

A new species of *Cypa* from New Guinea (Lepidoptera, Sphingidae, Smerinthinae)

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Suara Serangga Papua: 7 (3): 85 - 91

Abstract: A new species of the hawkmoth genus *Cypa*, *Cypa moniensis* spec. nov., is described based on a single male from Bilogai, in the Central Mountain Range of Papua province, Indonesia. It is easily distinguished from all other members of the genus by features of the habitus and the male genitalia. A checklist of species in the genus is also provided.

Rangkuman: Suatu spesies baru dari genus hawkmoth *Cypa*, *Cypa moniensis* spec. nov. dipertelakan berdasarkan hanya satu jantan saja dari Bilogai, di Pegunungan Tengah, Provinsi Papua, Indonesia. Spesies ini mudah dibedakan dari semua anggota lain genus ini dengan ciri-ciri habitus dan genetalia jantan. Suatu daftar spesies pada genus ini disajikan pula.

Keywords: hawkmoth, Indonesia, Papua.

Introduction

The genus *Cypa* currently comprises eleven species (with three subspecies) distributed throughout Southeast Asia from NW India and Sri Lanka, to Taiwan and New Guinea. For hawkmoths, they are small insects, with forewing lengths rarely exceeding 27 mm in the males and 37 mm in the females. Some species are island endemics: *Cypa bouyeri* Cadiou, 1998 and *Cypa kitchingi* Cadiou, 1997 are restricted to Sulawesi; *Cypa claggi* Clark, 1935 and *Cypa luzonica* Brechlin, 2009 are only found in the Philippines (the islands of Mindanao and Luzon respectively); and *Cypa ferruginea* Walker, [1865] is known only from Sri Lanka. Others have more regional distributions; *Cypa duponti* Roepke, 1941 and *Cypa terranea* (Butler, 1876) occur throughout Malesia, the latter with a few outlying records in NW Thailand, where *Cypa latericia* Inoue, 1991 is also found (and in adjacent border areas of Burma). More widespread still, occurring across much of mainland SE Asia, are *Cypa enodis* Jordan, 1931 and *Cypa uniformis* Mell, 1922, the latter currently with three subspecies, one of which, *C. u. attenuata* Inoue, 1991, is found in north Borneo. However, the most widespread of all *Cypa* species is *C. decolor* (Walker, 1856). The nominotypical subspecies, *C. d. decolor*, is found throughout Southeast

Asia west of Wallace's Line, from Northwest India to the Philippines, Borneo and Sumatra. It is replaced in the Moluccas, New Guinea and Sudest Island by *C. d. euroa* Rothschild & Jordan, 1903. There are no records yet of *Cypa decolor* from Java, Sulawesi or the Lesser Sunda Islands. Hogenes & Treadaway (1998) raised *euroa* to species status on the basis of unstated differences in "colouration, shape of the wings and ♂ and ♀ genitalia". However, these differences are small in relation to those found among other species of *Cypa* and the taxon is currently treated again as a subspecies of *C. decolor* (Kitching & Cadiou, 2000).

Thus, *C. decolor euroa* was, until recently, the only representative of the genus known from the island of New Guinea. However, in 2001, Br. Henk van Mastrigt collected a single male *Cypa* at Bilogai in the Central Mountain Range of Papua province, Indonesia. This specimen differs in both external habitus and particularly male genitalia from all other known species of the genus and is described below as a new species, *Cypa moniensis* spec. nov.

Abbreviations

BMNH - Natural History Museum, London, United Kingdom
 BMNH (E) - as above, Dept. of Entomology
 FWL - forewing length

Cypa moniensis spec. nov.

(Figs 1–9)

Holotype ♂, Indonesia, Papua, Peg. Sentral, Bilogai, 3°44,44' S - 137°02,18' E, 2100 m, 18-20.xii.2001, leg. H.J.M. van Mastrigt, BMNH(E) 2006-176, Sphingidae BMNH(E) Slide No. 2074, BMNH(E) #274543 [BMNH].

External characters: Fwl. ♂ 21.5 mm. Upperside (Fig. 1): Head grey-brown, vertex with a dark brown low median crest. Thorax and anterior two segments of abdomen dark brown; remainder of abdomen grey with brownish tones. Tegulae grey with a slight green cast, anterior edges dark brown. Antennae short, not reaching the forewing discal spot, brown scaled above, cilia strongly fasciculate, relatively long. Forewing not elongated, outer margin strongly scalloped; ground colour same grey with greenish overtones as tegulae; basal area, apex and tornus brown; antemedial, medial and postmedial lines represented by scattered irregular and indistinct brown spots; submarginal line continuous, brown, serrate; discal spot black. Hindwing uniform orange-brown, antemedial and postmedial lines only vaguely indicated. Underside (Fig. 2): Labial palps short, brown. Fore-femora purple-brown. Mid- and hindlegs grey with greenish overtones. Thorax pink with scattered white scales. Abdomen pink, posterior edges of segments with a narrow orange-yellow band. Forewing ground colour anterior to vein 1A+2A chestnut orange as far as postmedial line, but extending

along all veins to the margin and also as far as the submarginal line between veins M3 and CuA1; otherwise greenish-grey-brown except for an ochreous area over the submarginal line between veins M3 and CuA1; postmedial line dark brown, somewhat serrate but indistinct and visible only anterior to vein M3; submarginal line thin, serrate, blackish, continuous from costa to inner margin. Hindwing ground colour pink with scattered brown scales and brown transverse lines; antemedial line barely visible; median line evenly curved; postmedial line indistinct, only easily visible anterior to vein M3; submarginal line the most distinct, strongly serrate; anal fold chestnut brown. Female and immature stages unknown.

Male genitalia: (Figs 3-7): [Sphingidae BMNH(E) Slide No. 2074] Uncus deeply bifid, each half apically produced into a short, setose, heavily sclerotized, sharply pointed, downcurved processes; dorsally, inner edge of the two processes strongly curved forming a deep groove between them; ventrally, the outer surfaces strongly concave and inner edges sharply keeled; in dorsal view, outer edges broadly rounded. Tegumen dorsally a narrow band, posterior margin nearly straight, anterior margin evenly curved. Gnathos absent. Subscaphium present, ovate, slightly convex, smooth. Vinculum broadly V-shaped. Saccus short and rounded. Juxta comprised of two dorso-ventrally oriented, weakly sclerotized bands, on the outer edge of which is a broad, rounded, laterally compressed, ear-like sac. Valve (Figs 5–6) basally square, apex produced as a broadly rounded lobe, ventro-distal margin concave beyond sacculus; inner surface devoid of ornamentation other than scattered setae; outer surface lacking stridulatory scales; base of sacculus with a dorso-ventrally oriented broadly triangular ridge; distal edge a strongly concave, slightly raised and setose ridge; harpe absent. Valve apodeme (sensu Zwick, 2009) short, broadly rounded, not produced towards midline. Labides (processes of valve apodemes) well developed; directed initially towards midline then strongly and evenly recurved so that the apex is directed at the inner surface of the valve; dorso-ventrally compressed but twisted longitudinally through 90° so that the posterior edge basally in ventral apically and the apical section appears laterally compressed; apical half clavate, covered apically in short teeth; one subapical tooth strongly developed as a medially directed large spine that just touches the inner surface of the valve.

Phallus (sensu Kristensen, 2003; = aedeagus of previous authors) (Figs 7–9) short and broad; apically obliquely truncate with ventral margin produced as a smooth, bluntly pointed, lingulate projection; apex on right side with a band of circumferentially and posteriorly-directed short teeth; coecum very short and broadly rounded. Vesica emerging dorso-posteriorly, anterior to lingulate process; initially directed upward then recurved ventrally as an elongate and laterally compressed sac; sac with a ventro-anterior, roughly circular sclerotized patch bearing two dorso-ventrally and slightly obliquely oriented, smooth, low rounded ridges; right side with an upwardly-directed, bluntly pointed diverticulum, the top and posterior surface of which is covered with small, ventrally-directed, sclerotized, spinose cornuti that continue, much reduced

in size and sclerotization, onto the ventral surface of the vesica; ductus ejaculatorius arising laterally on the left side, directed upward and distally.

Distribution: Known only from the holotype. However, the species is likely to be found at other high elevation localities in the central mountain ranges of both Papua province, Indonesia and neighbouring Papua New Guinea.

Etymology: The name *monienses* derives from the name of the Moni tribe, who live in and around Bilogai.

Diagnosis: *Cypa moniensis* is only the second species of *Cypa* to be found on the island of New Guinea and the first to be described in over a century. It is easily distinguished from the other New Guinean taxon, *C. decolor euroa*, on features of both the external habitus and male genitalia. This latter has more elongate forewings and a uniform mid-brown coloration to the upperside of the head, thorax and abdomen. In the male genitalia, *C. d. euroa* has an undivided uncus, thin labides and a conspicuous sharply pointed process directed obliquely down across the inner surface of the valve. In addition, the apex of the phallus has a transversely directed hook-like process and the vesica is a simple, posteriorly-directed membranous tube.

In external habitus, *C. moniensis* is most similar to *C. bouyeri*, with which it shares similar colours and, in particular, greenish-grey tegulae that contrast with the more brownish tone of the rest of the upperside of the thorax. However, its male genitalia are similar in general form and structure to those of *C. d. euroa*.

Overall, *C. moniensis* can be distinguished from all other species of *Cypa* by the shapes of the valves and labides, and the ornamentation of the vesica, all of which are unique within the genus.

Discussion: With the exception of *C. decolor*, *Cypa* species do not seem to be particularly well attracted to light, and certainly not in numbers (I.J. Kitching, unpubl. pers. obs.), a situation that is often reflected in the relative numbers of specimens in collections. Furthermore, as far as is known, the majority of *Cypa* species (again with the notable exception of *C. decolor*) are crepuscular rather than truly nocturnal, and thus may be missed if light traps are not switched on sufficiently early, even before it has begun to get dark. Our knowledge of other sphingid taxa with similar behaviours, such as *Macroglossum*, has been significantly augmented by hand-netting at flowers (Cadiou, 1997). However, *Cypa* have reduced probosces and do not feed as adults, and thus this is not a viable alternative sampling strategy for this genus.

With this in mind, therefore, it is perhaps not unexpected that a new species of the genus would be found in the interior of the relatively unexplored island of New Guinea. Further sampling effort will almost certainly extend the range of the species on New Guinea, to which island *C. moniensis* will most likely prove endemic, and may even reveal further, as yet undetected species of this genus.

Checklist of species in genus *Cypa*

CYPA Walker, [1865]

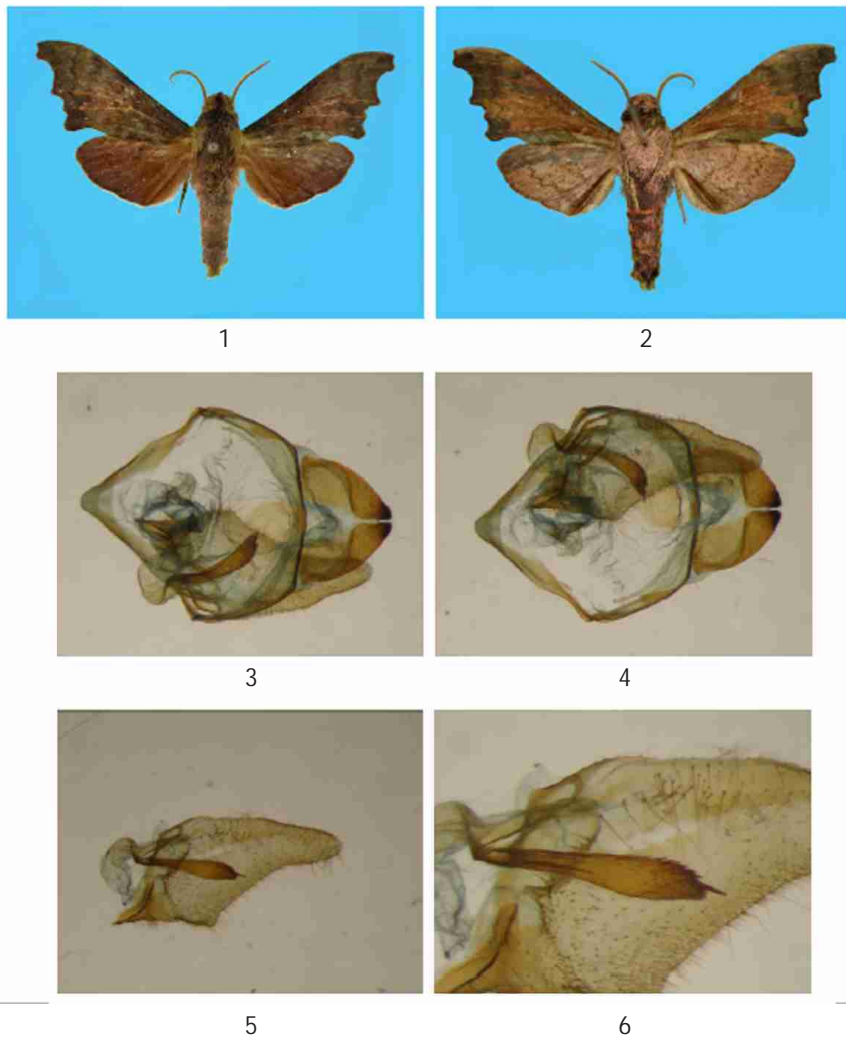
- bouyeri Cadiou, 1998
- claggi Clark, 1935
- decolor (Walker, 1856)
 - incongruens* Butler, 1881
 - manilae* Clark, 1930
- d. euroa Rothschild & Jordan, 1903
- duponti Roepke, 1941
- enodis Jordan, 1931
- ferruginea Walker, [1865]
- kitchingi Cadiou, 1997
- latericia Inoue, 1991
- luzonica Brechlin, 2009
- monienses spec. nov.
- terranea (Butler, 1876)
 - brooksi* (Clark, 1930)
- uniformis Mell, 1922
 - u. attenuata Inoue, 1991
 - u. pallens Jordan, 1926

Acknowledgements

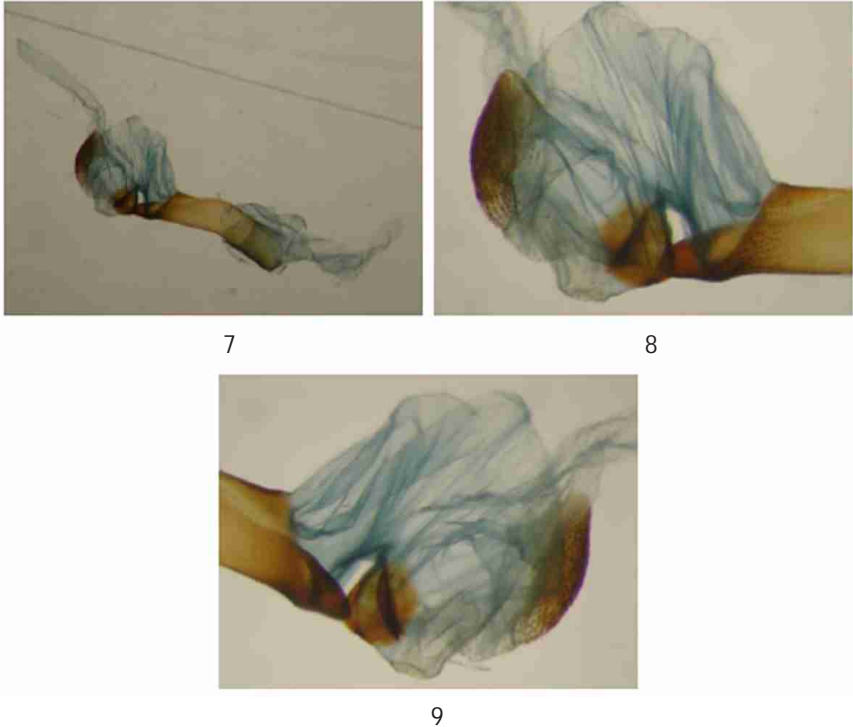
I would like to thank Br. Henk van Mastrigt (Jayapura, Indonesia) for the opportunity to describe a new species in one of my favourite sphingid genera.

Literature

- Cadiou, J.-M., 1997. Three further new taxa from Sulawesi in the family Sphingidae (Lepidoptera). *Lambillionea* 97: 379-387.
- Kitching, I. J. & Cadiou, J. -M., 2000. Hawkmoths of the world, an annotated and illustrated revisionary checklist (Lepidoptera: Sphingidae). viii + 226 pp. Cornell University Press, Ithaca, New York.
- Hogenes, W. & Treadaway, C.G., 1998. The Sphingidae (Lepidoptera) of the Philippines. *Nachrichten des Entomologischen Vereins Apollo* Suppl. 17: 17-132.
- Kristensen, N.P., 2003. Skeleton and muscles: adults. In: Kristensen, N.P. (Ed.), *Handbook of Zoology, Vol. IV: Part 36, Lepidoptera, Moths and Butterflies. Morphology, Physiology and Development*, vol. 2. Walter de Gruyter, Berlin, pp. 39-131.
- Zwick, A., 2009. The principal structure of the male genital sclerites and muscles of bombycoid moths, with special reference to Anthelidae (Lepidoptera: Bombycoidea). *Arthropod Structure & Development* 38: 147-161.



Figs 1–2. *Cypa moniensis* spec. nov. holotype ♂: 1. upperside; 2. underside.
Figs 3–6. *Cypa moniensis* spec. nov. holotype ♂: 3. male genitalia (left valve removed) dorsal view; 4. male genitalia (left valve removed) ventral view; 5. left valve, inner view; 6. left valve, close-up of process of valve apodeme.



Figs 7–9. *Cypa moniensis* spec. nov. holotype ♂: 7. phallus and vesica, lateral view right side, dorsal edge uppermost; 8. vesica, lateral view right side; 9. vesica lateral view left side.