

***Hyblaea behouneki* sp. n. from West Papua (Indonesia)
(Lepidoptera, Hyblaeidae) – Studies of Hyblaeidae 3¹**

Ulf BUCHSBAUM, Wolfgang SPEIDEL & Mei-Yu CHEN

Abstract

A new species of the genus *Hyblaea* FABRICIUS, 1793 from West Papua (Indonesia) is described. *Hyblaea behouneki* **sp. n.** differs phenotypically clearly from all other known *Hyblaea* species. It belongs to the *Hyblaea puera* group of species which is constituted by moths with similar superficial appearance which were formerly, and partly up to now, incorrectly synonymized with *Hyblaea puera* CRAMER, 1777. The holotype of the new species, its genitalia and a map showing the situation of the type locality are figured.

Furthermore, the family group name Hyblaeidae is attributed to another author (GUENÉE 1852) as currently accepted.

Introduction

The West Pacific Island New Guinea is a highly interesting area because of its biogeographical situation. Here, fauna elements of different zoogeographical subregions come together (CARVAJAL & ADLER 2005, LOHMAN et al. 2011, HOLT et al. 2013, LUCKY & SARNAT 2010, REICHHOLF, 2003, TURNER et al. 2001). Insects and vertebrates can be found here which occur directly east of the Wallace line as well as Australian elements (e. g. tree kangaroos, *Dendrolagus* MÜLLER, 1870 spec.), and elements from the pacific islands too (e. g. HOLT et al. 2013, TURNER et al. 2001). Widespread Oriental species can be also found, which, however, often belong to species complexes which are not yet resolved. Furthermore, West Papua has a high number of endemic species, especially in the high mountains (BROOKS et al. 2000, MYERS et al. 2000, TURNER et al. 2001).

Family Hyblaeidae GUENÉE, 1852

Hyblaeids were formerly treated as a subfamily Hyblaeinae of the Noctuidae (HAMPSON 1903, 1918). Larval morphology and the absence of a thoracic tympanal organ, however, clearly place them outside this large family and even outside Noctuoidea. Hyblaeidae GUENÉE, 1852 are currently placed in their own superfamily within Obtectomera (NIEUKERKEN et al. 2011). The authorship of the family group name is incorrectly ascribed to HAMPSON (1903: 4 in the key to the subfamilies) by NIEUKERKEN et al. 2011, as the name was already validly published by GUENÉE (1852: 388). It is a small family with about 20 species currently known. The status of some species remains unclear (CHANDRASEKHAR et al. 2008, DE FREINA & BUCHSBAUM 2012, BUCHSBAUM et al. 2012), so that further revisions are necessary.

In the literature, the larvae of *H. puera* have been noted as serious defoliators of teak (*Tectona grandis*) (e. g. DUGDALE et al. 1999, CHANDRASEKHAR et al. 2005, SINGH 1955, PERES-FILHO et al. 2002, MENEZES & MEHLIG 2005) and of mangrove in Mangrove Ecosystems (ARUN & MAHAJAN 2012). However, it remains unclear to which species these reports refer because of the probably numerous incorrect determinations in the *H. puera* species group. It is not resolved which species of the *H. puera* group is the real pest of teak (BITO 2007, CHANDRASEKHAR et al. 2008, BUCHSBAUM et al. 2012, DE FREINA & BUCHSBAUM 2012).

The early stages have been recorded from Japanese *Hyblaea* species (NISHIO 2000, 2003 and TANIDA 1990) and from an Indian taxon of the *H. puera* complex (HOLE, 1904).

The main distribution of Hyblaeidae are the tropical zones of the world (HOLLOWAY et al. 2001, ROBINSON et al. 1994). Most of them occur in the Old World tropics of Africa and Southeast Asia (SCOBLE, 1992, DE FREINA & BUCHSBAUM 2012). Four species are recorded in Australia (SHAFFER & NIELSEN 1996), three species are known from Taiwan (HEPPNER & INOUE 1992) and Japan (INOUE et al. 1982). Only one species is so far recorded from Korea (KIM & SOHN 2003).

¹ Studies in Hyblaeidae 2: BUCHSBAUM, U., DE FREINA, J. J. & M.-Y. CHEN (2012): *Hyblaea aureolaria* sp. n. from South Thailand (Lepidoptera, Hyblaeidae). – Nachrichten des Entomologischen Vereins Apollo, N. F. 32 (3/4): 177-179.

***Hyblaea behouneki* sp. n.** (Fig. 1 - 6)

Holotype (HT): ♂; (label 1) INDONESIA, Irian Jaya; 160 km O Nabire, Enarotali; 12. XII. 1993, 1700 m; leg. R. Brechlin & K. Cerny. (label 2) coll. G. BEHOUNEK; Deisenhofen/München. In Coll. Gottfried Behounek, later deposited in Coll. Zoologische Staatssammlung München (ZSM).

Paratypes (PT): 3 ♂ & 1 ♀; with same data and label as the holotype. In Coll. Behounek, later deposited in Coll. Zoologische Staatssammlung München (ZSM).

Description:

♂ Wingspan: 30 – 34 mm, Ø 31,6 mm, forewing length: 13 – 15 mm, Ø 14 mm.

♀ Wingspan 33 mm, forewing length: 15 mm.

Stout-bodied. Head greyish brown, ocelli small, chaetosemata absent; palps greyish brown. Antenna reddish brown, about half as long as forewing.

Upperside: Thorax, abdomen and wings greyish brown. Legs brown and yellow ringed. Forewings brown. Apical point black, submarginal fascia reduced to a small stripe near costa, dark brown, postmedian fascia dark brown as well, interrupted in middle. Basal area dark brown, with oblique distal border sometimes extending to upper half of postmedian fascia. Hindwing brown with yellow waved fascia in middle. Cilia yellowish brown.

Underside: Thorax and legs yellowish orange. Legs brown and yellow ringed. Abdomen reddish. Forewings at costa and termen reddish. Dorsum yellowish grey. Subterminal to median area brown with a kidney-shaped patch. Hindwings orange with black spots from costa to termen. Brown streaks from tornus to postdiscal region.

Male genitalia (Fig. 5): Uncus wide, forked. Valva rounded, weakly sclerotized. Clasper as long as the valva wide. Vinculum short and pointed. Aedeagus long, weakly sclerotized, without cornuti.

Female genitalia (Fig. 6): Papillae anales weakly hairy, short, small. Apophyses anteriores short. Ductus bursae thin, weakly sclerotized, long. Corpus bursae also weakly sclerotized. Two strongly sclerotized signa, horn-shaped. These signa are slightly smaller than in *H. puera* and allies.

The upside of *H. puera* CRAMER is figured in colour (pl. 103, fig. C) in the original description (CRAMER “1779” 1777), and the underside also (pl. 103, fig. D). It is not evident whether these figures are exact; only the study of a more extensive South-American material will allow an opinion and eventually the selection of a neotype. It seems sure, however, that *Hyblaea puera* does not agree with an Old-World taxon, and certainly not with the species described here.

Etymology: The species is named after our good friend and always cheerful colleague Gottfried BEHOUNEK (Grafing, near München), well-known specialist of worldwide Noctuidae, who has accumulated an enormous knowledge on this species-rich family. He is not only a good scientist but proved to be helpful in all respects to his friends. He made his private Noctuidae database widely available to young academics, and so gave a broad support to the noctuid community.

Discussion and differential diagnosis

Though the hyblaeid specimens are generally rare in collections, the number of species has increased considerably over the years. Therefore, it seems necessary to give a short review indicating characters in order to place the new species in a context. This review is restricted to the *Hyblaea puera* group of species and may be incomplete or may even lack a few species, but it is complete concerning the species near to the new one.

The *Hyblaea puera* group of species

This group may be defined by the following characters: Hindwing with medial fascia and narrow, elongate spot at termen, both in most cases yellow or seldom reddish. Characters given in the key of GAEDE (1917) have been used in the following comparative considerations.

H. occidentalius HOLLAND, 1894 (Gaboon) with putative synonyms *H. flavifasciata* HAMPSON, 1910 (Rhodesia), *H. flavipicta* HAMPSON, 1910 (Congo) and *H. rosacea* GAEDE, 1917 (Cameroon) have a strongly angulate hindwing fascia. These taxa can be excluded from further comparisons with the new species.

Two species have a nearly straight medial fascia (*H. insulsa* GAEDE, 1917, Gaboon, *H. sanguinea* GAEDE, 1917, Fiji). In the former one (*H. insulsa*), the fascia is yellowish brown and broad, in the latter one (*H. sanguinea*) it is bright red and narrower.

Two species have an irregular, mostly reddish yellow medial fascia of the hindwing: *H. synaema* TURNER, 1902 (Australia) has a dark discal spot of the forewing, whereas *H. puera* sensu GAEDE has not.



Fig. 1: *Hyblaea behouneki* sp. n. ♂ ; Holotype.



Fig. 2: *H. behouneki* sp. n. ♂ ; HT, underside.



Fig. 3: *H. behouneki* sp. n. ♀ ; Paratype.



Fig. 4: *H. behouneki* sp. n. ♀ , PT, underside.



Fig. 5: *H. behouneki* sp. n. ♂ , HT, genitalia.



Fig. 6: *H. behouneki* sp. n. ♀ , PT, genitalia.

The „species“ *H. puera* as conceived by GAEDE (1917) and current authors must be revised. It was indicated to have a very wide distribution. GUENÉE (1852) has lumped specimens from “Pondichéry, Java, Madagascar, Maurice, Para, Brésil, Guadeloupe, Cayenne” under the single species *H. puera*, synonymising *H. saga* FABRICIUS, 1787 (India), *H. unxia* HÜBNER, [1813] (unknown locality), and *H. apricans* BOISDUVAL, 1833 (Madagascar). *H. insulsa* GAEDE, 1917 (Gaboon) was placed in synonymy by BERIO (1967). SHAFER & NIELSEN (2009) included further synonyms: *H. mirificum* STRECKER, 1876 (USA), and *H. limacodella* WALKER, 1866 (Java). Furthermore, there is *H. puera* ssp. *vitiensis* PROUT, 1919 (Fiji) which makes the “species” present in almost all tropical and subtropical parts of the world. The structure of the genitalia, however, show *H. puera* as defined here to be a species-complex. *Hyblaea puera* was described from Surinam, and recent research data agree in regarding it as a merely Neotropical species. CHANDRASEKHAR et al. (2008) confirmed this with DNA analyses. Already BITO (2007) had considered *H. puera* to be a species complex and CHANDRASEKHAR et al. (2008) show, based on DNA analyses (mt-DNA-Barcode, CO-I), that the species from the old and new world are different and confirmed that there is a species complex.

Hyblaea maldivesa FISCHER & DE FREINA, 2012 (Maldives, island Asdhoo) belongs in close vicinity of *H. puera* auctorum; it is however not substantiated in the original description that it differs from all so-called Old-World synonyms of that species. *H. mauricea* DE FREINA & BUCHSBAUM, 2012 (Mauritius) is another species in the close vicinity of *H. puera*. Both island taxa are only known from females.

H. fontainei BERIO, 1967 from Congo, *H. madagascariensis* VIETTE, 1961 and *H. paulianii* VIETTE, 1961 both from Madagascar, are eventually not so closely related with *H. puera*, as they have a different forewing appearance. In case of *H. paulianii* and *H. madagascariensis*, the male genitalia are also different, *H. madagascariensis* has no trifurcate uncus (cf. also DE FREINA & BUCHSBAUM 2012) and *H. fontainei* has widely different male genitalia also.

BERIO (1967) places *H. insulsa* in synonymy of *H. puera*, This synonymisation is certainly wrong, but the status of this taxon must still be determined in further revisions. Anyway, BERIO’s concept of *H. puera* is much too wide, just like the concept of GUENÉE (1852), GAEDE (1917) and many authors until very recently.

The new species must be placed in proximity of *H. puera* auctorum, but differs from this “species” at first glance by the presence of dark brown fasciae in the forewing, of which there are at most only traces in the former.

In addition to the present species, New Guinea is inhabited by a few further *Hyblaea* species which, however, belong to the *H. constellata* GUENÉE, 1852 – species group.

Acknowledgements

Special thanks to Gottfried BEHOUNEK for borrowing the specimens here described for more detailed research. Many thanks to Dr. Alberto ZILLI British Museum (Natural History), London, for photos of specimens of the *Hyblaea puera* group in his museum which enabled us comparison with our new species.



Fig. 7: *H. behouneki* sp. n. map with type locality.

Zusammenfassung

Eine neue Art der Gattung *Hyblaea* FABRICIUS, 1793 aus West Papua (Indonesien) wird beschrieben. *Hyblaea behouneki* sp. n. unterscheidet sich sowohl phänotypisch als auch genitaliter sehr deutlich von allen bisher bekannten Arten dieser Gattung. Sie gehört in die *Hyblaea puera* Artengruppe, die sich aus Faltern mit ähnlichem Habitus zusammensetzt, die früher und teilweise bis jetzt unrichtig mit *Hyblaea puera* CRAMER, 1777 synonymisiert wurden. Der Holotypus, dessen Genitalstrukturen sowie eine Karte mit der Lage des Typenfundortes werden abgebildet.

Außerdem wird der Familiengruppenname Hyblacidae einem anderen (GUENÉE 1852) als dem gegenwärtig angenommenen Autor zugerechnet.

References

- ARUN, P. R. & M. V. MAHAJAN 2012: Ecological costs and benefits of Teak Defoliator (*Hyblaea puera* CRAMER) outbreaks in a Mangrove Ecosystem. – *Marine Science* **2** (5): 48-51.
- BERIO, E. (1967: Revisione di alcune *Hyblaea* del gruppo di *puera* CR. (Lepidoptera: Noctuidae). – *Annali del Museo Civico di Storia Naturale "G. Doria"*, Genova **4** (182): 1-10.
- BITO, D. 2007: An alien in an archipelago: *Spathodea campanulata* and the geographic variability of its moths (Lepidoptera) communities in the New Guinea and Bismarck Islands. – *Journal of Biogeography* **34**: 769-778.
- BROOKS, T. M., MITTERMEIER, R. A., MITTERMEIER, C. G., DA FONSECA, G. A. B., RYLANDS, A. B., KONSTANT, W. R., FLICK, P., PILGRIM, J., OLDFIELD, S., MAGIN, G. & C. HILTON-TAYLOR 2002: Habitat loss and extinction in the hotspots of biodiversity. – *Conservation Biology* **16** (4): 909-923.
- BUCHSBAUM, U., DE FREINA, J. J. & M.-Y. CHEN 2012: *Hyblaea aureolaria* sp. n. from South Thailand (Lepidoptera, Hyblaeidae). *Studies in Hyblaeidae* 2. – *Nachrichten des Entomologischen Vereins Apollo*, N. F. **32** (3/4): 177-179.
- CARVAJAL, A. & G. H. ADLER 2005: Biogeography of mammals on tropical Pacific Islands. – *Journal of Biogeography* **32**: 1561-1569.
- CHANDRASEKHAR, N., N. V. NEETHA, L. K. VAIDYAN & M. BANERJEE 2008: Deciphering the molecular phylogenetics of family Hyblaeidae and inferring the phylogeographical relationships using DNA Barcoding. – *Journal of Genetics and Molecular Biology* **19** (3): 158-167.
- CRAMER P. ("1779") 1777: De uitlandsche kapellen voorkomende in drie waereld-deelen Asia, Africa en America. 2. Amsterdam, Utrecht, pp. 1 – 151, pl. 97-192.
- DE FREINA, J. & U. BUCHSBAUM 2012: Anmerkungen zur Taxonomie der Familie Hyblaeidae mit Beschreibung der neuen Art, *Hyblaea mauricea* spec. nov., von der Insel Mauritius (Lepidoptera, Hyblaeidae). – *Spixiana*, München **35**: 143-147.
- DUGDALE, J. S., KRISTENSEN, N. P., ROBINSON, G. S. & M. SCOBLE 1999: The Smaller Microlepidoptera-Grade Superfamilies. In: KRISTENSEN, N. P. (ed.): *Lepidoptera, Moths and Butterflies. 1: Evolution, Systematics and Biogeography*. – Walter de Gruyter, Berlin, New York: pp. 217-232.
- GAEDE, M. 1917: Alte und neue Arten der Noctuiden-Gattung *Hyblaea* F. – *Deutsche Entomologische Zeitschrift* **1917**: 23-29.
- GUENEE, A. 1852: Noctuérites 2. In BOISDUVAL, J. B. A. D. & A. GUENEE: *Histoire naturelle des Insectes. Species general des Lépidoptères* **6**. Paris, 444 pp.
- HAMPSON, G. F. 1903: *Catalogue of the Lepidoptera Phalaenae in the British Museum* **4**. London, xx + 689 pp.
- HAMPSON, G. F. 1918: List of the families and subfamilies of the Lepidoptera. *Novitates Zoologicae* **25**: 383-394.
- HEPPNER, J. B. & H. INOUE 1992: *Lepidoptera of Taiwan. 1, Part 2: Checklist*. – Association of Tropical Lepidoptera, Gainesville, FL: 276 pp.
- HOLE, R. S. 1904: Two notorious Insect pests. – *Journal of the Bombay Natural History Society* **15**: 679-697, pl. A-F.
- HOLLOWAY, J. D., KIBBY, G. & D. PEGGIE 2001: The families of Malesian moths and butterflies. *Fauna Malesiana Handbook* **3**. – Brill, Leiden, Boston, Köln. 455 pp.
- HOLT, B. G., LESSARD, J.-P., BORREGAARD, M. K., FRITZ, S. A., ARAUJO, M. B., DIMITROV, D., FABRE, P.-H., GRAHAM, C. H., GRAVES, G. R., JONSSON, K. A., NOGUÉS-BRAVO, D., WANG, Z., WHITTAKER, R. J., FJELDSA, J. & C. RAHBEK 2013: An Update of Wallace's Zoogeographic Regions of the World. – *Science* **339**: 74-78.
- INOUE, H., SUGI, S., KUROKO, H., MORIUTI, S. & A. KAWABE 1982: *Moths of Japan. 2: Plates and Synonymic Catalogue*. – Kodansha, Tokyo. 552 pp., 392 pls.
- KIM, S. S. & J. C. SON 2003: A new record of the Family Hyblaeidae (Lepidoptera) from Korea. – *Korean Journal of Entomology* **33** (2): 127-131.
- LOHMAN, D. J., DE BRUYN, M., PAGE, T., VON RINTELEN, K., HALL, R., NG, P. K. L., SHIH, H.-T., CARVALHO, G. R. & T. VON RINTELEN 2011: Biogeography of the Indo-Australian Archipelago. – *Annual Review of Ecology, Evolution, and Systematics* **42**: 205-226.

- LUCKY, A. & E. M. SARNAT 2010: Biogeography and diversification of the Pacific ant genus *Lordomyrma* Emry. – *Journal of Biogeography* **37**: 624-634.
- MENEZES, M. P. & U. MEHLIG 2005: Desfolhação maciça de árvores de *Avicennia germinans* (L.) Stern 1958 (Avicenniaceae) por *Hyblaea puera* (Lepidoptera: Hyblaeidae), nos manguezais da Península de Bragança, Pará, Brasil. – *Boletim do Museu Paraense Emílio Goeldi, Série Ciências Naturais* **1**: 221-226.
- MITTERMEIER, R. A., MYERS, N., THOMSEN, J. B., DA FONSECA, G. A. B. & S. OLIVIERI 1998: Biodiversity hotspots and major tropical wilderness areas: Approaches to setting conservation priorities. – *Conservation Biology* **12** (3): 516-520.
- MYERS, N., MITTERMEIER, R. A., MITTERMEIER, C. G., DA FONSECA, G. A. B. & J. KENT 2000: Biodiversity hotspots for conservation priorities. – *Nature* **403**: 853-858.
- NIJCKERKEN, E. VAN, KAILA, L., KITCHING, I. J., KRISTENSEN, N. P., LEES, D. C., MINET, J., MITTER, C., MUTANEN, M., REGIER, J. C., SIMONSEN, T. J., WAHLBERG, N., YEN, S.-H., ZAHIRI, R., ADAMSKI, D., BAIXERAS, J., BARTSCH, D., BENGTSSON, B. Å., BROWN, J. W., BUCHELI, S. R., DAVIS, D. R., DE PRINS, J., DE PRINS, W., EPSTEIN, M. E., GENTILI-POOLE, P., GIELIS, C., HÄTTENSCHWILER, P., HAUSMANN, A., HOLLOWAY, J. D., KALLIES, A., KARSHOLT, O., KAWAHARA, A. Y., KOSTER, S. (J. C.), KOZLOV, M. V., LAFONTAINE, J. D., LAMAS, G., LANDRY, J.-F., LEE, S., NUSS, M., PARK, K.-T., PENZ, C., ROTA, J., SCHINTLMEISTER, A., SCHMIDT, B. C., SOHN, J.-C., SOLIS, M. A., TARMANN, G. M., WARREN, A. D., WELLER, S., YAKOVLEV, R. V., ZOLOTUHN, V. V. & A. ZWICK 2011: Order Lepidoptera Linnaeus, 1758. In: ZHANG, Z.-Q. (Ed.) *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*. – *Zootaxa* **3148**: 212-221.
- NISHIO, N. 2000: Mating behavior of *Hyblaea fortissima* (Hyblaeidae). – *Yugato* **160**: 82-83.
- NISHIO, N. 2003: Life History of *Hyblaea fortissima* BUTLER (Hyblaeidae). – *Yadoriga* **199**: 36-39.
- PERES-FILHO, O., DORVAL, A. & E. BERTI-FILHO 2002: Ocorrência de *Hyblaea puera* (CRAMER, 1777) (Lepidoptera: Hyblaeidae) em Teca no Brasil. – *Bragantia, Campinas* **61** (1): 59-60.
- REICHHOLF, J. H. 2003: Malesian Island Biogeography. From Alfred R. Wallace to Robert H. MacArthur and beyond: What makes “Wallacea” so unique? – *Journal of the Zoological Society Wallacea* **1**: 4-11.
- ROBINSON, G. S., TUCK, K. R. & SHAFFER, M. 1994: A field guide to the smaller moths of South-east Asia. – *Natural History Museum, London & Malaysian Nature Society, Kuala Lumpur*, 308 pp.
- SCOBLE, M. J. 1992: The Lepidoptera. Form, Function and Diversity. – *The Natural History Museum in association with Oxford University Press*. 404 pp.
- SHAFFER, M. & E. S. NIELSON 1996: Hyblaeidae. In: NIELSEN, E. S., EDWARDS, E. D. & T. V. RANGSI (eds): *Checklist of the Lepidoptera of Australia*. – *Monographs on Australian Lepidoptera*, **4**. – CSIRO Australia. p 159.
- SINGH, B. 1955: Description and systematic position of larva and pupa of the Teak defoliator, *Hyblaea puera* CRAMER (Insecta, Lepidoptera, Hyblaeidae). – *Indian Forest Records (New Series), Entomology*, **9** (1): 1-16.
- TANIDA, M. 1990: Notes on “water-drinking” behavior of the adult Hyblaeidae. – *The Japan Heterocerists Journal* **157**: 97-98.
- TURNER, H., HOVENKAMP, P. & P. C. VAN WELZEN 2001: Biogeography of Southeast Asia and the West Pacific. – *Journal of Biogeography* **28**: 217-230.

Authors addresses:

Ulf BUCHSBAUM
 Wolfgang SPEIDEL
 Mei-Yu CHEN
 SNSB - Zoologische Staatssammlung München
 Münchhausenstraße 21, D - 81247 München, Germany
 buchsbaum@snsb.de
 speidel@snsb.de
 chen@snsb.de
 Additionally for W. S.:
 Nebelhornstr. 21, D-82140 Olching, Germany.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Mitteilungen der Münchner Entomologischen Gesellschaft](#)

Jahr/Year: 2019

Band/Volume: [109](#)

Autor(en)/Author(s): Buchsbaum Ulf, Speidel Wolfgang, Chen Mei-Yu

Artikel/Article: [Hyblaea behouneki sp. n. from West Papua \(Indonesia\) \(Lepidoptera, Hyblaeidae\) – Studies of Hyblaeidae 3 143-148](#)