

# The Butterflies of the Yemen Arab Republic

By TORBEN B. LARSEN

With a Review of Species in the *Charaxes viola*-Group  
from Arabia and East Africa

by A. H. B. RYDON

Det Kongelige Danske Videnskabernes Selskab  
Biologiske Skrifter 23:3



Kommissionær: Munksgaard  
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## Synopsis

This paper summarises the present knowledge of the Rhopalocera (Insecta; Lepidoptera) of the Yemen Arab Republic, based on the available literature, certain unpublished data and a personal collecting trip to the country in May 1980. Of the 106 species listed the majority are clearly Afrotropical of origin though there is a significant Palearctic element. The eremic species characteristic of Central Arabia are largely missing from the wetter parts of Yemen. A total of 31 species are recorded from Yemen for the first time, eleven of which are new to Arabia; a further two are new to any part of southwestern Arabia. The genus *Tuxentius* is erected for African Lycaenidae formerly included in the monotypic Oriental genus *Castalius* Hübner. Two species of Lycaenidae, *Cacyreus niebuhri* and *Lepidochrysops forsskali* as well as a subspecies, *Neptis serena annah*, of a member of the Nymphalidae are described as new taxa. The taxon described as *Castalius melaena interruptus* Gabriel is raised to specific rank in the genus *Tuxentius*.

An appendix to the paper by A. H. B. Rydon describes three new species of the *viola*-group of Afrotropical *Charaxes*. *C. bernstorffi* is described from the Yemen Arab Republic, *C. smilesi* and *C. larseni* from SW Ethiopia. *C. figinii* van Someren and *C. daria* van Someren & Jackson have been raised to specific rank from the status of subspecies of *C. viola* Butler and lectotypes have been designated.

*C. kirki* Butler and *C. chanleri* Holland have been re-instated to their original specific rank. *C. etheocles suk* Carpenter & Jackson has been re-combined with *C. kirki* rather than with *C. viola*. The lectotype has been designated for the taxon *C. viola picta* van Someren & Jackson.

KEY WORDS: – Rhopalocera – Yemen Arab Republic – Arabia – Ethiopia – *Tuxentius* gen. nov. – *Castalius* – *Charaxes bernstorffi* sp. nov. – *Charaxes smilesi* sp. nov. – *Charaxes larseni* sp. nov. – *Charaxes figinii* stat. rev. – *Charaxes daria* stat. rev. – *Charaxes kirki* stat. rev. – *Charaxes chanleri* stat. rev. – *Charaxes kirki suk* comb. nov. – *Neptis serena annah* ssp. nov. – *Cacyreus niebuhri* sp. nov. – *Lepidochrysops forsskali* sp. nov. – *Castalius melaena interruptus* gen. et stat. rev.

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## Introduction

As part of the preparations for writing a monograph on the butterflies of Arabia, I have undertaken a number of study tours to various parts of the Peninsula and its neighbouring countries. These visits have so far led to publications on the butterflies of Jordan (Larsen & Nakamura in press) and on various parts of Oman (Larsen 1977, 1980, Larsen & Larsen 1980). I have also attempted to collect as much Arabian butterfly material and information as possible from other sources.

It gradually became clear that a personal visit to the Yemen Arab Republic (henceforth referred to as Yemen) was highly desirable. Little collecting had taken place and at least twenty species known from the People's Democratic Republic of Yemen or Saudi Arabia were not yet recorded. The possibility that species not known from Arabia might be present was also worth considering. A number of taxa from southwestern Arabia were still so poorly known that assessment of their status was uncertain. Finally, there was an urgent need to place the butterfly fauna in a better perspective. Little has been written on the ecology of Yemen and the taxonomists who wrote up previous collections were unfamiliar with the country.

In order to resolve some of these issues, I spent five weeks of May 1980 visiting as many ecological zones as possible and bringing back a large butterfly material. The visit was financed by a grant kindly provided by the Danish Carlsberg Foundation.

This paper presents a summary of current knowledge of the Yemeni butterfly fauna based on previously published data, my own observa-

tions in 1980 and a limited quantity of other unpublished data. I collected 101 species, missing five which had previously been recorded, so that the total for Yemen is 106. Of these, 31 were first recorded during my own trip. Many were species which I had confidently expected to find, but no less than 11 were species new to the Arabian peninsula, three of which were new to science and one of which represented a new subspecies. Three further species were new to southwestern Arabia. I had hoped to find one or two species new to Arabia as an extra bonus to what was bound to be useful trip. I was wholly unprepared to find as many of eleven, including four taxa new to science. I believe this is mainly due to the fact that parts of Yemen receive a precipitation which is considerably higher than in the former Aden protectorate which is so much better researched from an entomological point of view. These extreme high rainfall zones at both higher and lower levels have not been stressed in the limited literature on Arabian ecology. I had expected that one extended visit to Yemen would be sufficient to fill the gaps in our knowledge of the Yemeni butterflies, when viewed in relation to our knowledge of the neighbouring countries. In retrospect this was perhaps an optimistic view and it is likely that a further visit would reveal more species hitherto overlooked in Arabia.

The current situation in lepidopterological research in Arabia may be summarised as follows. The fauna of Oman is well known, though collecting in the highest parts of the Jabal Akhdar range in June and in the high mountains of Musandam in May might produce a few further species. Eastern Saudi Arabia and Qatar are well researched

thanks to recent collecting by Pittaway (1979, 1980, 1981) and Pitcher (1979); the fauna of the United Arab Emirates is poorly known, but it is limited and its composition may be extrapolated. Central Saudi Arabia (especially the mountains around Unaiza) might produce one or two additional Palaearctic species. The general fauna of the Hejaz is known or can be extrapolated, except for one urgent need: a comprehensive collection in April on the high mountains near Tabuk, which may well contain relict populations of Palaearctic species, including the two species recently described as endemic to the high mountains of South Sinai. The Asir mountains are very unlikely to produce species not found in Yemen, though the Tihama may have one or two additional Nilotic species. The most urgent need, however, is a comprehensive collection from the Wadi Hadhramaut, the fauna of which is only known in a fragmentary fashion, but where one interesting endemic species has nonetheless been found.

But while the total composition of the butterfly fauna is relatively well known, much more information is needed on ecological aspects, biology, migration and seasonal distribution. This is where the gaps cannot be filled except by residents of the countries concerned. Butterflies are now among the best known and well documented components of the Arabian fauna and they can be used as quite sensitive biogeographic and ecological indicators. It is my hope that this paper will stimulate others to help in filling the remaining gaps.

### Acknowledgements

I am indebted to many people for the success of my trip to Yemen and for assistance in developing this paper.

Mr. J. Björnsson, Mr. R. Garner, Mr. H. Haig Thomas, Mr N. McDonald, Mr C. Smith and Mr R. Turp provided logistical assistance and advice. Mr & Mrs J. Mandaville of the American Institute of

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A special thanks must be directed to Mr *John Wood* who during six years in Yemen has acquired a better personal knowledge of the country than any other field naturalist. His botanical knowledge was freely given and his advice on which parts of the country to visit was invaluable. He kindly assisted me in the writing of the brief botanical overview for this paper.

Mr *R. Vane-Wright*, Mr *P. Ackery* and Mrs *R. Arora* of the British Museum of Natural History extended their usual help and assistance for which I continue to be grateful. M and Mme *J. Pierre* in Paris kindly advised on the status of *Neptis serena* and *Acraea eponina*. Dr *A. H. B. Rydon* took the trouble of studying my specimens of the difficult *Charaxes viola*-group. Dr *K. Saitoh* of Hirosaki University arranged for the determination of chromosome numbers of butterflies collected in Yemen.

I am grateful to Dr *S. L. Tuxen* of the Zoological Museum of Copenhagen who has encouraged my research into Arabian butterflies during the last five years.

Professor *B. Christensen* and Professor *K. G. Wingstrand* provided valuable comments during their review of a draft of the paper and Mr *Stuart Norman* reviewed the final manuscript. While remaining errors and inconsistencies are my own responsibility, their comments have greatly improved the final version of the paper.

My final thanks are due to the Carlsberg Foundation of Copenhagen whose generous grant made my visit to Yemen possible.

Many people in and outside Arabia have helped me at other times during my Arabian researches; their assistance and friendship have not been forgotten.



## History of Collecting

The butterflies of southern Arabia were until recently poorly known, though the former Aden Protectorate constituted a partial exception (Butler 1885, Yerbury 1893, Gabriel 1954). Little material was available from any part of Oman (Butler 1899, Riley 1932, Wiltshire 1952), though the Oman Flora and Fauna Survey and three visits to Oman by me have largely filled that gap (Harrison 1975, Gallagher 1980, Larsen 1977, Larsen 1980, Larsen & Larsen 1980).

Yemen remains poorly explored by naturalists, with the exception of botanists (Forsskål 1775b, Botta 1841, Defflers 1889 among others, and J. Wood (in prep.)). This may seem strange since Yemen has for long been known to be of the highest interest, but during the period from 1880 to 1930, when so much intensive collecting and taxonomic work took place, Yemen was for all practical purposes closed to researchers for political reasons. Even after 1930, any improvement in this respect was slight. Then, during the 1950s and 1960s, civil war raged. Only during the last ten years has access become relatively easy.

In 1761 the Danish King *Frederik V* launched the first scientific expedition to Yemen under the direct supervision of the Prime Minister, Count *Bernstorff*. The concept was good and grand. The expedition was to cover all aspects of science and comprised a humanist, *Frederik von Haven*; a botanist, *Peter Forsskål*; a topographer, *Carsten Niebuhr*; a physician, *Christian Cramer*; and a servant *Berggren*. The outcome of the expedition was tragic. Only Niebuhr survived; the rest died from malaria in Yemen or just after leaving the country. The course of the expedition and the personal rivalries which bedevilled it from the outset are ably and dramatically chronicled by Hansen (1962) in a book which has been translated into Arabic and which is widely known in Yemen. For dramatic effect Hansen unfortunately understates the true and lasting scientific value of the expedition. Not only did Niebuhr publish a full account of the

voyage (Niebuhr 1772, 1774, 1778) whose chapters on the Yemen are still required reading for visitors, but he also supervised the publication of Forsskål's work (1775a, 1775b, 1776) with Baurenfeind's painstaking drawings. Forsskål or Niebuhr must almost certainly have collected some butterflies in Yemen, but there are none among the taxa published by Fabricius who received the expedition's invertebrates (Zimßen 1964). They were probably among the material smashed by the venal dola of Mocha.

Klug (1829–34) published the new species of butterflies from *Hemprich* and *Ehrenberg's* expedition to Ethiopia and Arabia. Some species are recorded as "ex Arabia Felice" and may have been from Yemen, but the exact route of the expedition apparently cannot be established (Scott 1942), so they may have been from Saudi Arabia or PDRY\*. The number of names bestowed by Klug which appear in the systematic part of this paper testifies to the importance of Klug's work as a starting point for the study of Arabian butterflies.

In 1928 and 1931 the two German polyhistorians, *Rathjens* and *von Wissmann*, visited Sana'a. Neither was an entomologist, but especially Rathjens caught a large number of butterflies which were published by Warnecke (1929, 1932, 1933, 1934). He was the first to publish information on the Palaearctic elements of the Yemeni butterflies and named several new species and subspecies.

In 1937 a British Museum (Natural History) Expedition to SW Arabia had among its main objectives to collect in the highest parts of the Yemen mountains. The members were *H. Scott* and *D. S. Britton*, both professional entomologists. Although not butterfly specialists, this group was high on their list of priorities. As it happened, most of their collecting took place in the Aden protectorate while they were waiting for permis-

\* According to Defflers (1889) they visited Lohheya and Mor north of Hodeida in Yemen as well as several localities in the Asir. I have not been able to trace the authority for this statement, nor from where butterflies were procured.

sion to enter Yemen. In December 1936 permission was received, but once inside the country, they found their freedom of movement seriously circumscribed by petty minded provincial authorities. They were eventually forced to leave Yemen earlier than planned. Nonetheless, they did bring back one of the most comprehensive collections of Arabian butterflies, including many species new to Yemen and several new taxa. Gabriel (1954) published a comprehensive paper on the butterflies and took the opportunity of including most of the incidental and unpublished Arabian butterflies in the British Museum (Natural History). Little of this material was from Yemen.

Wiltshire (1952) published the butterflies collected by the Middle East Anti-Locust Unit in a comprehensive paper, but although members of the unit strayed into Yemen on occasion, little of the material was from there. However, together with the paper by Gabriel (1954), it is a cornerstone in our current knowledge of Arabian butterflies.

In 1974 and 1975 the then British Ambassador to Yemen, Mr. *D. C. Carden*, and his sons made a small collection which they kindly entrusted to me. Their most outstanding capture was a small series of *Papilio machaon rathjensi* Warnecke, the first to come to light since the types were destroyed during World War II.

Mr. *A. R. Pittaway* kindly showed me a small collection formed by Mr. *D. Robertson* and probably other small, incidental collections have been made. Despite attempts to trace them, including enquiries among long time residents of Sana'a, I have not been able to locate further material, except for a small, unlabelled collection in the Ministry of Agriculture which, however, contained nothing of special interest. I may have overlooked some unpublished material in the collections of the British Museum (Natural History), but the loss of information is necessarily slight, as I have checked fairly carefully in the case of more interesting species.

Holotypes and appropriate paratypes of taxa described in this paper have been donated to the British Museum (Natural History).

## Outline of Current Expedition

The current expedition was planned with a view to visiting the main ecological zones which could be identified in advance, but with a clear emphasis on the wettest parts of the Ibb province at levels between 1400 and 3000 m, as these had not been visited by earlier collectors. Two zones, only, were excluded. I considered that it would be unnecessary to visit the high mountains north of Sana'a as they resemble the Asir and would be most unlikely to contain species not found in the vicinity of Sana'a. The desert areas of the eastern parts of the country near Mareb might well contain some eremic species not found elsewhere in the country, but the total number of species was certain to be low. Both places would have demanded an investment of time disproportionate to any conceivable yield. During consultations in Sana'a there was general agreement that my proposed itinerary was sound, although John Wood insisted that I should visit one of the three steep mountains rising directly from the Tihama (Jabals Bura, Milhan and Raymah). Future collectors should pay more attention to this area than I was able to do.

On arrival in Sana'a I was pleased to find both accommodation, communications and practical aspects of collecting a good deal easier than I had expected. I met with nothing but kindness from the local population.

The map on page 11 shows my own itinerary as well as the collecting stations of Scott & Britton. The few localities quoted by Warnecke and not contained in the two other lists are also included. In the section on vegetation most of the collecting stations are referred to their relevant vegetation zone.

The results of my own collecting activity are

summarised in Table 1 and were well above my advance expectations which I had tried to quantify.

Table 1. Recapitulation of the known butterflies of Yemen and additions to the fauna made by T. B. Larsen in May 1980.

Family and subfamily	Known from Yemen before 1980	Discovered by Larsen, May 1980	TOTAL FOR YEMEN	Of which new to Arabia**
PAPILIONIDAE	2	—	2	—
PIERIDAE	21	8*	29	2
DANAINAE	1	—	1	—
CHARAXINAE	1	1	2	1
NYMPHALINAE	10	5	15	2
ACRAEINAE	3	2	5	1
SATYRINAE	3	1	4	—
LYCAENIDAE	23	10	33	5
HESPERIIDAE	11	4	15	—
TOTAL	75	31	106***	11

\* Including *Eurema brigitta* which had been taken by Robertson a few months earlier.

\*\* In addition to new records for Arabia, three species were taken as new to SW Arabia. *E. belemia* is known from eastern Arabia; *G. pumilio* and *C. antevippe* have been taken in Dhofar.

\*\*\* Larsen collected a total of 101 species. The five species not seen were: *A. encedon*, *C. anchises*, *S. mangana*, *S. mafa* and *S. doris*.

## Climate and Vegetation

As befits a country with mountains rising to more than 3500 m less than 50 km from the coastline, the ecological conditions of Yemen are varied. On the whole, the Arabian peninsula is very arid, but the ridge of mountains stretching from Jeddah to Aden form a partial exception to the rule. Little in the way of firm meteorological data exists for Yemen, but the data from 1975 – an extremely wet year – will still serve to highlight some of the characteristics (figs. 2 & 3). Generally speaking, there are two rainy seasons in Yemen, the first in April/May and the second, more important, in August. The exact timing may vary and the volume of precipitation differs considerably from year to year. The Tihama plain gets very little rain

in the best of years and the area from Sana'a northwards, east of the highest mountains receives only moderate quantities. However, the western slopes of the mountains may receive more rain than the average for most European countries; this is especially true for the steep mountain ranges rising closest to the sea. Local topographical conditions at middle heights may lead to patterns of rainfall well exceeding the average. When this is coupled with the presence of permanent streams, such as at Udain, the effect on flora and fauna is very pronounced. The high mountains above 2500 m receive what is very adequate rainfall by Arabian standards, especially on the western slopes. However, local topography in the area about Ibb in the southern part of the country, ensures that it receives more rain than any other part of Arabia. The total at Ibb for 1975 was an astounding 2205 mm, and it seems likely that the average could well be in the range of 1000 mm+. There is little doubt that the rainfall received by the steep coastal mountains (Jabal Bura, Jabal Raymah and Jabal Milhan) and by the Ibb area surpasses any part of the Saudi Arabian Asir mountains where the averages are less than 600 mm (Yemen Arab Republic 1976).

The second aspect of particular interest is that of temperatures which vary considerably with altitude and with the extent to which a locality is sheltered from the sea. The Tihama plain (as exemplified by Zabid in fig 2) is very hot with average temperatures varying from 25 to 30° C, with relatively little variation between daily maxima and minima. The pattern continues up the mountains of the coast, though average temperatures decline. The highest mountains and the highlands east of the first range mountains have much lower temperatures ranging from about 15 to 20° C, with much greater daily fluctuation. In the winter months frost is not unusual. The relict Palaearctic flora and fauna is almost wholly restricted to areas which have at least occasional frost; where this is not the case, the pattern is more reminiscent of tropical montane.

*Collecting localities quoted in systematic part. Numbering refers to facing map.*

### Torben Larsen

#### Localities in Yemen 1980

- 1 Sana'a town, 2300 m, 5.v. 1980
- 2 Wadi Dahr, 2200 m, 5.v. 1980
- 3 Hizyaz, 2100 m, 6.v. 1980
- 4 Mafhaq, 8.v. 1980, 1600 m
- 5 Jabal Dawran, 2500–2800 m, 9.v. 1980
- 6 Wadi Dahr, 10.v. 1980
- 7 Sana'a Town, 2000 m, 11.v. 1980
- 8 Suq al Khamis, 2900 m, 11.v. 1980
- 9 Khamis Bani Saad, 500 m, 11.v. 1980
- 10 Rima Tihama, 300 m, 12.v. 1980
- 11 Hodeida, 300 m, 11.v. 1980
- 12 Wadi Rima (Ghawadir), 400 m, 12.v. 1980
- 13 Wadi Rima (Mishrafa), 500 m, 13.v. 1980
- 14 Jabal Sabr, 2600 m, 14.v. 1980
- 15 Wadi Dhabab, Taizz, 1400 m, 15.v. 1980
- 16 Ibb, 2000 m, 15/22.v. 1980
- 17 Shamahi, Jabal Bada'an, 2500 m, 16.v. 1980
- 18 Udayin, Wadi Dur, 1500 m, 17.v. 1980
- 19 Naqil Sumara, 2800 m, 18.v. 1980
- 20 Dalil, J. Sumara, 1700 m, 18.v. 1980
- 21 as 17, 19.v. 1980, but 2900 m
- 22 as 17, 20.v. 1980
- 23 as 18, 21.v. 1980
- 24 Udayin, Wadi Annah, 1400 m, 22.v. 1980
- 25 30 km S of Ibb, 1700 m, 23.v. 1980
- 26 Wadi Sughna, 1400 m, 25.v. 1980
- 27 Jabal Bura', Suq as Sabt, 900 m, 28.v. 1980
- 28 Ubal, 500 m, 29.v. 1980
- 29 30 km E of Ubal, 600 m, 29.v. 1980
- 30 Medina el Abid, 1600 m, 29.v. 1980
- 31 Bajil, 400 m, 29.v. 1980
- 32 Shibam, Wadi al Ahjar, 2800 m, 30.v. 1980
- 33 Suq al Khamis, 2900 m, 31.v. 1980
- 34 Mafhaq, 1500 m, 31.v. 1980
- 35 Beni Mansour, 1500 m, 1.vi. 1980
- 36 Hodeida – Sana'a Rd, 2700 m, 1.vi. 1980

### Collecting Localities of Scott and Britton (Scott & Britton)

- A Taizz, 1400 m, 10/29.xii.1937
- B Jabal Sabr, 1400 m, 15.xii.1937
- C Wadi Sabr, 2000 m, 19.xii.1937
- D Wadi Thabad, 1700 m, 25.xii.1937
- E Usaifira, 1400 m, 13, 14, 22.xii.1937
- F Kaa-al-Hagle, 2800 m, 3.i.1938
- G Sana'a, 2200 m, 5/7.i.1938
- H Hada, 2400 m, 14.i.1938
- I Beit Baus, 2100 m, 28.i.1938
- J Asr, 200 m, 1, 14, 27, 28.ii.1938
- K Wadi Dahr, 2400 m, 21.i and 5.ii.1938
- L al Azraqain, 2400 m, 31.i.1938
- M Jabal Kohl, 3000 m, 1.ii.1938
- N al Errein, 2900 m, 2.ii.1938
- O Kaulat el Asakeir, 2900 m, 4.ii.1938
- P Ghaiman, 2600 m, 16/18.ii.1938
- Q Jabal Masnah, 2600 m, 9.iii.1938
- R Hammam Ali, 1800 m, 10.iii.1938
- S Medina el Abid, 1200 m, 10.iii.1938
- T Ghailama (Wadi), 700 m, 11.iii.1938
- U Wadi Siham (near Ubal), 600 m, 11.iii.1938
- V Hodeida, sea level, 14.iii.1938.

### Additional localities of Rathjens and von Wissmann

- I Bajil, 400 m.
- II Hajeila, 600 m.
- III Wadi Brar, 600–1500 m.
- IV Usil, 1800 m.
- V Aedjz, 1400 m.

It is not easy to establish a clear cut pattern of vegetational zonation in Yemen. The interaction between rainfall, temperature, the abruptly rising mountains, the rain-shadows, local topographical peculiarities and differences in soils combine to form a mosaic rather than a series of parallel

bands. In addition the basic data needed for a full ecological interpretation are still largely missing. The following sections therefore represent my own observations, placed in perspective by published data and by discussions with John Wood, probably the field naturalist with the best perso-

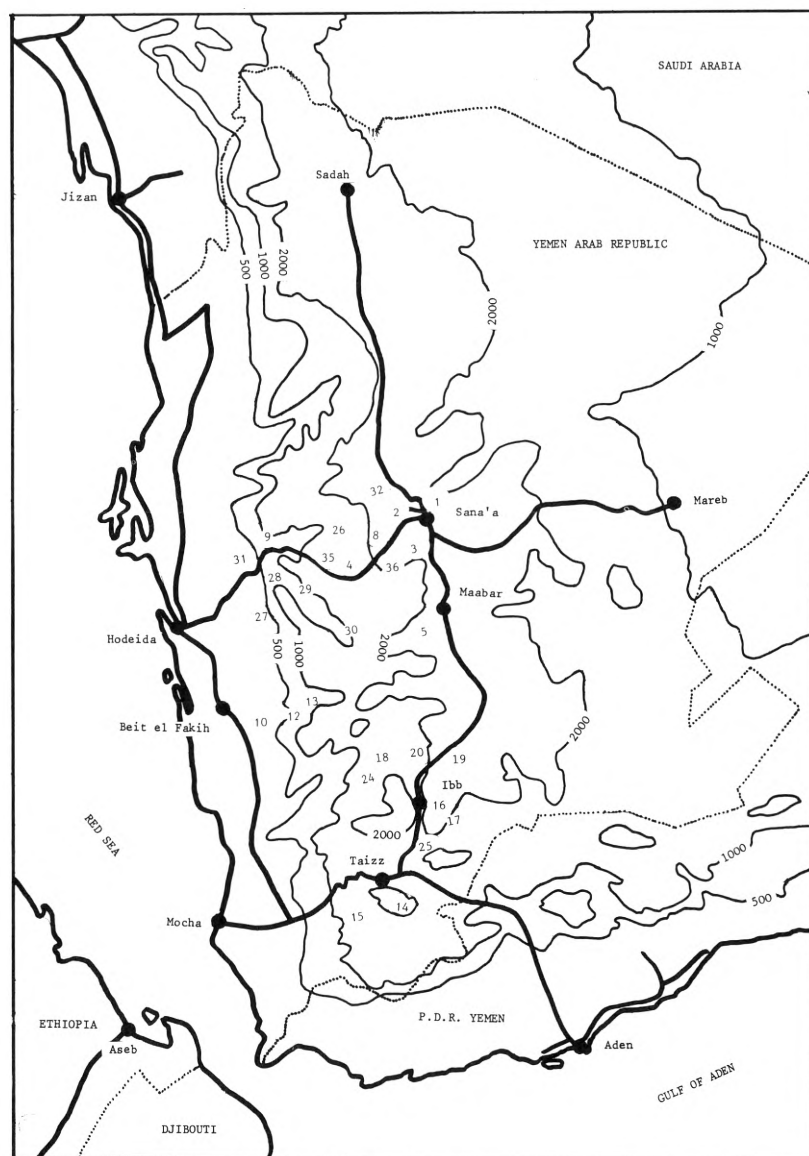


Fig 1. Map of Yemen showing collecting localities for butterflies (see text on facing page).

nal knowledge of the country. However, the observations are at least a useful guide for future collecting and may even provide an approximation of the true situation.

While the flora of Yemen is well known in terms of its species, little or nothing has been published

on its structure, plant communities or zonation. Zohary (1973) classifies it in his Eritreo-Arabian sub-region of the Sudanian zone, a classification which is fully acceptable, and defines the following broad vegetational zones:

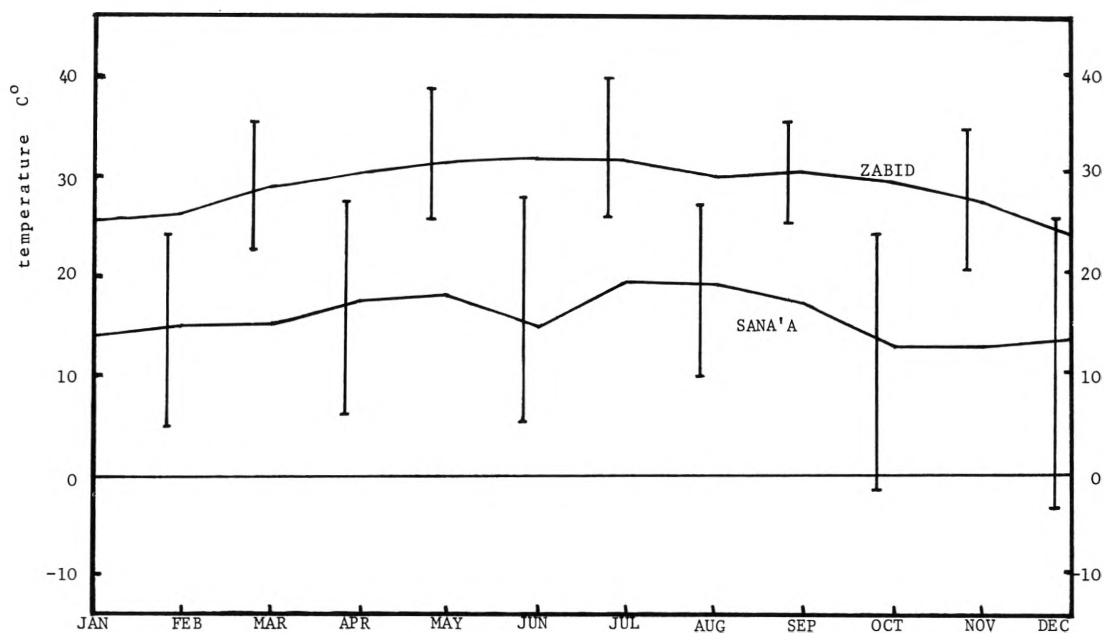


Fig. 2. Average monthly temperatures in Zabid, Tihama and at Sana'a, 2400 m during 1975. Minima and maxima shown for every second month by a vertical bar (Yemen Arab Republic 1976).

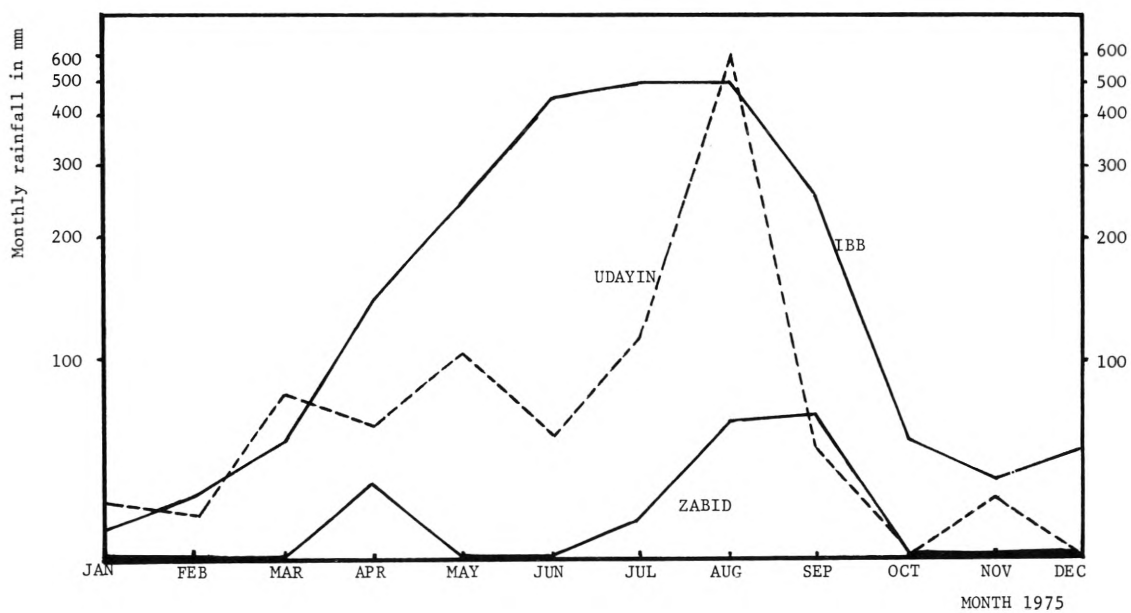


Fig. 3 Rainfall in three selected localities of Yemen in 1975. Zabid, on the Tihama (annual total 143 mm); Udayin, 1500 m (annual total 1107 mm); and Ibb, 2000 m (annual total 2205 mm). The year 1975 was exceptionally wet (Yemen Arab Republic 1976).

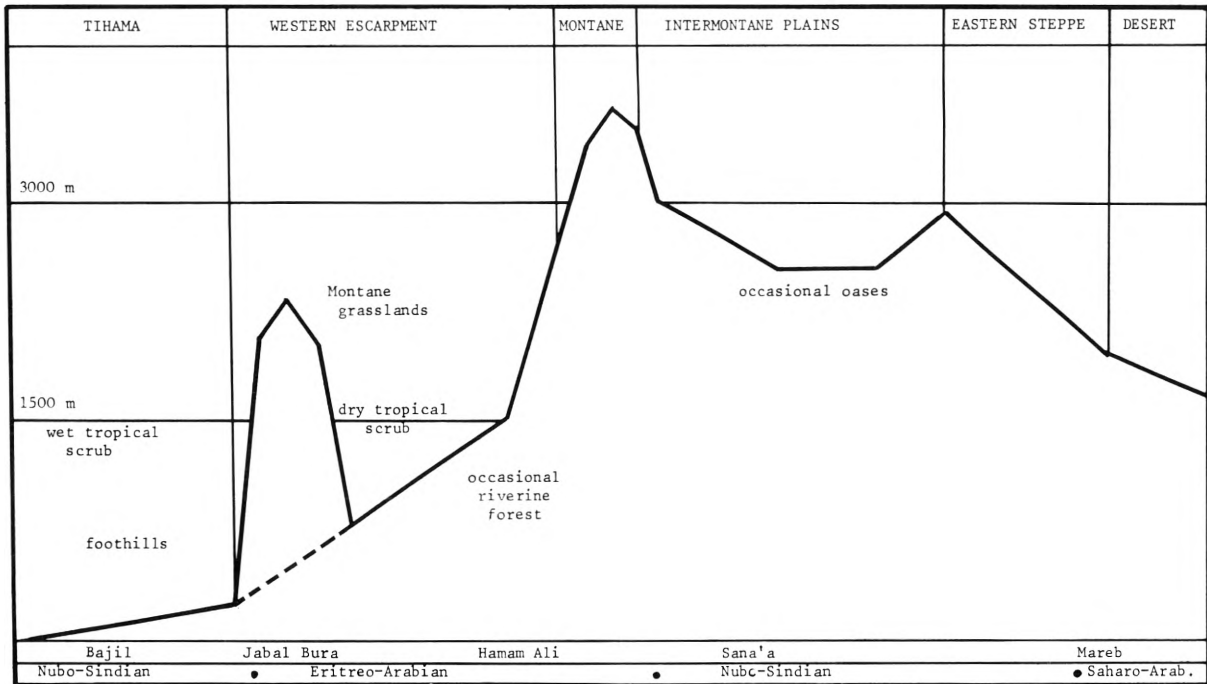


Fig. 4 and Table 2. Main Vegetational zones in Yemen.

1. *Maerua-Acacia* orchard on the Tihama (0–500 m).
2. *Acacia-Commiphora* scrub (500–1500 m, with *Commiphora* especially a lower levels).
3. Evergreen forest or scrub (1500–2000 m).
4. Montane forest (2000–3000 m), with *Juniperus* in the Asir.
5. Afro-Alpine low vegetation (2500–3000 m +).

This description is correct in a very broad sense, except that *Maerua-Acacia* orchard is not characteristic of the Tihama, but it obscures the segmentation of the main escarpment of Yemen where some butterfly species clearly follow vegetational subdivisions. The very brief illustrated transect shown by Wissmann (1941), and to which Zohary refers, is actually more detailed and in accord with what follows. However, neither Zohary nor Wissmann could have identified the crucial north-south distinction at higher altitudes because of lack of data at the time.

1.	<i>The Tihama Plain</i>	0–500 m
2.	<i>The Western Escarpment</i>	400–2700 m
	I <i>Low Division</i>	400–1800 m
	a: Foothills	400–700 m
	b: Dry tropical scrub	600–1800 m
	c: Wet tropical scrub	700–1800 m
	d: Riverine forest	500–1700 m
	e: Euphorbia scrub	1200–1800 m (Taizz area)
	II <i>High Division</i>	
	a: Qat country	1800–2700
	b: Montane grassland	1200–2700 m
3.	<i>Montane Zone</i>	
	a: Northern montane	2700–3600 m
	b: Southern montane	2700–3200 m
4.	<i>Intermontane Plains</i>	
5.	<i>Eastern Steppe</i>	
6.	<i>Eastern Desert</i>	

The following section therefore aims at summarising the major vegetational sub-divisions in Yemen, especially insofar as they are useful in analysing butterfly distribution and comparisons with the butterfly faunae on the western side of

the Red Sea. It must be stressed that some subdivisions which do not appear important for butterflies have been omitted and that there is an unusually wide degree of overlap in relation to altitudes because of the fractured nature of the topography and the microclimatic factors. In this respect, too, there are similarities with Ethiopia.

### 1. *The Tihama Plain* (0–500 m)

Between the foothills of the main mountain range and the sea lies a gently sloping alluvial plain, bisected by river valleys which often do not reach the sea. It is known as the Tihama and stretches northwards to about Jeddah in Saudi Arabia. The width is usually 20 to 30 km. Near the coast the vegetation is dominated by large stretches of *Sal-sola* and *Suada* which is nearly devoid of butterflies. *Capparis decidua* (= *aphylla* auct.) grows locally and is the food plant of *Colotis ephyia* Klug and *Calopieris eulimene* Klug, both of which are limited to the Tihama. Scattered stands of *Salvadora persica* attract *Colotis phisadia* Godart and *C. calais* Fabricius. Stands of *Acacia tortilis* ensure the presence of the more hardy *Acacia*-feeding members of the Lycaenidae. *Cadaba decidua* and *C. rotundifolia* (? indicator of drainage salination) permit many of the common *Colotis*-species to survive on the Tihama proper. The *Maerua-Acacia* orchard which Vesey-Fitzgerald considered prominent in the Asir Tihama is not much in evidence though it could be a good butterfly habitat where it exists. The best time for insects in the Tihama is from October to February. On the Tihama the rains of the high mountains are mainly reflected in the form of flash floods. The flora and fauna have clear affinities to that part of the African Sahel stretching from Lake Chad to Port Sudan and the Ahwash. This area contains a limited but interesting number of endemic butterflies such as *Colotis pleione* Klug, *C. ephyia* Klug, *C. protomedia* Klug and *Calopieris eulimene* Klug all of which in Arabia are more or less limited to the Tihama and the immediate foothills. Some of the Tihama-like ve-

getation penetrates the larger river valleys such as the Wadi Siham, but of my collecting stations only the Rima Tihama and Hodeida are typical of the zone.

### 2. *The Western Escarpment* (400–2700 m)

#### I *Low Division*

##### a: *Foothills* (400–700 m)

The foothills share many of the characteristics of the dry tropical scrub zone of slightly higher elevations, but it has a number of special plants and is rather more diverse than most of the localities of the dry scrub zone. *Boscia angustifolia* – and hence *Colotis eris contractus* Gabriel – is effectively limited to the foothills, which in many respects resemble the rain-shadow zone of the Dhofar escarpment. Sahelian species of butterflies abound and so far the almost unknown *Colotis ungemachi* le Cerf is only known from the foothills. I collected at Ghawadir, Mishrafa and Khamis bani Saad and found all the localities surprisingly rich in species.

##### b: *Dry tropical scrub* (600–1800 m)

This zone comprises the middle parts of the western escarpment which lies in the rain-shadow of the first range of steep mountains (Jabal Milhan, Jabal Bura, Jabal Raymah) as well as the eastern parts of those mountains themselves. Gently sloping western slopes in the northern parts of the country should also be included.

There are numerous different plant associations in this zone, but characteristic plants in general are *Adenia obesum*, *Zizyphus spinachristi*, *Anisotes* sp., *Grewia* sp., *Cissus quadrangularis*, *Jatropha spinosa*, *Hibiscus deflersii*, *Acacia asak* and *A. mellifera*. *Acacia tortilis*, so common on the Tihama, is virtually missing. Among the localities for butterflies, Mafhaq and Beni Mansour are the most characteristic for this zone, as well as several of Rathjens and Wissmann's collecting places near Manakha. The butterfly fauna is essentially Sahelian in character, but many tropical species which cannot survive on the Tihama occur while some of the pure Sahelian specialists do not penetrate



at all (e.g. *Colotis ephyia* Klug and *Calopieris eulimene* Klug). Most of the typical lowland butterflies of Afro-Tropical origin may be found in the dry zone, though they are sometimes local, but some are only found in the wetter parts of the zone where there is riverine forest. A few eremic elements are also present. The upper limit of the zone is clearly delimited through the absence of *Cadaba* and *Maerua* which leads to an abrupt near disappearance of the *Colotis* group.

c: Wet tropical scrub (700–1800 m)

Where there is no rain-shadow and in the generally wetter southern parts of Yemen rainfall is higher and supports a richer flora. Few of the species from the dry zone are missing, but they are less dominant, and many additional species appear, including *Combretum* which is the food plant of some Afro-Tropical species which are rare or absent in the drier parts (e.g. the two *Hypolycaena* and *Hamanumida daedalus* Fabricius). This is typical coffee country and it is strongly transformed by man who has cultivated it since time immemorial, often with the assistance of painstaking terracing. The areas surrounding riverine forest at Wadi Dur, Wadi Annah and to a lesser extent Wadi Sughna fall in this category.

d: Riverine forest (600–1700 m)

An interesting, and entomologically important, feature of some of the river valleys, especially in the wet tropical scrub, is riverine forest. At low levels, such as at Suq as Sabt, where the riverine forest extends up the mountain side, it forms an *Acacia/Combretum* forest almost unique in Arabia. In the river valley itself *Ficus glumosa*, *Celtis integrifolia* and *Phoenix* spp. are characteristic. So far *Charaxes bernstorffi* n. sp. is only known from Suq as Sabt. Riverine forests higher up (Wadi Dhabab, Wadi Annah, Wadi Dur and Wadi Sughna) are strongly transformed by man and have largely been turned into coffee plantations. However, many trees have been allowed to survive as shade trees, and some of these such as *Ficus* spp. grow to

enormous size. An impoverished version of the original vegetation usually borders the plantations, containing species such as *Syzigium guineense*, *Lannea fruticosa* and *Ehretia* sp. So far *Neptis serena annah* ssp. nov. is known only from this type of environment, while *Phalanta phalantha* Fabricius, *Cupidopsis iobates* Hopffer and *Gegenes hottentota* Latreille are other characteristic species of butterflies. Although not tied to riverine forest many other tropical species abound in and around the limited stretches where it is well developed and riverine forest is one of the best collecting habitats in the country. More than 30 species can easily be collected in a day.

e: Euphorbia scrub (1200–1800 m)

Especially in the area around Taizz there is a visually very noticeable association with *Euphorbia cactus*, *E. inarticulata* and *E. schimperi* as dominants. The general ecological conditions would appear to be quite suitable for the normal dry tropical scrub, but in fact *Acacia*, *Commiphora* and *Grewia* are almost missing. In consequence the butterfly fauna is poorer, but it would not surprise me if one or two interesting, so far unrecorded, species occurred there (e.g. *Desmolycaena arabica* Riley).

## II High Division

a: Qat country (1800–2700 m)

This zone covers the west-facing higher mountains throughout Yemen and has been heavily modified by man. Much of it is terraced and trees have been felled for millenia. It is probably true to say that the climax vegetation nowhere remains intact and even that its exact composition cannot be reconstructed. However, there were probably quite extensive woodlands since *Olea africana* is found together with other plants with which it forms forest associations elsewhere. *Acacia negrii*, *Rosa abyssinica* and the yellow-flowered *Buddleia polystachya* are characteristic larger plants – the latter unfortunately does not attract masses of butterflies like its blue flowered garden varieties.

The ground flora is rich and varied. Among the butterflies *Precis limnoria* Klug, *Lepidochrysops arabicus* Gabriel and *L. forsskali* sp. n. are linked to this zone. Many other tropical species occur, some of which are found in riverine forest and the higher zones, but not in the tropical scrub zones (e.g. *Cacyreus virilis* Aurivillius). The localities of Dalil, Ibb, 30 km S of Ibb, Jabal Sabr, Wadi Thabad, Usaifira, Taizz, Shibam, etc fall in this zone.

b: Montane grassland (2700–1200 m)

In some localities within the escarpment zone, typically on the Jabal Bura, areas of undulating grassland may be found. I was unable to visit them. They are composed of grasses as well as heather (*Erica arborea*), and species of *Helichrysum*. As in Dhofar and parts of eastern Africa man has probably played a part in their development; otherwise the wide altitudinal span is difficult to explain. In eastern Africa montane grassland has a limited, but often characteristic, butterfly fauna of a more or less montane character and the zone deserves a visit by future collectors.

3. *The Montane Zone* (2700–3600 m)

a: Northern montane (2700–3600 m)

The northern montane zone differs from the southern in two main respects, namely the fact that it normally has frost and its lower average annual precipitation. The lower precipitation is probably more topographically than meteorologically determined. The visual aspect is mostly that of a dry, stony steppe with trees and larger shrubs limited to the edges of water courses. The flora is quite rich, however, and many of the low plants are endemic or characteristic. Species of *Dianthus*, *Thymus*, *Cichorium* and *Delosperma* may be mentioned. In this part of the country there is virtually no penetration of Afro-Tropical butterflies, the main exception being the endemic *Euchrysops philbyi* whose closest relatives are found in Afro-montane habitats in East Africa. The dominant butterflies in this zone are the Palearctic species, all of which may be found in good localities. It would

be true to say that the plants show a much greater Afro-montane/endemic character than is the case with butterflies. Suq al Khamis and the top of Jabal Dawran are typical exponents of this zone.

b: Southern montane (2700–3200 m)

In the southern mountains, south of the Jabal Sumara, the mountains are usually frost free and the visual aspects of the vegetation is more typically Afro-montane. It is more prominent, grows taller and is more profuse. The contrast with the steppe like character of the northern zone is quite astounding, especially considering that there are still no trees. In favoured localities whole mountainsides may be covered in dense meadows of *Hypericum* and grass, giving it an almost alpine look. *Alchemis*, *Senecio sumarae*, *Arabis alpinum* and *Thalictum* sp. are other character plants. Visually the presence of *Ferula communis* (the common Mediterranean variety) is strongly felt and there are other Mediterranean species in the southern montane zone which are found no further north, possibly because of the absence of frost in the south. All the truly Palearctic butterflies probably occur in the south, though *Euchloe belemia* Cramer has not yet been recorded. But contrary to what happens in the northern montane zone there is a significant penetration of tropical species and, although *Cacyreus niebuhri* sp. n. was collected at the lowest levels, it should probably be considered a southern montane endemic. The highest parts of the Jabal Bada'an and Jabal Sabr are typical localities of this zone which is deserving of further research.

4. *Intermontane Plains* (3600–2200–3000 m)

North of the Jabal Sumara and east of the main mountain range, including its eastern flanks, the visual aspect of the vegetation is rather like that of the northern montane zone, but on closer examination it proves to be rich plants not found elsewhere, including a significant endemic element. Among typical plants are *Lavendula pubescens*, *Psiadia arabica*, *Euriops* sp., *Aloe tomentosa* and *Ephedra*

*intermedia* all of which grow on the slopes of the adjacent mountains. The plains proper have an admixture of prominent trees, especially *Acacia negrii*, *A. pachyceras* and *Zizyphus*. *Alkanna orientale* and *Diplotaxis erucoides* are typical low plants. The butterfly fauna is poor, consisting mainly of Palaearctic species, which reach much lower levels in the intermontane plains than they do on the western escarpment, and of the hardiest of the tropical species which can survive occasional frost, but whose food plants are not available in the northern montane zone. This mixture leads to curious sights such as *Lycaena phlaeas shima* Gabriel and *Axiocerces harpax kadugli* Talbot flying together, or of *Gomalia elma* Trimen and *Carcharodus alceae* Esper sunning themselves side by side in the same little glade. Hazyaz, Sana'a, Shibam and many of Scott & Britton's localities are in this zone, which is certainly of more interest from the botanical point of view than for its butterflies. Some of the oasis localities such as Wadi Dahr contain tropical species which could not survive in the intermontane plains proper.

##### 5. Eastern Steppe

East of the mountains bordering the intermontane plains a vast area of steppe and pseudo-savanna extends, mainly comprised of sparse growth of common tropical trees such as *Maerua crassifolia*, *Acacia mutica*, *Euphorbia adenensis* and *Moretia parviflora* as well many other common and widespread sub-desertic species. It merges gradually with the desert proper, so in parts there is a mixture of Sudanian and Saharo-Arabian vegetation (sensu Zohary 1973). The butterfly fauna is almost certainly poor, consisting of a mixture of hardy tropical (mostly pan-tropical) and eremic species.

##### 6. Eastern Desert

The true eastern desert is immediately distinguished from the eastern steppe by the complete absence of trees, which give way to stands of *Salvadora persica*, *Calligonum comosum* and *Tribulus* sp. These are typical of the Arabian desert as a whole.

The zone has not been studied from an entomological point of view, but the butterfly fauna is almost certain to be very poor. *Colotis phisadia* Godart follows its food plant *Salvadora* everywhere, *Pontia glauconome* Klug will be present, and there are probably scattered colonies of the two *Apharitis* species. Transient populations of migrant species occur when conditions are particularly favourable.

### General Observations

There are two main seasons for butterflies in Yemen. The general opinion is that late September through October is the best time of the year, following the autumn rains which are normally both heavier and more reliable than the spring rains. For a number of personal reasons I chose the month of May, which in years of good rain was expected to be almost as good. The months from January to March 1980 were very dry in most of Yemen and Dr C. Naumann who spent 14 days of March collecting *Zygaena (Reissita) simonyi* near Maba'ar hardly caught any species of *Rhopalocera*. There was, however, plentiful rain in April and when I arrived the flora was well developed in many places and on the foothills and in the southern parts of the country conditions were about as perfect as one could wish for in a country where the flora is adapted to erratic variations in rainfall. It appears that I was exceptionally fortunate since the spring rains in the years 1976 to 1979 had been particularly poor.

Generally speaking, butterflies were plentiful, both in terms of species and numbers of individuals, though in some localities the fauna was restricted. My first experiences were in the oases around Sana'a, especially Wadi Dahr. The somewhat mixed fauna of Wadi Dahr was out in force, but the number of species was low; I caught 10 species on my first visit, 11 on my second, for a total of about 14. But some species such as *Mylothris arabicus* and *Lasiommata felix* were very numerous. In the montane zone (such as on Jabal Daw-

ran or at Suq al Khamis) numbers of specimens were less and only dozen or so species, chiefly Palaearctic, would be captured during a day's collecting.

However, in the tropical zones the pattern changed. During a single day's collecting at Mishrafa in the foothills of the tropical savanna zone, no less than 37 species were noted – I have rarely caught that many in a single day elsewhere in the Middle East. Similar totals could be noted in the wet riverine forest biotopes of Wadi Dur and Wadi Annah. The same was true of Suq as Sabt at the foot of Jabal Bura, where 36 species were caught during one morning of collecting; had more time been available I am sure the total would have surpassed 40.

The high mountain above Ibb (Jabal Bada'an) was investigated twice at 2400–2500 m and once at 2900 m. In both cases about 15 species were noted during a day's collecting, several of them of great interest. I had been particularly interested to see the highest parts of the Jabal Sumara north of Ibb since they seemed the most likely place to find additional Palaearctic species, but they proved a disappointment. Only 4 species were seen on a perfect day. The tropical scrub zone lower down the same mountain produced 21 species in a couple of hours.

The figures quoted above should be seen in conjunction with experience elsewhere in Arabia. Thus in eastern Saudi Arabia there are less than 30 species and it would be impossible to collect all of these in any one season. I caught slightly under 20 species during ten days of intensive collecting during the best season in the Musandam.

I saw little evidence of migration, though I did catch *Colotis evippe* at Shibam in a locality far from any breeding localities. The tropical species in the steppe zones east of the main mountains are almost certainly reinforced by migration. Records of *Catopsilia florella*, *Anaphaeis aurota* and *Colotis evagore* from Sana'a must be linked to migration.

It is a well known phenomenon among butterflies that males climb upwards to circle round

hilltops probably competing for lesser number of females which are never in evidence on the hilltops as they are almost immediately courted and the couple departs. I have little personal field experience with this type of behaviour (Larsen 1976b) but found the phenomenon more frequent in Yemen. I spent three mornings on prominent hilltops on three mountains with the following results:

Table 3. Hilltopping butterflies on three mountains in Yemen.

Species	Jabal Dawran 2700 m	Jabal Sabr 2700 m	Jabal Bada'an 2900 m
<i>Papilio machaon</i>	–	×	×
<i>Papilio demodocus</i>	×	–	×
<i>Euchloe belemia</i>	×	–	–
<i>Precis limnoria</i>	–	×	×
<i>Pseudotergumia tewfiki</i>	×	–	–
<i>Myrina silenus</i>	×	–	×
<i>Lycaena phlaeas</i>	×	×	×
<i>Anthene butleri</i>	×	–	×
<i>Lampides boeticus</i>	×	–	×
<i>Lepidochrysops arabicus</i>	×	×	?×

All these species were hilltopping in the true sense of the word, that is they were removed from breeding territories. *Papilio demodocus* and *Myrina silenus* were almost certainly at least 500 m above permanent breeding sites. The persistence of some of the hilltopping specimens is remarkable; I saw my first specimen of *Papilio machaon* on Jabal Sabr hilltopping wildly in a strong wind around a rocky outcrop which was difficult of access and movement. I caught the specimen in my thirteenth try; the previous twelve near misses had not scared it away except for brief periods. On the same hilltop I observed one specimen of *Precis limnoria* for more than three hours.

In parts of the tropics large agglomerations of butterflies may be seen at damp patches, especially during the dry season. Only some species – from all families – are involved. I do not recollect having seen an analysis of which species do and

which do not. I have also found it nearly impossible to predict when this type of behaviour can be observed. In both Dhofar and the Musandam very few were seen at water, although I visited many places which were suitable. In Yemen, many species came to water, though never in masses. The following species were observed drinking. *Papilio demodocus* (many), *Belenois creona* (many), *Mylothris arabicus*, *Eurema hecabe* (usually in shady places), *Precis limnoria*, *Hamanumida dae-*

*dalus*, *Acraea doubledayi* (one battered female), *Anthene amarah*, *Anthene butleri*, *Tarucus theophrastus*, *Syntarucus jeanneli*, *Cacyreus virilis*, *Azonus jesous* (many), *Azonus moriqua*, *Cupidopsis iobates*, *Euchrysops osiris* (many), *Pelopidas thrax* and *Pelopidas mathias*. *Papilio demodocus* excreted liquid to assist the drinking process, presumably to release more of the salts which appear to be as – if not more – important than getting moisture.

## Systematic Part

### PAPILIONIDAE

#### Papilioninae

*PAPILIO MACHAON RATHJENSI* Warnecke  
1932

*Int. ent. Z.*, 25:473.

Jabal Sabr, Jabal Bada'an, Hodeida/Sana'a Rd.  
*Rathjens* & *Wissmann*: near Sana'a, *Carden*: Taizz.

#### Plate 1

This interesting subspecies of the common European swallowtail butterfly was first captured in and around Sana'a by Rathjens and von Wissmann, who found it relatively common, but it was not noted by the Scott & Britton expedition. The type series was destroyed during the Second World War and no further specimens were found till Carden secured a pair near Taizz, which he gave to me. Dissection of the male specimen showed that the genitalia matched those of the Saharan subspecies, the characteristic ssp. *saharae* Oberthür, supporting Eller's original contention (Eller 1936, 1939). I have recently reviewed the interesting situation in respect of the three Arabian populations of *machaon* (Larsen 1981). Ssp. *rathjensi* is endemic to Yemen and has not been found in Asir, though it could occur there. In Yemen it appears to be restricted to the high mountains above 2500 m or so and only on the Jabal Bada'an did I see it in quantity. Most of the specimens I saw were found hilltopping with other species well away from their natural habitat. Despite much searching on likely food plants I found no larvae; this was most unfortunate since the larva of ssp. *saharae* is known to differ in colour from all other populations of *machaon*

(Clarke & Sheppard 1956). In the two southern localities *Ferula communis* (Umbelliferae) is a likely food plant but they could also live on scattered patches of introduced *Ruta* (Rutaceae). In the drier north there is no *Ferula*; here *Pimpinella calcalis* (Umbelliferae) is a possibility. Cultivated *Foeniculum vulgare* (Umbelliferae) is common near human habitation, but cannot be a primary food plant, though it is a favourite in the Mediterranean area. There are no differences in behaviour between the Yemeni and European *machaon* (but it is somewhat startling to see it flying together with *Papilio demodocus* Esper!). Saitoh (pers. Comm.) determined that the chromosome number of a specimen from Jabal Sabr was  $n=30$ .

*PAPILIO DEMODOCUS DEMODOCUS* Esper  
1798

*Ausl. Schmelt.*: 205.

Mafhaq, Jabal Dawran, Wadi Dahr, Jabal Sabr, Ibb, Jabal Bada'an, Wadi Dur, Wadi Annah, Maba'ar, 30 km. S. of Ibb, Wadi Sughna, Suq as Sabt, Medina el Abid, Beni Mansour.

*Rathjens* & *Wissmann*: Sana'a. *Scott* & *Britton*: Usaifira, Wadi Thabad, Wadi Dahr. *Carden*: S. of Taizz.

This is a common butterfly in most parts of Yemen. I have seen it hilltopping as high as 3000 m and ovipositing as high as 2500 m. There are no records from the Tihama proper, but given its migratory capacity it should be found there, at least from time to time. In most parts of Africa *demodocus* now feeds chiefly on cultivated *Citrus* (Rutaceae) and has become a synanthropic spe-

cies, characteristic of disturbed habitats. In Yemen it is often found in natural habitats where it feeds on *Teclea nobilis* (Rutaceae) on which I found eggs at Wadi Dur and Wadi Sughna. I did also see a female ovipositing on introduced *Ruta graveolans* (Rutaceae) in a garden on the Jabal Sabr. In Dhofar I found masses of larvae on *Haplophyllum tuberculatum* (Rutaceae) (Larsen 1980), but this plant is remarkably scarce in Yemen. At Wadi Dur dozens of *demodocus* visited damp patches in the river bed; contrary to many swallowtails which hover while drinking, they settled with wings folded over the back and the legs fully stretched, the abdomen hanging almost vertically down. At Suq as Sabt I found a male specimen whose proboscis had been trapped in the flower of *Kahania laniflora* (Asclepiadaceae); despite powerful fluttering of the wings the butterfly was unable to escape.

## PIERIDAE

### Pierinae

*MYLOTHRIS ARABICUS* Gabriel 1954  
*BMNH exp. SW Arabia*, 1: 364.

Wadi Dahr, Wadi Dur, Wadi Annah.

*Scott & Britton*: Wadi Dahr (Type locality). *Robertson*: Shibam.

Until recently this tropical butterfly was only known from the four males and three females constituting the type series. In February 1980 Robertson caught two males at Shibam, and in April 1980 Guichard caught a single female at Abha, in the Asir mountains of Saudi Arabia. Both localities are ecologically similar to the type locality. I found it extremely common in the type locality, but I also took a few in the coffee plantations at Wadi Dur and Wadi Annah, a very different environment. Gabriel placed the species next to the East African *M. agathina* Cramer from which in the male sex it is mainly distinguished by the reduced amount of orange in the UNFW cell.

The female of *arabicus* is almost indistinguishable from the male while that of *agathina* has a pinkish-orange ground colour. The male genitalia of the two species are very close and given their allopatry it is probably a matter of taste whether one considers the two to be subspecies of the same species or distinct. Since the degree of external and genitalic differentiation between many sympatric species of *Mylothris* is very slight, I retain *arabicus* at the specific level. The butterflies usually flew in the darkest parts of the plantations and at Wadi Dahr literally hundreds might be seen flying inside dense plantations of qat (*Catha edulis*) or of pomegranate (*Punica granatum*). Sometimes whole chains of up to a dozen males could be seen chasing an eligible female; seated females displaying interest in copulation might be courted by up to six males. In the early afternoon the butterflies started to congregate in large numbers in suitable shady roosting places. The food plant is *Loranthus schimperi* (Loranthaceae) which was very common. The eggs are laid in batches of 20 to 30, on a young leaf, evenly spaced within a circle of 10–15 mm. I found eggs on *Loranthus* growing on almond, pear, willow, pomegranate, *Capparis cartilaginea* and *Tamarix*, but not on those growing on qat. The adult butterflies were attracted to flowers, especially to a small field of alfalfa (*Medicago sativa*).

*PONTIA DAPLIDICE DAPLIDICE* Linné 1758  
*Syst. Nat.*, ed X: 468.

Wadi Dahr, Hizyaz, Sana'a, Suq al Khamis, Jabal Bada'an, Shibam.

*Rathjens & Wissmann*: Sana'a, *Scott & Britton*: Ghaiman, Asr, Hada, Sana'a, Wadi Dahr, al Errein, Beit Baus. *Carden*: Suq al Khamis.

This butterfly is widely distributed in the Palearctic, but in the subdesert regions it is replaced by *P. glauconome*. Outside of the western Arabian mountain range, the only known Arabian specimen is a single female which I caught in the

mountains near Rostaq in Oman (Larsen & Larsen 1980); given the great migratory potential of the species, I am surprised that it has not been found elsewhere in Arabia. There is a population of *daplidice* also in the high mountains of Ethiopia and Somalia which was named ssp. *aethiops* by Joannis & Verity (1912); it was described as a “jolic race, bien caractérisée”. I have examined long series of *aethiops* in the collections of the British Museum (Natural History) without finding significant differences to nominate *daplidice*. Gabriel (1954) included Arabian material of *daplidice* in *aethiops*. This I cannot accept since there is no difference at all between series from Jordan and Lebanon and the variable series from Arabia. Commenting on Rathjens and Wissmann’s material, the first to receive scientific attention, Warnecke specifically commented: “es handelt sich um typische *daplidice*”, a view with which I fully agree, especially taking into account the significant variation within all populations of the species. I found it fairly common above 2500 m, sometimes slightly lower, usually in the vicinity of cultivation. I saw a female ovipositing on *Caylusia hexagyna* (Resedaceae), a genus of plant on which it has been recorded elsewhere. Adult butterflies came in large numbers to alfalfa (*Medicago sativa*).

*PONTIA GLAUCONOME GLAUCONOME* Klug 1829

*Sym. Phys.*, text pl. 7, figs 18–19.

Hizyaz, Wadi Sughna, 30 km. E of Ubal, Beni Mansour.

*Rathjens & Wissmann*: Bajil, Sana’a. *Scott & Britton*: Ghaiman.

*P. glauconome* is a typical eremic element in the Arabian fauna; it is probably the most widely distributed butterfly in Arabia and is normally common. In Yemen it appears to be rather scarce, probably because conditions are either too tropical or temperate to provide optimal conditions. I

would expect it to be more common in the sub-desertic eastern parts of the country which I did not visit. *P. glauconome* and *P. daplidice* are basically ecological vicariants which rarely fly together, though they do so on the barren plains south of Sana’a; at Hizyaz I captured both with one stroke of the net. In this locality the two also shared *Caylusia hexagyna* (Resedaceae) as food plant. The normal food plant of *glaucanome*, *Ochradenus* (Resedaceae), is a sub-desert plant which is not much in evidence in Yemen.

*EUCHLOE BELEMIA BELEMIA* Esper 1799

*Schmett. Abb. Besch.*: 110, 2.

Jabal Dawran.

New to southwestern Arabia.

This butterfly is known from the coastal strip of Arabia from Kuwait to the Musandam Peninsula, from Iraq, Syria, Jordan, Palestine and Egypt. In Central Arabia it is replaced by localised populations of *Euchloe falloui* Allard (Riyadh, Jeddah). An isolated population is known to inhabit parts of Somalia and Ethiopia and I had *belemia* on my list of possible species. The Ethiopian population is known as ssp. *abyssinica* Riley; the small series in the British Museum (Natural History) indicates that *abyssinica* is well differentiated from other populations of *belemia*; the wings are rounded, the black markings somewhat differently shaped, and the green colour on the hindwing underside is not disposed in well defined stripes. There are records from February, March, June and November, so the taxon is not likely to be defined simply by an extreme summer form. I would have expected Yemeni *belemia* to be allied to the Ethiopian form, but this is not the case. My four specimens are almost indistinguishable from material from Jordan (first generation) and show no affinity to *abyssinica*. I found the species on a rough mountain plateau under the same type of conditions as elsewhere in its range. The most logical wild food plant in the area was *Erucastrum ara-*



*bicum* (Cruciferae) but a species of *Capsella* (Cruciferae) was present in scattered cultivation and could presumably also be used. I would not expect *E. falloui* to be found in Yemen (except perhaps at places like Mareb) and Nakamura (1979) has shown that records from Ethiopia are in error.

*ANAPHAEIS CREONA LEUCOGYNE* Butler  
1885

*Proc. zool. Soc. London*: 492

Wadi Dhabab, Jabal Bada'an, Wadi Annah, Wadi Sughna, Suq as Sabt.

*Scott & Britton*: Usaifira, Hamman Ali, Taizz. *Carden*: Taizz.

I am still not fully satisfied that the true taxonomic status of *leucogyne* is as given above; it is limited to Arabia and differs quite strongly from both East and West African *creona* Cramer. The very simple genitalia appear to match those of Tanzanian specimens, but this is not necessarily decisive. More research is needed. I found the butterfly mainly in the wet, hot valleys with profuse vegetation at middle heights, though a single specimen appeared on subalpine meadows on the Jabal Bada'an. At Suq as Sabt and in Wadi Sughna the species was very common and males were attracted to water in considerable quantity. At Wadi Sughna the food plant was *Capparis tomentosa* (Capparidaceae) in which a steep mountain side was smothered. The young larvae were feeding gregariously.

*ANAPHAEIS AUROTA AUROTA* Fabricius 1793  
*Ent. Syst.* 3 (1): 197.

Ghawadir

*Rathjens & Wissmann*: Sana'a. *Carden*: Taizz.

This strongly migrant Indo-African butterfly is usually common throughout its range. The paucity of Yemen records is surprising; the Scott

& Britton expedition failed to find it. It was very common at Ghawadir, but I failed to find it at Mishrafa a few miles further up the Wadi Rima and in many other suitable localities. The three records are from all ecological zones and *aurota* is probably locally common in most of the country from time to time.

*PINACOPTERYX ERIPHA TRITOGENIA* Klug  
1829

*Sym. Phys.*, text pl. 7, figs 18–19.

Ghawadir, Mishrafa, Wadi Annah, Wadi Sughna, Medina al Abid.

New to Yemen.

*P. eripha* is an extremely variable butterfly. I prefer to use the name *tritogenia* for the populations of the northern Sahel zone from Mauretania to Arabia, limiting the nominate subspecies to Africa south of the Equator. The name *lacteipennis* Butler has been used subspecifically for Arabia by Gabriel (1954), but I feel this is basically a dry season morph, though it is fairly constant in the driest parts of the range of the species. Riley (1932) used *tritogenia* for specimens from Dhofar and my own Dhofar material is similar to his; my Yemeni series is identical with the Dhofar specimens, but some specimens from PDRY match *lacteipennis* well, so I can understand Gabriel's view. I found the species locally common, usually flying with large numbers of *Colotis*. The food plants are most species of Capparidaceae, the same species used by the *Colotis*. Saitoh (*pers. comm.*) determined the chromosome number of this species from Dhofar as  $n=13$ , the same number as in West Africa.

*CALOPIERIS EULIMENE* Klug 1829  
*Sym. Phys.*, text pl. 7, figs. 5–8.

Rima Tihama (Huzzainiya).

New to Yemen.

This delicately beautiful little butterfly is known only from the Sahel zone of East Africa from Lake Chad to Port Sudan. It does not penetrate the Somali region. In Arabia it has been found on a number of occasions in the area near Jeddah and Qunfidha in Saudi Arabia and my small series represents the southernmost locality known in Arabia. It is unlikely to have been overlooked in the Aden area where collecting has been relatively intensive. The biotope was flat, sandy sub-desert with few redeeming features, except for large stands of *Capparis decidua* (Capparidaceae) which is the larval food plant. The only other butterflies about were *Colotis danae*, *C. दौरا* and *C. ephyia*.

*COLOTIS CALAIS AMATUS* Fabricius 1775  
*Ent. Syst.*, 3 (1): 197.

Ghawadir, Mishrafa, Suq as Sabt, Ubal, 30 km E of Ubal.

*Scott & Britton*: Usaifira, Wadi Ghailama. *Carden*: Sana'a.

This butterfly is less common than *C. phisadia*, but is usually found in association with it, since they share the same food plant, *Salvadora persica* (Salvadoraceae). Essentially it is limited to the zone below 1500 m in Yemen, like most of the other *Colotis*, so the record by Carden from Sana'a is puzzling. However, many of the *Colotis* are at least to some extent migratory, so perhaps it has made its way up from lower regions. The food plant is certainly unknown at this level.

*COLOTIS PHISADIA PHISADIA* Godart 1819  
*Ent. Méth.*, 9: 132.

Ghawadir, Mishrafa, Suq as Sabt, Ubal, 30 km E of Ubal.

*Scott & Britton*: Usaifira, Hammam Ali.

This species is widely distributed in the Sahel zone of Africa and in Arabia, north to the Dead Sea of Jordan (Larsen & Nakamura in press); a

distinct subspecies flies in India. It is strictly localised to areas where the food plant *Salvadora persica* (Salvadoraceae) grows, often in rocky places, sometimes in sandy dunes. Often the butterfly is very common and usually it flies with smaller numbers of *C. calais*, which also feeds on *Salvadora*. The female of *phisadia* is very variable in ground colour and all the known forms are represented in my material; it is not a case of polymorphism as all forms are connected by intermediates. The butterfly is migratory, which is probably the reason why even small isolated stands of the food plant often contain a colony of the species. The eggs are laid in clutches and the young larvae feed communally, 10–15 to a leaf; they eat so fast that the leaf literally vanishes before the eyes of the observer.

*COLOTIS CHRYSONOME CHRYSONOME* Klug 1829  
*Sym. Phys.*, text pl. 7, figs. 9–10.

Ghawadir, Mishrafa, Wadi Annah, 30 km S of Ibb, Wadi Sughna.

*Scott & Britton*: Usaifira.

*C. chrysonome* is distributed from Mauretania to Arabia in the drier parts of the Sahel, and a disjunct population exists on the shores of the Dead Sea in Jordan (Larsen & Nakamura in press). A couple of ill defined subspecies exist in the Sahara and in parts of Ethiopia. This is not a common butterfly in Arabia, mainly having been recorded in ones or twos from a number of localities. I found very few in Dhofar and probably saw less than a dozen in Yemen, only three of which I caught. The sole food plants appear to be species of *Maerua* (Capparidaceae); in Wadi Annah I found it in association with scattered stands of *Maerua oblongifolia*. The butterfly is quite strong on the wing and not easy to capture.

*COLOTIS UNGEMACHI* le Cerf 1922*Bull. Mus. Hist. Nat.*: 228.

Plate 2

Mishrafa

New to Yemen. Unpublished for Arabia.

Since this unusual little butterfly was described from Ethiopia, it has remained an almost unknown entity. The first Arabian specimens to be noted were two from Jizan, Saudi Arabia, 23.ii.1979, which A. S. Talhouk captured and brought to me for identification. One of the specimens he kindly donated to the British Museum (Natural History) which did not have the species. K. M. Guichard informed me that that he had seen a further Saudi Arabian specimen (19°16'N, 41°22'E) in the collection of the Locust Research Institute at Jeddah; it was dated January 1973. I caught two males at Mishrafa, in an old cemetery overgrown with large stands of *Cadaba rotundifolia* and *Boscia* (Capparidaceae). They were flying with one of the largest concentrations of *Colotis* species I have ever seen: *calais*, *phisadia*, *chrysonome*, *protomedia*, *halimede*, *danae*, *daira*, *evagore* and *eris*. The underside pattern of *ungemachi* indicates an affinity to the *chrysonome*-group of the *Colotis*, and I agree with Talbot (1939) in placing it here. It is likely that it shares with *chrysonome* species of *Maerua* (Capparidaceae) as the food plants.

*COLOTIS PROTOMEDIA* Klug 1829*Sym. Phys.*, text pl. 8, figs. 13–16.

Mafhaq, Ghawadir, Mishrafa, Wadi Dur, Wadi Sughna, Suq as Sabt, Beni Mansour.

*Rathjens & Wissmann*: Wadi Brar, Aedjz.

This delightful butterfly is characteristic of open savanna scrubland, where it flies about very much like species of *Gonepteryx* in the southern parts of Europe. It was widely distributed, but not normally common. It is found in the driest parts of Africa from northern Nigeria to the coast of the Red Sea; in Arabia it is known from Jeddah to Aden.

*COLOTIS HALIMEDE HALIMEDE* Klug 1829*Sym. Phys.*, text pl. 7, 12–15.

Mishrafa, 30 km E of Ubal.

*Rathjens & Wissmann*: Wadi Brar

Most previous authors used the name *coelestis* Swinhoe for the Arabian populations of this butterfly, a view agreed with by Talbot (1939). Bernardi (1962) points out the error of this application which had already been recognised by Rothschild (1921). This butterfly is limited to the driest parts of tropical Arabia, where *Boscia* and *Commiphora* grow. The adult butterflies fly swiftly, much like other species in the genus, but they often settle on the ground with wings closed. Recorded food plants are all in the genus of *Cadaba* (Capparidaceae) and I observed females laying eggs on *Cadaba rotundifolia* at Mishrafa. In Dhofar this plant was not available, so it must have fed on a more conventional type of *Cadaba*. Both in Dhofar and Yemen species of *Cadaba* are found well beyond the range of the butterfly so its distribution appears to be limited by factors other than food plant choice.

*COLOTIS DANA EUPOMPE* Klug 1829*Sym. Phys.*, text pl. 6. Figs. 11–14.

Mafhaq, Rima Tihama, Ghawadir, Mishrafa, Wadi Dhabab, Wadi Dur, Wadi Annah, 30 km S of Ibb, Wadi Sughna, Suq as Sabt, Ubal, Medina el Abid, Beni Mansour.

*Scott & Britton*: Hammam Ali.

This widely distributed butterfly was by far the most common species of its genus in Yemen. It was found in all localities visited below 1600 m or so, and it was usually numerous. It shares species of *Cadaba* as food plant with *C. eucharis* and usually the two were found together; but when one species was missing, it was always *eucharis*. As in Africa the female varies in the extent to which the apex of the forewing is coloured with red.

*COLOTIS EUCHARIS EVARNE* Klug 1829

*Sym. Phys.*, text pl. 6, figs. 1–4.

Mafhaq, Ghawadir, Wadi Dhabab, Wadi Dur, Wadi Annah, Suq as Sabt.

*Rathjens & Wissmann: Aedjz. Scott & Britton: Usaifira.*

As elsewhere in Arabia (and in much of the rest of its range) this butterfly usually flies with *C. danae* and is nearly as widely distributed. It flies wherever the food plants, *Cadaba* (Capparidaceae), grow. The adult butterflies are fond of the flowers of *Cadaba* and in subdesert regions with sparse vegetation one sometimes has the impression that a bush with populations of *eucharis* and *danae* constitutes an ecosystem of its own. In fact, the wide distribution of these two butterflies is probably an indication that they have considerable powers of dispersal. Wandering, rather than actively migrating, singles are often encountered. The specimens were mostly large and bright, but with little or no black markings.

*COLOTIS EVIPPE EPIGONE* Felder 1865\*

*Reise der Novara, Lep.*, 2: 186.

Wadi Annah, Wadi Sughna, 30 km S of Ibb, Shibam.

New to Yemen.

So far in Arabia this butterfly was only known from PDRY. I found it in four different localities, all of which were ecologically different. In all cases very few specimens were seen and fewer captured. The species must have considerable powers of dispersal since I caught a specimen on alfalfa (*Medicago sativa*) at Shibam at an altitude of nearly 2800 m, 1000 metres higher and many miles from anywhere suitable for permanent breeding. At Wadi Annah, on the other hand, it was flying with numerous other species of *Colotis*. All my specimens are very lightly marked with black which is usually characteristic of dry season morphs.

\*Reiche (1849) described a male and a female *Colotis* under the name of *exole*. The male was a specimen of *C. evippe* and the female a specimen of *C. antevippe*. In d'Abbrera (1980) the subspecies of both *evippe* and *antevippe* flying in Arabia are given as *exole*. As the male specimen takes page and plate priority over the female, the combination *C. antevippe exole* is an invalid homonym. Both Aurivillius (1898) and Talbot (1939) synonymised *exole* with *omphale* Godart 1819 rather than with *epigone*. Reiche's specimens came from the area which can legitimately be claimed to be in the »shatter zone« between *omphale* and *epigone* and the species is very plastic. So even if Reiche's single specimen may look rather more typical *epigone* than typical *omphale*, I see little point in quarreling with Aurivillius and Talbot, thus retaining the well known *epigone*, the usage of which has been consistent and well understood for at least 40 years. This approach is also adopted by Carcasson (1981) on whose manuscript d'Abbrera's book is otherwise largely based.

*COLOTIS DAIRA DAIRA* Klug 1829

*Sym. Phys.*, text pl. 8, figs. 1–4.

Khamis Bani Saad, Ghawadir, Mishrafa, Wadi Annah, Rima Tihama.

*Scott & Britton: Usaifira.*

Rathjens & Wissmann caught a few specimens of *Colotis* at Aedjz and Sana'a, but their treatment by Warnecke under the names of f. *yerburi* Swinhoe and *nouna* Lucas is such that it is difficult to be certain whether he is referring to forms of *C. दौरا* or *C. evagore*. Nominate *daira* is limited to Arabia, from Dhofar to Aden and Yemen and the Asir. A record from Riyadh (see Beccari 1971) is almost certainly in error. There is much seasonal and individual variation in the species, especially in the female sex. Some females have the orange spot on the apex of the forewings totally replaced with black; some are primrose instead of white. The species is local but often common where it occurs; usually it is found flying with many other species of *Colotis*.

*COLOTIS ANTEVIPPE ZERA* Lucas 1852

*Rev. Zool.*, 4 (ser. 2): 425.

Mafhaq, Wadi Rima, Wadi Dhabab, Wadi Dur.

New to Yemen, new to southwestern Arabia.

Plate 2

*Colotis antevippe* was first recorded from Arabia in 1977 when P. Granville White took some specimens in Dhofar, where I also found it in October 1979 (Larsen & Larsen 1980). I was somewhat surprised to find the species in many localities in Yemen, considering that it had not been recorded from that area previously. All Arabian material is identical, except for size which varies considerably. The male upperside has moderate black markings, the orange apical spot usually being only slightly bordered inwards by black. The underside is unmarked, never having the end of the nervures underlined in black which is characteristic of many African populations. Neither in Dhofar, nor in Yemen did I find the species in quantity. Usually single males were met with, flying fast and direct in wadis or on rough ground, often in places where other species of *Colotis* were not much in evidence. I would not be too surprised if the Arabian populations of *C. antevippe* proved to be subspecifically distinct.

*COLOTIS EPHYIA* Klug 1829

*Sym. Phys.*, text pl. 6:9–10.

Rima Tihama.

New to Yemen.

Plate 2

I took three males of this rare butterfly flying around bushes of *Capparis decidua* (Capparidaceae) in the company of *Calopieris eulimene*, both of which were found nowhere else. *C. ephyia* is known from Sudan and Wiltshire (1952) reported a single specimen from Qanuna Kalt in the Asir Region of Saudi Arabia. At first I considered that the specimens were simply small dry season forms of *C. antevippe*, but they are in fact relatively easy to separate. *C. ephyia* is smaller, the orange apical spot is slightly less brilliant above; the underside of the forewings is distinctly yellow in the apical area, and the base of the forewing cell

is yellow; on the costa of the hindwing underside there is no trace of orange. Even in lightly marked *antevippe* there is usually on the upperside some basal grey suffusion which is missing in my series of *ephyia*, which also has completely white abdomens and legs. However, I could imagine that the last two characteristics are subject to seasonal variation.

*COLOTIS LIAGORE* Klug 1829

*Sym. Phys.*, text pl. 6, figs. 5–8.

Ghawadir, 30 km E of Ubal.

*Scott & Britton*: Usaifira.

This species lives in a narrow band of the dry zone of the African Sahel from Mauretania to Arabia; it is also found in Baluchistan. Pittaway (1979) found it feeding on *Capparis cartilaginea* (Capparidaceae) near Riyadh, but in Oman I have found it on *Maerua crassifolia* (Capparidaceae) as well. Several *Colotis* are polyphagous, so this is quite plausible. In Yemen *liagore* appears to be quite scarce, probably in part because the climate is so wet that it does not afford optimal conditions for the species, which is sometimes abundant elsewhere in Arabia. My Yemeni females all have much stronger black markings than I have seen elsewhere in Arabia; in Sudan females are often almost indistinguishable from their unmarked males. This probably does not constitute valid subspecific characteristics.

*COLOTIS EVAGORE EVAGORE* Klug 1829

*Sym. Phys.*, text pl. 8, figs. 5–6.

Mishrafa, 30 km E of Ubal.

*Scott & Britton*: Usaifira. *Carden*: Hammam Ali. Specimens from Aedjz and Sana'a captured by Rathjens & Wissmann may belong to this taxon or to *C. दौरا*.

There are scattered records of this little *Colotis* from between Jeddah and Aden, but it has not

been recorded from the Wadi Hadhramaut or from Dhofar. It does not seem to be very common, however. I only found it in limited quantity twice. In both cases it was flying with *Colotis halimede* in localities with a profuse growth of *Cadaba rotundifolia* (Capparidaceae); I saw females of *halimede* laying eggs on this plant and I suspect that *evagore* also used it as a food plant, though it is known to feed on *Capparis* in Morocco. Its flight is weaker, lower and more fluttering than other species of *Colotis*; despite this it is known to have considerable powers of dispersal and it is the only *Colotis* to reach Morocco and the Tunisian oases.

*COLOTIS ERIS CONTRACTUS* Gabriel 1954  
*BMNH Exp. SW Arabia*, 1:370.

Mishrafa, Wadi Annah, Wadi Sughna.  
*Rathjens & Wissmann: Wadi Bar.* Plate 2

Males of ssp. *contractus* are very distinctive. On the male forewings the black markings are developed to the point where the white ground colour is virtually limited to the cell. Material which I collected in Dhofar matched the original description and at Mishrafa I took a series of males which if anything has even less white on the forewings. There is no Arabian male resembling the various African subspecies in the British Museum (Natural History) and no African specimens even begin to approximate *contractus*. The difference between Arabian and African females is similar to that of the males and holds good for all material seen from Aden, Dhofar and Mishrafa. To my surprise I caught three females in Wadi Annah and Wadi Sughna which are of typical African configuration. The most extreme example is a female from Wadi Sughna which has the black markings so reduced that apart from the forewing apical markings, the only black is an indistinct streak along vein 1. I fail to understand this, since the difference between the three females in question and all other Arabian material is beyond

normal seasonal variation. In the *Colotis* lightly marked specimens are normally dry season forms, but they were caught in wetter conditions than I have seen *eris* elsewhere. It was most unfortunate that no males were procured. At Mishrafa I found the species common on a couple of tall *Boscia* which was certainly the food plant since a couple of specimens with the wings still limp dropped out of the tree. I did not see *Boscia* at Wadi Sughna and Wadi Annah so the food plant was probably *Cadaba* (Capparidaceae).

*MADAIS FAUSTA FAUSTA* Olivier 1804  
*Voy. Othoman: Plate 33.*

Mafhaq.  
*Scott & Britton: Usaifira.*

Material from SW Arabia is often referred to ssp. *vi* Swinhoe. I have already given my reasons for not accepting the validity of an Arabian taxon of this migratory butterfly different from the one found in the Levant and in Iraq (Larsen 1980). In earlier papers on Arabian butterflies I had overlooked the presence of *fausta* in Somalia, from where a new subspecies was described as ssp. *somalica* Carpenter & Jackson (1950). I should think this is also a synonym of *fausta*, an extreme dry season form without subspecific validity. The species is surprisingly scarce in southern Arabia; I caught no more than three specimens in Dhofar and in Yemen I saw only a single specimen which I was unable to catch.

*NEPHERONIA BUQUETI BUCHANANI* Rothschild 1921  
*Novit. Zool.*, 28:151.

Ghawadir, Suq as Sabt.  
*Scott & Britton: Usaifira.*

This butterfly is probably under-represented in collections from Arabia because of the combination of two factors. Firstly it is almost impossible to

distinguish from the ubiquitous *Catopsilia florella* in flight; secondly it is quite difficult to catch. I caught only two. The Arabian population of *buqueti* is often referred to as ssp. *arabica* Hopffer, but this is not correct as this name was clearly intended to cover specimens with strong black markings along nearly the whole margin of the upper forewings. This is not characteristic of Arabian specimens and it occurs in all populations to a varying degree. I use the name *buchanani* provisionally for all populations north of the Equator. I do not know of any food plant records from our area, but I found *buqueti* associated with *Salvadora persica* in both Yemen and Dhofar. This is a known food plant for *Eronia cleodora* Hübner, a close relative.

### Coliadinae

*CATOPSILIA FLORELLA* Fabricius 1775

*Syst. Ent.*: 479.

Hodeida, Ghawadir, Wadi Dhabab, Wadi Dur, Wadi Annah, Wadi Sughna, Beni Mansour.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Taizz, Usaifira. *Carden*: Taizz.

This is a strongly migrant tropical butterfly distributed throughout Africa, Arabia and India, penetrating even the Mediterranean region. It has been found in all the ecological zones of Yemen, but does not appear to be very common, though there are probably population explosions from time to time, as seen in other localities. The food plant is *Cassia italica* (Leguminosae) which is common throughout Yemen in river beds and in ill-kept agricultural lands. On the wing *florella* is easily mistaken for *Nepheronia buqueti*.

*EUREMA BRIGITTA* Stoll 1780

in *Cramer, Pap. Exot.*, 4:82. pl. 331.

Wadi Dur, Wadi Annah.

*Robertson*: Wadi Dahr.

New to Yemen. Unpublished for Arabia.

This common African butterfly appears to be relatively scarce in Arabia. The first specimen was taken by Talhouk near Jizan in Saudi Arabia, iv. 1979. Robertson took a single specimen at Wadi Dahr (an unusual habitat for a tropical species) and I took singles in the two localities indicated. The specimens are typical African wet season forms. It is possible that the reference to *E. desjardinsi* from Dar es Scheil near Bajil refers to this species, but on the other hand there is little reason why the latter should not be found in Yemen. My specimens were flying with much larger numbers of *E. hecabe* but were definitely the only ones I saw as I was keeping a special look out for *E. brigitta*.

*EUREMA HECABE SOLIFERA* Butler 1875

*Ann. Mag. Nat. Hist.*, 15 (4): 396.

Hodeida, Ghawadir, Mishrafa, Wadi Dhabab, Wadi Dur, Wadi Annah, Wadi Sughna, Suq as Sabt, Beni Mansour.

*Rathjens & Wissmann*: Bajil. *Scott & Britton*: Usaifira, Wadi Ghailama, Wadi Thabad.

The name *senegalensis* Boisduval 1836 has normally been used for the African subspecies of this Palaeotropical butterfly. Based on Carcasson's manuscript, d'Abrera (1980) used the name *solifera* while using the name *senegalensis* for the taxon usually known as *E. brenda* Doubleday & Hewitson 1847. No reason was given for the action, but inspection of the types in the British Museum (Natural History) confirms the correctness of this action, thereby unfortunately throwing confusion into what (for long) has been standard usage. Most Arabian material I have seen has been quite comparable to African material, but there appears to be somewhat less variation in Arabia than on the continent. Forms with strong brown markings on the underside are decidedly rare. The species flies both in open land and in the tropical valleys. As elsewhere in Arabia it is

not normally numerous where it occurs, though it is often abundant in other parts of its range. In Wadi Dur specimens came willingly to water.

*COLIAS ELECTO MENELIKI* Berger 1940

*Expl. P.N.A. Mission G. F. de Witte*, 30:40.

Sana'a, Wadi Dahr, Jabal Dawran, Jabal Sabr, Jabal Bada'an, Jabal Sumara, Shibam, Suq al Khamis, Hizyaz.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Sana'a, Ertil, Hada, Jabal Sumara, Migyal al Alaf, Ghaiman, Wadi Dahr, Kaulat al Asakeir, Usaifira (!). *Carden*: Sana'a, Suq al Khamis.

Berger (1953) described ssp. *philbyi* after a series of small specimens collected near Taif in the northern Asir. Gabriel (1954) accepts the latter name for Asir material, while assigning SW Arabian specimens to the Ethiopian subspecies *meneliki* Berger. I have good series from both areas and I can find no constant differences. Berger's type series appear to consist of atypical, small and in some cases structurally discoloured specimens, some of which remind me of small, pallid specimens which occasionally occurred in the first broods of *Colias croceus* Fourcroy in Lebanon. This was probably due to the larvae developing under sub-optimal conditions (Larsen 1974a). Contrary to what was known at the time, *C. electo* in Arabia has an unbroken range from Taif to PDRY, and Jannone (1948) has shown it to be migratory in Eritrea and this is doubtless the case also in Arabia. The presence of two subspecies in Arabia, therefore, cannot be sustained. As in other species of *Colias* the females are dimorphic; in Yemen the white female form comprises 10–15% of the total. Berger considered the high proportion of white females in the Taif population a further indication of its subspecific validity; since Philby knew his butterflies well it is much more likely that he simply took as many of the »interesting« females as possible. The name *philbyi* remains available for the entire Arabian population

of *C. electo*, even if the description is based on an atypical series, but I do not consider it worthwhile to discriminate between the Ethiopian and Arabian populations which are very close and which could even be in migratory contact. In Yemen the species is common everywhere between 2400 and 3000 metres and probably higher. The natural habitat is open hillsides where its general behaviour is just like that of the European *C. croceus*. It is often found in association with the other Palaearctic species. It has adapted well to cultivation and is now most numerous in lucerne fields and probably uses lucerne as the larval food plant.

## NYMPHALIDAE

### Danainae

*DANAUS CHRYSIPPUS CHRYSIPPUS* Linné 1758

*Syst. Nat.*, ed X: 471.

Wadi Dahr, Hizyaz, Mafhaq, Ghawadir, Mishrafa, Wadi Dur, Dalil, Wadi Annah, Wadi Sughna, Suq as Sabt, 30 km E of Ubal, Medina el Abid.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Asr, Hammam Ali, Sana'a, Taizz. *Carden*: Sana'a, Taizz.

*D. chrysippus* is one of the most widespread and common butterflies in Arabia, but while I found it in most localities, it was not normally numerous. I was extremely surprised not to meet with a single specimen of f. *dorippus* Klug, which often constitutes nearly 30% of the southwestern Arabian populations. I only saw one specimen of f. *alcippus* Cramer, but this form is usually uncommon in Arabia. There is evidence of seasonal variation of polymorphism in this butterfly. The preferred food plant is *Calotropis procera* (Asclepiadaceae) although most other species of this plant family may be used. At Suq as Sabt I found it feeding on *Kahania laniflora*.



## Charaxinae

### *CHARAXES BERNSTORFFI* Rydon

*Original description in a separate appendix to this paper, p. 63.*

Suq as Sabt.

New to Science.

Plate 2

The type series which consisted of four battered males was caught in an open clearing in the river bed above Suq as Sabt, surrounded by dense riverine forest and *Combretum/Acacia* scrub. They were patrolling the clearing in the usual manner of the *Charaxes*, but never penetrated the thickets. Otherwise I would have been lucky to capture more than one specimen. Its taxonomic status is discussed in Rydon's appendix. I saw a few additional males and a single female. It is interesting that a species of this complex should have turned up in Arabia, but it is perhaps not surprising as other species of the complex penetrate far into the Sahel zone. The food plant choice within the group is wide and includes many common species of plants found in the area.

### *CHARAXES HANSALI HANSALI* Felder 1867

*Reise Novara, Lep.*: 446, pl. 59.

Mafhaq, Jabal Dawran, Wadi Dur, Wadi Annah. *Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Asr, Sana'a. *Carden*: Wadi Bani Husheish, NE of Sana'a. *Addington*: Sana'a.

Yemeni specimens belong to the nominate subspecies rather than to *ssp. arabica* Riley which is limited to Dhofar. My single female from Yemen supports this view. This appears to be a widely distributed butterfly in Yemen, though I never saw it in numbers. As always with *Charaxes* species it is almost impossible to capture adequate series without traps or at least some good natural bait. I noted no special habitat for this butterfly which is

known to feed on a variety of savanna trees. A high school student (Addington) showed me a large female which was caught on the premises of the International School in Sana'a in May 1980; it had been attacked by a sparrow-like bird in flight and had sustained damage to the body so it could no longer fly although the wings were quite undamaged. The female which I caught at Mafhaq was investigating a bush of *Sagaretia spicifolia* (Rhamnaceae) as if it wanted to lay eggs, but I did not actually see it lay any.

## Nymphalinae

### *HAMANUMIDA DAEDALUS* Fabricius 1775

*Syst. Ent.*: 82.

Wadi Dur, Wadi Annah, Wadi Sughna, Suq as Sabt, Beni Mansour.

*Scott & Britton*: Hammam Ali, Ghailama.

This common African butterfly appears to be limited in Yemen to the more well watered parts of the tropical zones below 1500 m or so. At Wadi Sughna and Suq as Sabt it was more numerous than I have ever seen it in Africa, flying in the river beds surrounded on all sides by dense vegetation. At Suq as Sabt many specimens came to water. The flight of *daedalus* is very characteristic; they stay so close to ground level that it is almost impossible to capture specimens with a sidewise swing of the net. Sevastopulo (1975) records *Combretum* (Combretaceae) as the food plant in East Africa; this is a typical species in the area where it has been found in Yemen.

### *NEPTIS SERENA ANNAH* ssp. nov.

Wadi Annah, Wadi Dur.

New to Arabia. New subspecies. Plate 2 – Fig. 5

The genitalia of this species of *Neptis*, the first of the genus to be found in Arabia, clearly show it to

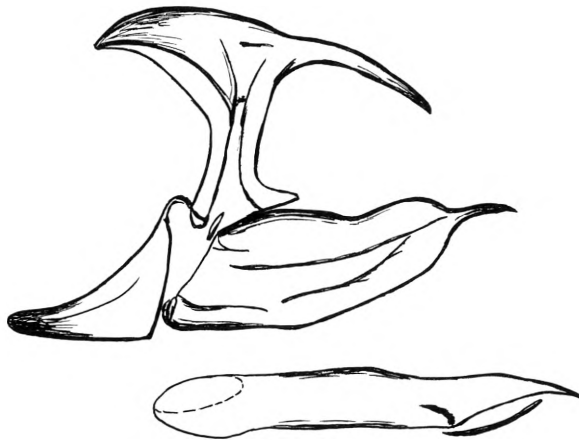


Fig. 5. The male genitalia of *Neptis serena annah* ssp. nov. (Coll. T. B. Larsen, no ASC).

be allied to the *serena* Overlaet/*kiriakoffi* Overlaet group of species (Overlaet 1955), to which the South African *penningtoni* van Son is also allied. The genitalia and the general habitus, coupled with the overall distribution of the species in question leaves no doubt that it should be linked with *serena*. This view has kindly been endorsed by Pierre and Pierre-Balthus (*pers. comm.*) However, my series from Yemen differs so substantially from other populations of *serena* that it deserves subspecific status.

*Description:* The Yemeni subspecies differs from all other populations of *Neptis serena* through the much wider white bands of all four wings, but especially the hindwings. The subapical white spots on the upperside and underside of the forewings are better developed than in other populations of the group. *Male Holotype:* Yemen Arab Republic, Udayin, 1400 m, Wadi Annah, 22.v.1980. T. B. Larsen leg. (Coll. British Museum (N.H.)) *Paratypes:* 9 ♂♂, 1 ♀, same locality, same date, and Wadi Dur, 17 & 21.v.1980. T. B. Larsen leg.

I found this species in two localities, in both cases along a permanent river, bordered by dense vegetation surrounding ancient coffee planta-

tions. They patrolled the river bed flying with the usual measured wing-beat of the *Neptis* at two to three metres above the ground. The first specimen I caught was initially seen at a distance of nearly 30 metres, but even then there was no doubt it was a *Neptis*.

*BYBLIA ACHELOIA ACHELOIA* Wallengren 1857

*Lep. Rhop. Caff.:* 29.

Mafhaq, Wadi Dhabab, Wadi Dur, 30 km S of Ibb, Wadi Sughna, Suq as Sabt, Medina al Abid.

*Scott & Britton:* Usaifira, Taizz, Wadi Thabad. *Carden:* near Ibb.

The West African subspecies of *acheloia*, *crameri* Aurivillius, is much darker than the nominate subspecies which stretches from the Cape to Arabia. The latter is superficially very close to *B. ilithyia* but may be distinguished by the characters noted under *ilithyia*. *B. acheloia* is relatively common in tropical shrublands where it flies close to the ground and often inside bushes so that it is difficult to catch. Seasonal and sexual dimorphism in Yemeni *acheloia* appears to be less than in southern Africa.

*BYBLIA ILITHYIA ILITHYIA* Drury 1773

*Illustr. Ex. Ent.,* 2, pl. 17.

Beni Mansour.

New to Yemen.

In Arabia this butterfly is usually very similar to *B. acheloia*. They may be told apart by the fact that on the underside of the forewings the black submarginal line in *ilithyia* continues straight towards the costa; in *acheloia* it is bent inwards and is usually conjoined with the black markings at the end of the cell. On the upperside of the hindwings the discal area contains a series of small black spots which are absent in *acheloia*. There is some seasonal and sexual variation in *acheloia*, less

in *ilithya*. The difference in the size of genitalia between the two species is truly remarkable. I caught only a single male of *ilithya* in Yemen, while *acheloia* was common and widespread. *B. ilithya* has not been recorded frequently in PDRY, but I found the species very common in Dhofar in October 1979 (Larsen 1980). In West Africa *ilithya* is only found in very dry areas while *acheloia* is more eclectic.

*EURYTELA DRYOPE BRITTONI* Gabriel 1954  
*BMNH Exp. SW Arabia*, 1: 359.

Wadi Dahr, Wadi Sughna, Wadi Annah.  
*Scott & Britton*: Usaifira, Hammam Ali.

I had very bad luck with this butterfly, meeting with it only rarely and missing most of the few specimens I saw. Only two specimens in poor condition were caught, but they match the original description and ssp. *brittoni* appears to be valid as a subspecies. I usually found the species in tropical valleys with extensive vegetation and permanent water; Wadi Dahr matches that type of locality, but it is so high up the mountains that I was surprised to see *dryope*. The flight is rapid and dancing, often up and down river beds or along other topographical features. Sevastopulo (1975) reports that it feeds on *Tragia* and *Ricinus* (Euphorbiaceae) in East Africa.

*VANESSA CARDUI CARDUI* Linné 1758  
*Syst. Nat., ed. X*: 475.

Jabal Dawran, Wadi Dahr, Ghawadir, Jabal Sabr.  
*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Sana'a, Wadi Dahr, Jabal Masnah, Migyal al Alaf, Hada, Jabal Kohl. *Carden*: Sana'a.

This migrant butterfly has an almost worldwide distribution and has been found throughout Arabia and Yemen. I met it very rarely in Yemen and the general experience in Arabia is that it is relatively scarce, except locally from time to time

when there are huge population build-ups. Yemen is one of the few places in Arabia where *cardui* ought to be able to survive on a permanent basis, but even here I suspect that migration plays an important role in its population dynamics.

*JUNONIA ORITHYA HERE* Lang 1884  
*Entomologist*, 17: 206.

Wadi Dahr, Ghawadir, Mishrafa, Wadi Dur, Wadi Annah, Wadi Sughna, Suq as Sabt, Ubal, 30 km E of Ubal, Medina el Abid, Shibam, Beni Mansour.  
*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Ghailama, Wadi Dahr, Sana'a.

The names *Junonia* and *Precis* have been used in the literature with such a lack of consistency that I have previously used *Precis* for all members of the group. I am, however, now persuaded that the classification of de Lesse (1952) should be adopted. Ssp. *here* was described after specimens from Bagdad and Aden; it differs from the African ssp. *madagascariensis* Guenée in the much lighter ground colour of the underside and in the lack of any trace of orange colouration on the upperside of the male. It resembles the Indian ssp. *swinhoei* Butler in both of these respects, but *swinhoei* consistently has a much broader white apical band in both sexes. Ssp. *here* extends into the Horn of Africa and the distribution of ssp. *swinhoei* and *here* is similar to that Indian and Middle Eastern subspecies of *Madais fausta* Olivier. It is one of the most common butterflies in Arabia; I found it everywhere in Yemen below 200 m. Often *J. hierta* and *orithya* fly together; in some cases *J. oenone* as well.

*JUNONIA OENONE OENONE* Linné 1758  
*Syst. Nat., ed. X*: 473.

Ghawadir, Mishrafa, Wadi Dur, Wadi Annah, 30 km S of Ibb, Wadi Sughna, Suq as Sabt.  
*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Usaifira.

This butterfly is among the most widespread in Africa where the degree of variation on a geographic basis is negligible. The species is often referred to as *clelia* Cramer, but this is now generally recognised to be a synonym of *oenone*. Gabriel (1954) refers the Arabian populations to *J. oenone clelia* with no justification. Arabian specimens in no way differ materially from those of continental Africa and if they did they would have needed a subspecific name of their own. The species appears to be relatively widespread in the tropical part of the country (commonly sympatric with *J. hierta* and *J. orithya*) but I never saw more than a few specimens at any time; in Africa it may be very numerous. I am somewhat suspicious of Rathjens & von Wissmann's record from Sana'a.

*JUNONIA HIERTA CEBRENE* Trimen 1879

*Trans. ent. Soc. London*, 353.

Hizyaz, Mafhaq, Sana'a, Ghawadir, Mishrafa, Wadi Dur, Wadi Annah, Wadi Sughna, Suq as Sabt, Ubal, 30 km E of Ubal, Beni Mansour.

*Rathjens & Wissmann: Sana'a. Scott & Britton: Taizz, Ghailama.*

This is generally a common species in south-western Arabia and in Dhofar I am surprised that no more previous records were made. I found it nearly everywhere, often in quantity. The species is known to be migratory (Larsen 1978) and it has been caught in Lebanon (Larsen 1974); I am rather surprised it has never been found in central, eastern or southeastern Arabia. The males are strongly territorial and vigorously defend a chosen territory. I found the female ovipositing on *Barleria apressa* (Acanthaceae) at Udayin, a genus of plant on which the species is known to feed elsewhere.

*JUNONIA CHORIMENE* Guérin 1844

*Icon. Règne Anim. Ins.*: 476.

Mafhaq, Ghawadir, Wadi Dur, Dalil, Wadi Annah, Wadi Sughna, Suq as Sabt, Medina el Abid, Beni Mansour.

New to Yemen.

This essentially savanna species has been noted on a few occasions in the Asir mountains just north of Yemen. There are no records from the PDRY and I was somewhat surprised to find *chorimene* both widespread and relatively common in suitable localities as high as 1600 m. It usually flew in dried out river beds in savanna environments, but it was very common along a shady road at Wadi Dur which was also favoured by *Phalanta phalantha* and *Neptis serena*. There are no differences between specimens from my Yemen series and those which I have from northern Nigeria (Kaduna and Jos).

*PRECIS LIMNORIA NIVEISTICTUS* Gabriel 1954

*BMNH Exp. SW Arabia*, 1: 361.

Jabal Sabr, Wadi Dhabab, Jabal Bada'an, Wadir Dur, Dalil, Wadi Annah.

New to Yemen.

Plate 2

Gabriel described ssp. *niveistictus* from about 20 Arabian specimens of both sexes from Asir, the Aden Protectorate and the Wadi Hadhramaut. It is distinguished by the lack of any russet colouration on the upperside of the wings and by a more profuse white spotting in the postdiscal area, especially of the forewings. Rebel (1907) studied a few specimens with similar characteristics from the Aden area, but did not describe it since Klug (1834) had described nominate *limnoria* from Arabia Felix. The specimen depicted in Klug differs from all other Arabian material in its smaller size and very strong red markings on the wings, but the text is quite clear: »Arabia felice semel capta«. Although Klug was very accurate, it seems unlikely that the type of *limnoria* was from Arabia; it resembles much more closely those of dry Ethi-

opia, an area visited by the same expedition. The name *naib* Guérin should probably be considered a synonym of true *limnoris*. In Yemen the species was widely distributed in bushland between 1400 and 2500 m, but usually only a few specimens were seen on each occasion, and they were very difficult to catch. They appeared to like water courses and were occasionally found hilltopping. The food plants are probably species of Labiatae.

*HYPOLIMNAS MISIPPUS* Linné 1764

*Mus. Lud. Ulr.*: 264.

Ghawadir, Wadi Annah, Wadi Sughna, Suq as Sabt.

*Scott & Britton*: Usaifira.

This butterfly, the female of which is an excellent mimic of *Danaus chrysippus*, is widespread in Arabia, but it is not normally common. True to form, I found it only in ones or twos in a few localities. The food plant most frequently referred to in the Middle East is *Portulaca oleracea* (Portulacaceae) which is usually associated with cultivation or permanent water sources, but the species is known to feed on a wide range of plants, including several common Acanthaceous plants. The female mimics all the forms of *Danaus chrysippus*; I only saw the typical female form, but others have caught *f. inaria* Cramer, *f. alcippoides* Butler and intermediate forms in Aden.

*SALAMIS ANACARDII NEBULOSA* Trimen 1881

*Trans. ent. Soc. London*: 441.

Wadi Dur, Dalil, Wadi Annah, Wadi Sughna, Beni Mansour,

*Scott & Britton*: Usaifira, Wadi Thabad.

*Ssp. nebulosa* is found from South Africa to Ethiopia and southwestern Arabia; the nominate subspecies is West African. My only previous field experience is with *S. parrhasius* Drury in West Africa. This butterfly is a denizen of dense prim-

ary forest and it was therefore rather surprising to meet with *anacardii* even in wadis with only few low trees. However, behaviour is the same. The male selects a vantage point in a tree as high up as possible, from where it occasionally sallies forth. The butterfly rarely descends to ground level, though it can be lured down by throwing some light object into the air; usually a male will swoop down to investigate. The undersides of the three specimens which I caught are very light.

*PHALANTA PHALANTHA AETHIOPICA* Rothschild & Jordan 1903

*Novit. Zool.*, 10: 505.

Wadi Dur, Wadi Annah, Wadi Sughna, Suq as Sabt.

New to Arabia.

This butterfly is widely distributed in Africa and Asia. Asian specimens consistently have a discal line of obscure black spots in the discal area of the upperside of both wings which is equally consistently missing in the African. The Yemen series is unequivocally of African origin, contrary to the population of Socotra (*granti*) which appears to be of Asian origin. I found it flying rather commonly in the densely overgrown river valleys, patrolling incessantly up and down the river bed or roads, but never straying into neighbouring scrubland. The species is migratory, but it may have been overlooked in Arabia so far since its biotope is truly limited to areas like Wadi Dur and Suq as Sabt, biotopes which have not previously been sampled by collectors. *P. phalantha* was high on my list of probable Arabian species.

*MELITAEA DESERTICOLA SCOTTI* Higgins 1941 *comb. nov.*

*Trans. R.ent. Soc. London*, 91: 236.

Jabal Dawran, Suq al Khamis, Jabal Bada'an, Jabal Sumara, various points along the Sana'a-Hodeida Rd at 2500–2800 m.

*Scott & Britton*: Jebel Kohl.

Higgins described ssp. *scotti* as a subspecies of *abyssinica* Oberthür from Ethiopia, a species of which I have neither been able to examine adequate series nor to study the genitalia. I consider *scotti* to be a subspecies of *Melitaea deserticola* Oberthür, which is found from Morocco to Lebanon along the North African coast and in some of the Saharan mountain massifs. The differences in external appearance are so slight that if *scotti* had not been isolated geographically, I would have included it in ssp. *macromaculata* Belter from Lebanon and Jordan. The genitalia do not appear to differ; both the apex of the valve and the harpe are without crests, and the uncus of both species have small scaphial elements which are missing in all other species of the »*didyma*-group«. My long series from Yemen is fairly consistent in having even heavier black spotting than in ssp. *macromaculata*, especially in respect of the discal series of the male upperside; I suspect this may be seasonally variable. A series from Saudi Arabia (Wadi al Tarya, 5.iv.1980, K M Guichard leg.) in my collection are more lightly spotted than the Yemeni. However, Arabian material is consistently smaller than Jordanian; the series of four prominent black subapical spots are usually straight in *macromaculata*, slightly curved inwards in *scotti*. In Dhofar a population of this butterfly exists (Larsen 1980) which has much reduced black spotting. I would expect that *abyssinica* in Ethiopia should also be considered a subspecies of *deserticola*. The species was quite common on rough hillsides with low vegetation; in behaviour they differed from Lebanese and Jordanian *deserticola* in always flying quite close to the ground. Unfortunately I failed to find the food plant; *Anarrhinum orientalis* (Schrophulariaceae), on which it fed in Lebanon, was common in most of the localities where I found the butterfly, but no larvae were procured.

## Acraeinae

*ACRAEA NEOBULE NEOBULE* Doubleday 1848  
*Gen. Diurn. Lepid.*, pl. 19.

Jabal Bada'an, 30 km S of Ibb.  
New to Yemen.

I caught only two specimens of this butterfly, which has been recorded from near Aden and from the Wadi Hadhramaut. The ground colour is slightly lighter than in nominate material from Somalia and the black markings rather less developed, but in my view not sufficiently to justify subspecific status. Rebel (1907) described the species *A. arabica* after a series from the Wadi Hadhramaut, but it is clearly a form of *neobule*. It is small, has reduced black spotting and a sharply defined unscaled patch at the apex. Gabriel described f. *sheba* of *neobule* after a series from near Mukalla. It is also small, but very much lighter than both *arabica* and normal *neobule*. I believe both are only extreme ecological forms of *neobule*. However, it must be admitted that the differences between the series of the three forms in the British Museum (Natural History) are impressive. On the other hand the differences are not really greater than may be seen, for example, in *Melitaea didyma* in hot and dry places like the Antilebanon where third generation specimens are analogous to *sheba* and *arabica*. The issue can only be finally solved by resident collectors. It has been suggested that *neobule* is conspecific with *A. violae* F. from India and Sri Lanka, e.g. by le Doux (1922). I have not been able to study this issue in depth, but although the two are obviously related, it appears to me that the two taxa have evolved sufficiently to merit specific status.

*ACRAEA DOUBLEDAYI AZVAKI* Carcasson 1981  
*Collins handguide to the butterflies of Africa*: 177.

Mafhaq, Ghawadir, Wadi Dhabab, Wadi Dur, Dalil, 30 km S of Ibb, Wadi Sughna, Suq as Sabt, Ubal, Beni Mansour.

*Rathjens & Wissmann*: Wadi Brar. *Scott & Britton*: Usaifira, Ghailama, Taizz.

The validity of the Arabian subspecies of *doubledayi* Guérin is not in doubt, as the larger size, denser scaling and brighter colours makes it an altogether more impressive insect. It appears to be the most common of the Arabian *Acraea*, flying in the wet cultivated wadis as well as in dry ravines. However, I never found it in quantity. It flies with a measured yet powerful flight, often gliding with the wings extended. On such occasions the snow-white colour of the long abdomen is apparent even at considerable distance. At 30 km S of Ibb I saw a female at water. It is regrettable that Eltringham's well known *arabica* falls as a homonym of *arabica* Rebel, since I can only accept the latter as a seasonal form of *A. neobule* Doubleday.

*ACRAEA CHILO CHILO* Godman 1880

*Proc. zool. Soc. London*: 184 .

Dalil, Wadi Dur, Wadi Annah.

*Rathjens & Wissmann*: Wadi Brar.

I collected three males and one female. The males differ in size and colour pattern. Gabriel (1954) referred specimens from the mountainous parts of the Aden area to the nominate subspecies, the holotype of which he examined, rather than to ssp. *yemensis* le Doux (erroneously listed as ssp. *yemenensis* by d'Abrera (1980)). Given the variation of my own series and the fact that ssp. *yemensis* was erected on the basis of two males, I think it prudent to follow Gabriel. Five of the seven known Arabian males do not fully conform to the minor and relatively weak differential characteristics cited by le Doux. In addition comparative material of the nominate subspecies from immediately across the Red Sea is in short supply. The deep orange males with their slow and deliberate

flight, usually several metres above the ground, are most conspicuous. Fortunately they sometimes swoop down or come to flowers (including *Lycium*) and may then be caught. The species is decidedly less widespread and numerous than *A. doubledayi azvaki* Carcasson.

*ACRAEA ENCEDON RATHJENSI* le Doux 1933  
*Mitt. Münch. ent. Ges.*, 23 : 35.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Hammam Ali, Usaifira, Taizz.

This is one of the few butterflies known from Yemen which I did not capture. The Arabian material of this butterfly is remarkably consistent in its relatively large size, the dense scaling and a ground colour which is more strongly orange-brown than even individual variations from the African continent. The apical band of the forewing is never white. It is accepted as a valid subspecies also by Pierre (1974). I am puzzled by the record from Sana'a as I am by certain other of Rathjens and von Wissmann's tropical species recorded from there. Neither the ecology nor the climate is suitable and I suspect that some unlabelled material might have been included under a catch-all Sana'a label.

*ACRAEA EPONINA* Cramer 1780 ssp.

*Pap. Exot.*, 3: 138.

Jabal Bada'an.

New to Arabia.

Plate 2

On grassy meadows just below the scarp of Jabal Bada'an above Ibb at 2400 m I took a series of seven specimens of this butterfly, flying together with *Melitaea deserticola*, *Lasiommata felix*, *Carcharodus alceae*, *Zygaena simonyi* and other Palaearctic species. The behaviour and flight pattern was so much like *Melitaea deserticola* that it was a few moments before I recognised it for what it

was. *A. eponina* is one of the most widespread members of the genus and its presence in Arabia is not really surprising, but the locality where I found it was the last place I had imagined. The series is rather uniform and quite distinctive, though J. Pierre kindly showed me a few Ethiopian specimens which bore some resemblance. The marginal orange lunules of the upperside of the forewing are much better developed than in any other specimen I have seen either at the Muséum National de l'Histoire Naturelle in Paris or at the British Museum (Natural History) in London. At the apex they form streaks 3 to 4 mm long, and that in space four forms a streak directed at the cell no less than 5 mm long. The underside of the hindwings has red blotches connecting some of the black spot, reminiscent of *f. ventura* Hewitson and *rangatana* Eltringham, the exact taxonomic status of which is uncertain. I was tempted to describe this butterfly as a new subspecies (related to *A. jordani* Ung. 1932?) but the taxonomic and nomenclatorial confusion surrounding *eponina* is so great that I desist from doing so for the time being. During a visit to Nigeria in December 1980 I noted that the flight of Nigerian *eponina* was much weaker and lower to the ground. I found this to be true also in Madagascar and Ethiopia in July 1982.

## Satyrinae

*MELANITIS LEDA LEDA* Drury 1773  
*Ill. nat. Hist.*, 1: 29–30.

Wadi Dur.  
New to Yemen.

I share the view of Fox (in Fox, Lindsey, Clench and Miller 1965) that the use of the name *africana* Fruhstorfer for African populations of this butterfly is superfluous: »The only reliable character for separating *africana* from *leda* is the locality label«. This large and unmistakable butterfly appears to be very scarce in Arabia, having been

recorded from Aden and Lahej in PDRY on a number of occasions, from the Asir (Wiltshire 1952) and once from Oman's Dhofar province (Larsen & Larsen 1980). I saw a single specimen at Wadir Dur but unfortunately missed it. It was a dry season form with a camouflaged underside without prominent ocelli as in the wet season.

*LASIOMMATA FELIX* Warnecke 1929  
*Int. ent. Zeitschr.*, 22: 365.

Wadi Dahr, Hizyaz, Jabal Dawran, Suq al Khamis, Jabal Sabr, Jabal Bada'an, Jabal Sumara, 30 km S of Ibb and observations on many localities on the Sana'a – Hodeida Rd.

*Rathjens* & *Wissmann*: Sana'a. *Scott* & *Britton*: Sana'a, Hada, Asr, Ghaiman, Wadi Sabr, Beit Baus. *Carden*: Suq al Khamis, near Taizz.

This butterfly is closely allied to the Ethiopian species, *L. maderakal* Guérin. They are of Palearctic origin and appear most closely related to *L. menava* Moore of Iran and Afghanistan. It is a common butterfly in Yemen and in the high mountains of Saudi Arabia and PDRY, basically above 2200 m. The colloquial name »Wall Butterfly« is even more apt for *felix* than for the European members of the genus; the species is almost only found in places where there are vertical cliff faces or walls. At Wadi Dahr, where all gardens are enclosed by high stone walls, *felix* is very common and nearly all movement is vertical, up and down the walls. The same is true to a lesser extent in uncultivated areas. Since it often lives in exposed places with strong winds this type of behaviour might protect it against unwanted dispersal.

*YPTHIMA ASTEROPE ASTEROPE* Klug 1832  
*Sym. Phys.*, text pl. 29, figs. 11, 14.

Mafhaq, Khamis Bani Saad, Ghawadir, Mishrafa, Wadi Dur, Wadi Annah, 30 km S of Ibb, Wadi Sughna, Suq as Sabt, Ubal, Medina el Abid, Beni Mansour, Dalil.



*Scott & Britton*: Usaifira, Taizz, Hammam Ali, Asr. *Carden*: Taizz.

This is a common and widespread little butterfly at lower and middle heights in Yemen, though occasional specimens may be taken as high as 2400 m. It flies in both oasis environments and on open rough ground. The imagines enjoy sunning themselves with the wings  $\frac{3}{4}$  open. Saitoh (pers. comm.) determined that a specimen from Dalil had a chromosome count of  $n=14$ ; this is the same number as I found in Lebanon (Larsen 1975). There are a number of similar species in Africa, currently under revision by Kielland; I kept a special look-out for variation but found only typical *asterope*.

*PSEUDOTERGUMIA TEWFIKI* Wiltshire 1949  
*Bull. Soc. ent. Fouad I*, 33: 353.

Jabal Dawran.

*Scott & Britton*: Jabal Masnah, Naqil Isla (N of Maba'ar). One of Wiltshire's type specimens collected by Tewfik is labelled Jabal Mataran, Yemen.

Kudrna (1977) includes *Pseudotergumia* in the genus *Hipparchia*; the curious appendages to the tegumen and the geographical distribution of the *Pseudotergumia* is such that I prefer maintaining it at generic level. The presence of this species in the high mountains of southwestern Arabia is interesting, not only because it is a prominent member of the small group of Palaearctic species, but because of the geographical distribution of the other species in the genus: *P. pisidice* Klug in the Sinai, Palestine, Jordan, Lebanon, Syria and South Turkey; *P. fidia* Linné in North Africa and Spain to parts of southern France; and *P. wyssi* Christ in a number of distinct subspecies in the Canary Islands. The genus would appear to be the remnant of an ancient fauna centered south of the Mediterranean. *P. tewfikii* seems limited to the high mountains (above 2000 m + ) especially

in the less wet parts of the country. Unfortunately I only managed to catch two specimens on Jabal Dawran and never saw the species again.

## LYCAENIDAE

### Theclinae

*MYRINA SILENUS* Fabricius 1775 ssp. (? *nzoiaea* Stoneham)

*Syst. ent.*: 531.

Jabal Dawran, Jabal Bada'an (2900), Suq as Sabt. New to Yemen.

Clench (in Fox *et al.* 1965) maintains that there are three subspecies of *silenus*. The nominate subspecies from West Africa, ssp. *ficedula* Trimen from South Africa and an undescribed subspecies in NE Africa and by implication Arabia. Stempffer (1969) described ssp. *deserticola* with a holotype from Tibesti and a paratype from SW Africa. There is also a ssp. *penningtoni* Dickson & Stephen 1971 from southern Africa. The two latter appear to be desert ecotypes rather than subspecies. Arabian series of *silenus* are variable; some have the extended chestnut markings in the apex of the forewings characteristic of *ficedula*, others do not. The extent to which the blue colour is suppressed by the black markings varies in both sexes. The West African populations (outside of the deserts) are fairly stable, but there is so much variation in South and East Africa that I am still hesitant in taking action on Clench's suggestion and describing a new subspecies on the basis of the rather extensive Arabian material on hand. I found the butterfly quite scarce in Yemen. I first caught a few specimens hilltopping on Jabal Dawran and Jabal Bada'an far from any suitable breeding localities. At Suq as Sabt I caught a few under natural conditions, but saw it nowhere else. The food plants are species of *Ficus*.

*SPINDASIS SOMALINA* Butler 1885  
*Proc. zool. Soc. London*: 764

Mafhaq, Dalil, Wadi Dur.

*Scott & Britton*: Ghailama. *Waterston*: Medina el Abid.

I was fortunate enough to take a dozen of this butterfly whose distribution is limited to southern Arabia, Somalia and parts of Ethiopia. At Mafhaq no less than 10 were caught during an hour's collecting, all males in good condition. Gabriel (1954) stated that compared to the holotype "on the hindwing underside certain small differences are noted which may indicate an Arabian race when additional specimens become available." I have examined extensive series and find no difference between Arabian and Somali material apart from a slight tendency for the orange spots to be darker in Arabia. The two specimens collected by Waterston at Medina el Abid have larger red macules on the apex of the upperside of the forewing than any of the others. The butterfly was always encountered in low shrubland; males would be perched on a bare twig or on a small candelabra like *Euphorbia*, spending most of their time at rest, "grinding" the hindwings. Occasionally they would fly off on a brief furious sortie and return to settle. I caught my series by keeping a look-out for flying specimens, moving to the general area and carefully examining all likely vantage points. The two specimens whose upperside is figured as *Spindasis scotti* Gabriel by d'Abrera are in fact *S. somalina*; the holotype of *S. scotti*, which is a good species, remains unique\*.

*AXIOCERCES HARPAX KADUGLI* Talbot 1935

*Ent. month. Mag.* 71: 120.

Hizyaz, Jabal Dawran, Wadi Dhabab, Jabal Bada'an, 30 km S of Ibb, Shibam, Suq al Khamis.

*Rathjens & Wissmann*: Sana'a, Suq al Khamis. *Scott & Britton*: Hada, Ghaiman, Usaifira, Wadi Thabad. *Carden*: near Sana'a, Jabal Sumara.

Ssp. *kadugli* is a butterfly inhabiting the drier parts of tropical Africa north of the Equator; its underside differs from the nominate ssp. which flies in the wetter parts of West Africa. All material seen from Yemen is unequivocally *kadugli*. The species appears to be common and widespread between 1500 and 2700 m + in Yemen, but for some reason it does not appear to go lower than 1400 m or so – at least there are no records from Yemen, PDRY or Saudi Arabia. In Dhofar P. Granville White took it a sea level (Larsen 1980). Mostly I found it on rather barren mountain sides feeding on *Acacia*-bushes rather than trees. It seems able to adapt to altitudes which other lowland tropical species cannot. The imagines are very fond of flowers.

*EPAMERA GLAUCUS* Butler 1885

*Proc. zool. Soc. London*: 667.

30 km E of Ubal.

*Rathjens & Wissmann*: Usil. *Scott & Britton*: Taizz.

Arabian specimens of this butterfly have sometimes been referred to ssp. *jordanus* Staudinger, but as pointed out by Stempffer this subspecies is effectively limited to the Dead Sea area. However, now that more material from both Jordan and Arabia is on hand, it has become clear that no valid subspecies of *glaucus* can be maintained (Larsen 1980). I found the species only during one of my last days in the country, despite the fact that I had been searching for it, and given the paucity of Arabian records in general we may assume that the species is very localised. It feeds on Loranthaceae, and I found it in some quantity on *Loranthus schimperi* growing in profusion on a stand of old *Tamarix*; it was almost impossible to catch although a stone thrown at the *Loranthus* would provoke a small explosion of flying butterflies which stayed well out of reach.

\* A.R. Pittaway collected a second female in Dhofar in June 1981.

*HYPOLYCAENA PACHALICA* Butler 1888

*Proc. zool. Soc. London*; 69.

Mishrafa, Suq as Sabt.

New to Yemen, but known from Saudi Arabia and PDRY.

This butterfly is close to *H. philippus*, but the genitalia differ markedly and two Yemeni specimens match the drawing given by Stempffer (1938). The distribution is East African from Kenya and Tanzania to Ethiopia, Somalia and Arabia. The behaviour of the imago is very much like the common West African *philippus* with which I initially confused it. According to Sevastopulo (1975) the larval food plant is *Combretum*, a characteristic component of the flora in the type of mountain foot hills in which my specimens were caught. However, in PDRY Scott & Britton found it as high as 2000 m.

*HYPOLYCAENA PHILIPPUS PHILIPPUS* Fabricius 1793

*Ent. Syst.* 3 (1): 283.

30 km S of Ibb.

*Scott & Britton*: Wadi Sabr.

I caught a single specimen of this butterfly, which is common throughout tropical Africa, in a wooded ravine. The specimen is in very bad condition. I would not have expected it to be *philippus*; the size is much smaller and the underside markings are very weak. However, the male genitalia are close to those figured by Stempffer (1938), though the sub-unci and their apophyses appear more regular and more slender. The small series of specimens in the British Museum (Natural History) from PDRY are closer to normal African specimens, though one or two are also lightly marked on the underside. A wide variety of food plants are known from the most diverse families and *philippus* is generally very common in Africa, so its apparent rarity in Arabia is a bit surprising.

*DEUDORIX LIVIA* Klug 1834

*Sym. Phys.*, text pl. 40, figs 3–4.

Ghawadir, Medina el Abid.

*Rathjen & Wissmann*: Sana'a. *Scott & Britton*: Usaifira, Sana'a.

*D. livia* is widely distributed in Africa, the eastern Mediterranean and Arabia, but it is somewhat fitful in appearance, partly because it is migratory. Records from Arabia are sporadic. It was common at Ghawadir, where it was almost certainly feeding on *Acacia ehrenbergiana* (Leguminosae). I caught a single female at Medina el Abid which I observed ovipositing on *Acacia asak*. The species is also known to feed inside the fruits of pomegranate (*Punica granatum*) as well as on the young fruits of dates (*Phoenix dactylifera*), most unusual food plant choices for a member of the Lycaenidae.

## Lycaeninae

*LYCAENA PHLAEAS SHIMA* Gabriel 1954

*BMNH Exp. SW Arabia*, 1: 338.

Jabal Dawran, Wadi Dahr, Jabal Sabr, Jabal Bada'an, Jabal Sumara, Suq al Khamis, km 30 Sana'a-Hodeida Rd.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Errein, Maba'ar. *Carden*: Jabal Sumara.

This distinctive subspecies of the European Small Copper is found in suitable localities throughout the Arabian mountains from Taif in the north (Guichard) to PDRY. It is somewhat localised, however, often being found on hilltops. Probably the species is effectively limited to altitudes above 2300 m, although species of the food plant (*Rumex*) descend considerably lower than that. Behaviour and ecology in quite analogous to that of the nominate subspecies.

## Polyommatainae

*ANTHENE AMARAH AMARAH* Guérin 1849  
*Lef. Voy. Abyss.*: 384.

Ghawadir, Wadi Dur, Dalil.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*:  
Hammam Ali, near Taizz.

This little butterfly is the most widespread member of the large African genus *Anthene*; it is the only one nearly to reach the Palaearctic in Jordan (Larsen & Nakamura in press). I found it very common in parts of Dhofar and there are several reports of its abundance in Aden. I was somewhat surprised to find that in Yemen it was both rare and local during my visit, and that it was missing entirely from many suitable localities. The food plants are species of *Acacia* (Leguminosae) and it usually flies with one or more of the *Azanus*. The male has a well developed territorial instinct; at Wadi Dur I saw an individual maintaining the same vantage point during two visits four days apart.

*ANTHENE CONTRASTATA CONTRASTATA*  
Ungemach 1932  
*Mém. Soc. Sci. nat. Maroc*: 86.

Mishrafa.

New to Yemen.

### Plate 2

I captured a single female of this butterfly sitting on an *Acacia* tree but despite diligent searching I could trace no more specimens. Gabriel (1954) placed two females from Aden in this species; there are in fact a few males from Aden in the collections of British Museum (Natural History) and these have been explicitly identified as this taxon by Stempffer (1938). In all probability the butterfly will be found in localised colonies wherever *Acacia* grows; the Aden specimens referred to were captured at 2000 m +.

*ANTHENE BUTLERI ARABICUS* Gabriel 1954  
*BMNH Exp. SW Arabia*, 1: 379.

Jabal Dawran, Wadi Dur, Dalil, 30 km S of Ibb.  
*Scott & Britton*: Wadi Thabad. *Carden*: near Ibb.

The underside of most of my specimens appears to be even more indistinctly marked than those of Gabriel's original description. They all have a faint black costal spot on the underside of the hindwings which is not mentioned in the original description. The genitalia of a Yemeni specimen (coll. T. B. Larsen, no. APX) match those of *A. butleri aurobrunnea* Stempffer (1936). I found the species mainly in single specimens, usually sitting on foliage about one metre above the ground. It was never met with in quantity. On Jabal Dawran I was surprised to see the species as one of a number participating in hilltopping behaviour. There are no records of this butterfly from below 1500 m. The South African subspecies is known to feed on species of Crassulaceae.

*CUPIDOPSIS IOBATES IOBATES* Hopffer 1855  
*Ber. K. Preuss. Akad. Wiss.*: 639 ff.

Wadi Dur, Suq as Sabt, Wadi Sughna.

New to Yemen. One of Warnecke's papers lists this species as having been found in Arabia but I have not been able to trace any authority for this statement. The species has certainly not been recorded from Arabia during this century.

I found this little butterfly in three of the most tropical localities visited. At Wadi Sughna I caught a few specimens at water; in the two other localities they were flying in scrubland away from the rivers. The flight was relatively weak and they were easily seen to be different from the large numbers of common Lycaenidae in the same localities. Even in my small series there is considerable variation in the extent of orange markings on the hindwing.

*LAMPIDES BOETICUS* Linné 1767

*Syst. Nat.* ed. XII: 789

Jabal Dawran, Sana'a, Jabal Bada'an, Suq al Khamis.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Sana'a, Usaifira. *Carden*: Sana'a.

This Pan-Palaeotropical migrant butterfly is widespread in Yemen, but as elsewhere in Arabia it is not as common as might be expected. I probably saw less than a dozen specimens, usually near cultivation. It feeds on a large selection of Leguminosae and the climatic conditions in Yemen appear to be ideal.

*CACYREUS NIEBUHRI* *sp. nov.*

Jabal Bada'an.

New to science.

Plate 1, 2 – Fig. 6

This new species appears to be most closely related to *C. ethiopicus* Tite 1961 (figured). It is the only other black species in the *Cacyreus*-group with blue scaling on the upperside of the male.

*Male genitalia*: The male genitalia resemble those of *C. ethiopicus*, but rather than having the apex of the valves broadly spatulate, they are drawn out to a distinct point. No confusion with any other species is possible.

*Male upperside*: Forewing 11 mm. Ground colour dark blackish brown, overlaid with sparse but clear blue scaling on the basal part of the forewing and the discal and post-discal part of the hindwings. The upper hindwing has a jet-black anal spot, framed by bluish-white scales, surmounting the prominent tail. The fringe is clearly chequered on the forewing, less clearly so on the hindwing.

*Female upperside*: The female is slightly larger than the male and carries slightly more blue scaling, but is otherwise identical. The upperside of both sexes closely resembles that of *C. ethiopicus*, but the latter has two anal eye spots on the hindwings.

*Underside*: The underside is rather similar to that of *C. ethiopicus*, but differs in having only one anal eye spot. The large costal spot in interspaces 5 and 6 is directed outwards; if continued it would reach the margin at vein 3 or 4, while in *C. ethiopicus* it is pointed towards the anal angle.

*Male holotype*: Yemen Arab Republic, Ibb Province, Jabal Bada'an, 2400 m, 20. v. 1980. T. B. Larsen, leg.

*Paratypes*: 7 ♂♂, 9 ♀♀, same locality, 16 & 20.v.1980. T. B. Larsen leg.

The degree of variation in the type series is negligible. Two mounts of male genitalia (coll. T. B. Larsen, nos. ARZ, ASE) are identical.

Male holotype in coll. British Museum (Natural History). It is a pleasure for me to name this butterfly in honour of Carsten Niebuhr, the modest, efficient and thoroughly sympathetic survivor of the Danish Yemen Expedition of more than 200 years ago, a personality I would much have liked to know.

The type series was taken in two spots on the Jabal Bada'an at about 2400 m, separated by about 500 m. The biotopes were well watered mountain slopes with profuse low vegetation interspersed with outcrops of rock. In both places

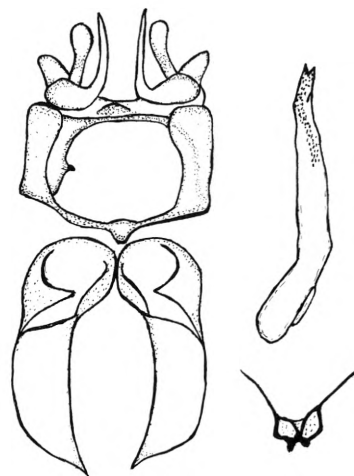


Fig. 6. Male genitalia of *Cacyreus niebuhri* *sp. nov.* (Coll. T. B. Larsen, no. ARZ).

niches in the rock were overgrown with strong stands of *Pelargonium alchaimelloides* (Geraniaceae) which is almost certainly the food plant, since *Cacyreus palaemon* Cramer and *C. marshalli* Butler in East Africa are known to feed on Geraniaceae. I expect *C. niebuhri* to be limited to the upper reaches of the wetter mountains of the Yemen Arab Republic. I first encountered the species at 09.00 when both sexes were actively flying in search of sexual partners. In between sorties they would rest on rocks, sunning themselves with the wings  $\frac{3}{4}$  open (see photo). They were almost totally inactive during the afternoon.

*CACYREUS VIRILIS* Aurivillius 1924

Seitz, *Gross-Schmett. Erde*: 463.

Ibb, Jabal Bada'an, Wadi Dur, Dalil, 30 km S of Ibb, near Khamis Madhyul on Sana'a-Hodeida Rd.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Wadi Sabr, Hammam Ali. *Carden*: Suq al Khamis, Sana'a.

Aurivillius described this species as a form of the African *C. lingeus* Cramer, the genitalia of which are completely different. I have examined the genitalia of three Yemeni specimens as well as one

from Nigeria and Stempffer's published figures. The distal half of the valves in Yemeni specimens is longer than in the African, but the length varies from specimen to specimen. Had all been as long as the longest I have seen, the creation of a new subspecies would be indicated. As it is, the best procedure is to note that the Arabian population appears to be in the process of speciating. I found *virilis* in many localities under very different conditions. At 2500 m on the Jabal Bada'an it flew with many of the Palaearctic species in an area characterised by the presence of water mint; at Wadi Dur it was common in the most tropical of habitats. I saw a female laying eggs on *Salvia schimperi* (Labiatae) at 2800 m near Khamis Madhyul; *virilis* is known to feed on Labiatae (Clark & Dickson 1971, Sevastopulo 1975).

*SYNTARUCUS BREVIDENTATUS* Tite 1958

*Entomologist*, 91: 189.

Wadi Dhabab, Dalil. Tite (1958) mentions Yemen in his description of this species, almost certainly referring to the specimens from Usaifira identified as *S. jeanneli* by Gabriel (1954).

The three species of *Syntarucus* known from Yemen are impossible to separate with certainty except through dissection. Early records are therefore suspect. *S. babaulti* Stempffer should also occur. The genitalia of my three *brevidentatus* are typical, carrying some 12–14 thorns on the apex of the valve. The genitalia of my small series of *jeanneli*, however, are atypical in that they carry 5–8 teeth, rather than the 3 or 4 of African populations. As noted by Stempffer (1935) there is variation also in the shape of the subunci. The two species appear less clearly separated in Yemen than on the continent. None of the species were very common.

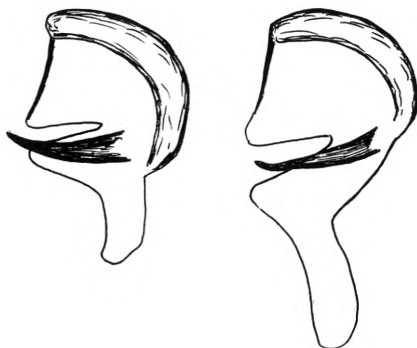


Fig. 7. Valves of *Cacyreus virilis* Aurivillius. Left: Kaduna, Nigeria. Right: An extreme example from Yemen (coll. Larsen, no. APW).

*SYNTARUCUS JEANNELI* Stempffer 1935

*Mission Omo*, II: 232.

Wadi Dahr.

Scott & Britton: Usaifira (Probably in reality *S. brevidentatus*; see preceding species).

I found a few specimens of this butterfly flying in the agricultural areas at Wadi Dahr, especially in shady places. Some specimens came to water on the main road.

*SYNTARUCUS PIRITHOUS* Linné 1767

*Syst. Nat.* ed. XII: 790.

Sana'a, Ghawadir, Wadi Dhabab, Suq as Sabt.

Rathjens & Wissmann: ? Sana'a. Scott & Britton: Sana'a, Usaifira.

I found this to be the most common and widespread of the Yemeni *Syntarucus* though it was never abundant. Both Scott and I found it flying with another species of the genus in the Taizz area; in Africa it is usual to find two or even three *Syntarucus* in the same locality and any ecological segregation between *pirithous*, *jeanneli*, *brevidentatus* and *babaulti* must be slight. *S. pulcher* Murray appears somewhat linked to swamplands.

*TARUCUS THEOPHRASTUS* Fabricius 1793

*Ent. Syst.*, 3 (1): 281.

Wadi Dhabab, Dalil, Udayin, Wadi Annah, Suq as Sabt, Beni Mansour, Wadi Dur.

Scott & Britton: Taizz, Usaifira.

In Africa it is normally quite easy to differentiate between *T. theophrastus* and *T. rosaceus* without dissection. This is unfortunately not the case in Yemen and it was only on my return that I could be sure both species were represented in my material. I have not dissected all specimens caught and it is likely that there are more cases of sympatry than indicated by the localities quoted. Both species are narrowly linked to the food plant, *Zizyphus spina-christi* (Rhamnaceae), but they are fond of flowers and at Wadi Dur I found them

coming to water quite frequently. In Arabia *theophrastus* appears to be limited to the tropical zone, while *rosaceus* is widespread as far north as the Jordan Valley.

*TARUCUS ROSACEUS* Austaut 1885

*Le Naturaliste*, 7 (18): 141.

Mafhaq, Khamis Bani Saad, Hodeida, Ghawadir, Mishrafa, Wadi Sughna, Beni Mansour.

Scott & Britton: Taizz, Usaifira, Hammam Ali. Rathjens & von Wissmann caught specimens of *Tarucus* at Aedjz, quoted as *mediterraneus* Bethune-Baker, a synonym of *rosaceus*. It is not possible to be certain whether they belong to *rosaceus* or to *theophrastus*.

This species was quite common in the localities quoted above; generally speaking it would appear that the driest places which I visited produced *rosaceus* and the wettest *theophrastus*, but this could be a coincidence. At Beni Mansour I saw large numbers feeding from an isolated flowering *Acacia* in the company of masses of *Azanus jesous* and *A. ubaldus*. It is worth pointing out that I did not find *T. balkanicus* in Yemen, nor has it been collected by others in southwestern Arabia, despite the fact that it is known from the Wadi Hadhramaut, from Dhofar, Oman and most of eastern Arabia, reappearing again in Kharthoum, where I have personally taken it and verified the identity through dissection.

*TUXENTIUS* gen.nov. (gender masculine)

Type species: *Lycaena melaena* Trimen 1887 : 82.

A number of African and Oriental species of the Lycaenidae have conventionally been included in the genus *Castalius* Hübner (Type species *rosimon* Fabricius, a common Asian butterfly) on the basis of convergent external features, chiefly underside patterns consisting of bold black markings on a white background. All Oriental species, except

*rosimon*, have since been transferred to the resurrected genera *Caleta* Fruhstorfer and *Discolampa* Toxopeus. Their genitalia prove them to be far removed from both *Castalius rosimon* and from the African species currently included in *Castalius* (Eliot 1978). In some respects *rosimon* is closer to the African “*Castalius*” than are the other Oriental species; it has the same metallic green marginal spots on the underside of the hindwings and it feeds on *Zizyphus*. However, as pointed out by Stempffer (1967), the genitalia differ radically in all respects from the African species. My own opinion is that they might be monophyletic, but if so they diverged at least as far back as the Miocene. The differences are now so strong that they certainly do not permit the African species to be considered congeneric with *rosimon*. Eliot (1973) agrees with this view and considers that *Castalius* should be limited as a monotypic genus.

Stempffer (1967) ranged the African “*Castalius*” in four groups, each of which he believed might eventually be found to merit generic status.

1. *hintza*-group. UPS ground colour blue. Genitalia lacking subunci. Penis highly specialised. Only member: *hintza* Trimen and its subspecies.

2. *cretosus*-group. UPS black and white. Penis minute. Subunci massive with specialised apex. Furca normally developed. Species included: *cretosus* Butler, *kaffana* Talbot, *calice* Hopffer, ? *gregorii* Butler.

3. *melaena*-group. UPS black and white. Penis minute. Subunci unspecialised. Furca enlarged and fused with valves. Species included: *melaena* Trimen, ? *griqua* Trimen, *melaena interruptus* Gabriel, to which should be added *stempfferi* Kielland and *hesperis* Vári.

4. *carana*-group. UPS black and white, Penis normal in size. Subunci unspecialised, slender. Some variation in degree of development of furca, which may be absent. Species included: *carana* Hewitson, *margaritaceus* Sharpe, *ertli* Aurivillius, to which should be added an undescribed species

from Tanzania which I caught a few years ago; it is possible that the taxon *carana* covers more than one species.

I agree with Stempffer that *hintza* should not be considered congeneric with the remaining species. Eliot (1973) took the consequence of this view and erected the genus *Zintha*. I do not, however, agree with Stempffer that the three other groups are sufficiently distinct to merit generic status. I prefer to treat them as two species-groups within a genus, characterised by whether or not the penis is normal or of a highly specialised, minute size. It is highly improbable that the unique, minute penis should have developed independently in the *cretosus* and *melaena*-groups. The fact that the *carana*-group has a normally dimensioned – if unspecialised – penis does not appear sufficient to warrant the creation of a separate genus in the absence of other supporting characteristics. As Darwin rightly remarked, we do not know the special features of the ancestor. The differences in genitalia within the African “*Castalius*” are no larger than within the *Tarucus* or the *Cacyreus*.

I therefore give the following description of *Tuxentius*, covering all the African species currently included in “*Castalius*”. By choosing *melaena* as the type species, I enable the *carana*-group to be removed to a separate genus if more detailed study should indicate the desirability of so doing.

#### Genus *TUXENTIUS*

Upperside and underside of both sexes with a black and white colour pattern with no trace of blue scaling. All species have a well defined series of black spots, overlaid with green metallic scales, on the margin of the UNHW, reminiscent of the genus *Tarucus*. Sexual dimorphism is negligible. Genitalia relatively unspecialised. Uncus consists of two simple lobes fused to the tegumen, Subunci are present in all species, sometimes slightly



specialised. Valves carry a strong harpe (lower process in Stempffer's terminology) which is analogous to the same structure in the *rosaceus*-group of the *Tarucus*. The shape of the valve differs from species to species, affording excellent specific characters. The genus is divided into two clear groups: one has a normally developed penis, the other – to which *melaena* belongs – has a minute penis. As far as is known the genus feeds on *Zizyphus*, the same food plant as that of the *Tarucus*, to which *Tuxentius* is closely related.

I take great pleasure in naming this genus in honour of Dr S. L. Tuxen. His book on the genitalia of insects needs no introduction (Tuxen (2nd ed.) 1970), but he has also encouraged my own researches into entomology since we first met when, at the age of 12, I sought his advice on some obscure butterfly which I had caught in South India.

I hope shortly do a revision of the *Tuxentius* in view of the undescribed species which I caught in Tanzania and the presence of unidentified material in the collections of the British Museum (Natural History).

*TUXENTIUS INTERRUPTUS* Gabriel 1954 *stat. rev.*

*BMNH Exp. SW Arabia*, 1: 381.

Mafhaq, Wadi Dhabab, 30 km S of Ibb.

*Scott & Britton*: Usaifira, Taizz, Wadi Sabr, Wadi Thabad.

Plate 2, Fig. 8

Gabriel described this butterfly as a subspecies of *melaena* on the basis of superficial similarities in general pattern. It differs from *melaena* and other species of the genus in having the typical streak from the base to the costa of the underside of the forewings broken up into a basal streak and a costal spot. This occurs in other species as a rare aberration. However, the genitalia (fig. 8) differ completely from those of *melaena*. They are closer

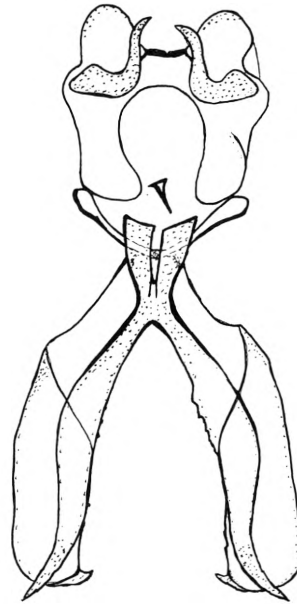


Fig. 8. Male genitalia of *Tuxentius interruptus* Gabriel (Coll. T. B. Larsen, no. ASM).

to those of *stempfferi* Kielland (1976) but until material from the intervening area between Tanzania and Yemen has been studied, it is too early to decide whether *stempfferi* should be considered a subspecies of *interruptus*. So far the species is only known from SW Arabia, but I should not be surprised if it was found on the other side of the Red Sea as well. I did not take many specimens, but all are consistent with Gabriel's type series. They were associated with dense stands of *Zizyphus spina-christi* which is almost certainly the food plant. On the wing it was easy to distinguish *interruptus* from species of *Tarucus* living on the same trees.

*ZIZEERIA KNYSNA* Trimen 1862

*Trans. ent. Soc. London*, 3: 282.

Sana'a, Mafhaq, Wadi Dahr, Hodeida, Ghawadir, Wadi Dhabab, Wadi Dur, Dalil, Wadi Annah, Wadi Sughna, Suq as Sabt, Suq al Khamis.

*Rathjens & Wissmann: Sana'a. Scott & Britton: Usaifira, Wadi Thabad, Kaulat al Asakeir, Taizz, Hada, Asr, Wadi Dahr.*

This butterfly is common throughout the country except at the highest levels. Usually it is found in conjunction with permanent water, including wells, and it is often common in agricultural lands, especially in fields of alfalfa (*Medicago sativa*). In Arabia *knysna* has been found from Mecca to Aden and from there to the Hadhramaut and Dhofar. In northern Oman and eastern Arabia it is replaced by *Z. karsandra* Moore and there is so far no case of recorded sympatry. I had expected the close relative, *Zizina antanossa* Mabille, to occur in Yemen but did not find it.

*ACTIZERA LUCIDA LUCIDA* Trimen 1883  
*Trans. ent. Soc. London: 348.*

Jabal Bada'an, 30 km S of Ibb.  
New to Arabia

This little butterfly is basically a species of the African montane grasslands, but it may be found in other biotopes. I was not really surprised to find it, though it was not on my list of expected species. The specimens from Jabal Bada'an were caught on grassy slopes with patches of *Hypericum* which are very reminiscent of the montane zone of Kenya; the single specimen caught 30 km S of Ibb was caught in more dry terrain and at considerably lower altitude. Judging from information given by John Wood, the top of the coastal mountains (Raymah, Bura and Milhan) should have optimal conditions for this species. The butterfly is not very active, fluttering weakly among low vegetation, and it may easily be overlooked.

*ZIZULA HYLAX HYLAX* Fabricius 1775  
*Ent. Syst.: 526.*

Ghawadir, Wadi Dhabab, Wadi Dur, Wadi Annah, Suq as Sabt, 30 km E of Ubal, Medina el Abid.

*Rathjens & Wissmann: Sana'a. Scott & Britton: Usaifira, Wadi Thabad.*

The name *gaika* Trimen has normally been used for African subspecies of this butterfly and its Arabian off-shoot. I follow Stempffer (1967) and Clench (in Fox et al. 1965) in considering *gaika* a synonym of *hylax*. I can see no difference between African and Arabian specimens and series which I have caught in India and Sri Lanka. Some of the East Asian subspecies may be valid. In Yemen I found *hylax* rather widely distributed but much less numerous than in Dhofar. In Africa it is known to feed on a bewildering array of plants from many different families.

*AZANUS JESOUS* Guérin 1849  
*Lef. Voy. Abyss.: 383.*

Hizyaz, Wadi Dahr, Sana'a, Ghawadir, Wadi Dhabab, Jabal Bada'an, Dalil, Wadi Dur, Wadi Annah, 30 km S of Ibb, Wadi Sughna, Suq as Sabt, Shibam, Suq al Khamis, Beni Mansour, Sana'a Airport.  
*Rathjens & Wissmann: Sana'a. Scott & Britton: Sana'a. Carden: Hammam Ali.*

This is one of the most common butterflies of southern Arabia and I found it in nearly all localities visited during the trip, usually in considerable quantity, often flying with other members of the Lycaenidae, including its congeners *A. ubuldus* and *A. moriqua*. At Wadi Dur and Wadi Annah it was a common visitor to water; at Beni Mansour isolated flowering *Acacia*-trees were teeming with specimens feeding from the flowers. At Hizyaz the larvae were feeding in large numbers on *Acacia etbaica* (Leguminosae); many pupae were found under stones beneath the tree, often together with scorpions, spiders or Carabid beetles which might be expected to be potential predators of larvae or pupae.

*AZANUS UBALDUS* Cramer 1782  
*Pap. exot., 4: 209.*

Wadi Dahr, Hizyaz, Dawran Town, Ghawadir, Mishrafa, Wadi Dur, near Ubal, Beni Mansour. Rathjens & Wissmann: Sana'a. Scott & Britton: Sana'a, Mighyal al Alaf.

The many subspecific names which have been bestowed on this little butterfly should be considered synonyms; all populations vary considerably depending on season and rainfall. I believe all populations are in migratory contact with each other. *A. ubaldus* is somewhat more localised than its congener *A. jesous* and it is also more easily overlooked. It is fairly common in most of south-western Arabia, less common and more unpredictable in eastern, central and northern Arabia. At Hizyaz I found it associated with *Acacia etbaica*, but all the pupae collected produced *A. jesous* rather than *ubaldus*. The Wadi Dur specimens were caught at water together with *A. jesous* and *A. moriqua*.

*AZANUS MORIQUA* Wallengren 1857

*Lep. Rhop. Kaff.*: 39.

Ghawadir, Wadi Dur, Dalil, 30 km S of Ibb, Suq as Sabt..

Scott & Britton: Ghaiman. Carden: Taizz.

This butterfly is widely distributed in Yemen but is much less common and does not go as high up the mountains as its two congeners *A. jesous* and *A. ubaldus*. Nearly all my specimens were caught at water. Warnecke reports that Rathjens and Wissmann caught one male and three females of the closely related species *A. mirza* Plötz at Sana'a; there are no other records of this butterfly from Arabia, so although its presence is not to be ruled out, I am more inclined to believe it is due to misidentification. *A. mirza* and *moriqua* are distinguished only through the broader block borders of the male upperside in *moriqua*.

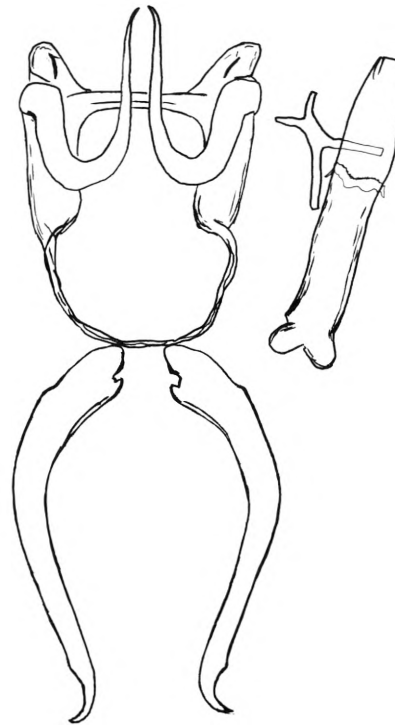


Fig. 9. Male genitalia of *Lepidochrysops arabicus* Gabriel. (Coll. T. B. Larsen, no. ASJ).

*LEPIDOCHRYSOPS ARABICUS* Gabriel 1954

*BMNH Exp. SW Arabia*, 1: 384.

Jabal Dawran, Jabal Sabr, 30 km S of Ibb,<sup>?</sup> Jabal Bada'an. New to Yemen.

Fig. 9

This butterfly was described after specimens caught by Scott & Britton in the high mountains of PDRY and it is no surprise that it should occur also in Yemen. I found it very localised but relatively common where it occurred. On both Jabal Dawran and Jabal Sabr they were found on hill tops where they participated in the hilltopping behaviour, but it also seemed to be the permanent habitat judging from the behaviour of the females. Unfortunately I did not see any females ovipositing, but the biotopes were overgrown with the blue flowered *Nepeta deflersiana* which seems a

logical food plant. All known members of the *Lepidochrysops* feed on Labiatae. I take the opportunity of figuring the genitalia which have not previously been illustrated; they are entirely typical of the genus. The specimens figured by d'Abrera (1980) belong to the following species.

*LEPIDOCHRYSOPS FORSSKALI* sp. nov.

Dalil.

New to science.

Plate 2, Fig. 10

This is a fairly characteristic member of the *Lepidochrysops*. However, it matches none of the other hundred or so species of the genus so far described. The *Lepidochrysops* are one of the largest genera of African *Lycaenidae* and have a strong tendency towards the development of very local species. The group is in need of revision. Much more material of many species is needed. In addition to the photographs on plate 2, I give the following description:

*Male upperside:* Forewing averaging 20 mm. All four wings a shining blue which in tone and intensity is remarkably close to that of the common European *Polyommatus icarus*. Rottemburg. The forewing has a few black scales indicating the end-cell spot, hardly noticeable except under the microscope in some specimens. Narrow black marginal border, average width of which is four rows of scales. The scaling is very dense. No trace of the underside markings is visible through the wings under normal lighting. The tips of the veins are lightly marked in black. The hindwings have the same colour as the forewings. Costa light brown, a spot of which is also found towards the margin of space 7. Marginal line as on the forewings, but the tips of the veins are more prominently underlined with black to a depth of 2 mm. In space two there is a prominent black spot, crowned by a weak orange lunule, hardly visible in some specimens. Vein 2 ends in a prominent tail. The

fringes are light brown on the inner half, white on the outer.

*Male underside:* The tone of colour and the general disposition of the spots very much like in *Lepidochrysops quassi* on an immediate visual impression, although the two species do not have a particularly close affinity within the genus. The cell spots of *forsskali* are distinctly sagittate, especially on the forewing. The discal range of spots is normally angled in space 2. On the hindwing there is a minute to small black spot in the anal angle, in addition to the main black eyespot of space 2. Both contain metallic scales and are crowned with red.

*Female upperside:* The two female specimens available differ, representing a dark and a light form. The ground colour is a dusky blue; the light female has whitish scaling at the edge of the blue scaling, resulting in much more contrast between blue and dark brown areas. The forewing costa is dark brown and there is a dark margin of about 3.5 mm width along the margin, divided into two by traces of lighter lunules. There is a prominent end-cell spot which in shape is distinctly sagittate. The hindwing is marked as normal in female *Lepidochrysops*. There is no trace of an end-cell spot, but the underside markings in spaces 3 and 4 are indicated with dark scaling. The black spot in space two is prominently crowned with orange and there are traces of orange scaling also in space 3. The hindwings have the cell and spaces 1–5 dusted with blue, but there is no trace of blue in the remaining costal region. As in the male the scaling is so dense that the wing is totally opaque – in contrast to species such as *polydialecta* Bethune-Baker.

*Female underside:* As in the male, but lighter, especially in the lightest of the two specimens.

*Male genitalia:* The general configuration of the male genitalia is typical for the genus. However, the broadly cut tip of the valve is unusual and was verified in two specimens. It will be noted that the shape of the valves differs markedly from that of *L. arabicus*. There is known to be

some variation in the shape of valves within species of *Lepidochrysops*, but in my limited experience with the genus both Stempffer and Tite (personal communication and various papers) underestimated the potential value of the male genitalia in this difficult genus.

*Male holotype*: Yemen Arab Republic, Ibb Province, foot of Jabal Sumara, ca 2 km NE of Dalil Village (14°07' N, 44°14' E), ca 1900 m. T. B. Larsen leg. 18.v.1980. (Coll. British Museum (N.H.)).

*Paratypes*: 12 ♂♂ and 2 ♀♀. Same locality, same date.

Examination of the Arabian material of *Lepidochrysops* in the British Museum (Natural History) shows that Gabriel's designated allotype of *L. arabicus* is in fact a specimen of *L. forsskali*. So are all the specimens from Dhala and a few from "el Kubar". Unfortunately d'Abrera (1980) illustrates three specimens of the present taxon as *L. arabicus*.

I take pleasure in dedicating this beautiful Lycaenid to the memory of Peter Forsskål, the botanist of the Danish expedition to Arabia Felix. On July, 3rd, 1763, suffering from malaria, he was carried on a stretcher within sight of the type locality. He died a week later at Yarim, 30 km further along the Sana'a Rd.

I found this butterfly on a 45° slope covered with low vegetation, including a pretty red-flowered *Hibiscus* and the food plant of *forsskali*, tentatively identified as *Becium serpyllifolium* (but possibly an *Ocimum*). Both plants are among the type of Labiatae on which the *Lepidochrysops* are known to feed. I saw one female ovipositing. The males were patrolling at furious speed close to the ground; when I was able to catch as many as 15 on this almost unmanageable hillside it was due to the fact that the butterflies flew in a straight line, and it was possible to estimate a point of interception well in advance. Their brilliant blue colour made them seem larger than they actually were. The total area inhabited by the species was not more than 1000 m<sup>2</sup>.

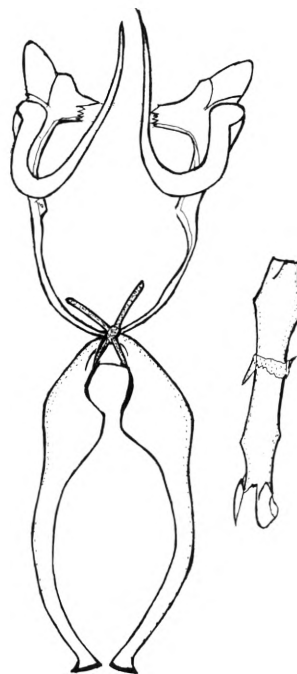


Fig. 10. Male genitalia of *Lepidochrysops forsskali* sp. nov. (Coll. T. B. Larsen, no. ASD).

#### *LEPIDOCHRYSOPS* sp.

Khamis Bani Saad.

New to Arabia; probably new to science.

Plate 2

I caught a single female of a species of *Lepidochrysops* on a rocky hill-side at lower levels than the localities in which *L. arabicus* and *L. forsskali* were found. It differs from *arabicus* in its very light underside and in the absence of black discal markings beyond the cell spot on the forewing upperside. It comes closer to females of *forsskali*, but differs as follows: smaller size (FW 19mm); underside colour generally lighter; upperside ground colour lighter with more extensive white marginal and submarginal lunules; forewing cell spot narrow and not sagittate as in all specimens

of *forsskali*; underside of forewing has very small discal spots, arranged in a continuous curve and not angled in interspace 2 as in *forsskali*; underside of hindwings with a prominent black spot in space 2, but not a small black spot with metallic scales in space 1 which is present in all specimens of *forsskali* and *arabicus*. It is not possible to make a confident attribution of this butterfly on the basis of a single female.

*EUCHRYSOPS OSIRIS* Hopffer 1855

*Ber. Verh. Akad. Wiss. Berlin*: 642

Ghawadir, Wadi Dhabab, Wadi Dur, Dalil, Suq as Sabt, Wadi Sughna, Mafhaq, Wadi Annah.

*Scott & Britton*: Ghailama.

Occasional records of *E. cnejus* Fabricius, an Oriental species, from Aden (e.g. Yerbury 1893) is due to confusion with *osiris*, which is superficially similar but whose genitalia are very different. I never found *osiris* common in West or East Africa and was rather surprised to find it widespread and sometimes abundant in Yemen; in Dhofar it was normally present in restricted numbers. At Wadi Dur I saw many specimens at water. At Wadi Annah I found a female ovipositing on *Becium filamentosum* (Labiatae) which confirms my impression that it was feeding on a species of *Becium* (n. sp., being described by A. Miller, Royal Botanical Garden, Edinburgh) in Dhofar. At Suq as Sabt I found a female ovipositing on a plant tentatively identified after photographs as *Ocimum hadiense* (Labiatae) by John Wood.

*EUCHRYSOPS MALATHANA* Boisduval 1833

*Faune Madag.*: 25.

Suq as Sabt.

New to Yemen.

This widely distributed African butterfly has been recorded from Aden and other localities in the PDRY on a number of occasions. I had ex-

pected to find this species, but I was surprised to find it in an undisturbed habitat, since it is often most common in cultivated areas in Africa. A male was captured. The single specimen is clearly referable to this species rather than to *E. nilotica* Aurivillius which despite its treatment as a form of *E. malathana* for more than sixty years is a perfectly valid species.

*EUCHRYSOPS PHILBYI* Gabriel 1954

*BMNH Exp. SW Arabia*, 1: 386.

Jabal Dawran, Jabal Bada'an, Suq al Khamis.

*Scott & Britton*: Jabal Masnah, Jabal Kohl, Ghaiman, Asr.

This Arabian endemic is one of the few tropical species which is effectively limited to the montane zone of the high mountains in Yemen and Asir. All records are from 2500 m+ where the butterfly is found on bare, stony hillsides, often together with *Melitaea deserticola*. The flight is fast and very close to the ground, so although the species is relatively common and numerous it is very difficult to collect an adequate series. I failed to take any males, so unfortunately I cannot depict the genitalia. Gabriel suggested it was allied to *E. kabrosae* Bethune-Baker from the East African mountains.

*FREYERIA TROCHYLUS TROCHYLUS* Freyer 1844

*Neu. Beitr. Schmett.*, 5: 98.

Hizyaz, Mafhaq, Dawran, Suq al Khamis, Ghawadir, Mishrafa, Dalil, Suq as Sabt, Medina el Abid.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Ghaiman, Taizz, Usaifira, Hada, Jabal Sumara, Wadi Dahr, Beit Baus, Errein, Jabal Kohl.

This widespread little butterfly is common throughout Arabia and in Yemen. It usually lives in little colonies wherever there are suitable food

plants, chiefly *Heliotropium* (Boraginaceae) and *Indigofera* (Leguminosae). I found it associated with *Heliotropium* at Ghawadir and with *Indigofera* at Suq as Sabt.

## HESPERIIDAE

### Coeliadinae

*COELIADES ANCHISES ANCHISES* Gerstaecker  
1871

*Decken's Reise Ost-Afr.*, 3: 374.

*Rathjens & Wissmann*: Sana'a.

The only Yemeni specimens were collected from Sana'a between 25.vi and 11.vii. 1931. There are a few records from the PDRY, especially from near Aden. The specimens from Aden are clearly referable to the nominate subspecies with the broad well developed white band on the underside of the hind-wings. In Dhofar and in northern Oman ssp. *jucunda* Butler with reduced white markings is locally abundant, feeding on *Acridocarpus orientalis* (Malpighiaceae) (Larsen 1977). Ssp. *jucunda* was described from Socotran specimens. Sana'a is the last place in Yemen where I would have expected this butterfly which I never met with personally in many places where I would have expected it. Sevestopulo (1975) listed *Marsdenia* (Asclepiadaceae) as the food plant of *anchises* in East Africa.

### Pyrginae

*SARANGESA PHIDYLE* Walker 1870

*Entomologist*, 5: 56.

Wadi Dhabab, Wadi Dur, Dalil, 30 km S of Ibb.

*Scott & Britton*: Taizz.

The names *eliminata* Holland and *deserticola* Rebel have often been applied to Arabian populations of this butterfly but should be considered synonyms. The use of the name *djaelaetae* Wallengren

is due to misidentification. I did not find this species very common in Yemen, certainly less so than in Dhofar. Only in some steep wadis S of Ibb did I find it in large numbers. At 09.00 no less than 13 specimens were sitting with the wings flat on the roof and sides of one open cave where they must undoubtedly have roosted during the night since it was too early for them to start actively seeking shade from the sun.

*SPIALIA SPIO* Linné 1767

*Syst. Nat.*, ed. XII: 796.

Wadi Dahr.

*Scott & Britton*: Wadi Dahr.

This common African species flies throughout the continent in a single subspecies; Yemeni specimens in no way differ. There are only three records of *spio* from Arabia, the two referred to above and a pair from the Wadi Hadhramaut (de Jong 1978). I collected only two males, bringing the known Arabian material to five. I was surprised not to find it in many of the localities which I visited and which, judging from my experience in both East and West Africa, should be quite suitable. The agricultural area at high altitude at Wadi Dahr was the last place I would have expected to find it. It feeds on species of Malvaceae (e.g. *Altheae*, *Hibiscus*, *Pavonia*, and *Sida*) and these are available throughout Yemen.

*SPIALIA DIOMUS DIOMUS* Hopffer 1855

*Ber. Verh. Akad. Wiss. Berlin*: 643.

Mafhaq.

*Scott & Britton*: Hada.

The Arabian specimens of this butterfly belong to the populations stretching from Mauretania to Arabia and south to Tanzania; in southern Africa it is replaced by ssp. *ferax* Wallengren. Like *spio* it appears to be relatively rare; apart from a mention from PDRY by Evans (1937), Gabriel's series from PDRY and a single specimen from Hada are the first to appear in print. My single specimen

was collected in a shallow, dry wadi where *S. colotes* was common. Again the question of food plants is not responsible for the apparent rarity of *diomus* in Arabia; the larva has been known to feed on *Hermannia* (Sterculiaceae), *Sida*, *Hibiscus*, *Pavonia* (Malvaceae) and *Triumfetta* (Tiliaceae) (Murray 1959, Sevastopulo 1975).

*SPIALIA DORIS DORIS* Walker 1870

*Entomologist*, 5: 56.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Asr.

Although I was keeping a special watch for species of *Spialia* I failed to find three of the species, including *doris* which generally speaking is the most common and certainly the most widely distributed of the Arabian species. *S. doris* is essentially an eremic species and it may be that the species is found more frequently in the eastern part of Yemen than in the tropical regions where I spent my time. There are, however, numerous records from PDRY. The food plants are desert species of *Convolvulus* (Convolvulaceae).

*SPIALIA COLOTES SEMICONFLUENS* de Jong 1978

*Tijds. v. Ent.*, 121: 58.

Hizyaz, Mafhaq, Jabal Dawran, Ghawadir, Mishrafa, Ibb, Jabal Bada'an, Wadi Dur, Wadi Annah, Wadi Sughna, Suq as Sabt.  
New to Yemen.

In his revision of the African *Spialia*, de Jong (1978) included Arabian material in his new subspecies *semiconfluens*, characterised by the fusing of the discal spots on the underside of the hindwings to an irregular band. My extensive material from Dhofar and Yemen match this description, though all my specimens have much more clearly defined white submarginal spots on the upper side of the wings than the specimen depicted by de Jong (plate 2, figs 13–14). The valve of the male

genitalia has a triangular rather than an ovoid shape, tapering towards the apex. The Arabian populations may deserve subspecific status. Considering that it has not previously been recorded from Yemen, I was surprised to find it generally distributed from low levels to well over 2000 m in a wide variety of habitats. It was most frequent in shallow wadis in open scrub, defending a chosen territory from a vantage point on a stick or a rock; whether at 400 m or at 2500 m where the vegetation varies considerably, the visual aspect of its biotope was similar. Only at Wadi Dur did I find it a wet area with lush vegetation.

*SPIALIA MAFA HIGGINSI* Evans 1937

*Cat. Afr. Hesp.*; 62.

*Scott & Britton*: near Ibb, Sana'a, Hada.

Nominate *mafa* Trimen is from South Africa; ssp. *higginsii* is found in East Africa and southern Arabia. The species is well adapted to arid conditions and I am not surprised that it was collected near Sana'a, some of the specimens in lucerne fields. I failed to find it. The food plant of the nominate subspecies in South Africa is *Hibiscus aethiopicus* (Malvaceae).

*SPIALIA MANGANA* Rebel 1899

*Anz. Akad. Wiss. Wien*, 36: 360.

*Scott & Britton*: Taizz.

This skipper is limited to Ethiopia, Somalia, southwestern Arabia and Dhofar. Very little is known about it, but in all probability it is limited to dry localities, behaving much as the other species of the genus. Scott & Britton captured four specimens in PDRY and one in Yemen; P. Granville White caught a single specimen in Dhofar. There are no other published records from Arabia and I failed to find it in both Dhofar and Yemen. Rebel's types were from Ras Fartak in the Hadhramaut region.



*GOMALIA ELMA ELMA* Trimen 1862

*Trans. ent. Soc. London*: 288.

Wadi Dahr, Suq as Sabt.

New to Yemen.

I have elsewhere (Larsen 1980) indicated my reasons for considering Arabian material of this butterfly to be allied with the African *elma* rather than with the Indian *albofasciata* Moore, despite the fact that they were so treated by Evans (1937). It appears to be a somewhat sporadic butterfly in Arabia, from where it is so far known between Oman and Yemen, though K. M. Guichard (pers. comm.) believes he has seen an example from Saudi Arabia. I caught only a single specimen in each of the two localities cited, one in agricultural lands (a qat plantation) and the other in dense riverine forest. I found it feeding on *Abutilon* in Oman and all other records I have seen have been from the same plant (Malvaceae).

*CARCHARODUS ALCEAE WISSMANNI* Warncke 1934

*Mitt. Münch. ent. Ges.*, 24: 20.

Sana'a, Wadi Dahr, Jabal Sabr, Jabal Bada'an, Suq al Khamis.

*Rathjens & Wissmann*: Sana'a. *Scott & Britton*: Sana'a, Hada, Kaulat al Asakeir, Wadi Dahr, Mighyal al Alaf. *Carden*: Sana'a.

This little Palaearctic skipper is locally common, mainly in and around agricultural areas where its food plants, species of *Malva* (Malvaceae), grow. De Jong (1974) pointed out that the genitalia of North African *alceae* differed from those of the other subspecies and later (1978), following field investigations, he raised it to specific rank as *C. tripolinus* Verity. The genitalia of ssp. *wissmanni* clearly demonstrate that it is not related to the North African taxon, but to the Mediterranean, Iranian and especially Afghan populations.

## Hesperiinae

*PELOPIDAS THRAX THRAX* Hübner 1821

*Samml. Exot. Schmett.*, pl. 150.

Khamis Bani Saad, Ghawadir, Wadi Dur, Wadi Annah.

New to Yemen.

This butterfly is common through much of Arabia and is probably slightly migratory (Larsen 1976a). It was bound to be found in Yemen eventually, though I did not find it common. In Oman it is essentially an oasis insect but the ecological conditions in Yemen are such that it can survive in the more wooded parts of the country. It still seems to be most at home in dense agricultural areas, such as the coffee plantations of Wadi Dur and Wadi Annah. It was a frequent visitor to water. Specimens of both sexes sought the shade of caves and overhanging rock during the heat of the day.

*PELOPIDAS MATHIAS MATHIAS* Fabricius 1798

*Ent. Syst. Suppl.*: 438.

Ghawadir, Wadi Sughna, Suq as Sabt, Shibam.

*Rathjens & Wissmann*: Sana'a.

There are records of this butterfly from most of the southern half of Arabia, but it is generally speaking not common. In habits and choice of habitat it closely resembles the preceding species and it is not uncommon to find them flying together.

*GEGENES HOTTENTOTA* Latreille 1823

*Enc. Meth.*, 9: 777.

Wadi Dur, Wadi Sughna.

*Scott & Britton*: Usaifira, Hammam Ali.

This skipper is characteristic of the wetter savanna zones of Africa and has been caught rarely in Arabia; Scott & Britton were the only ones to capture it. I took only five or six specimens all in the immediate vicinity of flowing water sur-

rounded by coffee plantations. They have a rapid flight close to the ground and are very wary; it is far from easy to collect an adequate series unless they are attracted to flowers.

*GEGENES NOSTRODAMUS* Fabricius 1793

*Ent. Syst.* 3: 328.

Ubal.

*Rathjens & Wissmann: Sana'a.*

The Arabian literature discusses whether Aden specimens belong to the nominate subspecies or to ssp. *karsana* Moore from NW India. Individual variation in all populations is so great that I share the view of Evans (1937) than no subspecies of *nostrodamus* should be recognised. Contrary to the two other Arabian *Gegenes*, *nostrodamus* is an essentially Palaearctic butterfly. However, it descends to the level of Kharthoum along the Nile Valley. In the tropics it is essentially an oasis insect. The single male specimen which I caught differs from most in having traces of the female white spots on the forewing upperside. It appears to be a scarce species in southwestern Arabia; it may be very numerous in the Nile Valley.

*GEGENES PUMILIO* Hoffmannsegg 1804

*Illig. Mag. Insektenkunde*, 30 203.

Dalil.

New to Yemen. Not previously recorded from southwestern Arabia.

Normally African *pumilio* is referred to ssp. *gam-*

*bica* Mabille, but apart from the locality label there are no firm distinguishing characteristics. Splitting the species into a Mediterranean *pumilio* and an African *gambica* also obscures a more interesting and important issue. The chromosome number of undoubted *pumilio* from Nice is  $n=24$  (de Lesse 1960), which is also true of *pumilio* from Algiers (de Lesse 1967); undoubted *pumilio* from near Adana in Turkey has a chromosome number of  $n=41$  (de Lesse 1960 (identity of the specimen verified by me)) and this is the case in several specimens from Beirut determined by me (but not included in my paper on the chromosomes of Lebanese Rhopalocera (Larsen 1975)). Confusion with *G. nostrodamus* can be ruled out since this species has a chromosome number of  $n=15$  (Larsen, unpublished, Cairo; Saitoh 1979, Dead Sea area). I caught a single specimen of this butterfly at Dalil and Saitoh determined its chromosome number as  $n=41$ , i.e. the same as for the East Mediterranean populations. Most of the available names for *pumilio*, which obviously covers at least two taxa, are from Italy. It is therefore impossible to determine the correct nomenclature of the taxa until chromosome counts from Italy and Yugoslavia are available. Until recently *pumilio* was not known from Arabia. P. Granville White caught specimens in Dhofar in 1977, and in 1979 I caught it in both northern Oman and on the Musandam Peninsula (Larsen and Larsen 1980). It has now been recorded also in southwestern Arabia. Rebel described ssp. *monochroa* from Socotra, but the differences between Socotran and African specimens, if any, are too small to warrant subspecific distinction.

## List of Possible Species

About a dozen species known from other parts of southwestern Arabia are almost certain to be found in Yemen. They are listed below with appropriate comments. However, as stated elsewhere in this paper, the fact that I found eleven species new to Arabia is an indication that more species hitherto unrecorded from the Peninsula will be found. I suspect there may be one or two additional Palaearctic species (*Euchloe crameri* Butler and *Pseudophilotes abencerragus* Pierret are likely candidates) and anything up to a dozen of Afro-Tropical or African montane origin (exactly which species is difficult to predict, but *Zizina antanossa* Mabille is one obvious candidate).

*Colotis pleione* Klug. Known from the area around Jeddah, from Jizan and from Aden. It is certain to occur on the Tihama and elsewhere in its range it is closely associated with *Colotis ephyia* and *Calopieris eulimene*.\*

*Colias erate marnoana* Rogenhofer. An isolated subspecies of this Palaearctic butterfly exists in the Sudan, Ethiopia and Somalia. In 1936 H. St. J. Philby collected a number of specimens in various parts of the Asir mountains, including Abha, Khamis Mushait, Suda and Hada. No-one else has recorded it from Arabia. The species is known to be migratory and the specimens may be the progeny of an invasion from the other side of the Red Sea, but there is little reason why it should not establish itself in Arabia so it may have been overlooked (Jannone 1948).

*Epamera nursei* Butler. This rare butterfly has been collected near Aden and near Jeddah. It is

almost certain to occur in Yemen but is easily overlooked. It was described as a subspecies of *Epamera tajoraca* Walker, but was raised to specific rank by Stempffer (1959).\*

*Deudorix antalus* Hopffer. A few specimens of this butterfly has been recorded from the Asir mountains and from PDRY. It is certain to occur in Yemen. It is probably somewhat migratory and therefore unpredictable. It certainly is not common.\*

*Apharitis acamas bellatrix* Butler. There are records of this butterfly from Asir, Aden, Wadi Hadhramaut, Dhofar, Masirah, northern Oman and near Riyadh. It is an essentially Saharo-Arabian butterfly which must occur in Yemen, especially in the interior, but perhaps on the Tihama.

*Apharitis myrmecophila* Dumont. An uncommon sub-desert butterfly which has been caught in the depths of the Rub al Khali and on the island of Masirah. It almost certainly will be found in the interior, for example at Mareb.

*Spindasis scotti* Gabriel. The unique holotype female was taken in PDRY (Jabal Maf'ari) and it should be looked for in Yemen. Two erroneously determined specimens of *Spindasis somalina* were placed under this species in the British Museum (Natural History) but this was never published as a Yemeni record. They are figured as *S. scotti* by d'Abrera (1980).

*Syntarucus babaulti* Stempffer. This species has been taken in Aden, but not specifically publish-

ed. It is however clear that one of the specimens dissected by Rebel (1907) refers to this taxon. It usually flies with the other *Syntarucus*.

*Euchrysops lois* Butler. This unusual butterfly has been taken in Dhofar, the Wadi Hadhramaut, the Aden Protectorate and Somalia. It may well occur in the drier mountains of Yemen.\*

*Chilades parrhasius* Fabricius. Common in eastern Arabia and Oman. Recorded from the Aden area. It might just be found in Yemen.

*Borbo borbonica zelleri* Lederer. There are doubtful records of this migrant species from Arabia, but leaving aside the doubts, the species is almost certain to occur in Arabia, including Yemen, at least occasionally.

*Borbo gemella* Mabille. Gabriel (1954) reports a single specimen from the southern Asir, the only record from Arabia. The presence of *gemella* in Arabia would not be very surprising.\*

\* Species subsequently recorded from Yemen (see postscript below).

## Postscript

While this manuscript was in press I had the good fortune to visit the Yemen Arab Republic for the second time. The results of this trip will be incorporated into my monograph on Arabian Butterflies currently in press with Stacey International. In the interest of completeness it is worthwhile noting that the following taxa new to Arabia were found:

*Stonehamia varanes vologeses* Mabille, *Chloroselas* sp. nr. *esmeralda* Butler, *Deudorix dinochares* Smith, *Anthe* sp. nov., *Tarucus grammicus* Grose Smith, *Zizina antanossa* Mabille, *Caprona pillaana* Wallen-

gren and *Baoris fatuelles fatuellus* Hopffer. In addition the following species, known from neighbouring countries, were collected as new to Yemen: *Colotis pleione pleione* Klug, *Epamera nursei* Butler, *Deudorix antalus* Hopffer and *Borbo gemella* Mabille. Dr. Emilio Balletto of Genua kindly communicated to me a small collection from Yemen which contained *Euchrysops lois* Butler as new to the country. The species collected are not all that surprising though it is remarkable that *Stonehamia varanes* has escaped discovery till now. The results of my second visit do not materially alter the general conclusions given in this paper.

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## Appendix. By A. H. B. RYDON

Taxonomic notes on some members of the *Charaxes viola* group,  
with descriptions of three new species from Yemen Arab Republic and Ethiopia.  
(Lepidoptera: Nymphalidae, Charaxinae).

*CHARAXES BERNSTORFFI* Rydon sp.n. (Pl. 3, figs. 1, 2; text-figs. 1, 2, 5).

This new species of *Charaxes* Ochseneimer is represented by four battered males which were collected by Mr. T.B.Larsen at Suq as Sabt, Jabal Bura, Yemen Arab Republic, on the 28th May 1980. It is the first time that a member of the so-called "black" *Charaxes* complex of the Afrotropical region has been found in Arabia and therefore it is of particular interest to students of African butterflies.

The shape, coloration and markings of the upperside and underside of the wings of *bernstorffi* place it nearest to *Ch. viola* Butler (1865: 627) and its subspecies – a far-ranging group of African savanna *Charaxes*, but especially close to *Ch. viola kirki* Butler (1881: 145–146) (vide Pl. 4, figs. 19, 20) and to *Ch. viola suk* Carpenter & Jackson (1950: 98–99) (vide Pl. 4, figs. 23, 24) of eastern Africa, due to the greyness or greyish-drabness of the ground colour of the underside (compared to the brownness or brownish-drabness of *Ch. viola viola* and *Ch. v. picta* van Someren & Jackson (1952: 263) (vide Pls. 3, 4, figs. 5–8, 15, 16), the latter taxon being closely related taxonomically to the former) and to the strongly falcate forewing the termen of which, however, is more emarginate than in *kirki* or *suk*, but with the apex blunter and less produced than in *suk*.

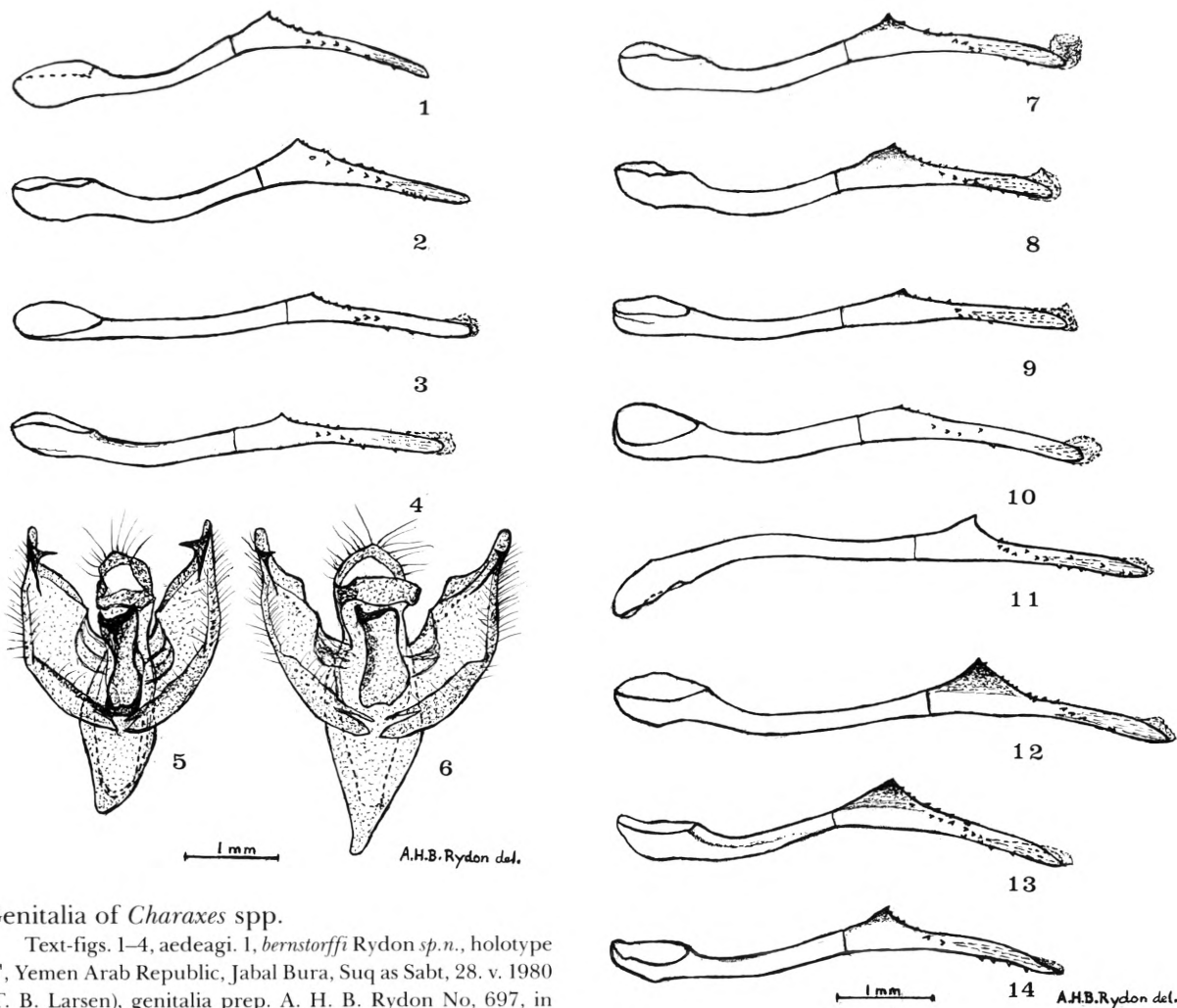
An examination of the genitalia of *bernstorffi* (text-figs. 1, 2, 5) shows that they have a similar structure to those of *Ch. viola viola* (text-figs. 3, 4, 6), in that the valves are relatively broad and have their apex produced into a lobe at the base of

which there is a large inward-pointing hook – a common feature of the "black" *ethalion-etheocles-viola* group of African *Charaxes*, but the saccus is shorter and blunter than in *viola viola*, and the aedeagus (text-figs. 1, 2), though varying a little in length (i.e. 4,7–5,0 mm) and in the number of smaller spines running posteriad from the main spine (situated on the dorsal side of the aedeagus distal to the anellus), is quite unlike that of *viola viola* (text-figs. 3, 4) in which the main spine is much reduced in size; if anything, the aedeagus of *bernstorffi* is closer to *kirki* and *suk* than to *viola viola* or *v. picta* (from "West Africa" and Uganda respectively) (cf. text-figs. 1–4, 9, 12, 13).

For the above reasons I am treating *bernstorffi* here as a good species, though belonging to the *Charaxes viola* group (*s.l.*).

Holotype ♂: head, palps, thorax and abdomen black above, with a white spot in front of and behind the base of each antenna – a characteristic feature of the genus; eyes brown, with some white scaling behind them; the underside of the palps creamy-white or creamy-buff, as are the forelegs also; thorax light grey below, with the mid and hind legs creamy or buffy white; abdomen whitish below.

*Upperside.* Ground colour of both wings black, with a dark blue-violet sheen. Forewing: subapex with a white spot in space 7 and in space 6, with a suggestion of a third one in space 5; a bluish-white postdiscal spot in 6, with another faint one below it in 5, and a pale blue spot at the apex of the cell; outer margin narrowly drab between the darker vein-endings.



### Genitalia of *Charaxes* spp.

Text-figs. 1-4, aedeagi. 1, *bernstorffi* Rydon *sp.n.*, holotype ♂, Yemen Arab Republic, Jabal Bura, Suq as Sabt, 28. v. 1980 (T. B. Larsen), genitalia prep. A. H. B. Rydon No. 697, in BMNH. 2, *bernstorffi*, paratype ♂, same locality, date and collector as the holotype, genitalia prep. A. H. B. Rydon No. 715, in BMNH. 3, *viola viola* Butler, putative ♂, Sierra Leone, Giberea, 2. vi. 1912 (J. J. Simpson), genitalia prep. R. L. Smiles No. 231. 4, *viola viola*, putative ♂, Ghana (Gold coast), genitalia prep. R. L. Smiles No. 232, in BMNH.

Text-figs. 5, 6; genital armatures without their aedeagi; ventral view to show the structure of the valves, etc. 5, *bernstorffi*, holotype ♂, same data as text-fig. 1. 6, *viola viola*, same data as text-fig. 3. A. H. B. Rydon del. (The genitalia of *bernstorffi* are somewhat variable, as can be seen from comparing the two aedeagi figured above (text-figs. 1, 2), the first being shorter (4.7 mm in length) compared with the second one which is 5 mm long, the former also being less heavily spined along its posterior third than the latter. The uncus, gnathos, saccus and costa of the valves of two of the allotypes of *bernstorffi* (not figured above) differ a little from those of the holotype (text-fig. 5), being nearer in appearance to those of *viola viola* (text-fig. 6) but are generally smaller than the latter.)

Text-figs. 7-14, aedeagi (cf. text-figs. 1-30 in Pt. V of van Someren's "Revisional Notes on African *Charaxes*", 1969). 7, *figinii* van Someren (= *etheocles* ♂ f. *figinii* Storace) *stat. n.*, Eritrea, Setit, El Eghin, ii. 1906 (D. Fignini), genitalia prep. R. L. Smiles No. 223, in Genoa Museum. 8, *larseni* Rydon *sp.n.*, S. W. Ethiopia, Jambo, Nanji Hill, 13. v. 1901 (O. Neumann), genitalia prep. R. L. Smiles No. 224, in BMNH. 9, *viola picta* van Someren & Jackson (= *etheocles* ♂ f. *picta* Rothschild), Uganda, Unyoro, Kosokwa, 25. viii. 1897 (Dr. Ansorge), genitalia prep. R. L. Smiles No. 235, in BMNH. 10, *smilesi* Rydon *sp.n.*, S. W. Ethiopia, Jimma (Djimma), Kankati, 15-18. v. 1925 (O. Neumann), genitalia prep. R. L. Smiles No. 228, Rothschild Bequest 1939-1, in BMNH. 11, *daria* van Someren & Jackson (= *etheocles* ♀ f. *daria* Rothschild & Jordan), *stat. n.*, S. E. Ethiopia, Gillett Mts. (1900-2200 m), i.vii. 1900 (von Erlanger & Neumann), genitalia prep. R. L. Smiles No. 227, Rothschild Bequest 1939-1, in BMNH. 12, *kirki kirki* Butler, *stat. rev.*, Tanzania, Arusha (A. H. B. Rydon), genitalia prep. A. H. B.

Hindwing: a faint postmedial bluish-green lunulate line is present between veins 2–6, distad of which there is a submarginal series of small discrete bluish-white interneural linear marks in 1c–7, which are separated from the admarginal dentate band by the black ground colour, the admarginal band itself being light ochreous-buff (with a trace of red scaling at its centre) from just below vein 8 as far as vein 4 and greenish from there to the anal angle, with the ochreous-buff of the upper part of the band extending down both tails, and the greenish band at the anal angle having two black spots in it and being outlined proximally by the bluish-white submarginal linear marks already referred to above; abdominal fold greyish-drab, but a lighter colour along its inner margin; outer margin of wing black, with the fringe white between the vein-endings.

*Underside.* Forewing: ground colour greyish-drab, with the subapical and postdiscal white or bluish-white spots of the upperside reproduced below as pale whitish marks, and with the transverse black wavy lines in the subbasal and discal areas boldly marked, the medial series of lines being narrowly outlined on its outer side by the pale greyish-drab ground colour, external to which the wing becomes pale brownish-drab as far as the postmedial black lunulate line (which expands into a black dot in 1b), distal to which there is a series of submarginal macules, the double macule or “eye-spot” in 1b being large and blackish, the one in 2 being brownish-drab with a black spot at its outer edge, and those in 3–5 also brownish-drab, becoming indistinct as they continue to the costa, the wing being pale greyish-drab from the latter macules to the outer margin.

Hindwing: ground colour of the basal half of the wing light greyish-drab, crossed by thin discontinuous wavy black lines in the basal, discal and medial positions, the discal and medial lines enclosing a wavy drab band which is outlined distally by the lighter greyish-drab ground colour (most noticeably so from the costa to vein 6, then in spaces 4–2, and again from vein 2 to the inner margin where the wavy black median line ends), external to which the ground colour of the wing becomes a pale brownish-drab and is crossed by an incomplete black scalloped line (which is an extension of the postmedial black lunulate line of the forewing, already mentioned above) running down the wing from vein 8 to vein 5, then fading out in the middle of the wing until it appears again in space 1c as a short curved black line, just basad of where the brownish lunulate line (an extension of the submarginal pale brownish macules of the forewing) meets the inner margin; from the latter brownish lunulate line the ground colour becomes pale greyish-drab and is crossed by a submarginal series of faint whitish interneural streaks in spaces 7–1c (representing the bluish-white linear marks of the upperside), which are themselves narrowly outlined on their outer side by pale greyish streaks in 7–4, and by small black dots in 3–1c, the latter dots being incorporated in the admarginal dentate band which is greyish-green from the anal angle as far as vein 4 and pale ochraceous-buff from there to vein 6, with a trace of the same colour at the end of vein 3 and down both tails (i.e. on veins 2 and 4 respectively), and with some reddish scaling in the middle of the ochreous-buff band between veins 5 and 6, the reddish scaling extending as far as vein 8; the outer margin of the wing greyish, with the fringe whitish between the vein-endings.

Variation among the four males: the holotype ♂, described in some detail above, appears to be the freshest specimen, though its right forewing is slightly malformed, and the outer third of its right hindwing is missing (presumably amputated by a bird or lizard). The three paratypes

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Rydon No. 178, in coll. A. H. B. Rydon. 13, *kiriki suk* Carpenter & Jackson, *comb. n.*, N. W. Kenya, Kongalai (4,500'), i. 1973 (S. C. Collins), genitalia prep. A. H. B. Rydon No. 729, in Coll. A. H. B. Rydon. 14, *chanleri* Holland, *stat. rev.*, paratype ♂, East Africa (Kenya). Jombene Range, Chanler-Höhnell Expedition, genitalia prep. R. L. Smiles No. 271, ex coll. V. G. L. van Someren, in BMNH.

have much the same pattern and colouring on the upperside of the wings as in the holotype, except that the white subapical spots of the forewing are slightly reduced in size in two of the males, and the postdiscal spot in space 5 is either missing or indistinct, as is also the bluish spot at the apex of the cell. In one of the males, with a more or less intact hindwing, the admarginal dentate band is light ochreous-buff from veins 4–6, but does not have any red scaling at its centre, unlike the holotype. The underside of two of the paratypes differs from that of the holotype in being uniformly pale greyish-drab, with the transverse wavy black lines in the subbasal and discal areas less boldly marked in the forewing and scarcely visible in the hindwing, and the postmedial black lunulate or scalloped line very faint in the forewing and absent, or only to be guessed at, in the hindwing. The “eye-spot” in 1b at the tornus of the forewing (consisting of two black conjoined spots) is, however, present in all the males.

Type data: expanse of holotype 51 mm; length of left forewing 29 mm. Average expanse of holotype and two paratypes 51 mm; average length of right forewing of two paratype males 30 mm; average antenna-wing ratio of holotype and two paratypes 0.43; width of forewing (from tornus to the middle of the costa) of three males 19 mm; length of upper tail 7–5 mm and that of lower tail 5–4 mm (measured on their costal and anal sides respectively).

Holotype ♂: Yemen Arab Republic, Jabal Bura, Suq as Sabt (900 m), 28.v.1980 (T.B.Larsen), genitalia preparation Rydon 697. To be deposited in the BMNH. Paratypes: 3♂♂, same data as the holotype, but one of them has been dissected by the author (i.e. genitalia preparation Rydon 715) and one by Mr. Larsen.

*Remarks:* Mr. Larsen tells me that he has seen the putative female of *bernstorffi* on the wing, and that it has a yellow band in the forewing and a white one in the hindwing on the upperside, which is not surprising in that the females of *viola viola*, *v.picta*, *v.suk* (i.e. ♀f. *kirkoides* Carpenter &

Jackson (1950: 98)) and *v.kirki* all have some yellow or ochreous-yellow in the forewing and a white band in the hindwing. However, *v.suk* also has other forms of female, including a white-banded form (i.e. ♀f. *achaemenesopsis* Carpenter & Jackson (1950: 99)), as does *v.kirki* (i.e. ♀f. *handari* Poulton (1926: 555)); as the females of the “black” *Charaxes* often mimic the commoner and/or larger species of *Charaxes* flying with them, it is possible that a white-banded female form of *bernstorffi* may also occur in the Yemen Arab Republic owing to the presence there of the larger *Ch.hansali* Felder. It will also be of interest to see whether the median band in the hindwing broadens out or becomes narrower as it runs from the costa towards the inner margin of the wing. The females of the East African congeners of *bernstorffi* (i.e. *kirki*, *suk*, *chanleri* Holland (1896: 262, 753) and *daria* van Someren & Jackson (1952: 264)) have the hindwing band narrower in space 1c than at the costa, as opposed to the females of the more western taxa such as *viola viola* and *viola picta* (and also one of the outlying members of the *viola* group that occurs in South Africa, namely *Ch.vansonii* van Someren (1975: 108)), in which the median light band of the hindwing is broader in 1c than it is at the costa. (Vide Pl. 5, figs. 25–34).\*

\* Since writing these notes, Mr. Larsen has secured a specimen of the presumptive female of *bernstorffi* (vide Pl. 5, figs. 35, 36). It matches the description already given of it by Mr. Larsen when he saw it on the wing, in that the median band in the forewing is light buff-yellow and the band in the hindwing whitish from the costa to vein 6 and pale whitish-yellow from there to space 1c. (The median band in the hindwing also has some light grey scaling on its inner side from vein 6 to the middle of space 1c, which makes the band appear to be broader than it really is.) The forewing band being broader than the hindwing band places the putative female of *bernstorffi* nearer to *kirki*, *suk* and *chanleri* than to *viola viola* or *v.picta*, and especially to *chanleri* (as figured by van Someren, 1969, Pl. 20, figs. 189, 190), but the median band of *bernstorffi* is narrower than in *chanleri* and especially so in the hindwing where it is more wavy and noticeably narrower between veins 6–4 than in *chanleri*. The pattern of the underside of the female of *be-*

*Discussion.* In order to place *bernstorffi* correctly among its congeners, it was necessary to compare it also with *Ch.viola figinii* van Someren (1969: 149, footnote; map 6, opposite p. 132) from West Eritrea, and with *viola daria* from S. E. Ethiopia, both of which taxa are geographically nearer to *bernstorffi* than are *viola viola*, *v.picta*, *v.chanleri*, *v.kirki* and *v.suk*. Dr.Poggi of the Natural History Museum, Genoa, kindly sent me the holotype of *figinii* for comparison with *bernstorffi*. *Ch. figinii* (vide Pl. 3, figs. 3, 4) was originally described as a ♂ form of *Ch.etheocles etheocles* (Cramer, 1777) by Storace (1948: 139) but was raised to a subspecies of *viola* by van Someren in 1969, as indicated above; however, an examination of its aedeagus (text-fig. 7) shows that it is nearer *bernstorffi* (text-figs. 1, 2) than to *viola viola* (text-figs. 3, 4), because of the stronger bend towards the anterior end, and the larger, more prominent main dorsal

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*rnstorffi* agrees well with that of the males, except that the light median band of the upperside is also present on the underside (though it is noticeably narrower and more wavy in the hindwing than it is on the upperside) and the dark postmedial lunate line of the hindwing is displaced more basad than in the males. The female of *bernstorffi*, as postulated above, superficially resembles (especially on the upperside) the larger and more powerful *Ch.hansali hansali* which (*teste* Larsen) also flies in the Yemen and which has a broader, pale-yellow, median band than in *hansali arabica* Riley from Dhofar, in S.E.Arabia. There is no doubt in my mind that the female described above and figured in Plate 5 belongs to the male of *bernstorffi* figured in Plate 3, and its distinctiveness, when compared with the other females of the *viola* group, confirms its status as a good species. (It should be noted here that the figures of the female of *bernstorffi* in Plate 5, figs. 35 & 36, are too dark in colour, except for the light median band which is about right; the basal area of the upperside of both wings should be a lighter tone of brown, and the ground colour of the underside of both wings a lighter grey.) Data of the female of *bernstorffi*: expanse of forewings approximately 55 mm; length of right forewing 33 mm; antenna/wing ratio 0,36; length of upper tail 7 mm; lower tail 5–4 mm, as measured on the costal and anal sides of it.

Allotype ♀: Yemen, A.R., Hajjah (900 m), Wadi Sharas, 10.x.1981 (T.B.Larsen).

To be deposited in the BMNH.

spine, in the aedeagus of *figinii*; but the shape, coloration and markings of the upperside and underside of the wings of the latter are quite unlike *bernstorffi*, the forewing being broader, and more produced and pointed at the apex in *figinii* than it is in *bernstorffi*, with the subapical spots in spaces 6 and 7 glaucous and reduced in size in *figinii*, not white and relatively large as in *bernstorffi*. The underside of the wings of *figinii* is a glossy russet-brown, with the subbasal and other transverse wavy blackish lines much less prominent than in the various members of the *viola* group already mentioned above, being represented by a few small black dots in the cell of the forewing and by the narrow black wavy subbasal and medial lines in 1b, and also by a trace of the postmedial lunulate line in 1b, with the double blackish spot (i.e. the “eye-spot”) present at the tornus of the same wing, but with all the lines of the hindwing indistinct, except from space 1b to the inner margin, the brownish ground colour of the underside indicating a closer relationship with *viola viola* and *v.picta* (the type-locality of which is Unyoro, Uganda) than with the *kirki-sukchanleri* group; this apparent relationship, however, is belied by the shape of the forewing, the upperside coloration and the markings, and the shape of the aedeagus. For these reasons I here raise *figinii* to species rank, i.e. *Charaxes figinii* van Someren (1969: 149), *stat. n.*, and I here designate, as its lectotype, the holotype of *Charaxes etheocles* ♂f. *figinii* Storace (1948: 139) the type data of which is as follows: Eritrea, Setit, El Eghin, ii.1906 (D.Figini), in Museo Civico di Storia Naturale, Genova. (Length of right forewing 31 mm; antenna-wing ratio 0.42; width of right forewing (from tornus to the middle of the costa) 20,5 mm; right upper tail 5 mm; right lower tail 5–3,5 mm (measured on its costal and anal sides respectively); genitalia preparation, R. L. Smiles No.223).

Compared with the putative male of *viola daria*, *bernstorffi* is much smaller, and has the white subapical and postdiscal spots relatively larger and

more prominent on the upperside of the forewing, and the ground colour of the underside greyish drab rather than the brownness or brownish-drabness of *daria*, and the tails much longer (cf. Pl. 3, figs. 1, 2, 9, 10). The aedeagus of *daria* (text-fig. 11) is very distinctive in having the main spine inverted (as it is also in other outlying members of the *viola* group in southern Africa and Angola, such as *Ch.vansoni*, *Ch.variata* van Someren (1975: 108) and *Ch.loandae* van Someren (1975: 108), but the main spine of *daria* is larger and its aedeagus is longer than in the latter taxa). For the above reason, I here raise *viola daria* to species rank, namely *Charaxes daria* van Someren & Jackson (1952: 264) (= *Charaxes etheocles* ♀f. *daria* Rothschild & Jordan (1903: 542)) *stat.n.*, and I also hereby designate the holotype female of *Ch.etheocles* ♀f. *daria* (Jabalo Gurgura (7.46N, 41.25E), 15.vi.1900 (Erl. & Neumann), Rothschild Bequest 1939-1, in BMNH) as the lectotype of *Ch.daria* (vide Pl. 5, figs. 33, 34). The latter lectotype was also figured by van Someren (1969, Pl. 20, figs. 185, 186), as was a “typical” (*sic*) ♂ (*ibid.*, fig. 187) from the Gillett Mts. (7.30N, 40.30E), in S.E.Ethiopia, which are, in fact, quite close to the type-locality of the lectotype female. However, van Someren & Jackson (1952: 264) actually made a male that had been captured in June 1941 at Adola, in southern Ethiopia, by M. S. Berkeley, the “neallotype” of their “*viola daria*”; but Adola is much further away from the type-locality of *daria* (i.e. Jabalo-Gurgura) than are the Gillett Mts. and an examination of its aedeagus reveals that it does not have the inverted main spine of putative *daria*, but rather a shorter aedeagus, with a small dorsal spine (much as in *viola viola* and *viola picta*), but with the shaft of the aedeagus broader and generally more solid in appearance than in the latter two taxa (cf. text-figs. 3, 4, 10, 11). There are two other males in the collection of the BMNH, with a similar aedeagus to that of the so-called “neallotype” of *daria*, from Jimma (Djimma), in S. W. Ethiopia, which indicates that we are dealing with a distinct species. (Previously these males had

been lumped with an assortment of “black” males from Ethiopia in the BMNH collection under the general heading of “*viola daria*”, some of which, from an examination of the genitalia, belong to the *viola suk* “aggregate” of van Someren (1969: 132), and some to the *viola viola/viola picta* complex (*q.v.*) among others. Without an examination of their genitalia, it is virtually impossible to tell these males apart, since one has to take into account the possibility of natural variation producing dissimilar males; however, armed with the knowledge that one is dealing with dissimilar species, and not just varieties of the same species, one is then able to see which characters distinguish one species from another; in other words, one has first to know for sure (i.e. by rearing them *ex ovo*, or by an examination of their genitalia) that the males represent different species before one can separate them from one another!). As the Jimma males clearly represent a distinct species, it is now necessary for me to describe it here, and I have pleasure in naming it in honour of Mr. R.L. Smiles of the BMNH, who has kindly done a number of genitalia dissections for me recently on the *viola* group (*s.l.*).

*CHARAXES SMILESI* Rydon sp.n. (Pl. 4, figs. 13, 14, 17, 18; text-fig. 10).

About the same size as the putative male of *daria* (Pl. 3, figs. 9, 10), but with the outer margin of the forewing more emarginate, and the tails on the hindwing slightly thicker than in *daria*, but equally short; the upperside and underside coloration and pattern of both wings superficially similar to those of *daria*; but knowing, from an examination of the aedeagi of the two species, that the two taxa are in fact distinct, it is possible to see other differences between them, which would otherwise be overlooked, or regarded as trivial variations of the one and same species (as has happened in the case of *daria* and *smilesi* during

the past fifty years or so). Holotype ♂: *upperside*. Ground colour black with a faint greenish sheen.

Forewing: subapical spots in spaces 6 and 7 whitish (the spot in 6 being small and indistinct in the holotype but well-marked in the two paratypes); the postdiscal spot in the subbase of 6 being whiter than in *daria* (in which the spot is glaucous), with a suggestion of another light spot in 5 below the whitish spot in 6; a small bluish spot present at the apex of the cell (as it is to a greater or lesser extent in *daria* also); the outer margin with the pale glaucous interneural patches smaller and more discrete than in *daria*.

Hindwing: postmedial greenish lunulate line between veins 2–5 vaguely present (as in *daria*), as also is the submarginal series of small bluish-white linear marks, the marginal dentate band being slightly narrower than in *daria* and pale ochreous-tawny from vein 7 to vein 4, then dull olive from there to the anal angle, the greenish colour extending down both tails which are themselves thicker at their base than in *daria*; outer margin black; abdominal fold greyish.

*Underside*. Ground colour a darker tone of brown than in *daria* and the pattern more variegated.

Forewing: ground colour walnut brown (compared to the lighter Dresden brown of *daria*), with the subapical and postdiscal whitish spots of the upperside indicated below as light brownish spots, with the transverse black wavy lines well-marked, the area between the submedial and medial lines in space 4 being a darker brown colour (i.e. burnt umber), as also it is between vein 5 and the costa (basad of the two subapical light brown spots), with a dark brown subapical spot in space 7 also, the submarginal series of macules also being burnt umber, with the double macule in 1b (the “eyespot”) being blackish-brown as in *daria*.

Hindwing: ground colour of the basal and discal areas walnut brown, with the transverse discal and medial wavy black lines well-marked and enclosing a wavy burnt umber band from the costa to vein 4, the latter band being outlined on its

outer side by the lighter walnut brown ground colour, distad of which the wing becomes burnt umber again as far as the postmedial black lunulate line which runs down the wing from vein 8 to the inner margin just basad of the anal angle, the lunulate black line (just referred to) being situated closer to the medial wavy black line than it is in *daria*; distad of the latter lunulate line there is a series of interneural burnt umber crescentic marks running from vein 8 to the inner margin near the anal angle, then a series of pale whitish submarginal linear marks (representing the bluish-white linear marks of the upperside) which are outlined on their outer side by some blackish scaling; the admarginal dentate band being slightly narrower than in *daria* and duller in colour, being dull ochreous-brown from vein 8 to vein 4, then dull greenish to the anal angle and down both tails; outer margin black, with the fringe white between the vein-endings.

Variation among the three males (including the “neallotype” of “*daria*”): a specimen from Jimma (V.G.L. van Someren coll., BM 1959–468) as well as the above “neallotype of *daria*” both have the subapical whitish spots in 6 and 7 of the forewing upperside larger, and hence more prominent, than in the holotype; otherwise, all three are very similar to one another, in that the marginal pale glaucous band of the upperside of the forewing is narrower than in *daria*, with a tendency for it to break up into small discrete interneural patches, and the admarginal band in the hindwing also being narrower than in *daria*; the ground colour of the underside of all three males is a darker brown colour and the pattern more strongly variegated than in *daria*, which appear to be the best superficial characters for distinguishing *smilesi* from the latter species. Type data: expanse of holotype, 58 mm; length of forewing, 36 mm; antenna/wing ratio 0.43; upper tail, 3.5 mm; lower tail, 5–3 mm (measured on its costal and anal sides respectively).

Holotype ♂, S.W.Ethiopia, Jimma (Djimma), Kankati, 15–18th May 1925 (O. Neumann), geni-

genitalia preparation Smiles No. 228, Rothschild Bequest 1939-1, in BMNH. Paratype ♂♂: 1♂, Jimma, II. '43 (van Someren), V.G.L. van Someren coll., BM 1959-468; 1♂ ("Neallotype ♂" of "*Charaxes viola daria* Rothschild, 1900" (*sensu* van Someren & Jackson, 1952: 264)), Ethiopia, Adola, June 1942 (M.S. Berkeley), photograph neg. No. 34021-2, genitalia prep. Smiles No. 281, Brit. Mus. 1951-95.

There is a male in the BM collection from the Didessa River, in western Ethiopia, which was captured by K.M. Guichard on 24.v.1946, with an expanse of 56 mm, and an antenna/wing ratio of 0,44 (the same as in the putative male of *daria* from the Gillett Mts.); it has a less emarginate forewing and a blunter apex than in *daria*, but the markings and coloration of the upperside and underside are quite near those of *daria*, as is also the aedeagus which has an inverted main spine like the latter; so, for the time being, Guichard's specimen will have to be placed to *daria* until more material is forthcoming from the Didessa River area.

Van Someren & Jackson (1952: 264), when they described the so-called "neallotype" of *daria*, referred to a "long series of males from many parts of Abyssinia in the British Museum"; presumably they considered these males all belonged to "*daria*", but, as has been shown above, a mere six or seven of these males actually belong to the *daria*/*smilesi* group. Some of the others are nearer to *viola suk* and to *viola picta* than to *daria* or *smilesi*, when one examines their genitalia.

One of the above males was captured by O. Neumann on the 17th April 1925 at Shalio, L. Abasso; it is close to *viola picta* as far as the aedeagus goes, though the aedeagus is shorter than in *picta* (i.e. 5,1 mm compared with *picta*'s 5,3-5,8 mm (average of six aedeagi 5,6 mm)); it is near *picta* in appearance, but smaller, with the forewing more falcate and the upperside of the latter wing not so spangled or as brightly-marked as in topotypical *picta* from Unyoro, Uganda, and with hardly any pale interneural scaling at its

outer margin, the hindwing admarginal band being red from veins 7-4 and greenish from there to the anal angle; the underside much as in *picta*, but slightly darker, with the light postdiscal zigzag band narrower than in *picta*, the underside pattern being more variegated than in *daria* (from the Gillett Mts.), and the tails relatively longer than in the latter.

Another male, which has been placed to "*viola daria*" in the collection of the BMNH, was caught by R. E. Cheeseman on 24th May 1926 at "Gala Awea", 25 miles east of L. Tana (6.500'); it is much as the above one from "Shalio, L. Abasso", but with some ochreous internervular scaling at the outer margin of the forewing, the white subapical and postdiscal spots of the upperside of the latter wing well-marked, with a bluish spot at the apex of the cell; hindwing admarginal band light red from vein 7 to the upper tail and dark green from there to the anal angle; the light submarginal spots present in the hindwing, but they are small and indistinct except at the anal angle; the postmedial lunulate line vaguely present from veins 1-6; underside much as the above (i.e. browner than in *viola viola*), being nearer to *smilesi* in colour, more strongly marked than in *daria*, and with the only tail (on vein 2) relatively longer than in *daria* or *smilesi*. (Expanse of forewings 56 mm; right forewing (from base of wing to the apex) 35 mm; antenna/wing ratio 0,40); the aedeagus being 5,3 mm in length (hence within the range of *viola picta*) and having a small main dorsal spine (as in *viola viola* and *v. picta*), thus this male is closely related to the latter two species.

Yet another black male, placed to "*viola daria*" in the BM collection, was also captured by R.E. Cheeseman, but on 31st October 1926, at Gondar, 20 miles north of L. Tana (7.000'); this specimen is near the above two specimens (i.e. from "Gala Awea" and "Shalio, L. Abasso"), but has the admarginal band of the upperside hindwing narrowly buff from vein 7 to the upper tail and a darker indeterminate colour from there to the anal angle, with its aedeagus more bent than in



the latter two males and hence tending more towards that of *figinii* (text-fig. 7) than to *picta* (text-fig. 9), being 5,6 mm in length, thus it is well within the range of *picta* (average length of aedeagus 5,6 mm) with which taxon I think it should, for the time being, be placed.

There are also twenty-six males in the BMNH, which were collected by Ohneisen and Kreth, in April 1926, between Ghimirra (Gimera), in Kefa (Kaffa) Province, S.W. Ethiopia, and the north of L. Turkana (L. Rudolf). Twenty-three of these males are closer in appearance to topotypical *kirki* (from Tanzania) than to typical *suk* (from Kacheleba, Karasuk, N.W. Kenya) in that their forewings are broader than in *suk*, with the outer margin less emarginate and not so pointed at the apex as in *suk*, and the ground colour of the underside of the wings drabber and without the strong satiny sheen in the forewing of *suk*. Four of these males have been dissected for me by Mr. Smiles; their aedeagi are close to *kirki* (text-fig. 12), having a prominent dorsal spine and an average length of 5,9 mm, the same as in *kirki*. These twenty-three males, however, must for the present be placed in the *suk* "aggregate" of van Someren (1969: 133), although this aggregate is shown on van Someren's Map 6 (*ibid.*, opposite p. 132) to extend only as far as the northern end of L. Turkana, and not as far north as Ghimmira. The holotype male of *suk* (vide Pl. 4, figs. 23, 24) is in the BMNH, and this must obviously be regarded as the typical form of van Someren's "aggregate". There are ten other males from the type-locality of *suk* (i.e. Kacheleba, Karasuk, N. W. Kenya) in the BMNH (ex colls. van Someren and Jackson), and another twelve from various localities in the adjoining Karamoja district of N.E. Uganda; and I have five in my own collection, four of which were collected by Major Iain Grahame in Karasuk, and one of which was obtained by S.C. Collins at Kongalai (4,500 ft.) in N.W. Kenya; all these males agree well with the holotype of *suk* in having a greyer underside, and a more falcate and pointed forewing than in typical *kirki*, the length

of the forewing (measured from base to apex) of twenty-two males in the BMNH ranging from 31–33 mm (average, 32 mm), compared to an average of 34 mm for eleven males of *kirki* in my own collection. (The five *suk* in my collection, however, have a forewing length that ranges from 31–34 mm, with three having an average length of 32 mm, and two with a length of 34 mm which approximates that of *kirki*.) The aedeagi of my *suk* specimens all have a large dorsal spine as in *kirki*, and they are almost equally long, ranging in length from 5,6–6,0 mm (average, 5,8 mm), except in Collins's specimen with a length of 5,4 mm, compared with an average of 5,9 mm (range, 5,8–6,2 mm) of four specimens of *kirki* in my collection (cf. text-figs. 12, 13). The females of *suk* are also distinctive from *kirki* in shape, pattern and coloration, and are smaller than the latter, having an average forewing length of 36,5 mm compared with 38,8 mm in *kirki* (Pl. 5, figs. 27–32). There are three named forms of the females of *suk*, i.e. *kirkoides*, *intermedia* and *achaemenesopsis*; the form *albifascia* Poulton (1926: 553) which van Someren (1969: 133, Pl. 15, fig. 143) placed to *suk* is in fact a form of *kirki*, the holotype of which came from the Teita Hills ("Dabida Mountain"), in southern Kenya, where *suk* does not occur, although a somewhat similar form to *albifascia* is also found among *suk* females, just as a white-banded form of female (i.e. ♀f. *handari* Poulton (1926: 555)) occurs occasionally in *kirki*. The females of *suk* have the outer margin of the forewing more emarginate and the apex of the wing more produced and pointed than in *kirki*; the postmedial series of light spots in the forewing meeting the costa at a more acute angle than in *kirki*, and the underside of both wings having a greyer ground colour than in the latter. One would, on the above grounds, be perfectly justified in separating *suk* from *kirki* and in making them distinct species, but until more work has been done on the *suk* aggregate in the field (e.g. by rearing them *ex ovo*, and comparing the early stages and foodplant requirements of the members of the aggregate with those of *kirki*,

etc.), it seems to me that the best thing to do is to maintain it as a distinct taxon for the present, as van Someren (1969: 133) did in the following words: "The late T.H.E. Jackson was of the opinion that *viola suk* should be sunk as a synonym of *viola kirki*. This, however, would ignore certain facts such as: (a) the males of *suk* and *kirki* differ; (b) the white-barred female form *achaemenesopsis* is extremely plentiful, making up half the female population (of *suk*), whereas *handari* of *viola kirki* is the exception in this population; (c) there must therefore be some difference in the genetical make-up of the two races." Van Someren went on to say: "It is possible that the two aggregates merge somewhere in the Kedong valley of the Rift, but this does not discount the fact that in *suk* we have a bio-ecological aggregate occupying a large area to the north of the range of *viola kirki*."

From the foregoing somewhat detailed discussion on *suk* and *kirki*, and as a result of comparing the aedeagi of the two taxa (cf. text-figs. 12, 13) with those of *viola viola* and *v. picta* (cf. text-figs. 3, 4, 9), it is clear that *kirki* and *suk* are closely allied taxa, but that they differ markedly from *viola viola* and *v. picta* (as far as their aedeagi go, that is), so I feel that *kirki* should now be reinstated to its original status as a good species, i.e. *Charaxes kirki* Butler *stat. rev.*, and that *suk* should, for the time being, be combined with the latter species, i.e. *Charaxes kirki suk* Carpenter & Jackson *comb.n.*

Among the twenty-six males from the Ghimirra-L. Turkana area, already mentioned above, are three specimens with the spots on the upperside of the forewing smaller than in the other twenty-three *kirki*-like males, and with the admarginal band of the hindwing narrower and the tails shorter and thicker, and the ground colour of the underside generally browner; these three males have an aedeagus like that of *smilesi* from Jimma and Adola (vide text-fig. 10), and so should be placed to that species, but it is not possible to say for certain, from the insufficient data on their labels, whether these three *smilesi*-like males fly with the *kirki*-like males.

Another taxon that has to be taken into account when dealing with the East African and Ethiopian members of the *viola* group is *Ch. chanleri* Holland (1896: 262♂; 753♀) from N.E. Kenya. This species, though originally described as such by Holland, was sunk to a male form of *Ch. etheocles etheocles* by Rothschild & Jordan, in their monograph of *Charaxes* (1900: 482), who associated it, on pp. 483–484 of the same work, with black males from Unyoro, Uganda (to which, incidentally, Rothschild himself had already given the name of *picta* on p. 483!), and with males from Walenso, Sheik Husein, etc., in S. E. Ethiopia (the type-locality of *Ch. daria*), and from Dares-Salaam (where *Ch. kirki* flies), and also with males from the upper Zambesi (now Zambia), to which van Someren (1975: 108) gave the name of *Ch. variata*, and with males from Angola (i.e. *Ch. loandae* van Someren (1975: 108)), and even with a male from Rustenburg, in the Transvaal (probably *Ch. vansoni* van Someren (1975: 108))! (It should be stated here, in passing, that Rothschild & Jordan were obliged to lump all these species together because they were unable to separate them on genitalial grounds; this was because they only examined the posterior spinous portion of the aedeagus and not the complete organ; if they had done the latter, they would have seen that the aedeagus in some species is more bent or twisted on itself, so that the dorsal spine (as seen in *kirki*, for example) becomes inverted (as in *daria*, *variata*, *loandae*, *vansoni*, etc.); but apart from this, they should have seen that the arrangement of the main and lesser spines also tend to differ markedly in different species (vide van Someren, 1969, text-figs. 1–30). It is indeed strange that such good workers, as Rothschild and Jordan were, overlooked these points.

Van Someren & Jackson (1952: 268), however, raised *chanleri* from the lowly position to which it had been relegated by Rothschild & Jordan (1900: 482) to a subspecies of *Ch. viola*, and this new combination was also maintained by van Someren (1969: 133). There is a paratype of *chanleri* in the

BMNH (ex coll. V.G.L. van Someren), the genitalia of which were kindly dissected for me by Mr. Smiles; its aedeagus (text-fig. 14) is relatively short compared with *kirki* (i.e. 5,4 mm as against an average of 5,9 mm) and thus it is within the range of *picta* (5,3 mm–5,8 mm (average of 6 aedeagi 5,6 mm)), but it has a larger main spine than in the latter, the spine being more twisted over laterally than in *kirki* or *suk* (cf. text-figs. 12, 13, 14). The butterfly itself (Pl. 4, figs. 21, 22) is, in size and shape, much as in *picta* (Pl. 4, figs. 15, 16), with the forewing as broad as in *picta*, *daria* and *smilesi*, but not so emarginate or falcate as in *kirki* and *suk*. On its upperside, *chanleri* is reminiscent of *picta*, but it is not so heavily spotted subapically and submarginally as in the latter, and has a broader light marginal band both in the forewing and the hindwing, with the greenish postmedial lunulate line in the hindwing very faint compared with the prominent one of *picta*; the ground colour of the underside being brownish-drab (that is, a darker colour than in *picta*), not grey or greyish-drab as in *kirki* and *suk*, being closer in colour to *daria*, but differing from the latter in the longer tails and the more ornate upperside. Without an examination of its aedeagus it would have been well-nigh impossible to place *chanleri* correctly among its congeners, as it appears, superficially, to be intermediate between *picta* and *daria* in the underside markings and coloration in particular; however, the aedeagus (text-fig. 14) shows it to be more closely related to *kirki* and *suk* than to *daria* or *picta*, but it is distinctive enough to be regarded as a good species, that is *Charaxes chanleri* Holland *stat.rev.* There is no specimen of the female of *chanleri* for me to refer to in the BMNH, but one has been figured in Pl. 20 of van Someren (1969) from Ethiopia (S. Abyssinia). This female's forewing is less falcate than in *kirki* or *suk*, with the underside pattern of both wings more strongly variegated than in the last two species, with the light median band on the upperside of the forewing entire, not splitting into two series of spots, from the inner margin to vein 4, and with the

spots in spaces 4 and 5 conjoined and reproduced on the underside also, and with the outer spots in spaces 6 and 7 bending in more sharply than in *kirki*, *suk*, or *daria*. These features support my contention that *chanleri* should be reinstated as a good species.

The type-locality of *chanleri* is the "Jombene Range, N.E. Mt. Kenya", but van Someren (1969: 134) has extended its range to include "the lower Meru (Mt. Kenya) area and the Njombe Range in southern Ethiopia, Mega and Neghelli to Dua River." In van Someren's Map 6 (*ibid.* opp.p. 132) *chanleri* is shown as almost meeting *daria* in S.E. Ethiopia, but there is no doubt that the two taxa are quite distinct, as we have seen above, and it is unlikely that they overlap anywhere, since *daria* appears to be a montane species, whereas *chanleri* is mainly a savanna one.

Among the *etheocles*-like *Charaxes*, collected by Oscar Neumann for Lord Rothschild of the Tring Museum in May 1901, are two small black males from Nanji Hill (spelt "Uanji Hill" by Rothschild & Jordan, 1903: 542), in the Jambo area of S.W. Ethiopia. They received a special mention by Rothschild & Jordan who placed them, with all the other black *Charaxes* that Neumann collected in Ethiopia, under the general heading of *Ch.etheocles etheocles*. Superficially they look like dwarf specimens of *smilesi* (cf. Pls. 3, 4, figs. 11, 12, 13, 14, 17, 18) but differ from the latter in their squarer shape and relatively longer tails, and also in their genitalia, their aedeagi being quite close to those of *bernstorffi* and *figinii* but with a more strongly sclerotized dorsal spine than in the latter (cf. text-figs. 1, 2, 7, 8). For the above reasons I am here treating these two small *Charaxes* from Nanji (?Uanji) Hill as a good species, but, like *bernstorffi* and *figinii*, belonging to the *viola* group (s.l.). That they belong to the latter group is supported by the fact that they were collected on the same day (i.e. 13th May 1901) and at the same spot as were *Ch.epijasius* Reiche and *Ch.achaemenes* Felder, according to the data given by Rothschild & Jordan (1903: 541–542), both of the last species being

savanna dwellers, as are the members of the *viola* group too. I have great pleasure in naming the new species after Mr. T.B. Larsen, the discoverer of *Ch.bernstorffi*.

*CHARAXES LARSENI* Rydon sp.n. (Pl. 3, figs. 11, 12; text-fig. 8)

Holotype ♂: head, thorax and abdomen black above, with the usual characteristic white spot in front of and behind the base of each of the black antennae; eyes also black, outlined on their posterior side with some white scaling; palps black above, creamy-white below, as are the forelegs too, with the thorax somewhat greyish below; mid and hind legs also greyish, with some black scales scattered along them; abdomen buff below.

*Upperside*: ground colour of both wings black, without any noticeable sheen. Forewing: subapex with a white spot in spaces 6 and 7 respectively, with a trace of a bluish spot postdiscally in 6 (more noticeable in the paratype than in the holotype), and a faint blue spot at the apex of the cell (but only visible as a few blue scales, under the microscope, in the paratype); outer margin with a trace of light ochreous-buff scaling extending basad between the black vein-endings. Hindwing: a faint greenish postmedial lunulate band is present between veins 2–5, with the series of small bluish-white submarginal internervular linear marks (more strongly marked in the paratype) running from spaces 7-1b, outlined by some black scaling on their outer side; the admarginal dentate band ochraceous-buff from veins 7–4, with a trace of red scaling at its centre and greenish from there to the anal angle; outer margin black, with some white cilia on the fringe between the vein-endings; abdominal fold greyish.

*Underside*: ground colour walnut brown, that is a darker brown than in *viola viola*, *v. picta* and *daria*, but about the same colour as in *smilesi* (cf. Pls. 3, 4; figs. 12, 14, 18). Forewing: the subbasal and medial black wavy transverse lines well-marked; between the latter medial lines and the

postmedial black lunulate line there is a faint greyish sheen (more noticeable in the paratype) between vein 3 and the costa, and extending distad of the aforementioned lunulate line from vein 6 to the apex of the wing; the subapical white spots of the upperside represented below as pale whitish ones in 6 and 7; the postmedial black lunulate line well-marked from veins 1–4 (with a slight extension of it in 1b as a black blob), the lunulate line becoming fainter from there to the costa, with the submarginal series of macules prominent also, the double macule in 1b (i.e. the “eyespot”) being blackish, those in 2–5 blackish-brown, the macules fading out from there but appearing as a brownish spot in 7; the ground colour of the wing to the outer margin walnut brown. Hindwing: subbase to the wavy black discontinuous discal transverse line greyish-brown, beyond which the wavy discal band is burnt umber, outlined on its outer side by the black medial zigzag line that runs from the costa to the inner margin and which is narrowly outlined distally by some discontinuous greyish-brown scaling, being a lighter greyish colour from 1c to the inner margin; distad of the latter, the ground colour of the wing becomes a dark walnut brown which obscures to some extent the black postmedial lunulate line crossing the wing from the costa to just basad of the anal angle, and which is narrowly outlined on its outer side by some paler brown, followed by a series of dark brown interneural crescentic or lunate macules, then by a submarginal row of small, whitish, linear marks from space 8 to the anal angle (more strongly marked in the paratype), which are outlined distally by some black scaling, with two black dots in 1c at the anal angle; admarginal dentate band reddish from veins 8 to 4, then greenish from there to the anal angle and down both tails; outer margin black, with the fringe white between the vein-endings; the abdominal fold pale greyish-brown. Type data: holotype ♂ and paratype ♂, S.W. Ethiopia, Jambo area, Nanji (?Uanji) Hill, 13.v.1901 (O. Neumann), Rothschild Bequest 1939–I, BMNH.

Expanse 45 mm; length of right forewing (measured from base to apex) 29 mm; antenna/wing ratio 0,45; length of upper tail 4,5 mm, that of the lower tail 4,5–3 m (measured on its costal and anal sides respectively).

Before concluding this paper, it is necessary to designate the lectotype of *Ch.viola picta* which has been mentioned above in the discussions of *Ch.bernstorffi* and *Ch.chanleri*; this taxon was raised from its original status as a male form of *Ch.etheocles*, namely *Ch.etheocles* ♂f. *picta* Rothschild (in Rothschild & Jordan, 1900: 483), to a subspecies of *Ch.viola* by van Someren & Jackson (1952) 263, but they did not designate a holotype for their new taxon. I, therefore, here designate the holotype of *Ch.etheocles* ♂f. *picta* Rothschild & Jordan as the lectotype of *Ch.viola picta* van Someren & Jackson the data of which is: Uganda, Unyoro, Kitanwa, 9.x.1897 (Dr. Ansorge), photograph neg. No. 38825/30, Rothschild Bequest 1939–1, BMNH. (It is necessary to fix the type of *viola picta* because van Someren (1969, Map 6, opp. p. 132) has extended its range to eastern Nigeria in the west and to well north of Khartoum

to the north; it is unlikely that topotypical *picta* occurs in such a vast area unchanged, the specimens from “Shalio, L. Abasso” (O. Neumann) and the two of R.E. Cheeseman’s from east and north of L. Tana, which I have already discussed above, indicating, for example, a trend away from the Uganda form of *viola picta*.)

#### Acknowledgements

I am much indebted to Mr. Larsen for allowing me to work on and describe his new *Charaxes* from the Yemen Arab Republic, and to the trustees and officials of the BMNH for permitting me to work on the material in the national collections, especially to Mr. R. L. Smiles for doing many genitalia dissections for me, and to Miss Gilbert of the Entomological Library for her unfailing help in checking dubious citations in the literature for me. I am also grateful to Dr. Poggi of the Museo Civico di Storia Naturale, Genoa, for the loan of the holotype of *Ch.figini*, and to Major Iain Grahame of Lamarsh, Bures, Suffolk, for some useful information on *Ch.kirki suk*.

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# Plate 1–5

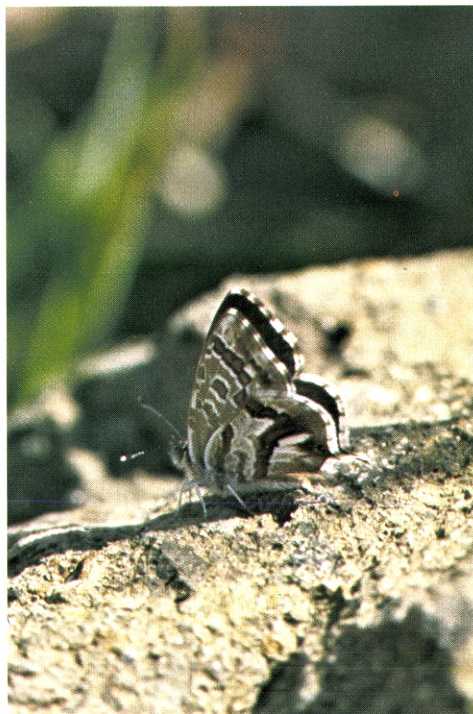
## PLATE 1

- Fig. 1. *Papilio machaon rathjensi* ♂, Jabal Bada'an, 2900 m, 19.v.1980. T. B. Larsen leg.
- Fig. 2. View of the type locality of *Lepidochrysops forsskali* sp. n. Yemen, Ibb Prov., Dalil.
- Fig. 3. The river valley at Suq as Sabt. This was the type locality of *Charaxes bernstorffi*. *Phalanta phalantha*, *Hamanumida daedalus* and *Hypolycaena pachalica* were other interesting components of the butterfly fauna.
- Fig. 4. *Cacyreus niebuhri* sp. nov. ♀, sitting on a rock in the type locality Jabal Bada'an, 2400 m.
- Fig. 5. Jabal Bada'an, 2900 m. Subalpine meadowland where the first Arabian specimen of *Actizera lucida* was taken. Otherwise the fauna was almost wholly Palaearctic. The tall lily in the foreground is the endemic *Crinum yemense*.





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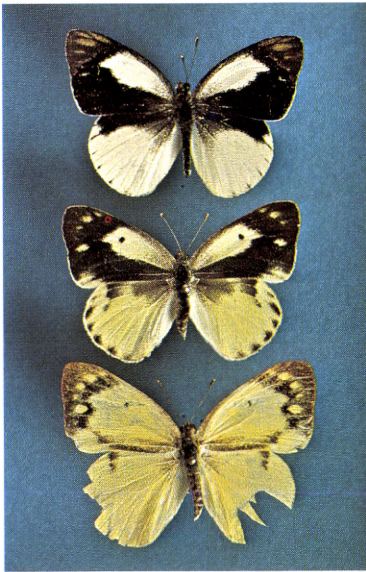


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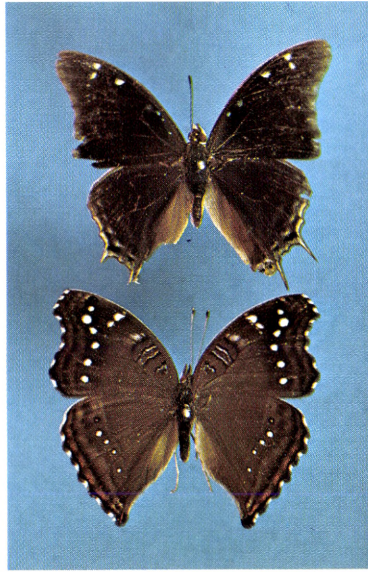
## PLATE 2

(0.70 × natural size)

- Fig. 6. *Colotis eris contractus* ♂, Oman, Dhofar, Wadi Sha'ath 6.x.1979. T. B. Larsen leg.  
*Colotis eris contractus* ♀, Yemen A. R., Mishrafa 13.v.1980. T. B. Larsen leg.  
*Colotis eris?* ♀, Yemen A. R., Wadi Sughna 26.v.1980. T. B. Larsen leg.
- Fig. 7. *Charaxes bernstorffi* ♂, Yemen A. R., Suq as Sabt 28.v.1980. T. B. Larsen leg. (PARATYPE).  
*Precis limnoria niveistictus* ♂, Yemen A. R., Ibb, Dalil 18.v.1980. T. B. Larsen leg.
- Fig. 8. *Lepidochrysops forsskali* ♂, Yemen A. R., Ibb, Dalil 18.v.1980. T. B. Larsen leg. (HOLOTYPE).  
*Lepidochrysops forsskali* ♀, Yemen A. R., Ibb, Dalil 18.v.1980. T. B. Larsen leg. (PARATYPE).  
*Lepidochrysops forsskali* ♂, UNS, Yemen A. R., Ibb, Dalil 18.v.1980. T. B. Larsen leg. (PARATYPE).
- Fig. 9. *Colotis ungemachi* ♂, Yemen A. R., Mishrafa 13.v.1980. T. B. Larsen leg.  
*Colotis ungemachi* ♂ UNS, Yemen A. R., Mishrafa 13.v.1980. T. B. Larsen leg.
- Fig. 10. *Colotis antevippe* ♂, Yemen A. R., Udayin, Wadi Dur 17.v.1980. T. B. Larsen leg.  
*Colotis ephyia* ♂, Yemen A. R., Rima Tihama 12.v.1980. T. B. Larsen leg.
- Fig. 11. *Lepidochrysops* sp. ♀ UNS, Yemen A. R., Khamis B. Saad 10.v.1980. T. B. Larsen leg.  
*Tuxentius interruptus* ♀ UNS, Yemen A. R., Taizz, Wadi Dhabab 15.v.1980. T. B. Larsen leg.  
*Anthene contrastata* ♀ UNS, Yemen A. R., Mishrafa 13.v.1980. T. B. Larsen leg.
- Fig. 12. *Acraea eponina* ♂, Yemen A. R., Jabal Bada'an 16.v.1980. T. B. Larsen leg.  
*Acraea eponina* ♀ UNS, Yemen A. R., Jabal Bada'an 16.v.1980. T. B. Larsen leg.
- Fig. 13. *Neptis serena annah* ♂, Yemen A. R., Wadi Annah 22.v.1980. T. B. Larsen leg. (HOLOTYPE).  
*Neptis serena annah* ♂ UNS, Yemen A. R., Wadi Dur 17.v.1980. T. B. Larsen leg. (PARATYPE).
- Fig. 14. *Cacyreus niebuhri* ♂, Yemen A. R., Jabal Bada'an 20.v.1980. T. B. Larsen leg. (HOLOTYPE).  
*Cacyreus niebuhri* ♀, Yemen A. R., Jabal Bada'an 20.v.1980. T. B. Larsen leg. (PARATYPE).  
*Cacyreus niebuhri* ♂ UNS, Yemen A. R., Jabal Bada'an 20.v.1980. T. B. Larsen leg. (PARATYPE).



6



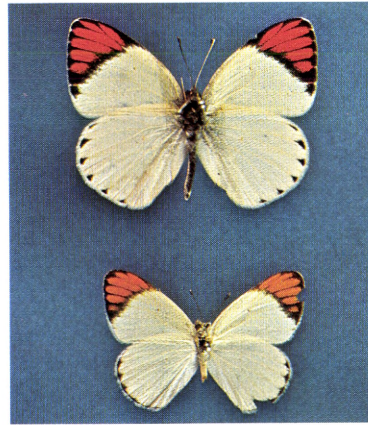
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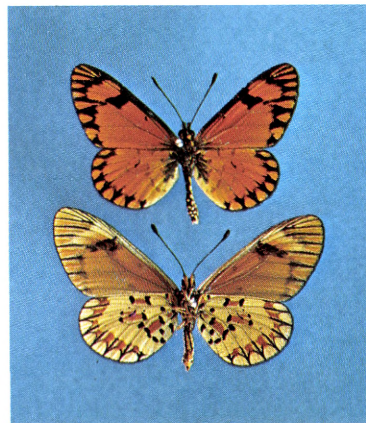
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## PLATE 3

Explanations of the figures of the males of some *Charaxes* species (upperside and underside).

Figs. 1,2. *bernstorffi* Rydon *sp.n.* Holotype ♂, Yemen Arab Republic, Jabal Bura, Suq as Sabt (900 m), 28.v.1980 (T. B. Larsen), in BMNH.

Figs. 3,4. *figinii* van Someren, *stat. n.* Lectotype ♂, Eritrea, Setit, El Eghin, ii.1906 (D. Figini), in Genoa Museum.

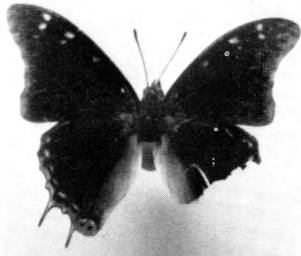
Figs. 5,6. *viola viola* Butler. Putative ♂, Ghana (Gold Coast), in BMNH.

Figs. 7,8. *viola viola* Butler. Putative ♂, Sierra Leone, Giberea, 1.vi.1912 (J. J. Simpson), in BMNH.

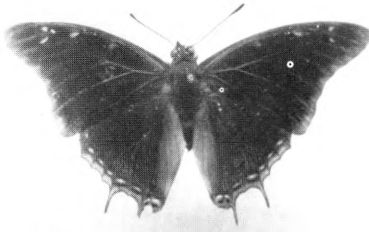
Figs. 9,10. *daria* van Someren & Jackson, *stat.n.* Putative ♂, S. E. Ethiopia, Gillett Mts, 1.vii.1900 (von Erlanger & Neumann), in BMNH.

Figs. 11,12. *larseni* Rydon *sp.n.* Holotype ♂, S. W. Ethiopia, Jambo, Nanji Hill, 13.v.1901 (O. Neumann), Rothschild Bequest 1939-1, in BMNH.

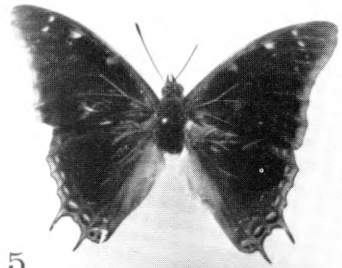
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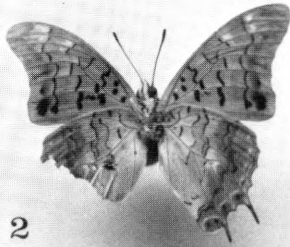
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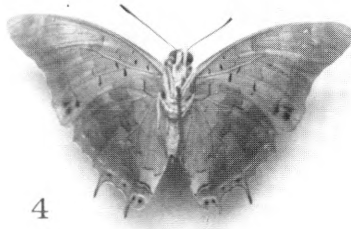
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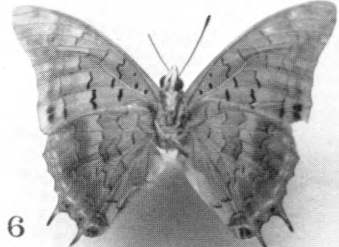
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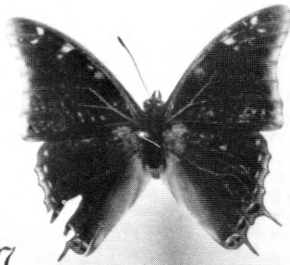
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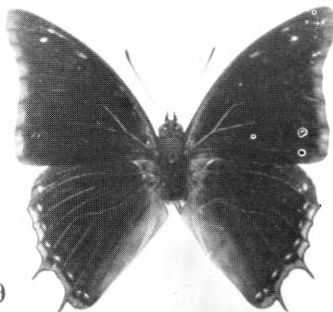
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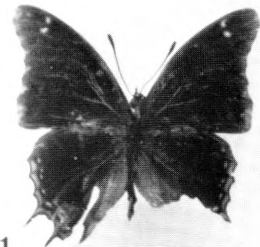
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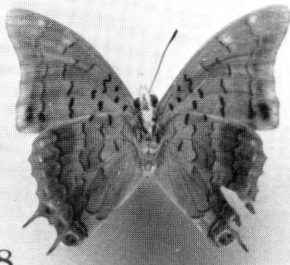
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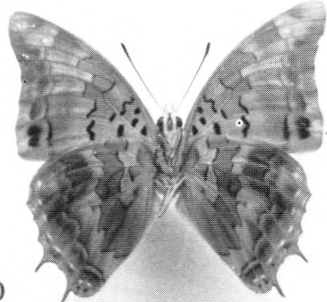
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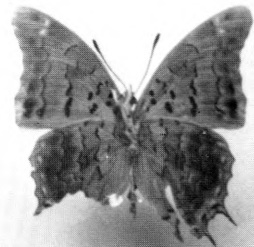
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## PLATE 4

Explanations of the figures of the males of some *Charaxes* species (upperside and underside).

Figs. 13,14. *smilesi* Rydon *sp.n.* Holotype ♂, S. W. Ethiopia, Kankati, Jimma (Djimma), 15-18.v.1925 (O. Neumann), Rothschild Bequest 1939-1, in BMNH-

Figs. 15,16. *viola picta* van Someren & Jackson. Lectotype ♂, Uganda, Unyoro, Kitanwa, 9.x.1897 (Dr. Ansorge), Rothschild Bequest 1939-1, in BMNH.

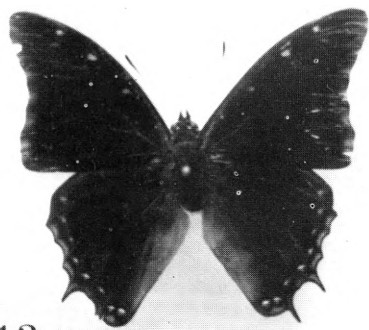
Figs. 17,18 *smilesi* Rydon *sp.n.* Paratype ♂, S. Ethiopia, Adola, vi.1942 (M. S. Berkeley), in BMNH.

Figs. 19,20. *kirki kirki* Butler, *stat.rev.* Neallotype ♂, Kenya coast, Kilifi, April 1943 (T. H. E. Jackson), in BMNH.

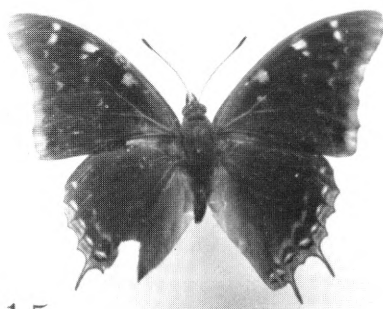
Figs. 21,22. *chanleri* Holland, *stat.rev.* Paratype ♂, E. Africa, Kenya, Jombene Range (Chanler-Höhnel Expedition), ex coll. V. G. L. van Someren, in BMNH.

Figs. 23,24. *kirki suk* Carpenter & Jackson, *comb.n.* Holotype ♂, Kenya, Suk, Kacheleba, Jan. 1949 (T. H. E. Jackson), in BMNH.

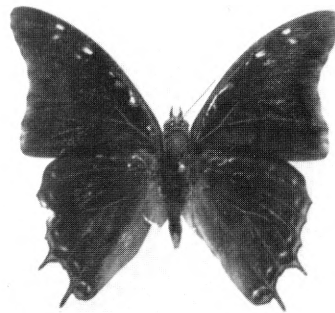
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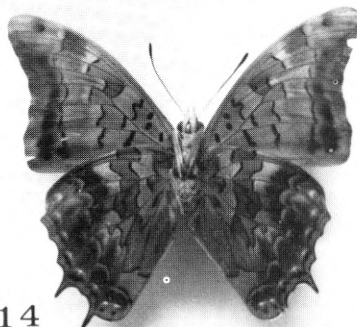
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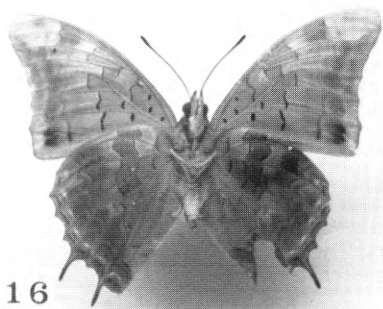
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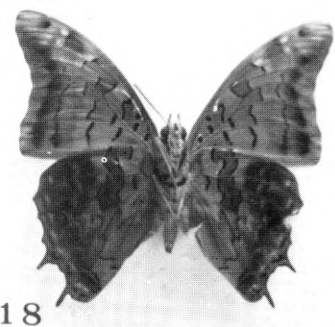
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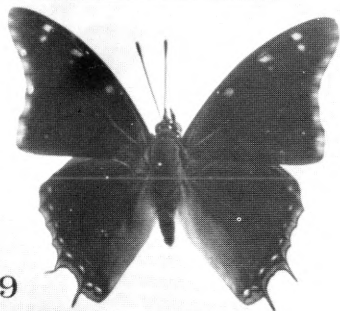
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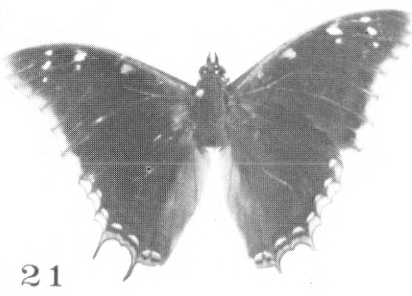
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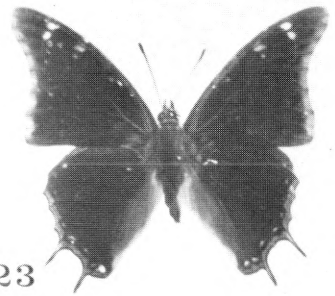
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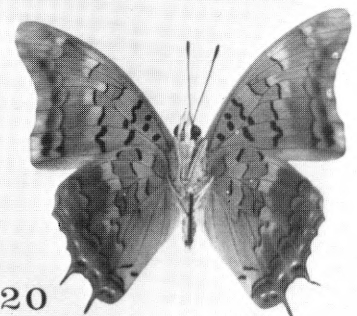
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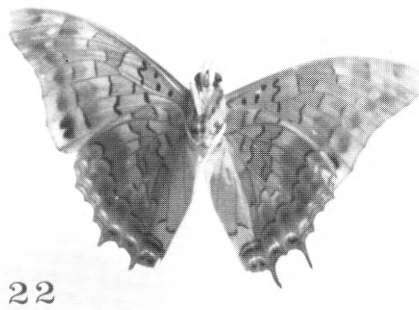
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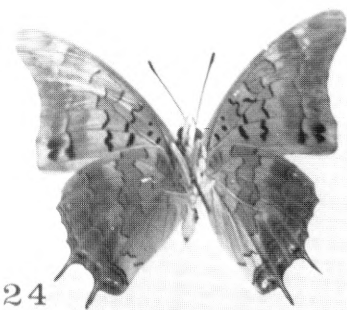
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## PLATE 5

Explanations of the figures of the females of some *Charaxes* species (upperside and underside).

Figs. 25,26. *viola viola* Butler. Holotype ♀, »West Africa«, B. M. Type No. Rh. 10468, in BMNH.

Figs. 27,28. *kirki kirki* Butler, *stat.rev.* Holotype ♀, East Africa (Tanzania), Mamboia, B. M. Type No. 10479, in BMNH.

Figs. 29,30. *kirki suk* Carpenter & Jackson, *comb.n.* ♀ f.*kirkooides* Carpenter & Jackson. Allotype ♀, Kenya, Suk, Kacheleba, Jan. 1949 (T. H. E. Jackson), in BMNH.

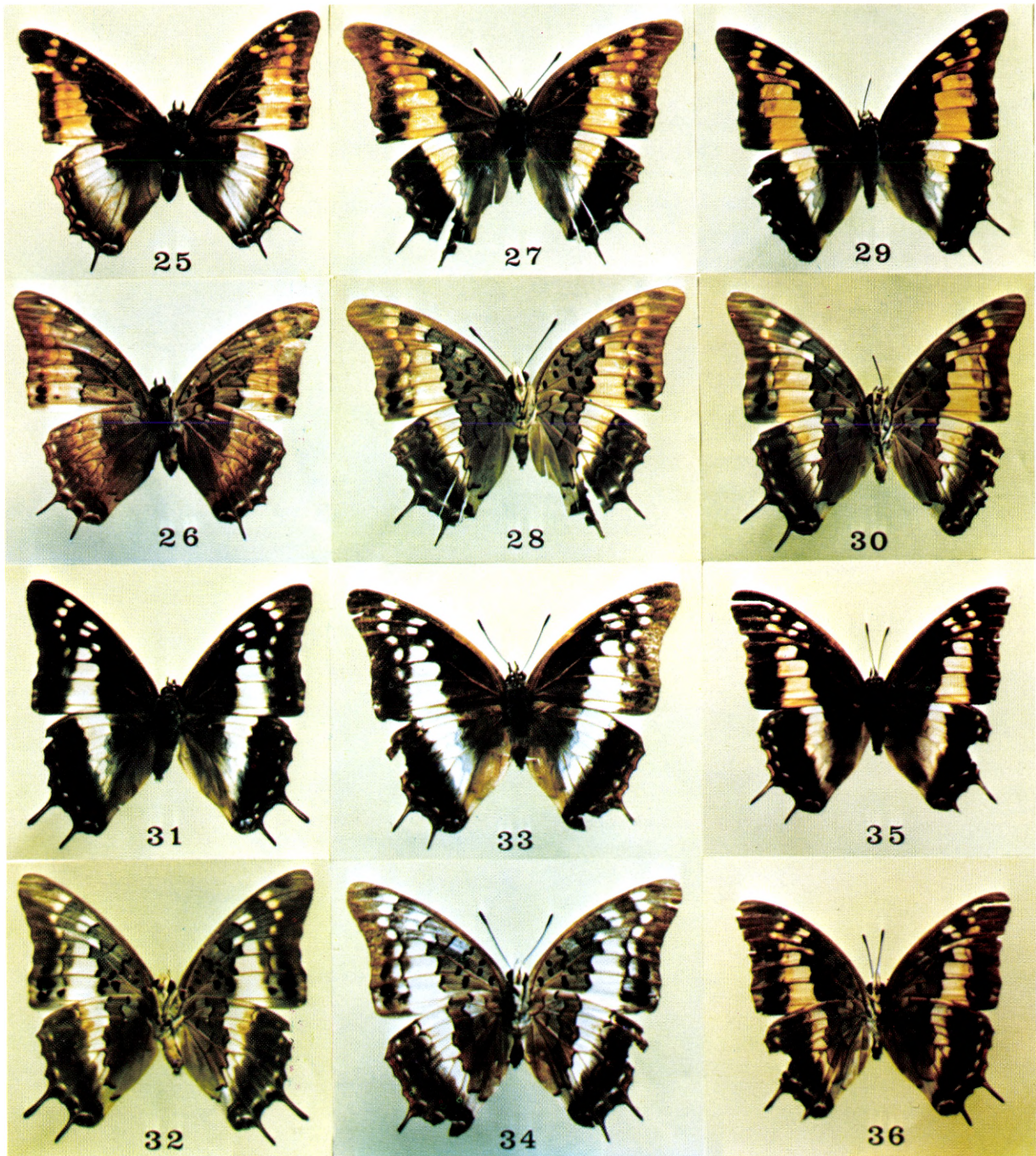
Figs. 31,32. *kirki suk* Carpenter & Jackson, *comb.n.* ♀ f.*achaemenesopsis* Carpenter & Jackson. Allotype ♀, Kenya, Suk, Kacheleba, Jan. 1949 (T. H. E. Jackson), in BMNH.

Figs. 33,34. *daria* van Someren & Jackson, *stat.n.* Lectotype ♀, S. E. Ethiopia, Jabalo Gurgura, 15.vi.1900 (von Erlanger & Neumann), in BMNH.

Figs. 35,36. *bernstorffi* Rydon *sp.n.* Allotype ♀, Yemen A. R., Hajjah (900 m), Wadi Sharas, 10.x.1981 (T. B. Larsen), in BMNH.

(All the above photographs of BMNH type-specimens were taken by A. H. B. Rydon, by kind permission of that Museum's trustees and officials.)





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