zealand, where *Eutegaeus bostocki* has been found (MICHAEL 1908).

From Macquarie Island a *Holonothrus* species, an *Oppia* species, five *Halozetes* species, two *Totobates* species (thus *T. antarcticus* Wallw.) are known, as well as some genera not known from South America or New Zealand. Among these the island has only *Totobates antarcticus* in common with New Zealand. These oribatids must have immigrated to the island after the Glacial Age, if they cannot have survived the Glacial Age in a locally ice-free area. A survival through the ages in an ice-free area on the Subantarctic islands is certainly not unimaginable, considering the somewhat similar conditions in Greenland, where part of the present fauna is supposed to have survived the whole Glacial Age. Under the severe climatic conditions and the extremely poor ecological possibilities it must be supposed that the above-mentioned genera on the Subantarctic islands have developed a number of species most of which are different from the representatives of the genera in New Zealand or in South America. Instead of this suggested survival of previous faunal elements through the Glacial Periods the present fauna can be supposed to be descendants of later elements immigrated from New Zealand which under the difficult conditions have changed into what is now found there. Apparently there can be no doubt that these islands form a connecting link between South America and New Zealand.

The relation of New Zealand to Australia and Tasmania must also be briefly mentioned. As Australia is a practically unknown area as regards oribatids, we must pass lightly over it. *Sellnickia caudata* (Mich.), however, has been recorded there. Some few species from Tasmania collected by Colonel J. STAGAARD (*Tutorozetes ter-*

mophilus Ham. and *Belloppia Wahlworki* Ham. (not published)) suggest a connexion between the oribatid fauna on this island and New Zealand.

So far New Zealand and Africa south of Sahara do not seem to have any species in common, even though a few genera have species so much alike in the two areas that there must once have been a certain connexion. *Nodocephus dentatus* Ham. and *N. hammerae* Balogh (1961 b) from Central Africa are hardly distinguishable. The former only differs from the latter by its pseudostigmatic organ having a shorter hairy club as well as by its longer notogastral hair. It has been asked (WALLWORK) whether *Oppiella suramericana* (Ham.) (1958) should be identical with *Oppia bituberculata* Balogh, Angola (1961 a). *O. suramericana* is, however, much more elegant, with narrower lamellae, which distally end in an extremely acuminate cuspis, and furthermore it has a small chitinous semilunar plate in front of the anterior margin of the hysterosoma. The appearance of the lamellae, however, might be conceived from a subjective estimate, a coarser drawing, etc. I have therefore made a comparison with a few specimens kindly submitted to me by Dr. BALOGH, and have found that the difference is clear enough, i. a. implied in the coarser structure of the lamellae of Dr. BALOGH's specimens. *Punctoribates longiporosus* Balogh, Angola (0.398 mm, 1963, figs. 12-13), greatly resembles *P. manzanoensis* Ham., the Argentine (0.45 mm, 1958), but is a little smaller.

Some genera with vicarious species are common to New Zealand, South America, and Africa, or only to two of these areas. This is a case of genera which are widely distributed on the southern hemisphere, e.g. *Austrocarabodes*, *Pseudotocepheus*, *Eutegaeus*, *Lamellobates*, *Setobates*, and *Rostrozetes*. *Pseudotocepheus* and *Setobates* are common to New Zealand and Africa, but have not been recorded from South America.

In connexion with the mention of Africa it should be pointed out that there is a remarkable similarity between the genera *Mikizetes* (HAMMER 1958, 1961) from the Argentine and Peru, respectively, and *Zetomotrichus* (GRANDJEAN 1954) from North Africa. These two genera in practically all characters differ so highly from all other genera described that it is beyond doubt that once in the beginning of time, when the continents constituted a connected whole, they must have had common ancestors. *Zetomotrichus* essentially differs from *Mikizetes* by Genu IV and Tarsus IV being provided with a long, thick spine, which enables the animal to jump. From Central Asia a closely related genus *Ghilarovus* has recently been described (KRIVOLUTSKY 1966 b). This very widely scattered occurrence of three closely related genera shows the great age of the group.

New Zealand, with its situation in the Pacific, must to some degree be expected to have been influenced by the fauna of the surrounding islands. Even though an immigration by way of the ocean must be assumed to take place extremely rarely, it does take place. In *The Development of Insect Faunae in Oceania* (1960) p. 59 GRESSITT writes: "The native insects of Hawaii, though numbering between five and ten thousand species, belong to only 103 families. This is hardly more than one-tenth of the existing families of insects. Even some families with 40,000 world species are

lacking in Hawaii. Moreover, the number of genera of native Hawaiian insects is not much more than double that number and all native insects are said to be descended from only 240 natural introductions." This extremely rare immigration shows how homogeneous the composition of the fauna must be. (New Zealand has no species and few genera in common with Hawaii (JACOT 1934)). Some ancestors of the endemic species in New Zealand must be assumed to have come from without, but with our present slight knowledge of the fauna in these regions it cannot be decided from what part of the Pacific area they have come, or they have come from Australia. *Sellnickia caudata* (Mich.), besides from Australia and New Zealand is also known from Sumatra. *Oppiella nova* (Oudms.) has also been found in Sumatra. *Oppia arcualis* (Berl.) and *Rostrozetes foveolatus* Selln. have been recorded from Java, but apart from that, New Zealand has no species in common with the Indonesian islands, from which, indeed, Berlese has brought home some species. Apart from *Sellnickia caudata* the species referred to here have a wide distribution, and the establishment of their presence indicates nothing about a possible relation to New Zealand. The following genera are common to New Zealand and the Pacific area: *Nothrus*, *Acronothrus*, *Liodes*, *Hermanniella*, *Austrocarabodes*, *Carabodes*, *Oppia*, *Protoribates*, *Scheloribates*, and *Pelops* (SELLNICK 1959). It must, however, be admitted that comparisons with areas north*) and east of New Zealand suffer highly from our lack of knowledge of the fauna in the areas in question.

Transantarctic Relationships

If the spreading of oribatids took place by air currents or sea currents, there would be a much closer agreement between the faunas of the various regions. The chance of New Zealand being populated from the Pacific area, if so, would presumably be as great as that of being populated from South America, which, indeed, is situated considerably farther away. When the above-mentioned comparison of the oribatid fauna of New Zealand with the oribatid faunas in other regions in the southern hemisphere decidedly redounds to the advantage of South America, there can hardly be any doubt that there has previously been a connexion by land between these two territories, a connexion which was broken off at the latest in the beginning of the Eocene Period, i. e. about 58 million years ago.

The Transantarctic relationships have been the object of discussion between biologists for more than a century. Numerous research workers have contributed to this discussion, each within his special sphere. The botanist HOOKER was the first to note the great similarity between the floras of the southern countries. During his long voyage from 1839 to 1843 he visited the Antarctic areas and had a rich opportunity to make observations. I shall not here go into the great number of discussions in

*) In a material of about 90 oribatid species from the Fiji Isls. recently examined by me, not a single one of New Zealand's presumably endemic genera or species was found (not published).

favour of and against the theory of Transantarctic relationships, but refer to BRUNDIN's great work on chironomids (1966), probably the most profound and exhaustive work of this kind, and to smaller but rather convincing works by EVANS (1959), PARAMONOV (1955), BRITTON (1949, 1957), USINGER & MATSUDA (1959), BREHM (1949), and FREEMAN (1959).

The connecting link between New Zealand and South America within the oribatids is fairly strong, consisting with certainty of the species of the *Trimalaconothrus opisthoseta* group. The large number of species common to New Zealand and South America (p. 84) perhaps with a thorough knowledge of the fauna in southern Australia and Tasmania and all the surrounding regions may establish other ties. The knowledge of the oribatids, not only of their distribution, but of their close mutual relationship, must be an absolute condition before a wider Transantarctic relationship can be demonstrated within this group.

Summary

In Part III 100 species of oribatids are mentioned, distributed on 30 genera. 88 species are new. A total of 312 species have been found in New Zealand. 244 new species have been set up, and 40 new genera. Nearly all the species have been found to be evenly distributed all over the country.

The oribatid fauna of New Zealand can be classed in three groups: (1) Species widely distributed all over the earth, 39 species. The species within this group are assumed to be very old, and to have had a wide distribution before New Zealand became an isolated area, (2) Species which besides from New Zealand are known only from the Andes Mountains in South America, 17 species. This group includes some species within the genus *Trimalaconothrus*, which because of some special morphological characters common to them clearly suggest Transantarctic relationships, while the other species which are common to New Zealand and South America do not show such special characters, for which reason it cannot be decided whether their presence in New Zealand and South America is also due to Transantarctic relationships. (3) 255 endemic species. These constitute about 82 per cent.

A comparison between the oribatids of New Zealand and those of the surrounding territories, i. e. Africa, the Subantarctic Islands, Australia, and the Pacific area, shows a certain relationship with the Subantarctic Islands, with which New Zealand has a few species and some genera in common, several of which also occur in South America. The oribatid fauna of New Zealand thus by way of the Subantarctic Islands seems to be closely connected with that of South America (the Andes Mountains), which must be a result of Transantarctic relationships. The knowledge of the oribatid fauna round New Zealand, however, is very defective, for which reason future investigations presumably still more clearly will reveal a connexion between the oribatid faunas of New Zealand and South America.

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Explanation of the Figures on Plates I-XXXIII

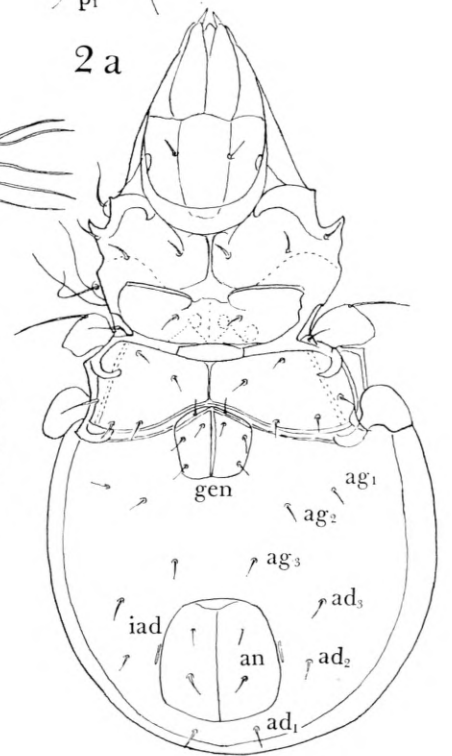
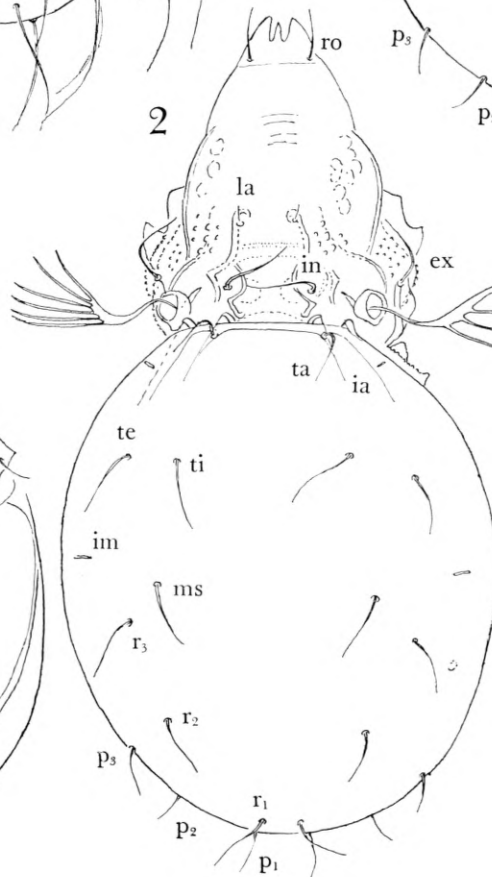
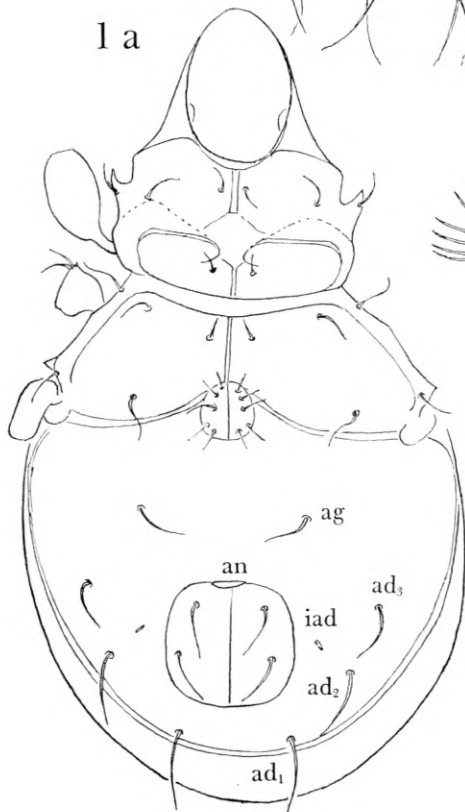
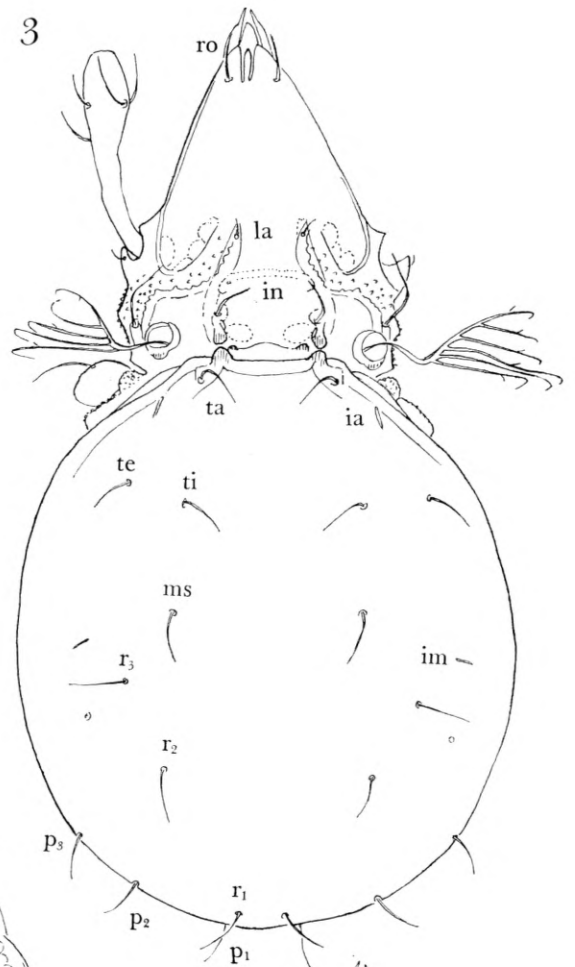
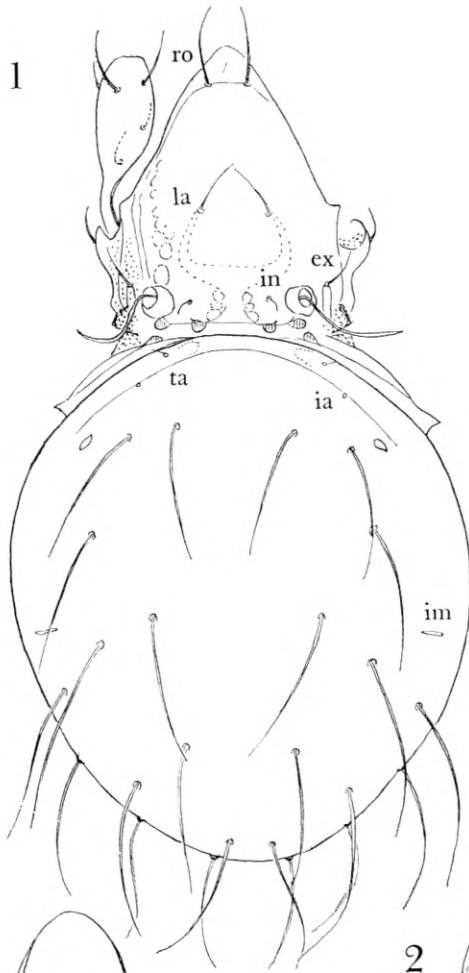
- Fig. 1. *Polyoppia Baloghi* n. gen. n. sp.
 - 1a. — — ventral side.
 - 2. *Tripiloppia Aokii* n. gen. n. sp.
 - 2a. — — ventral side.
 - 3. — *Trägårdhi* n. sp.
 - 4. — *Forsslundi* n. sp.
 - 5. — *Tarras-Wahlbergi* n. sp.
 - 6. — *Dalenii* n. sp.
 - 6a. — — tip of rostrum.
 - 6b. — — pseudostigmatic organ.
 - 7. *Oppiella nova* (Oudms.)
 - 8. — *dubia* Ham.
 - 9. — *suramericana* Ham.
 - 10. — *fallax* var. *obsoleta* (Paoli).
 - 11. — *Bullanovae* n. sp.
 - 11a. — — ventral side.
 - 12. *Quadroppia quadricarinata* (Mich.).
 - 13. — *circumita* Ham.
 - 14. *Belloppia Wallworki* n. gen. n. sp.
 - 14a. — — pseudostigmatic organ.
 - 14b. — — ventral side.
 - 15. — *Evansi* n. sp.
 - 15a. — — pseudostigmatic organ.
 - 16. — *Shealsi* n. sp.
 - 17. *Miropia zealandica* n. gen. n. sp.
 - 17a. — — anterior part of hysterostoma and surroundings.
 - 17b. — — ventral side.
 - 17c. — — Genu, Tibia and Tarsus I.
 - 17d. — — the end of Tarsus I.
 - 17e. — — - - - - - IV.
 - 18. *Paroppia Lebruni* n. gen. n. sp.
 - 18a. — — ventral side.
 - 18b. — — Tibia and Tarsus I.
 - 19. *Solenoppia Grandjeani* n. gen. n. sp.
 - 19a. — — pseudostigmatic organ.
 - 19b. — — ventral side.
 - 19c. — — Leg I.
 - 19d. — — Leg II.
 - 20. — *Travei* n. sp.
 - 20a. — — pseudostigmatic organ in different views.
 - 21. — *Taberlyi* n. sp.

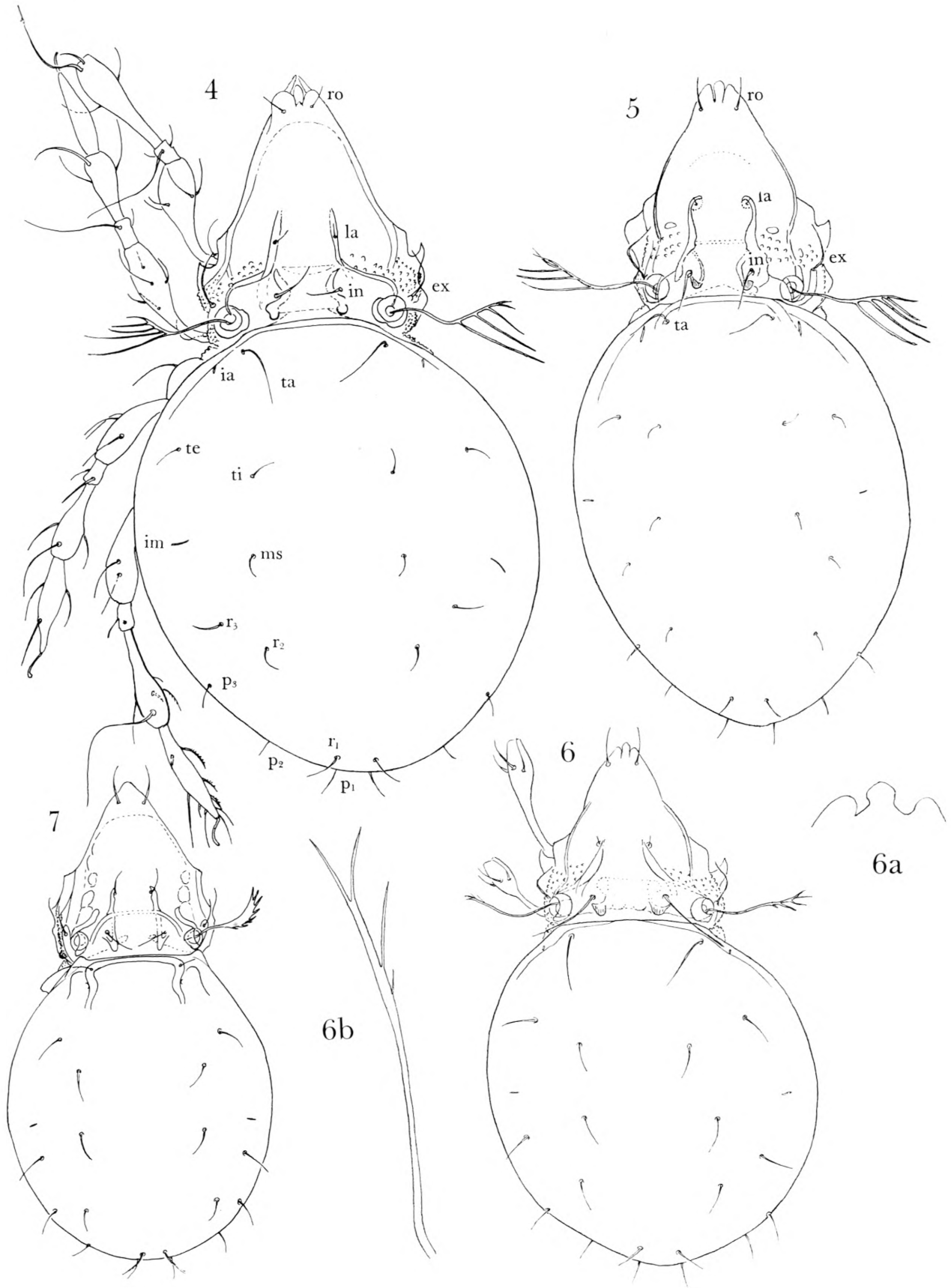
- Fig. 21 a. *Solenoppia Taberlyi* n. sp., pseudostigmatic organ.
 - 22. *Operculoppia Kunsti* n. gen. n. sp.
 - 22 a. — — pseudostigmatic organ.
 - 22 b. — — ventral side.
 - 23. — *Jelevae* n. sp.
 - 23 a. — — pseudostigmatic organ in different views.
 - 23 b. — — ventral side.
 - 23 c. — — Leg I.
 - 24. — *crassiseta* n. sp.
 - 24 a. — — ventral side.
 - 24 b. — — Tibia and Tarsus II.
 - 25. *Membranoppia Krivoluzkyi* n. gen. n. sp.
 - 25 a. — — pseudostigmatic organ.
 - 25 b. — — ventral side.
 - 26. — *Sitnikovae* n. sp.
 - 26 a. — — pseudostigmatic organ.
 - 27. — *Karppineni* n. sp.
 - 27 a. — — pseudostigmatic organ in different views.
 - 28. *Globoppia* sp.
 - 29. — *nidicola* n. sp.
 - 30. *Hamoppia Lionsi* n. gen. n. sp.
 - 30 a. — — ventral side.
 - 31. — *Thamdrupi* n. sp.
 - 32. *Laminoppia Blocki* n. gen. n. sp.
 - 32 a. — — propodosoma in an oblique lateral view.
 - 32 b. — — ventral side.
 - 32 c. — — Genu, Tibia and Tarsus I.
 - 32 d. — — Leg IV.
 - 33. *Amerioppia longiclava* Ham.
 - 34. — *Woolleyi* n. sp.
 - 34 a. — — pseudostigmatic organ.
 - 35. *Lancetoppia Sellnicki* n. sp.
 - 36. — *Strenzkei* n. sp.
 - 36 a. — — pseudostigmatic organ.
 - 36 b. — — ventral side.
 - 37. — *Willmanni* n. sp.
 - 38. — *van der Hammeni* n. sp.
 - 38 a. — — — pseudostigmatic organ.
 - 39. — *Märkeli* n. sp.
 - 40. — *Becki* n. sp.
 - 41. — *Knullei* n. sp.
 - 42. — *Poppi* n. sp.
 - 43. — *Schusteri* n. sp.
 - 43 a. — — ventral side.
 - 44. — *Ramsayi* n. sp.
 - 44 a. — — pseudostigmatic organ in different views.
 - 45. — *Luxtoni* n. sp.
 - 46. — *Moritzzi* n. sp.
 - 46 a. — — ventral side.
 - 47. — *Woodringi* n. sp.

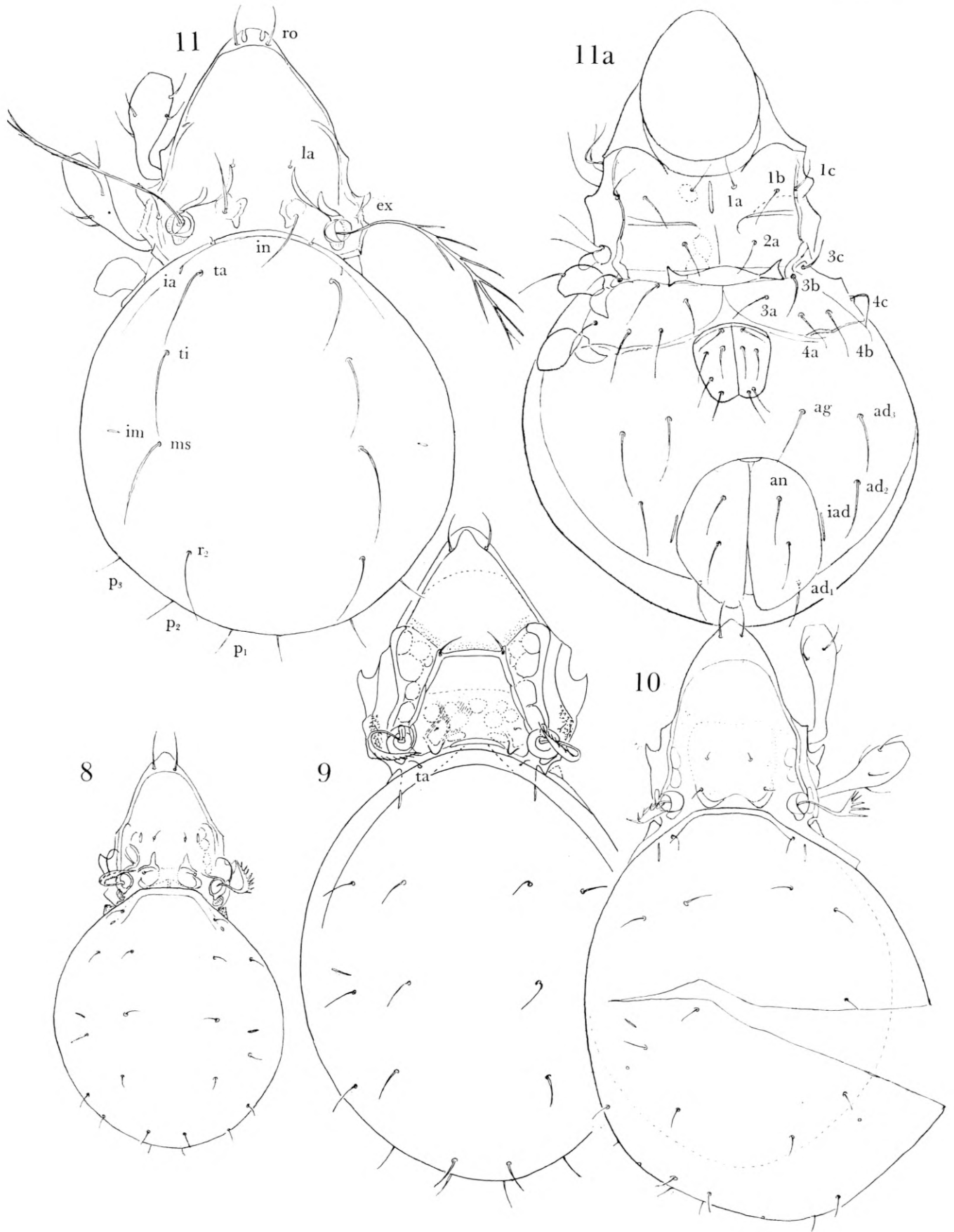
- Fig. 48. *Lanceloppia Menkei* n. sp.
 - 49. — *Mahunkai* n. sp.
 - 50. — *Schweizeri* n. sp.
 - 50a. — — propodosoma in lateral view.
 - 51. — *Csiszarae* n. sp.
 - 52. — *Vaneki* n. sp.
 - 53. — *Seydi* n. sp.
 - 54. — *Jacoli* n. sp.
 - 54a. — — propodosoma in lateral view.
 - 55. — *Berleseii* n. sp.
 - 56. — *Banksi* n. sp.
 - 57. — *Ewingi* n. sp.
 - 58. — *Thori* n. sp.
 - 59. — *Bertheti* n. sp.
 - 60. — *rigidiseta* n. sp.
 - 60a. — — ventral side.
 - 61. — *Piffli* n. sp.
 - 62. *Oppia Feideri* n. sp.
 - 62a. — — pseudostigmatic organ.
 - 62b. — — ventral side.
 - 63. — *Haarløvi* n. sp.
 - 63a. — — pseudostigmatic organ.
 - 63b. — — ventral side.
 - 64. — *Perez-Inigo* n. sp.
 - 64a. — — Leg I.
 - 64b. — — ventral side.
 - 65. — *Pletzeni* n. sp.
 - 65a. — — ventral side.
 - 66. — *Turki* n. sp.
 - 66a. — — ventral side.
 - 67. — *Tuxeni* n. sp.
 - 67a. — — ventral side.
 - 68. — *Covarrubiasi* n. sp.
 - 68a. — — ventral side.
 - 69. — *Newelli* n. sp.
 - 69a. — — ventral side.
 - 70. — *Oudemansi* n. sp.
 - 71. — *Baderi* n. sp.
 - 71a. — — ventral side.
 - 72. — *Mihelcici* n. sp.
 - 72a. — — ventral side.
 - 73. — ? *minus* (Paoli)
 - 73a. — — sketch of ventral side.
 - 74. — *minutissima* Selln.
 - 75. — *arcualis* (Berl.).
 - 75a. — — pseudostigmatic organ.
 - 75b. — — ventral side.
 - 76. — *Winkleri* n. sp.
 - 76a. — — pseudostigmatic organ.
 - 77. *Brachioppia Higginsii* n. sp.

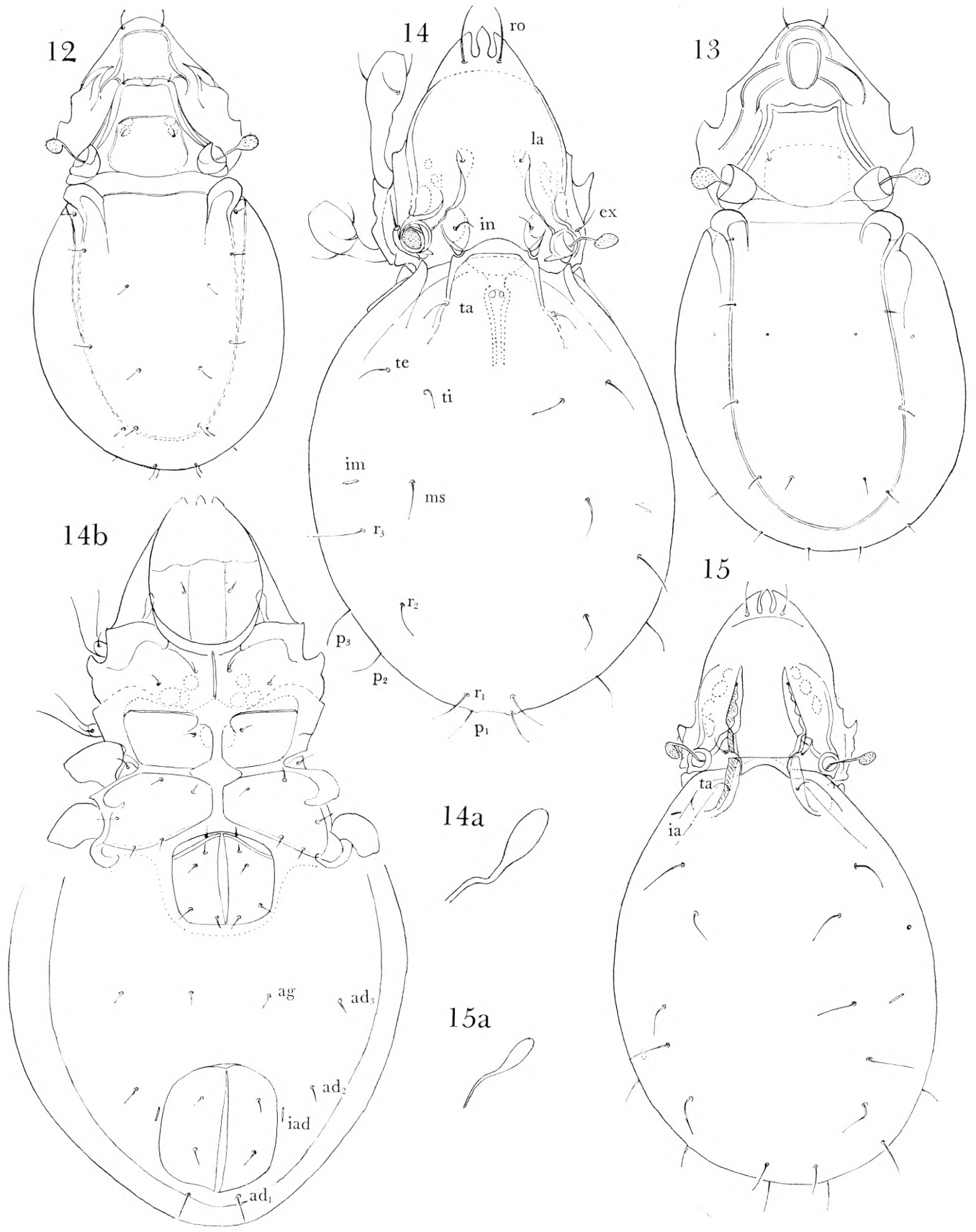
- Fig. 78. *Brachioppia Hartensteini* n. sp.
 - 79. — *Walkeri* n. sp.
 - 80. ? — *Suciui* n. sp.
 - 80a. - — — pseudostigmatic organ.
 - 80b. - — — ventral side.
 - 81. *Brachioppiella Rajskaa* n. sp.
 - 82. — *Rafalskaa* n. sp.
 - 83. *Ramusella Sengbuschi* n. sp.
 - 83a. — — pseudostigmatic organ.
 - 84. *Neoribates barbatus* n. sp.
 - 84a. — — propodosoma in oblique lateral view.
 - 84b. — — pseudostigmatic organ.
 - 84c. — — ventral side.
 - 85. *Galumna scaber* n. sp.
 - 85a. — — propodosoma in lateral view.
 - 85b. — — ventral side.
 - 86. — *rugosa* n. sp.
 - 86a. — — propodosoma in lateral view.
 - 86b. — — ventral side.
 - 87. — *microfissum* n. sp.
 - 87a. — — propodosoma in lateral view.
 - 87b. — — ventral side.
 - 88. *Acrogalumna longiplumus* (Berl.).
 - 88a. — — propodosoma in lateral view.
 - 89. *Allogalumna novazealandica* n. sp.
 - 89a. — — propodosoma in oblique lateral view.
 - 89b. — — ventral side.
 - 90. — *remota* n. sp.
 - 90a. — — propodosoma in lateral view.
 - 90b. — — ventral side.
 - 91. *Pergalumna reniformis* n. sp.
 - 91a. — — propodosoma in lateral view.
 - 91b. — — pseudostigmatic organ.
 - 91c. — — ventral side.
 - 92. — *silvestris* n. sp.
 - 92a. — — propodosoma in lateral view.
 - 92b. — — different shapes of Aa.
 - 92c. — — ventral side.
 - 93. *Zeasuctobelba arcuata* n. sp.
 - 94. *Machuella pyriformis* n. sp.
 - 94a. — — ventral side.
 - 95. *Scheloribates maoriensis* n. sp.
 - 95a. — — pseudostigmatic organ.
 - 96. ? *Xylobates sicafer* n. sp.
 - 96a. - — — part of ventral side.
 - 97. *Lauritzenia acutirostrum* n. sp.
 - 98a. — *rotundirostrum* n. sp.
 - 98. — — ventral side.
 - 99. *Tolobates capita* n. sp.
 - 100. — *microseta* n. sp.

PLATES





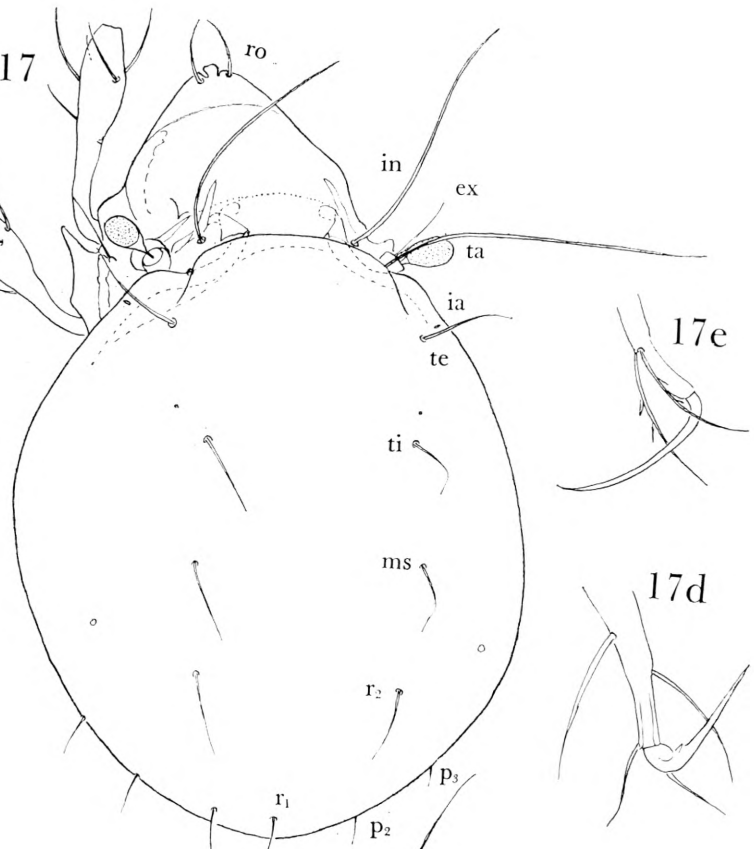




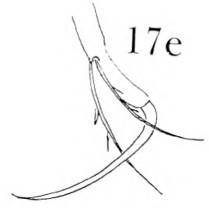
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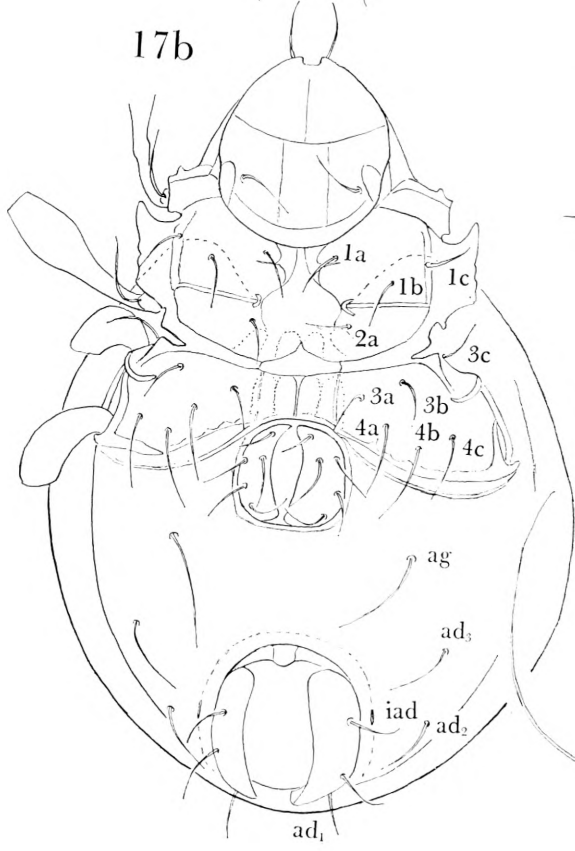
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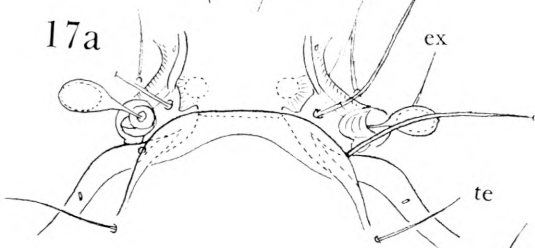
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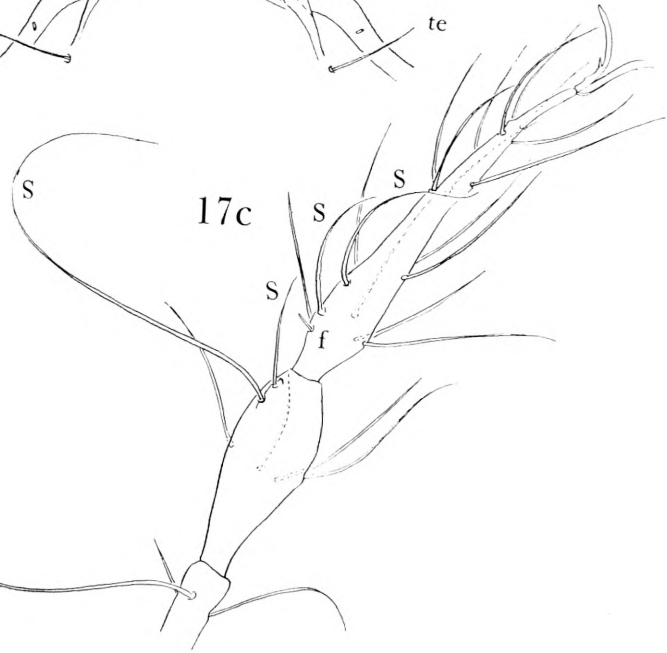
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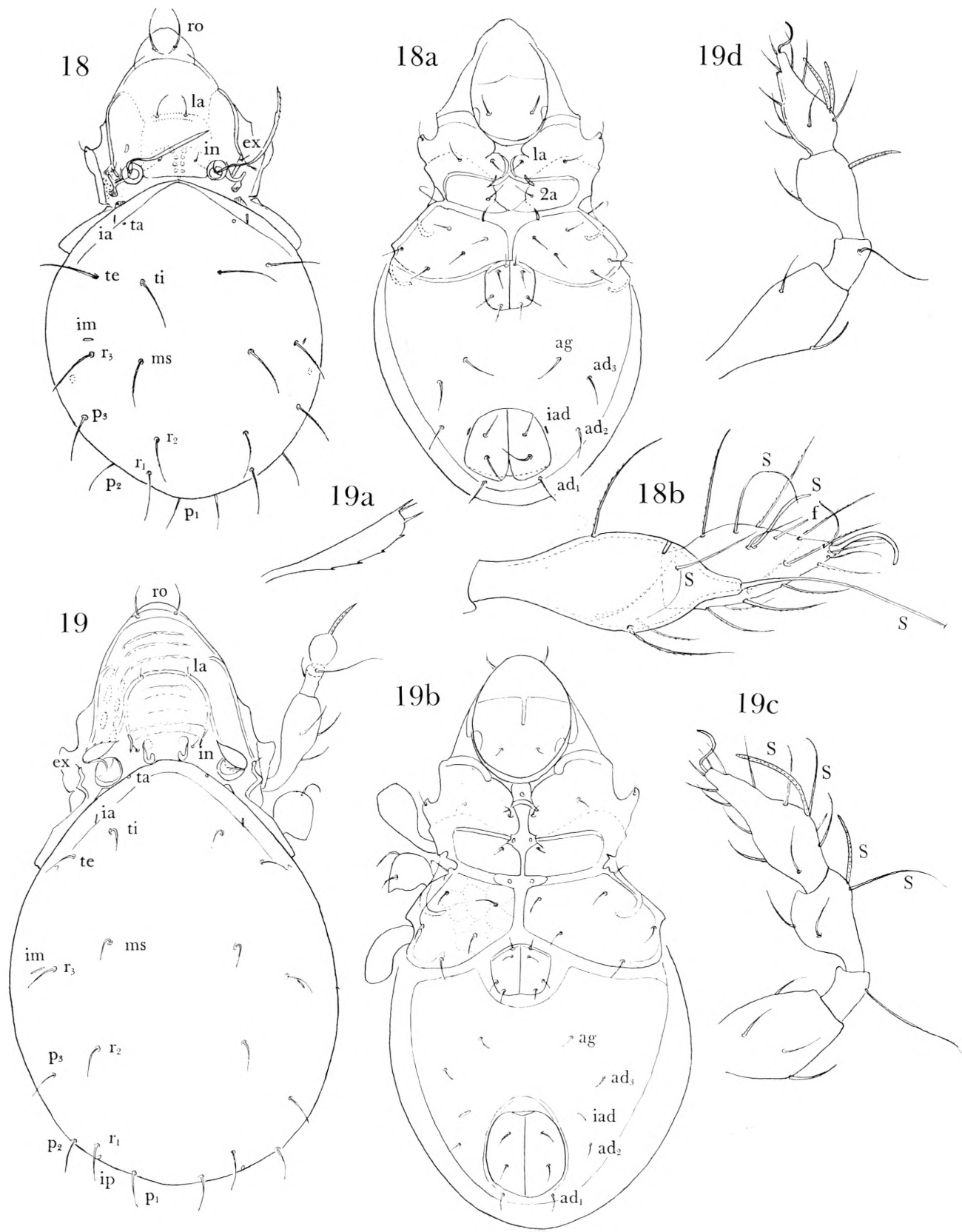


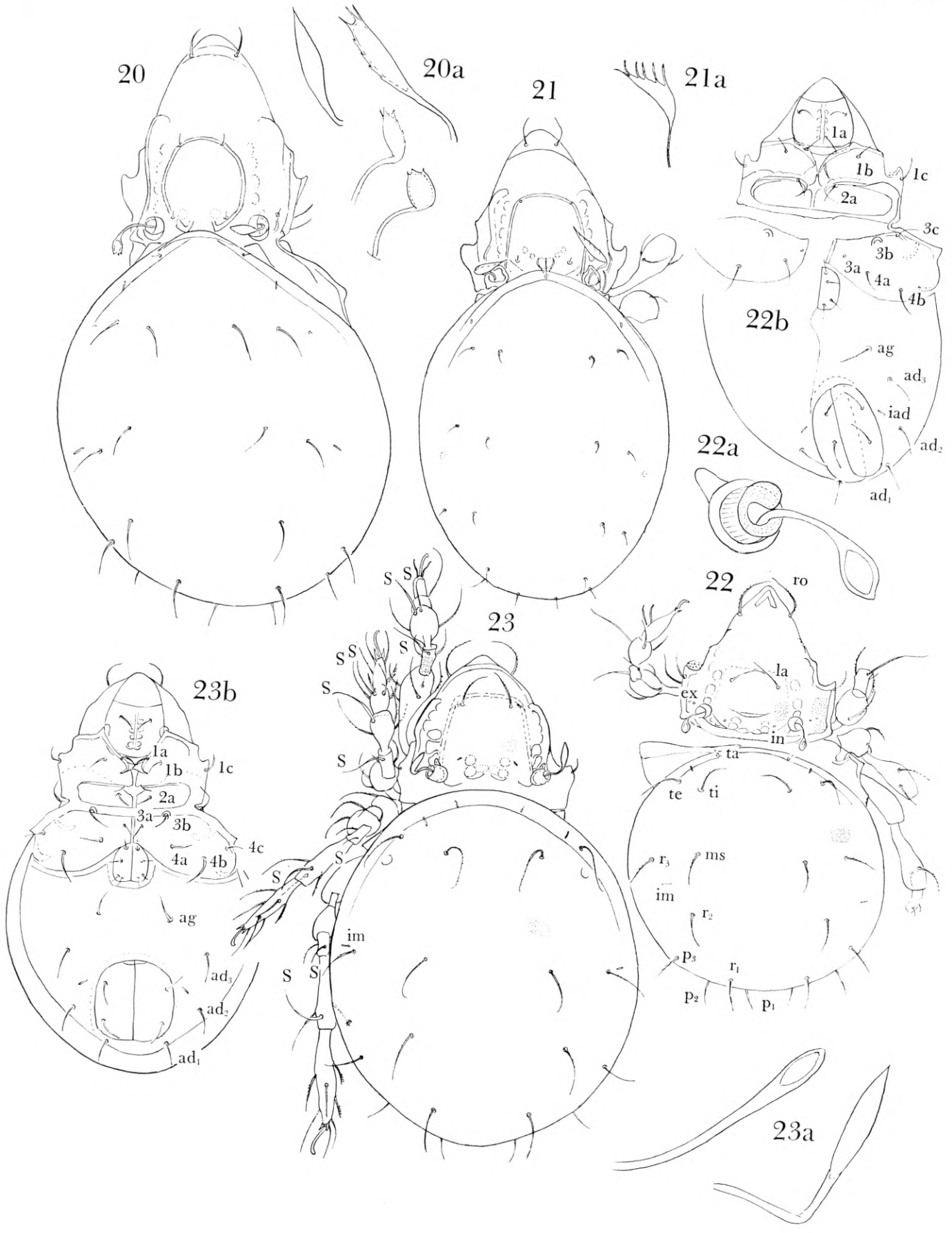
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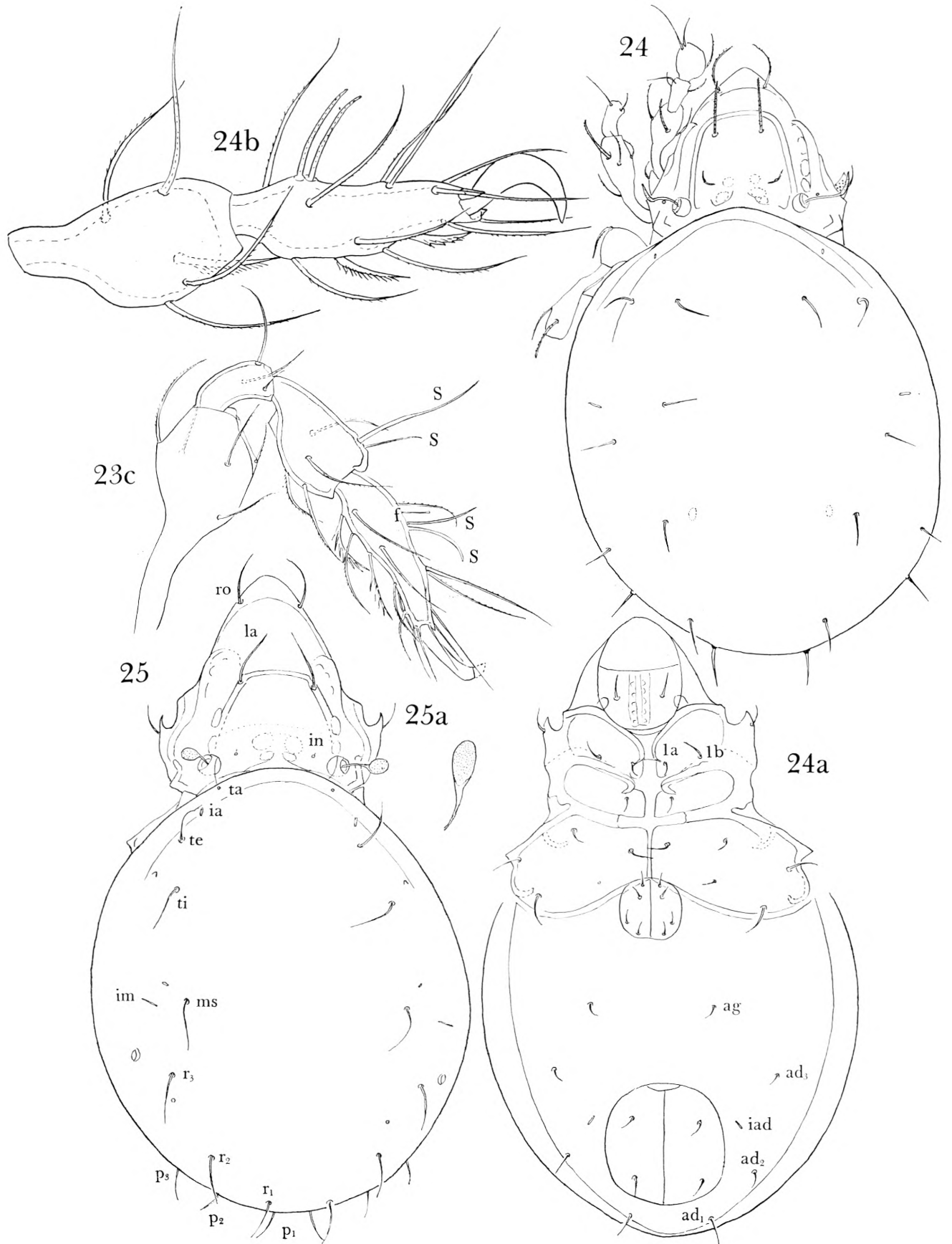


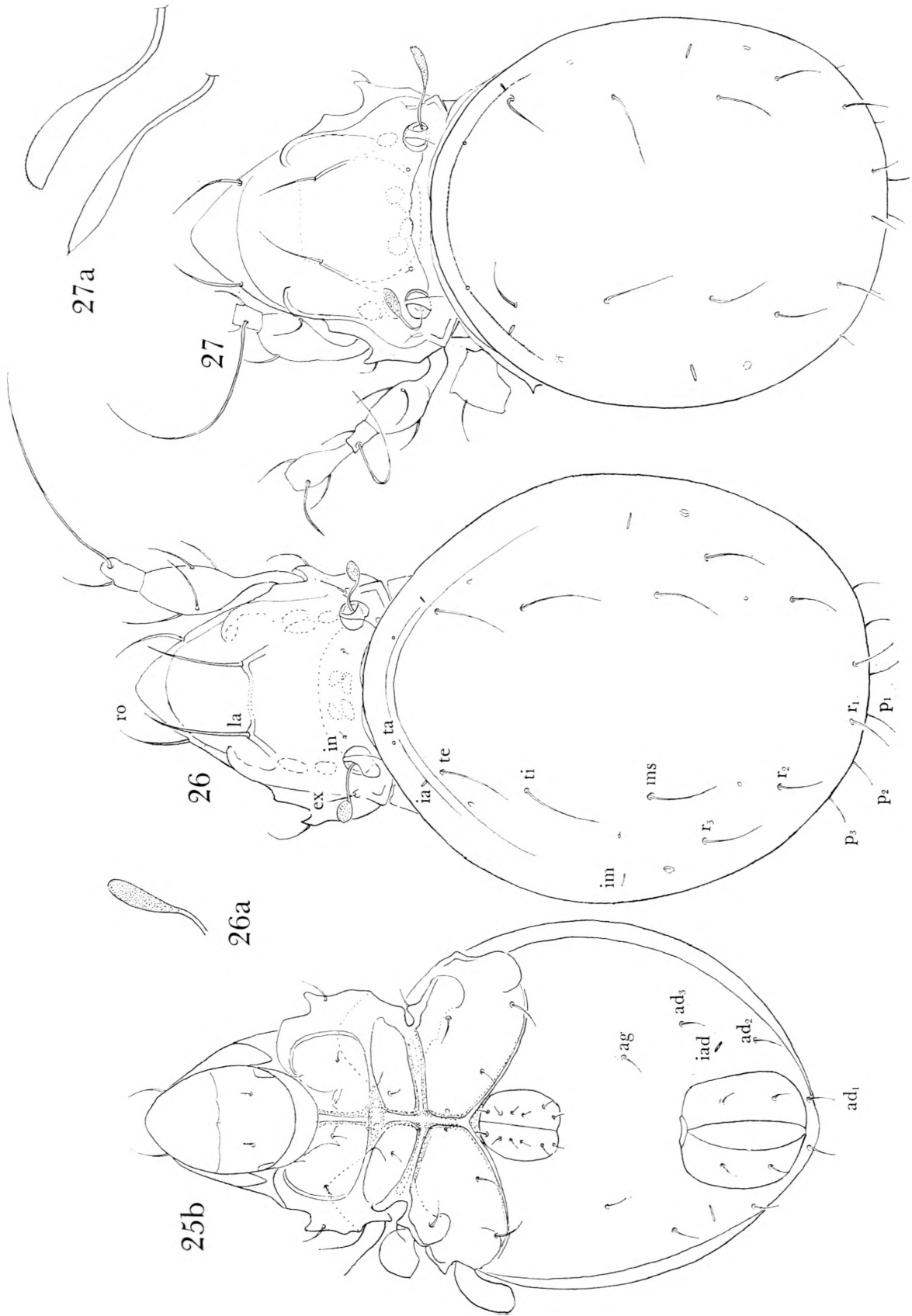
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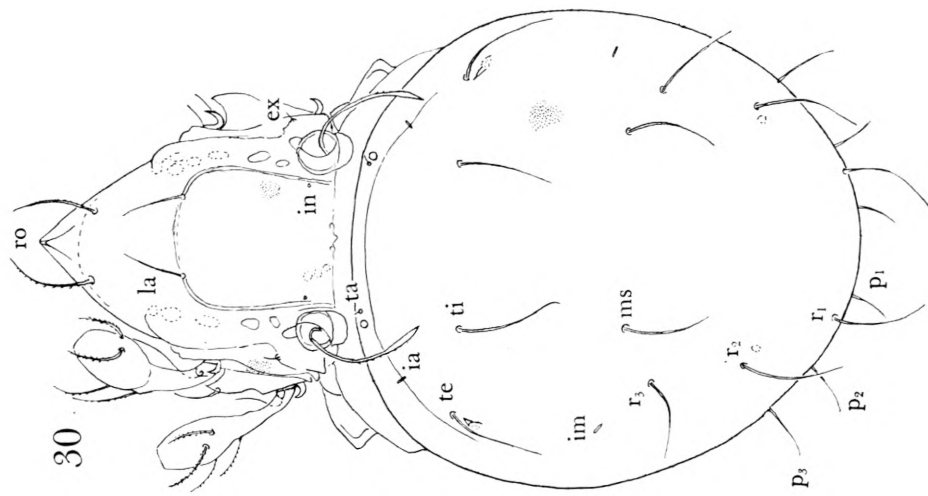
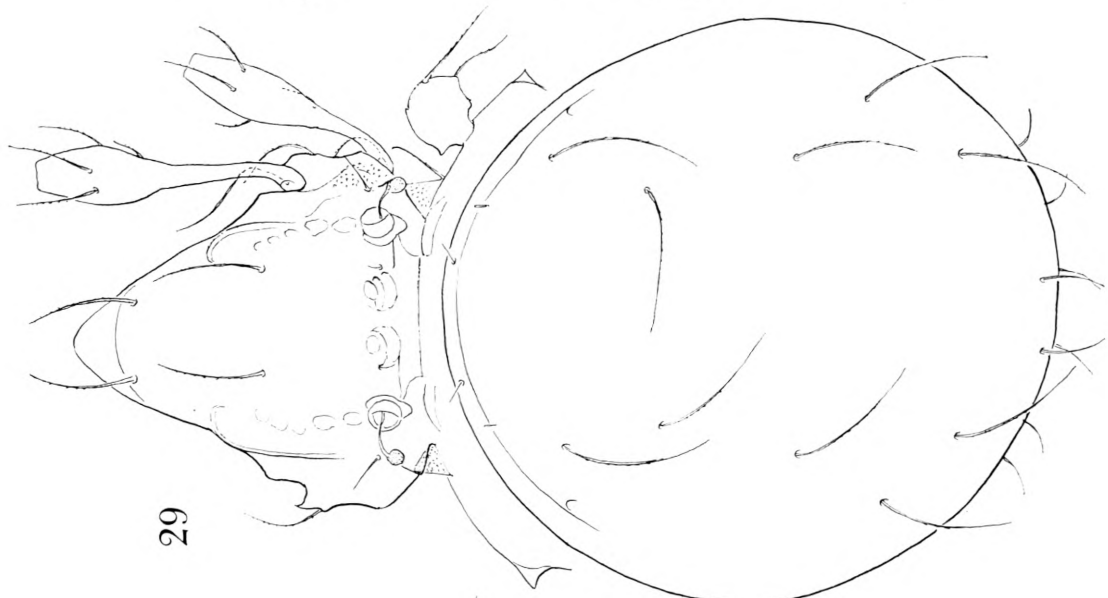
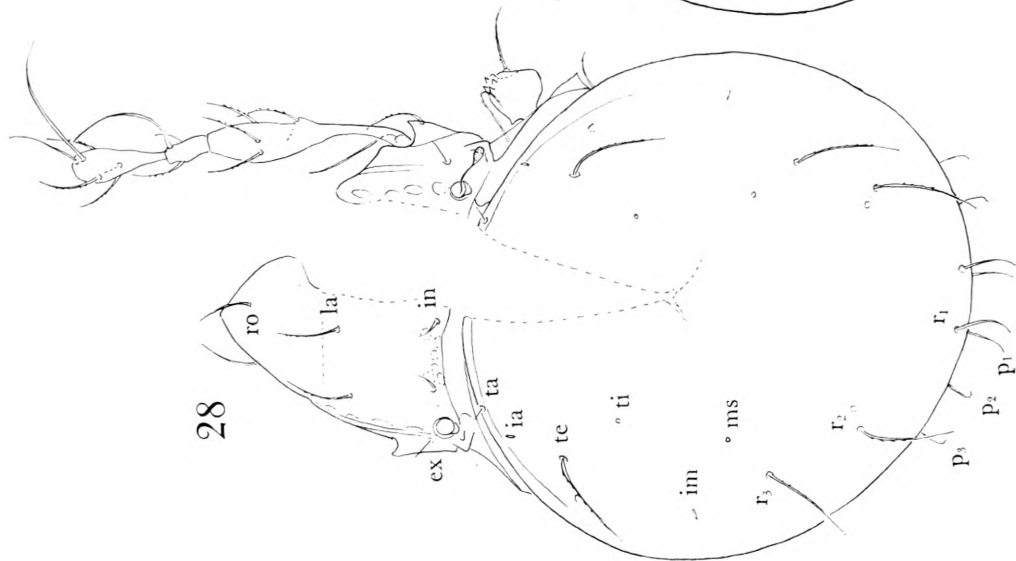




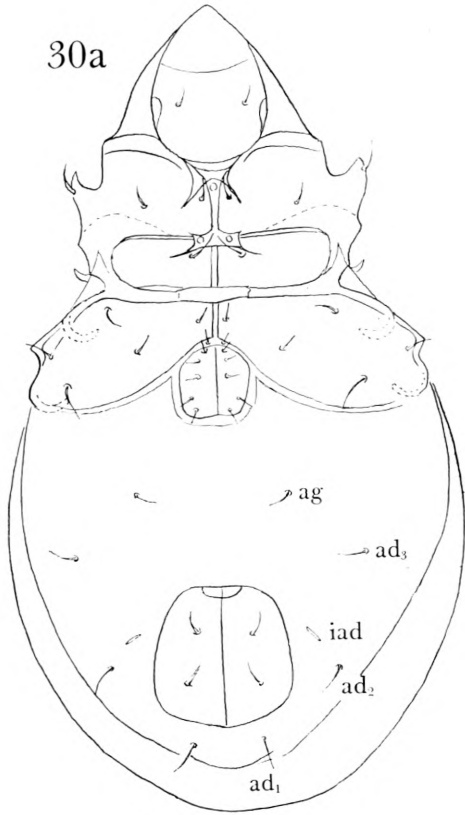




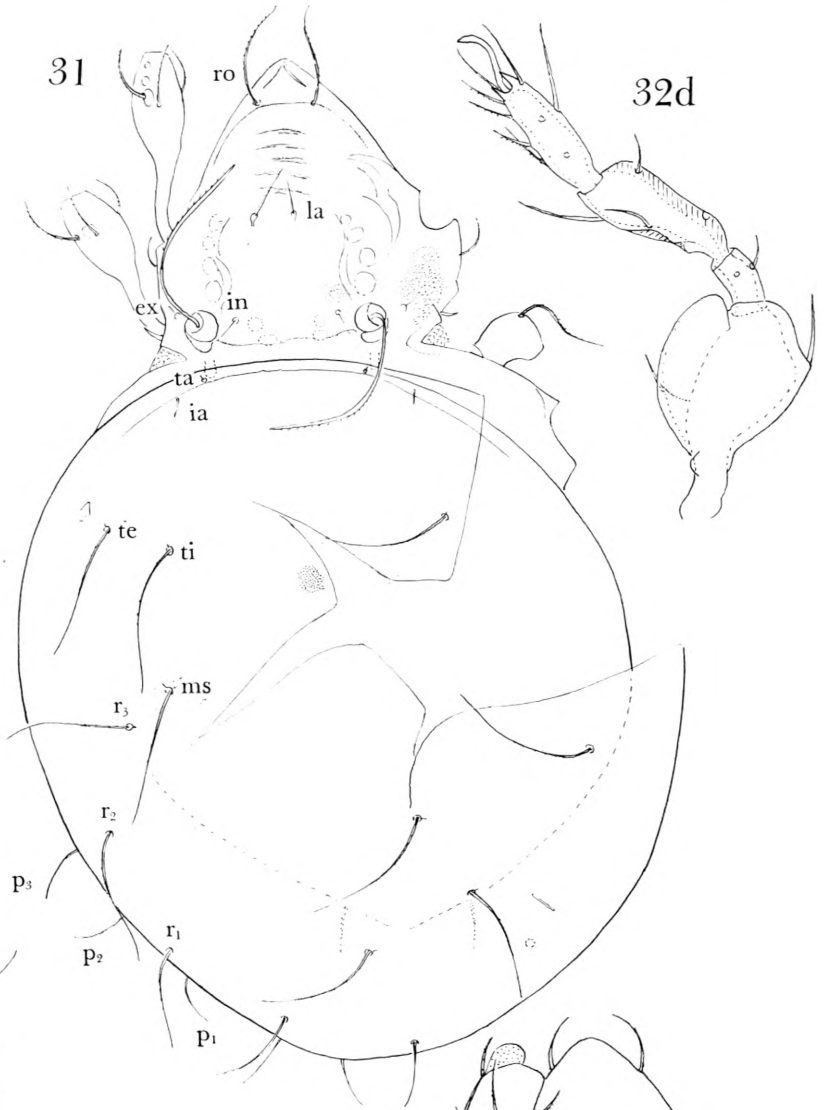




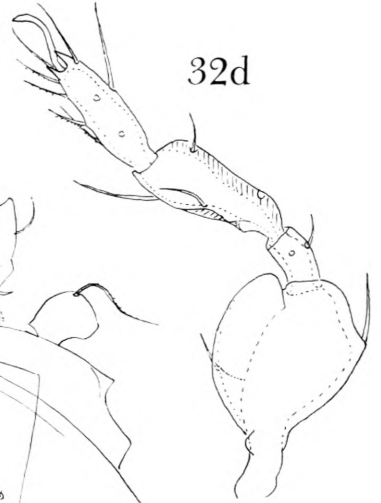
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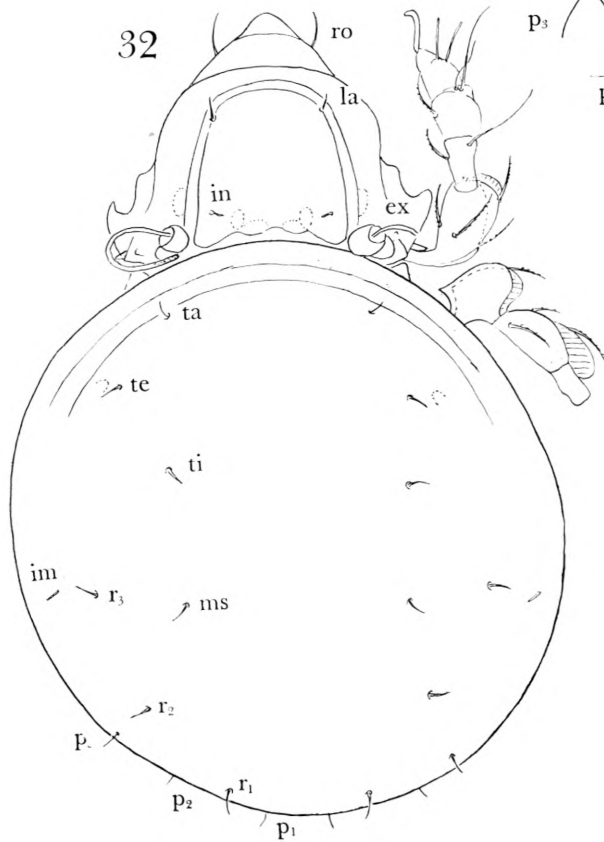
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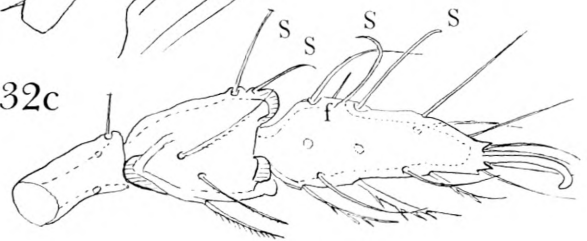
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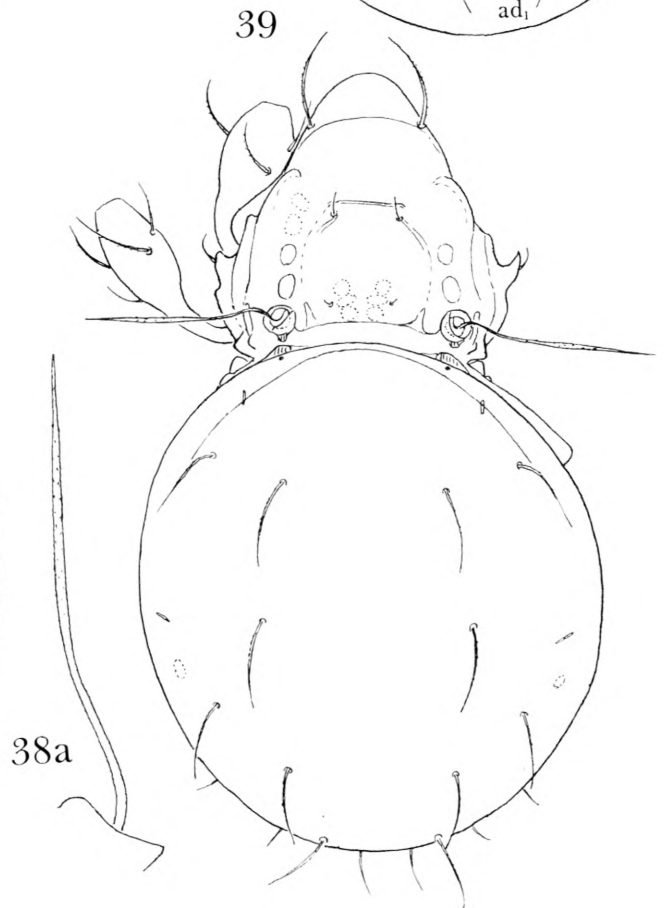
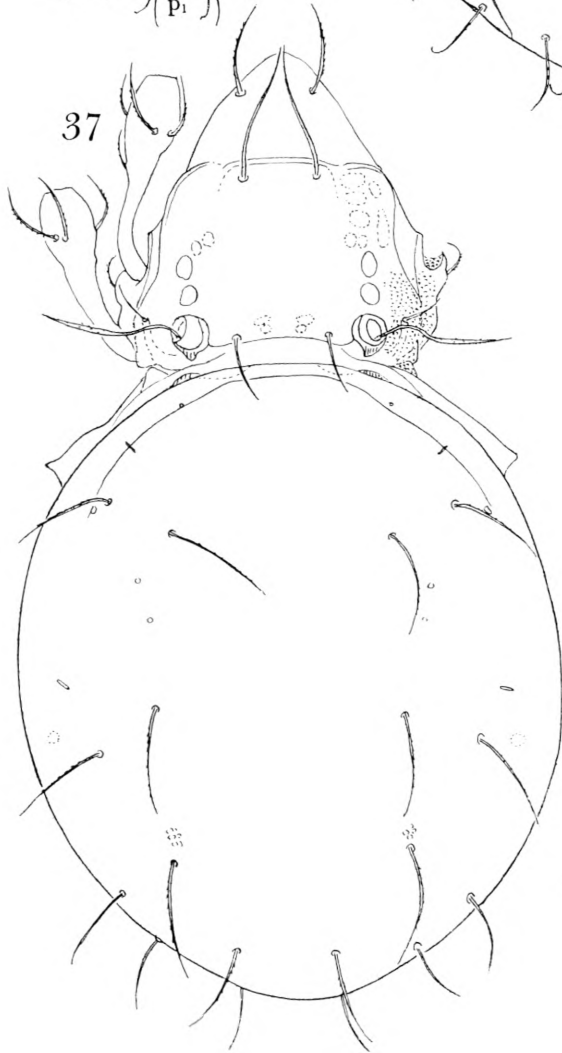
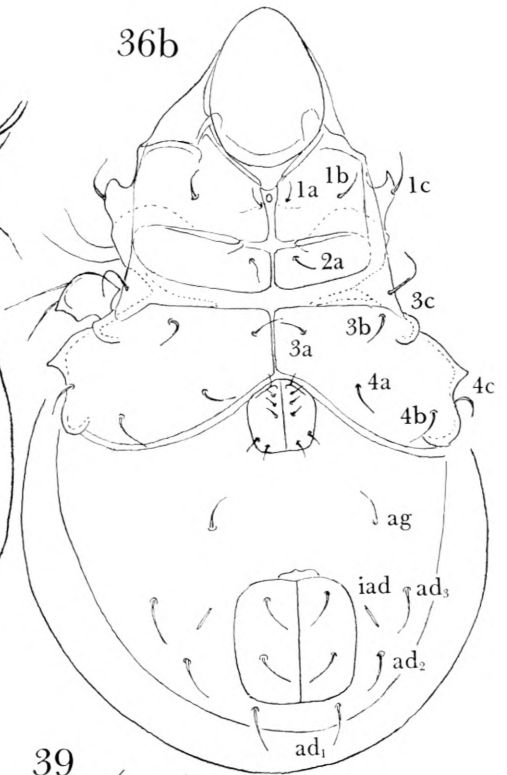
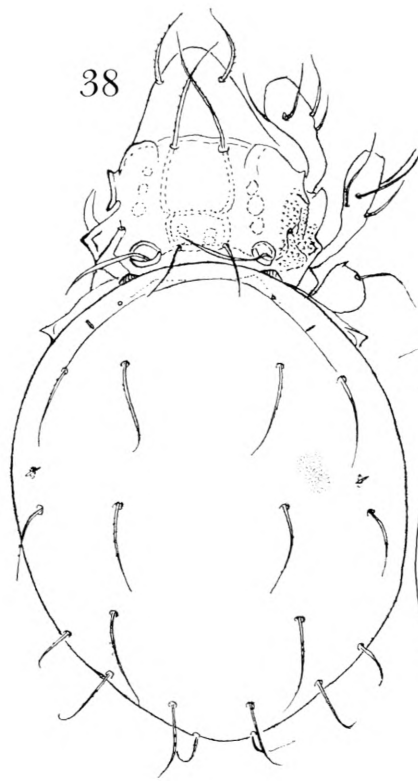
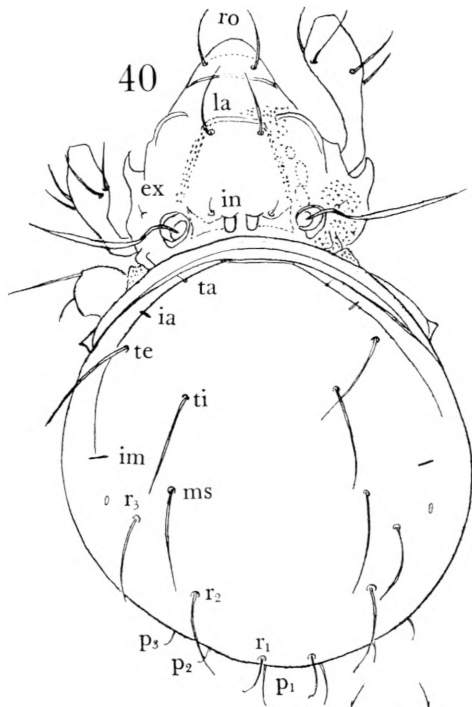
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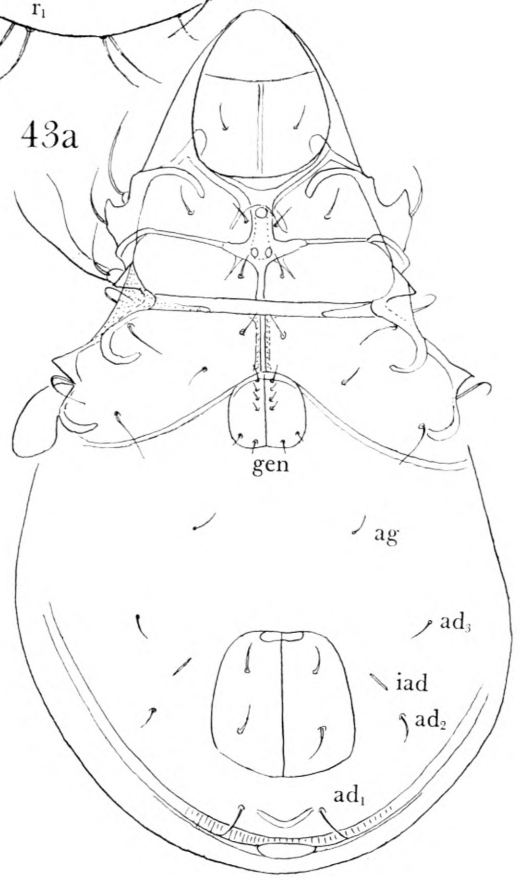
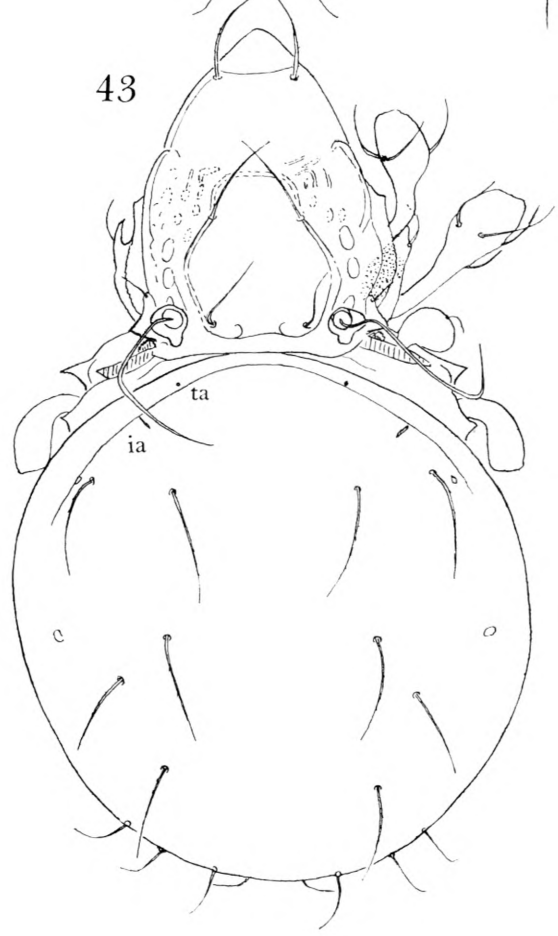
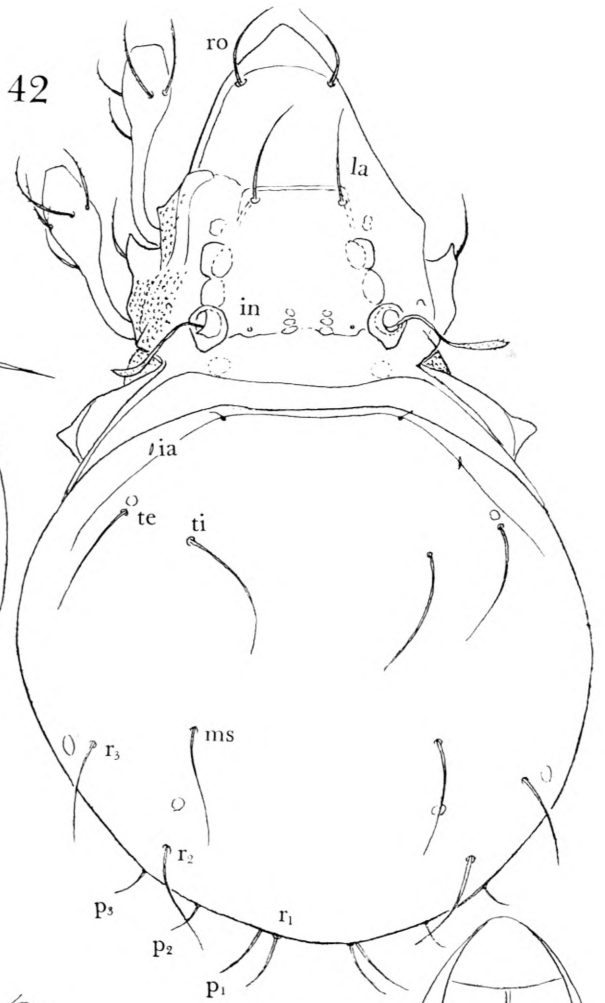
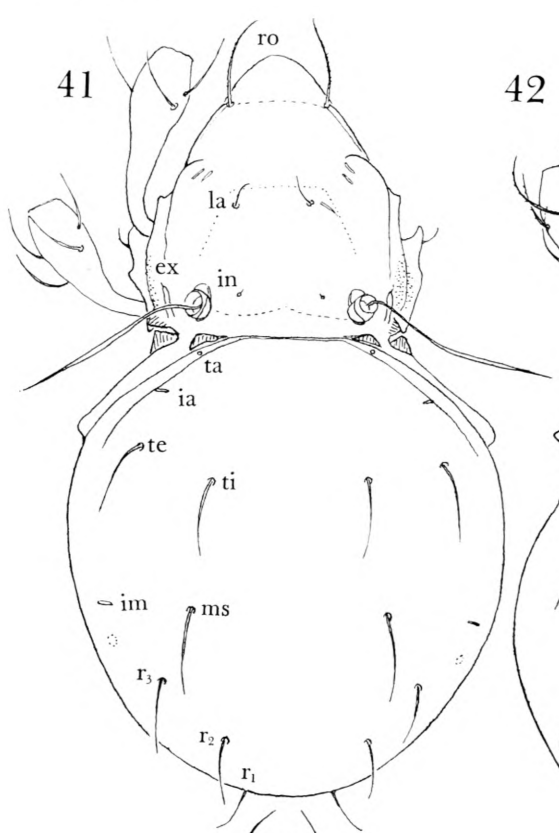


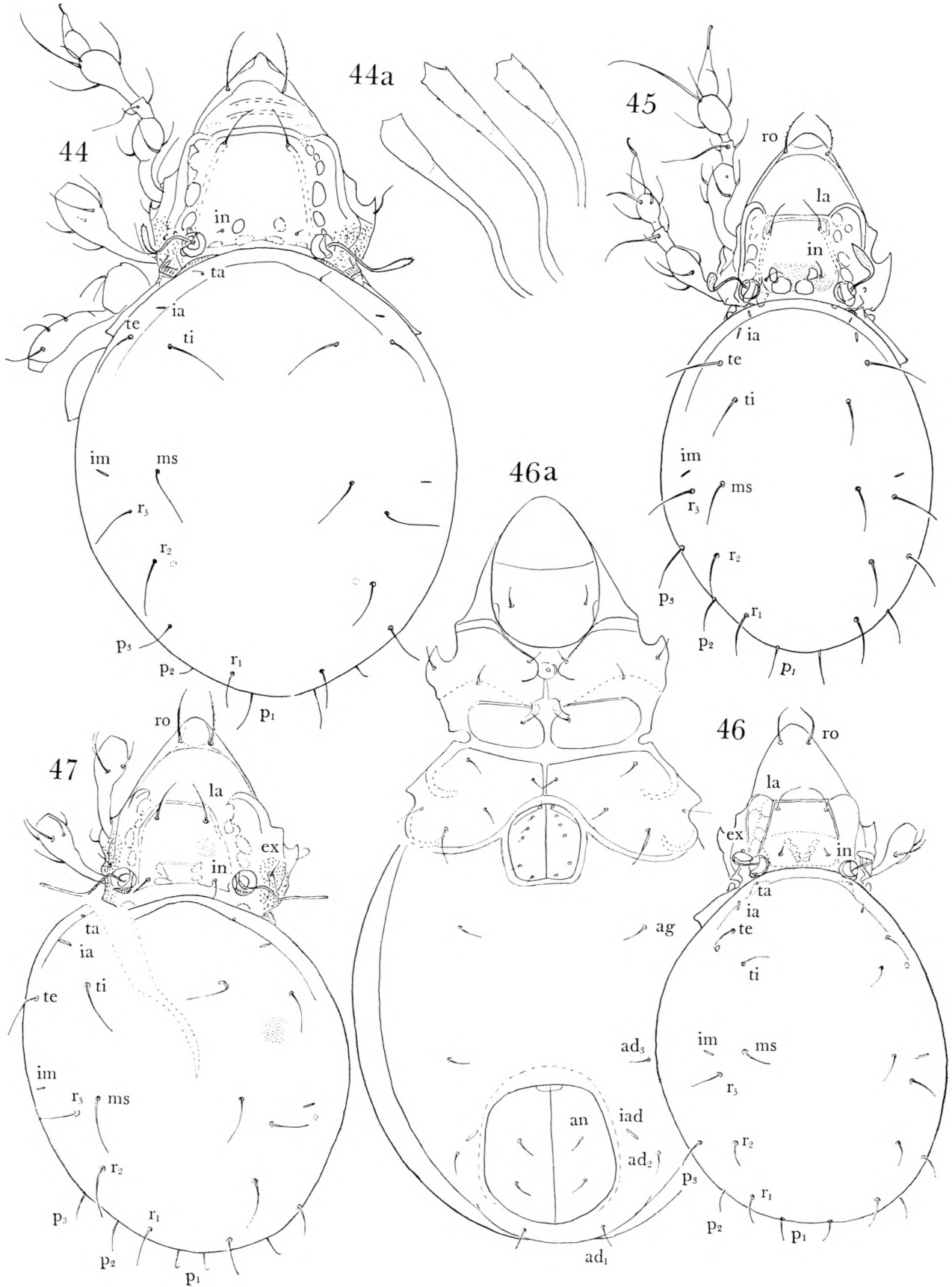
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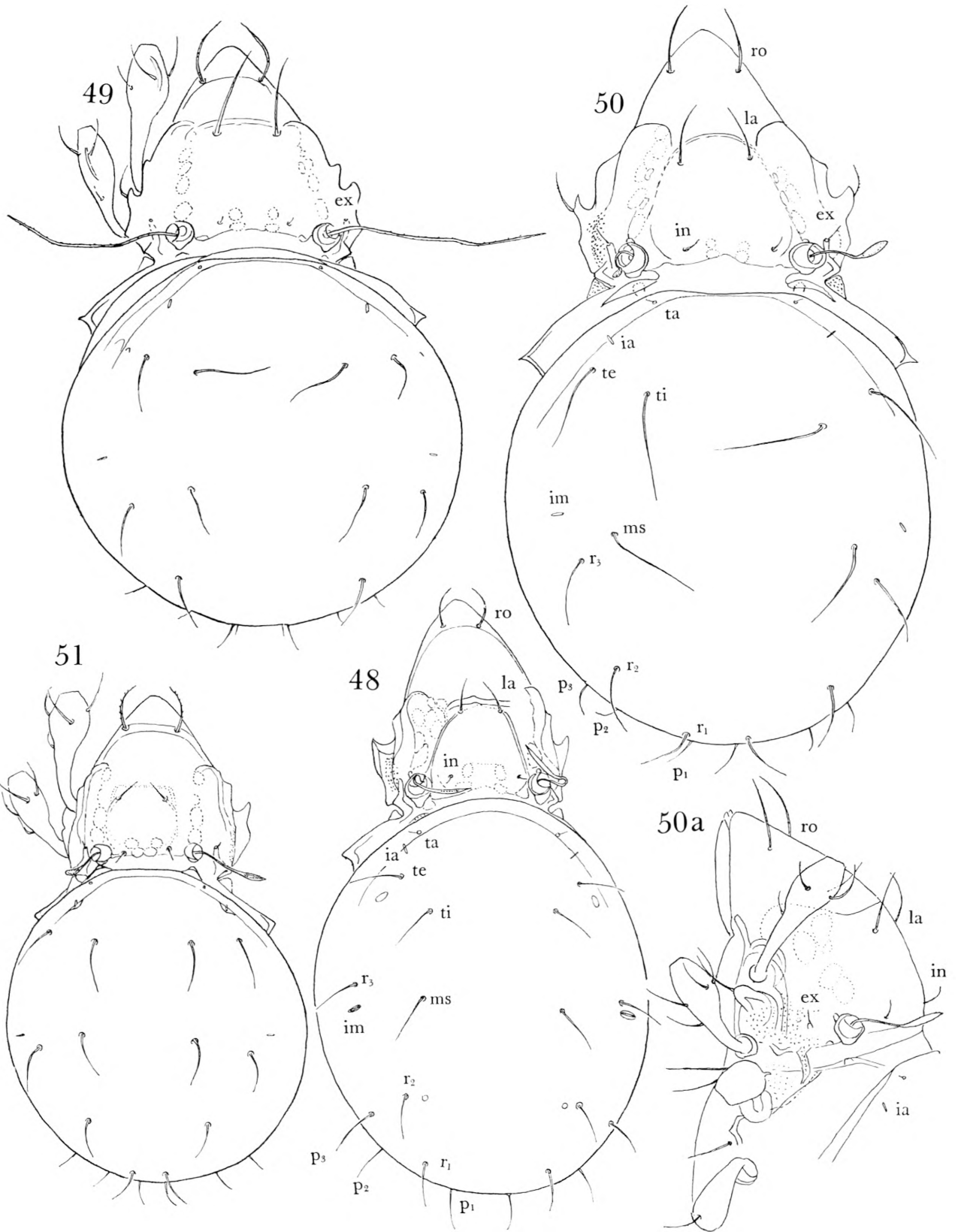


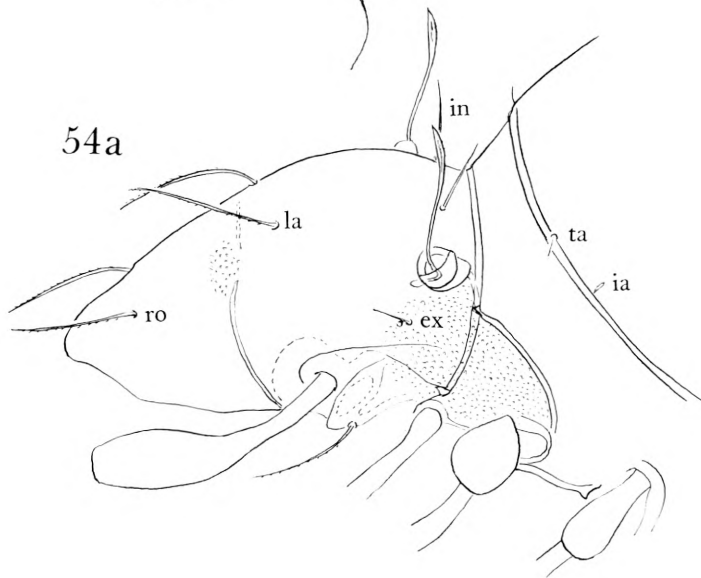
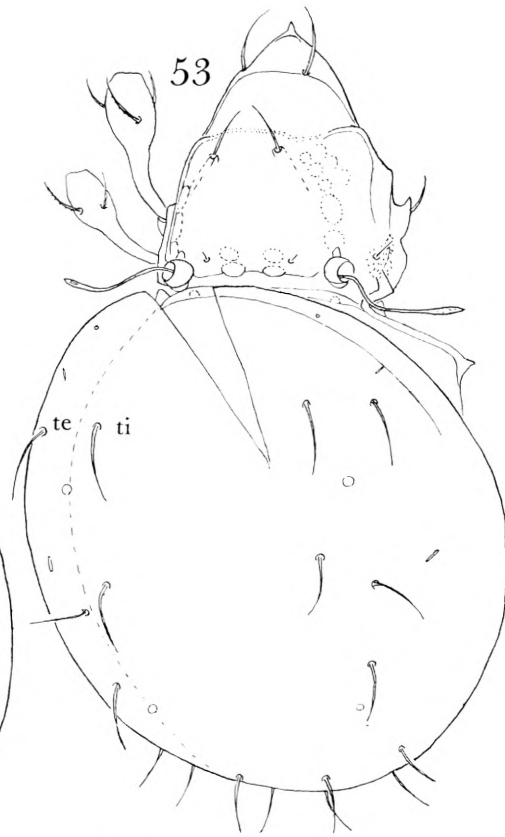
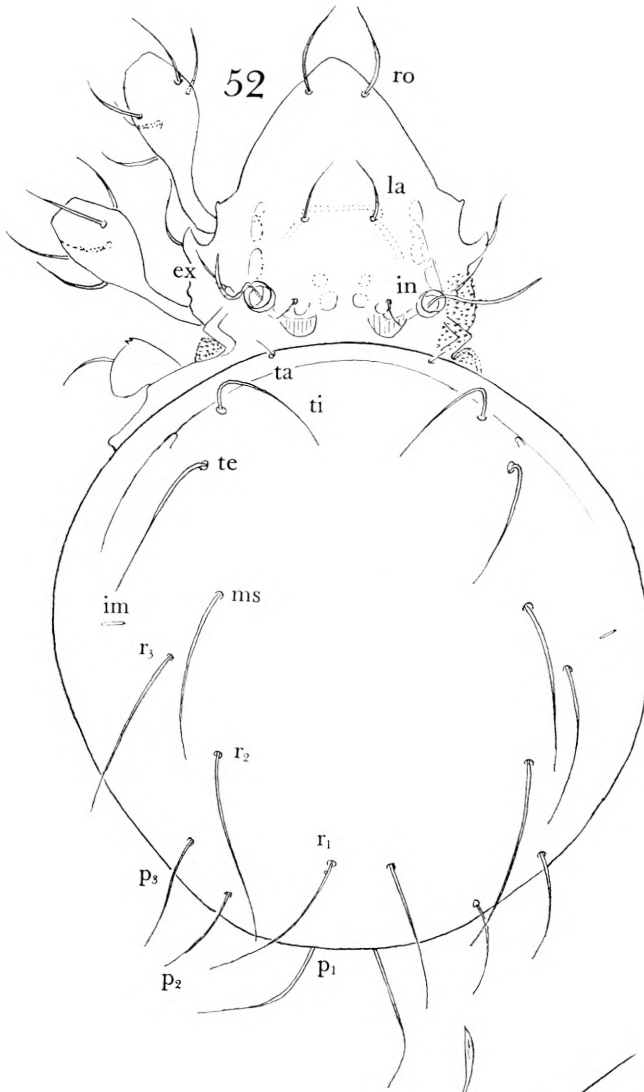


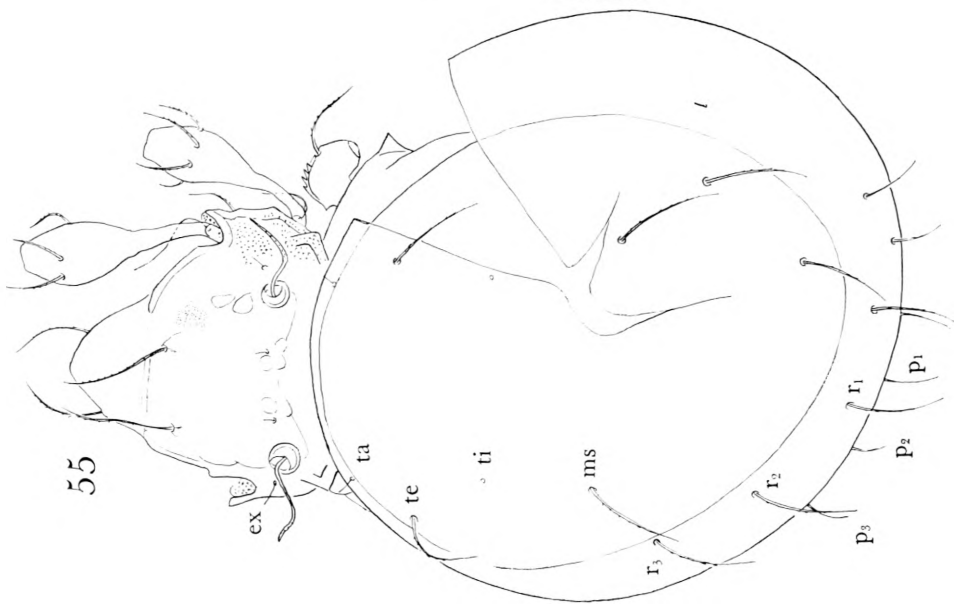
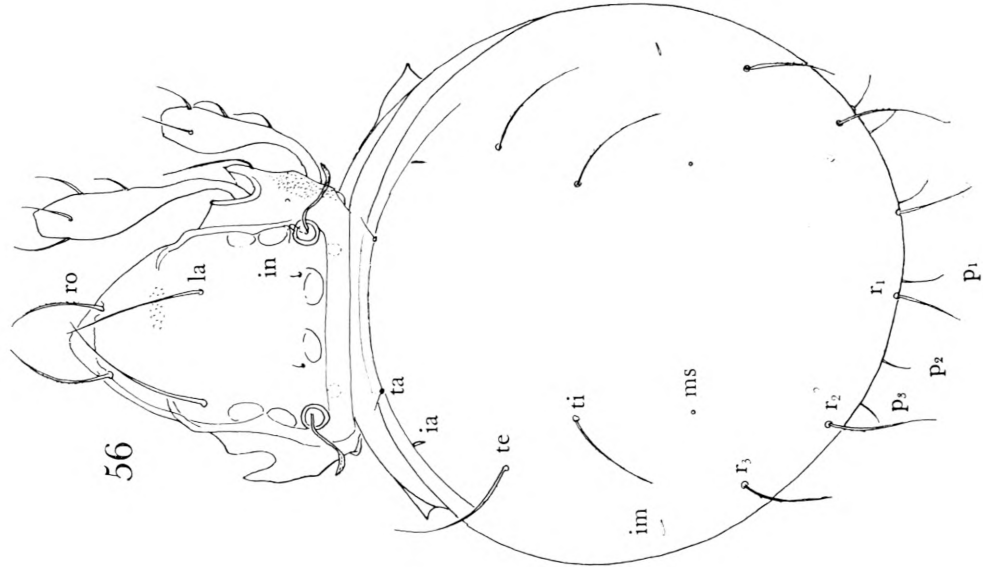
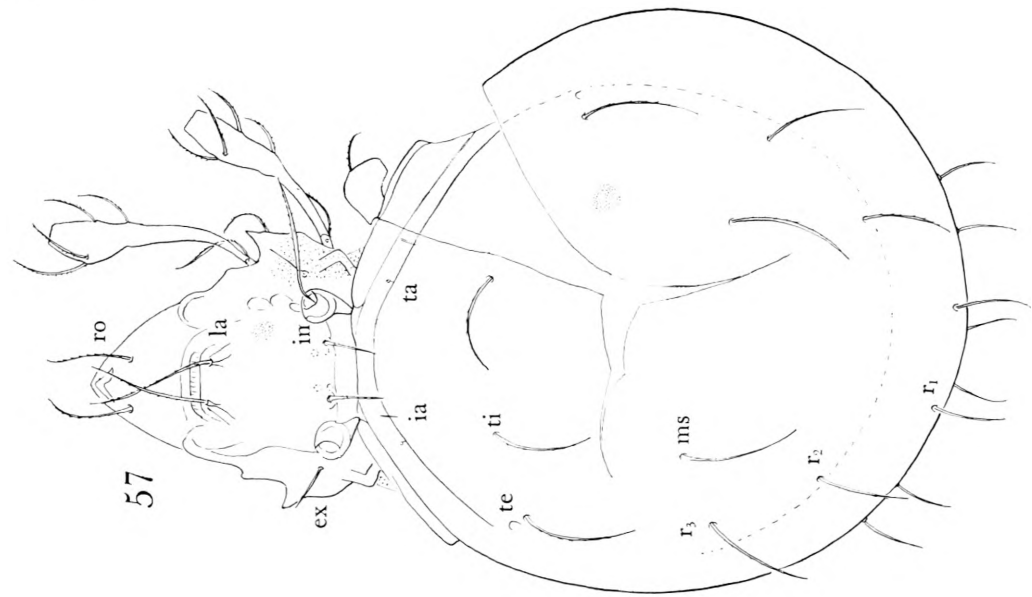


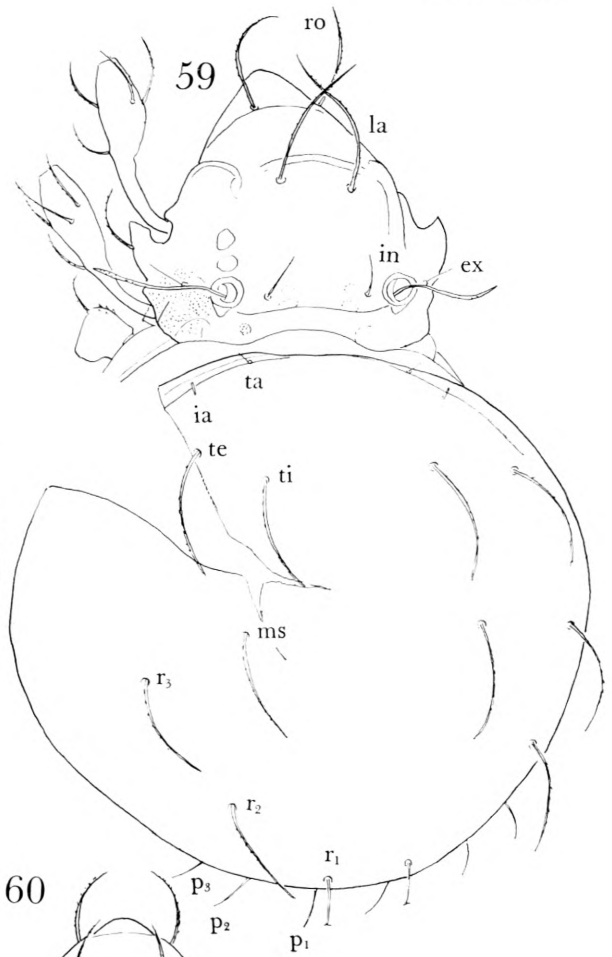
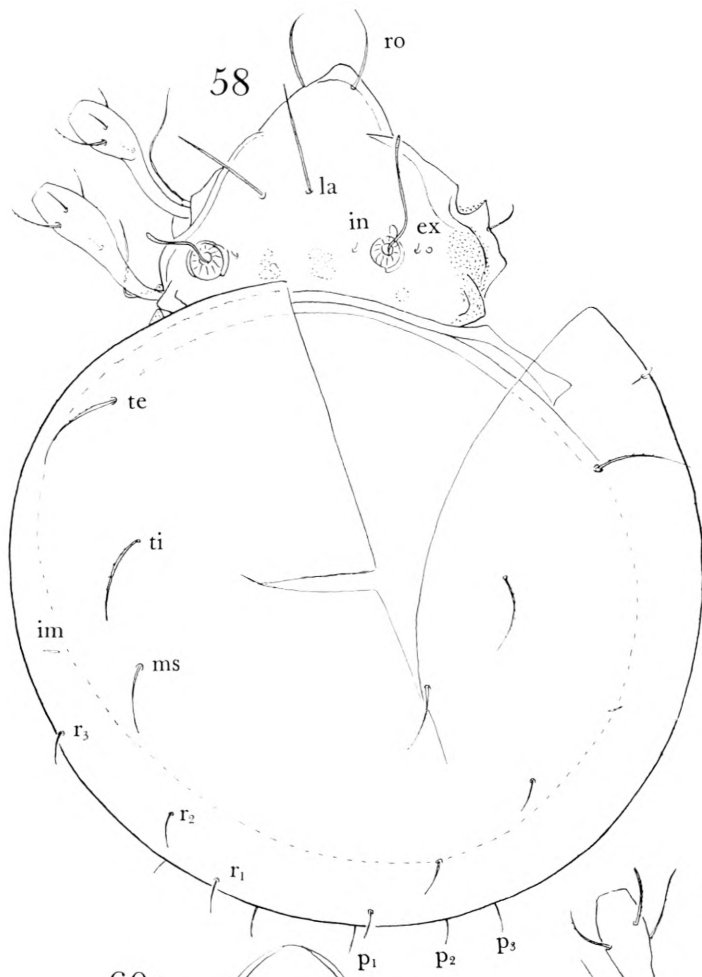




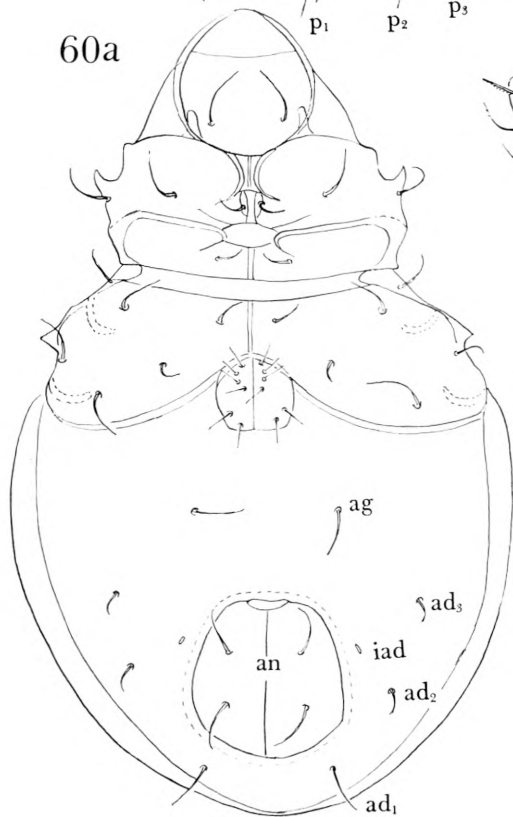




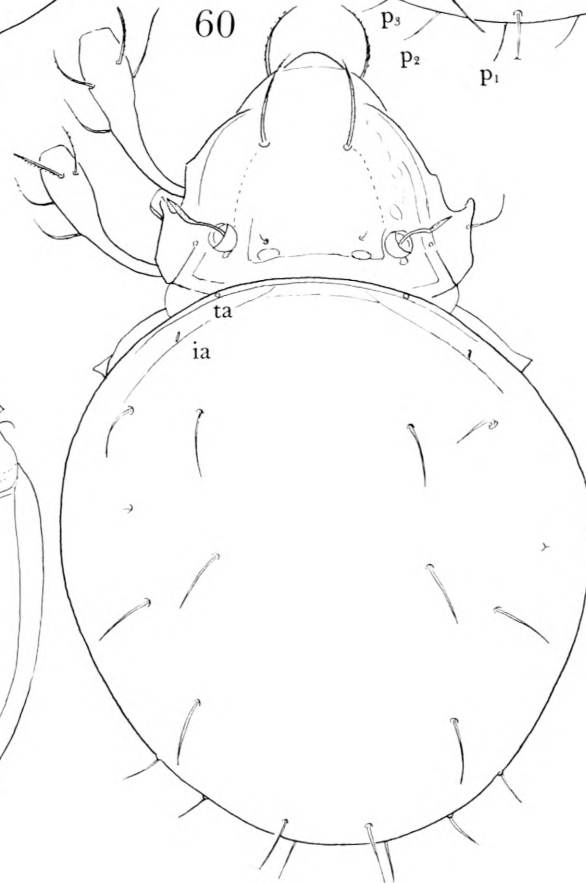


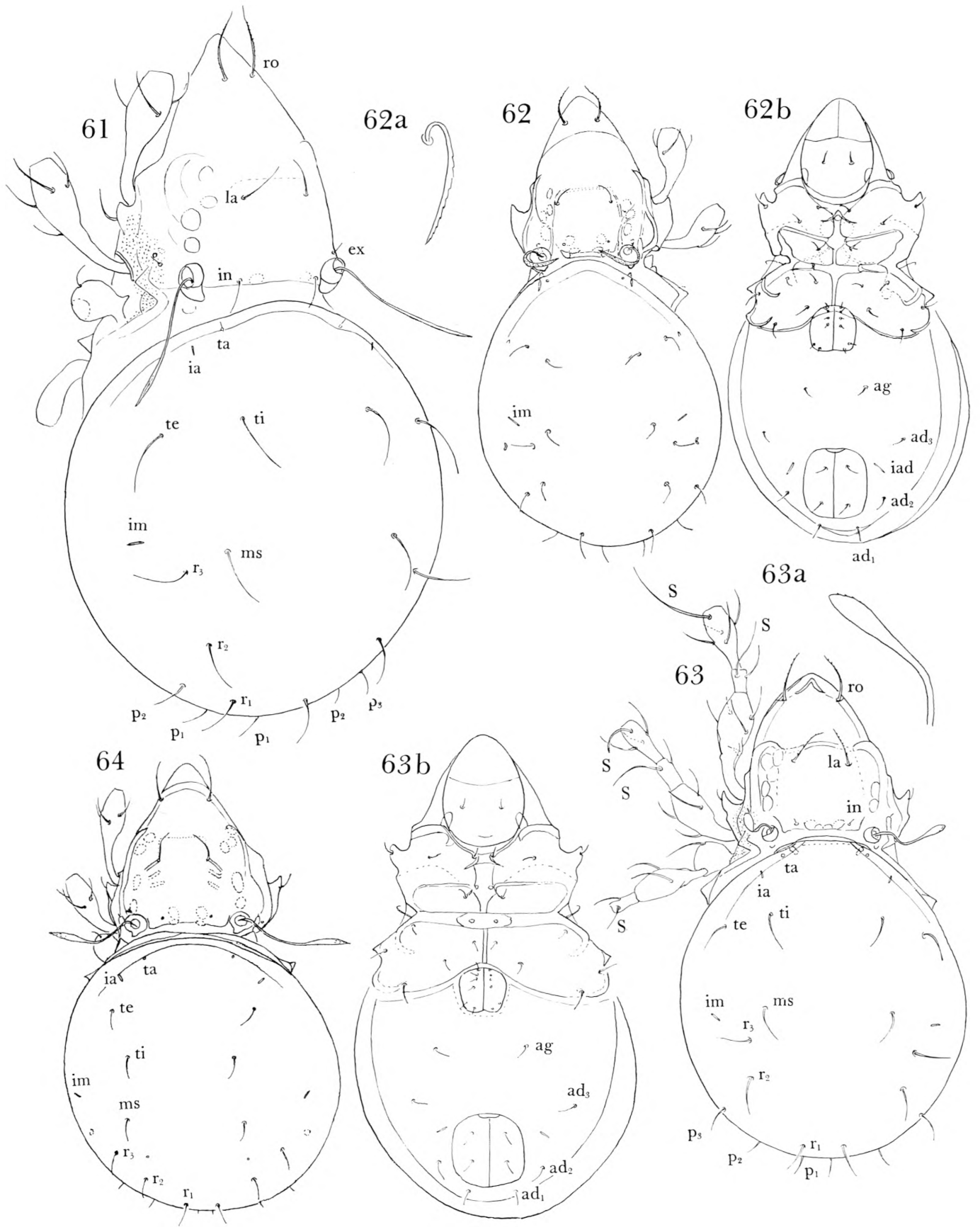


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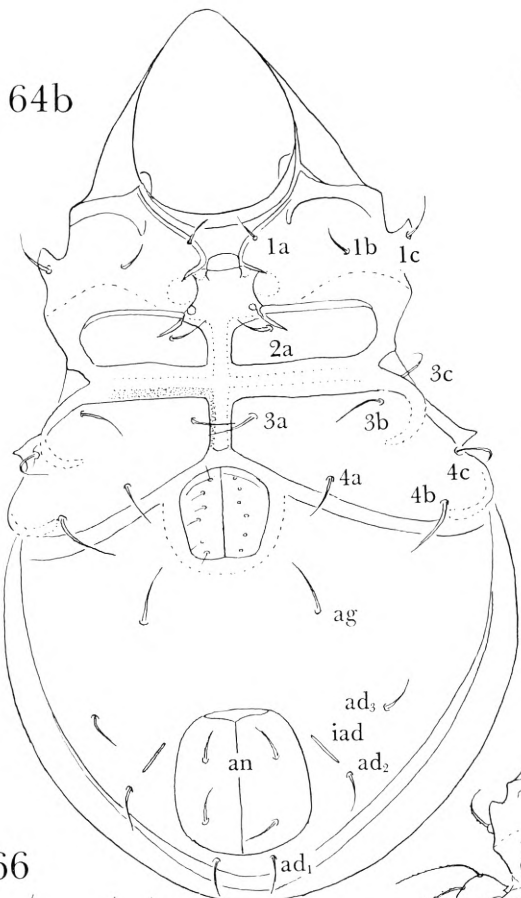


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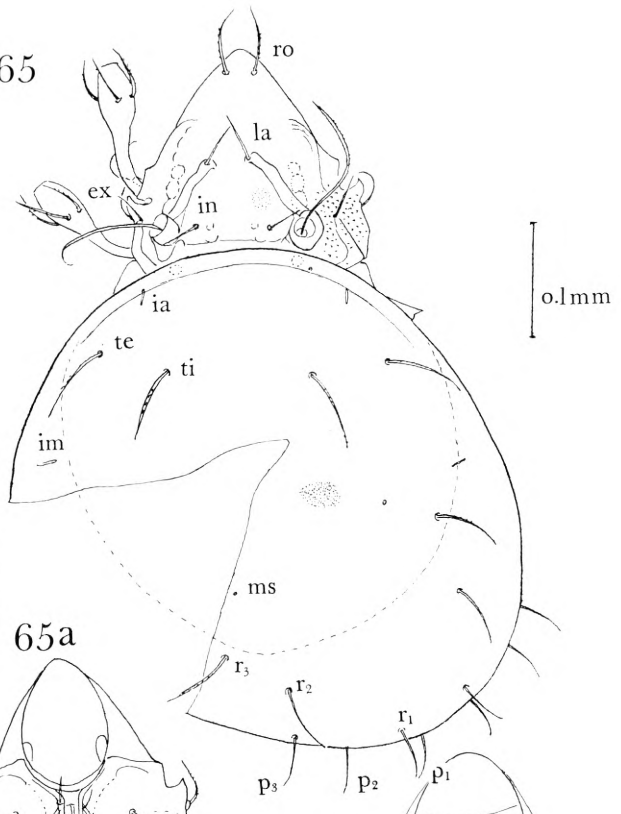




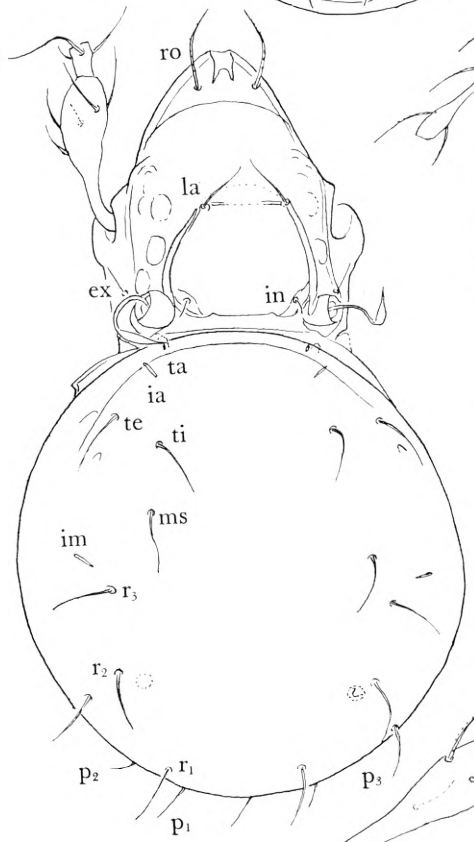
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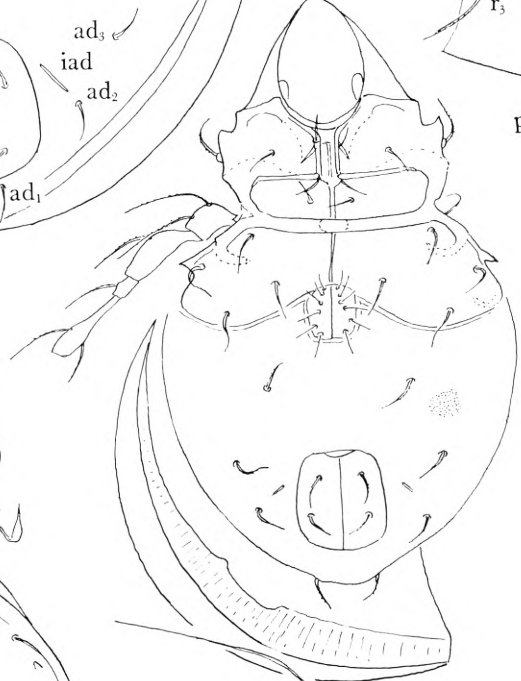
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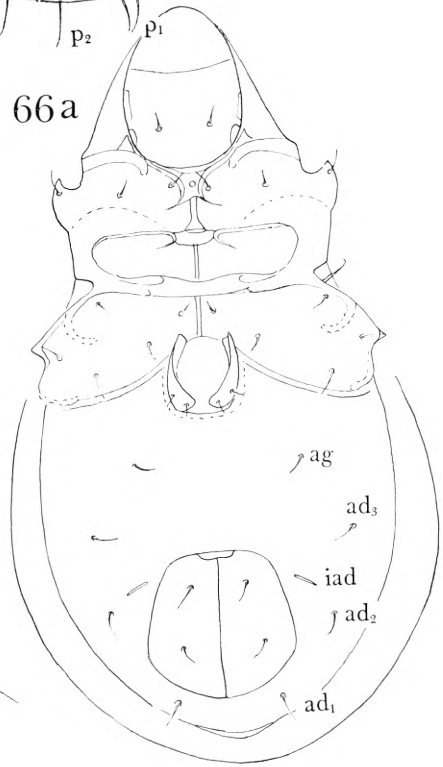
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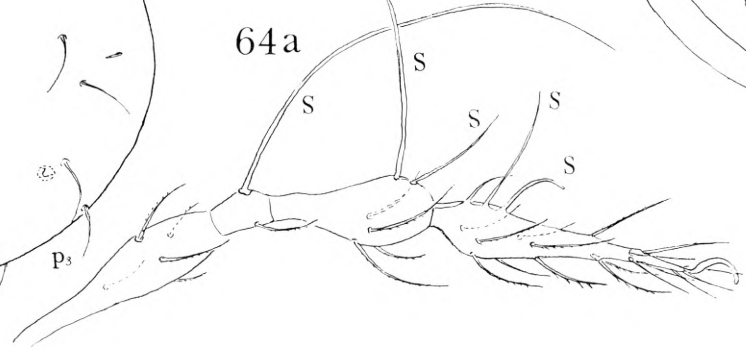
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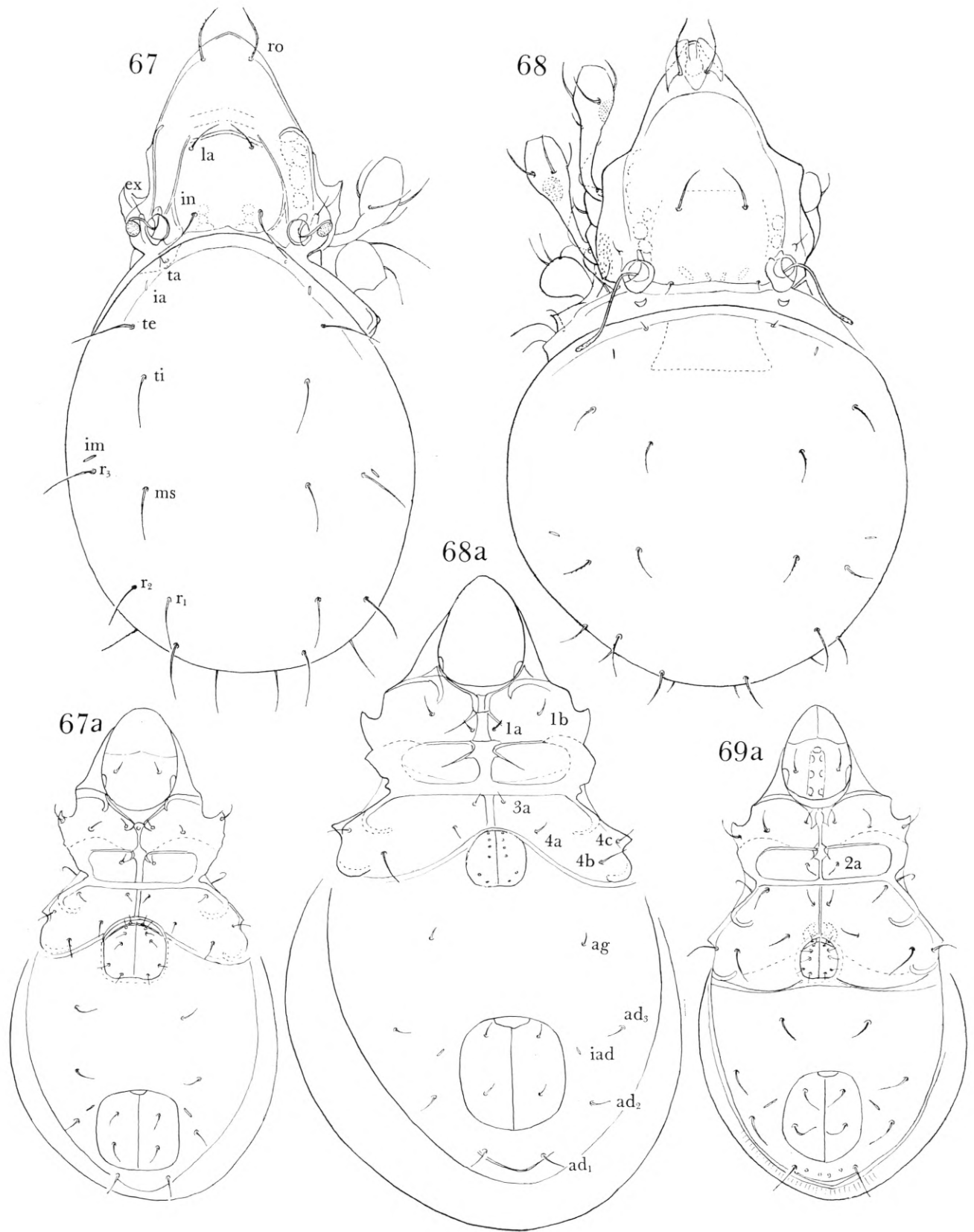


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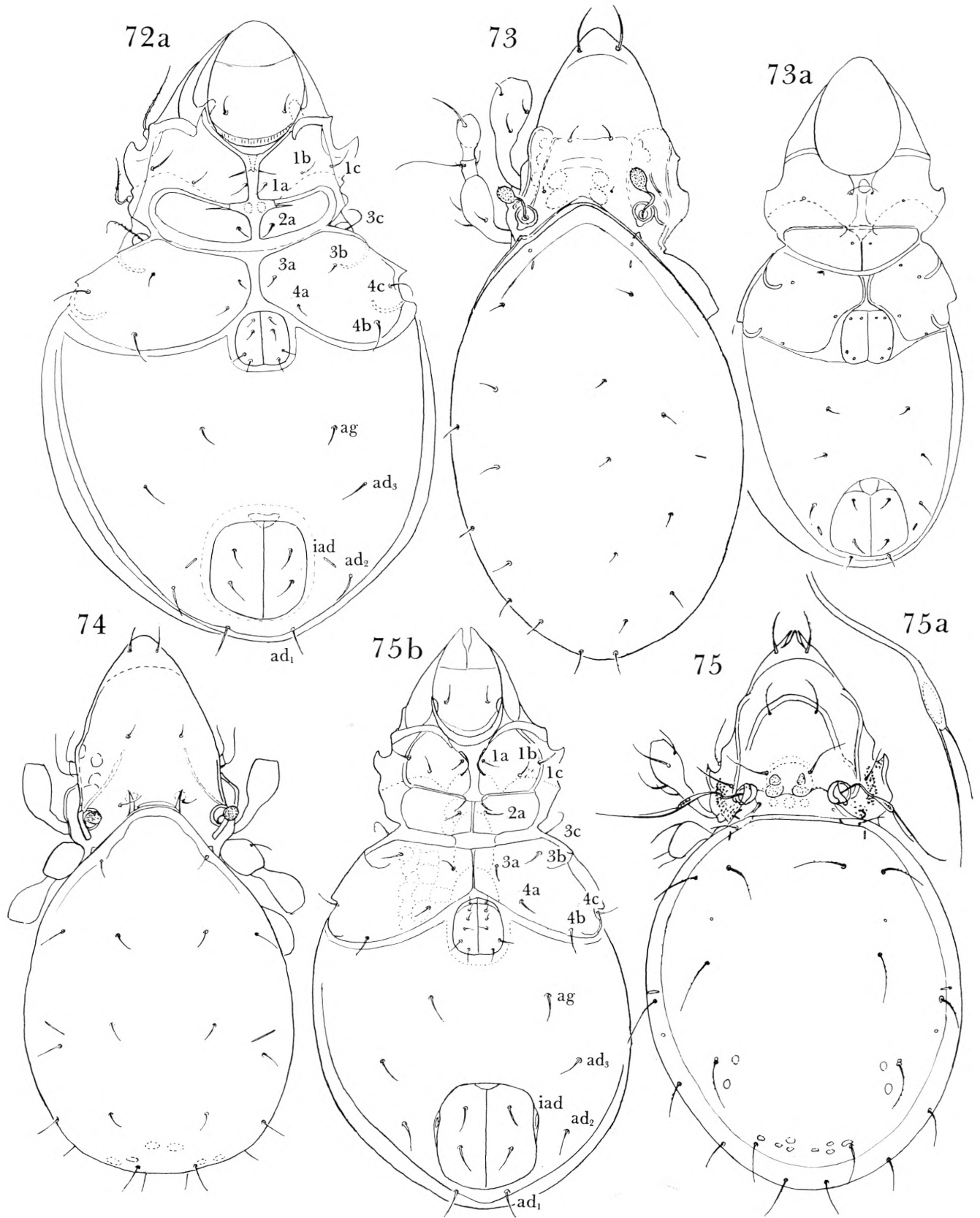


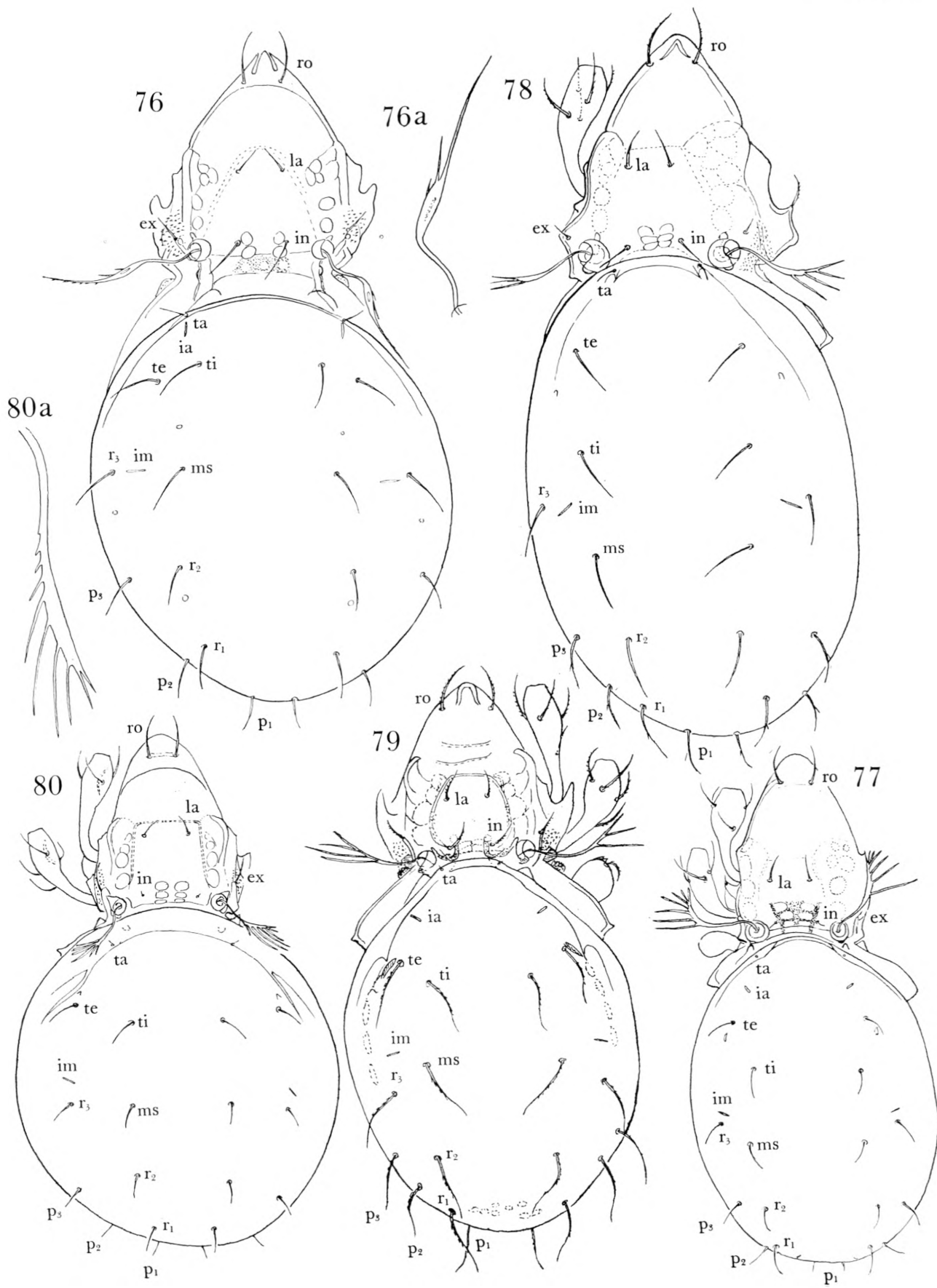
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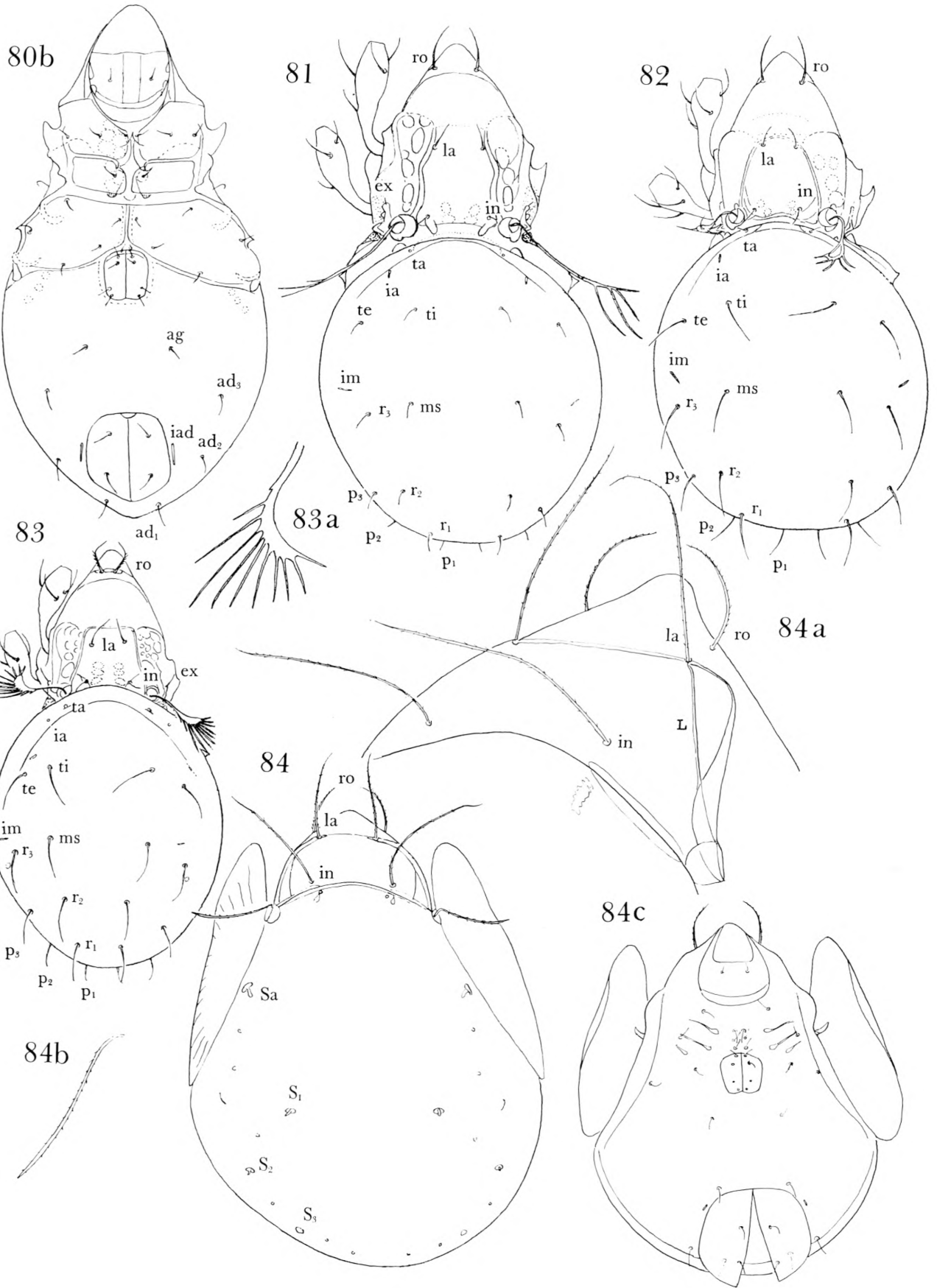


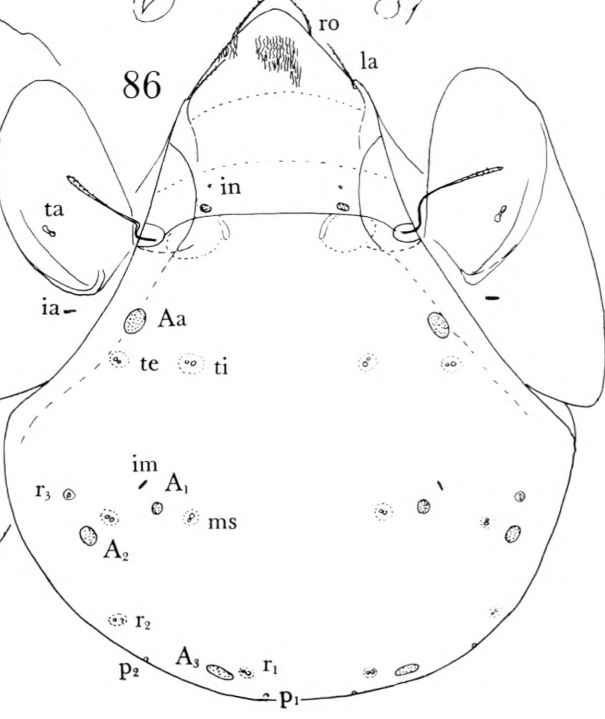
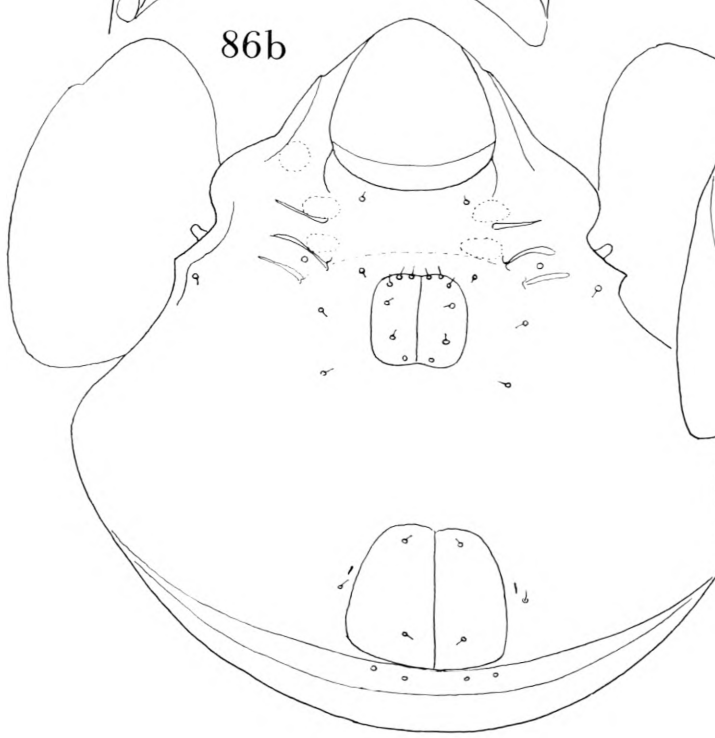
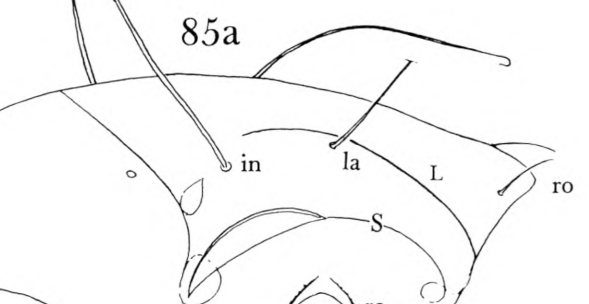
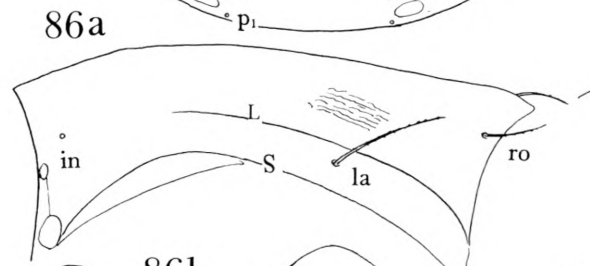
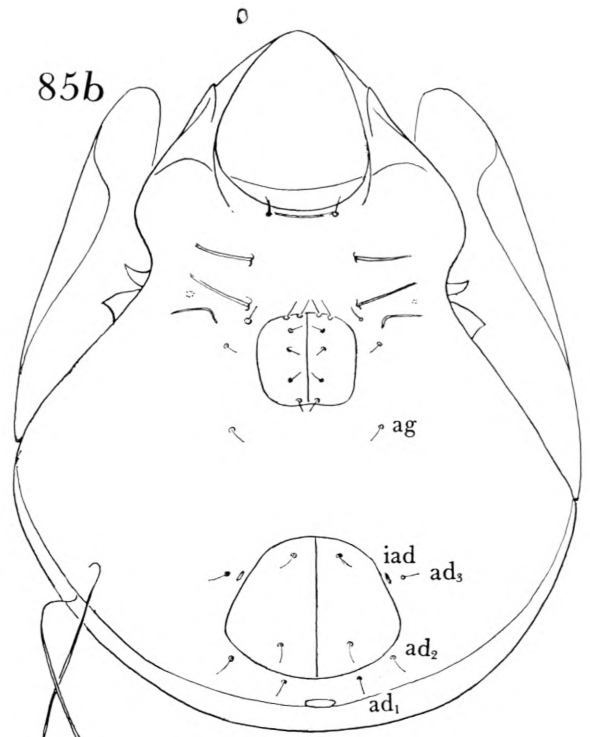
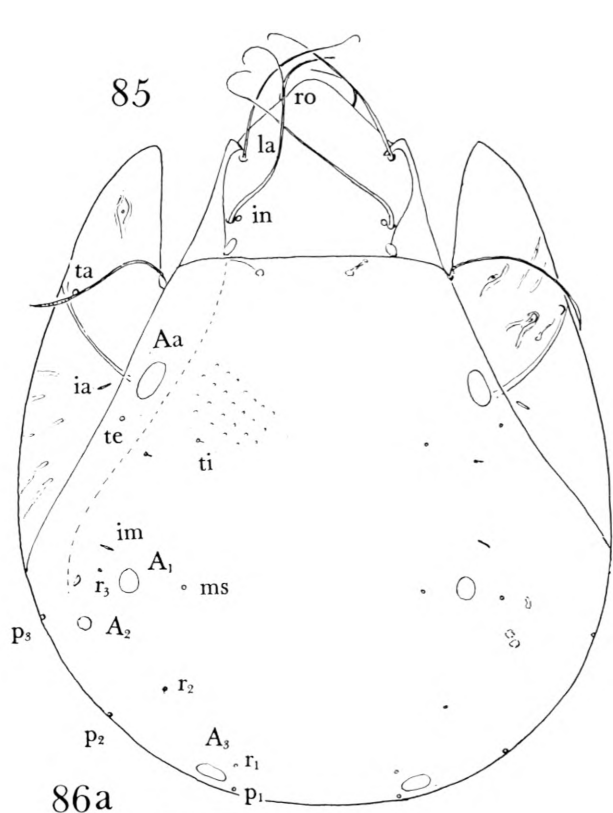




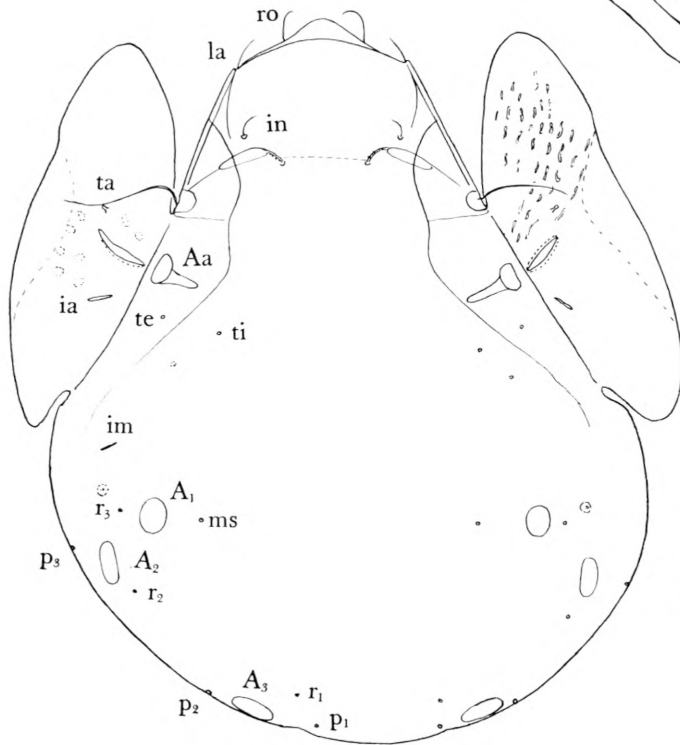




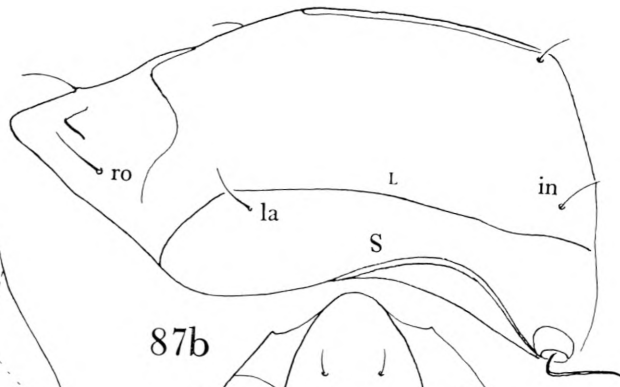




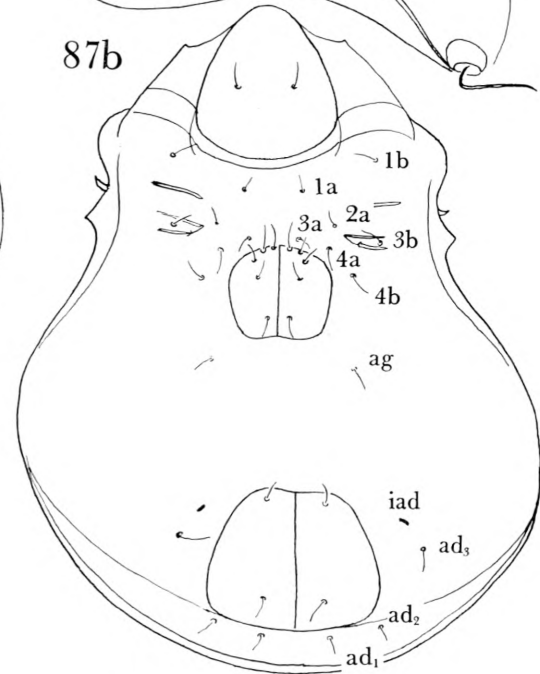
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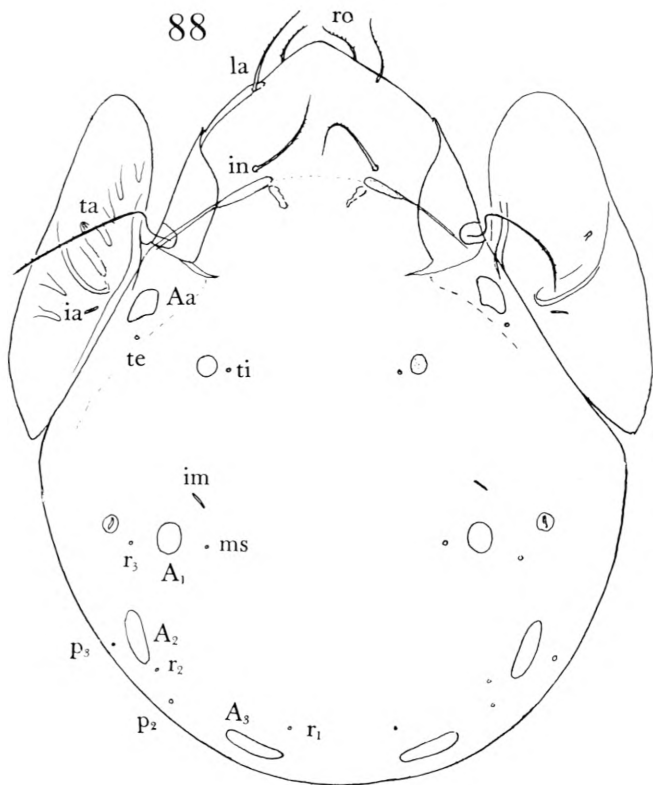
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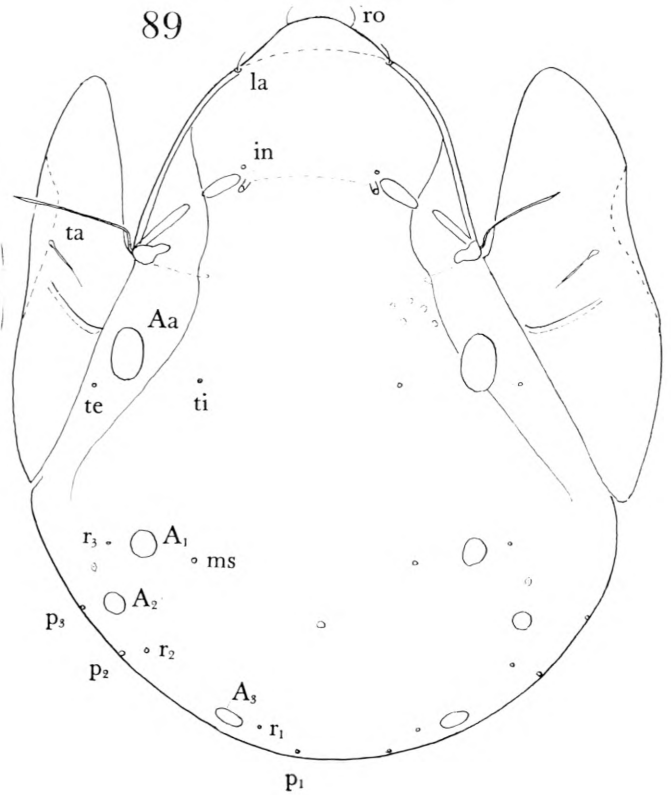
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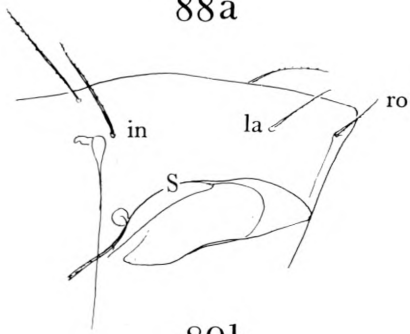
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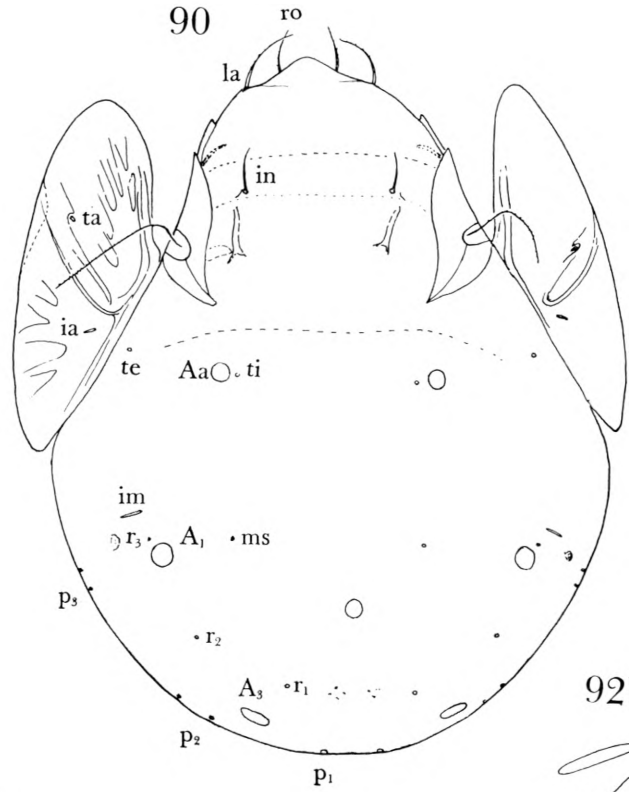
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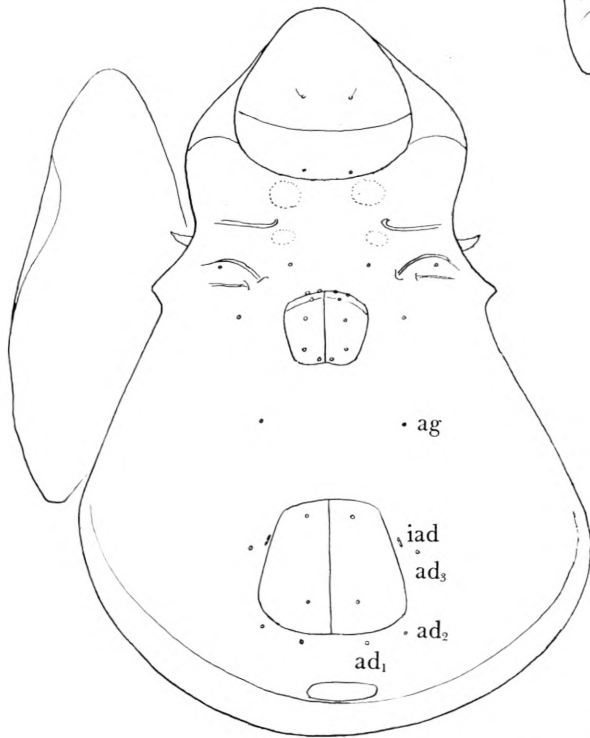
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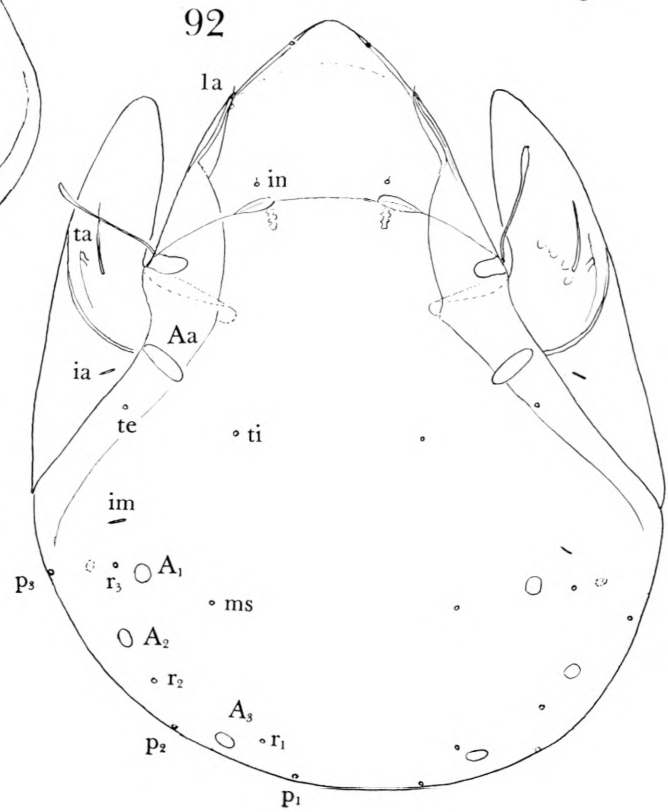


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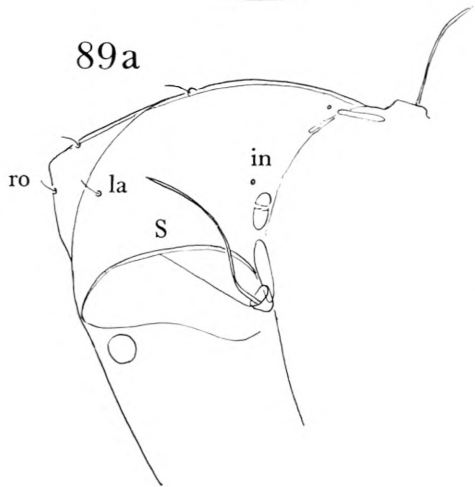


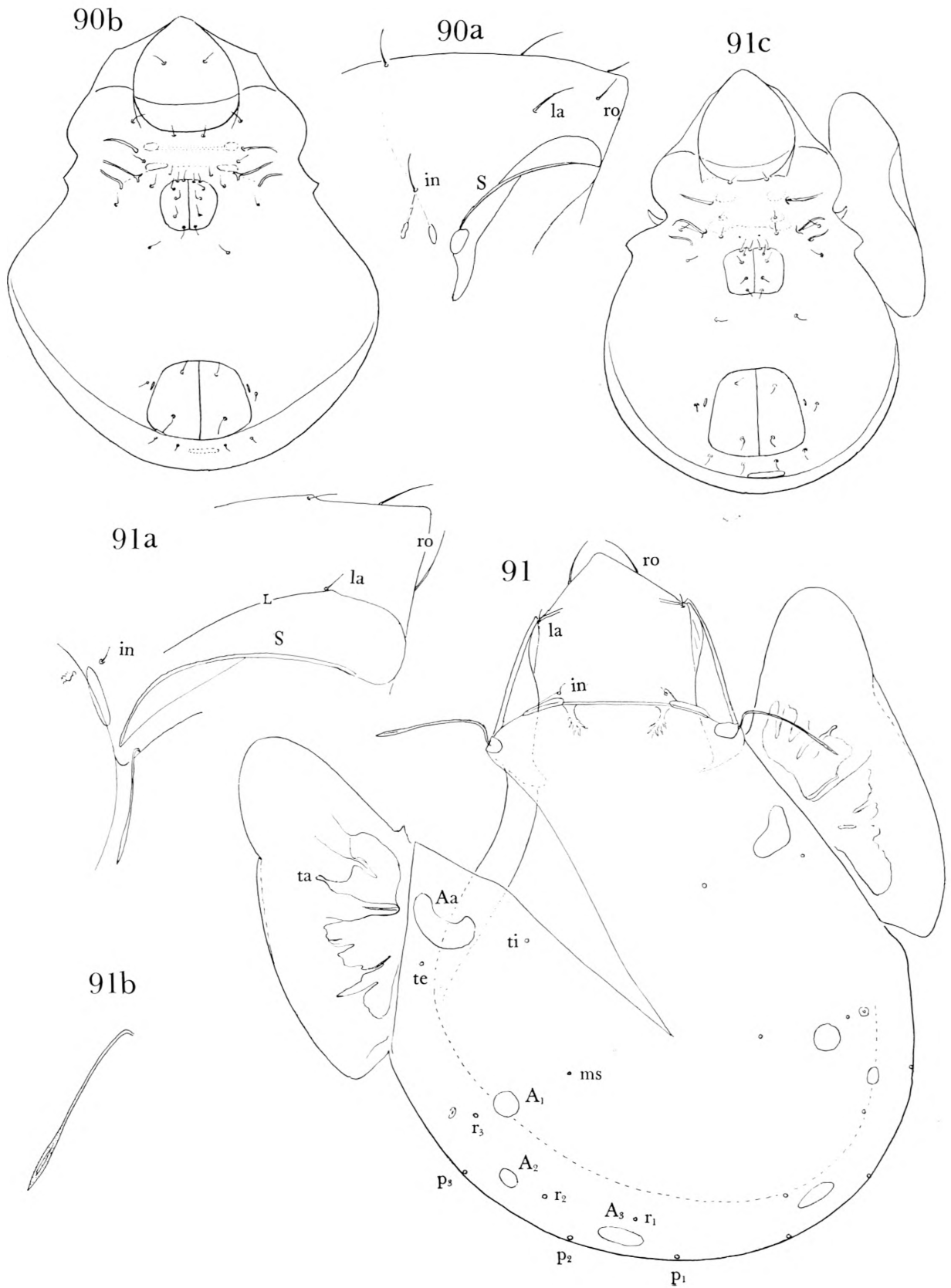
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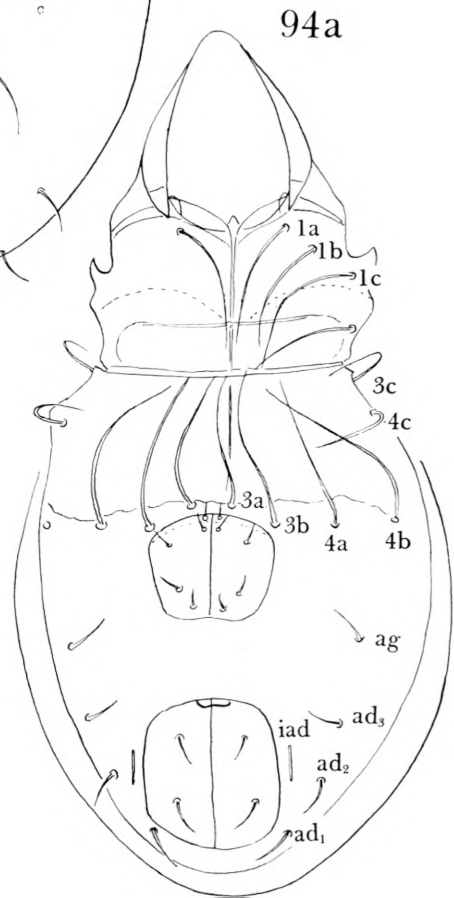
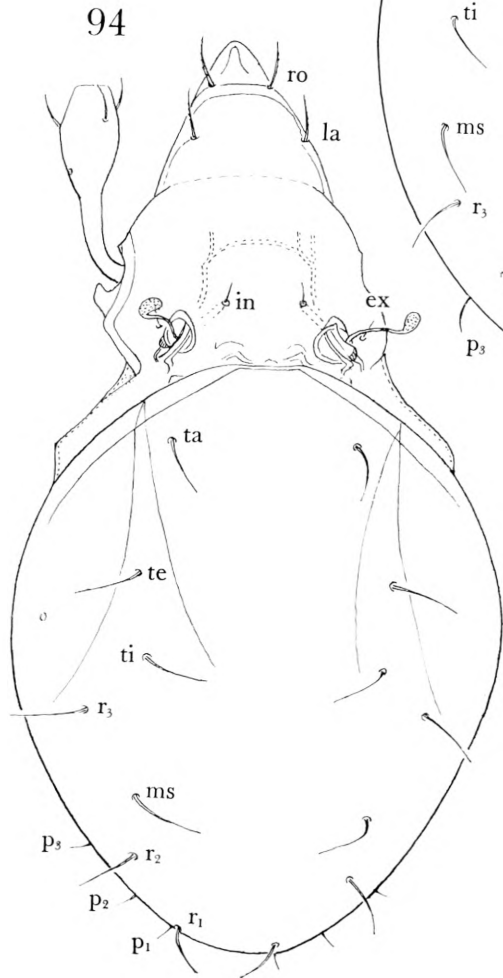
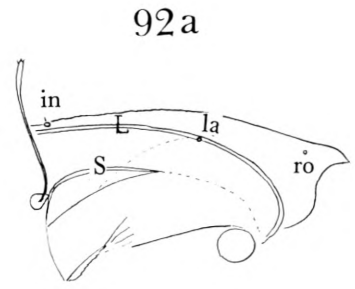
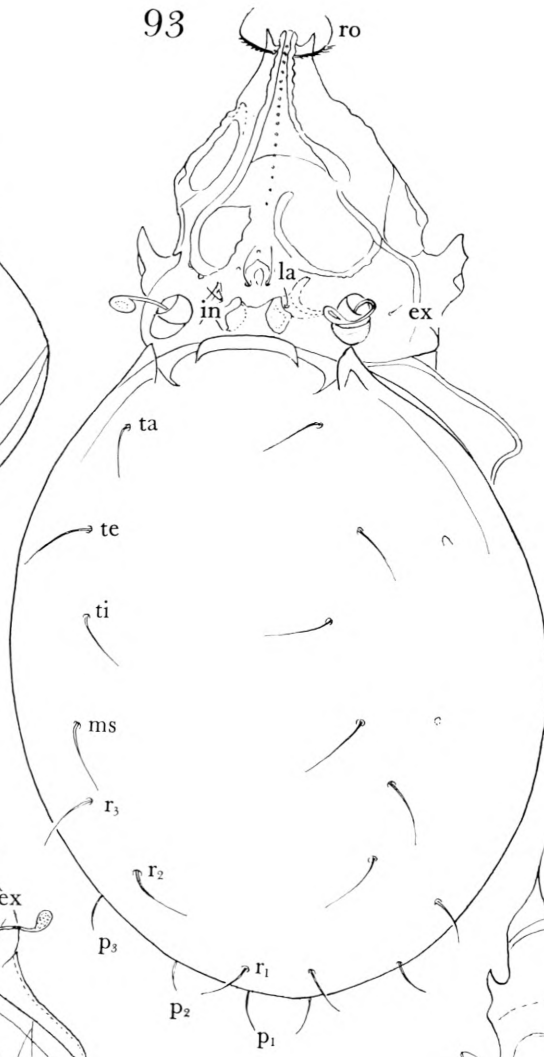
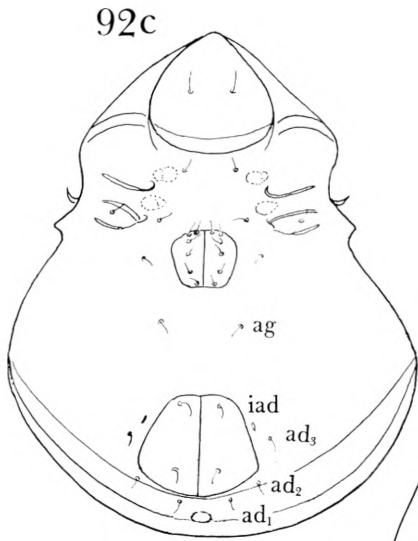
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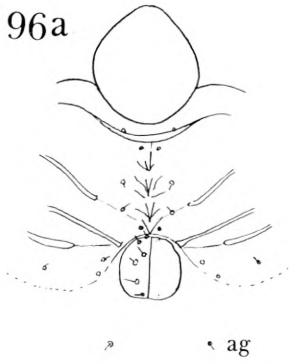
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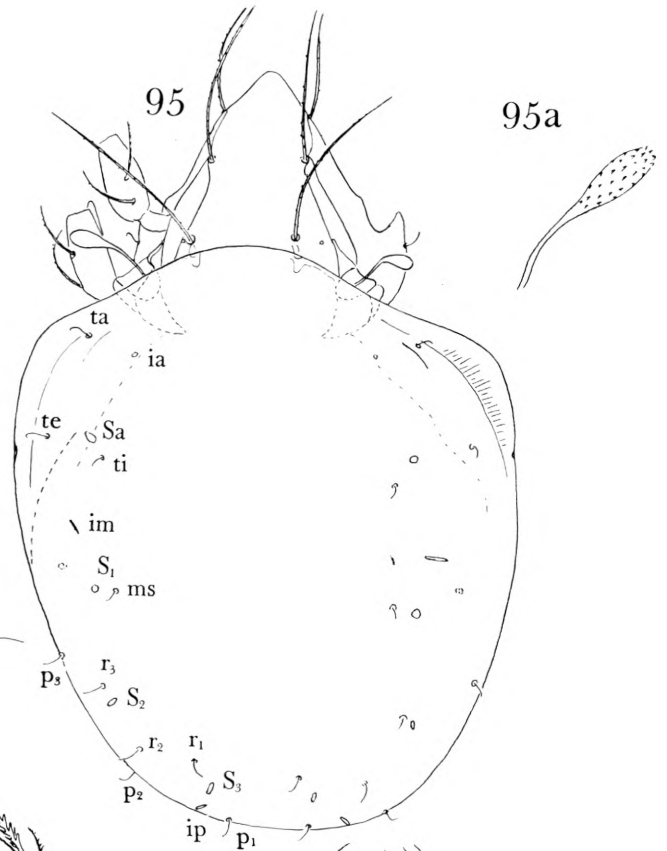


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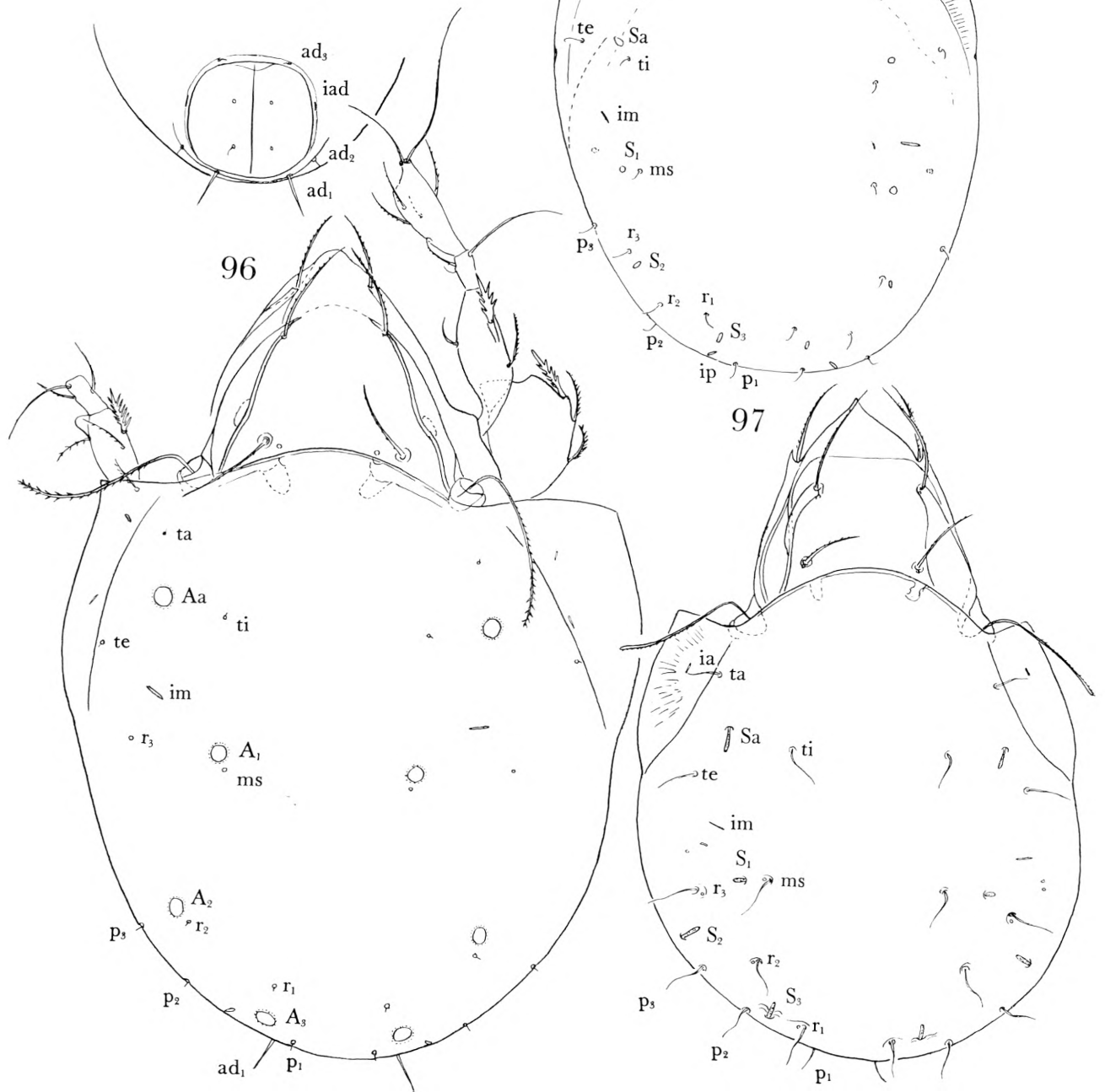
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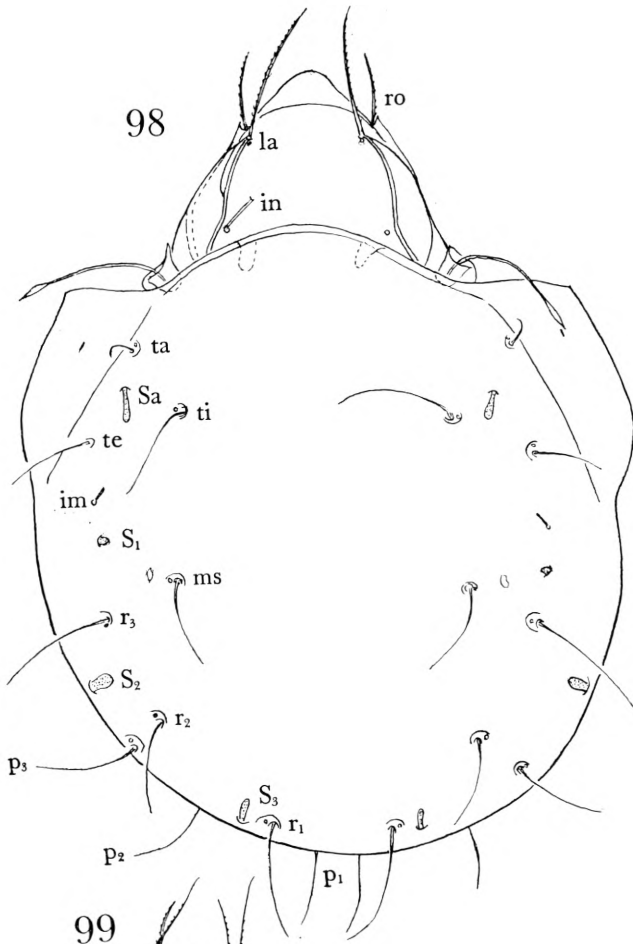


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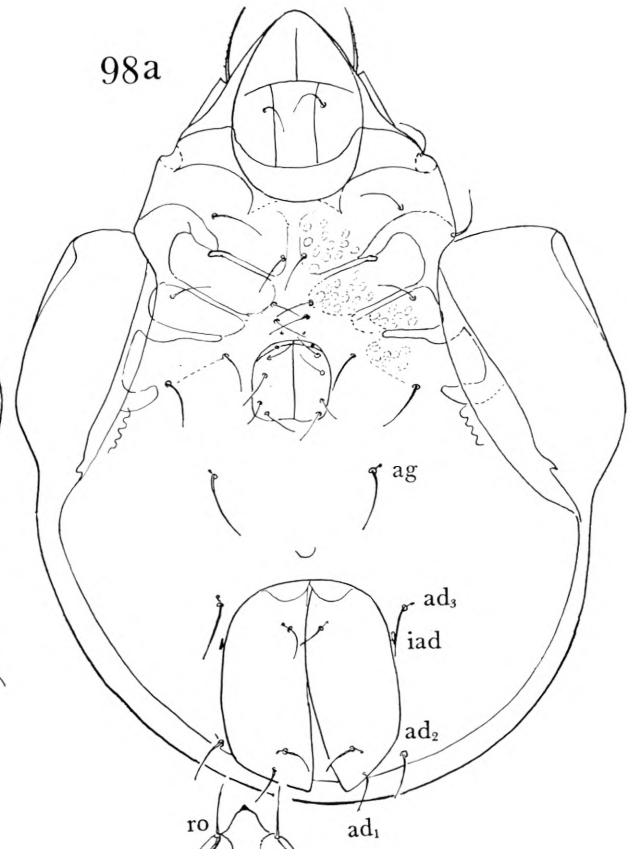
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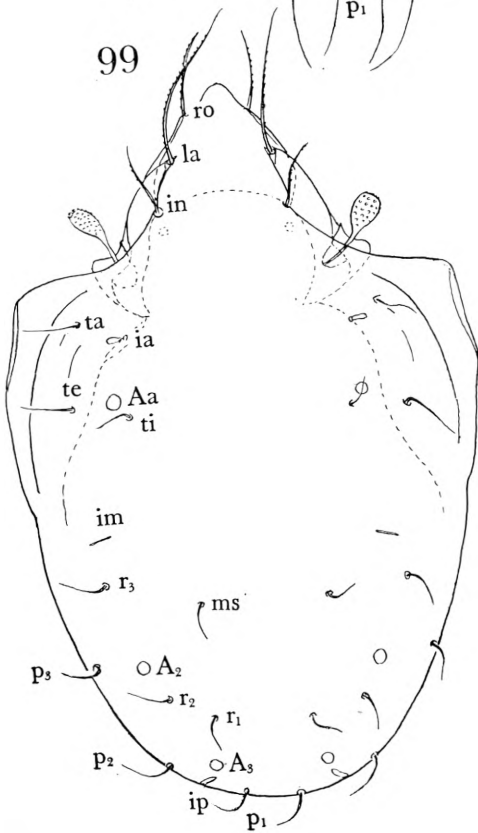
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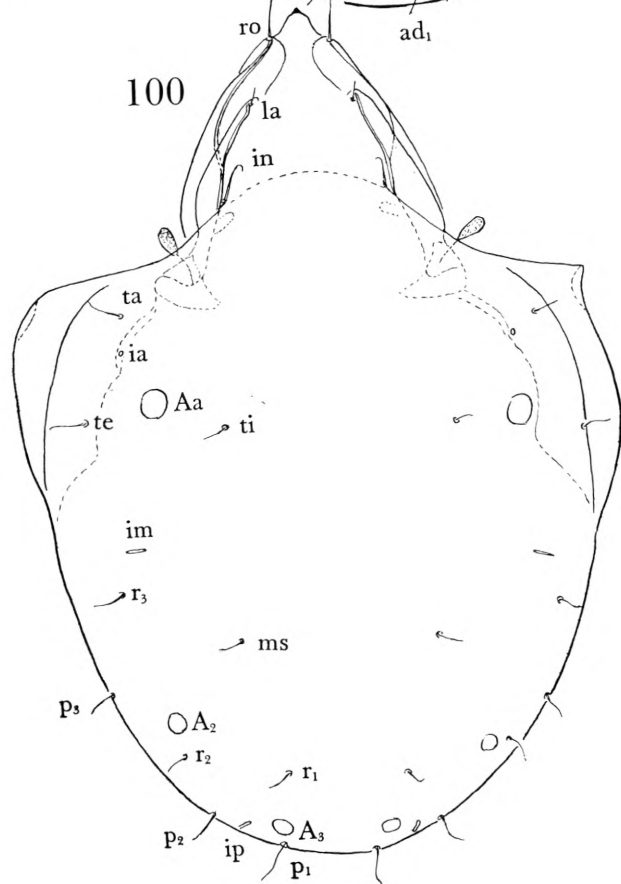
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100



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