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The Mirinidae of Vietnam (Lepidoptera)

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Abstract

A new species of Mirinidae (Lepidoptera) is described from Vietnam and compared with related species: *Mirina confucius* sp. nov. The description is illustrated by 30 figures, 5 of them in color.

Zusammenfassung

Eine neue Mirinidae-Art (Lepidoptera) wird aus Vietnam beschrieben und mit verwandten Arten verglichen: *Mirina confucius* sp. nov. Die Beschreibung ist mit 30 Abbildungen versehen, 5 davon in Farbe.

Introduction

A new species of *Mirina* STAUDINGER, 1892 was discovered in the materials collected by A. SCHINTLMEISTER and V. SINJAEV in Northern Vietnam, Mount Fan-Si-Pan in March 1995 and by M. HREBLAY and C. SZABÓKY in Northern Thailand, Changwat Chiang Mai in February 1998. By now only two species of this small genus were known: *Mirina christophi* STAUDINGER, 1892 from South-Eastern Russia (Primorye) and Northern Korea and *Mirina fenzeli* MELL, 1938 (= *Mirina longnanensis* CHEN & WANG, 1993) from China, Shaanxi, Tapaishan and Gansu, Wen County. All species of the genus occur very local in small areas and usually they are considered as endemics or relics. Foodplants of *Mirina christophi* are wild *Lonicera* and *Veigella*. Nothing is known about the biology of the Chinese species but all *Mirina*-species are typical for leaffall or mixed forests and are

on the wings from end of May till June or beginning of July.

Taxonomic remarks. The phylogenetic position of the genus *Mirina* STAUDINGER, 1892 within the Lepidoptera is still vague. Usually *Mirina* is considered as a member of Endromidae and placed there in a separate subfamily Mirininae KOZLOV, 1985 (an attribution of its authority to KUZNETZOV & STEKOLNIKOV, 1985 is incorrect because their work was published three months later than KOZLOV's one, as a matter of fact in January 1986). The actual tendency to raise it into the rank of a monotypic family, Mirinidae, is followed.

The problems concerning the taxonomic position of *Mirina* within the Bombycoidea was discussed by KOZLOV (1985) for *Mirina christophi* STAUDINGER, 1892 with the result of the erection of a new subfamily, Mirininae KOZLOV, 1985. This point of view was followed also by KUZNETSOV & STEKOLNIKOV (1985 [1986]) after having studied the musculature of the male genitalia of *Mirina*, *Endromis* and other related groups of Bombycoidea. Further information was published by MINET (1986, 1994). In his first article, MINET considered the Mirininae in the rank of a separate family with remark "En effet, la position systématique du genre *Mirina* STAUDINGER a été considérée comme incertaine..., et l'attribution de ce genre aux Endromidae ou aux Bombycidae ne repose que sur de vagues ressemblances phénétiques" (p.303). In the second article he considered the Mirinidae as a sister group of the Endromidae, but pointed out that the synapomorphies between these two families seem to be of limited significance (p. 73). Moreover, from all 4 synapomorphies listed by J. MINET (29. - 32.), no one is unique and at least the synapomorphies 29. - 31. "independently evolved in a few other groups" (e.g. Lasiocampidae). As far as known, there are no convincing autapomorphies for the Mirinidae which would allow to consider the taxon as a separate family and at the same time there are so far no synapomorphies for it and for the Endromidae. The first point of view was discussed by KUZNETZOV & STEKOLNIKOV 1985: 41: "As regards Bombycidae and Brahmaeidae, there are some apomorphic features in genitalia and their musculature in *Endromis* OCHS. and *Mirina* STGR., namely the unique fastening of m1 on the lateral sides of uncus, development of the proximal hillocks on the uncus, fastening of m4 to the distal edges of hemitransstilla, fastening of m3 to sacculus as in some Brahmaeidae and Sphingidae, peculiarities of valvae and the tends of the intravalvar muscles to situate dia-metrical within the valvae, a fastening place is changed on the membrane, a presence of rudimental socii and reduction of the gnathos. At the same time *Mirina* differs from *Endromis* besides the pointed yet important morphological peculiarities of caterpillars [they have well observed glands, that can turn inside out, above the bases of abdominal legs and their body is covered, as in the Saturniidae, by long spines] by another position of m6 on the aedeagus, partially replacement of a fastening place of m4 on the membrane and by the reduction of m2. Although the m2 reduction is observed in many Bombycoidea families, the totality of characters that distinguish the *Mirina* STGR. from *Endromis* OCHS., allows us to support the taxonomic range of a subfamily Mirininae KOZLOV, 1985 for that genus". It has also been claimed to possess a very characteristic type of cocoon and pupation on the food-plant in *Mirina* which is not typical for *Endromis*, but the last characters have a weak taxonomic significance.

As was pointed out above, there are great difficulties to provide good autapomorphies for *Mirina*. So far only one species in the genus was known or, more correctly, investigated, in which there were no problems to obtain many "good and reliable" characters.

But when the second species, *Mirina fenzeli*, was redescribed, it became very hard to find good autapomorphies for the two species; and now it is practically impossible to do so in the discovery of a third species. There are many possible combinations of different characters for various pairs of the species, e.g. *christophi* - *fenzeli*, *christophi* - *confucius*, *confucius* - *fenzeli*, but we were not able to join the three by at least one significant feature (the common groundplan of the venation, the sexual dimorphism in the development of foretibia epiphysis, 3-segmented palpi labiales [2-segmented palpi labiales were mentioned by MINET (1994) as synapomorphy for Mirinidae and Endromidae, but *Mirina* really have 3-segmented palpi with a very small third segment, which is practically fused with the second one - see figs 12-14], similar construction of a pretarsus, etc. were not taken into consideration because of the little phylogenetic use and their overlapping into a few other groups) that can be considered as an unique characteristic one. The reduction of m2 is in principle a good phylogenetic feature, but it also cannot be used here as unique one because it occurs, probably independently, in at least three "bombycoid" families: Bombycidae, Lasiocampidae, Saturniidae. Therefore only two characters can be marked here as supposed to be the autapomorphies for this genus. Unfortunately, females of *Mirina fenzeli* are unknown though one was pointed out as to belong to the type series and although all males checked in the description were found in the collections of Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK) and in Zoologisches Museum Humboldt-Universität (Berlin). The mentioned characters are:

1. The tergite VIII in females is strongly modified as figured.
2. The presence of a membranous fold situated dorsally on the membranous zone of tergite VIII in females, not far from the caudal edge.

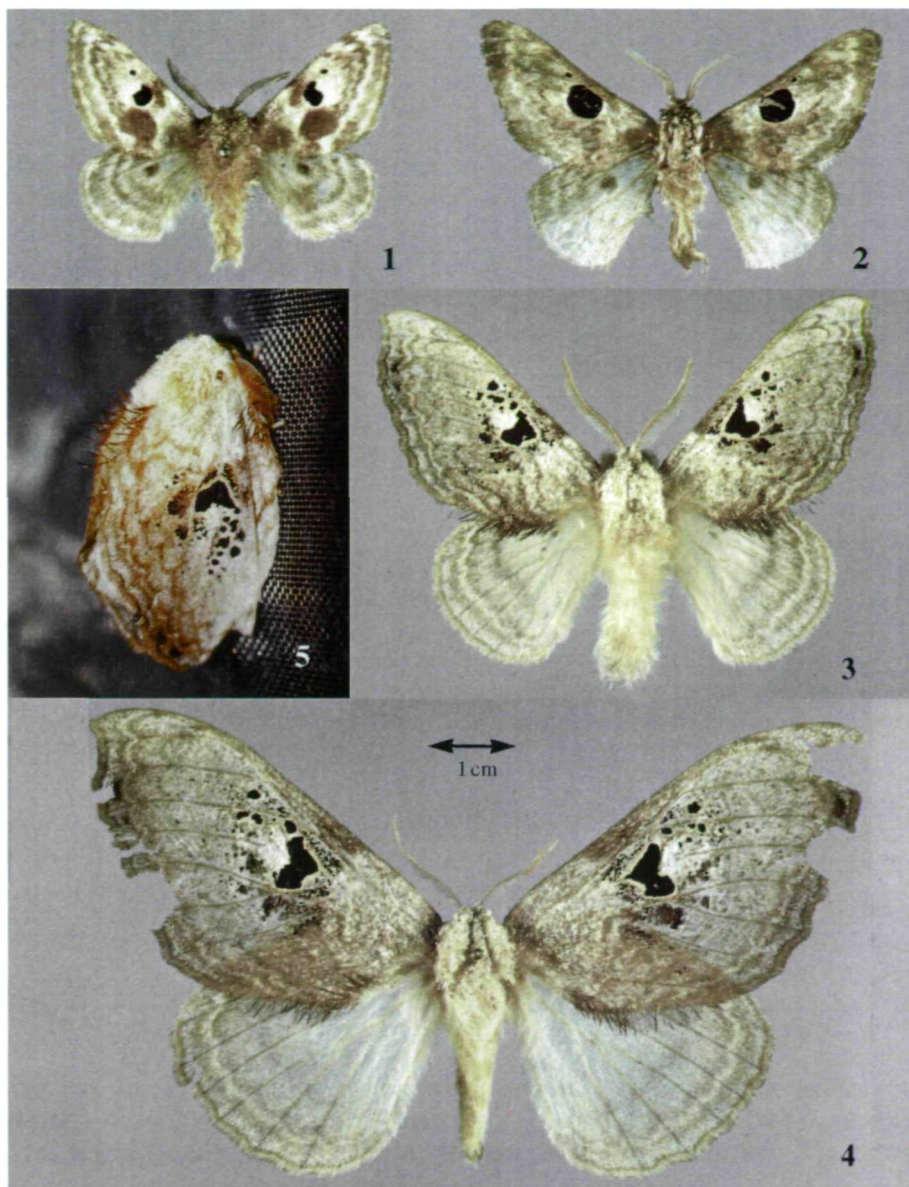
Further useful characters and additional real arguments have to be obtained for solving this taxonomic problem. Investigations of larval morphology for Chinese and Vietnamese species seem to be especially interesting. Up to now we consider all species provisionally as members of a single genus belonging to the monotypic family Mirinidae. Phylogenetic relationships between this family and the Endromidae need further investigations.

Mirina confucius sp. nov.

Holotype-♂: N. Vietnam, Mt. Fan-si-pan, N-Seite, Cha-pa (= Sapa) 1600m, 22°17'N, 103°44'E, prim. Urwald, 25.-30.III.1995, leg. SCHINTLMEISTER & SINJAEV (MWM = Museum Witt München).

Paratypes: 32♂♂ N. Vietnam, Mt. Fan-si-pan, N-Seite, Cha-pa (= Sapa) 1600m, 22°17'N, 103°44'E, prim. Urwald, 25.-30.III.1995, leg. SCHINTLMEISTER & SINJAEV(MWM); 2♂♂ with same data (ZFMK); 1♂ same data (coll. SCHINTLMEISTER); 1♂♀ same data (coll. ZOLOTUHIN); 1♂♀ same data (coll. SINJAEV); 4♂♂ Thailand, Changwat, Chiang Mai, Mt. Doi Phahompok, 16km NW of Fang, 2000m, 24.II.1998, leg. M. HREBLAY and C. SZABÓKY (MWM); 1♂ Changwat, Chiang Mai, Mt. Doi Phahompok, 16km NW of Fang, 2000m, 10.I.1999, leg. A. SZABÓ & Z. CZERE (MWM); 5♂♂ with same data, 18km NW of Fang, 2100m, 18.I., 20.I. and 25.II.1998 (MWM).

Male. Large moths, expanse 56-60mm, forewing length 30-33mm. Antennae bipectinated dark-yellow; eyes large. Body covered by dense creamish-yellow scales, thorax with unnumerous blackish scales, abdomen slightly lighter. Forewings elongated with lunula-



1. *Mirina christophi* STAUDINGER – ♂, Russia, Primorye;
2. *Mirina fenzeli* MELL – ♂, China, Tapaishan im Tsinling, Prov. Süd-Shensi, Co-Type;
3., 4. *Mirina confucius* sp. n. – ♂♀, N. Vietnam, Mt. Fan-si-pan, Holotype and Paratype;
5. *Mirina confucius* sp. n. – male in rest position, Mt. Fan-si-pan (Photo: V. SINJAEV).

ted outer margin; the same colour as the thorax but more brownish externally. A large C-like black discal spot, numerous black points, some more small spots and a large metallic shining mirror are typical; four transversal undulate brownish fasciae and a cream-grey touch in Cu-zone are presented. Anal margin of the forewings covered by long black hair-shaped scales. Hindwings rounded, creamish-yellow, more dark externally with two parallel transversal lunulate brownish lines. Cilia cream-yellow in hindwings and brownish-grey in forewings. Venation as in other *Mirina*-species. Forelegs with large ellipsoid epiphysis in the males and with a very short, practically reduced one in the females.

Female. Larger and darker with more expressed discal spot on the forewings; hindwings more semitransparent. Antennae also bipectinated but flagellar appendages shorter than in males. Expanse 88 mm, forewing length 55mm.

Male genitalia. Strong, well sclerotized. Uncus peak-shaped with deep dorso-cranial wrinkle, its dorsal surface covered by clear small wart-shaped projections carrying single setae; gnathos absent. Valvae broad, flattened and in shape and equipment very different from those of related species, with obvious caudal cut, inner sublateral folding and harp-shaped projection on inner surface; saccus short. Aedeagus thin, tubular with long distal kegle-shaped appendages, rounded apically and corresponding to lower lobe of aedeagus in *Mirina fenzeli*. Vesica with a single conical cornutus. Tergite VIII forms a pseudouncus as it was not observed in other *Mirina*. Male genitalia of related species are illustrated by KOZLOV (1985) and ZOLOTUHIN (1995).

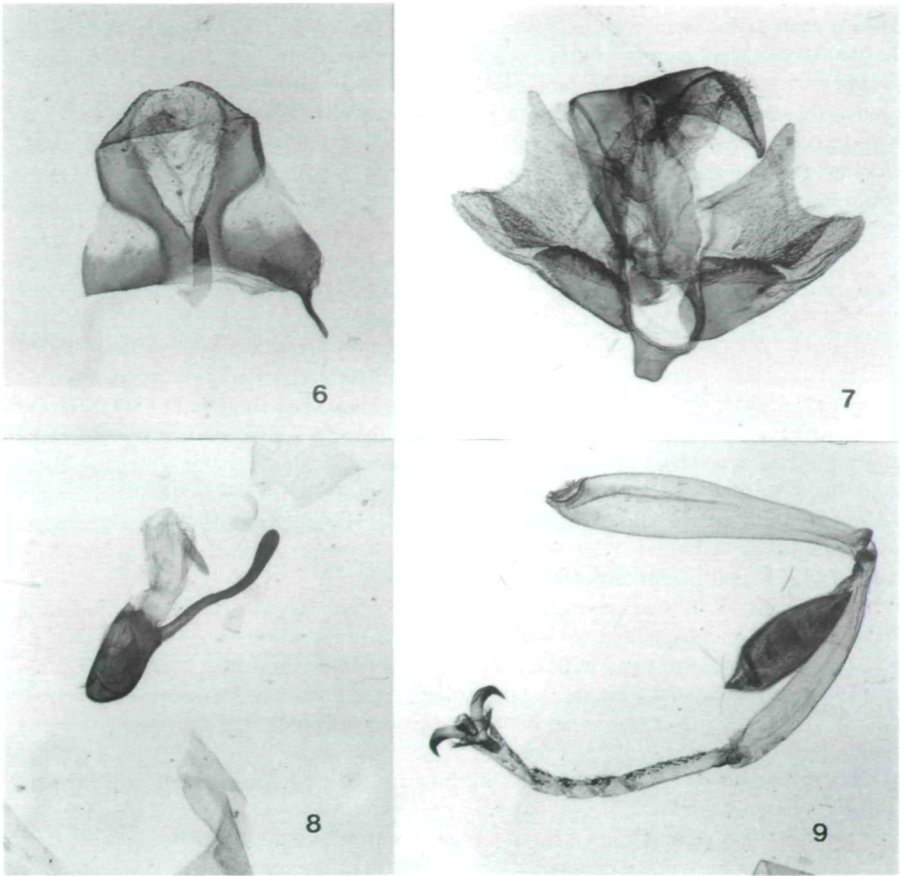
Female genitalia. Caudal segments slightly elongated. Tergite VIII forms caudally a sclerotized fold. As it is pointed out above, the sclerotization of the tergite VIII is characteristic for the females of two known species and the membranous bag is also typical for the membranous zone of the tergite. Vaginal plates well developed; ostium membranous; anthrum and ductus short and broad membranous; bursa copulatrix bag-shaped, without cornuti, membranous.

Preimaginal instars and biology are still unknown. All specimens were collected on light in primary forest.

Diagnosis. The new species cannot be confused with other species of the genus because of the large size, the dentated external margin of the forewings and the shape of the discal spot.

Acknowledgement

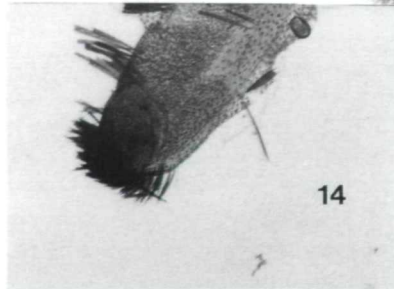
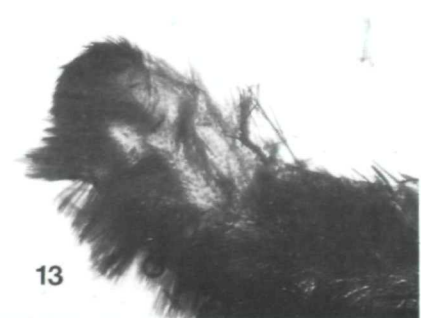
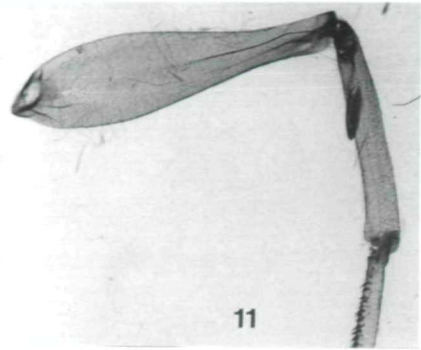
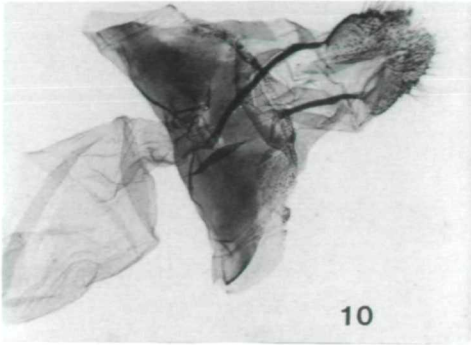
For the very fruitful discussion during the preparation of the manuscript, we would like to express our sincere thanks to Dr. Harald FÄNGER (ZFMK, Bonn).

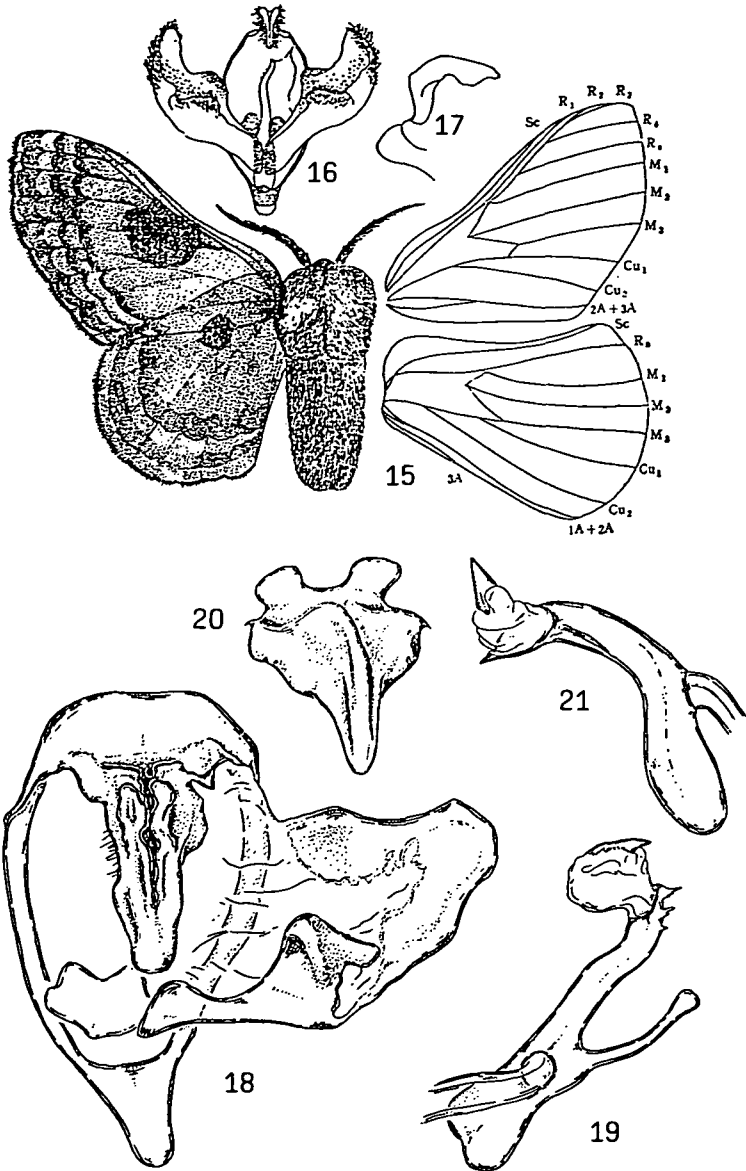


Figures 6-14 (p. 18-19)

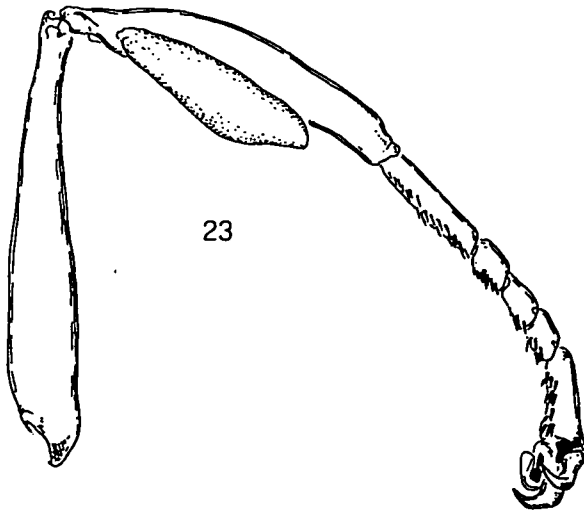
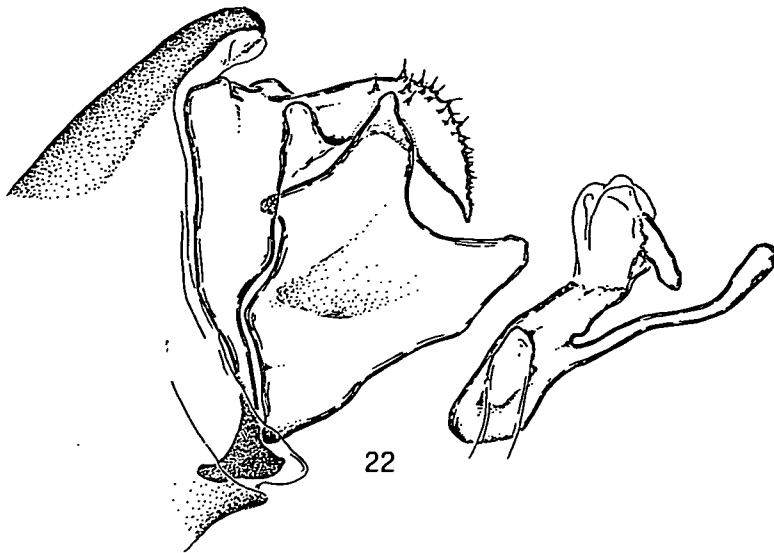
Morphological characters of *Mirina confucius* sp. nov.

Fig. 6: Paratype ♀, tergite VIII; fig. 7: Paratype ♂, genitalia; fig. 8: Paratype ♂, aedeagus; fig. 9: Paratype ♂, foreleg showing epiphysis; fig. 10: Paratype ♀, genitalia; fig. 11: Paratype ♀, foreleg showing sexual dimorphism in the size of epiphysis; fig. 12-14: Paratype ♀, palpi labiales, showing 3-segmented palpi.

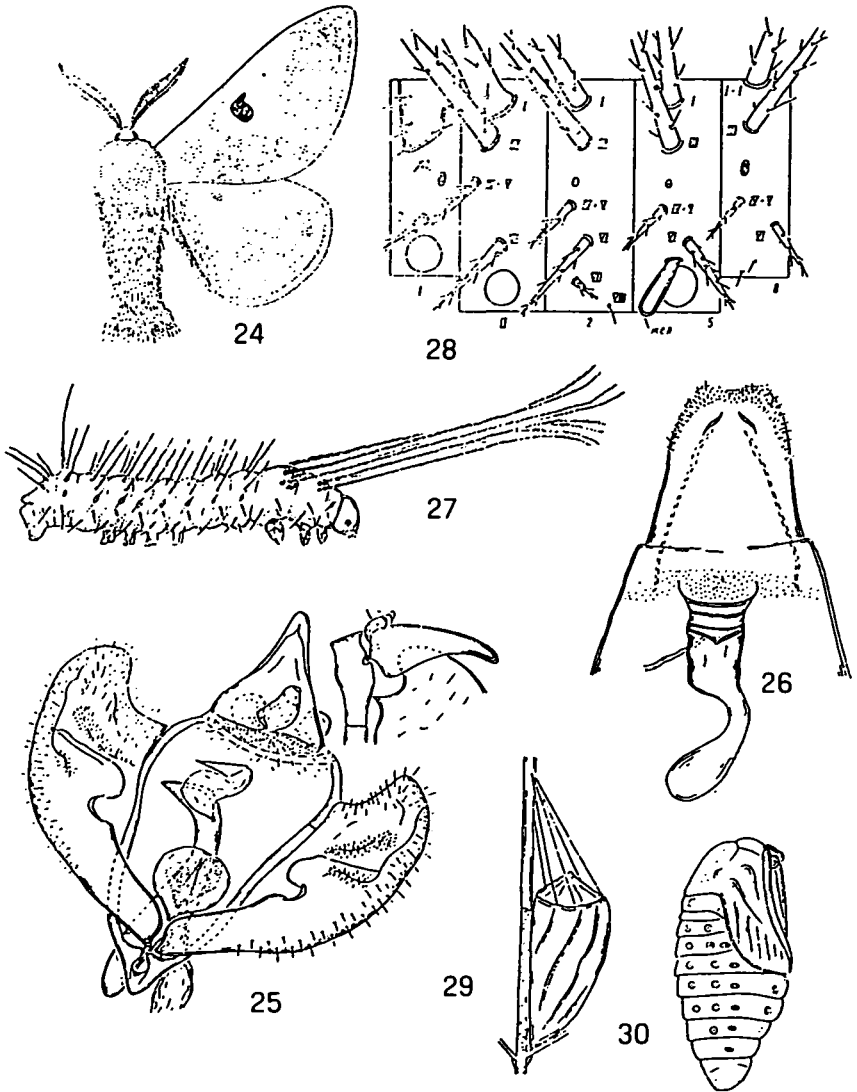




Figs 15-21 *Mirina* spp. 15-17 *Mirina longnanensis* CHEN & WANG (= *fenzeli*): Imago, ♂ genitalia in ventral view, uncus in lateral view and venation (taken from CHEN & WANG 1993); 18-19 *Mirina fenzeli* MELL paratype-♂: genitalia ventral and aedeagus; 20-21 *Mirina christophi* STGR. ♂: Uncus with tegumen and aedeagus.



Figs 22-23 *Mirina confucius* sp. nov. paratype ♂. 22: Genitalia lateral and aedeagus; 23: Foreleg showing epiphysis.



Figs 24-30 Morphology of *Mirina christophi* STGR. (after KOZLOV, M.V. 1985). 24: ♂, wing venation; 25: ♂ genitalia in general view and uncus dorsal; 26: ♀ genitalia; 27: 2nd instar larva; 28: Chaetotaxy of 1st instar larva; 29: Cocoon; 30: Pupa.

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Literaturbesprechung

DE FREINA, J.J. 1997: Die Bombyces und Sphinges der Westpalaearktis, Band 4, Sesiidae – Glasflügler. - Edition Forschung und Wissenschaft Verlag, München. 432 Seiten, 21 Farbtafeln (Bestimmungstabeln) mit 1897 Einzeldarstellungen in natürlicher Größe, 7 Farbtafeln mit 44 Lebendaufnahmen, 740 schwarzweiße Textabbildungen, 127 Verbreitungskarten, mit ausführlichem Glossar, Synopsis der bearbeiteten Arten, Typenverzeichnis, ausführliches Verzeichnis der Futterpflanzen und Parasiten, Literaturverzeichnis, Feuilletonteil mit Beiträgen zur Geschichte der Sesiien-Erforschung, Abbildungen von Sesiien-Biotopen auf 4 Farbtafeln. DIN A4-Format, Kunstlederband, Fadenheftung, fünffarbiger Schutzumschlag, Hochglanzpapier, Text deutsch mit englischem Beibext. ISBN 3-926285-03-6.

Nach Erscheinen der Bände 1 und 2 ist mit Band 4 dieser Buchreihe erstmals ein ausführliches Werk über die europäischen und nordafrikanischen Sesiienarten erschienen. In

mehrfähriger Arbeit wurde eine Fülle von Fakten und Wissen zusammengetragen und nach dem aus den Vorgängerbänden bewährten Schema bearbeitet.

Dieses für Liebhaber- und Berufsentomologen gleichermaßen geeignete neue Bestimmungsbuch bietet auf 21 brilliant gedruckten und optisch sehr harmonisch gestalteten Farbtafeln einen kompletten Überblick über die in Europa und Nordafrika lebenden Sesienarten. 1897 Einzeldarstellungen, darunter ein hoher Anteil an Typenmaterial, decken das Artenspektrum und die Variabilität der behandelten Arten und Unterarten großzügig ab und ermöglichen so die Bestimmung der derzeit bekannten Taxa. Unterstützt wird die Determinationsarbeit durch weitere 7 Farbtafeln mit 44 Freilandaufnahmen und einer Fülle von 740 Schwarzweiß-Textabbildungen.

Neben dem umfangreichen Hauptteil mit seinen genauen taxonomischen und biologischen Angaben (Bestimmungsschlüssel, Internationale Namen, Gesamtverbreitung, Synonymie, Beschreibung der Art, Flugzeit, Habitat und Raupenentwicklung, Verbreitung, Variabilität, Zucht, Beschreibung der Raupe, ähnliche Arten) bietet das Werk ein einführendes "Sesien"-Glossarium, einen Kartenteil mit 127 Verbreitungskarten, eine ausführliche Synopsis sowie ein Verzeichnis (partim) darüber, welches Typenmaterial in welchem europäischen Museum aufbewahrt ist.

Ausführlich ist auch das in lateinische und deutsche Namen unterteilte Verzeichnis der Raupen-Futterpflanzen. Die vom Autor mit viel Akribie betriebenen Literaturrecherchen haben erstmals zu einem zitatenreichen und weitgehend kompletten Verzeichnis der Publikationen über europäische und nordafrikanische Sesien geführt. In einem Appendix von HERRMANN, R. & A. HOFMANN werden die Taxa *Bembecia karel* und *Chamaesphexia guenter* als neue Arten beschrieben.

Das Werk schließt mit einem Feuilletonenteil, in dem bedeutende Sesiidologen, die sich um die Erforschung der Glasflügler verdient gemacht haben, gewürdigt werden. Auf 4 weiteren Farbtafeln sind charakteristische Sesienlebensräume in Nordafrika und Europa abgebildet. Die Indizes (Verzeichnisse zoologischer und botanischer Namen sowie Index von bei Sesien nachgewiesenen Larvalparasiten) sind klar und detailliert gegliedert.

Zu Kritik gibt das Werk kaum Anlaß. Zu bemängeln wäre allenfalls, daß mit vergrößerten Darstellungen von charakteristischen Einzelexemplaren eine zusätzliche Bestimmungshilfe bei schwer unterscheidbaren Arten hätte geliefert werden können.

Trotz des nicht geringen Kaufpreises, der jedoch aufgrund der anspruchsvollen Gestaltung und der niederen Auflagenzahl vertretbar ist, kann dieses Sesien-Standardwerk jedem mit der Systematik und Biologie dieser Insektengruppe befaßten Entomologen als besondere Bereicherung seiner Bibliothek empfohlen werden. Wolfgang SCHACHT

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