

Parymenopus davisoni Wood-Mason synonym of *Helvia cardinalis* Stål (Insecta: Mantodea: Hymenopodidae)

CHRISTIAN J. SCHWARZ

Abstract

After a brief outline of their taxonomic history, *Parymenopus davisoni* Wood-Mason, 1890 (Hymenopodidae, Hymenopodini) is revealed to be a junior synonym of *Helvia cardinalis* Stål, 1877.

Key words: *Helvia*, *Parymenopus*, new synonymy, Sunda Archipelago

Zusammenfassung

Nach einem kurzen Abriss der taxonomischen Historie wird dargelegt, dass *Parymenopus davisoni* Wood-Mason, 1890 (Hymenopodidae, Hymenopodini) ein jüngeres Synonym von *Helvia cardinalis* Stål, 1877 ist.

Contents

1	Introduction	49
2	Establishing the synonymy	49
3	References	51

1 Introduction

The so-called “flower mantids” of the tribus Hymenopodini are rather colorful, medium-sized mantodeans characterized, among others, by a relatively short prothorax, lobed abdomen and walking legs at least in females, a keeled clypeus, and a short process on the vertex (BEIER 1934, 1964, WIELAND 2013). Many species also feature conical eyes which may or may not end in a small tubercle. They are also known for the possession of a second hearing organ on the mesothorax (YAGER 1996). However, this feature is not restricted to this tribus but also found in other hymenopodids (YAGER & SVENSON 2008). Recent molecular studies have revealed the group to be polyphyletic, as some of the Afrotropical members previously assigned to it belong to a different lineage (YAGER & SVENSON 2008, SVENSON & WHITING 2009).

The Oriental members form a well-defined and putative monophyletic group, though, represented by *Hymenopus* Audinet-Serville, 1831, *Creobroter* Audinet-Serville, 1839, *Helvia* Stål, 1877, *Parymenopus* Wood-Mason, 1890, and *Theopropus* Saussure, 1898 (EHRMANN 2002). While *Hymenopus*, *Parymenopus*, and *Helvia* are monotypic, *Theopropus* and particularly the speciose and widespread genus *Creobroter* are clearly in need of revision (SCHWARZ & KONOPIK 2014).

Acknowledgements

I thank GUNVI LINDBERG (NRM) for providing the photographs of the type of *Helvia cardinalis*, REINHARD EHRMANN and ALEXANDER RIEDEL for facilitating visits to the SMNK and providing photographs, as well as ROGER ROY (MNHN) and three

anonymous reviewers for valuable comments on the manuscript. Last but not least, THOMAS RÖNISCH (Böblingen, Germany) and ACHIM WILLSCHE (Durlangen, Germany) provided me with the captive-bred specimens that awoke my interest in their taxonomic status.

Acronyms

CSC	author's collection
MNHN	Muséum National d'Histoire Naturelle, Paris
NRM	Naturhistoriska Riksmuseet, Stockholm
SMNK	Staatliches Museum für Naturkunde Karlsruhe

2 Establishing the synonymy

While working on the taxonomy and biogeography of the praying mantids of Borneo (SCHWARZ & KONOPIK 2014), it became obvious through institutional visits and literature surveys that the above-mentioned genera are rather widespread on the Sunda Archipelago, and even many species ranges span over more than one island or peninsula. It was only *Helvia* Stål, 1877, with *cardinalis* as its only species created at that occasion, which seemed to be restricted to the Malay Peninsula (“Malacca” in STÅL 1877). The genus and species is described after a male in Latin on pages 86 and 87, with no illustration given. It remains up to date the only recorded specimen of this taxon. However, like most of STÅL's types housed in the NRM, it was figured by SJÖSTEDT (1930, pl. 15, fig. 6) in his catalogue of mantodean type specimens deposited in that institution. Even though in black and white and at low resolution, the figure shows some important features

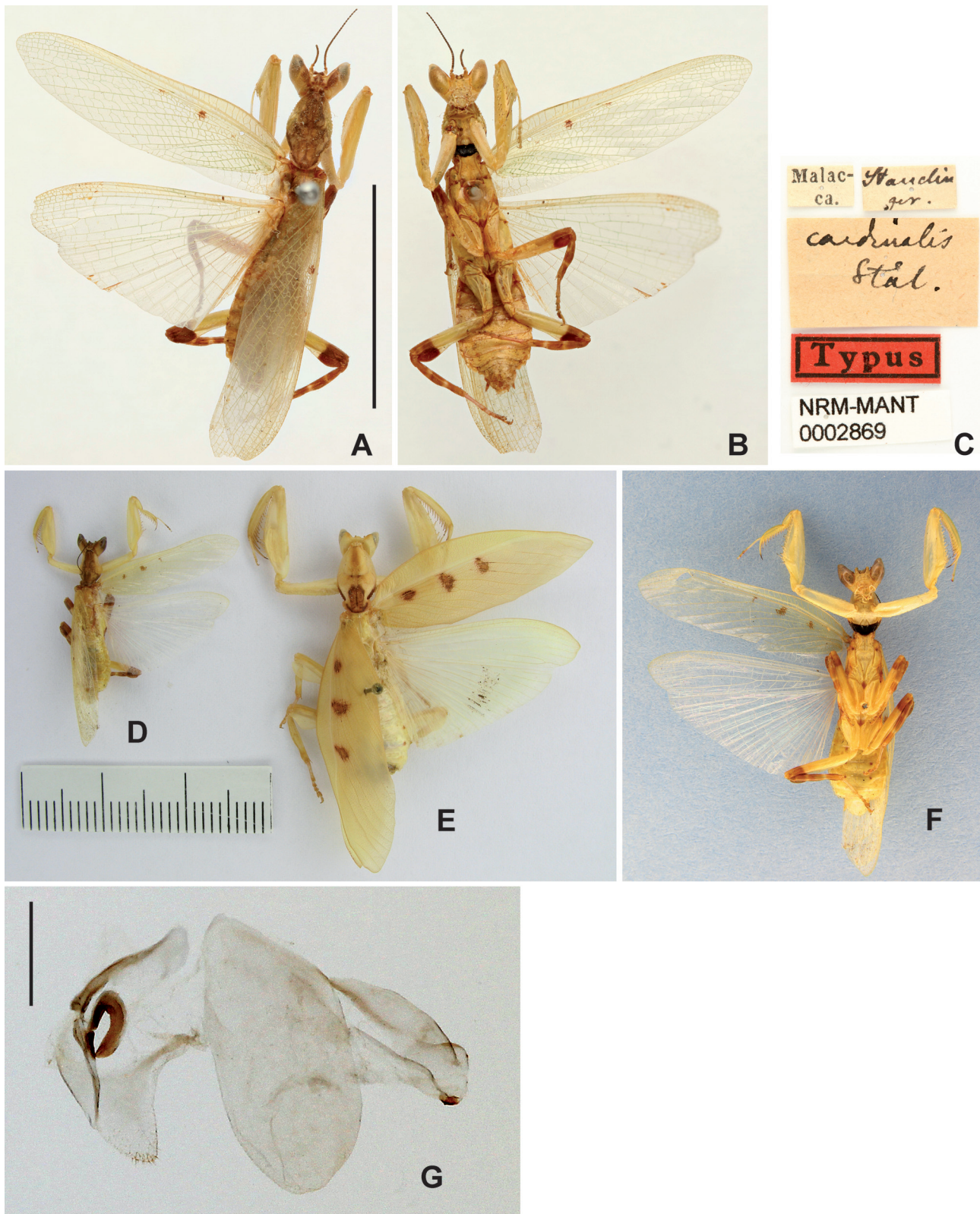


Fig. 1. *Helvia cardinalis*, holotype, NRM (A–C), Malay Peninsula, Cameron Highlands, SMNK (D–F), Malay Peninsula, Merapoh, CSC (G). – A. Dorsal view. B. Ventral view. C. Labels. D. ♂, dorsal view. E. ♀, dorsal view. F. ♂, ventral view. G. ♂ genitalia (preparation SCHWARZ no. 150). – Scales: 30 mm (D, E), 10 mm (A, B), 1 mm (G). – Photos: G. LINDBERG, © NRM (A–C), R. EHLMANN, © SMNK (D–F), author (G).

which are also present in the males of *Parymenopus davisoni* Wood-Mason, 1890, like the shape of head and pronotum, the pale tegmina, and the conspicuously annulated mid and hind legs.

P. davisoni was described in detail after a female from “Singapore” (WOOD-MASON 1890, pp. 437–439). The accompanying plate XVIIIA illustrates head and pronotum in dorsal view, head in anterior view, and a mid leg in posterior view. This species is very similar to its putative sister-species, the well-known *Hymenopus coronatus* (Olivier, 1792), distinguished from the latter mainly by the lack of ocular tubercles, a very short process on the vertex, and smaller lobes on the walking legs, which extend only along the distal half of the femora. *Hymenopus coronatus* is known to exhibit true masquerade, imitating a generalized angiosperm inflorescence (ANNANDALE 1900, TOMASINELLI 2001, O’HANLON et al. 2014a, b). *Parymenopus davisoni*, however, is only rarely referenced in the scientific literature. REHN (1903) comments upon a female from “Trong, Lower Siam”, while BEIER (1931) recorded additional females (presumably from the Malay Peninsula or northern Borneo, since the other specimens treated in that paper originated from there) and described the male for the first time (p. 153), without providing figures. The confusion about the unjustified emendation of the generic name to *Parhymenopus* by GIGLIO-TOS (1919, 1927) was clarified by ROY (2007). It is only recently, through the effort of mantid enthusiasts, that this species has achieved some attention and more material is available for study (HEYNDERYCX 2000, RÖNISCH 2012).

Due to the striking resemblance of SJÖSTEDT’s figure to male specimens of *Parymenopus davisoni*, a possible synonymy seemed likely. Due to the courtesy of Mr. GUNVI LINDBERG (NRM), it was possible to examine high resolution photographs of the type of *Helvia cardinalis* (Fig. 1A, B), and to compare it with BEIER’s description and with specimens of *Parymenopus davisoni* housed in the SMNK and in the author’s collection. The data of the investigated specimens are:

- ♂♀, C Malaysia, Cameron Highlands, 35 km Tapah Richtung Tanah Rata (4.11°N–101.14°E), 2.XI.2001, leg. P. GRABOWITZ; SMNK (Fig. 1D–F).
- ♀, N Sumatra, Dolok-Merangir, VIII.1970, leg. L. DIEHL; SMNK.
- ♂♀, S Thailand, Sura Thani (Ban Don) (9.08°N–99.19°E), IX.1987, leg. S. STEINKE; SMNK.
- 4 ♂♂, 10 ♀♀, Malay Peninsula, vic. Merapoh, 3.IX.2010, leg. T. RÖNISCH & J. KÜHNE, captive bred, ded. T. RÖNISCH & A. WILLSCH, III.–IV.2014; CSC.

There are no significant differences, on the contrary, characteristic diagnostic features, like the shape of the frontal shield and of the eyes, the three maculations on the tegmen (which are likely homologous to the color patterns of other Asian Hymenopodini, see discussion in WIELAND 2013), the apically darkened mid and hind femora, the dorsally widened mid and hind tibiae, which are

shorter than the corresponding femora and exhibit two light annulations, and particularly the black prosternal band, clearly show the two species to be conspecific. The prosternal band is missing in *Hymenopus*, but found in a closely related Asian genus, *Theopropus* Saussure, 1898. The three genera also share an accentuated sexual dimorphism, and reddish first instars with blackish heads and walking legs that mimic reduviid bugs of the genus *Eulyes* (SHELFORD 1902, LEONG & TEO 2008, RÖNISCH 2012).

In contrast to the type of *Helvia cardinalis*, the pronotum of the figured male from the Cameron Highlands has concave anterior margins, but this feature, as well as body size, and the intensity of the tegminal maculations, varies between specimens of both sexes and from various locations. It seems to be prone to post-mortem shrinkage in dry-mounted specimens and is of no diagnostic value. This is also the case for the male genitals, which are very simplified in “true” Hymenopodini and very similar even across genera, contrary to the species-specific diversity exhibited by most other mantodeans (Fig. 1G). The minuscule subapical eye tubercle of males referred to by STÅL (1877) (barely discernible in Fig. 1A, B, D) is frequently missing at all.

Considering the similarities outlined above, and the uniqueness of the taxon concerned, the two species cannot be maintained as distinct anymore. Therefore, a new synonymy has to be established:

Helvia cardinalis Stål, 1877 = *Parymenopus davisoni* Wood-Mason, 1890, **n. syn.**

The species is distributed in southern Thailand, the Malay Peninsula, Sumatra, and Borneo (REHN 1903, GIGLIO-TOS 1919, 1927, BEIER 1931, ROY 2007). An occurrence on Java may be expected due to past geographic connections via the Sunda Shelf (SCHWARZ & KONOPK 2014), but needs confirmation.

3 References

- ANNANDALE, N. (1900): Observations on the habits and natural surroundings of insects made during the “Skeat Expedition” to the Malay Peninsula, 1899–1900. – Proceedings of the Zoological Society of London **1900**: 837–869.
- BEIER, M. (1931): Neue und interessante Mantiden. – Bulletin of the Raffles Museum **6**: 149–154.
- BEIER, M. (1934): Mantodea, Fam. Mantidae, Subfam. Hymenopodinae. – In: WYTSMAN, P.: Genera Insectorum **196**, 37 pp. (Nachträge **1937**, 2 pp.); Tervuren.
- BEIER, M. (1964): Blattopteroidea, Mantodea. – In: BRONN, H. G. (ed.): Klassen und Ordnungen des Tierreichs. Fünfter Band: Arthropoda. III. Abteilung: Insecta, pp. 849–970; Leipzig.
- EHRMANN, R. (2002): Mantodea – Gottesanbeterinnen der Welt, 519 pp.; Münster (Natur und Tier-Verlag).
- GIGLIO-TOS, E. (1919): Saggio di una nuova classificazione dei mantidi. – Bullettino della Società Entomologica Italiana **49**: 50–87.
- GIGLIO-TOS, E. (1927): Das Tierreich. 50. Lieferung. – Orthoptera Mantidae, XL + 707 pp.; Berlin & Leipzig (Walter de Gruyter & Co.).

- HEYNDERYCX, J. (2000): *Parhymenopus davidsoni* Woodmason 1890 (Mantidae, Hymenoponae). – *Lambillionea* **100**: 623–624.
- LEONG, T. M. & TEO, S. C. (2008): Records of the praying mantis, *Theopropus elegans* (Westwood) (Mantodea: Hymenopodidae: Hymenopodinae) in Singapore, with notes on oviposition and hatching. – *Nature in Singapore* **1**: 211–214.
- O'HANLON, J. C., HOLWELL, G. I. & HERBERSTEIN, M. E. (2014a): Pollinator deception in the Orchid Mantis. – *The American Naturalist* **183**: 126–132.
- O'HANLON, J. C., HOLWELL, G. I. & HERBERSTEIN, M. E. (2014b): Predatory pollinator deception resemble a model species? – *Current Zoology* **60**: 90–103.
- REHN, J. A. G. (1903): Studies in Old World Mantidae (Orthoptera). – *Proceedings of the Academy of Natural Sciences of Philadelphia* **55**: 701–718.
- RÖNISCH, T. (2012): Haltung und Nachzucht von *Parymenopus davidsoni*. – *Reptilia* **17**: 52–55.
- ROY, R. (2007): *Parymenopus* Wood-Mason, 1890, et *Cataspilota* Giglio-Tos, 1917, genres valides (Dict. Mantodea). – *Bulletin de la Société entomologique de France* **112**: 91–92.
- SCHWARZ, C. J. & KONOPIK, O. (2014): An annotated checklist of the praying mantises (Mantodea) of Borneo, including the results of the 2008 scientific expedition to Lanjak Entimau Wildlife Sanctuary, Sarawak. – *Zootaxa* **3797**: 130–168.
- SHELFORD, R. (1902): Observations on some mimetic insects and spiders from Borneo and Singapore. – *Proceedings of the Zoological Society of London* **1902** (2): 230–284.
- SJÖSTEDT, Y. (1930): Orthopterentypen im Naturhistorischen Reichsmuseum zu Stockholm. – *Arkiv för Zoologi* **21A**: 1–43.
- STÅL, C. (1877): *Systema Mantodeorum. Essai d'une systématique nouvelle des Mantodées*. – *Bihang till Kongliga Svenska Vetenskaps Akademiens Handlingar* **4**: 1–91.
- SVENSON, G. J. & WHITING, M. F. (2009): Reconstructing the origins of praying mantises (Dictyoptera, Mantodea): the role of Gondwanan vicariance and morphological convergence. – *Cladistics* **25**: 468–514.
- TOMASINELLI, F. (2001): Engel des Todes. Die Orchideen-Mantis. Mimikry, Verhalten und Pflege von *Hymenopus coronatus*. – *Reptilia* **6**: 33–37.
- WIELAND, F. (2013): The phylogenetic system of Mantodea (Insecta: Dictyoptera). – *Species, Phylogeny, and Evolution* **3**: 1–306.
- WOOD-MASON, J. (1890): Description of a new genus and species (*Parymenopus Davidsoni*) of Mantodea from the Oriental Region. – *Annals and Magazine of Natural History* (6) **5**: 437–439.
- YAGER, D. D. (1996): Serially homologous ears perform frequency range fractionation in the praying mantis, *Creobroter* (Mantodea, Hymenopodidae). – *Journal of Comparative Physiology A* **178**: 463–475.
- YAGER, D. D. & SVENSON, G. J. (2008): Patterns of praying mantis auditory system evolution based on morphological, molecular, neurophysiological, and behavioural data. – *Biological Journal of the Linnean Society* **94**: 541–568.

Author's address:

Dipl.-Biol. CHRISTIAN J. SCHWARZ, Ruhr University Bochum, Department of Biology and Biotechnology, Conservation Biology Unit, ND 1, 44780 Bochum, Germany;
e-mail: christianschw@gmx.de

Manuscript received: 23.V.2014, accepted: 31.VII.2014.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Stuttgarter Beiträge Naturkunde Serie A \[Biologie\]](#)

Jahr/Year: 2015

Band/Volume: [NS_8_A](#)

Autor(en)/Author(s): Schwarz Christian J.

Artikel/Article: [Parymenopus davisoni Wood-Mason synonym of Helvia cardinalis Stål \(Insecta: Mantodea: Hymenopodidae\) 49-52](#)