

## ZEITSCHRIFT FÜR ENTOMOLOGIE

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Description of a new species and new subspecies  
of the genus *Anaea* Hübner, 1819, from the Yucatán  
peninsula, with notes on other species  
(Lepidoptera, Nymphalidae, Charaxinae)

Thomas J. Witt

### Abstract

In this paper *Anaea* (*Memphis*) *maya* sp.n. and *Anaea* (*Memphis*) *glycerium yucatanum* ssp.n., both taken by Mr E.C. W e l l i n g in the Yucatán peninsula, Mexico, are described. The unknown female of *Anaea* (*Memphis*) *fumata* HALL, 1935, is described and the identity of the questionable female of *Anaea* (*Memphis*) *aureola* (BATES, 1866) is clarified.

### Zusammenfassung

In der vorliegenden Arbeit werden eine neue Art, *Anaea* (*Memphis*) *maya* sp.n. und eine neue Subspezies, *Anaea* (*Memphis*) *glycerium yucatanum* ssp.n., die beide von Herrn E. C. W e l l i n g auf der Halbinsel Yucatán, Mexico, erbeutet worden sind, beschrieben. Das unbekannte Weibchen von *Anaea* (*Memphis*) *fumata* HALL, 1935, wird beschrieben und die Identität des fraglichen Weibchens von *Anaea*

(*Memphis*) *aureola* (BATES, 1866) wird geklärt.

1. *Anaea* (*Memphis*) *maya*, sp.n.

In 1978 I received a series of nine specimens belonging to the *halice*-group of the genus *Anaea* HÜBNER, 1819 (sensu C o m s t o c k, 1961) from Mr E.C. W e l l i n g, Mérida, Yucatán. Three of them proved to belong to *Anaea martinezi* DE LA MAZA & DIAZ FRANCES, 1978, occurring north of Oaxaca, Mexico. Six of them together with two specimens from the collection of the Allyn Museum, Sarasota, Florida, and one specimen from the collection of the British Museum (Nat.Hist.), London, already mentioned by W i t t (1972), proved to represent a new species occurring in the surroundings of Pisté in the Yucatán peninsula. One male was taken in Chiltepec, Oaxaca, a locality from where *Anaea martinezi* DE LA MAZA & DIAZ FRANCES was taken.

Holotype ♂: Mexico, Yucatán, Municipio Tinúm, Pisté, 30.8.1957, leg. E. C. W e l l i n g, coll. W i t t, Munich (genitalia slide no. 1575, T. J. W i t t, plate 7, fig. 1).

Paratypes: 1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 29.8.1957, leg. E. C. W e l l i n g, coll. W e l l i n g, Mérida (genitalia slide no. 1554, T. J. W i t t);

1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 15.8.1960, leg. E. C. W e l l i n g, coll. W e l l i n g, Mérida (genitalia slide no. 1576, T. J. W i t t);

1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 6.9.1960, leg. E. C. W e l l i n g, coll. W e l l i n g, Mérida (genitalia slide no. 1555, T. J. W i t t);

1 ♂ Mexico, Yucatán, Pisté, 25.10.1959, leg. E. C. W e l l i n g, coll. Allyn Museum, Sarasota (genitalia slide no. 2580, L. D. M i l l e r);

1 ♂ Mexico, Chichan Itza, 2.12.1955, leg. E.C. W e l l i n g, coll. British Museum (Nat. Hist.), London (genitalia slide no. 1966-687, T. G. H o w a r t h);

1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 24.10.1960, leg. E.C. W e l l i n g, coll. W i t t, Munich (genitalia slide no. 1552, T. J. W i t t);

1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 27.11. 1960, leg. E. C. W e l l i n g, coll. W e l l i n g, Mérida (genitalia slide no. 1553, T. J. W i t t);

1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 30.9. 1978, leg. E. C. W e l l i n g, coll. W e l l i n g, Mérida;

1 ♂ Mexico, Oaxaca, Chiltepec, 15.8.1964, leg. E. C. W e l l i n g, coll. Allyn Museum, Sarasota (genitalia slide no. 2581, L. D. M i l l e r).

Male: ground-colour of upperside reddish brown, without violet sheen, brighter than all other species of the *halice*-group. Colour-pattern of forewings as in *fumata* HALL, but outer margin at right angles to inner margin. In *fumata* the outer margin forms an obtuse angle with the inner margin. Outer margin paler than in *fumata* and *martinezi*. Band connecting costal spot with outside margin absent, unlike rest of species-group. Shape of forewing more compact than in *martinezi*; the apex is not extended. There is a small white-centred black spot in the middle of the hindwing located in the area between  $m_3$  and  $cu_1$  or between  $m_2$  and  $m_3$ , too. Underside of forewing uniform in colour-pattern; hindwing with darker band separating the row of black spots along outer margin from the inner area. There are usually spots (one in each cell) along outer margin of the hindwing, as on the upperside.

There are two males collected in 24.10.1960 and 27.11. 1960 that differ from the typical form as described above: the band connecting the costal spot with the outer margin in typical specimens is represented by dark spots, variously extended in each cell but not linked together. The underside has more white spots than typical specimens.

Measurements. Holotype: wingspan 45 mm, forewing 23 mm. Paratypes: wingspan 42-46 mm, forewing 23-25 mm.

The author (1972) examined the material of *Anaea fumata* HALL in the British Museum (Nat. Hist.), London. Besides recording *A. fumata* as new for Mexico (Pisté) and Nicaragua, I noted a male from Chichan Itza, Yucatán, differing from *fumata* in the absence of a band on the forewing. The genitalia of this male differed in the shape

of the saccus, valvae and uncus from Comstock's (1961) fig.163 of *fumata*. In order to confirm these differences all available males have been dissected showing that there is a considerable individual variation and that it may not be possible to separate *maya* sp.n. and *fumata* HALL on male genitalia.

Three males of *A. martinezi* DE LA MAZA & DIAZ FRANCES have been dissected:

1 ♂ Mexico, Oaxaca, Chiltepec, 10.2.1963, leg. E. C. Welling, coll. Welling, Mérida (genitalia slide no. 1577, T. J. Witt, plate 7, fig. 2);

1 ♂ Mexico, Oaxaca, Chiltepec, 8.10.1961, leg. E. C. Welling, coll. Witt, Munich (genitalia slide no. 1550, T. J. Witt);

1 ♂ Mexico, Municipio Comaltepec, Soloyapan el Bajo, Oaxaca, 200 m, July 1963, leg. E. C. Welling, coll. Welling, Mérida (genitalia slide no. 1551, T. J. Witt).

No differences in male genitalia between *martinezi* and *maya* could be found.

The *halice*-group now consists of eight species: *A. tehuana* HALL, 1917, *A. chrysophana* (BATES, 1866), *A. fumata* HALL, 1935, *A. maya* sp.n., *A. martinezi* DE LA MAZA & DIAZ FRANCES, 1978, *A. moretta* (DRUCE, 1877), *A. moretta wiegeliana* WITT, 1970, *A. evelina* JOHNSON & COMSTOCK, 1961, *A. halice* (GODARD, "1819", 1824).

Comstock, 1961, considers the *halice*-group as "superspecies", a group of closely related species. Witt (1972) considers the group as a very recently evolved monophyletic complex of species which still is splitting into new species. My studies of *Anaea moretta* and *evelina* showed that there are populations that cannot be assigned with certainty to either species, a clear example of "species in statu nascendi". More extensive material and knowledge of the early stages and food-plants is required allowing insight into the variation between different generations.

As suggested by Mr Welling, the new species is named after the Maya people who have helped him very much in obtaining many hundreds of thousands of butterflies during the 24 years he spent collecting in the Yu-

catán peninsula.

## 2. *Anaea (Memphis) glycerium yucatanum*, ssp.n.

*Anaea (Memphis) glycerium* (DOUBLEDAY, 1850) is a widespread species. Records listed by C o m s t o c k (1961) include Arizona, Mexico, Guatemala, Nicaragua, Costa Rica, Panama and the Panama Canal Zone. *Anaea (Memphis) glycerium comstocki* WITT, 1972, was described from specimens collected in Venezuela, Colombia and French Guiana. This subspecies differs from the nominate subspecies in the paler ground-colour of both sexes and the larger size. In 1978 I received two pairs of *Anaea glycerium* from Mr W e l l i n g who took them in the Yucatán peninsula. He wrote: "They are exceedingly rare here. We have always taken one or two every five years or so, among many tens of thousands of specimens."

These specimens represent the first record for the Yucatán peninsula. They prove to be subspecifically distinct from the nominate race and ssp.*comstocki* WITT and are described as follows:

Holotype ♂: Mexico, Yucatán, Nuevo X-Can, Quintana Roo, 3.11.1978, leg. E. C. W e l l i n g, coll. W i t t, Munich.

Allotype ♀: Mexico, Yucatán, Municipio Tinúm, Pisté, 19.8.1978, leg. E. C. W e l l i n g, coll. W i t t, Munich.

Paratypes: 1 ♂ Mexico, Yucatán, Municipio Tinúm, Pisté, 13.9.1978, leg. E. C. W e l l i n g, coll. W i t t, Munich;

1 ♀ Mexico, Yucatán, Nuevo X-Can, Quintana Roo, 17.9.1978, leg. E. C. W e l l i n g, coll. W i t t, Munich.

Male: Ground-colour of upperside slightly darker than in nominate subspecies and ground-colour of underside darker.

Measurements. *Anaea glycerium* males from Mexico range from 27 to 34 mm, males of *yucatanum* ssp.n. from 28 to 29 mm.

Female: Colour-pattern as in nominate subspecies, but marginal band and apical area dark brown, the area between them strong ochre brown in contrast to *glycerium*

where this area is yellowish ochre and *comstocki* where it is paler. The inner area proximal the brown margin, which is dark-brown, is also strong ochre-brown towards the base in contrast to *glycerium* and *comstocki*. On the hindwing this strong ochre-brown colour is present at the base and is more extensive along the anal area and towards the outer margin; single small white-centred black spots are present between veins  $m_3$  and  $cu_1$  and  $cu_2$  and two spots between  $cu_2$  and  $pcu$ . An important difference is that in *glycerium* the outer margin of the hindwings is a strong ochre-brown while in *yucatanum* ssp.n. this outer margin is identical in colour to the ground colour of the wing. The pattern of the underside is more densely speckled and darker brown.

Measurements. Length of forewing ranges from 32 to 33 mm. That of nominate subspecies ranges from 30 to 37 mm.

### 3. The female of *Anaea (Memphis) fumata* HALL, 1935

From Mr H. G e r s t n e r, Schweinfurt, West Germany, who has sent me important material of the genus *Anaea* HÜBNER for years, I received an interesting series of *A. fumata* from Venezuela containing the hitherto unknown female of *fumata*. The distribution of this species was represented by C o m s t o c k (1961) and W i t t (1972).

5 ♂♂ 3 ♀♀ Venezuela, Pick Avila, 16. and 19.12.1973, coll. W i t t, Munich (one male genitalia slide no. 1556, T. J. W i t t).

The female belongs to the group of females without white spots on the forewings, like *tehuana* and *chrysophana*. The band connecting the costal spot with the outside margin is unbroken; but the outside margin forms an obtuse angle with the inner margin as in the male figured in C o m s t o c k (1961) and the band is a little diffuse towards the outside margin. The ground-colour is paler than in the male, but is unlike that of the yellowish female of *A. chrysophana* BATES as figured in C o m s t o c k (1961, plate 12, fig.4). The wing shape of the female of *A. tehuana* HALL is more compact, the tail of the hindwing (vein  $m_3$ ) is shorter and broader in *tehuana*.

#### 4. The female of *Anaea (Memphis) aureola* (BATES, 1866)

From Mr Gerstner I received 2 ♂♂ 1 ♀ of this rarely captured species, taken by one of his collectors and labelled "Mexico, Puebla, September 1979". The female of *aureola* was unknown to Comstock (1961).

It was first described by Godman & Salvin (1884) in *Biologia Centrali-Americana*. The hand-coloured plate shows a specimen with dark green ground-colour and a broad, diagonally transverse band on the forewing. Although the latin description refers to the colour of this band as white ("anticis autem fascia transversa albida ultra cellulam"), the band of the specimen figured is of a pale green colour.

Röber (1916) in: Seitz, *Die Gross-Schmetterlinge der Erde*, figured a female with a white band on the forewing. In addition to this difference to the illustration in Godman & Salvin's female, the tail (m<sub>3</sub>) is more than twice as long in the Röber figure. The picture in Seitz shows the metallic sheen of the fore- and hindwings very well. In the Godman & Salvin illustration this sheen is represented by another tone of green.

Mr R. Smiles, British Museum (Nat. Hist.), London, was so kind as to send me coloured diapositives of the two females deposited in the British Museum's collection. I was surprised to be able to identify one of them to be the single female mentioned and figured in *Biologia Centrali-Americana*:

1 ♀ Polochic Valley, F. D. G. & O. S.; R. Polochic, Vera Paz, Hague; sp. figured; B. C. A. Lep. Rhop., *Anaea aurelia*, Bates. Godman - Salvin Coll. 1917-2;

The transverse band proved to be rather white and is little speckled with metallic light blue scales and differs from the hand-coloured drawing by the colour of the band which is of a pale green colour. This difference only can be interpreted as the result of wrong hand-colouring. The tails (m<sub>3</sub>) are broken.

1 ♀ Vulcan Chiriqui; Joyce Bequest Brit. Mus. 1934-120;

This second female has very long tails. The white band

is more extensively speckled with metallic blue scales, the underside is darker.

The transverse band of my specimen is white, there are metallic blue scales and there is no doubt that these three females belong to the same species. Like other *Anaea*-species, the underside is highly variable. The extension of the metallic blue scales in the white band and of the metallic sheen on the fore- and hindwings is variable, too. According to the collector, my males and the female were taken in the same locality in September and I am satisfied that the sexes are properly matched.

Because of the confusion resulting from the differing illustrations in Godman & Salvin and Röber in: Seitz, Comstock (1961) was unable to clarify the identity of the female. As the work of Comstock was done during and shortly after the Second World War, he had little occasion to have a look into the British Museum's collections.

## Acknowledgements

The author is grateful to Mr E. C. Welling, Mérida, for loans and gifts of material, to Mr H. Gerstner, Schweinfurt, for delivering the *fumata*-series, to Dr L. D. Miller, Allyn Museum, Sarasota, for sending photographs of the questionable specimens, to Mr R. Smiles, British Museum (Nat. Hist.), London, for sending diapositives of the females of *Anaea aureola*, to Mr E. Lehmann, Zoologische Staatssammlung, Munich, for dissecting specimens, to Mr B. Aulsebrook, Großhelfendorf, for drawing the genitalia, to Mrs M. Müller, Zoologische Staatssammlung, Munich, for her photographic assistance, to Dr W. Forster, Zoologische Staatssammlung, Munich, for lending me the paper of de la Maza and Diaz Francés and to Mr A. Watson, British Museum (Nat. Hist.), London, for reading the manuscript.



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# Plate 1

- Fig.1: *Anaea maya* sp.n. ♂, Holotype  
Mexico, Yucatán, Mpio. Tinúm, Pisté, 30.8.1957,  
leg. W e l l i n g, coll. W i t t, Munich (gen.  
slide no. 1575, T. J. W i t t)
- Fig.2: *Anaea maya* sp.n. ♂, Paratype  
Mexico, Yucatán, Mpio. Tinúm, Pisté, 29.8.1957,  
leg. W e l l i n g, coll. W e l l i n g, Mérida  
(gen. slide no. 1554, T. J. W i t t)
- Fig.3: *Anaea maya* sp.n. ♂, Paratype  
Mexico, Yucatán, Mpio. Tinúm, Pisté, 6.9.1960,  
leg. W e l l i n g, coll. W e l l i n g, Mérida  
(gen. slide no. 1555, T. J. W i t t)
- Fig.4: *Anaea maya* sp.n. ♂, Paratype  
Mexico, Yucatán, Mpio. Tinúm, Pisté, 24.10.1960,  
leg. W e l l i n g, coll. W i t t, Munich (gen.  
slide no. 1552, T. J. W i t t)
- Fig.5: *Anaea martinezi* DE LA MAZA & DIAZ FRANCES, 1978 ♂  
Mexico, Oaxaca, Chiltepec, 8.10.1961, leg. W e l l i n g, coll. W i t t, Munich (gen. slide no. 1550, T. J. W i t t)
- Fig.6: *Anaea martinezi* DE LA MAZA & DIAZ FRANCES, 1978 ♂  
Mexico, Oaxaca, Chiltepec, 10.2.1963, leg. W e l l i n g, coll. W e l l i n g, Mérida (gen. slide no. 1577)
- Fig.7: *Anaea fumata* HALL, 1935 ♂  
Venezuela, Pick Avila, 19.12.1973, coll. W i t t, Munich
- Fig.8: *Anaea fumata* HALL, 1935 ♀  
Venezuela, Pick Avila, 16.12.1973, coll. W i t t, Munich

# Plate 2

underside of plate 1

# Plate 3

- Fig.1: *Anaea glycerium glycerium* (DOUBLEDAY, 1850) ♂  
Mexico, Morelos, October 1968, coll. W i t t, Munich

Fig.2: *Anaea glycerium glycerium* (DOUBLEDAY, 1850) ♀  
Mexico, Puerto Eligio, Mpio. Oaxaca, Comaltepec,  
700m, 7.9.1964, leg. W e l l i n g, coll. W i t t, Munich

Fig.3: *Anaea glycerium yucatanum* Ssp.n. ♂, Holotype  
Mexico, Yucatán, Nuevo X-Can, Quintana Roo, 3.11.  
1978, leg. W e l l i n g, coll. W i t t, Munich

Fig.4: *Anaea glycerium yucatanum* Ssp.n. ♀, Allotype  
Mexico, Yucatán, Mpio. Tinúm, Pisté, 19.8.1978,  
leg. W e l l i n g, coll. W i t t, Munich

Fig.5: *Anaea glycerium comstocki* WITT, 1972 ♂, Holotype  
Colombie, Pereira (Cauca), coll. W i t t, Munich

Fig.6: *Anaea glycerium comstocki* WITT, 1972 ♀, Allotype  
Colombie, Pereira, Cauca, coll. W i t t, Munich

#### Plate 4

underside of plate 3

#### Plate 5

Fig.1: *Anaea aureola* (BATES, 1866) ♂  
Mexico, Puebla, Sept. 1979, coll. W i t t, Munich

Fig.2: *Anaea aureola* (BATES, 1866) ♀  
Mexico, Puebla, Sept. 1979, coll. W i t t, Munich

#### Plate 6

underside of plate 5

#### Plate 7

Fig.1: *Anaea maya* sp.n. ♂, Holotype  
Mexico, Yucatán, Mpio. Tinúm, Pisté, 30.8.1957,  
leg. W e l l i n g, coll. W i t t, Munich (gen.  
slide no. 1575, T. J. W i t t)

Fig.2: *Anaea martinezi* DE LA MAZA & DIAZ FRANCES, 1978 ♂  
Mexico, Oaxaca, Chiltepec, 10.2.1963, leg. W e l l i n g, coll. W e l l i n g, Mérida (gen. slide  
no. 1577, T. J. W i t t)

Fig.3: *Anaea fumata* HALL, 1935 ♂  
Matagalpa, Nicaragua, coll. L e M o u l t, coll.  
W i t t, Munich (gen. slide no. 138, T. J. W i t t)

Plate 1

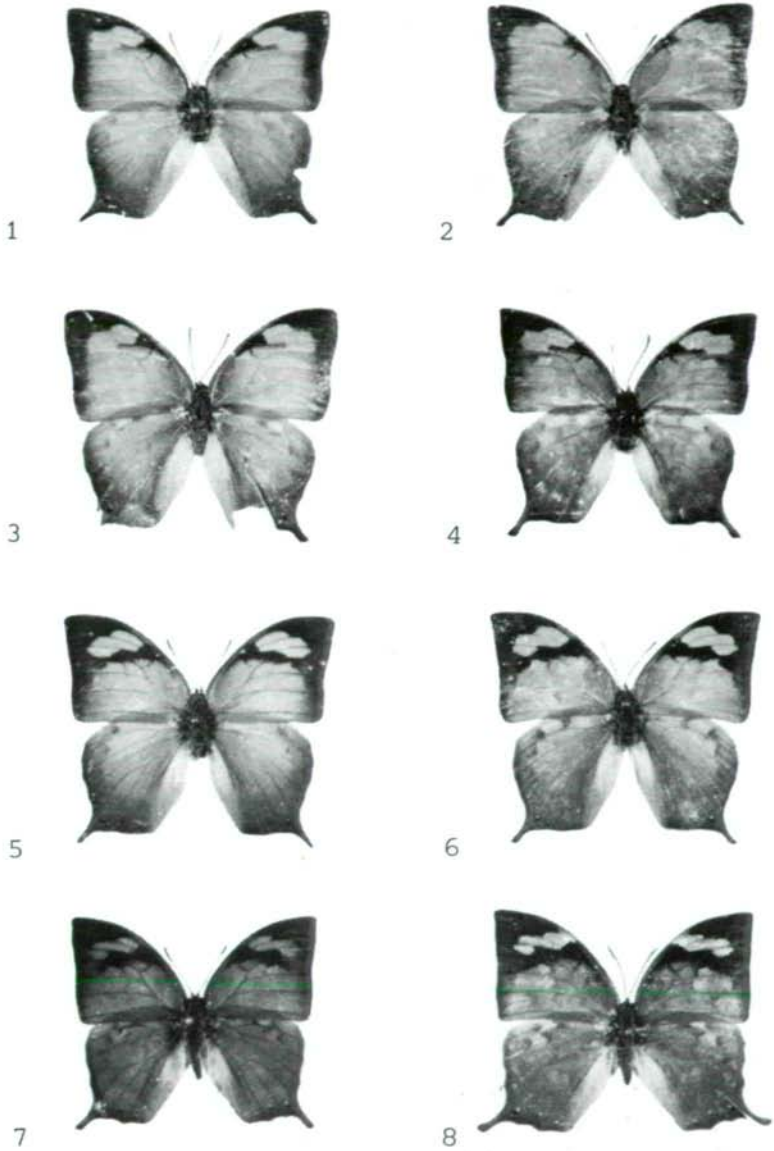


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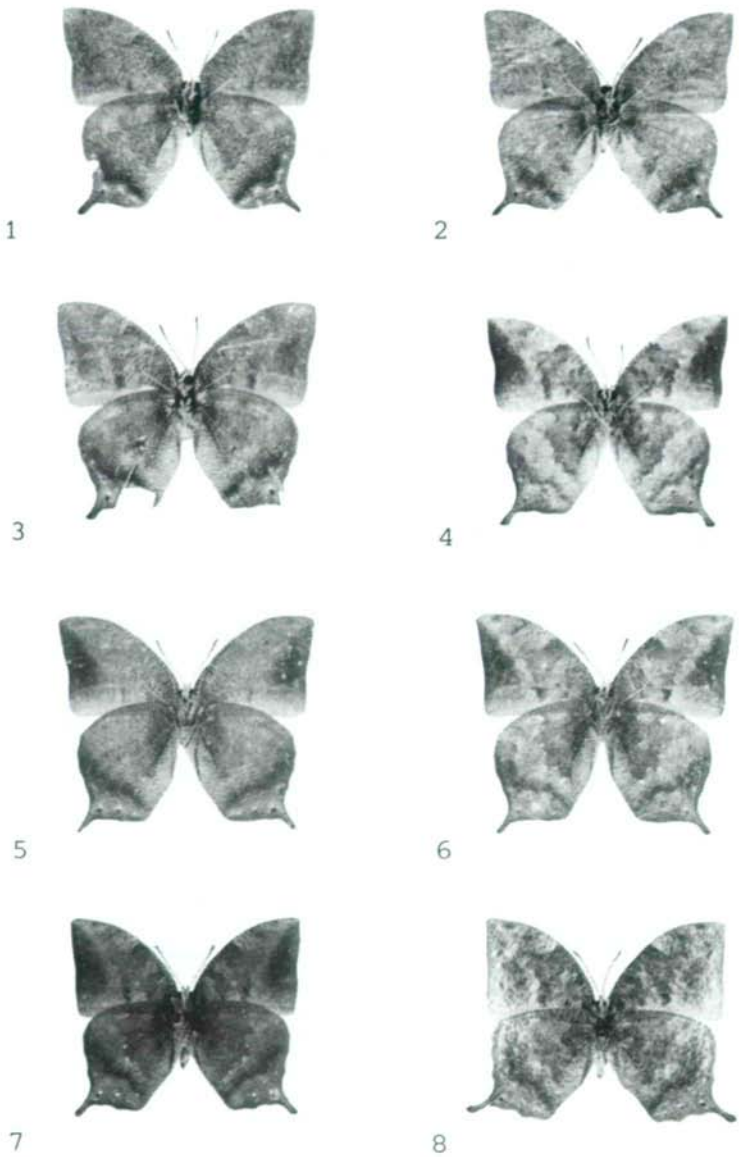


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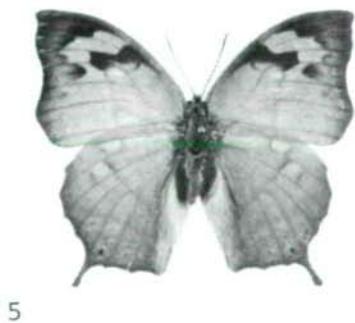
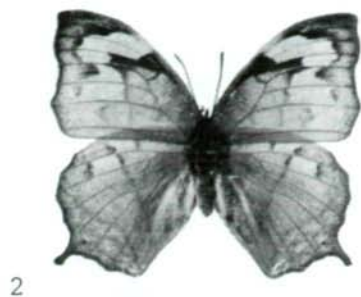


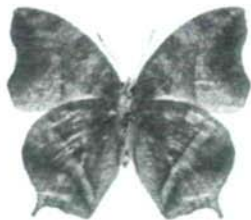
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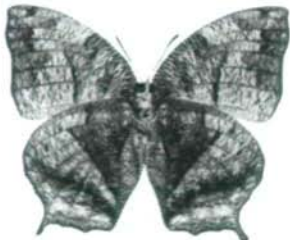
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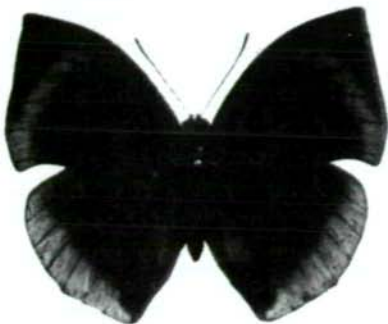


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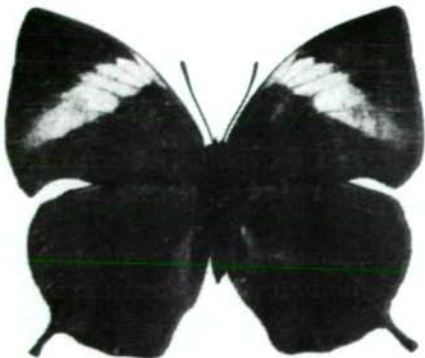


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Plate 5



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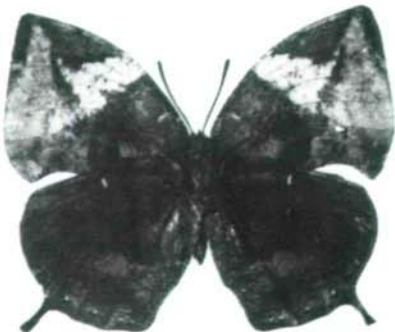
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Plate 6



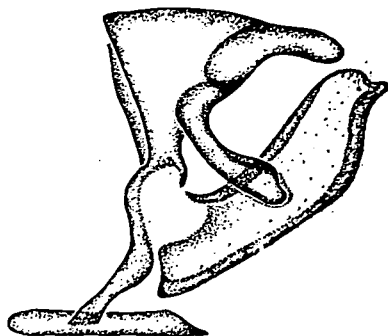
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Plate 7

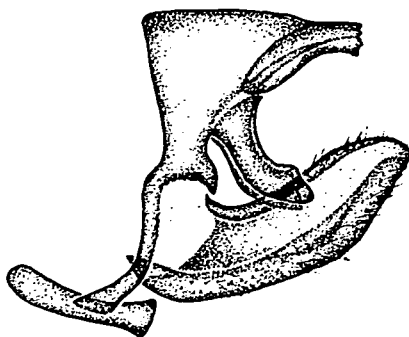
1) Gen Präparat 1575



2) Gen Präparat 1577



3) Gen Präparat 138



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