

TWO NEW BUTTERFLIES (LEPIDOPTERA, LYCAENIDAE) FROM THE COLLECTIONS OF THE MUSEUM ZOOLOGI BOGOR, INDONESIA

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Abstract - Two new species of butterfly, *Epimastidia suffuscus* sp. n., and *Paraduba tenebrae* sp. n., (Lycaenidae), are described from the collections of the Museum Zoologi Bogor (MZB), Indonesia. Their probable provenance, almost certainly West Papua, is discussed in detail.

Key words: Indonesia, West Papua, Lycaenidae, new taxa, *Epimastidia*, *Paraduba*.

INTRODUCTION

The butterfly collections of the Museum Zoologi Bogor (MZB), Indonesia, include a significant number of specimens collected by American and Dutch expeditions to Indonesia several decades ago, particularly at the time of the Archbold and other expeditions in the late 1930s. These expedition specimens are invariably accompanied by handwritten data, often coded, apparently cut from the glassine or paper envelopes in which field collected material is conventionally placed. The labels are usually folded and pinned beneath the specimen. A proportion of the specimens have, in addition to handwritten labels, typed data labels bearing full data.

Handwritten labels are in various hands, and it is considered probable that typed labels were added at a later date to specimens with detailed information on the “field” envelopes, whilst those with only limited data (e.g. a date, or part of a date) bear only that original data – presumably because the full data of where and when the specimen was taken was difficult or impossible to determine by whoever subsequently prepared the formal specimen labels.

This paper examines two distinctive and undescribed lycaenid butterfly species, for which locality data is inconclusive, but which were almost certainly collected on expeditions to West Papua in the 1930s (see discussion). Investigations into their provenance suggests they were collected either on the 3rd Archbold Expedition to West Papua (1938-1939), where a significant proportion of MZB specimens with full data originated, and/or from a subsequent expedition by the Royal Dutch Geographical Society (Koninklijk Nederlands Aardrijkskundig Genootschap: KNAG) to several Papuan localities from September to November 1939. This question is analysed in the discussion section, below.

NEW TAXA

Epimastidia Druce, 1891

The genus *Epimastidia* is restricted to the Indo-Pacific region from the islands of Maluku, Indonesia in the west to those of the Solomon Islands in the east, and comprises only three previously described species, *E. inops* (Felder & Felder,

1860) (Type Locality [TL]: Aru islands, Indonesia), *E. arienis* Druce, 1891 (TL: Florida Island, Solomon Islands), and *E. yiwikana* Schröder, 2010 (TL: Wamena, Baliem Valley, Snow Mountains, Irian Jaya [now West Papua], Indonesia).

Four males of a distinctive fourth species of *Epimastidia* in the MZB are described here.

Epimastidia suffuscus, Tennent, Müller & Peggie, sp. n. (Figs 1-7)

Type material (4♂♂): HOLOTYPE: ♂, labelled “A 4-11-39”; Indonesia, almost certainly West Papua. Genitalia preparation JT 871, registration MZB LEPI. 32472 (MZB, Indonesia). PARATYPES: 2♂♂, labelled “A 10 Oct”; 1♂, labelled “A 22 Oct”. Genitalia preparation JT 882 (1 paratype BMNH; remainder MZB, Indonesia) (see Distribution, and Discussion for analysis of labels).

Diagnosis: The upperside of *Epimastidia* males are shades of brilliant, almost iridescent blue with narrow marginal borders; undersides of both sexes of known species are highly distinctive. This species has an unusually extensive broad brown border on the underside of both wings, unlike any other known *Epimastidia* species. Underside markings are variable; the under surface of all four available males are illustrated (figs 2-5).

Description: Forewing length 19.5mm; upperside bright, shining blue with greenish tinge (more green than *E. inops* or *E. arienis* when seen in series; judging from description of *E. yiwikana* possibly similar, but only photographs of *yiwikana* seen by authors); black marginal border widest at forewing apex and hindwing tornus (similar to *E. yiwikana*); underside forewing distal third suffused (variable) with broad dirty black marginal border enclosing complete series of indistinct submarginal pale chevrons and other more obscure marginal and post median markings (border significantly less broad in all other species, enclosing double series of pale, bluish markings in *E. inops*; prominent series of pale blue submarginal markings in *E. arienis*; obscure pale submarginal spots, tinged orange, in *E. yiwikana*); inner edge of this border irregular and ill-defined (well-defined in all other *Epimastidia* species); basal third creamy-white dusted with brown scales, especially along veins (plain, clear creamy-white in other *Epimastidia* species) extending to costa, with brown cell spot (costa broadly brown in *E. inops* and *E. yiwikana*); hindwing similar, border and all markings more extensive (enclosing prominent orange lunules in *E. yiwikana*). Genitalia like other species, particularly *E. inops* and *E. yiwikana*, valve broad, unremarkable, with apex curving inwardly to a point (figs 6, 7). Genitalia of *Epimastidia* species are less diagnostic than some lycaenid groups. Female unknown.

Distribution: The distribution of this species is not known with certainty, but there is strong circumstantial evidence to suggest that it occurs in the Indonesian province of West Papua on the main island of New Guinea (see discussion).

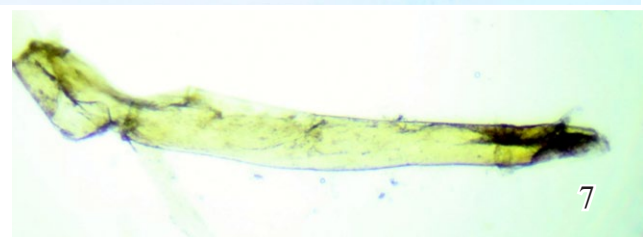


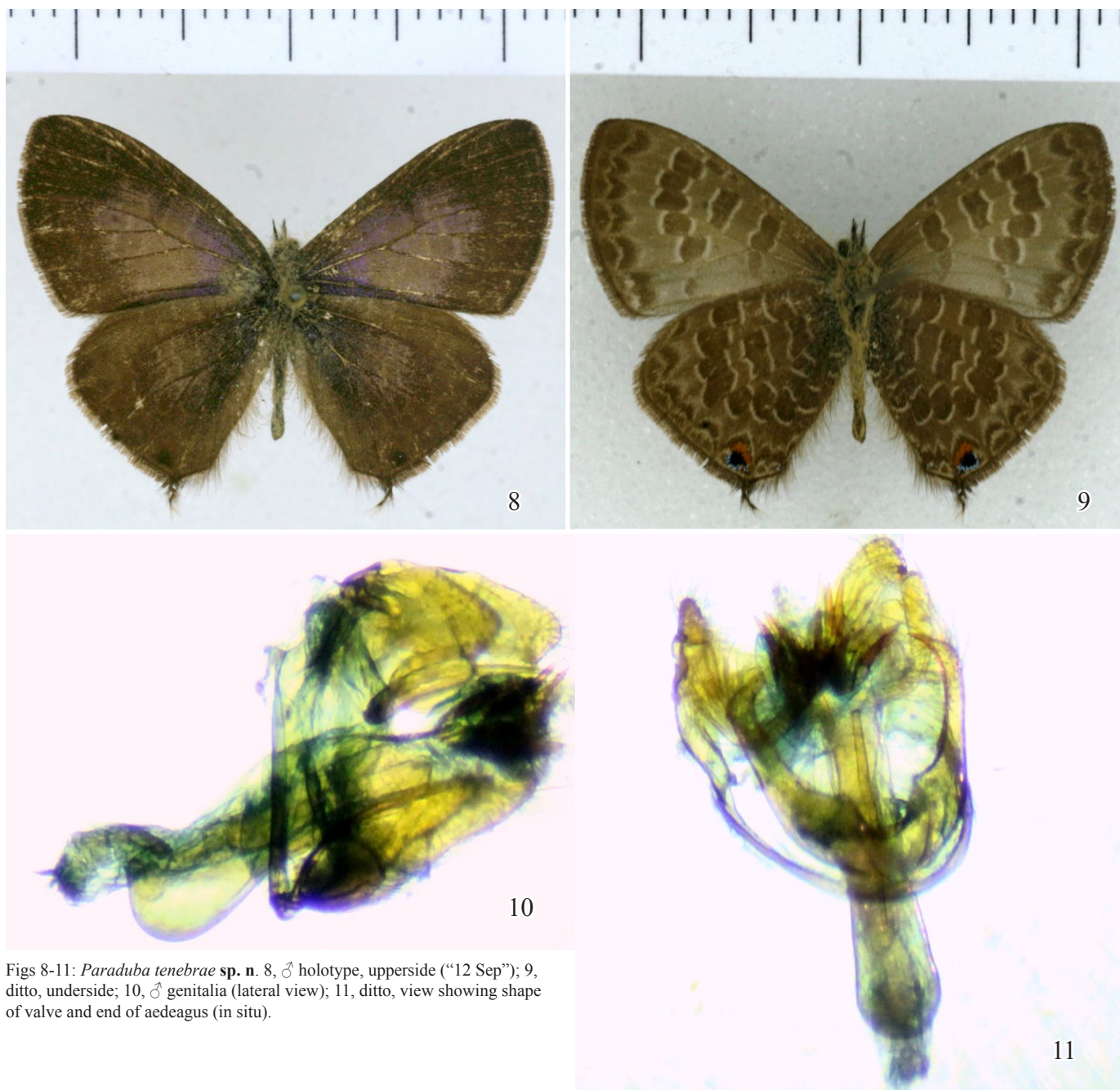
Figs 1-7: *Epimastidia suffuscus* sp. n. 1, ♂ holotype, upperside (“A 4-11-39”); 2, ditto, underside; 3, ♂ paratype, underside (“a 10 Oct”); 4, ♂ paratype, underside (“a 10 Oct”); 5, ♂ paratype, underside (“A 22 Oct”); 6, ♂ genitalia, aedeagus removed (lateral view); 7, ♂ genitalia, aedeagus.

Etymology: The name *suffuscus* is derived from the distinctive underside brown suffusion of this species.

***Paraduba* Bethune-Baker, 1906**

This is a small genus of four described species, occurring on the main island of New Guinea and Normanby Island in the D’Entrecasteaux group, Milne Bay Province, Papua New Guinea. *Paraduba metriodes* (Bethune-Baker, 1911) (TL: Dinawa, Papua New Guinea), occurs at low to moderate elevations, whilst *P. owgarra* Bethune-Baker, 1906 (TL:





Figs 8-11: *Paraduba tenebrae* sp. n. 8, ♂ holotype, upperside (“12 Sep”); 9, ditto, underside; 10, ♂ genitalia (lateral view); 11, ditto, view showing shape of valve and end of aedeagus (in situ).

Owgarra, Papua New Guinea), and *P. siwiensis* Tite, 1963 (TL: Arfak Mountains, West Papua), are fundamentally montane. *P. mastrigti* Cassidy, 2003 (TL: Indonesia, Irian Jaya [West Papua], Central Bergland, Sumatamon) is probably also montane – the type locality is at ca 1,000 m elevation in the central highlands of West Papua. A fifth species, based on a male in the MZB, is described here.

***Paraduba tenebrae*, Tennent, Müller
& Peggie, sp. n. (figs 8-11)**

Type material (1♂): HOLOTYPE: ♂, labelled “12 Sep”; Indonesia, almost certainly West Papua. Genitalia preparation JT 875, registration MZB LEPI. 32476 (MZB, Indonesia) (see Distribution, and Discussion for analysis of labels).

Diagnosis: This highly distinctive species differs from other *Paraduba* species in its broad wing borders and restricted blue on the upper surface, and in its diagnostic underside markings. The aedeagus is also remarkable in its shape and form.

Description: Forewing length 14mm; upperside dull, wings with distinct mid-chocolate brown fringe; forewing with basal approximately two-thirds subdued purple-blue, veins lined brown; outer third broadly chocolate brown, extending along costa to base of wing and encroaching into cell (all other *Paraduba* species dark purple-blue with narrower margins); hindwing distinctly angular at apex (less angular in *P. siwiensis*; more rounded in other *Paraduba* species); dull, indistinct purple-blue scales restricted to cell area, remainder of wing plain chocolate-brown (hindwing blue or purple-blue extensive in other *Paraduba* species); inner margin hirsute, with prominent hairs extending to ‘tufted’ tail at tornus (tail more filamentous in other *Paraduba* species); tornal spot subdued, inconspicuous; underside chocolate brown, with irregular darker brown markings broadly lined pale brownish-white (grey-brown in *P. metriodes*; more contrasting in *P. mastrigti*); forewing marginal/submarginal chevrons similar to other *Paraduba* species; post median band irregular (more regular in other *Paraduba* species); hindwing with complex arrangement of confluent dark brown markings, outwardly lined pale brownish-white, loosely

forming irregular bands (markings more regular in other *Paraduba* species); hindwing with prominent black tornal spot, outwardly lined with blue, inwardly broadly bordered orange. Genitalia similar in general form to other *Paraduba* species; vinculum with sharply angled 'shoulder' (more rounded in *P. owgarra* and others); valve slender, curving slightly at apex, with sparse hairs; aedeagus remarkable, very large in comparison with other *Paraduba* species, stout, culminating in two separated clusters of up to seven spiked processes (apex of *P. owgarra* unadorned; apex of *P. mastrigti* also 'split', but with 'plain ventral and dorsal processes at tip' [Cassidy, 2003, fig. 24b]) (figs 10, 11). The aedeagus proved impossible to remove from the remainder of the genitalia without causing structural damage, due to its large size and the fact that it seemed sturdily secured. With only the holotype available, this was not pursued. Female unknown.

Distribution: Like *Epimastidia suffuscus*, above, the distribution of this species is not known with certainty, but there is strong circumstantial evidence to suggest that it occurs in the Indonesian province of West Papua on the main island of New Guinea (see discussion).

Etymology: The name *tenebrae* refers to the dark and rather sombre overall appearance of this butterfly.

DISCUSSION

It will be regarded as unusual in modern times to describe new taxa with inadequate locality data and it is true that all five of the specimens dealt with in this paper bear no data beyond what is taken to be a rough date. Two of the *Epimastidia* have handwritten labels (use of lower/upper case "a"/"A" is deliberate in what follows) with "a 10 Oct"; a third is labelled "A 22 Oct" and the remaining specimen is labelled "A 4-11-39". The *Paraduba* bears a label "12 Sep". By themselves the labels impart little beyond the possibility that all were caught somewhere in September – October, with one *Epimastidia* declaring [19]39.

However, the collections at the MZB are not extensive, and a high proportion of specimens in the collection were collected by the 3rd Archbold Expedition to various localities in West Papua, Indonesia, in 1938 and 1939. The labels in question are on two different surfaces, one is shiny "glassine"; the other rough quality plain white paper. Both these surfaces were and are standard surfaces for making folded envelopes in which butterflies (and other insects collected 'dry') are collected and stored in the field, with data written on the outside of the envelopes. The labels in question are almost certainly these data, cut from the original envelopes, and are in two (possibly three) different hands. Three of the *Epimastidia*, and the *Paraduba* are probably in one hand and format, whilst one of the *Epimastidia* labels – the one with the date "39" – is clearly written by a different hand.

Also in MZB are several other specimens with similar labels – for example, a male *Altiapa pandora* Joicey & Talbot, 1916, also carries a label "a 26 Oct". There is also a series of 13♂♂ and 2♀♀ *Cephrenes augiades bruno* Evans, 1935, bearing printed labels "Neth[erlands] Ind[ies] American New Guinea Exped[ition] Araucaria Camp 800 m[etres] ... L. J. Toxopeus" with various dates in March and April 1939. Each specimen also carries cut-out sections of the original data from which the printed labels were derived, on the same range of surfaces as the *Epimastidia* and *Paraduba* presented here. All the 'original' labels appear to be of approximately the same age, and are similarly stained; unfortunately, although they are also written in similar ink, they do not appear to be from the same hand.

Toxopeus – leader of the 3rd Archbold Expedition – mapped 17 localities visited by the 3rd Archbold Expedition in 1938 and 1939 (Toxopeus, 1940). It is clear from his account that Toxopeus placed detailed data on specimens: following a two week 'patrol' to the Baliem Valley he said "My few specimens captured during the patrol have got detailed labels." (Toxopeus, 1940: 278). He also gave details of prevailing weather conditions for each entry. However, a proportion of specimens were collected by "assistants", whilst other "collections" appear to have been purchased, presumably from non-expedition members – it might be reasonably surmised that assistants were less likely to write detailed data on specimen envelopes and that no more than a date might be considered sufficient data, since this could be compared to expedition localities when the time came to process them.

The solitary *Paraduba tenebrae* named above is a hirsute insect, which generally signifies a cold habitat at northerly latitudes or high elevation. Many of the expedition localities are at relatively high elevation, and a date of "12 Sep[tember]" 1938 (there are no localities for September 1939) would place the expedition at Letterbox Camp, 3,500–3,700 metres elevation \pm 4 kilometres to the east of Mount Wilhelmina, in "swampy alpine vegetation, at the timber line" (Toxopeus, 1940: 278).

So far as three of the four *Epimastidia* specimens are concerned – if they came from the Archbold Expedition – dates of the 10th and 22nd of October 1938 (once again there are no localities for October 1939) place the expedition at Moss Forest Camp in a variety of forest habitats, at elevations of 2,600–3,000 metres. For the record, this would place the *Altiapa pandora* in the same general region on the 22nd of October 1938. Whilst one would expect *Altiapa* to fly at high elevation, this seems rather high for a species of *Epimastidia*, although we acknowledge that *E. suffuscus* is a highly distinctive species and that nothing is known of its habits.

The 4th *Epimastidia* specimen, with data of "4-11-[19]39", does not fit the Archbold Expedition dates if it is taken to be the 4th of November 1939, since the last dates provided by Toxopeus for that year are in April. However, if the "11" is taken to mean "ii", i.e. the 4th of February 1939, that places it at Top Camp at high elevation. Perhaps more likely – this was a joint Dutch / American Expedition, and Americans routinely place the month before the day – it might represent the 11th of April 1939, when the expedition was camped at Bernhard Camp, a forested environment "traversed by many creeks" (Toxopeus, 1940: 279) at \pm 50 metres elevation, in a typical habitat for *Epimastidia*. It is reiterated that this label is in a different hand and format to all the other labels considered in this paper.

However, in discussing the Archbold Expeditions with Rob de Vos, collection manager of Lepidoptera at Naturalis Biodiversity Center, Leiden, it was learned that a further expedition was undertaken by the Royal Dutch Geographical Society (Koninklijk Nederlands Aardrijkskundig Genootschap: KNAG) to several Papuan localities in 1939. This expedition, also known as the Le Roux Expedition, visited the Nassau Range (surroundings of Lake Habbema and Mt. Wilhelmina), the Central Mountain Range, the surroundings of Hollandia (Jayapura) and the Paniai Lakes area (Wisselmeren). From September to November 1939, the expedition camped in the

Araboe Valley in the Paniai area, and it is considered quite possible that the “A” present on the handwritten *Epimastidia* labels refers to Araboebivak (Araboe Camp), at around 1750m elevation. The dates, elevation and camp from the KNAG expedition would fit all five specimens mentioned in this paper.

It is acknowledged that the preceding paragraphs contain little more than supposition and that there is no firm evidence to provide a locality for any of the specimens described here. But the anecdotal evidence: similar style, surface and aging of labels to known Archbold Expedition material; Archbold dates that largely place the specimens in a suitable habitat; placement amongst known Archbold material in MCZ, suggest the possibility that all these specimens may well have originated from the Archbold Expedition. Alternatively – and the dates suggest this may even be the more likely option – they may originate from the KNAG expedition in 1939.

No firm claim is made here for any of the specific localities outlined above, but we are confident that “West Papua” is the likely locality. Until further specimens become available, distribution will remain something of an enigma, but West Papua supports a wide variety of remote habitats that are likely to remain unexplored for the foreseeable future – to leave such distinctive butterflies without a name for a further 7 decades or more seems to us a poor option.

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