

# A new species of *Mycalesis* HÜBNER, 1818 from the Sepik Basin, Papua New Guinea (Lepidoptera: Nymphalidae, Satyrinae)

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**Abstract:** *Mycalesis woxvoldi* sp. n. is described from the Sepik Basin lowlands, with the unique male holotype deposited in the Australian Museum, Sydney. The adult male and genitalia are figured and compared with superficially related species, in particular *Mycalesis duponchelii* (GUÉRIN-MÉNEVILLE, 1830), *M. mucia* HEWITSON, 1862, *M. bilineata* FRUHSTORFER, 1906 and *M. bififormis* ROTHSCHILD & DURRANT, 1915.

**Eine neue Art der Gattung *Mycalesis* HÜBNER, 1818 aus dem unteren Sepik-Tal, Papua-Neuguinea (Lepidoptera: Nymphalidae, Satyrinae)**

**Zusammenfassung:** *Mycalesis woxvoldi* sp. n. wird aus dem Tiefland des Unterlaufs des Sepik-Flusses beschrieben. Der männliche Holotypus (und einzig bekanntes Stück der Art) befindet sich im Australischen Museum in Sydney. Das Männchen und die männlichen Genitalien werden beschrieben und abgebildet und mit den oberflächlich ähnlichen Arten *Mycalesis duponchelii* (GUÉRIN-MÉNEVILLE, 1830), *M. mucia* HEWITSON, 1862, *M. bilineata* FRUHSTORFER, 1906 und *M. bififormis* ROTHSCHILD & DURRANT, 1915 verglichen.

## Introduction

The subtribe Mycalesina (Nymphalidae: Satyrinae) has radiated spectacularly in the Old World tropics, comprising more than 270 species usually placed in 6 genera (LEES 1997 [unpubl.], TORRES et al. 2001). In a molecular phylogeny of the subtribe, containing more than 80 taxa, KODANDARAMAIAH et al. (2010) recognised six higher clades and implied that the group radiated rapidly around the Oligocene/Miocene boundary, although basal relationships were unresolved.

*Mycalesis* is the most species-rich among current mycalesine genera with estimates of the number of species ranging from 87 to over 100 (AOKI et al. 1982, TENNENT 2001, VANE-WRIGHT & DE JONG 2003). This genus is almost ubiquitously distributed in the Indo-Australian region ranging from Sri Lanka and India in the West, across Indochina, Southeast Asia and New Guinea, to North-east Australia and the Solomon Islands in the East. *Lohora* MOORE, 1880 and *Nirvanopsis* VANE-WRIGHT, 2003 are endemic to Sulawesi. *Lohora* contains 17 species, and *Nirvanopsis* was for a long time considered to be monobasic (previously as *Nirvana* TSUKADA & NISHIYAMA, 1979), but now includes another, recently described species, *N. susah* (MÜLLER, 2004). It had been suggested that *Mycalesis* is probably paraphyletic with respect to *Lohora* (VANE-WRIGHT & DE JONG 2003), and that *Nirvanopsis* might belong within *Lohora* (VANE-WRIGHT & FERMON 2003). KODANDARAMAIAH et al. (2010) found that *Nirvanopsis* was nested within *Lohora* as a stable clade, rendering the latter paraphyletic, although *Nirvanopsis* was recovered as monophyletic with strong support.

*Mycalesis* was considered closely related to another Indo-Australian mycalesine genus, *Orsotriaena* WALLENGREN, 1858, but this has been refuted by recent molecular studies (PEÑA et al. 2006, PEÑA & WAHLBERG 2008).

The Australasian species assessed by KODANDARAMAIAH et al. (2010) [viz. *M. barbara* GROSE-SMITH, 1894, *M. aethiops* BUTLER, 1868, *M. mucia*, *M. phidon* HEWITSON, 1862, *M. mehadeva* (BOISDUVAL, 1832), *M. cacodaemon* KIRSCH, 1877, *M. sirius* (FABRICIUS, 1775), *M. duponchelii*, *M. discolobus* FRUHSTORFER, 1906, *M. elia* GROSE-SMITH, 1894, *M. terminus* (FABRICIUS, 1775), *M. mulleri* TENNENT, 2000, *M. splendens* MATHEW, 1887, *M. interrupta* GROSE-SMITH, 1889, *M. biliki* TENNENT, 2001, *M. richardi* TENNENT, 2001 and *M. sara* MATHEW, 1887) in addition to the Oriental *M. doherlyi* ELWES, 1891, *M. maianeas* HEWITSON, 1864, *M. itys* C. & R. FELDER, 1867, *M. fuscum* C. & R. FELDER, 1860 and *M. anapita* MOORE, 1858] formed a stable clade, referred to as *Mycalesis* clade II = *Mydosama* MOORE). The majority of Australasian species possess a series of transverse bands parallel to the termen on the underside of both wings, although one group comprising a small number of species from New Guinea and the Solomon Islands lacks the prominent basal band. A new species represented by a single specimen, albeit worn, falling in this category is documented herein.

Nomenclature follows that of PARSONS (1998) and TENNENT (2002). The description follows the venation according to the numerical notation.

## Abbreviations

AM	Australian Museum, Sydney, NSW, Australia.
ANIC	Australian National Insect Collection, Canberra, ACT, Australia.
BMNH	The Natural History Museum (formerly British Museum [Natural History]), London, England.

## *Mycalesis woxvoldi* sp. n.

(Figs. 1, 2, 24.)

**Holotype** ♂: labelled “Papua New Guinea, Sepik Basin, West Sepik Province (4°24' S, 142°2' E, 35 m), 12. vi. 2010, C. J. MULLER”; genitalia dissected and held in vial pinned to specimen (in Australian Museum, Sydney, Registration Number AM K.432505). – No paratypes.

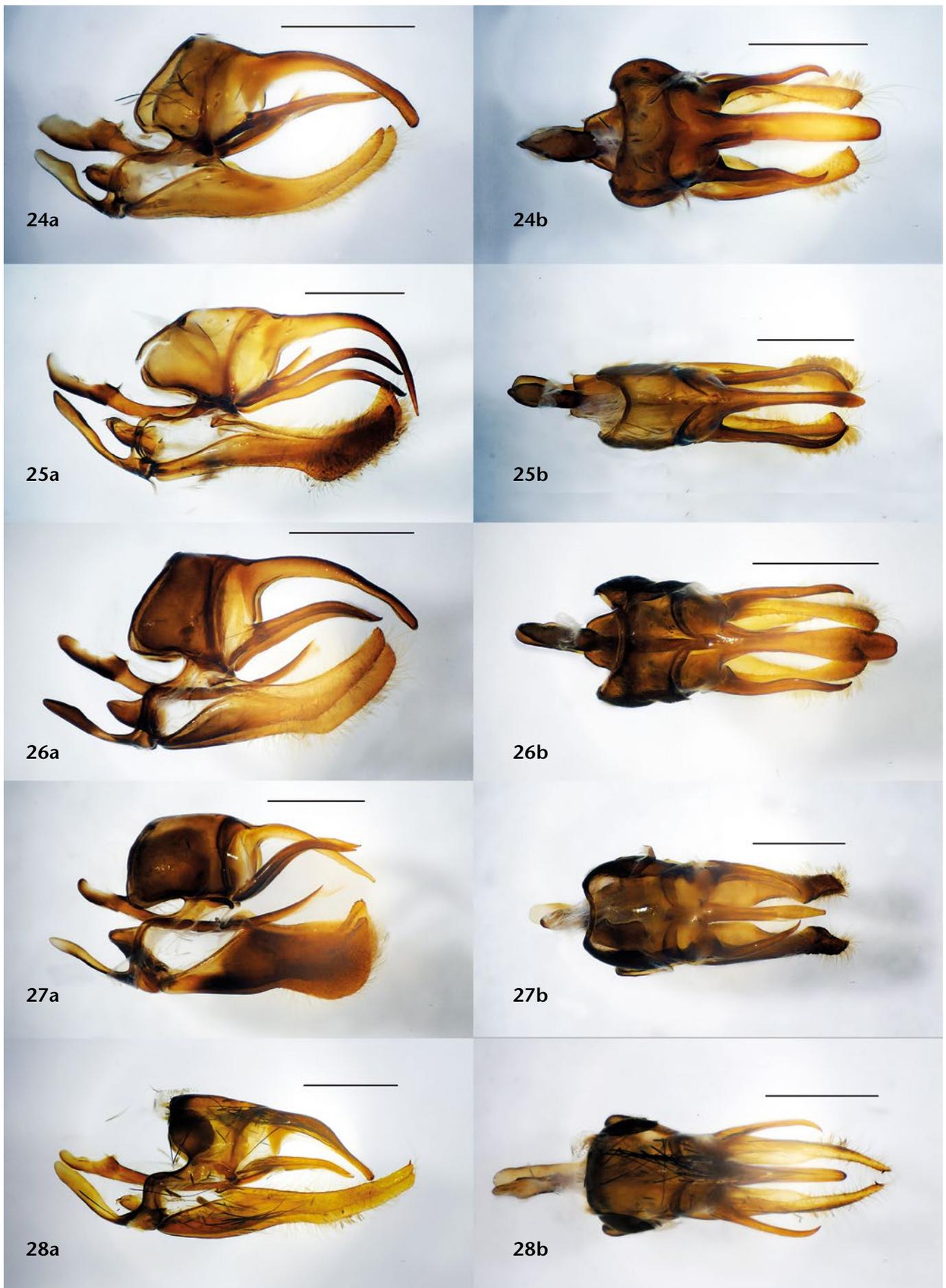
**Etymology:** The species name honours the renowned ornithologist, colleague and friend, Dr. Iain WOXVOLD, Melbourne, who was present at the time of capturing the holotype.

## Diagnosis

♂ (Figs. 1, 2). Forewing length 28 mm, antenna 13.5 mm (holotype). Head deep grey; labial palpus buff, eye ringed with buff; antenna dark brown dorsally and



Figs. 1–10: *Mycalesis* adult ♂♂. Odd numbers uppersides, even numbers undersides. — Figs. 1, 2: *Mycalesis voxvoldi* sp. n. (holotype). — Figs. 3, 4: *M. duponchelii* (Sepik Basin). — Figs. 5, 6: *M. mucia* (Sepik Basin). — Figs. 7, 8: *M. bififormis* (Hindenburg Range). — Figs. 9, 10: *M. bilineata* (Gulf Province). — Figs. 11–19: *Mycalesis* types. — Figs. 11–13: *Mycalesis bififormis* (holotype ♂ BMNH); 11: ups., 12: uns., 13: labels. — Figs. 14–16: *M. bilineata* (holotype ♀, BMNH); 14: ups., 15: uns., 16: labels. — Figs. 17–19: *M. taxilides* (holotype ♂, BMNH); 17: ups., 18: uns., 19: labels. — Figs. 20–22: *M. mucia* (holotype ♂, BMNH); 20: ups., 21: uns., 22: label. — Fig. 23: *M. duponchelii*, plate illustration reproduced from original description. — Scale bar (top left corner) = 10 mm (i.e., approx. natural size), valid for all specimen photos, but not for labels and reproduction.



Figs. 24–28: Male genitalia of *Mycalesis*, where **a** is genitalia in lateral view and **b** is genitalia in dorsal view. — Fig. 24: *Mycalesis woxvoldi* (holotype). Fig. 25: *M. duponchelii* (Sepik Basin). Fig. 26: *M. mucia* (Sepik Basin). Fig. 27: *M. biformis* (Hindenburg Range). Fig. 28: *M. bilineata* (Gulf Province). — Scale bars = 1mm, genitalia not to the same scale.

orange-brown ventrally and at apex of club. Thorax dorsally dark brown with rusty hue, ventrally thorax and legs buff. Abdomen dark brown with rusty hue dorsally, lighter brown beneath.

Forewing with costa slightly bowed, termen nearly straight, inner margin strongly bowed near base. Forewing upperside black, with basal area with maroon scaling, overall deep purple suffusion to wing; forewing with cubitus and anal vein swollen near base.

Forewing underside buff-yellow-brown and otherwise unmarked basally, a median chestnut band approximately 1.5 mm wide extending from space 1b to vein 8, this band diffuse and lighter brown basally, outer half of wing glossy blue-grey, a large black postmedian eyespot approximately 3 mm diameter with white centre and a yellow and dark brown ring filling space 2, a smaller postmedian eyespot approximately 2 mm diameter of similar colour and pattern in space 5, vestigial postmedian spots each in spaces 3 and 4, two narrow deep blue-grey wavy subterminal bands at approximately 1 mm and 2.5 mm from termen.

Both hindwings significantly damaged and sections of wing not available for description, particularly in the tornal area. Hindwing upperside black with overall deep purple suffusion to wing, costa broadly cream-yellow and extending into cell, prominent hair tuft in costal area near base of cell; Hindwing underside buff-yellow-brown and otherwise unmarked basally, a median chestnut band approximately 1.5 mm wide extending from near costa (part of costa missing due to wing damage) to space 1b, this band diffuse and lighter brown basally, where present outer half of wing glossy blue-grey, large black postmedian eyespots approximately 2.5 mm diameter with white centres (that in space 2 bears two white central spots) and a yellow and dark brown ring filling spaces 2, 6 and presumably space 1 (most of space 1 in postmedian area missing), smaller postmedian eyespots of similar colour and pattern in spaces 3, 4 and 5, where present two narrow deep blue-grey wavy subterminal bands at approximately 1 mm and 2.5 mm from termen.

**Genitalia** (Figs. 24a, b). Tegumen very broad dorsally, approximately 0.65 the length of uncus, lateral margin slightly concave; uncus long and arched, of approximately even thickness in both lateral and dorsal views; brachia of gnathos long and nearly straight; valva long and narrow laterally, with smooth bowed margin, broad in dorsal view with apical tooth; aedeagus strongly swollen at base in lateral view, bowed and tapering to apex; juxta swollen and very rounded; saccus broad and heavily clubbed.

**Distribution:** Sepik Basin, Papua New Guinea.

## Discussion

*M. woxvoldi* sp. n. is highly distinctive in its wingshape, pattern and colouration. It is among the largest in the genus in New Guinea. Superficially, on the upperside,

the ♂ resembles that of both *M. biformis* (Figs. 7, 8; type Figs. 11–13) and *M. bilineata* (Figs. 9–10), bearing an essentially black upperside with an indigo sheen. *M. taxilides* FRUHSTORFER, 1911 (type, Figs. 17–19) was shown to be a synonym of *M. bilineata* (type, Figs. 14–16) by PARSONS (1998). This is verified herein, as the author has observed both sexes of *M. bilineata* in copulation in Western Province and reared adults of both sexes from eggs oviposited in the field by the same female.

*M. woxvoldi* is much larger than both *M. bilineata* and *M. biformis*, neither species of which appear to be known from the Sepik, nor at any localities north of the central cordillera in mainland New Guinea. Records of *M. biformis* from Dore Bay on the Bird's Head Peninsula, West Papua (D'ABRERA 1990), refer to specimens of *M. aethiops* that he wrongly attributed to ♀♀ of *M. biformis*. The underside of the new species is very disparate from these taxa, in particular lacking the prominent basal bands of *M. bilineata* and *M. biformis*, suggesting that *M. woxvoldi* sp. n. is more closely related to the orange-brown *M. duponchelii* group (comprising the New Guinean *M. duponchelii* and *M. mucia*) plus the Solomons radiation of species comprising *M. sara*, *M. splendens*, *M. biliki* and *M. richardi*), in which the basal half of both wings on the underside are devoid of markings. *M. woxvoldi* is particularly unique in its melanic phenotype and in bearing a broadly cream-yellow hindwing upperside costa. The ♂ of *M. woxvoldi* is very distinctive in wingshape, in that it has a pointed forewing with a straight termen, whereas the termen is convex and the wings are more rounded in both *M. duponchelii* and *M. mucia*.

Additionally, on the underside of *M. woxvoldi* the median band is narrower than in both of these species and the patch of sex scales on the forewing inner margin is much larger in *M. woxvoldi*, extending to the subterminal area whereas it is restricted to the median area in *M. duponchelii* and *M. mucia*. The postmedian spots on the underside of both wings are much reduced in *M. woxvoldi* when compared to *M. duponchelii* and *M. mucia* (type Figs. 20–22). In their original descriptions, both GUÉRIN-MÉNEVILLE (1830) and HEWITSON (1862) described and well illustrated *M. duponchelii* and *M. mucia*, respectively (see Fig. 23 for the former). Another very unusual feature in *M. woxvoldi* is the presence of double pupils in the centre of the eyespot on the hindwing underside in space 2. This feature appears to be unique in *Mycalesis*, certainly for *Mydosama*. The isolated position of *M. woxvoldi* in a phylogenetic tree of *Mydosama* using several gene fragments (unpublished) further attests to the remoteness of this taxon.

The genitalia of *M. woxvoldi* are distinct in that the tegument crown is very broad laterally and the uncus is of approximately even width, unlike other *Mycalesis* species examined in which it is slender in the mid section or tapered apically (Figs. 25–28). The brachia of the gnathos are nearly straight, whereas in other species examined

the brachia are bowed strongly and point downwards apically. The base of the aedeagus is enlarged with respect to other *Mycalesis* examined and the juxta and saccus are more rounded. The valva is also distinct in *M. woxvoldi*, lacking the bent elbow on the ventral margin that is well developed in other putative congeners of the new species.

The holotype of *M. woxvoldi* was taken near dusk as it settled on foliage about 5 m above the ground in an unusual habitat in which the vegetation is sparsely layered and the understorey dominated by sprawling *Freycinetia* (Pandanaeae). The canopy is homogeneous, flat, small- or medium-crowned, and microphyllous and dominated by *Tetramerista glabra* (Tetrameristaceae), *Calophyllum papuanum*, *Garcinia* sp. (sect. *Cambogia*) (both Clusiaceae), *Gmelina ledermanni* (Lamiaceae), *Syzygium* aff. *hemilamprum*, *S. effusum* (Myrtaceae), *Palaquium* sp. (Sapotaceae) and *Podocarpus neriifolius* (Podocarpaceae). Only a single specimen (the holotype) was observed during five days of intensive searching in June 2010 and again for one day in March 2011 but no further specimens were recorded. The area was remarkably impoverished in butterfly diversity, although both *Mycalesis duponchellii* and *M. mucia* were fairly common.

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