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Ahlbergia clarolinea spec. nov. from NW Yunnan province, China

(Lepidoptera, Lycaenidae)

by

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Abstract: *Ahlbergia clarolinea* **spec.nov.** is described from Lijiang, NW Yunnan. It can be easily distinguished from all other known species of the genus *Ahlbergia* BRYK, 1946 by the ground colour on the underside of the wings, which are densely powdered with bright grey scales throughout. Its closest relative seems to be *A. chalybeia* (LEECH, 1893) from Hubei, which has a brown basal disc and a much paler postdiscal area on the underside of the hindwing. JOHNSON's definition of the species group (1992) is disputed, and a new one is delineated which comprises of *A. chalybeia* (LEECH, 1893), *A. chalcidis* CHOU & LI, 1994 and *A. clarolinea* **spec.nov.** In addition, doubt is thrown upon JOHNSON's combination of the ♂ and ♀ for *A. chalybeia* (LEECH, 1893).

Ahlbergia ***c l a r o l i n e a*** **spec.nov.**

(colourplate 12, fig. 1-3)

Description

♂ upperside of the forewing: ground colour densely clad with bright blue scales in the discocellular cell, basal 2/3 of spaces 1a and 1b, and the basal half of space 2, blackish at the costal and outer areas; male scent brand brown and rather long, but a little shorter than half the length of the discocellular cell.

Upperside of the hindwing: ground colour mostly bright blue below vein 6, leaving only the submarginal area and that above blackish; outer margin of the hindwing lined with bright blue scales in spaces 1b-3; anal lobe weakly developed; anal area in spaces 1a and 1b pale grey.

Underside of the forewing: ground colour a mottled grey throughout, appearing blackish and less mottled at the base; discocellular bar blackish; postdiscal line black and very clear, margined by white scales on its outer side; submarginal markings clear, black and sagittate, and surrounded by paler scales; marginal area darker.

Underside of the hindwing: ground colour a mottled grey throughout; two subbasal lines black and clear, one in space 7 and one in the cell; discal line black and clear; submarginal markings blackish and mottled, sagittate in shape; marginal area broadly suffused with blackish scales, appearing darker than the inner area.

♂ genitalia as illustrated (fig. 5, 6).

♀ upperside of the forewing: No scent brand on the forewing, otherwise the markings are the same as in the ♂, including the extension of bluish colouring on the wings.
♀ genitalia: as illustrated (fig. 4), ductus bursae long and thin, even in width throughout, from the end of corpus bursae to the terminal lamellae; lamella postvaginalis rather large, rounded at the terminal end, the ventrum only with very slight convolutions, signum bifurcate, dorsal surface of the cephalic end of the corpus bursae near the ductus bursae narrowly sclerotized.

Diagnosis: This new species is close to *A. chalybeia* (LEECH) from Hubei and *A. chalcidis* CHOU & LI, 1994 from Kunming, Yunnan, but can be easily distinguished from both by the following combination of characters.

1) The ground colour on the underside of all wings is densely powdered by grey scales throughout, such extensive scattering of grey scales not being found in *A. chalybeia* (LEECH), *A. chalcidis* CHOU & LI and nearly all of the other species.
2) The ground colour on the underside of all four wings is grey-brown on both sides of the discal line, whereas in *A. chalybeia* (LEECH) and *A. chalcidis* CHOU & LI a dark brown inner area is clearly separated from a much paler and whiter outer section.
3) In a ventral view of the ♀ genitalia the natural shape of the lamella postvaginalis (not flattened) is nearly 5 times as broad as the ductus bursae, whereas in *A. chalybeia* (LEECH) it is about 3 times as wide. (The ♀ of *A. chalcidis* CHOU & LI is still unknown at present.) It should be noted that the ♂ genitalia are not usually important in specific classification within the *Ahlbergia* as there is little difference between the species. A comparison of the male genitalia of *A. chalybeia* (LEECH), *A. chalcidis* CHOU & LI, and *A. clarolinea* **spec.nov.**, is not discussed here because the detailed structures of *A. chalcidis* CHOU & LI are still unknown (only a sketch of a lateral view was published in the original description of *A. chalcidis* CHOU & LI, this being of no use for a classification of the *Ahlbergia* as only a ventral view of the natural shape of valvae is of value).

Discussion: 1) What species group should the new species belong to?
JOHNSON (1992) combined *A. chalybeia* (LEECH) and *A. bimaculata* JOHNSON, 1992 into a small species group, namely the *chalybeia* group, based upon their large size, broad wings, a lack of "structural color" (meaning the blue colour on the upperside of the male) and the "primitive" ♂ and ♀ genitalia ("robust and with generally unsculptured structures", meaning the lacking of ventral convolutions on"the lamella postvaginalis). However, *A. clarolinea* **spec.nov.** does not belong to such a group because it shares with *A. chalybeia* (LEECH) the ventrally curving lamella antevaginalis which is unique among the genus, whereas in *A. bimaculata* JOHNSON it is ventrally straight. Thus a ventrally curving lamella antevaginalis in ♀ genitalia should be considered as one of the defining characters for the *chalybeia* group, which should contain only *A. chalybeia* (LEECH), *A. clarolinea* **spec.nov.** and *A. chalcidis* CHOU & LI. *A. chalcidis* CHOU & LI from Yunnan is included in this group because it is hardly distinguishable from *A. chalybeia* (LEECH) in the pattern and colouration on the underside of the wings. It is very possible that *A. chalcidis* CHOU & LI represents only a

southwestern subspecies of *A. chalybeia* (LEECH), but with the ground colour of the upperside less marked with blue.
2) Did JOHNSON (1992) wrongly combine a dark ♂ with the bright lectotype ♀ for *A. chalybeia* (LEECH)? In Johnson (1992), only three specimens were found in LEECH's syntype series of *A. chalybeia* (LEECH) from the type locality, Changyang in Hubei province of China: ♂ "a" with a mostly brown upperside ground colour, ♂ "c" with a broad blue upperside ground colour, and ♀ "b" with a broad blue upperside ground colour. Probably based upon his experience in most other species of *Ahlbergia*, JOHNSON considered that the sexual dimorphism of *A. chalybeia* (LEECH) should be apparent in the upperside ground colour and combined the dark ♂ "a" with the bright ♀ "b" under the name *A. chalybeia* (LEECH), and selected the ♀ "b" as the lectotype. Meanwhile, he described the bright ♂ "c" as a new species within the genus *Novosatsuma* JOHNSON, 1992. However, the newly discovered *A. clarolinea* **spec.nov.** shows no sexual dimorphism in the upperside ground colour and the unique holotype ♂ of *A. chalcidis* CHOU & LI bears rather extensive blue colouration on the upperside of all four wings. This strongly suggests that the bright ♂ "c" in LEECH's type series should be combined with the lectotype ♀ under the name *A. chalybeia* (LEECH) and that *Novosatsuma cibdela* JOHNSON, 1992 should be a synonym of *A. chalybeia* (LEECH). It should be noted that the genus *Novosatsuma* does not show reliable differences in the ♂ genitalia from the genus *Ahlbergia* and that a ♀ specimen of *N. cibdela* JOHNSON has yet to be discovered. It is possible that the dark ♂ "a" in LEECH's type series represents an undescribed species, but an examination of more specimens would be needed before a definitive conclusion could be made.
3) What should be the diagnostic characters for the new *A. chalybeia* species group?
It is difficult to soundly define the *A. chalybeia* species group at present because the ♀ of *A. chalcidis* CHOU & LI is still unknown and JOHNSON's combination of ♂ and ♀ for „*A. chalybeia*" needs to be reviewed after an examination of more specimens. However, at least the ventrally curved lamella antevaginalis should be considered as a synapomorphy to support the monophyly of the *A. chalybeia* group. In addition, the combination of following characters will probably prove useful to define the group: sexual dimorphism is largely absent except for the male scent brand; both sexes bear rather extensive blue colouration on the upperside of all wings; and the discal lines and submarginal markings are clearly defined on the undersides. However, these characters cannot be considered as definitive synapomorphies as they are also found in other groups.

Type data: Holotype ♀: LF 15mm, Yun-shan-ping, Yulongxueshan Mts., North of Lijiang, NW Yunnan, 2800 m, April 29th 2005, leg. H. HUANG, Deposited in Biological Laboratory of Qingdao Vocational and Technical College, Qingdao, China. Paratype: 8 ♂♂ and 1 ♀, Lijiang area, NW Yunnan, end of April 2006, leg. A.-M. CHEN, Deposited in the private collection of A.-M. CHEN.

Etymology. The name refers to the very clear linear markings on the underside of the wings that characterize the new species.

Distribution: NW Yunnan only.

BRIDGES, C. A. (1988): Catalogue of Lycaenidae and Riodinidae.- Urbana, Illinois.

CHOU, I. ed. (1994): Monographia Rhopalocerorum Sinensium. Henan Science and Technology.

HUANG, H. (2003): A list of butterflies collected from Nujiang and Dulongjiang, China with descriptions of new species, new subspecies and revisional notes. – Neue Ent. Nachr. 55: 3-114, 160-177, Marktleuthen.

HUANG, H. & C.-S. WU (2003): New and little known Chinese butterflies in the collection of the Institute of Zoology, Academia Sinica, Beijing-1. – Neue Ent. Nachr. 55: 115-143, Marktleuthen.

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JOHNSON, K. (1992): The Palaearctic "elfin" butterflies (Lycaenidae, Theclinae). – Neue Ent. Nachr. 29: 3-141, Marktleuthen.

JOHNSON, K. (2000): A new elfin butterfly (Lycaenidae: Eumaeini) from Northern China with comments on the nomenclature of Palaearctic elfins. – The Taxonomic Report Vol. 2, No. 1:1-4, illustrated. - Neue Ent. Nachr. **29**: 3-141, Marktleuthen.

Colour plate 12, p. 513

Fig. 1: *Ahlbergia clarolinea* **spec.nov.** Holotype ♀ upperside (left half) and underside (right half).

Fig. 2: *Ahlbergia clarolinea* **spec.nov.** Paratype ♂ upperside (left half) and underside (right half).

Fig. 3: *Ahlbergia clarolinea* **spec.nov.** Paratype ♂ upperside (left half) and underside (right half).

Fig. 4: ♀ genitalia of *Ahlbergia clarolinea* **spec.nov.** taken from the holotype, consisting of lateral (top) and ventral (bottom) views of the whole genitalia.

Fig. 5: ♂ genitalia of *Ahlbergia clarolinea* **spec.nov.** taken from the paratype specimen illustrated in fig.2 (left ring in lateral view, middle valvae in ventral view, and right ring in ventral view).

Fig. 6: ♂ genitalia of *Ahlbergia clarolinea* **spec.nov.** taken from the paratype specimen illustrated in fig.3 (left ring in lateral view, middle valvae in ventral view, and right ring in

Fig. 4

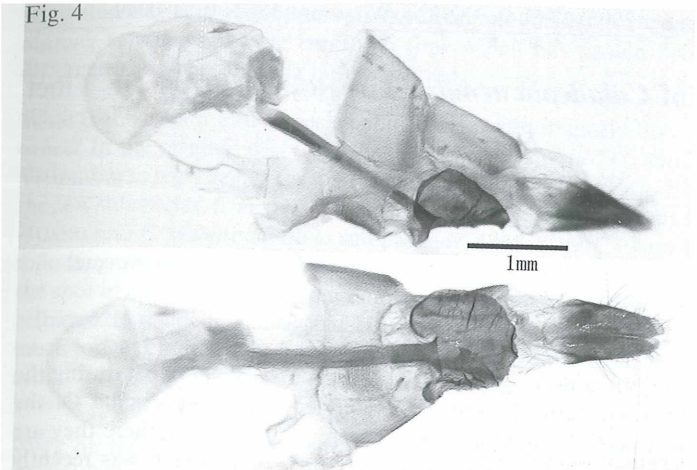


Fig. 5

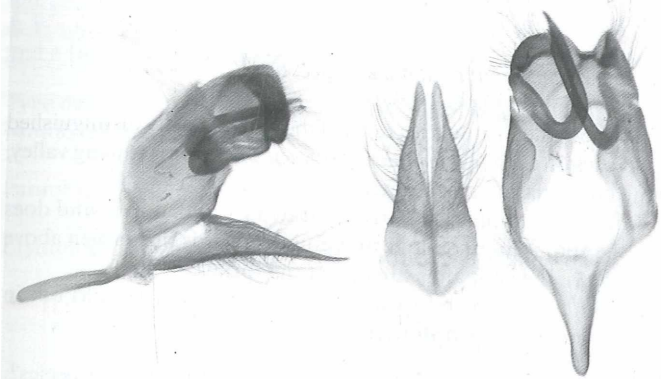
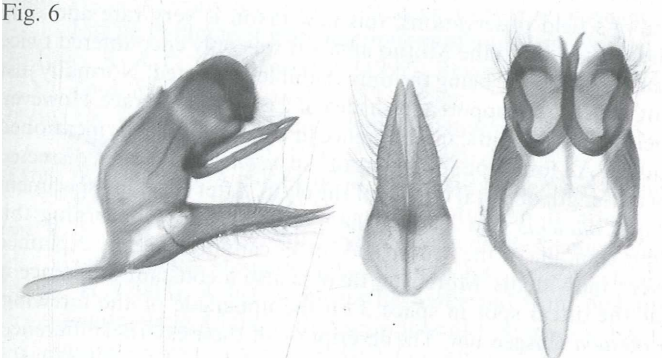


Fig. 6



Farbtafel 1

PIATKOWSKI, H.-J.: Beitrag zur Erfassung der Noctuidae Griechenlands (Insecta: Lepidoptera). - Atalanta (2006) **37** (3/4): 345-392, Würzburg (Dezember 2006).

Abb. 1: Nordgriechenland: Der Kerkini-See (A), südwestliche Uferregion (70 m) im Strimonas-Flußtal, eingebettet zwischen dem Kerkini-Grenzgebirge (bis 2031 m) zu Bulgarien im Norden, dem Disoro-Gebirge (bis 767 m) im Westen und dem Mavrovouni-Gebirge (bis 1179 m) im Süden. Foto: 2.VII.1995. Fundort von u. a.: *Colobochyla salicalis* D. & S. (7), *Dysgonia torrida* GN. (35), *Heliothis maritima bulgarica* DRAUDT (137), *Pyrrhia umbra* HUFN. (142), *Eucarta amethystina* HBN. (185), *Cosmia pyralina* D. & S. (190).

Abb. 2: Nordgriechenland: Südwest-Ausläufer des Vermio-Gebirges östlich Kozani, Zentral-Makedonia, in der Nähe des Dorfes Kilada (D), 700 m. Foto: 10.V.2000. Fundort von u. a.: *Gonospileia triquetra* D. & S. (51), *Agrochola wautieri* DUFAY (197), *Agrochola osthelderi* BRSN. (199), *Episema glaucina* ESP. (203), *Episema lederi* CHRISTOPH (205), *Noctua orbona* HUFN. (288).

Abb. 3: Nordgriechenland: Östlicher Katara-Pass im Pindos-Gebirge, nordwestliches Thessalia, 30 km westlich Kalambaka. Blick über das Malakassiatiko-Flusstal auf einen Südhang mit dem Dorf Trigona (H), 750 m. Foto: 29.VI.1996. Fundort von u. a.: *Cryphia amygdalina* BRSN. (74), *Pyrrhia umbra* HUFN. (142), *Pyrrhia purpurina* ESP. (143), *Paradrina wullschlegeli schwingenschussi* BRSN. (156), *Eremodrina pertinax* STGR. (158), *Lithophane ledereri* STGR. (209), *Nonagria typhae* THNBG. (235), *Leucania herrichi* H.-S. (264), *Noctua janthe* BKH. (294), *Noctua haywardi* TAMS (297).

Abb. 4: Mittelgriechenland: Das Pargas-Gebirge (im Süden bis 927 m) erstreckt sich entlang der nördlichen Ipiros-Küste von Igoumenitsa über etwa 60 km bis Parga. Hier ein für die Umgebung Plataria typischer Süd-Osthang (J). Foto: 24.VI.1997. Fundort von u. a.: *Protodeltote pygarga* HUFN. (87), *Trichoplusia circumscripta* FRR. (103), *Spodoptera cilium* GN. (167), *Spodoptera littoralis* BSD. (168).

Abb. 5: Mittelgriechenland: Ionische Insel Lefkada, südliche Küstenregion bei Evgiros (IS-W), bis 450 m. Foto: 24. Mai 2000. Fundort von u. a.: *Nycteola siculana* FUCHS (57), *Spodoptera cilium latebrosa* LED. (167), *Spodoptera littoralis* BSD. (168).

Abb. 6: Mittelgriechenland: Halbinsel Pilion. Region östlich Visitsa (M), bis 650 m. Macchie mit u. a. *Spartium junceum* (Pfriemenginster), *Arbutus* (Erdbeerbaum) und *Cotinus coggygria* (Perückenstrauch). Foto: 18.V.1999. Fundort von u. a.: *Calophasia opalina* ESP. (118), *Xanthia aurago* D. & S. (194), *Dryobotodes tenebrosa* ESP. (213), *Nonagria typhae* THNBG. (235), *Noctua janthe* BKH. (294), *Noctua haywardi* TAMS (297). Fotos: PIATKOWSKI.

Farbtafel 1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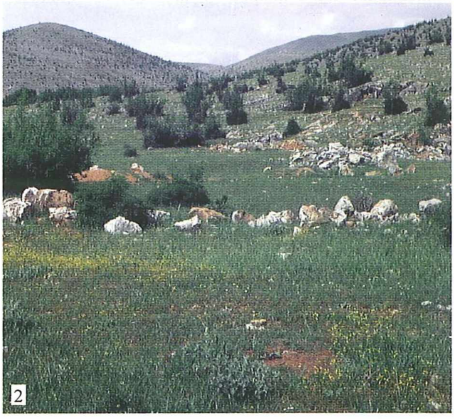
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Farbtafel 2

PIATKOWSKI, H.-J.: Beitrag zur Erfassung der Noctuidae Griechenlands (Insecta: Lepidoptera). - Atalanta (2006) **37** (3/4): 345-392, Würzburg (Dezember 2006).

Abb. 1: Mittelgriechenland: Das Kaliakouda-Gebirge (bis 2100 m), Umgebung Karpenissi, südlich Mega Hori (N). Foto: 27.V.1999. Fundort von u. a.: *Catocala promissa* D. & S. (19), *Cryphia amygdalina* BRSN. (74), *Polyphaenis subsericata* H.-S. (176), *Agrochola gratiosa* STGR. (200), *Apamea anceps* D. & S. (225), *Apamea sordens* HUFN. (226), *Lacanobia contigua* D. & S. (244), *Lacanobia suasa* D. & S. (245), *Noctua interposita* HBN. (289).

Abb. 2: Mittelgriechenland: Arahova (P), 1150 m, Parnassos-Südhang, Sterea Ellada. Foto: 19.IX.2001. Fundort von u. a.: Cryphia maeonis LED. (81), *Cornutiplusia circumflexa* L. (100), *Cucullia blattariae* ESP. (110) Raupen und Imagines, *Omphalophana antirrhinii* HBN. (118), *Spodoptera littoralis* BSD. (168), *Episema korsakovi* CHRISTOPH (206), *Leucania obsoleta* HBN. (262), *Ochropleura flammatra* D. & S. (284).

Abb. 3: Mittelgriechenland: Uferregion des Vouliakmeni-Sees (P), 0-30 m, am Kap Ireo, nordwestlich Korinthos und Loutraki. Foto: 7.VI.2005. Fundort von u. a.: *Lophoterges hoerhammeri* F. WAGNER (123).

Abb. 4: Südgriechenland: Dimitsana (S) im Zentral-Peloponnes westlich Tripoli (1000 m). Foto: 22.VII.2002. Fundort von u. a.: *Hadena filigrama* ESP. (255), *Hadena syriaca* OSTHLD. (258).

Abb. 5: Südgriechenland: Südöstliche Ausläufer des Lakonia-Gebirges im südöstlichen Peloponnes. Südhang mit *Euphorbia dendroides* nördlich Monemvasia (T). Foto: 22.V. 2003. Fundort von u. a.: *Ophiusa tirhaca* CR. (33), *Amephana dalmatica* RBL. (124).

Abb. 6: Südgriechenland: Halbinsel Mani in der Mitte des südlichen Peloponnes, Sangias-Gebirge (bis 1075 m), ein Ausläufer des Taigetos, Region südlich Vathia (T). Foto: 25.V.2003. Fundort von u. a.: *Ophiusa tirhaca* CR. (33), *Prodotis stolida* F. (37), *Odice suava* HBN. (89), *Trichoplusia circumscripta* FRR. (103), *Copiphana lunaki moreana* THURNER. (121), *Oria musculosa* HBN. (237). Fotos: PIATKOWSKI.

Farbtafel 2


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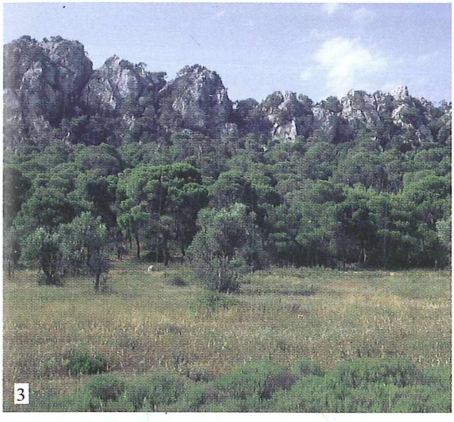
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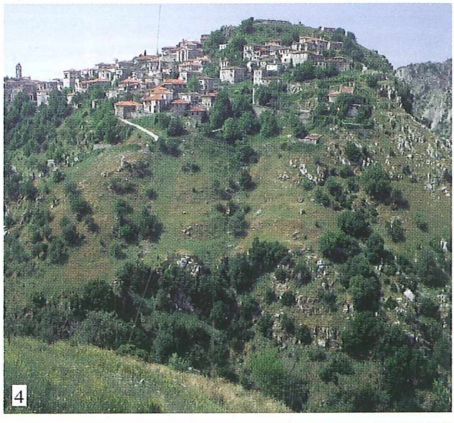
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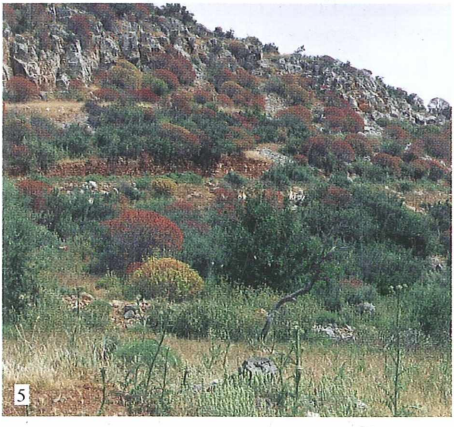
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Farbtafel 3

PIATKOWSKI, H.-J.: Beitrag zur Erfassung der Noctuidae Griechenlands (Insecta: Lepidoptera). - Atalanta (2006) **37** (3/4): 345-392, Würzburg (Dezember 2006).

Bei den Farbtafeln 3-6 verweisen die Zahlen in Klammern hinter den Artnamen auf die Numerierung der Arten im systematischen Teil, dort weitere Anmerkungen im Text.

Abb. 1: Habitat von *Cucullia verbasci* L. mit *Verbascum sinuatum, V. undulatum* und *V. longifolium*. Vatolakos (C), 800 m, 16 km N Grevena, Makedonia. Foto: 25.V.2005.

Abb. 2: Habitat von *Cucullia verbasci* L. mit *Verbascum densiflorum (thapsiforme)*. Agiokambos (E), 20 m, 50 km E Larissa, Ossa-SE, Thessalia. Foto: 2VI.2005.

Abb. 3: *Cucullia verbasci* L. (114). Erwachsene Raupen. Links: (lateral) an *Verbascum densiflorum*. Agiokambos (E), 20 m, 50 km E Larissa, Ossa-SE, Thessalia, 2.VI.2005. Rechts: (dorsal) an *V. sinuatum*. Vatolakos (C), 800 m, 16 km N Grevena, Makedonia, 25.V.2005.

Abb. 4: Habitat von *Cucullia verbasci* L. und *Cucullia thapsiphaga* TR. Ossa-Gebirge (bis 1272 m). Osthang bei Agiokambos, südlich Koutsoupia (E). Foto: 16.V.2000.

Abb. 5: *Cucullia verbasci* L. (114). Erwachsene Raupe (lateral, dorsal) an *V. sinuatum*. Vatolakos (C), 800 m, 16 km N Grevena, Makedonia, 25.V.2005.

Abb. 6: Habitat von *Cucullia verbasci* L. Timfristos-Gebirge (bis 2104 m) nordwestlich Karpenissi (N). Foto: 7.VI.1998.

Abb. 7: *Cucullia verbasci* L. (114). Erwachsene Raupen an *V. densiflorum*. Links: (lateral) Karpenissi (N), 1000 m, Timfristos, Sterea Ellada-NW, 7.VI.1998. Rechts: (dorsal) Asprangeli (G), 1100 m, Vikos-Schlucht, Ipiros-NE, 10.VI.1996. Fotos: PIATKOWSKI. Alle Raupenabbildungen sind Freilandaufnahmen.

Farbtafel 3


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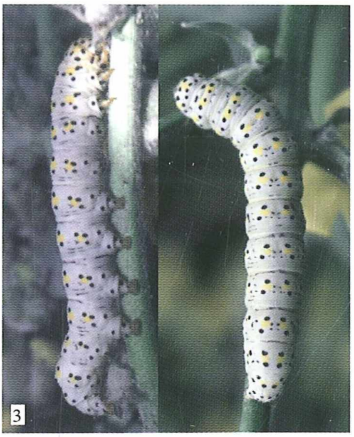
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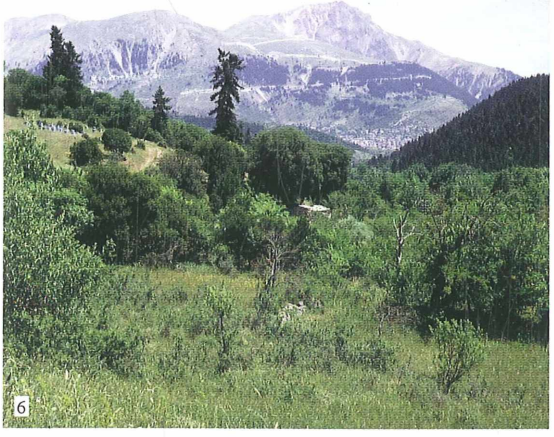
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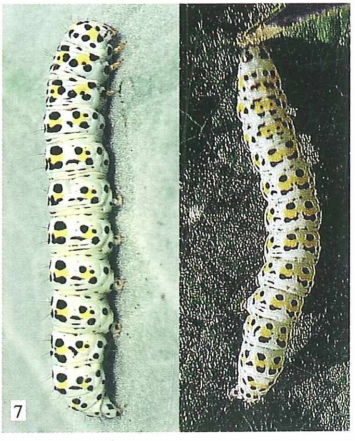
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Atalanta (Dezember 2006) **37** (3/4): 502-503, Würzburg, ISSN 0171-0079

Farbtafel 4

PIATKOWSKI, H.-J.: Beitrag zur Erfassung der Noctuidae Griechenlands (Insecta: Lepidoptera). - Atalanta (2006) **37** (3/4): 345-392, Würzburg (Dezember 2006).

Abb. 1: Habitat von *Cucullia thapsiphaga*-, *C. verbasci*- und *C. blattariae*-Raupen. Koukouli 2 km W (G), 950 m, östlich Asprangeli, Mitsikeli-Gebirge, Vikos-Schlucht, Ipiros-NE. Foto: 4.VI.1997.

Abb. 2: *Cucullia thapsiphaga* TR. (112). Erwachsene Raupen (lateral, dorsal) an *Verbascum lychnitis*. Koukouli 2 km W (G), 950 m, Vikos-Schlucht, Ipiros-NE, 11.VII.2004.

Abb. 3: Habitat von *Cucullia blattariae* ESP. Südliches Mittelgriechenland. Hochebene im südlichen Parnassos bei Desfina (P), 900 m, südlich Arahova, am nördlichen Golf von Korinth. Foto: 20.V. 2000.

Abb. 4: *Cucullia blattariae* ESP. (110). Erwachsene Raupe (dorsolateral) an *Scrophularia canina* und Kokons. Arahova (P), 1150 m, Parnassos, Sterea Ellada, 23.V.1999.

Abb. 5: Habitat von *Cucullia lychnitis* RBR. Pilio 3 km W (Q), 150 m, Insel Evia-Nord, Sterea Ellada-NE. Foto: 5.VII.2004.

Abb. 6: *Cucullia lychnitis* RBR. (113). Erwachsene Raupen (lateral, dorsal) an *Verbascum lychnitis* und Kokon. Pilio 3 km W (Q), 150 m, Insel Evia-Nord, 5.VII.2004.
Fotos: PIATKOWSKI. Alle Raupenabbildungen sind Freilandaufnahmen.

Farbtafel 4


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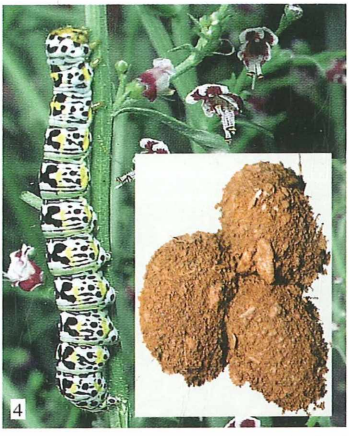
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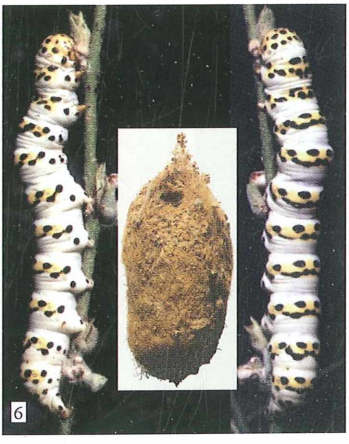
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Farbtafel 5

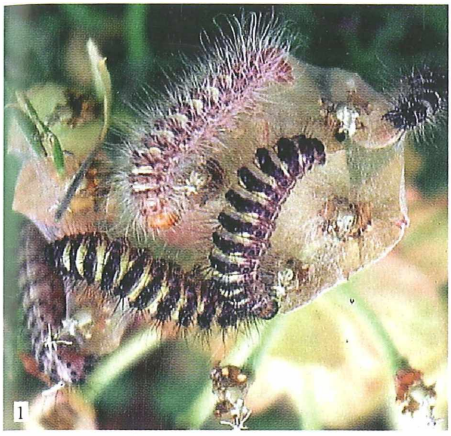
PIATKOWSKI, H.-J.: Beitrag zur Erfassung der Noctuidae Griechenlands (Insecta: Lepidoptera). - Atalanta (2006) **37** (3/4): 345-392, Würzburg (Dezember 2006).

Abb. 1-4: *Simyra nervosa* D. & S. (72). Abb. 1 und 2: Raupen vor und nach der letzten Häutung an *Euphorbia*-Blüten, -Blättern und -Stielen. Platanakia (A), 340 m, 75 km W Serres, 15 km W Kerkini-See, Makedonia-NE, 24.V.1998.
Abb. 3: Junge Raupen. Katara-Pass-E (H), 1700 m, 60 km W Kalambaka, Pindos, Thessalia-W. 24.VI.1992. Kokon aus Platanakia (wie Abb. 1 u. 2).
Abb. 4: Erwachsene Raupen (lateral, dorsolateral). Eptalofos (G), 800 m, 60 km SW Kastoria, Pindos-NE, Makedonia-W, 12.VI.1996.

Abb. 5: *Acronicta euphorbiae* D. & S. (68). Kokon und erwachsene Raupe (dorsolateral, ventral) an *Trifolium* (!). Neo Dermati (N), 700 m, 15 km S Karpenissi, Kaliakouda-NE, Sterea Ellada-NW, 5.VI.1998.

Abb. 6: *Apopestes spectrum* ESP. (42). Kokon und erwachsene Raupen. Links: (dorsolateral) Kalamaki (M), 450 m, 40 km SE Volos, Halbinsel Pilio-E, Thessalia-SE, 19.V.1999. Rechts: (dorsolateral) Davlia (P), 30 km NW Livadia, Parnassos-E-Ausläufer, Sterea Ellada-S-Mitte, 20.V.2000. Fotos: PIATKOWSKI. Alle Raupenabbildungen sind Freilandaufnahmen.

Farbtafel 5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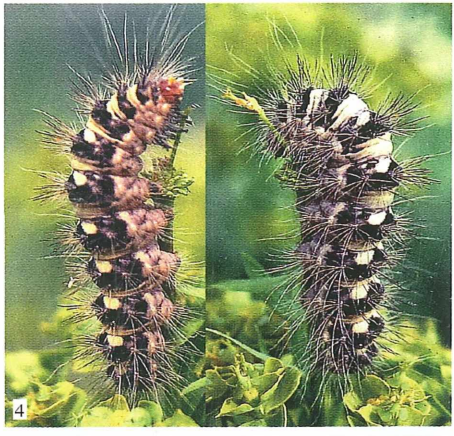
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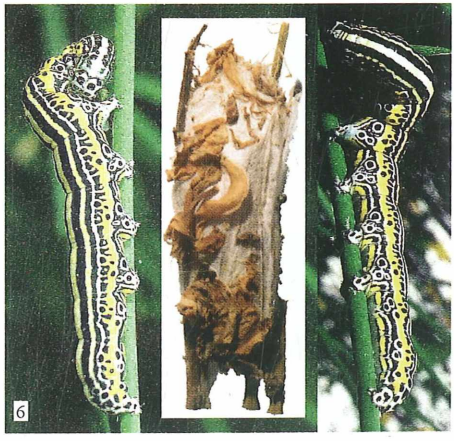
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Farbtafel 6

PIATKOWSKI, H.-J.: Beitrag zur Erfassung der Noctuidae Griechenlands (Insecta: Lepidoptera). - Atalanta (2006) **37** (3/4: 345-392, Würzburg (Dezember 2006).

Abb. 1–6: *Euclidia glyphica* L. (50). Die Individuen der griechischen Populationen (Abb. 1-4) sind gegenüber denen der mitteleuropäischen (Abb. 5, 6) deutlich größer, die Grundfarbe der Hinterflügel ist kräftiger orangebraun, das gesamte Erscheinungsbild ist dunkler.
Abb. 1: ♂, Trigona (H), 750 m, 30 km W Kalambaka, Katara-Pass-E, Thessalia, 17.VII.1991.
Abb. 2: ♀, Galaxidi (O), 30 m, 30 km S Amfissa, Sterea Ellada-S-Mitte, 24.V.1999.
Abb. 3: ♂, Aniada (N), 1160 m, 30 km SE Karpenissi, Kaliakouda, Sterea Ellada-NW, 28.V.1999.
Abb. 4: ♀, Kilada (D), 700 m, 18 km E Kosani, Makedonia, 23.VII.1991.
Abb. 5, 6: ♂, ♀, Deutschland, Hanau, 90 m, 18 km E Frankfurt, Hessen, 21.V., 6.VI.1975.

Abb. 7: *Catocala nymphagoga* ESP. (24). ♂, aberrativ, Mega Hori (N), 750 m, 18 km S Karpenissi, Sterea Ellada-NE, 15.-17.VII.1995.

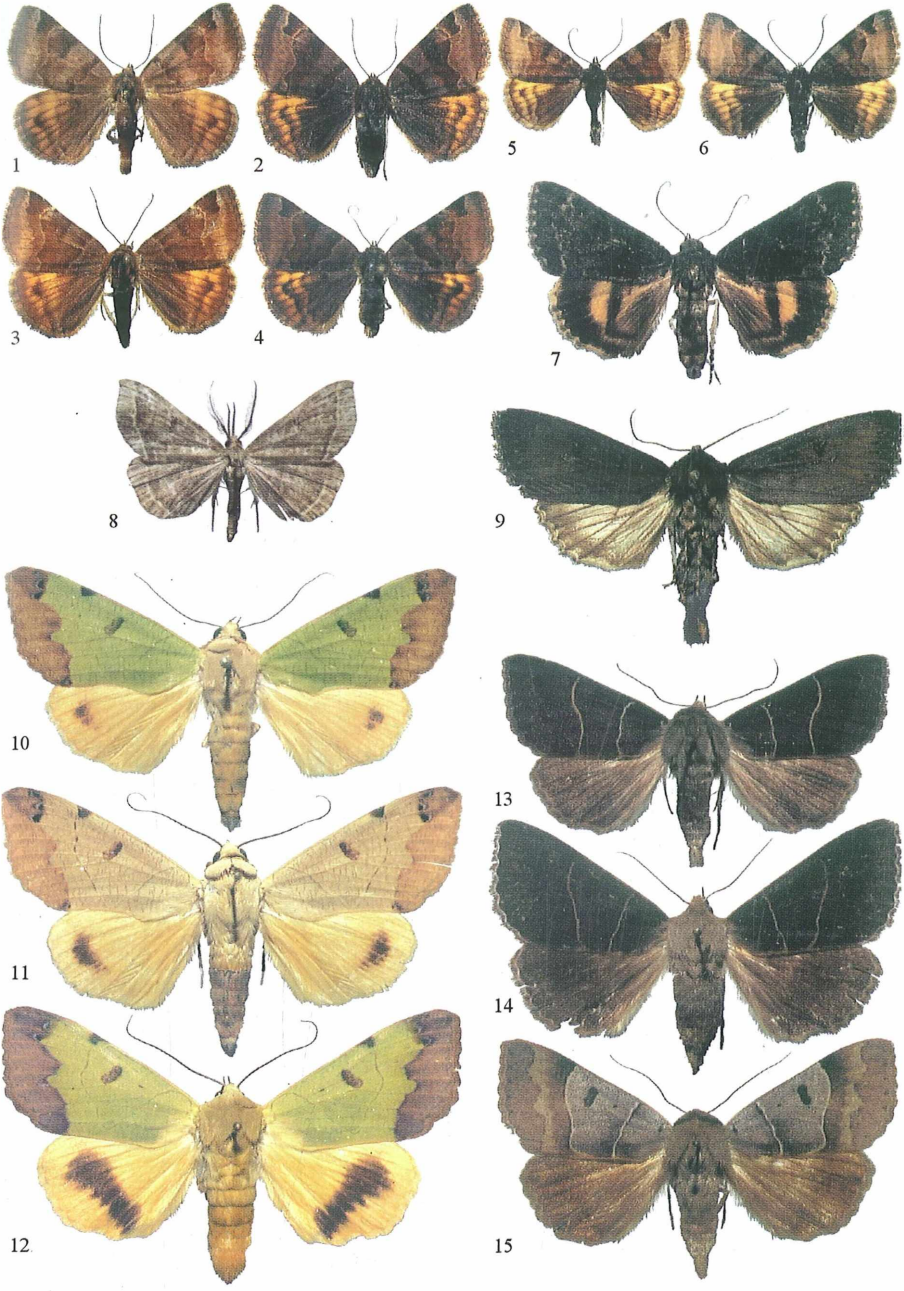
Abb. 8: *Polypogon simplicicornis* ZERNY (4). ♂, Limni Vouliakmenis (P), 15 m, 20 km NW Loutraki, Sterea Ellada-SW, 7.-8.VI.2005.

Abb. 9: *Nonagria typhae* THNBG. (235). ♂, aberrativ, Visitsa (M), 550 m, Halbinsel Pilio, Thessalia-SE, 5.-10.VII.1995. Die 3 vom Autor bisher in weit voneinander entfernt liegenden Regionen Griechenlands gefundenen Exemplare gehören alle dieser Form mit schwarzbraunen Vorderflügeln an.

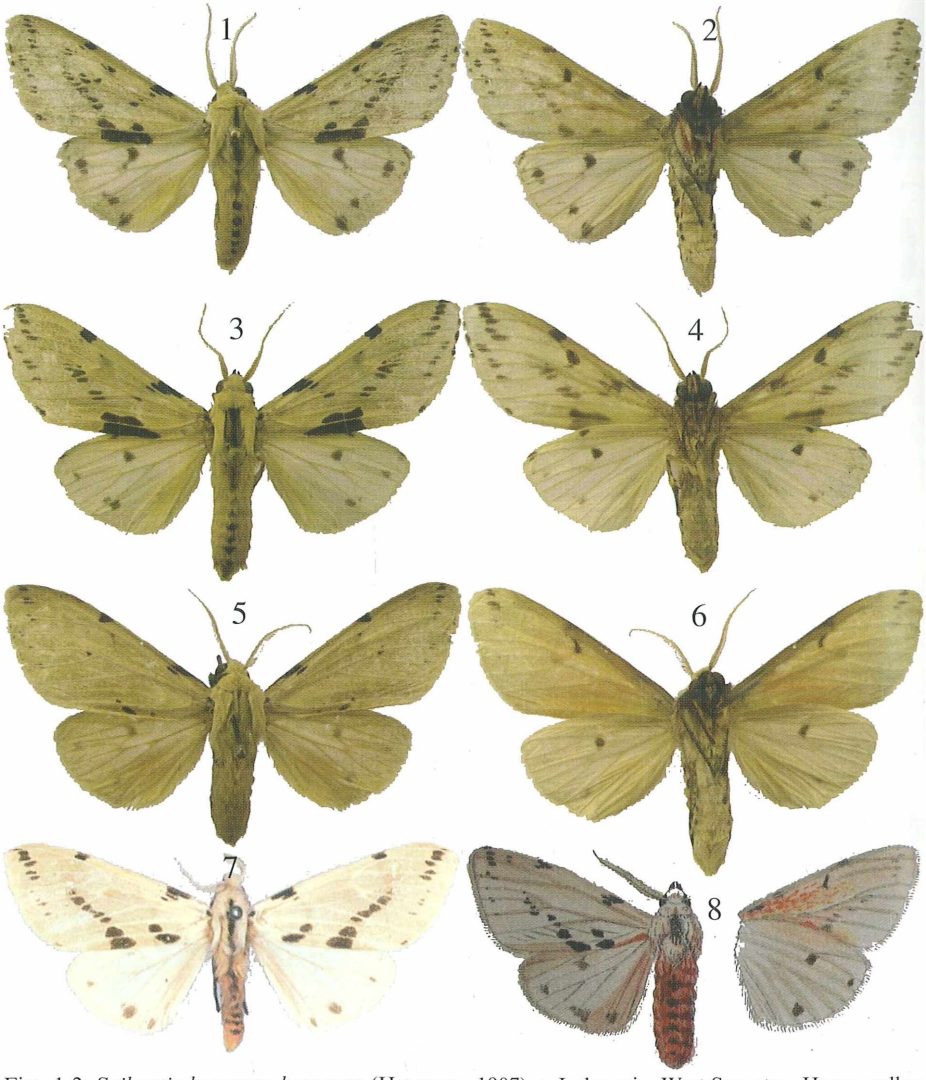
Abb. 10–12: *Ophiusa tirhaca* CRAMER (33). Etwa 70% aller vom Autor in Griechenland gesammelten oder vor Ort überprüften Exemplare weisen, geschlechterübergreifend, stark reduzierte Hinterflügelbänder auf (Abb. 10, 11).
Abb. 10: ♂, aberrativ, Limni Vouliakmenis (P), 15 m, 20 km NW Loutraki, 7.-8.VI.2005.
Abb. 11: ♂, aberrativ, Trigona (H), 750 m, Katara-Pass-E, Thessalia, 11.VIII.1994.
Abb. 12: ♀, Habitus typisch O. tirhaca CR., Vathia (T), 100 m, Halbinsel Mani, Peloponnisos, 26.V.2003.

Abb. 13–15: *Minucia lunaris* D. & S. (31). Abb. 13: ♂, als dunkle Form typisch für Griechenland, Asprangeli (G), 1050 m, 30 km N Ioannina, Mitsikeli, Ipiros-NE, 3.-7.V.2000.
Abb. 14: ♀, ein Exemplar mit atypisch verlaufenden Querlinien, Mega Peristeri (H), 700 m, 35 km E Ioannina, Lakmos-NW, Pindos, Ipiros-E, 13.V.1999.
Abb. 15: ♀, Habitus typisch lunaris, Asprangeli (G), 1050 m, 30 km N Ioannina, Ipiros, 5.V.2000.
Fotos: PIATKOWSKI. Alle Abbildungen im Maßstab 1:1.

Farbtafel 6

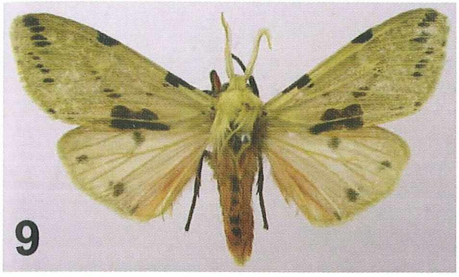


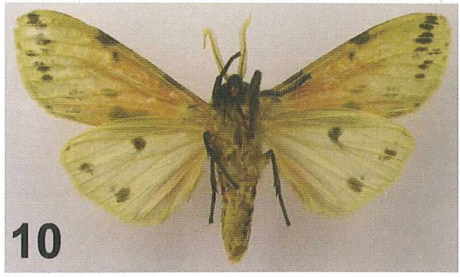
Colour plate 7 / Farbtafel 7

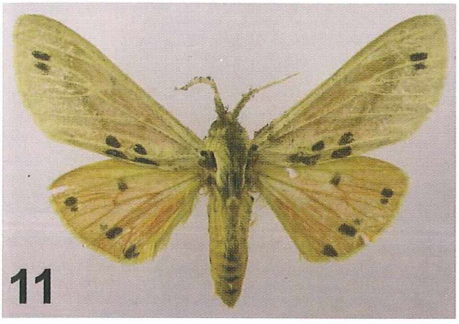


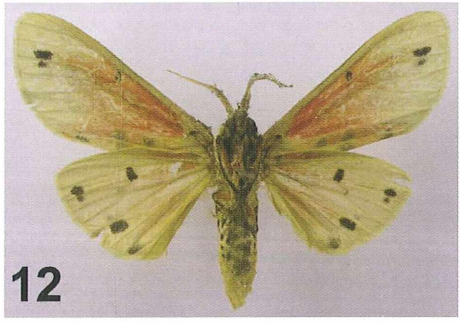
Figs. 1-2: *Spilarctia hypogopa hypogopa* (HAMPSON, 1907) ♂, Indonesia, West Sumatra, Harau valley, h=700 m, V.2004, native collector leg. (SZMN); 1 – upperside, 2 – underside.
Figs. 3-4: *Spilarctia hypogpa hypogopa* (HAMPSON, 1907) ♂, Malaysia, Borneo, Sarawak, G. Serapi, 29.IV.1990, coll. Y. KISHIDA; 3 – upperside, 4 – underside.
Figs. 5-6: *Spilarctia hypogopa mentawaica* DUBATOLOV **subsp. nov.**, ♂, holotype, Indonesia, Mentawai isls., Siberut isl., Bojakan, IX.2004, native collector leg. (SZMN); 5– upperside, 6: underside.
Fig. 7: *Spilarctia moorei* (SNELLEN, 1879) ♂, figure from the original description.
Fig. 8: *Spilarctia moorei* (SNELLEN, 1879) ♂, lectotype, [Indonesia], Celebes, Lokka [National Natural History Museum (Naturalis) in Leiden], by courtesy of Dr. J. DE JONG and Dr. R. DE VOS.

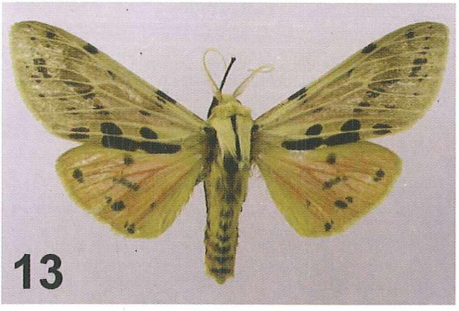
Colour plate 8 / Farbtafel 8

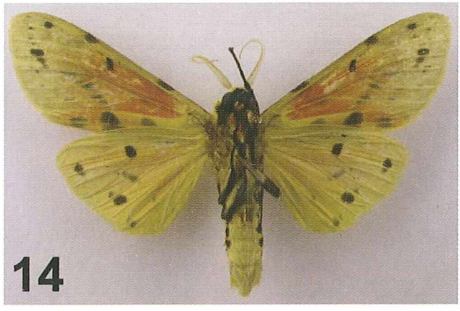


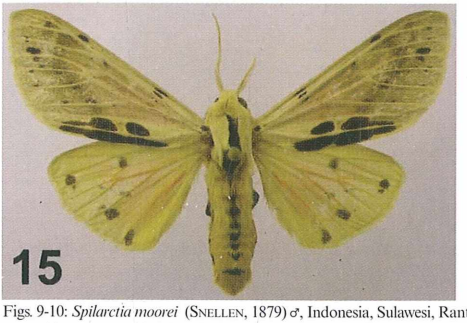


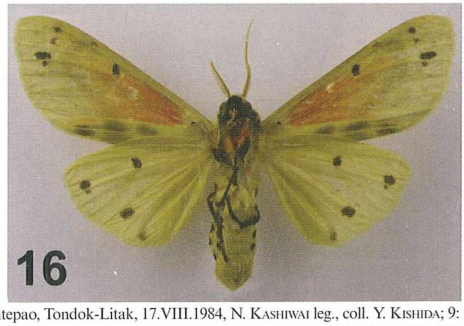












Figs. 9-10: *Spilarctia moorei* (SNELLEN, 1879) ♂, Indonesia, Sulawesi, Rantepao, Tondok-Litak, 17.VIII.1984, N. KASHIWAI leg., coll. Y. KISHIDA; 9: upperside, 10: underside. Figs. 11-12: *Spilarctia philippina* DUBATOLOV & KISHIDA **spec. nov.**, holotype ♂, Philippines, Negros I., Mt. Canlaon, IX.1997, native collector leg. (National Science Museum, Tokyo); 11: upperside, 12: underside. Figs. 13-14: *Spilarctia philippina mindanaoica* DUBATOLOV & KISHIDA **subspec. nov.**, holotype ♂, Philippines, Mindanao I., Mt. Busa, 11-18.VI.1997, native collector leg. (National Science Museum, Tokyo); 13: upperside, 14: underside. Figs. 15-16: *Spilarctia philippina mindanaoica* DUBATOLOV & KISHIDA **subspec. nov.**, paratype ♂, Philippines, Mindanao I., Mt. Busa, 11-18.VI.1997, native collector leg., coll. Y. KISHIDA; 15: upperside, 16: underside.

Colour plate 9 / Farbtafel 9

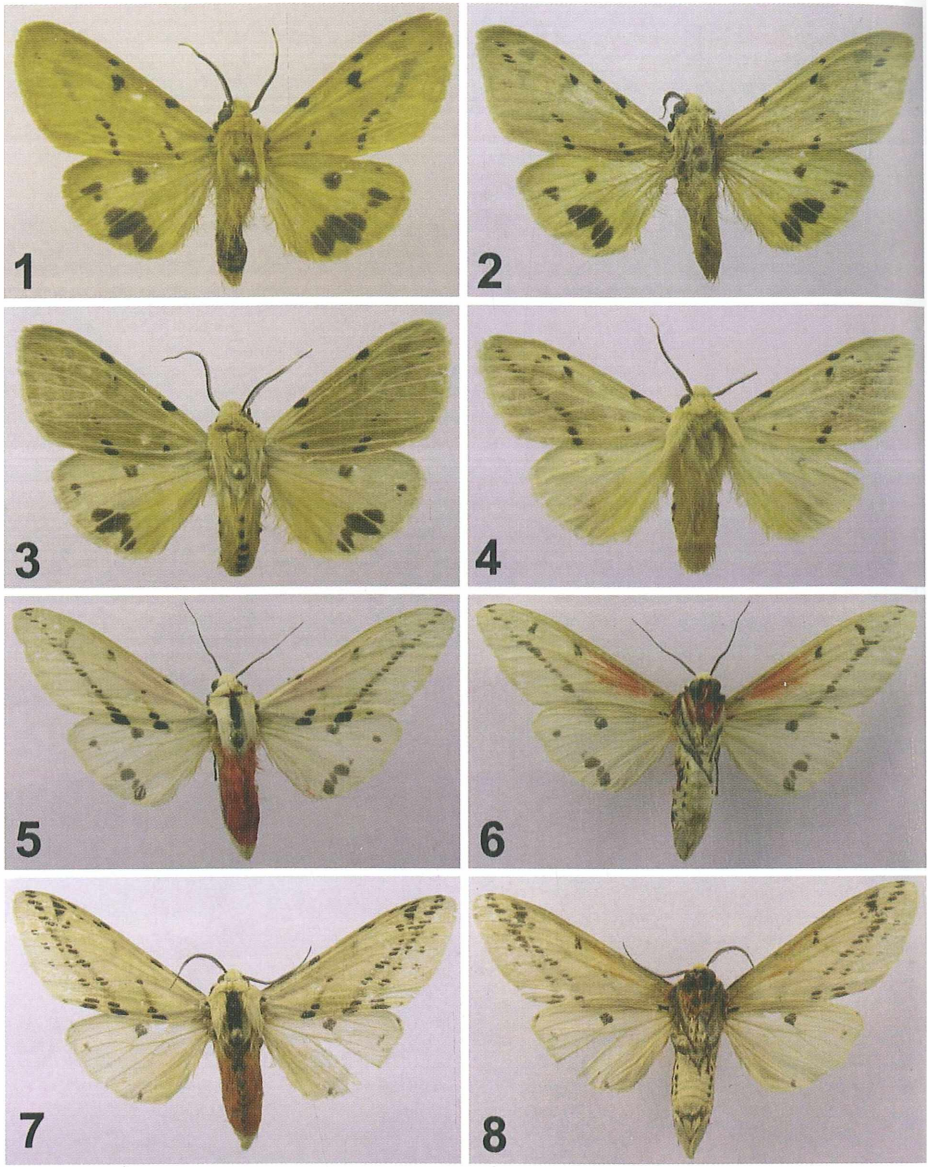


Fig. 1: *Spilarctia (punctata) siberuta* **spec. nov.**, paratype ♂, Indonesia, Mentawai isls., Siberut isl., Bojakan, IX.2004, native collector leg. Fig. 2: *Spilarctia punctata* (Moore, 1859) ♂, Indonesia, E Java, Mt. Argapura, IV.1995, anonymous leg., received from coll. Y. Kishida. Fig. 3: *Spilarctia (punctata) procedra* (Swinhoe, 1907) ♂, Indonesia, West Sumatra, Harau valley, 700 m, V.2004, native collector leg. Fig. 4: *Spilarctia (punctata) congruenta* (Thomas, [1993]) ♂, Indonesia, Java, Buitenzorg., 27-29.VII.1907, Bar. Brüggen leg. Fig. 5-6: *Spilarctia (ananda) irina* **spec. nov.**, holotype ♂, Indonesia, West Sumatra, Mt. Sanggul, 1300 m, VII.2004, native collector leg., upperside (5), underside (6). Fig. 7-8: *Spilarctia ananda* (Roepke , 1938) ♂, Indonesia, Bali, Tamblingan, VI.2004, native collector leg., upperside (7), underside (8).

Colour plate 10 / Farbtafel 10

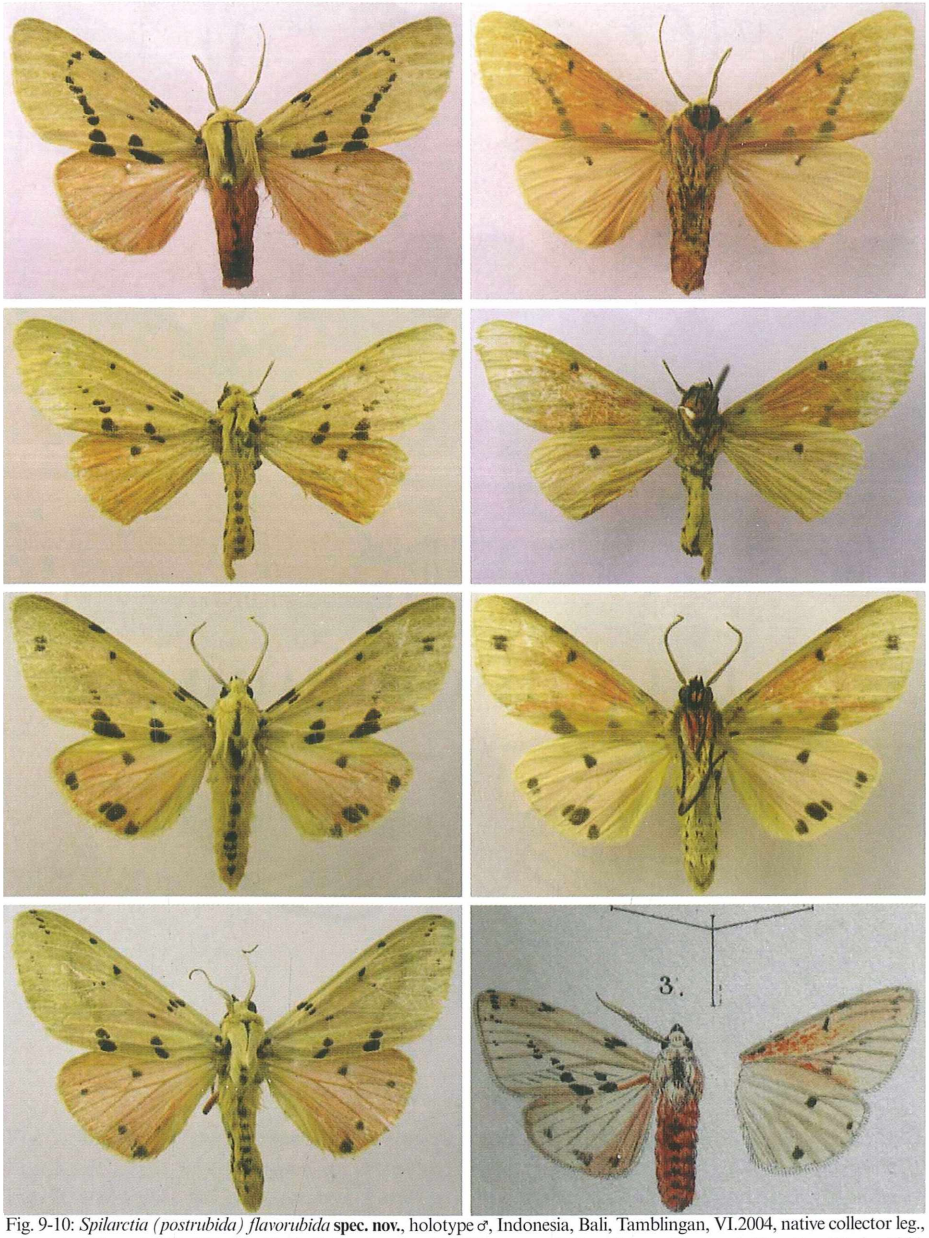


Fig. 9-10: *Spilarctia (postrubida) flavorubida* **spec. nov.**, holotype ♂, Indonesia, Bali, Tamblingan, VI.2004, native collector leg., upperside (10), underside (11). Fig. 11-12: *Spilarctia postrubida* (Wileman, 1910) ♂, Taiwan (Formosa), Nan Tow, Wushe, 1966, received from coll. Y. Kishida, upperside (11), underside (12). Fig. 13-14: *Spilarctia postrubida* (Wileman, 1910) ♂, Vietnam, Ninh Bình, Gia Vien, Cuc Phuong, 160 m, 20-21.III.1998, K. Yazaki leg., coll. Y. Kishida, upperside (13), underside (14). Fig. 15: *Spilarctia postrubida* (Wileman, 1910) ♂, Nepal, Mechi, Godok, 14.IV 1993, coll. Y. Kishida. Fig. 16: *Spilarctia moorei* (Snellen, 1879) ♂, figure from the original description by Snellen, 1879.

Colour plate 11 / Farbtafel 11

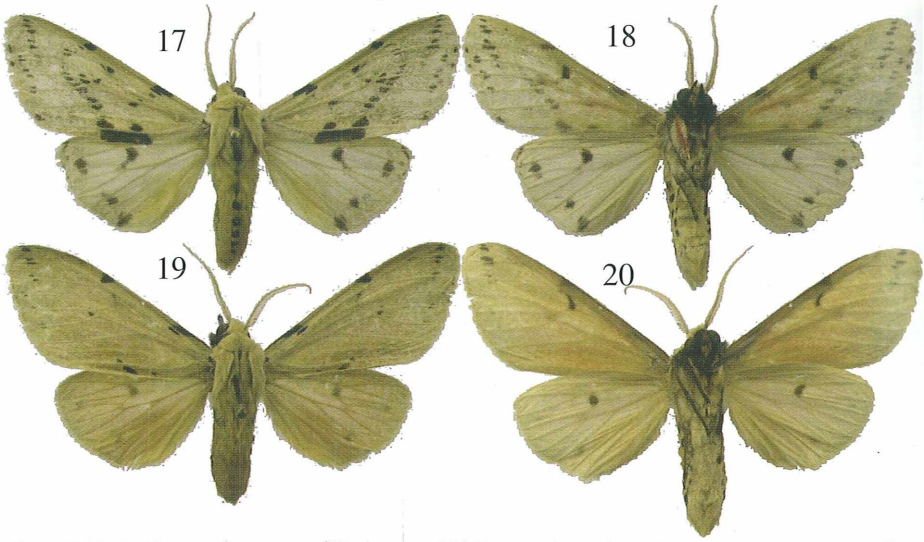
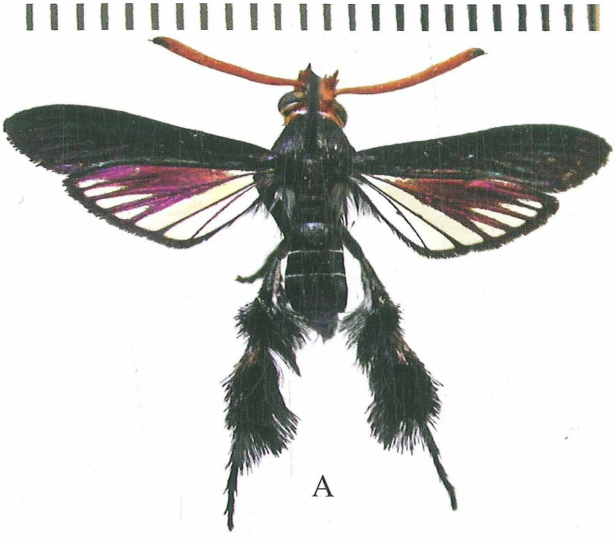


Fig. 17-18: *Spilarctia hypogopa* (HAMPSON, 1907) ♂, Indonesia, West Sumatra, Harau valley, 700 m, V 2004, native collector leg., upperside (17), underside (18).
Fig. 19-20. *Spilarctia hypogopa* (HAMPSON, 1907) ♂, Indonesia, Bali, Tamblingan, VI.2004, native collector leg., upperside (19), underside (20).



Melanosphecia auricollis (ROTHSCHILD, 1912), Sarawak, Gunung Gading N.P., 23.-26. 10. 2003 leg. W. MEY.

Colour plate 12 / Farbtafel 12

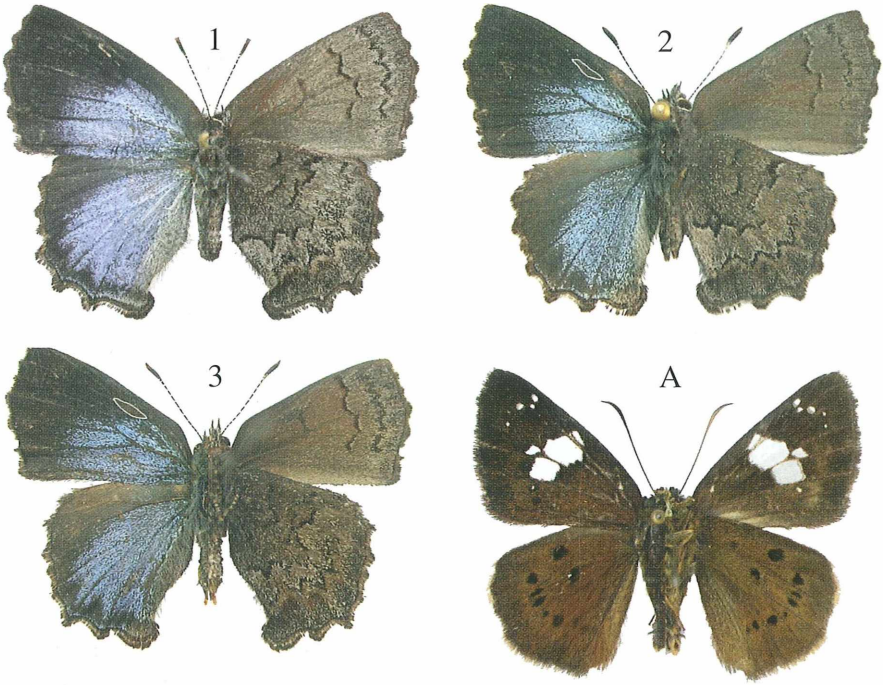


Fig. 1: *Ahlbergia clarolinea* **spec.nov.** Holotype ♀ upperside (left half) and underside (right half).
Fig. 2: *Ahlbergia clarolinea* **spec.nov.** Paratype ♂ upperside (left half) and underside (right half).
Fig. 3: *Ahlbergia clarolinea* **spec.nov.** Paratype ♂ upperside (left half) and underside (right half).
Fig.A: *Colandia uemurai motuoa* **subspec. nov.** holotype ♂ Upperside (left half) and Underside (right half).

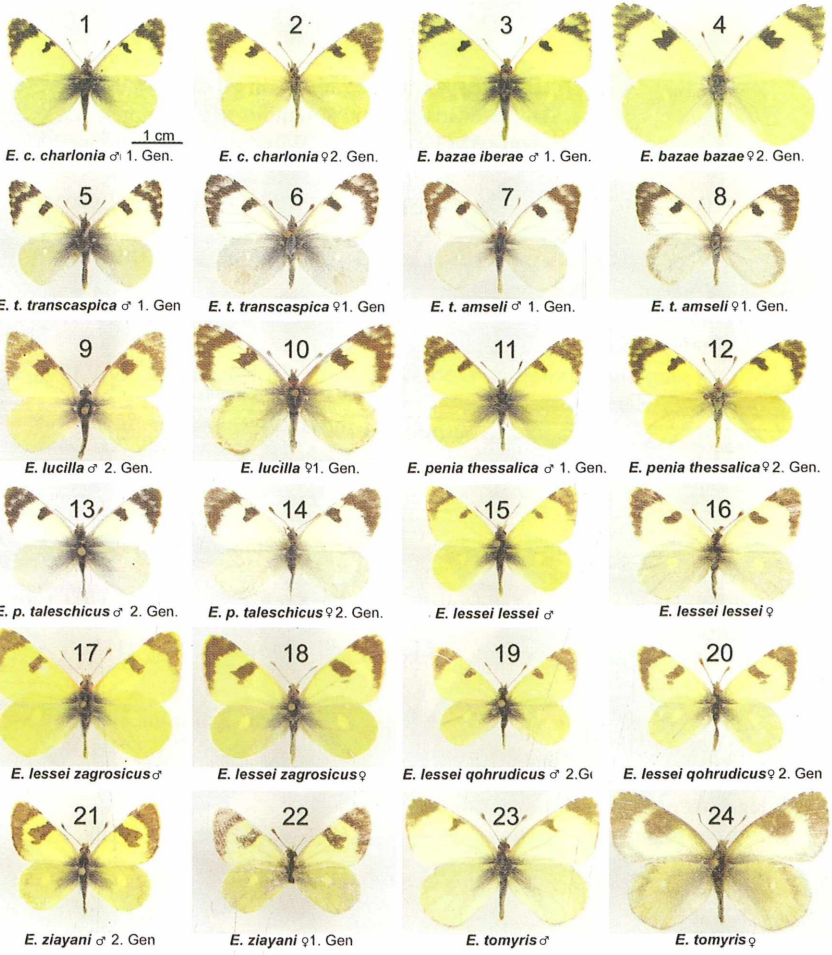
Colour plate 13 / Farbtafel 13

BACK, W., KNEBELSBERGER, TH. & M. A. MILLER: The phylogenetic relationships of the species and subspecies of the subgenus *Elphinstonia* KLOTS, 1930 (Lepidoptera, Pieridae). - Atalanta **37** (3/4): 469-482, Würzburg (Dezember 2006).

Abbreviations: *E.: Elphinstonia, c.: charlonia, p.: penia, t.: transcaspica*, Gen.: generation. Same scale for 1-24.Localities: **1**: Env. Tiznit, Maroc, 100m, Anti-Atlas occ., 1.-15.3.[19]99, M. R. TARRIER (129). **2**: Env. Tiznit, Maroc, 100m, Anti-Atlas occ.,16.-30.4.1999, leg. M. R. TARRIER (129). **3**: Umg. Caspe, Aragon, Spanien, 14.-16.3.05, W BACK, FS. **4**: Prov. Granada, Baza, 900m, Hoya de Baza, 31.5.2004, W. & CO. BACK, FS. **5**: Turkmenia mer. Kopetdag Mts., Kara Kala, 400m, 1.IV.1992,L. BIEBER coll. **6**: USSR, Turkmenia, Kopet-Dag Mts., 400-600m, 58°05'E, 37°59'N, 15.-19-IV.1991, No. L1, leg. G.CSORBA, GY. FÁBIÁN, B. HERCZIG, M. HERBIAY & G. RONKAY. **7**: Dalaki, Straße Bushir-Kazerun, 15.-21.3.1971 (19.), W. BACK, FR, Leist. **8**: Dalaki, Straße Bushir-Kazerun, 15.-21.3.1971 (19.), W. BACK, FR, Leist.**9**: Afghanistan, Jalalabad-Torkham, 500m, 18.4.1976, leg. Dr. RESHÖFT. **10**: O-Afghaniatan, Ghanikhel Umg., ca. 1000m, 14.3.1975, leg. M. DIETZ. **11**: Treska-Schlucht, Umg. Skopje, Mazedonien, 5.5.1978, leg. W. BACK, FR. **12**: Treska-Schlucht, Umg. Skopje, Mazedonien, e. l. 25.5.-10.6.[19]77, R. 20.5.[19]77, leg. W. BACK FR. **13**: Iran, Zanjan prov., östl. Mt. Tales, 1100-1300m, 9.-30.5.2003, leg. M. ZIAYAN, coll. W. BACK, FS. **14**: Iran, Zanjan prov., östl. Mt. Tales, 1100-1300m, 9.-30.5.2003, leg. M. Ziayan, coll. W. BACK, FS. **15**: Iran, Tehran prov., Khor-Sijan, 2400-2900m, 23.V.2001, leg. W. BACK, FS. **16**: N. Teheran, Darband (Tochal), Elburs, 2700m, 11.6.1999. **17**: Iran, Lorestan, Dorud, 15km S, 33°25' N, 49°08' E, 2700m, 4.-6.6.2000, leg. JIRI KLIR. **18**: Iran, Lorestan, Dorud, 15km S, 33°25' N, 49°08' E, 2700m, 4.-6.6.2000, leg. JIRI KLIR.**19**: Iran, Esfahan prov., Wadar-Zefre, Mt. Qohrod, 2400-2900m, 21.V.2001, leg. W. BACK, FS. **20**: Iran - centr. Esfahan prov., Qohrud, Mts. Zefre, 2400-2900m, 18.6.1999, leg. V. MAJOR. **21**: Iran, Zanjan prov., östl. Mt. Tales, 1100-1300m, 31.5.2002, leg. M. ZIAYAN, coll. W. BACK, FS. **22**: Iran, Zanjan prov., östl. Mt. Tales, 1100-1300m, 31.5.2002, leg. M. ZIAYAN, coll. W. BACK, FS. **23**: Turkmenistan, Ashkhabad, 10.4.89. **24**: Turkmenien, Kopetdagh, Aschchabad, 400m, 1.-10.IV.1991, leg. V. LUKHTANOV.

Colour plate 13 / Farbtafel 13

Plate 1 (Figs 1-24): species and subspecies of *Elphinstonia*

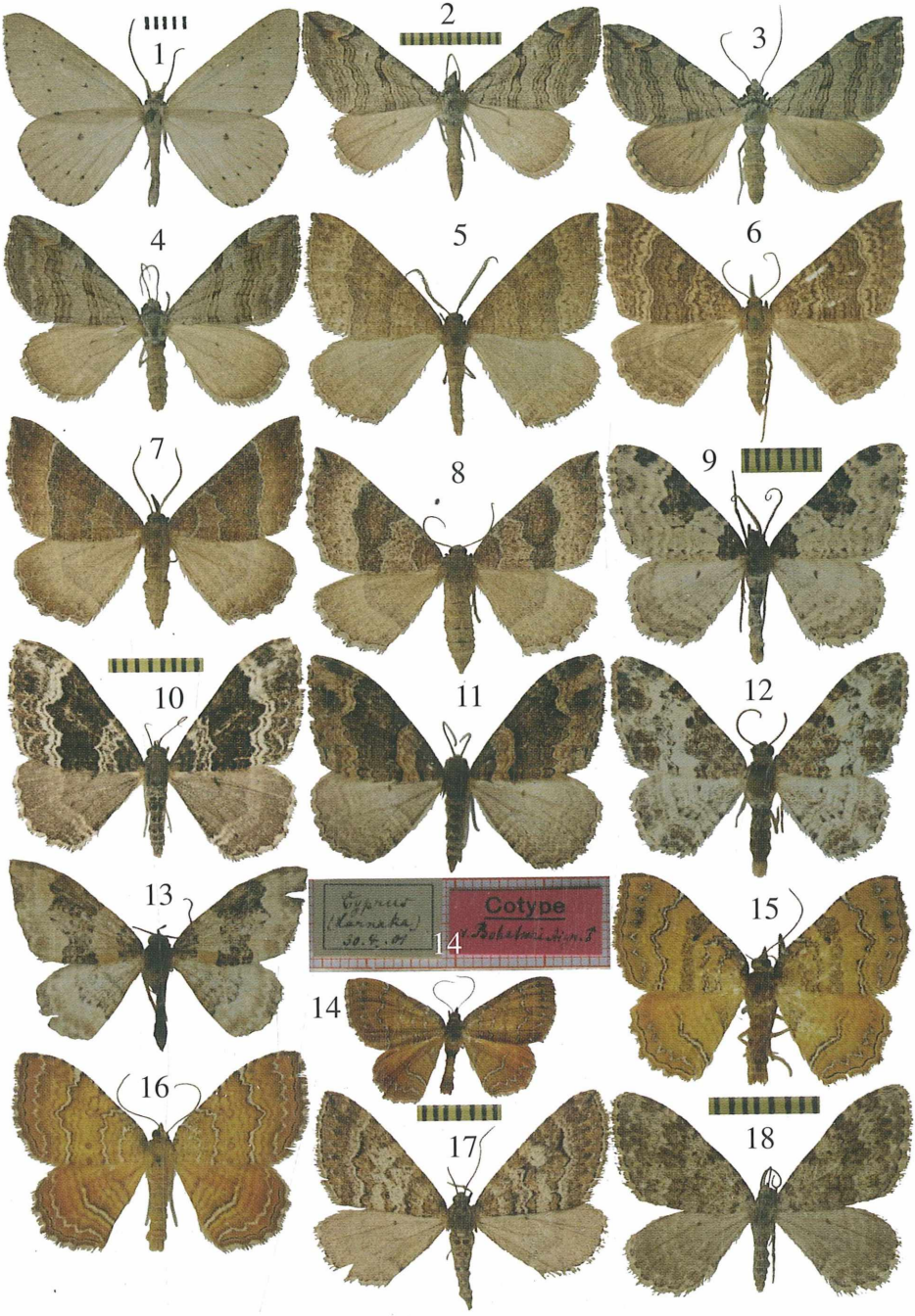


Farbtafel 14

FISCHER, H. & S. LEWANDOWSKI: Die Geometriden- Fauna von Zypern – eine Überarbeitung aller bisher bekannten Arten. (2. Teil: Orthostixinae und Larentiinae) (Lepidoptera: Geometridae, Orthostixinae, Larentiinae). - Atalanta **37** (3/4): 329-344, Würzburg (Dezemmber 2006).

Abb. 1: *Orthostixis cinerea* REBEL,1916, ♂, Zypern, Foini, 11.VI.2002, leg. LEWANDOWSKI & FISCHBACHER.
Abb. 2: *Aplocera plagiata* (LINNAEUS, 1758), ♂, Zypern, Agridia, 28.IX.2000, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 3: *Aplocera plagiata* (LINNAEUS, 1758), ♀, Kreta, Umg. Anogia, 20.IV.1994, ca. 1000 m ex larva, leg. CHRISTINE & HEINZ FISCHER.
Abb. 4: *Aplocera plagiata* (LINNAEUS, 1758), ♀, Korsika, Col de Vergio, 19.V.1996, 800 m, leg. FISCHER, H & C. ZEHENTNER.
Abb. 5: *Larentia clavaria pallidata* (STAUDINGER, 1901), ♂, Zypern, Kathikas, 1.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 6: *Larentia clavaria pallidata* (STAUDINGER, 1901), ♀, Zypern, Gialia, 2.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 7: *Larentia clavaria clavaria* (HAWORTH, 1809), ♂, Malta, St. Julian's, 1.III.1998, 5 m, e.l., leg. LEWANDOWSKI & TOBER.
Abb. 8: *Larentia clavaria clavaria* (HAWORTH, 1809), ♀, Malta, St. Julian's, 1.III.1998, 5 m, e.l., leg. LEWANDOWSKI & TOBER.
Abb. 9: *Xanthorhoe fluctuata* (LINNEAUS, 1758), ♂, Zypern, Latsi bei Polis, 31.V.2000, leg. LEWANDOWSKI & TOBER.
Abb. 10: *Xanthorhoe oxybiata* (MILLIÈRE, 1872), ♀, Zypern, Kathikas, 1. XI. 2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 11: *Catarhoe hortulanaria palaestinensis* (STAUDINGER, 1895), ♂, Zypern, Kathikas, 1. XI. 2002, leg. FISCHER, H & S. LEWANDOWSKI..
Abb. 12: *Catarhoe permixtaria* (HERRICH-SCHÄFFER, 1856, ♂, Zypern, Nikoklela, 1.- 8.V.2000, 150 m, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 13: *Protorhoe unicata* (GUENÉE, 1857), ♂, Zypern, Nikoklela 25.-31.III.2001, 150 m, leg. HENTSCHOLEK.
Abb. 14: *Camptogramma bilenatum bohatschi* (AIGNER, 1902), Typus ♂, Zypern, Larnaca, 30.IV.[19]01, coll. MNHU.
Abb. 15: *Camptogramma bilenatum bohatschi* (AIGNER, 1902), ♀, Zypern, Kidasi, 6.-12.VI.2002, 300 m, leg. HENTSCHOLEK.
Abb. 16: *Camptogramma bilenatum bohatschi* (AIGNER, 1902), ♂, Lesbos, Umg. Plomari 28.V.2005, 180 m, leg. SVETLANA & HEINZ FISCHER.
Abb. 17: *Antilurga adlata* (STAUDINGER, 1895), ♀, Zypern, Mylikouri, 3.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 18: *Nebula ablutaria* (BOISDUVAL, 1840), ♂, Zypern, Kathikas, 1.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.

Farbtafel 14



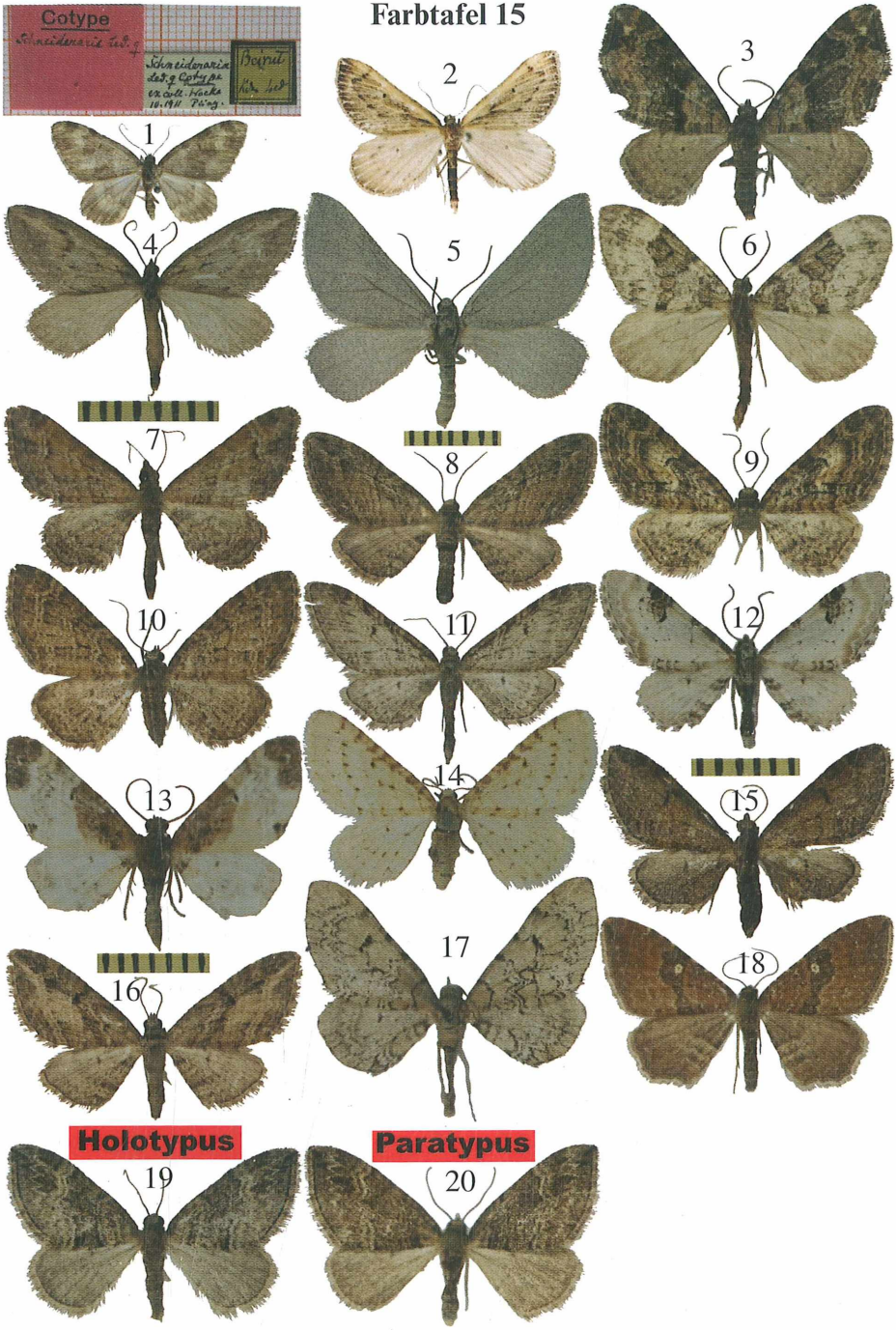
Farbtafel 15

FISCHER, H. & S. LEWANDOWSKI: Die Geometriden- Fauna von Zypern – eine Überarbeitung aller bisher bekannten Arten. (2. Teil: Orthostixinae und Larentiinae) (Lepidoptera: Geometridae, Orthostixinae, Larentiinae). - Atalanta **37** (3/4): 329-344, Würzburg (Dezemmber 2006).

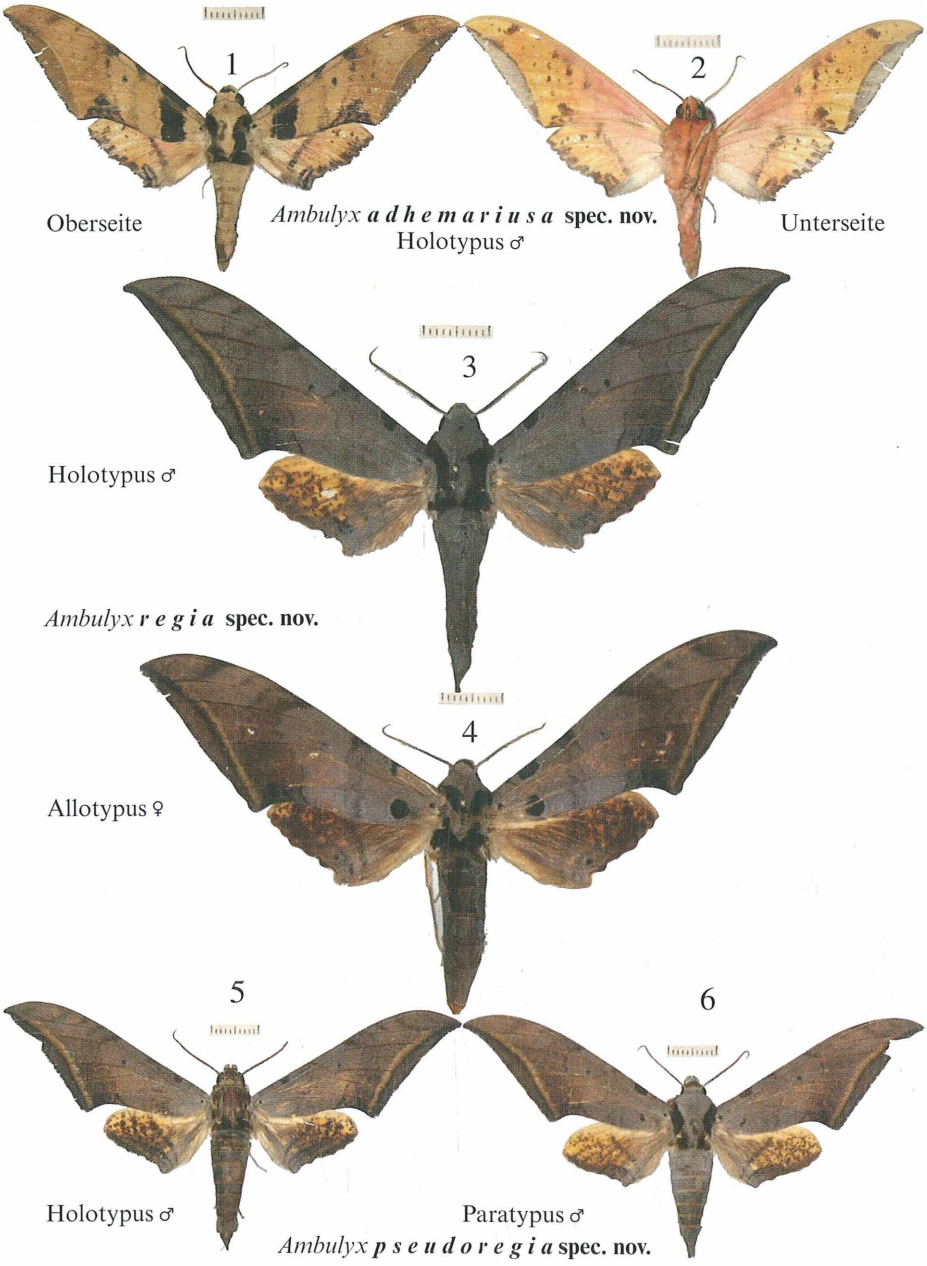
Abb. 1: *Nebula schneideraria* (LEDERER, 1855), Typus ♀, Beirut, X. 1911, leg. PÜNG.[ELER], coll. MNHU.
Abb. 2: *Myinodes shohami* HAUSMANN, 1994, ♂, Zypern, Limassol, Ypsonas, 30.I.2003, 50 m, leg. GEORGIOU.
Abb. 3: *Oulobophora externaria* (HERRICH-SCHÄFFER, 1848), ♀, Zypern / West, Nikloklela / Paphos, 25.-31.III.2001, 150 m, leg. HENTSCHOLEK.
Abb. 4: *Chesias rhegmatica* PROUT, 1937, ♂, Zypern, Latsi bei Polis, 28.II.1999, leg. LEWANDOWSKI & TOBER.
Abb. 5: *Lithostege palaestinensis* AMSEL, 1935, ♂, Zypern, Lefkosia, Archangelos, 3.IV.2002, leg. MAKRIS.
Abb. 6: *Thera variata subtaurica* (WEHRLI, 1932), ♂, Zypern, Pano Amiantos Umg., 27. IX 2002, 1640 m, leg. HENTSCHOLEK.
Abb. 7: *Gymnoscelis rufifasciata* (HAWORTH, 1809), ♂, Zypern, Latsi bei Polis, 10.VI.2000, leg. LEWANDOWSKI & TOBER.
Abb. 8: *Gymnoscelis rufifasciata* (HAWORTH, 1809), ♀, Zypern, Kathikas, 1.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 9: *Eupithecia dubiosa* DIETZE, 1910, ♂, Zypern, Latsi bei Polis, 28.II.1999, leg. LEWANDOWSKI & TOBER.
Abb. 10: *Eupithecia reisserata* PINKER, 1976, ♂, Griechenland, Parnassos Oros Umg. Delphi, 16.IV.1979, Li, 500-700 m, G. BAISCH, coll. ZSM.
Abb. 11: *Eupithecia quercetica* PROUT, 1938, ♂, Zypern, Latsi bei Polis, 28.II.1999, leg. LEWANDOWSKI & TOBER.
Abb. 12: *Eupithecia centaureata* ([DENIS & SCHIFFERMÜLLER], 1775), ♂, Zypern, Latsi bei Polis, 28.II.1999, leg. LEWANDOWSKI & TOBER.
Abb. 13: *Eupithecia breviculata* (DONZEL, 1837), ♂, Zypern, Nikoklela, 1.-8.V.2000, 150 m, leg. HENTSCHOLEK.
Abb. 14: *Eupithecia cerussaria* (LEDERER, 1855), ♂, Syrien, Beyrouth, leg. O. STAUDINGER, coll. ZSM.
Abb. 15: *Eupithecia ultimaria* BOISDUVAL, 1840, ♀, Zypern, Nikoklela, 25.-31.III.2001, 150 m, leg. HENTSCHOLEK.
Abb. 16: *Eupithecia ericeata* RAMBUR, 1833, ♂, Zypern, Kathikas, 1.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 17: *Eupithecia schiefereri* BOHATSCH, 1893, ♂, Lesbos, Umg. Plomari, 24.V.2005, 180 m, leg. SVETLANA & HEINZ FISCHER.
Abb. 18: *Orthonama obstipata* (FABRICIUS, 1794), ♀, Zypern, Gialia, 2.XI.2002, leg. FISCHER, H & S. LEWANDOWSKI.
Abb. 19: *Perizoma bifaciata melanaria* **subspec. nov.**, Holotypus ♂, Zypern, Lefkara, Umgebung, 29.IX.2004, 800 m, leg. LEWANDOWSKI & TOBER.
Abb. 20: *Perizoma bifaciata melanaria* **subspec. nov.**, Paratypus ♀, Zypern, 2 km südlich von Agridia, 28.IX.2000, 1060 m, leg. FISCHER, H & S. LEWANDOWSKI.

Alle Falter coll. S. LEWANDOWSKI & H. FISCHER, außer Tafel 14, Abb. 14: coll. MNHU, Tafel 15, Abb. 1: coll. MNHU, Abb. 2: coll. MAKRIS, Tafel 15, Abb. 10: coll. ZSM, Abb. 14: coll. ZSM. Alle Fotos S. LEWANDOWSKI & H. FISCHER, außer Tafel 15, Abb. 2: MAKRIS.

Farbtafel 15



Farbtafel 16



Ambulyx ***a d h e m a r i u s a*** **spec. nov.**
Holotypus ♂

Ambulyx ***r e g i a*** **spec. nov.**

Ambulyx ***p s e u d o r e g i a*** **spec. nov.**

Fundortangaben siehe Seite 483-486 (Maßskala jeweils 1 cm).