

A review of *Danis danis* (CRAMER, 1775) (Lepidoptera, Lycaenidae), with descriptions of seven new subspecies from Indonesia and Papua New Guinea

W. John TENNENT

W. John TENNENT, Scientific Associate, Division of Insects, Department of Life Sciences, Natural History Museum, London SW7 5BD, England; johntennent@hotmail.co.uk

Abstract: In researching butterflies from Milne Bay Province, Papua New Guinea, it was noted that several undescribed subspecies of the polyommata lycaenid species *Danis danis* (CRAMER, 1775), were present in the collections of the BMNH, London, and that although most previous authors each recognised in the region of 20 subspecies, most had never been illustrated. With this in mind, subspecies of *D. danis* across the species' range are reviewed; 24 subspecies are recognised, including seven new ones: *D. d. morotai* ssp. n. (Indonesia: North Maluku, Morotai Island); *D. d. gebe* ssp. n. (Indonesia: Maluku, Gebe Island); *D. d. kofiau* ssp. n. (Indonesia: Maluku, Kofiau Island); *D. d. mussau* ssp. n. (Papua New Guinea [PNG]: Mussau Island, St. Matthias group); *D. d. feni* ssp. n. (PNG: Feni Island); *D. d. murua* ssp. n. (PNG: Woodlark Island); *D. d. duperre* ssp. n. (PNG: Duperre group, eastern Louisiades) (holotypes all males, all in BMNH, London). **Lectotypes** (all males) are designated for *karpai* DRUCE & BETHUNE-BAKER, 1893; *regina* KIRBY, 1889; *philocrates* FRUHSTORFER, 1915; *anaximenes* FRUHSTORFER, 1915; and *herophilus* FRUHSTORFER, 1915 (all in BMNH, London). The status of *D. d. zainis* FRUHSTORFER, 1915 (PNG: Bismarck Archipelago, New Ireland), previously synonymised with *D. d. dispar* GROSE SMITH & KIRBY, 1895 (PNG: New Britain), is revised. The name *sophron* FRUHSTORFER, 1915 (TL: Buru) is placed as a new synonym of *D. d. apollonius* due to evidence suggesting erroneous labelling. With the exception of a female *occidentalis* RÖBER, 1926 from Buru, unavailable to the author, both sexes of all subspecies (including many primary and secondary type specimens) are illustrated, and a brief diagnosis provided for each. Distribution is presented in the form of maps.

Keywords: Lepidoptera, Lycaenidae, Polyommata, *Danis danis*, Indonesia, Papua New Guinea, new taxa.

Eine Revision der Art *Danis danis* (CRAMER, 1775) (Lepidoptera, Lycaenidae), mit der Beschreibung von sieben neuen Unterarten aus Indonesien und Papua-Neuguinea

Zusammenfassung: Im Rahmen von Studien der Tagfalterfauna der Milne-Bucht-Provinz, Papua-Neuguinea, konnten einige noch unbeschriebene Unterarten der Polyommata-Bläulingsart *Danis danis* (CRAMER, 1775) in den Sammlungsbeständen des BMNH in London festgestellt werden. Darüber hinaus stellte sich heraus, daß von den von den meisten früheren Autoren aufgezählten über 20 Unterarten dieses polymorphen Taxons die meisten noch nie abgebildet wurden. Auf dieser Grundlage wurden die Unterarten von *D. danis* über das gesamte Verbreitungsgebiet der Art analysiert und revidiert. Es werden 24 aktuelle Subspezies akzeptiert, davon die folgenden 7 neu beschrieben: *D. d. morotai* ssp. n. (Indonesien, Nordmolukken, Insel Morotai); *D. d. gebe* ssp. n. (Indonesien, Molukken, Insel Gebe); *D. d. kofiau* ssp. n. (Indonesien, Molukken, Insel Kofiau); *D. d. mussau* ssp. n. (Papua-Neuguinea [PNG]: Insel Mussau, St.-Matthias-Gruppe); *D. d. feni* ssp. n. (PNG: Insel Feni); *D. d. murua* ssp. n. (PNG: Insel Woodlark); *D. d. duperre* ssp. n. (PNG: Duperre-Gruppe, östliche Louisiaden) (Holotypen sind alle Männchen und alle im BMNH, Lon-

don). **Lectotypen** (alles Männchen) werden festgelegt für die Taxa: *karpai* DRUCE & BETHUNE-BAKER, 1893; *regina* KIRBY, 1889; *philocrates* FRUHSTORFER, 1915; *anaximenes* FRUHSTORFER, 1915; sowie *herophilus* FRUHSTORFER, 1915 (alle im BMNH, London). Der Status von *D. d. zainis* FRUHSTORFER, 1915 (PNG: Bismarck-Archipel, Insel Neuirland), früher als Synonym von *D. d. dispar* GROSE SMITH & KIRBY, 1895 (PNG: Insel Neubritannien) angesehen, wird revidiert. Der Name *sophron* FRUHSTORFER, 1915 (TL: Buru) wird als neues Synonym von *D. d. apollonius* angesehen wegen Hinweisen auf falsche Fundetikettierung. Mit der Ausnahme eines Weibchens des Taxons *occidentalis* RÖBER, 1926 von Buru, das der Autor nicht nachweisen konnte, werden beide Geschlechter aller Subspezies (einschließlich vieler primärer und sekundärer Typen) abgebildet und kurz diagnostiziert. Die Verbreitung aller Taxa wird in Karten skizziert.

Introduction

The genus *Danis* FABRICIUS, 1807 comprises 10 described species (HIROWATARI 1992), of which *D. danis* is the most widespread and diverse. DRUCE & BETHUNE-BAKER (1893) published a revision of *Danis*, then regarded as *Thysonotis* HÜBNER, 1816, in which they recognised five divisions incorporating *Danis sensu stricto* and some taxa now assigned to *Nacaduba* MOORE, [1881] (e.g. *cyanea* CRAMER, 1775), *Psychonotis* TOXOPEUS, 1930 (e.g. *kruera* DRUCE, 1891, *caelius* FELDER & FELDER, 1860 etc.), *Nothodanis* HIROWATARI, 1992 (*schaeffera* ESCHSCHOLTZ, 1821) and *Hypochrysops* FELDER & FELDER, 1860 (e.g. *miraculum* DRUCE & BETHUNE-BAKER, 1893).

HIROWATARI (1992), in his generic classification of Oriental and Australian polyommata butterflies, removed *Epimastidea* from *Danis*, and recognised three genera (*Danis*, *Perpheres* gen. n., and *Psychonotis*) in the *Danis* section. He recognised 10 species of “true *Danis*”. His arrangement has been followed subsequently by most authors.

Danis danis (CRAMER, 1775) is a rather attractive polyommata lycaenid butterfly that occurs from the Moluccas and some associated islands (Indonesia) in the west through the Kei and Aru groups, Waigeo and the main island of New Guinea to Cape York and the east coast of Queensland, Australia. Distribution includes many of the large satellite islands off the north and east coasts of New Guinea, including the Bismarck Archipelago, the St. Matthias group, the Trobriands, Woodlark, the D'Entrecasteaux group and islands of the Louisiade Archipelago.

In a rather muddled geographic sequence, D'ABRERA (1971) listed 16 subspecies of *D. danis* throughout its range: *seraphis* [sic] MISKIN (Cairns to Tully, Australia);

syrius MISKIN (Cape York, Australia); *apollonius* FELDER [sic] (New Guinea, Aru[?]); *supoi* RIBBE (= *supous* DRUCE & BETHUNE-BAKER) (Aru); *triopus* DE NICÉVILLE (Kai [Ewab] I.); *hermes* GROSE SMITH (= *phoibides* FRUHSTORFER) (Islands of Geelvink Bay, West Irian); *zuleika* GROSE SMITH (Yela [Rossel] I.) (Louisiades); *suleima* GROSE SMITH (St. Aignan [Misima]); *regina* KIRBY (Normanby I., D'Entrecasteaux Archipelago); *lampros* DRUCE (= *lamprosides* GROSE SMITH) (Trobriand Is.); nominotypical *danis* CRAMER (Ambon); *karpaiia* DRUCE & BETHUNE-BAKER (Serang [sic]); *philocrates* FRUHSTORFER (Obi); *philostratus* FELDER [sic] (Bachan, Halmahera, Morotai, Ternate, Waigeu); *dispar* GROSE SMITH & KIRBY (Bismarck Archipelago); *latifasciata* ROTHSCILD (= *sub-suleima* STRAND) (Admiralty Is.).

In his book on Papua New Guinea butterflies, PARSONS (1998) recognised nine *D. danis* subspecies in Papua New Guinea: *apollonius* (= *anaximenes* FRUHSTORFER), *proedrus* FRUHSTORFER, *regina*, *zuleika*, *lampros* (= *lamprosides*), *suleima*, *dispar* (= *subsuleima*, = *zainis*), *latifascia*, “ssp. Woodlark”. Aside from PARSONS’ note of an undescribed *D. danis* subspecies from Woodlark in 1998 (see *D. d. murua* ssp. n., below), the description of *D. d. tanimbarensis* by YAGISHITA (2000) is the only new taxon of *D. danis* described since FRUHSTORFER raised several names from the west of the species’ range, 85 years earlier (FRUHSTORFER 1915).

The roots of this review lie in research into butterfly distribution on the islands of Milne Bay Province, Papua New Guinea, where the author carried out extensive fieldwork in 2010–2012. In preparing to describe new subspecies from Woodlark and the eastern Louisiades, it became apparent not only that further undescribed subspecies were present in the BMNH collections, but that few of the subspecies already described had ever been illustrated. GRÜNBERG (in SEITZ 1916) recognised 12 “species” (i.e. subspecies of *D. danis*), and illustrated (Plate *Thysanotis* [sic], figs. 143a–c [partim]) *karpaiia* (as *karpaja*), *serapis*, *danis*, *apollonius*, *supous* and *philostratus*, with a series of both sexes and both upper and under surfaces. These were fairly crudely represented. In the century since SEITZ was published, other authors have provided little information and few illustrations of *D. danis*. For example, although D’ABRERA (1971: 324–325) listed 16 subspecies, he only illustrated upper surfaces of a pair each of *D. d. serapis* (as *seraphis*), nominotypical *danis* and *D. d. philocrates*, plus the under surface of a female *D. d. serapis*, despite a wide assortment of other distinctive phenotypes present in the BMNH and plenty of available page space. Also, although PARSONS (1998: 430) recognised eight named subspecies in Papua New Guinea, he only illustrated (PARSONS 1998: pl. 67, figs. 1885–1890) ‘halved’ specimens of *D. d. apollonius* (male and female, both surfaces) and *D. d. latifascia* (male underside, female upperside).

D. danis is a large lycaenid butterfly well represented in collections, due no doubt to the fact that it inhabits fores-

ted areas where it flies slowly, with a distinctive “bobbing” flight, 1–3 m above the ground. The slow flight of this species is derived from the fact that it is believed to be part of a mimetic complex of butterfly taxa including other *Danis* species, *Psychonotis* and some species of *Hypochrysops*. The unhurried flight of *Danis* presumably signifies unpalatability.

PARSONS (1998: 430) said of *D. danis*: “Although *danis* is very similar to most other species of the genus certain characters greatly assist in its identification. These include the notably pale blue ♂ upp[erside] which bears longer, more dense and prominent whitish androconial and hair scales than in other species of its genus. In *danis* the marginal fringe is more prominently chequered, and the iridescent pale blue und[erside] scaling is more distinctly turquoise ... in both sexes than in all other PNG *Danis* species.” — This is slightly misleading. *D. danis* certainly is similar in appearance to other *Danis* species, and the male is characterised by dense, usually prominent, androconial scales, giving a rather furry appearance. Some subspecies do also have a bright, silvery blue male not seen in other *Danis* species, although, as will be seen from the figures accompanying this paper, there is a very wide diversity of male colouration among the subspecies. The “chequered fringe” of *D. danis*, when present, may not be seen in specimens that have been on the wing even for a short period, and some subspecies lack a chequered fringe completely, even when fresh. Others seem to be quite variable in this respect, and may or may not have distinct fringes. The colour of the underside metallic markings of both sexes is also variable, and may be distinctly blue, green or with a mixture of the two colours. A helpful diagnostic separation of *D. danis* from other *Danis* species is the pyramidal white area on the underside forewing of both sexes; in *D. danis* the ‘base’ of this area occupies a central part of the inner margin; in all other species of *Danis*, the white area almost or actually reaches the forewing tornus, and is often irregularly shaped on the terminal edge.

The upper surface of both sexes is subject to considerable variation, taking a form which appears to be relatively constant on island populations. Male variation relates in particular to the extent of white scales on the median area of the forewing and the width of the dark border, especially on the hindwing. The white band of the female upperside varies in width and clarity; in its extreme forms the band may be almost obscured by dark scales. On the under surface, both sexes are subject to variation in the width of the white median band, the extent of the blue/green metallic markings, and the degree to which these markings are filled by dark submarginal spots on the hindwing submargin. Variation does not appear to be clinal, and ‘dark’ subspecies may occur on islands where ‘brighter’ subspecies occur on adjacent islands (cf. *D. d. duperre* ssp. n., below). On the New Guinea mainland, subpopulations are less constant in appearance, and some island subspecies (e.g. the islands west of the Vogelkop: Waigeo, Salawatti etc., and from some of the islands of Geelvink Bay: Yapen, Mefor etc.) are difficult to

convincingly separate from those on the mainland. The colour of underside metallic markings, used previously to differentiate subspecies, does vary from pale blue to a bright green, and although diagnostic in some cases (e.g. the Morotai phenotype is notably more blue green than subspecies on the other islands of North Maluku), it may be less diagnostic than other features, noted above.

Described subspecies of *Danis danis* are critically appraised and presented, with brief diagnoses, loosely from west to east, and seven new subspecies, described as a result of recent fieldwork in Milne Bay Province, Papua New Guinea, and examination of historical museum material. Etymology for the new taxa in all cases relates to the source island or islands.

Both sexes of each of the 24 subspecies (with exception of a Buru ♀ not available to the author) recognised are illustrated in colour: the majority for the first time. In view of the fact that photographs are provided of all taxa, only brief diagnostic characteristics are provided in the text. Distribution is mapped.

Abbreviations

ANIC	Australian National Insect Collection, Canberra, Australia.
BMNH	The Natural History Museum, London, U.K. (formerly British Museum [Natural History]).
HT	Holotype[s].
Isl.	Island/Islands (in legends).
lbl.	Label[s] (in legends).
LT	Lectotype[s].
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
PLT	Paralectotype[s].
PT	Paratype[s].
RMNH	Naturalis Biodiversity Center (formerly Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands.
ST	Syntype[s].
TL	Type locality.

The subspecies of *Danis danis* (CRAMER, 1775)

D. d. philostratus (FELDER & FELDER, 1865)

(Figs. 13–19.)

Lycaena philostratus: FELDER & FELDER (1865: 264, pl. 33, figs. 1, 2). — TL: Dodinga, [central] Halmahera.

Diagnosis: Male upperside dark royal blue; forewing with broad, uneven dark border, wider near apex and on costa near wing base; median patch lozenge-shaped, clear white; hindwing blue restricted to postmedian patch near costa, leaving broad dark border, especially at the tornus; white band narrow; underside metallic markings blue, prominent; hindwing submarginal metallic spots containing large black spots, almost overwhelming the blue towards the apex; white median band narrow, leaving broad postmedian and basal dark bands. Female upperside white median band indistinct, obscured by dark scales; underside with extensive metallic markings and reduced median white patch, especially on the hindwing, where the white band is narrow and uneven.

Distribution: North Maluku: the islands of Halmahera, Ternate, Kaioa (= Kayoa; Kayoja), Bacan.

Note: The patch of blue scales on the left forewing of the female holotype is the result of an historical repair; the underside median bands of this specimen are also particularly narrow. There is a certain amount of variation in specimens from the northern Moluccas; populations from Morotai are separable from *philostratus* (see below). See also notes regarding FRUHSTORFER's *sophron*, following *D. d. apollonius*.

D. d. morotai ssp. n.

(Figs. 20–24.)

Holotype ♂: Indonesia, North Maluku, Morotai, Daao, 3rd June 1992 (BMNH).

Paratypes (18 ♂♂, 9 ♀♀): 1 ♀, same data as HT, x. 2003 (BMNH). 1 ♂, same data as HT. 1 ♂, 2 ♀♀, same data as HT, x. 2003. 1 ♂, 1 ♀, same data as HT, viii. 2003. 1 ♂, same data as HT, x. 2006 (coll. RAWLINS). 9 ♂♂, 2 ♀♀, Morotai, iv. 1992. 1 ♂, Morotai, ix. 1992. 2 ♂♂, 3 ♀♀, Morotai, i. 1992 (coll. Akira YAGISHITA, Ibaraki, Japan). 3 ♂♂, Morotai, iii. 2005 (coll. Chris MÜLLER, Sydney, Australia).

Distribution: Restricted to the North Moluccan island of Morotai.

Diagnosis: Male similar to *D. d. philostratus*, but upperside blue colour distinctly tinged green (dark blue in *philostratus*); underside like *D. d. philostratus*; hindwing median white band broader. Female upperside white median band narrow, heavily clouded with dark scales (band often almost completely obscured in *D. d. philostratus*); underside median band also broader than *D. d. philostratus*.

Note: Three female *D. danis* in the BMNH bear labels claiming Buru as a source. They are almost certainly from Morotai (see notes following *D. d. occidentalis*, below, and discussion in TENNENT & RAWLINS 2008, regarding FRUHSTORFER's confusion regarding Buru and Morotai).

D. d. gebe ssp. n.

(Figs. 25–29.)

Holotype ♂: Indonesia, Maluku, Gebe Island, January 2010 (BMNH).

Paratypes (4 ♂♂, 3 ♀♀): 1 ♀, same data as HT (BMNH). 4 ♂♂, 2 ♀♀, same data as HT (coll. RAWLINS).

Diagnosis: Similar to *D. d. philostratus* from Halmahera to the west. Male upperside blue, with a slight greenish tint; white median band well-developed; underside like *D. d. philostratus*; hindwing basal black area extending slightly along costa, leaving distal edge of black area distinctly curved (see also *D. d. tanimbarensis* from Tanimbar, and notes regarding Sudest specimens following *D. d. suleima*). Female upperside like *D. d. philostratus*; upperside median band broader, clouded with dark scales (band almost or actually obscured in *D. d. philostratus*); underside like male; white median band broader than *D. d. philostratus*; extension of black along costa more extensive than male.

Distribution: Gebe Island, east of Halmahera.

***D. d. philocrates* (FRUHSTORFER, 1915)**

(Figs. 30–34.)

Thysonotis danis philocrates: FRUHSTORFER (1915: 50). — TL: Obi.

Lectotype by present designation: ♂ with the following labels: (1) printed label, bordered with narrow black lines “Obi H. FRUHSTORFER”; (2) handwritten label, broadly bordered black “*danis philocrates* FRHST.”; (3) “FRUHSTORFER Coll. B.M.1933–31.”; (4) typed, red bordered circular label “Type HT”; (5) typed “lectotype *Thysonotis danis philocrates* FRUHSTORFER, 1915, designated John TENNENT 2015”; (6) typed circular purple-bordered “Lectotype”. — Paralectotypes (the remaining 2 ♂♂, 4 ♀♀ ST): 1 ♀ with the following labels: (1) printed label, bordered with narrow black lines “Obi H. FRUHSTORFER”; (2) “FRUHSTORFER Coll. B.M.1933–31.”; (3) typed, red bordered circular label “Type AT”; (4) typed “paralectotype *Thysonotis danis philocrates* FRUHSTORFER, 1915, designated John TENNENT 2015”; (5) typed circular blue-bordered “Paralectotype”. 2 ♂♂, 3 ♀♀, each with the following labels: (1) printed label, bordered with narrow black lines “Obi H. FRUHSTORFER”; (2) “FRUHSTORFER Coll. B.M.1933–31.”; (3) typed “paralectotype *Thysonotis danis philocrates* FRUHSTORFER, 1915, designated John TENNENT 2015”; (4) typed circular blue-bordered “Paralectotype”.

Diagnosis: Male upperside royal blue, with broad dark borders; forewing white median patch prominent; hindwing blue restricted (less so than *philostratus*); underside blue metallic markings prominent; median band broad, clear white. Female upperside with clear white band, edges indistinct, suffused in places on the forewing by dark scales; underside forewing white area restricted; hindwing white band also narrow (but wider than *philostratus*).

Distribution: Obi.

Note: FRUHSTORFER described *philocrates* from 4 ♂♂ and 6 ♀♀ in his collection. There are 3 ♂♂ and 4 ♀♀ with FRUHSTORFER labels, or from the FRUHSTORFER collection, in the BMNH; of these a male is labelled “Type HT”; a female is labelled “Type AT”, and a further pair have paratype labels. The “holotype” also bears a handwritten label “*danis philocrates* FRHST.”, but does not have the dull red printed “Type” label that often accompanies FRUHSTORFER type specimens. The circular red bordered primary and yellow bordered secondary type labels have clearly been added to the specimens following accession by the BMNH, but none include any indication of what they might be the allotype or paratypes of. Lecto- and Paralectotypes are designated here to avoid future confusion. No ex-FRUHSTORFER specimen of *philocrates* was seen by the author in the collection of the MNHN.

***D. d. occidentalis* (RÖBER, 1926)**

(Figs. 35–36.)

Thysonotis danis occidentalis: RÖBER (1926: 376). — TL: Buru.

Diagnosis: Male fringes broadly chequered; upperside pale silvery blue; forewing median white patch restricted, almost obscured (apparently variable); brown margin distinct, of even width; hindwing with broad brown border, in tornal area and on inner margin extending to white median band, restricting blue area; white median band broad; underside similar to nominotypical *danis*,

hindwing median band broad; basal metallic blue ‘stripe’ extensive. Female not seen. It is noted that the male is quite similar to males of other subspecies, and that it is often the females that are distinctive.

Distribution: Buru.

Note: FRUHSTORFER (1915: 50) described *D. d. sophron* from a ♀ said to be from Buru. The HT ♀ of *sophron* in the BMNH (Figs. 84–86), labelled “Miro, Buru”, is likely to have originated from the New Guinea mainland (see detailed notes under the name *sophron* following *D. d. apollinius*, below).

***D. d. danis* (CRAMER, 1775)**

(Figs. 1–12, 37–40.)

Papilio Dan. Festiv. Danis: CRAMER (1775: 111, pl. 70, figs. E, F). — TL: “Indes Occidentales” (erroneous, correct: Ambon.) = *Damis* [*Damis*] *sebae*: BOISDUVAL (1832: 67) — TL: Ambon.

Diagnosis: Male upperside bright blue without greenish tinge; forewing border fairly broad, well defined; median patch prominent (that on the specimen figured is reduced), clear white, crossed by veins; hindwing dark border significantly broader at tornus, with blue extending into spaces, giving a “fingered” appearance; white band broad; underside forewing subcostal and submarginal metallic marks clear blue, prominent, extending down outer margin to space 2; median white patch triangular, pointed apically; hindwing white band broad; submarginal metallic spots blue, large, barely elongated, filled with even black spots that are fundamentally round or square. Female upperside with broad white median band, crossed by veins; forewing with usually prominent (variable) subcostal blue metallic markings; underside metallic bands extensive, tinged green; forewing white median patch less angular than male; hindwing submarginal metallic spots longer than male, enclosing large, lozenge-shaped black spots.

Distribution: Ambon.

Notes: CRAMER (1775: pl. 70, figs. E, F) illustrated a female upperside and underside of *Papilio danis*, both of which are fairly accurate representations of the *danis* populations from Ambon. The pattern plates for CRAMER’s work are in the archives of the Natural History Museum (BMNH), London, and are reproduced here (Figs. 1–2). CRAMER (1775: 111) referred also to figures published by SEBA (1765: [plate] 25, figs. 5, 6, 12, 13; [plate] 37, figs. 5, 6), effectively including the specimens from which the illustrations were produced, as syntypes of *Papilio danis*. Unlike CRAMER’s own illustrations, those of SEBA (Figs. 3–8) were in comparison crudely drawn, although the most important features of the insect (i.e. the shape and extent of upperside white markings, and the prominent lunules on the hindwing underside) can be seen to represent the same species.

Almost half a century later, BOISDUVAL (1832: 67) described, but did not illustrate, *Damis sebae* from the Moluccas and New Guinea.

HEMMING (1964: 105) selected CRAMER's illustration of *Papilio danis* (CRAMER, 1775: pl. 70, figs. E, F) (Figs. 1, 2) as LT for the nominal species *danis*, and went on to say: "The nominal species *Papilio danis* CRAMER, [1775], was cited by BOISDUVAL in the synonymy of the nominal species *Damis sebae* when that nominal species was established in 1832. Accordingly, the specimen selected ... to represent the lectotype of the nominal species *Papilio danis* CRAMER is one of the syntypes of the nominal species *Damis sebae* BOISDUVAL. That specimen is here selected to represent the lectotype of *Damis sebae* Boisduval." HEMMING (1964: 105) further observed that "as a result of the foregoing lectotype selection, the name *Damis sebae* BOISDUVAL, [1832], becomes a junior objective synonym of *Papilio danis* CRAMER, instead of, as previously, a junior subjective synonym of that name". This action – designation of LT for the nominal species *danis* and *sebae* – was discussed more fully by HEMMING (1967: 140–141).

BOISDUVAL's formal entry for *sebae* (there was brief mention on p. 67, where BOISDUVAL said of *Damis epicoritus* BOISDUVAL [*Nacaduba cyanea epicoritus* BOISDUVAL, 1832]: "It is the size of *Damis sebae*") was on page 68 (BRIDGES 1988: 314, correctly gave p. 68) with a short Latin description. A description in French followed on p. 69. BOISDUVAL referred (1832: 69) to both GODART (GODART & LATREILLE, 1819–[1824]: 578), and to CRAMER's plate of *Papilio danis*; BOISDUVAL's use of the name "*Damis*" may have been a misspelling of "*Danis*", since he used the former spelling four times over three pages, including his introduction of the genus, and his reference to CRAMER ("P. *Damis*. Cram., 70, E, F"). He made no mention of the name *Danis* FABRICIUS, 1807.

Interestingly, there is a ♂ specimen of *Danis danis* in the collections of the MNHN, clearly dating from D'URVILLE's "Astrolabe" voyage. The specimen is in poor condition, and bears printed labels (presumably added at a later date) claiming association with Dumont d'URVILLE's voyages of 1838–1840. It is reproduced here for historical interest (Figs. 10–12).

D. d. karpaia (DRUCE & BETHUNE-BAKER, 1893)

(Figs. 41–46.)

Thysonotis danis var. *karpaia*: DRUCE & BETHUNE-BAKER (1893: 540, pl. 45, figs. 3, 4). – TL: Indonesia, Maluku, Seram.

Lectotype by present designation: The ♂ with the following labels is herewith designated as lectotype: (1) typed "GODMAN-SALVIN Coll. 1908.–168."; (2) typed "Ceram Jilo C. RIBBE 1884"; (3) handwritten "T. *danis* var. *karpaia* H. H. DRUCE ♂ Type"; (4) handwritten "7./2 *Plebejus Danis*"; (5) typed circular red-bordered "Type"; (6) typed "lectotype *Thysonotis danis* var. *karpaia* DRUCE & BETHUNE-BAKER, 1893, designated John TENNENT 2015"; (7) typed circular purple-bordered "Lectotype". – Paralectotypes (1 ♂, 1 ♀ ST): a ♂ with the following labels (1) typed "GODMAN-SALVIN Coll. 1908.–168."; (2) typed "Ceram Ceram. BATES Coll."; (3) handwritten "T. *karpaia* ♂ H. H. DRUCE Type"; (4) typed circular red-bordered "Type"; (5) typed "paralectotype *Thysonotis danis* var. *karpaia* DRUCE & BETHUNE-BAKER, 1893, designated John TENNENT 2015"; (6) typed circular blue-bordered "Paralectotype". a ♀ with the following labels (1)

typed "GODMAN-SALVIN Coll. 1908.–168."; (2) typed "Ceram Jilo C. RIBBE 1884"; (3) handwritten "T. *danis* var. *karpaia* ♀ Type H. H. DRUCE"; (4) typed circular red-bordered "Type"; (5) typed "paralectotype *Thysonotis danis* var. *karpaia* DRUCE & BETHUNE-BAKER, 1893, designated John TENNENT 2015"; (6) typed circular blue-bordered "Paralectotype".

Diagnosis: This subspecies is only weakly separated from nominotypical *danis*, especially the male. Male resembles nominotypical *danis*; upperside hindwing blue more extensive than nominotypical *danis*, not noticeably "fingered"; underside similar to nominotypical *danis*, hindwing white band slightly broader. Female upperside band broad; forewing blue metallic markings almost always less extensive than nominotypical *danis*, often restricted to subcosta; underside similar to nominotypical *danis*, hindwing white band slightly broader.

Distribution: Seram and Gisser Islands. A series of 5 males labelled Gisser island in the collection of Akira YAGISHITA have a broad white hindwing area reminiscent of *D. d. tanimbarensis*.

DRUCE & BETHUNE-BAKER (1893) said of *karpaia*: "This form occurs only in Ceram and does not appear to vary. The types are in MSSRS. GODMAN and SALVIN's collection, and specimens are also contained in the British Museum." Of the BMNH series of *D. danis* from Seram, three specimens (2 ♂♂, 1 ♀) bear handwritten labels in Hamilton DRUCE's handwriting claiming type status. All are ex-GODMAN & SALVIN collection. It was not unusual in the late 19th century for more than one specimen to be labelled as "the" type and these are taken to be syntypes. The painting presented (DRUCE & BETHUNE-BAKER 1893: pl. 45, fig. 3) is not a faithful reproduction of either of the males with type labels.

Note: Individuals from Ambon and Seram may be difficult to separate; they are retained here as distinct taxa only provisionally. A case could easily be made for their synonymy.

D. d. kofiau ssp. n.

(Figs. 47–51.)

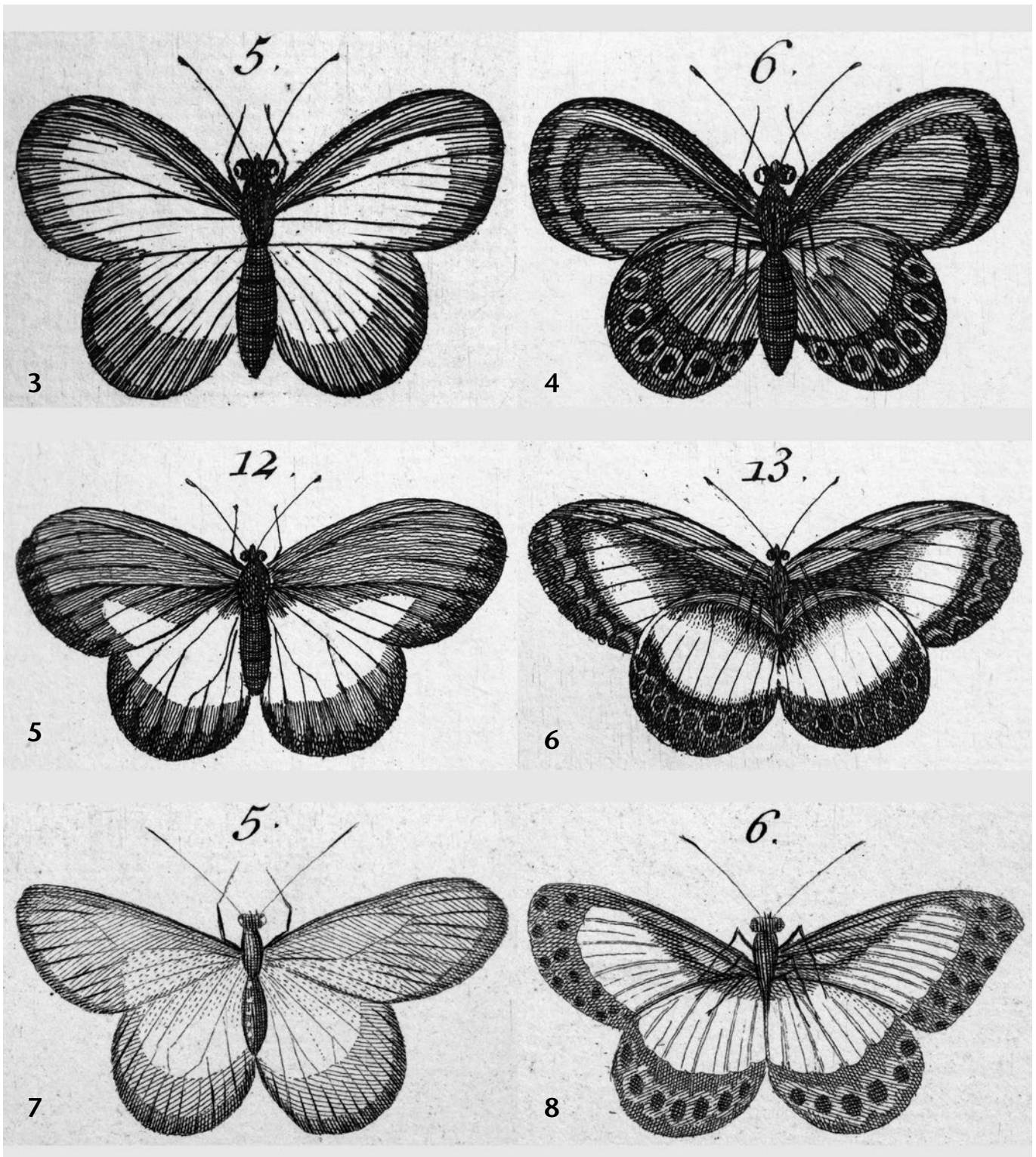
Holotype ♂: Indonesia, Kofiau, 8th September 1991 (BMNH).

Paratypes (5 ♂♂, 4 ♀♀): 1 ♀, same data as HT (BMNH). 5 ♂♂, 1 ♀, same data as HT. 1 ♀, same data as HT, 7. ix. 1991. 1 ♀, same data as HT, 16. ix. 1991 (all coll. RAWLINS).

Diagnosis: Differs from specimens from each of the adjacent islands, and from mainland New Guinea to the east. Male upperside pale greenish blue, with well-defined broad costal border and irregular marginal border; white median area large, clear white, barely broken by veins; underside white band also clear white, with distal border on hindwing band straight (often slightly curved in other subspecies). Female upperside median band white, clear (narrower, suffused at least to some degree with dark scales on geographically adjacent subspecies); underside like male, metallic marginal band enclosing lozenge-shaped black spots (spots invariably more elongated on mainland).

Distribution: Kofiau, an island group west of the Vogelkop and north of Misol.





Colour plate 1: Figs. 1–2, 9–12: Historic type material. — **Figs. 1–2:** *Papilio danis* CRAMER, from the pattern plates for plate 70 of CRAMER's *De Uitlandsche Kapellen*, figs. E, F. HEMMING selected the ups. (marked as fig. "E", not shown) as the LT for *Danis danis*. — (Figs. 3–8 in b&w on separate page, see b&w Plate A.) — Scale bars, where present, 1 cm; specimens in approximately natural size (lbl. not to the same size). — **Figs. 9–12:** label and a ♂ *Danis danis* specimen from the time of Dumont d'URVILLE, in the collection of the MNHN; 9: label; 10: reverse side of lower label; 11: ♂ ups.; 12: ♂ uns. — **Figs. 13–193:** *Danis danis*, more recent types and other specimens of the different subspecies. — **Figs. 13–19:** *D. d. philostratus*, Halmahera Isl.; 13–15: HT ♀, Dodinga, central Halmahera, 13: lbl., 14–15: ups., uns.; 16–17: ♂, ups., uns.; 18–19: ♀, ups., uns. — **Figs. 20–24:** *D. d. morotai* ssp. n., Morotai Isl.; 20–23: HT ♂, 20: lbl., 21–22: ups., uns.; 23–24: PT ♀, ups., uns. — **Figs. 25–29:** *D. d. gebe* ssp. n., Gebe Isl.; 25–27: HT ♂, 25: lbl., 26–27: ups., uns.; 28–29: PT ♀, ups., uns. — **Figs. 30–34:** *D. d. philocrates*, Obi Isl.; 30–32: LT ♂, 30: lbl.; 31–32: ups., uns.; 33–34: PLT ♀, 33A: lbl.; 33B: ups.; 34: uns. — **Figs. 35, 36:** *D. d. occidentalis*, ♂, Buru Isl. (coll. YAGISHITA, two different specimens), 35: ups., 36: uns. — **Figs. 37–40:** *D. d. danis*, Ambon Isl.; 37–38: ♂, ups., uns.; 39–40: ♀, ups., uns. (Fig. 40 on left side partially stained). — **Figs. 41–46:** *D. d. karpia*, Seram Isl.; 41–43: LT ♂, lbl., ups., uns.; 44–46: PLT ♀, lbl., ups., uns.

Figs. 3–8: The figures from SEBA's *Description exacte des principales curiositez naturelles du magnifique cabinet d'Albert SEBA*, on which (partim) CRAMER based his description of *Danis danis*, and BOISDUVAL (partim) his description of *Damis sebae*; **Figs. 3–6** from plate 25, figs. 5, 6, 12, 13; **Figs. 7–8** from plate 37, figs. 5, 6. — Enlarged.

***D. d. tanimbarensis* YAGISHITA, 2000**

(Figs. 52–55.)

Danis danis tanimbarensis: YAGISHITA (2000: 13, pl. 2, figs. 15–18). — TL: Tanimbar.

Diagnosis: A distinctive subspecies. The male has a broad hindwing band on the upper surface, and a very broad band on the underside, extending over more than half the hindwing, leaving a narrow dark band between the white band and submarginal margins; metallic submarginal hindwing markings restricted, enclosing round black spots. Female with broad, clear, median band; underside band less wide than male; metallic submarginal markings like male, restricted.

Distribution: Tanimbar and Babar, an island some 100 km west of Tanimbar.

***D. d. triopus* (DE NICÉVILLE, 1898)**

(Figs. 56–59.)

Thysonotis [*sic*] *triopus*: DE NICÉVILLE [*in* DE NICÉVILLE & KÜHN] (1898: 265). — TL: “Great and Little Ké Islands”.

Diagnosis: Male upperside forewing bright blue, with dark border slightly broader at tornus and dark scales in space 1b; white median patch unremarkable, prominently crossed by veins 2, 3; hindwing blue restricted to postmedian patch near apex; median band creamy-white; underside metallic markings blue-green, broad, prominent, absent from tornus; hindwing black spots in metallic band barely touching edge of metallic blocks, giving band prominent appearance. Female upperside dark; median band creamy-white, clear, often dusted with dark scales on forewing, usually with distinct metallic basal flush; underside metallic markings blue-green; hindwing submarginal markings long, extending over more than one-third of wing, containing elongated black lozenge-shaped spots; median band narrow, straight. Two females in the BMNH, labelled as being from “West Key Is.”, have the upperside band subdued, narrow, liberally sprinkled with dark scales, and a narrow median band on the underside hindwing. They are indistinguishable from females from Waigeo or the New Guinea mainland (*D. d. apollonius*).

Distribution: Kei (Ké or Key) Islands.

***D. d. supous* (DRUCE & BETHUNE-BAKER, 1893)**

(Figs. 60–63.)

Lycaena danis, CR., var. *supous* [STAUD. ms.]: DRUCE & BETHUNE-BAKER (1893: 542, pl. 45, fig. 7). — TL: Indonesia, Maluku, Wammo Dobbo, Aru.= *Plebejus danis* var. *supoi*: RIBBE (1889: 250). — TL: Aru (nomen nudum).

Diagnosis: A weakly differentiated subspecies. The differences between *triopes* and *supous* are minor, and superficially both sexes appear very much the same. However, the metallic basal and abdominal scales present on most female *triopes* are generally lacking in *supous*, which also has the white forewing band broken more obviously by a scattering of dark scales. The males of the two subspecies appear inseparable, and there are individual females

from either Kei or Aru that could be confused with the general phenotype occurring on the other islands.

Distribution: Aru Islands.

***D. d. apollonius* (FELDER & FELDER, 1865)**

(Figs. 64–102.)

Lycaena apollonius: FELDER & FELDER (1865: 265, pl. 33, fig. 3). — TL: New Guinea.= *Thysonotis apollinius* ab. *plumbeus*: ROTHSCILD (1915: 140). — TL: Misol.= *Thysonotis danis anaximenes*: FRUHSTORFER (1915: 51). — TL: Kumusi, British New Guinea.= *Thysonotis danis panaetius*: FRUHSTORFER (1915: 50). — TL: Salawatti.= *Thysonotis danis herophilus*: FRUHSTORFER (1915: 50). — TL: Waigeo.= *Thysonotis danis sophron*: FRUHSTORFER (1915: 50), *syn. n.* — TL: “Buru” [locality erroneous: see notes, below].= *Danis danis lona*: RÖBER (1927: 105). — TL: Waigeo.= *Thysonotis danis proedrus*: FRUHSTORFER (1915: 51). — TL: Owgarra, British New Guinea.= *Danis danis thinophilus*: TOXOPEUS (1930: 129). — TL: Misol.

Diagnosis: A very variable subspecies (see Figs.). Wing fringes rarely chequered. Male upperside varies in the shade of blue; dark margins quite broad, often narrower on the costa; white median markings well developed; hindwing median band rarely broad; underside median white band creamy white, clear; metallic markings variable, from bright blue to blue-green, with all intermediates. Female upperside median band variable in width, usually dusted with dark scales; underside hindwing band narrow; metallic markings extensive, prominent; hindwing marginal band extends in extreme cases over almost half the wing, enclosing large, lozenge-shaped black spots.

Distribution: Waigeo, Salawatti, Gorong (see note below), some of the islands of Teluk Cenderawasih (= Geelvink Bay) and throughout mainland New Guinea to Milne Bay.

Notes: DRUCE & BETHUNE-BAKER (1893) experienced difficulty in allocating the variety of phenotypes in New Guinea and islands to the west. They gave (DRUCE & BETHUNE-BAKER 1893: 541) the distribution of “*Thysonotis apollinius*” as “Hab. Central New Guinea (D’ALBERTIS); Islands in N. Geelvink Bay (KIRSCH); Port Moresby (GOLDIE) (Mus. G. & S.); New Guinea (Mus. STAUD.); Waigiou, Soron (OBERTHÜR); Jobi (KIRSCH); Mysol (WALLACE); Waigiou (PLATEN); Aru (WALLACE)” and went on to note “Female specimens from Mysol and one in Dr. STAUDINGER’s collection from Waigiou agree best with Dr. FELDER’s figure, but a female in Mssrs. GODMAN and SALVIN’s possession has a rather less extensive blue band on hind wing beneath. These gentlemen also possess a female from Aru Islands, which does not differ from the New Guinea female except in its smaller size ... this is a somewhat puzzling species on account of the exceptional difference in the widths of the blue bands on underside of hind wings of the two sexes and also the varying width

of this band in the female, no two specimens, even from the same locality, being identical ...”.

This subspecies has a wide distribution. It occurs with some variation throughout the mainland and on some of the larger islands close to the mainland from where subspecies were described a century and more ago, at a time when only limited material was available. In some cases (e.g. *herophilus*, described from Waigeo), such opinions were understandable, and examination of type specimens quite different in appearance provides the explanation. But material is more widely available now, and it is virtually impossible to convincingly separate material from, for example, Waigeo and Salwatti, from mainland populations. The islands of Teluk Cenderawasih (Geelvink Bay) are almost as problematic, although populations from Biak and Mefor do appear distinct (see *D. d. hermes*, below). As a general rule, islands some distance from a large area of land – be it another island or the New Guinea mainland – are more likely to support distinct phenotypes than those that are not. But as with most things in life, there are exceptions. For example, one might expect *D. danis* on the small islands of Gorong (= Goram) to be the same or similar phenotype to that on Seram, a relatively short distance (with a series of islands that could act as “stepping stones”) to the northwest; in fact Gorong females lack the upperside metallic markings of *D. d. karpaiia* and have some similarities with *D. d. triopes* from the Kei Islands to the southeast. However, they are perhaps closest to individuals from Waigeo, and the appearance of both sexes falls within the range of *D. d. apollonius sensu lato*.

The name *plumbeus*

The name *plumbeus* was raised by ROTHSCILD (1915a) to describe a male specimen with the blue upperside and metallic green underside markings replaced by “leaden lavender” and “leaden grey” respectively. The author has seen several specimens from different localities that display this feature patchily and asymmetrically, suggesting differences in colour are due to staining.

The name *proëdrus*

(Figs. 67–69.)

The name *proëdrus* [sic], raised by FRUHSTORFER (1915), was based on an undisclosed number of both sexes from Owgarra, British New Guinea (Papua New Guinea, a locality on the Aroa River). The only specimen in the BMNH from this locality carries the black-bordered label in FRUHSTORFER’s handwriting, with the name *proëdrus* (it also lacks its abdomen and carries a handwritten label declaring that the specimen was “dissected for FRUHSTORFER”) (Fig. 67). It is labelled as the holotype of *proëdrus* and is typical of *apollonius*.

The name *anaximenes* and lectotype designation

(Figs. 70–74.)

The name *anaximenes*, also raised by FRUHSTORFER in 1915, was based on an undisclosed number of both sexes from the Kumusi (or Kamusi) River, British New Guinea

(Papua New Guinea, Oro Province, on the north coast of New Guinea almost opposite Port Moresby). There are 6 ♂♂ and 7 ♀♀ from the Kumusi River in the BMNH, all collected by A. S. MEEK in 1907, but which have reached the Museum from various sources (i.e. from collections other than FRUHSTORFER’s). All these specimens clearly fall within the variation of *apollonius*. One male bears the typical black bordered label “*danis anaximenes* FRHST.”, but not the small red “type” label commonly used by FRUHSTORFER. It also has the standard red-bordered “Type HT” label, which has been added (probably by TITE) since accessioned by the BMNH. A female has a BMNH “Type AT” label, without any indication of what it was considered to be an allotype of. None of the remaining ex-FRUHSTORFER specimens bear labels claiming type status.

Lectotype designation: The ♂ mentioned above, with the following labels, is hereby selected as the lectotype for *anaximenes*: (1) printed label “Neu-Guinea ex coll. FRUHSTORFER”, with handwritten “Kumusi” added; (2) printed label “FRUHSTORFER Coll. B.M.1933–131”; (3) black bordered handwritten label “*danis anaximenes* Frhst.”; (4) circular red-bordered typed label “Type HT”; (5) typed label “lectotype *Thysonotis danis anaximenes* FRUHSTORFER, 1915, designated by John TENNENT, 2015”; (6) circular purple-bordered typed label “lectotype”. – Paralectotypes: The female mentioned above, with the following labels, hereby becomes a paralectotype: (1) printed label “Neu-Guinea ex coll. FRUHSTORFER”, with handwritten “Kumusi” added; (2) printed label “FRUHSTORFER Coll. B.M.1933–131”; (3) circular red-bordered typed label “Type AT”; (4) typed label “paralectotype *Thysonotis danis anaximenes* FRUHSTORFER, 1915, designated by John TENNENT, 2015”; (5) circular blue-bordered typed label “paralectotype”. Also a further ♂, with the following labels, becomes a paralectotype: (1) printed label “Neu-Guinea ex coll. FRUHSTORFER”, with handwritten “Kumusi” added; (2) handwritten “*anaximenes* FRUHST.”; (3) printed label “FRUHSTORFER Coll. B.M.1933–131”; (4) typed label “paralectotype *Thysonotis danis anaximenes* FRUHSTORFER, 1915, designated by John TENNENT, 2015”; (5) circular blue-bordered typed label “paralectotype”.

The name *herophilus* and lectotype designation

(Figs. 76–81.)

The name *herophilus*, raised by FRUHSTORFER (1915), was based on 10 ♂♂ and 1 ♀ in the FRUHSTORFER collection. There are a corresponding number of each sex in the BMNH; 1 ♂ bears a label stating “No orig. type-label. Selected as type (G. T., April, 1941)”; a female bears a similar label, and the remaining males all bear standard yellow PT labels. However, TITE’s actions appear not to have been published, and there is indication on only one of the specimens in addition to the “type”, of what they might be types of. Their collective status is probably best regarded as syntypic.

Lectotype designation: The ♂ specimen chosen by TITE, with the following labels, is hereby designated the lectotype for *herophilus*: (1) printed label “Waigiu H. FRUHSTORFER”; (2) printed label “FRUHSTORFER Coll. B.M.1933–131”; (3) black bordered handwritten label “*danis herophilus* FRHST.”; (4) handwritten label “No orig. type-label. Selected as type (G.T., April, 1941)”; (5) circular red bordered typed label “Type HT”; (6) typed label “lectotype *Thysonotis danis herophilus* FRUHSTORFER, 1915, designated by John TENNENT,



Colour plate 2: Figs. 47–51: *D. d. kofia* ssp. n., Kofiau Isl.; 47–49: HT ♂, lbl., ups., uns.; 50–51: PT ♀, ups., uns. — Figs. 52–55: *D. d. tanimbarensis*, Tanimbar Isl.; 52–53: ♂, ups., uns.; 54–55: ♀, ups., uns. — Figs. 56–59: *D. d. triopus*, Ké Besar [Great Kei] Isl.; 56–57: ♂, ups., uns.; 58–59: ♀, ups., uns. — Figs. 60–63: *D. d. supous*, Aru Isl.; 60–61: ♂, ups., uns.; 62–63: ♀, ups., uns. — Figs. 64–102: *D. d. apollonius*, different localities; 64–66: HT *apollonius*, ♀ (New Guinea), lbl., ups., uns.; 67–69: HT *proedrus*, ♂ (Owgarra, New Guinea), lbl., ups., uns.; 70–72: LT *anaximenes*, ♂ (Kumusi, New Guinea), lbl., ups., uns.; 73–75: PLT *anaximenes*, ♀ (Kumusi, New Guinea), lbl., ups., uns.; 76–78: LT *herophilus*, ♂ (Waigeo Isl., Papua), lbl., ups., uns.; 79–81: PLT *herophilus*, ♀ (Waigeo Isl., Papua), lbl., ups., uns.

Colour plate 3: Figs. 82–102: *D. d. apollonius*, different localities; 82–83: HT *panatius*, ♂ (Salawatti Isl., Papua), ups., uns. (RMNH); 84–86: HT *sophron*, ♀ ("Miro"), lbl., ups., uns.; 87–102: *apollonius*, different localities: 87–90: Waigeo Isl., 87–88 ♂, ups., uns., 89–90 ♀, ups., uns.; 91–94: Misol Isl., 91–92 ♂, ups., uns., 93–94 ♀, ups., uns.; 95–98: Stephansort, Astrolabe Bay, 95–96 ♂, ups., uns., 97–98 ♀, ups., uns.; 99–102: Milne Bay, 99–100 ♂, ups., uns., 101–102 ♀, ups., uns. — Figs. 103–110: *D. d. hermes*, Biak Isl.; 103–105: HT ♂, lbl., ups., uns.; 106–107: ♀, ups., uns.

2015”; (7) circular purple-bordered typed label “lectotype”. – Paralectotypes: The ♀ selected by TITE as the “allotype”, with the following labels, automatically becomes a paralectotype of *herophilus*: (1) printed label “Waigiu H. FRUHSTORFER”; (2) printed label “FRUHSTORFER Coll. B.M.1933–131”; (3) handwritten label “No orig. type-label. Selected as allotype (G.T., April, 1941); (4) circular red bordered typed label “Type AT”; (5) typed label “paralectotype *Thysonotis danis herophilus* FRUHSTORFER, 1915, designated by John TENNENT, 2015”; (6) circular blue-bordered typed label “paralectotype”. 9 further ♂ specimens, all with the following labels, are also identified as paralectotypes of *herophilus*: (1) printed label “Waigiu H. FRUHSTORFER”; (2) printed label “FRUHSTORFER Coll. B.M.1933–131”; (3) circular yellow bordered typed label “Paratype”; (4) typed label “paralectotype *Thysonotis danis herophilus* FRUHSTORFER, 1915, designated by John TENNENT, 2015”; (5) circular purple bordered typed label “lectotype”.

The name *panätius* [sic, = *panaetius*, transcription]

(Figs. 82–83.)

The name *panätius*, raised by FRUHSTORFER (1915), was based on a ♀ from Salawatti in the Naturalis Biodiversity Centre, Leiden.

The name *sophron*

(Figs. 84–86.)

The name *sophron* FRUHSTORFER was raised on the basis of an undisclosed number of ♀ specimens, probably in his collection, although their whereabouts were not declared. It poses an interesting question. His original description (FRUHSTORFER 1915: 50) is unequivocal: “*Th. danis sophron* subsp. nova. Buru”; he then went on to describe only the female.

Difficulties with a female specimen in the BMNH labelled as the HT of *sophron* are threefold:

1. The printed part of the geographical data label (Fig. 84) is headed “Neu-Guinea” – and Buru is in the Moluccas.
2. The label also states that the specimen is ex-FRUHSTORFER collection; it includes the hand-written data “Miro”, which FRUHSTORFER is known to have believed was associated with Buru. As RAWLINS (2004) and TENNENT & RAWLINS (2008: 77–78) pointed out in relation to FRUHSTORFER’s TL of “Buru, Miro ...” for *Pareronia argolis argolina* FRUHSTORFER, 1903 (Pieridae) and *Cethosia cydippe iphigenia* FRUHSTORFER, 1902 (Nymphalidae), “Miro” is not a settlement on Buru, but an alternative name for Mira, a settlement on the North Moluccan island of Morotai.
3. The under surface of the female “HT” is dissimilar to that of the few males known to be from Buru (cf. Figs. 36, 86).

Two additional females in the BMNH labelled as being from Mount Mada on Buru claim no status, but are also indistinguishable from females from Morotai (see *D. d. morotai* ssp. n., above). This locality (Mount Mada) has also been found previously to be misrepresented in the literature, and it is highly probable that none of these three females are in fact from Buru. The author has not seen a ♀ reliably labelled as being from that island.

A drawer label in the BMNH collection refers to “Allotype *sophron* FRUH. 5.37”, referring to the BMNH type collection. This is believed to be the result of a misunderstanding. Conventionally, if both sexes are available, it is usually a male that is designated as a holotype; the associated female then becomes the “allotype” (i.e. a paratype of the alternate sex). But in this case, where FRUHSTORFER described only the female, that sex must by definition represent the holotype, and since males appear not to have been known to FRUHSTORFER, there cannot be an “allotype” at all. It was thought that perhaps further specimens of *sophron* (and other *Danis danis* taxa) may be present in MNHN, where parts of the ex-FRUHSTORFER collection reside. However, none was found there on a recent visit by the author. On balance it seems likely that the specimen labelled as the holotype was labelled post-accession at the BMNH, probably by TITE, who added labels to a number of *Danis* species from the FRUHSTORFER collection. In other cases (*anaximenes*, *herophilus*, *philocrates*) LTs have been designated in this paper in order to avoid further confusion and to formally allow inclusion of unlabelled material with a type series; in the case of *sophron*, it may be that FRUHSTORFER only had a solitary female, but whatever the truth of the matter, only one specimen has been found, and there is no reason to doubt the HT status of the specimen already so labelled in the BMNH.

Examination of a series of specimens from Morotai, and of photographs of Morotai specimens supplied by Akira YAGISHITA with modern data that is not in question, suggests that source of the *sophron* HT is neither Buru nor Morotai, but almost certainly the main island of New Guinea, as the printed part of its label declares. The name *sophron* is placed with some confidence as a synonym of *D. d. apollonius*, and the two females in the BMNH bearing erroneous Buru data (M[oun]t Mada, Buru, 3,000 [feet], Sept[ember] [18]98 (DUMAS)) are placed equally confidently with Morotai populations, although they are not given any type status (see *D. d. morotai* ssp. n., above). See also Discussion, concerning identification of type material in the 1940s.

The name *thinophilus*

The name *thinophilus* was raised by TOXOPEUS in the form “*D. d. (ap[ollonius]) thinophilus* nom. n. pro *apollonius* FRUHST. nec FELDER. Misool” (i.e. a new name for *apollonius* in the sense of FRUHSTORFER, not FELDER). *D. danis* from Misol falls within the phenotypic range of *D. d. apollonius*.

D. d. hermes (GROSE SMITH, 1894)

(Figs. 103–110.)

Thysonotis hermes: GROSE SMITH (1894: 575). – TL: Korrido, Biak.

= *Thysonotis danis phoibides*: FRUHSTORFER (1915: 51). – TL: Mefor island.

Diagnosis: Male upperside blue dull, distinctly tinged with green; forewing costal dark margin broad; underside median band moderately broad; marginal metallic band almost

overwhelmed by large black spots. Female upperside white bands quite broad, suffused with brown scales; underside hindwing marginal metallic bands like male, enclosing very large black spots. See also notes, below.

Distribution: Schouten Islands (Biak and Mefor).

Notes: The type male specimen of *hermes* is distinctive, as are other specimens in a series in the BMNH from Biak and Mefor. The upperside blue colour of the male is distinctly tinged with green, and the forewing costal dark margin is broad; the underside hindwing marginal metallic band is almost overwhelmed by enlarged black spots. It is noted that, for example, females from Yapen Island have noticeably clear and relatively broad white bands on the upper surface and with broader underside hindwing bands than females on any of the other Geelvink Bay islands. But in general, aside from the distinctive phenotype from Biak and Mefor, *D. danis* from remaining islands of Teluk Cenderawasih (Geelvink Bay) cannot be separated from those of the New Guinea mainland (*apollonius*).

The name *phoibides*

The name *phoibides*, raised by FRUHSTORFER (1915), was based on 2 ♂♂ from Mefor in the BMNH and 1 ♂ from Biak in the Naturalis Biodiversity Centre, Leiden. FRUHSTORFER supposed the ♀ would be that mentioned by GROSE SMITH (1894: 575), from Korrido (Biak). This refers to the ♀ allotype of *hermes* GROSE SMITH 1894. The male labelled as the type specimen of *phoibides* is unlikely to be from Mefor; it resembles *D. d. apollinuis* and bears the same typed “New Guinea” label (see comments under *sophron*, following *D. d. apollonius*), with “Mefor” added in ink. Examination of a series of *D. danis* from Mefor in the BMNH suggests association with *D. d. hermes*.

The male specimen in the BMNH labelled as the type of *phoibides* is blue, without a greenish tinge, with the blue reaching the forewing costa. Judging from the remainder of the Mefor series in the BMNH, this specimen is clearly not from Mefor; the data label is the same style as the disputed label on what is said to be the holotype of *sophron* (i.e. printed “Neu-Guinea” and “ex coll. FRUHSTORFER”, with space for a handwritten locality between). In the case of *phoibides*, the name “Mefor” is written in the same hand that wrote “Mira” on the “*sophron*” type specimen. It can be said with a high degree of certainty that the specimen did not originate on the island of Mefor, and – since it is typical of *apollonius* – that it probably came from the New Guinea mainland. Of course, if the holotype of *phoibides* came from within the geographical range of *apollonius*, the former is properly a synonym of the latter, but there is an element of doubt regarding whether the specimen labelled as the type of *phoibides* is actually FRUHSTORFER’s type. The possibility that a ‘Type’ label was placed on this particular specimen in the 1940s, simply because it is the only specimen in the series with any obvious FRUHSTORFER connection – the others are all ex-JOICEY or ex-ROTHSCHILD – or that there was a mix-up with labelling at some stage, is not

discarded (see Discussion). However, since the type locality of FRUHSTORFER’s *phoibides* was clearly stated as being Mefor, and the usual Mefor phenotype seems to be *hermes*, the name *phoibides* is placed in synonymy with *hermes*.

D. d. dispar (GROSE SMITH & KIRBY, 1895)

(Figs. 111–117.)

Thysonotis dispar: GROSE SMITH & KIRBY (1895: [*Thysonotis*. I] 23, pl. *Thysonotis* I, figs. 1–4). — TL: New Britain.

Diagnosis: Male upperside deep blue; forewing marginal border narrow; white median patch barely discernible, heavily suffused with blue; hindwing median white band broad, clear; underside forewing blue metallic markings prominent on costa; white median stripe narrow, broken by veins; hindwing white band broad; submarginal metallic markings almost square, filled by round black spots. Female upperside white median band narrow, heavily suffused with dark scales on basal edge, leaving band partly obscured and uneven; underside similar to male, white band narrower; hindwing submarginal metallic markings more elongated.

Distribution: Bismarck Archipelago: New Britain and New Ireland.

Note: The holotype of *dispar* is in the BMNH.

D. d. zainis (FRUHSTORFER, 1915), **stat. rev.**

(Figs. 118–128.)

Thysonotis wallacei zainis: FRUHSTORFER (1915: 49). — TL: Neu-Hannover [New Hanover].

= *Danis danis dispar* [partim]: PARSONS (1998: 430).

Diagnosis: Similar to *D. d. dispar*, above. Male upperside forewing marginal border broader, less well defined; forewing white median patch absent or vestigial (with underside band showing through faintly); underside forewing costal metallic blue more extensive, extending to enclose prominent discoidal streak; hindwing also with more extensive metallic markings basally. Female similar to *D. d. dispar*.

Distribution: New Hanover, in the Bismarck Archipelago, and Emirau (= Squally) island in the St. Matthias group.

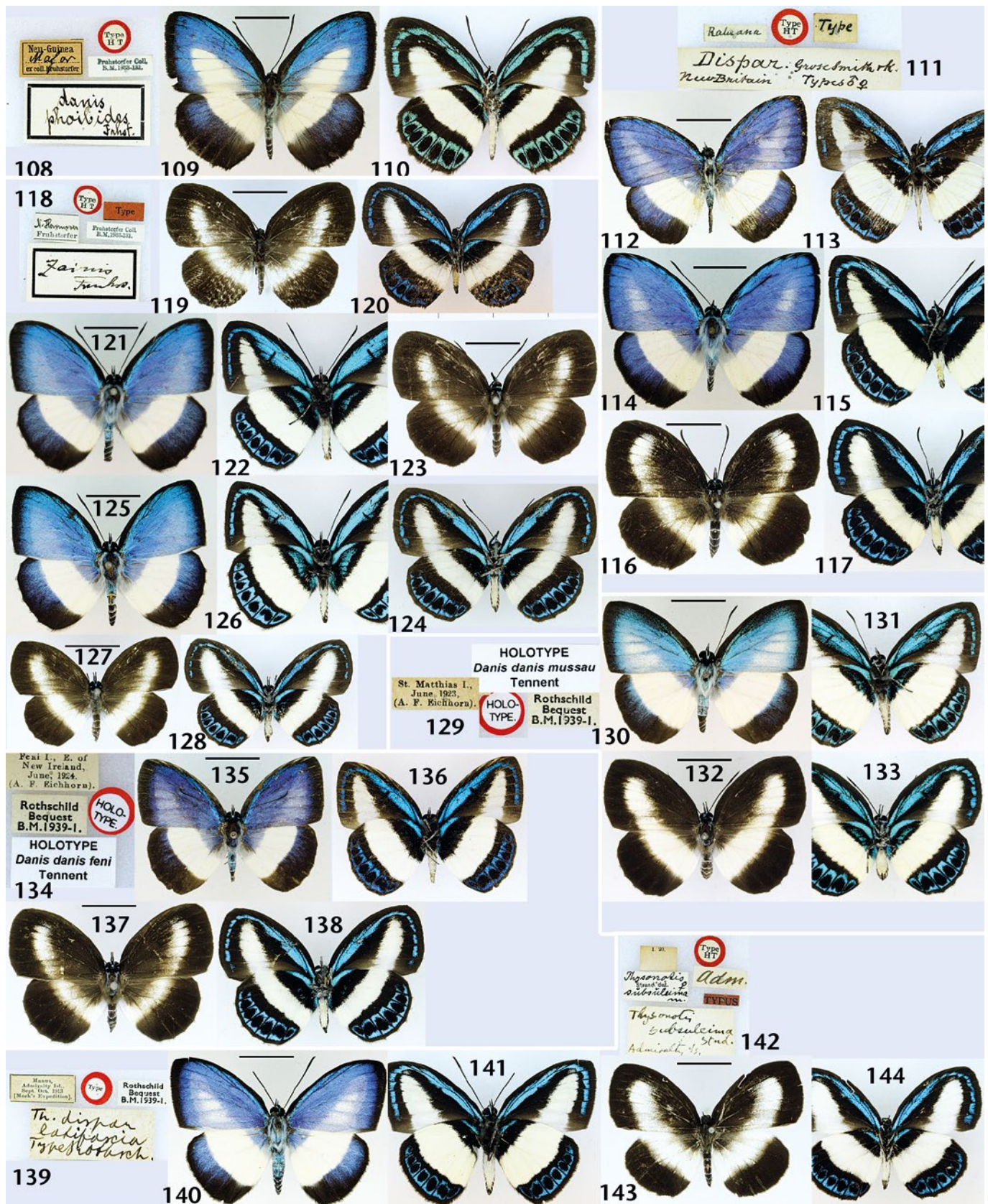
Note: PARSONS (1998: 430) synonymised *zainis* with *dispar*, without explanation. Whilst it is true that the female type of *zainis* (Figs. 119–120) probably falls within the variation of *dispar*, the only other males of *D. danis* from New Hanover in the BMNH are separable from those of the remainder of the Bismarck Archipelago in having much more metallic blue on the underside forewing costa. The subpopulation from Emirau also fits this description. The holotype of *zainis* is in the BMNH.

D. d. mussau **ssp. n.**

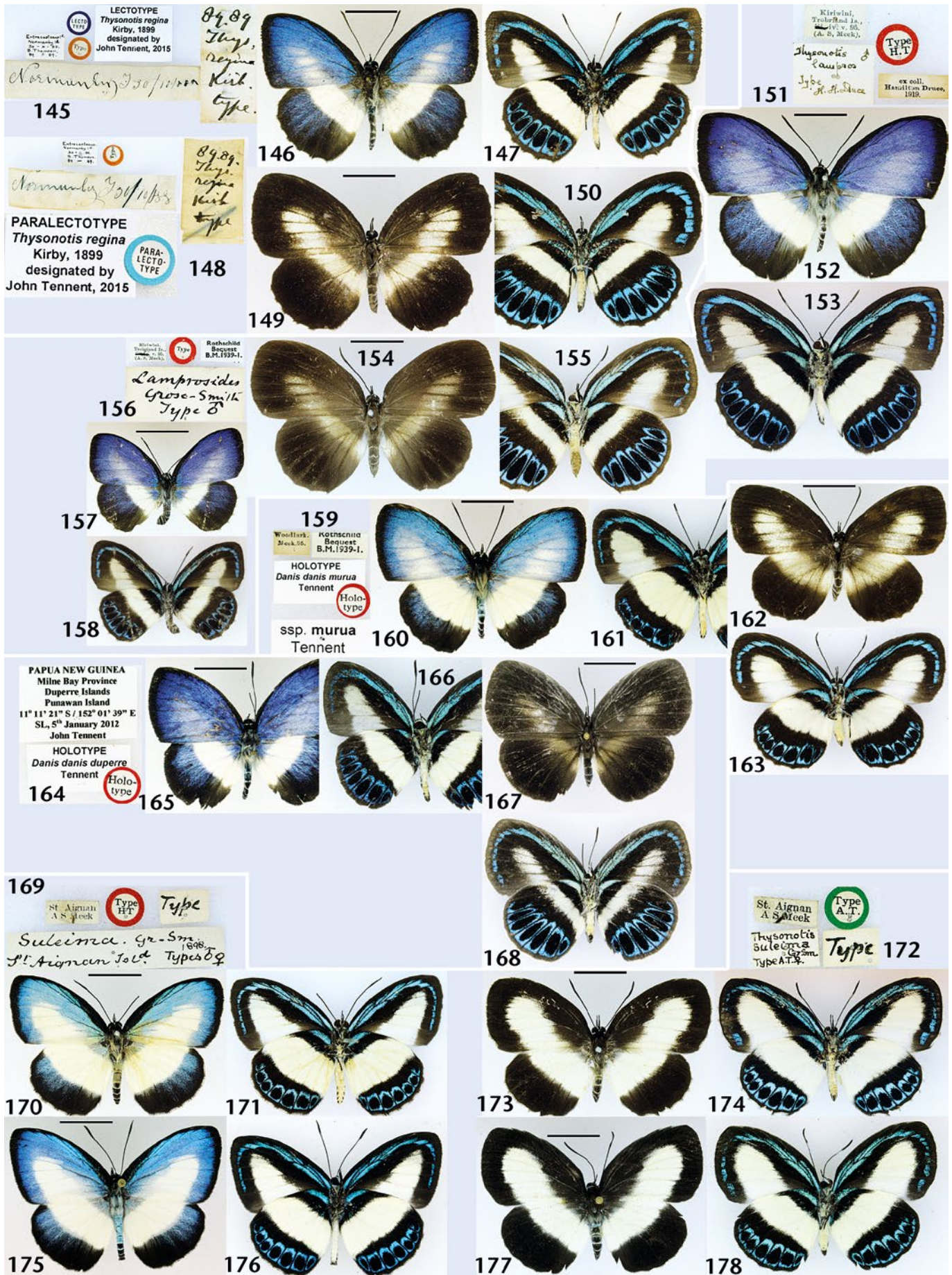
(Figs. 129–133.)

Holotype ♂: Papua New Guinea, New Ireland Province, St. Matthias island, June 1923, A. F. EICHORN, ROTHSCILD bequest B. M. 1939–1 (BMNH).

Paratypes (16 ♂♂, 10 ♀♀): 3 ♂♂, 5 ♀♀, same data as HT. 1 ♂, same data, but Brit. Mus. 1929–536. 2 ♂♂, 1 ♀, same data as HT, but JOICEY Bequest, Brit. Mus. 1934–120 (BMNH). 4 ♂♂, 2 ♀♀, Papua New Guinea, Nae Village area, Mussau Island,



Colour plate 4: Figs. 108–110: *D. d. hermes*, Biak Isl.; HT *phoebides*, ♂ ("Mefor", but almost certainly not from that island: see text), lbl., ups., uns. — Figs. 111–117: *D. d. dispar*, New Britain Isl.; 111–113: HT ♂, lbl., ups., uns.; 114–117: Talasea (New Britain), 114–115 ♂ ups., uns.; 116–117 ♀, ups., uns. — Figs. 118–128: *D. d. zainis*: 118–124: New Hanover Isl.; 118–120: HT ♀, lbl., ups., uns.; 121–122: ♂, ups., uns.; 123–124: ♀, ups., uns.; 125–128: Emirau Isl.; 125–126, ♂, ups., uns.; 127–128, ♀, ups., uns. — Figs. 129–133: *D. d. mussau* ssp. n., Mussau Isl.; 129–131: HT ♂, lbl., ups., uns.; 132–133: PT ♀, ups., uns. — Figs. 134–138: *D. d. feni* ssp. n., Feni Isl.; 134–136: HT ♂, lbl., ups., uns.; 137–138: PT ♀, ups., uns. — Figs. 139–144: *D. d. latifasciata*, Admiralty Isl.; 139–141: HT *latifasciata* ♂ (Manus), lbl., ups., uns.; 142–144: HT *subsuleima* ♀, lbl., ups., uns.



Colour plate 5: Figs. 145–150: *D. d. regina*, Normanby, D'Entrecasteaux Isl.; 145–147: LT ♂, lbl., ups., uns.; 148–150: PLT ♀, lbl., ups., uns. — Figs. 151–158: *D. d. lampros*, Kiriwina, Trobriand Isl.; 151–153: HT *lampros* ♂, lbl., ups., uns.; 154–155: ♀, ups., uns.; 156–158: HT *lamproside* ♂, lbl., ups., uns. — Figs. 159–163: *D. d. murua* ssp. n., Woodlark Isl.; 159–161: HT ♂, lbl., ups., uns.; 162–163: PT ♀, ups., uns. — Figs. 164–168: *D. d. duperre* ssp. n., Punawan Island, Duperre Isl.; 164–166: HT ♂, lbl., ups., uns.; 167–168: PT ♀, ups., uns. — Figs. 169–178: *D. d. suleima*; 169–174 Misima Isl.; 169–171: HT ♂, lbl., ups., uns.; 172–174: PT ♀, lbl., ups., uns.; 175–178: Sudest Isl.; 175–176: ♂ ups., uns.; 177–178: ♀ ups., uns.

1°30' S, 149°44' E, 0–70 m, 16.–22. x. 2014, Chris J. MÜLLER (Australian Museum, Sydney). 3 ♂♂, 1 ♀, same data (coll. Chris J. MÜLLER, Sydney). 2 ♂♂, Papua New Guinea, Lolieng Village area, Mussau Island, 1°26' S, 149°33' E, 0–300 m, 23.–28. x. 2014, Chris J. MÜLLER (Australian Museum, Sydney). 1 ♂, 1 ♀, same data (coll. Chris J. MÜLLER, Sydney).

Diagnosis: Similar to *D. d. zainis*, above. Male upperside pale silvery-blue (darker blue in *D. d. zainis*); forewing with broad marginal border, including the costa (costal margin narrow in *D. d. zainis*); forewing with rather obscure white median patch, broken by veins (white patch absent, or almost absent in *D. d. zainis*); underside forewing metallic markings extensive, like *D. d. zainis*; hindwing basal metallic margins extensive, slightly less so than *D. d. zainis*. Female similar to *D. d. zainis*, upperside white median band clearer, less obscured by dark scales.

Distribution: Mussau, previously known as St. Matthias, is the main island of the St. Matthias group.

D. d. feni ssp. n.

(Figs. 134–138.)

Holotype ♂: Papua New Guinea, Feni I[sland], E[ast] of New Ireland, June 1924 (A. F. EICHORN) (BMNH).

Paratypes (1 ♂, 6 ♀♀): 1 ♂, 3 ♀♀, same data as HT, v. 1924. 1 ♀, same data as HT, vi. 1924. 2 ♀♀, same data as HT, vii. 1924 (BMNH).

Diagnosis: Male upperside dark blue (brighter blue in *D. d. zainis*); forewing with broad marginal borders, less so on costa (marginal border less broad in *D. d. zainis* and *D. d. dispar*); median area like *D. d. zainis*, absent or vestigial; hindwing like *D. d. zainis*, but broad marginal border with only a tinge of blue, adjacent to terminal edge of white band (blue more extensive in all other *danis* subspecies, including *D. d. zainis* and *D. d. dispar*); underside metallic blue dull, clear (brighter, tinged green in *D. d. zainis*; brighter in *D. d. dispar*), less extensive than *D. d. zainis*. Female like *D. d. zainis*; upperside median white band heavily clouded with dark scales; forewing white band with dark scales on veins, especially veins 5, 6, extending from terminal edge, giving band a 'fingered' or 'splayed' appearance; underside like *D. d. zainis*.

Distribution: Feni Island.

D. d. latifascia (ROTHSCHILD, 1915)

(Figs. 139–144.)

Thysonotis latifascia: ROTHSCCHILD (1915b: 394). — TL: Manus, Admiralty Islands.

= *Thysonotis subsuleima*: STRAND (1916: 18, pl. 14, fig. 31). — TL: Admiralty Islands.

Diagnosis: Male very similar to *D. d. dispar* from New Britain; upperside forewing marginal border broader; median white patch slightly more extensive; hindwing median white band wider; underside white bands also broader. Female upperside white bands fairly broad, lightly dusted with dark scales (narrower, more heavily dusted in *D. d. dispar*); underside white bands also broader than *D. d. dispar*.

Distribution: The Admiralty Islands.

Note: Types of *latifascia* and *subsuleima* are in the BMNH. PARSONS (1998: 430) was of the opinion that some of the subspecies of *D. danis* probably warranted species status, singling out *latifascia* as an example. The reason for this is not understood; the Admiralties, although geographically remote, fall within the range of *D. danis*, and the *latifascia* phenotype is comparable with *danis* subspecies in the Bismarcks (it is only weakly differentiated from *D. d. dispar*), the St. Matthias group and elsewhere in the region. STRAND described *subsuleima* from a solitary ♀ from the Admiralties.

D. d. regina (KIRBY, 1889)

(Figs. 145–150.)

Thysonotis regina: KIRBY (1889: 163). — TL: "Normunby" [= Normanby].

Lectotype designation: KIRBY (1889) described *regina* from "six males and one female taken at Normunby (= Normanby) on Oct[ober] 30, 1888"; there are 3 ♂♂, 1 ♀ in the BMNH with this data; two specimens (a ♂ and a ♀) are labelled "type"; other specimens in this short series have no labels claiming any status. The ♂ specimen labelled by KIRBY as the type, with the following labels, is hereby designated lectotype of *Thysonotis regina*: (1) handwritten "Entrecasteaux I. Normanby Id. 30 - x - [18]88. B. THOMSON. 89 - 89"; (2) handwritten 89 89 *Thys. regina* KIRB. Type"; (3) circular red-bordered typed label "Type"; (4) typed "lectotype *Thysonotis regina* KIRBY, 1889, designated John TENNENT 2015"; (5) typed circular purple-bordered "Lectotype". — Paralectotypes (the further 2 ♂♂, 1 ♀ ST): The ♀ specimen labelled by KIRBY as the type, with the following labels, automatically becomes a paralectotype of *Thysonotis regina*: (1) handwritten "Entrecasteaux. Normanby Id. 30. x. [18]88. B. THOMSON. 89-89"; (2) handwritten "89 89 *Thys. regina* KIRB. type"; (3) circular red-bordered typed label "Type"; (4) typed "paralectotype *Thysonotis regina* KIRBY, 1889, designated John TENNENT 2015"; (5) typed circular blue-bordered "Paralectotype". Further: 1 ♂, with the following labels: (1) handwritten "Entrecasteaux. Normanby Id. 30. x. [18]88. B. THOMSON. 89-89"; (2) handwritten Normunby [sic] I 30/10/888 and (on reverse) 89 89 *Thys. Regina* KIRB. Type; (3) typed "paralectotype *Thysonotis regina* KIRBY, 1889, designated John TENNENT 2015"; (4) typed circular blue-bordered "Paralectotype". 1 ♂, with the following labels: (1) handwritten "Entrecasteaux. Normanby Id. 30. x. [18]88. B. THOMSON. 89-89"; (2) handwritten Normunby [sic] I 30/10/888; (3) handwritten "Gen 1963-497. G.E.T."; (4) typed "paralectotype *Thysonotis regina* KIRBY, 1889, designated John TENNENT 2015"; (5) typed circular blue-bordered "Paralectotype".

Diagnosis: Male upperside dark blue; upperside brown marginal border wider at tornus; white patch heavily overlaid by blue-lined veins; hindwing median white band narrow, leaving outer half of wing with dark border, lightly dusted with blue scales; underside hindwing median band narrow; submarginal blue metallic markings broad, filled by lozenge-shaped black spots. Female upperside with prominent white median band; veins lined with dark scales; underside blue metallic markings bright, well-developed, extensive; hindwing metallic markings extensive, black spots elongated.

Distribution: D'Entrecasteaux group: Goodenough, Normanby, Fergusson.

***D. d. lampros* (DRUCE, 1897)**

(Figs. 151–158.)

Thysonotis lampros: DRUCE (1897: 13). — TL: Trobriands.= *Thysonotis lamprosides*: GROSE SMITH (1898a: 105). — TL: Kiriwina, Trobriands.

Diagnosis: Male upperside blue, with broad marginal border; white median patch absent or showing faintly; hindwing median white stripe quite narrow, leaving terminal half of wing brown, liberally dusted with blue scales; underside blue metallic markings prominent; hindwing white band clear; postmarginal black spots large. Female upperside with narrow, subdued median band, heavily suffused with dark scales; underside white median band narrow; hindwing submarginal blue metallic markings extensive, enclosing large, elongated black spots.

Distribution: A wide distribution, from the Luzancay islands in the west, through the Trobriands, to the Marshall Bennetts.

Note: The HTs of both *lampros* and *lamprosides* are in the BMNH.

***D. d. murua* ssp. n.**

(Figs. 159–163.)

Danis danis “Ssp. Woodlark Island”: PARSONS (1998: 430).

Holotype ♂: Papua New Guinea, Milne Bay Province, Woodlark Island, IV. [18]97, A. S. MEEK, ROTHSCHILD bequest B.M. 1939–1 (BMNH).

Paratypes (9 ♂♂, 6 ♀♀): 1 ♀, same data as HT. 2 ♂♂, same data as HT, but III. [1897]. 2 ♂♂, 2 ♀♀, Woodlark, MEEK, [18]95, ROTHSCHILD bequest B.M. 1939–1. 1 ♀, Woodlark, [remainder of label indecipherable], ROTHSCHILD bequest B.M. 1939–1. 1 ♂, 1 ♀, Woodlark I[island], A. S. MEEK, 99–32 (all BMNH). 4 ♂♂, 1 ♀, Woodlark island, Kulumadau, 20 Jan[uary]–6 May, 1957, W. W. BRANDT (ANIC).

Diagnosis: Similar to other *D. danis* subspecies; male upperside silvery blue; forewing submarginal border broad, even; white median patch large, but subdued and largely overlaid with blue scales; underside forewing metallic markings prominent; hindwing white median band broad; submarginal metallic markings relatively small, square, almost overwhelmed by large black spots. Female upperside median band quite broad, heavily dusted with dark scales, especially along the veins; underside metallic blue markings bold; hindwing submarginal blue filled (may be almost obliterated) by large black spots.

Distribution: Restricted to Woodlark.

Note: As previously stated, all names introduced in this paper refer to geographical source; *Murua* is a native name for Woodlark.

***D. d. duperre* ssp. n.**

(Figs. 164–168.)

Holotype ♂: Papua New Guinea, Milne Bay Province, Duperre group, Punawan Island, SL, 5th January 2012, John TENNENT (BMNH).

Paratypes (2 ♂♂, 1 ♀): same data (all BMNH).

Diagnosis: very similar to *D. d. lampros*; wing fringes slightly chequered; male upperside dark, dull blue; fore-

wing marginal border broad, particularly at apex; white median band absent, but may be showing through from under surface; hindwing median white band narrow; underside similar to several other subspecies; forewing white band almost broken by dark scales along veins; hindwing band narrow; metallic markings well-developed; hindwing marginal metallic markings extensive (usually less so in *D. d. lampros*); filled by large black lozenge-shaped spots. Female virtually indistinguishable from *D. d. lampros* from the Trobriands and the Marshall Bennetts, quite unlike the subspecies on adjacent islands (cf. *D. d. suleima*, below); upperside median band almost completely obscured by dark scales; underside forewing median band narrow, veins lined with dark scales; hindwing median band very narrow; submarginal metallic markings extensive, largely filled by elongated lozenge-shaped black spots.

Distribution: eastern Louisiades; Duperre Islands (Punawan).

Note: This subspecies is admittedly weakly differentiated from *D. d. lampros*, which occurs ca. 250 km to the northwest, on the Marshall Bennetts. Quite different phenotypes occur nearby: *D. d. apollonius* 150 km to the west, and *D. d. suleima* on Misima, some 50 km to the north and the Calvados chain, approximately 20 km to the east.

***D. d. suleima* (GROSE SMITH, 1898)**

(Figs. 169–178.)

Thysonotis suleima: GROSE SMITH (1898b: 405). — TL: St. Aignan [= Misima] Island.

Diagnosis: Male upperside pale, silvery-blue; marginal borders broad; forewing white median patch large, clear; underside median band broad; metallic markings prominent, almost rectangular, enclosing round black spots. Female upperside with white scales on the edge of the forewing apex (cf. *D. d. zuleika*, below) white median band broad, edges diffuse; underside markings like male. See also note, below.

Distribution: eastern Louisiades: Misima, the Calvados Chain, and Sudest.

Note: Type specimens of *suleima* are in the BMNH. Males from Sudest and the Calvados Chain are often a different shade of blue in some lights, and females may, apparently very rarely, have metallic scales on the upperside costa. On the underside, both sexes have dark scales extending along the costa from the dark basal mark on the underside hindwing. This can be striking. However, this feature also occurs in some specimens from Misima, and is occasional on subspecies from localities further west. Sudest material is provisionally retained with *D. d. suleima*.

***D. d. zuleika* (GROSE SMITH, 1898)**

(Figs. 179–184.)

Thysonotis zuleika GROSE SMITH (1898b: 404). — TL: Rossel Island.



Colour plate 6: Figs. 179–184: *D. d. zuleika*, Rossel Isl.; 179–181: HT ♂, lbl., ups., uns.; 182–184: PT ♀, lbl., ups., uns. — Figs. 185–189: *D. d. syrius*, Queensland, Australia; 185–187: HT *reverdini*, ♂, lbl., ups., uns.; 188–189: ♀ ups., uns. — Figs. 190–193: *D. d. serapis*, Cedar Bay, Queensland, Australia; 190–191: ♂ ups., uns.; 192–193: ♀ ups., uns.

Diagnosis: Male upperside bright blue; forewing apex with a broad marginal border, becoming narrower towards the tornus; median white patch prominently crossed by blue-scaled veins; hindwing white median band broad; underside white bands broad, clear; hindwing submarginal metallic markings willed by round, back spots. Female upperside with broad white median band; forewing apex with prominent white apical scales, unlike any other subspecies (there is a suggestion of these white scales in *D. d. zuleika*, above); underside white band broad, clear; forewing apex with prominent white apical scales; metallic blue markings prominent; submarginal markings broad on both fore and hindwings.

Distribution: eastern Louisiades: restricted to Rossel Island.

Note: Type specimens of *zuleika* are in the BMNH.

D. d. syrius MISKIN, 1890

(Figs. 185–189.)

Danis syrius: MISKIN (1890: 34). — TL: North Queensland, Australia.

= *Thysonotis danis reverdini*: FRUHSTORFER (1915: 51). — TL: Cape York, Australia.

Diagnosis: Male upperside pale blue; forewing with broad marginal border; median white patch obscured by blue scales, especially on veins and the inner margin; hindwing blue scales extensive between white median band and wing margin; underside metallic blue-green markings prominent; white median band prominent, clear. Female upperside white median band lightly dusted with dark scales; remainder of wings plain dark brown (cf. *D. d. serapis*, below); underside blue-green markings bold, extensive.

Distribution: restricted to the northern parts of the Cape York Peninsula, Australia, from the Cape York/ Lockerbie area, and Iron Range (BRABY 2000).

Note: MISKIN (1891: 49) said the type(s) of *syrius* were in his collection; the holotype of *syrius* is now in the BMNH.

D. d. serapis MISKIN, 1891

(Figs. 190–193.)

Danis serapis: MISKIN (1891: 49). — TL: Cardwell, Cairns, Queensland, Australia.

Diagnosis: Male upperside like *D. d. syrius*, above; white forewing white patch larger, less obscured by blue scales; hindwing post discal blue scales less extensive; underside like *D. d. syrius*. Female upperside white median band clear; basal areas prominently and liberally dusted with green scales, especially on forewing; hindwing post discal area widely dusted with subdued green scales; underside like *D. d. syrius*; metallic markings often more green.

Distribution: coastal northeastern Queensland, from Cooktown to Townsville (BRABY 2000).

Note: MISKIN (1891: 49) said the type(s) of *serapis* were in his collection; they are now in the Queensland Museum, Brisbane, Australia.

Discussion

Five lectotypes (with a number of resulting paralectotypes) have been designated in this paper (*karpaia* DRUCE & BETHUNE-BAKER, 1893, *regina* KIRBY, 1889, *philocrates* FRUHSTORFER, 1915, *anaximenes* FRUHSTORFER, 1915, and *herophilus* FRUHSTORFER, 1915). This may seem rather excessive, particularly as some specimens were already labelled with “Type” labels. However, many formed part of a syntypic series. Additionally, the potential for unclear labelling provided, in some cases, confusion with primary types, including the fact that many syntypes remained unlabelled with regard to a name they may be associated with; this necessitates designation of lectotypes.

In particular, material associated with FRUHSTORFER's names raises some unusual issues. Hans FRUHSTORFER died in April 1922. Apparently in preparation for a sale, FRUHSTORFER's collection was catalogued the following year ([TALBOT] [1923]a, b, c; see also TENNENT 2008) and at that time included the types of *sophron* (Buru), *philocrates* (Obi), *phoibides* ("Mafor" [= Mefor]), *anaximenes* (Brit[ish] New Guinea) and *reverdini* (Queensland) (all as subspecies of *Thysonotis* [i.e. *Danis*] *danis*), together with *proedrus* (Brit[ish] New Guinea), which was listed as a distinct species of *Thysonotis* ([TALBOT] 1923b: 79). All these taxa are in the BMNH collections.

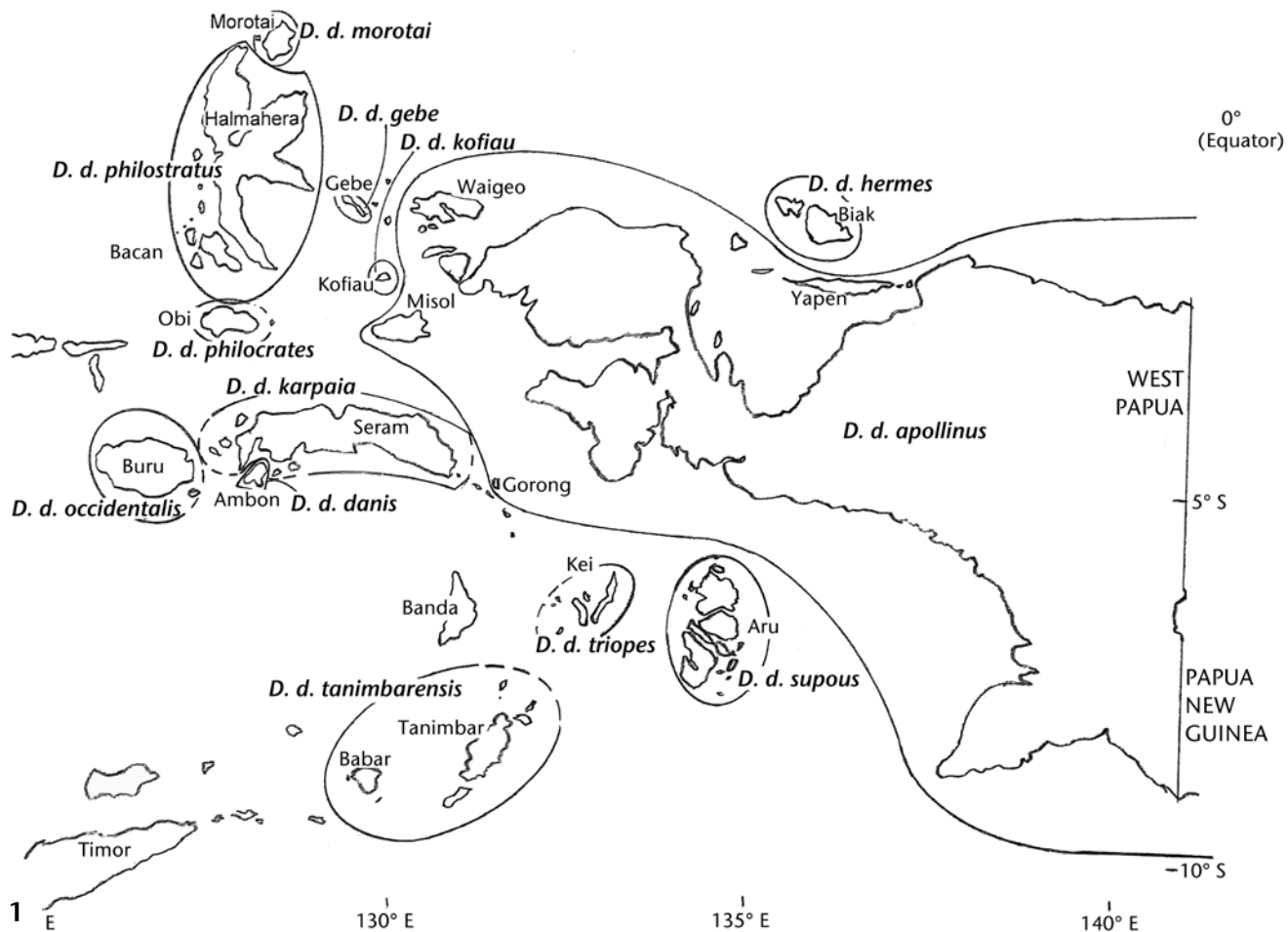
The question of recognising historical type specimens of butterflies in the BMNH and elsewhere may occasionally be problematic. Modern ICZN Rules require formal designation of a "name bearing" holotype specimen, with details of its deposition, and secondary types are dealt with similarly. But it was not always thus. In 1904 the Lepidoptera collections of the BMNH numbered only 355,767 specimens (RILEY 1964: 11) and were "more up-to-date" (i.e. better curated) than they had ever been. But the flood of donations and purchases between the early years of the 20th century and the outbreak of the Second World War in 1939 was huge – RILEY (1964) provided a chronological account of principal entomological accessions in this period; these included substantial collections from some major donors and 'museums' (e.g., BAINBRIDGE-FLETCHER, T. D. A. COCKERELL, GODMAN & SALVIN, Charles OBERTHÜR, J. J. JOICEY, H. J. ADAMS etc.). In 1939 the first entry in the accessions register records the bequest of the ROTHSCHILD collection, containing an estimated 2,500,000 Lepidoptera specimens. It was perhaps inevitable that this vast accumulation of material, from a wide variety of sources, contained at least some individual specimens of probable type status which might have been inadequately labelled – especially perhaps from FRUHSTORFER's collection.

At the outbreak of the Second World War two sets of circumstances combined to make care of the BMNH collections rather difficult in the short term. Firstly, several members of staff in the Entomology Department were called-up for service; secondly, scientifically valuable material was, for reasons of safety, removed from London. This included "all original drawings, irreplaceable books and documents, together with the BANKS and PETIVER collections (which formed part of the original British Museum foundation material) [which] were evacuated to Tring ... meanwhile ... extraction of type specimens from the collections continued ... in May 1940 the Coleoptera were removed to ... Henley-on-Thames, only to be transferred again later to Turville Park, a few miles away ... with them went some parts of the Library and most of the Type specimens of *Rhopalocera* ..." (RILEY 1964: 9–10). The "extraction of type specimens" mentioned by RILEY almost certainly included an understandably rather hurried selection for, occasionally, a specimen bearing a type label is encountered which is clearly not a type. The few cases that arise are

generally easily resolved when groups are revised or reviewed.

FRUHSTORFER's specimens are particularly prone to misinterpretation, not least because he habitually labelled more than one specimen as a type, as the following extract from a letter from FRUHSTORFER to the Director of the Hill Museum (George TALBOT), dated 18th December 1919, makes clear: "What concerns my types, there is an irregularity in fixing those. The first years, shall we say up to to 1899, I considered as types all the specimens before me and I fixed a label 'type' sometimes under a dozen of specimens, and sold also some of them. Later on, I learned to understand that there was only one type or two, if I had ♂ and ♀ before me and I attached the type label only to one, or if I had a couple [a pair?] to two specimens ... " (TALBOT [1923]c: 109). In this same letter, which appears to be a response to a query from TALBOT regarding confusion in type material of a *Delias* species, FRUHSTORFER also said "... I never sold a true type out of the collection of Indo Australians. The specimens in the Paris Museum are not types as I treated them since 1900 ... as a rule you have not to fear confusion. *Everything inside my collection has to be treated as a real type, everything outside as a cotype* ...". The words in italics here are underlined in TALBOT's reproduction of the letter (in those days underscoring represented italics when typed or handwritten); it is not known whether that section was also underlined by FRUHSTORFER himself in the original. Also, because the letter clearly relates to a *Delias* species, the claim that specimens in the Muséum National d'Histoire Naturelle, Paris, should not be regarded as types is ambiguous. This does not materially affect *D. danis*; the author visited the MNHN in March/April 2015, and saw no ex-FRUHSTORFER specimens of *D. danis* in the collections there.

TALBOT ([1923]c: 109), in an attempt to clarify FRUHSTORFER's letter, said by way of explanation: "The possession of the types of the FRUHSTORFER Collection and the series of specimens from which the original description [*sic*] were made is of the greatest importance to all students of butterflies in the future. Mr FRUHSTORFER has described such a large number of forms from little-known places of which the fauna is very poorly represented in most collections in Europe, that it is a very considerable asset to have this [*sic*] types available for study by independent students. A very great number of specimens labelled 'type' are not entered in the type catalogue, because they bear no name label. They represent probably for the most part doubtfully distinct forms. In some cases more than one ♂ and one ♀ are labelled 'type'. The selection of a holotype and an allotype is left to some future student. In many other cases one sex only is labelled 'type' when the other sex is also present. It is uncertain whether this sex was undescribed or whether the type label was omitted. Reference must be made to the original description ... where no mention is made by the author of his original series, we understand that it may be assumed that he had before him only those specimens now contained in



Map 1: distribution of *Danis danis* in Indonesia.

the collection. A few types described by RÖBER are also contained in the collection.”

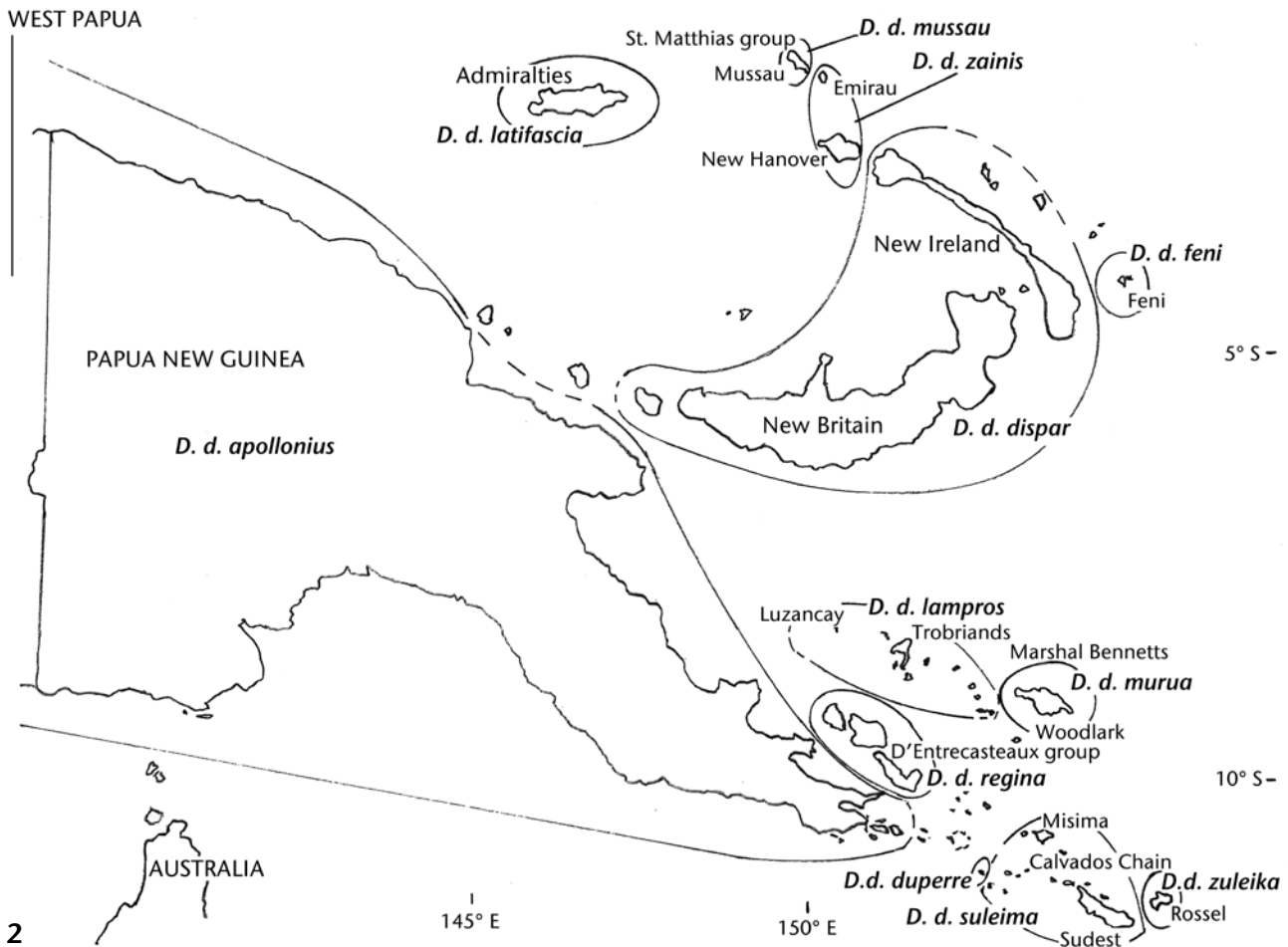
It is noted that in 1937 the BMNH acquired “the whole of the remainder of the FRUHSTORFER collection of Rhopalocera, 56,650 specimens, including 3,871 Types” (RILEY 1964: 40).

Acknowledgements

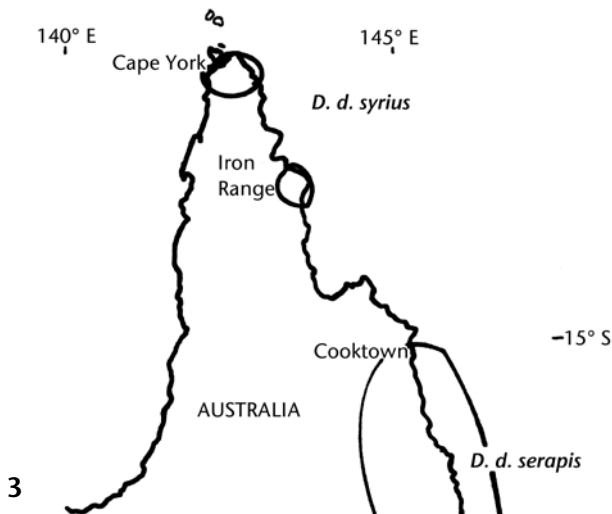
Andrew RAWLINS (Kent, UK) allowed free access to his extensive collection of Moluccan butterflies; Akira YAGISHITA (Ibaraki, Japan) also provided details from his own collection; Eulàlia Gassó MIRACLE, Collection Manager of Lepidoptera (Rhopalocera), Naturalis Biodiversity Centre, Leiden, kindly supplied photographs of the holotype of *panatius* (Figs. 82–83); Stefan SCHRÖDER (Köln, Germany) and Gerry TREMEWAN (Cornwall, UK) assisted with some translations; Dick VANE-WRIGHT (Kent, UK) gave good advice on a variety of subjects, as always; the following colleagues at a number of international institutions are thanked for access to the collections in their care in 2013: David GRIMALDI and Andrew JOHNSTON, American Museum of Natural History, New York; Scott MILLER, Bob ROBBINS and Brian HARRIS, Smithsonian Institution, Washington; John RAWLINS and colleagues, Carnegie Museum of Natural History, Pittsburgh,

Pennsylvania; Jackie MILLER and Andy WARREN, McGuire Center for Lepidoptera & Biodiversity, Gainesville, Florida; Norman PENNY, California Academy of Sciences, San Francisco, California; Chris LAMBKIN, Queensland Museum, Brisbane; Dave BRITTON, Australian Museum, Sydney; Ted EDWARDS, Australian National Insect Collection, Canberra. Stephen BRICE, Deputy Head of Mission, British Deputy High Commission, Calcutta, very kindly arranged security of several boxes of loan material whilst the author made a detour in May 2013; Rodolphe ROUGERIE, Muséum National d'Histoire Naturelle, Paris, allowed the author access to the collections under his care in March/ April 2015; Chris MÜLLER kindly reviewed a late draft of the manuscript and offered constructive comment.

The National Research Institute; the Department of Environment and Conservation, Papua New Guinea Government; the Provincial Research Committee, Milne Bay Provincial Government; and the New Guinea Bina-tang Research Center (NGBRC: formerly the Parataxonomist Training Centre), Madang, supported research in Milne Bay Province, and core funding for Papua New Guinea fieldwork was generously provided by National Geographic, Washington D.C. (CRE Grant #8319-07 and GEFNE Grant #6-11); The Linnean Society, Lon-



Map 2: distribution of *Danis danis* in Papua New Guinea.



Map 3: distribution of *Danis danis* in Australia.

don (Appleyard Fund); The Percy Sladen Exploration Fund, London (Linnean Society); the Natural History Museum, London (Special Funds); the Royal Entomological Society, St Albans (formerly London), the British Ecological Society, London (SEPG No 3651/4516). Martin JACOBY, Somerset, UK, very generously provided private funding, which allowed the author to spend significantly longer in the field in Milne Bay than would otherwise have been possible.

References

- BOISDUVAL, J. B. A. d'E. (1832): Faune entomologique de l'Océan Pacifique. — In: D'URVILLE, J. D., Voyage de découvertes de L'Astrolabe exécuté par ordre du roi, pendant les années 1826–1827–1828–1829, Fauna entomologique, 1 (Lépidoptères). — Paris.
- BRABY, M. F. (2000): Butterflies of Australia. Their identification, biology and distribution, 2 volumes. — Canberra (CSIRO Publishing), xxv + 976 pp.
- CRAMER, P., [& STOLL, C.] (1775–1790): De Uitlandsche Kapellen voorkomende in de drie waereld-deelen Asia, Africa en America. — Parts 1 (1–7): xxx, 16, 132 pp., pls. 1–84 (1775), 1 (8): 133–156, pls. 85–96 (1776), 2 (9–16): 152 pp., pls. 97–192 (1777), 3 (17–21): 104 pp., pls. 193–252 (1779), 3 (22–24): 105–176, pls. 253–288 (1780) [by CRAMER; published by STOLL after CRAMER's death], 4 (25–26a): 28 pp., pls. 289–304 (1780) [by CRAMER; published by STOLL after CRAMER's death], 4 (26b–28): pp. 29–90, pls. 305–336 (1780) [this and subsequent parts by STOLL], 4 (29–31): 91–164, pls. 337–372 (1781), 4 (32–34): 165–252, pls. 373–400 (1782), supplement (1): 1–42, pls. I–VIII (1787), (2): 3–162, pls. IX–XXVI (1790), (3): 163–184, pls. XXXVII–XLII (1790). — Amsterdam.
- DE NICÉVILLE, L., & KÜHN, H. (1898): An annotated list of the butterflies of the Ké Isles. — Journal of the Asiatic Society of Bengal, Calcutta, 67 (2): 251–283, pl. 1.
- DRUCE, H. H. (1897): Descriptions of four new species of Lycaenidae from the Eastern Archipelago. — Annals and Magazine of Natural History, London, (6) 19 (109): 13–16.

- , & BETHUNE-BAKER, G. T. (1893): A monograph of the butterflies of the genus *Thysonotis*. — Proceedings of the Zoological Society of London, London, 1893: 536–553, 3 pls.
- FELDER, C., & FELDER, R. (1865): Rhopalocera, Heft 2. — In: FELDER, C., FELDER, R. & ROGENHOFER, A. F. (eds.) ([“1864”] 1865–1866), Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859 unter den Befehlen des Commodore B. VON WÜLLERSTORF-URBAIR, Zoologischer Theil, Zweiter Band, Zweite Abtheilung: Lepidoptera, Rhopalocera [Hefte 1–3]. — Vienna (K.-k. Hof- und Staatsdruckerei), vi + 549 pp., with pls. 1–74 [“Atlas” volume; in part published later?].
- FRUHSTORFER, H. (1915): Neue Formen der Gattung *Thysonotis* und Aufzählung der bekannten Rassen auf Grund morphologischer Untersuchungen. — Societas Entomologica, Stuttgart, 30 (7): 39–40, (8) 42–45, (9) 49–52.
- GODART, G. P., & LATREILLE, P. A. (1819–[1824]): Encyclopédie méthodique. Histoire naturelle. 9. Entomologie, ou histoire naturelle des crustacés, des arachnides et des insectes. — Paris (Mme Agasse), 828 pp.
- GROSE SMITH, H. (1894): An account of a collection of diurnal Lepidoptera made by Mr. W. DOHERTY at Humboldt Bay, Dutch New Guinea, and in neighbouring islands, in the museum of the honourable Walter ROTHSCILD at Tring, with descriptions of new species. — Novitates Zoologicae, Tring, 1 (3): 331–584.
- (1898a): Descriptions of new species of Oriental butterflies. — Novitates Zoologicae, Tring, 5 (1): 103–110.
- (1898b): XLVI. — Descriptions of two new species of butterflies of the genus *Thysonotis*. — Annals and Magazine of Natural History, London, (7) 2 (11): 404–405.
- , & KIRBY, W. F. (1895): Rhopalocera Exotica, being illustrations of new, rare and unfigured species of butterflies. Vol. 2 with sixty hand-coloured plates. — Oriental Lycaenidae, pl. 4 (*Thysonotis* I), text p. 23–25.
- GRÜNBERG, K. (1916): *Thysonotis danis*. — Pp. 824–826 in: SEITZ, A. (ed., 1908–1928), Macrolepidoptera of the world, 9, The Rhopalocera of the Indo-Australian faunal region, 2 vols. [Die Gross-Schmetterlinge der Erde. Die Indo-Australischen Tagfalter (English language edition)]. — Stuttgart (F. Lehmann/A. Kernen), 1197 pp., 175 pls.
- HEMMING, A. F. (1964): XXII. Selection of lectotypes for two nominal species of the family Lycaenidae. — Annotationes Lepidopterologicae, London, 3: 105.
- (1967): The generic names of the butterflies and their type-species (Lepidoptera: Rhopalocera). — Bulletin of the British Museum of Natural History (Entomology), London, Supplement 9, 509 pp.
- KIRBY, W. F. (1889): XVII. On the collection of Lepidoptera formed by Basil THOMSON, Esq., in the Louisiade Archipelago. — Annals and Magazine of Natural History, London, (6) 4 (20): 156–167.
- MISKIN, W. H. (1890): Descriptions of hitherto undescribed Australian Lepidoptera (Rhopalocera) principally Lycaenidae. — Proceedings of the Linnean Society of New South Wales, Sydney, (2) 5 (1): 29–43.
- (1891): A synonymic catalogue of the Lepidoptera Rhopalocera (butterflies) of Australia with full bibliographical reference; including descriptions of some new species. — Annals of the Queensland Museum, Brisbane, 1: xx + 93 + ix pp.
- PARSONS, M. J. (1998): The butterflies of Papua New Guinea: their systematics and biology. — London (Academic Press), xvi + 736 pp., XXVI + 104 pls.
- QUICK, W. N. B. (1994): Early stages of *Danis danis serapis* MISKIN, 1891 (large green-banded blue) (Lepidoptera: Lycaenidae). — Queensland Naturalist, Brisbane, 33 (1–2): 39–40.
- RAWLINS, A. (2004): A review of subspecies and distribution of *Pareronia argolis* (C. & R. FELDER) from Maluku Province, Indonesia (Lepidoptera, Pieridae). — Futao, Tokyo, 48: 9–10, pl. 2.
- RIBBE, C. (1889): Beiträge zur Lepidopteren-Fauna von Gross-Ceram. — Deutsche Entomologische Zeitschrift Iris, Dresden, 2 (2): 187–265, pl. V.
- RILEY, N. D. (1964): The Department of Entomology of the British Museum (Natural History) 1904–1964. A brief historical sketch. — XII. International Congress of Entomology, London, 1964, 48 pp.
- RÖBER, J. K. M. (1926): Lepidopterologisches. — Entomologische Mitteilungen, Berlin, 15 (3/4): 226–230, (5/6): 372–377.
- (1927): Neue exotische Falter. — Internationale Entomologische Zeitschrift, Guben, 21 (14): 105–107.
- ROTHSCHILD, W. (1915a): On Lepidoptera from the islands of Ceram (Seran), Buru, Bali, and Misol. — Novitates Zoologicae, Tring, 22 (1): 105–144, (2): 200–227.
- (1915b): On the Lepidoptera in the Tring Museum sent by Mr. A. S. MEEK from the Admiralty Islands, Dampier and Vulcan Islands. — Novitates Zoologicae, Tring, 22 (2): 192–208, (3): 387–402.
- SEBA, A. (1765): Description exacte des principales curiositez naturelles du magnifique cabinet d’Albert SEBA (Locupletissimum naturalium thesauri accurate description per Universam Physices Historiam ...). Volume 4. — Amsterdam (Arksteum, Merkum & Schouten), viii + 42 + 226 pp., 108 pls.
- STRAND, E. (1916): Lepidoptera Niepeltiana, 2. Teil. Abbildungen und Beschreibungen neuer und wenig bekannter Lepidopteren aus der Sammlung W. NIEPELT. — In: NIEPELT, W. (ed.), Lepidoptera Niepeltiana, Zirlau (Schles.), 2: [2] + [27] pp., 5 pls.
- [TALBOT, G.] ([1923]a): The FRUHSTORFER collection of butterflies: Catalogue of types with general account and list of the more interesting forms. — Nice (J. Gastaud), 8 + 135 + ix pp. [For details of this obscure publication, see TENNENT (2008).]
- ([1923]b): FRUHSTORFER collection. First list of types. — Pp. [1]–88 in: [TALBOT, G.] ([1923]), The FRUHSTORFER collection of butterflies: Catalogue of types with general account and list of the more interesting forms. — Nice (J. Gastaud), 8 + 135 + ix pp.
- ([1923]c): Some notes respecting (*sic*) types, p. 109, in: [TALBOT, G.] ([1923]), The FRUHSTORFER collection of butterflies: Catalogue of types with general account and list of the more interesting forms. — Nice (J. Gastaud), 8 + 135 + ix pp.
- TENNENT, W. J. (2006): A checklist of the butterflies of Melanesia, Micronesia, Polynesia and some adjacent areas. — Zootaxa, Auckland, 1178: 1–209.
- (2008): Citation of the contents of the FRUHSTORFER collection of butterflies: Catalogue of types with general account and list of the more interesting forms published in the 1920s. — Entomologist’s Gazette, Iver, Buckinghamshire, 59 (1): 41–53.
- , & RAWLINS, A. (2008): A review of *Cethosia cydippe* (LINNAEUS, 1767) (Lepidoptera: Nymphalidae) from the Moluccan islands (Maluku, Indonesia). — Butterflies (*Teinopalpus*), Tokyo, 49: 67–81.
- TOXOPEUS, L. J. (1930): De soort als functie van plaats en tijd, getoetst aan de Lycaenidae van het australaziatisch gebied. — Amsterdam (H. J. Paris), VIII + 198 pp., 4 pls.
- YAGISHITA, A. (2000): A new subspecies of *Danis danis* (CRAMER) (1775) from Tanimbar Islands, Indonesia (Lepidoptera: Lycaenidae). — Futao, Tokyo, 34: 12–13, pl. 2, figs. 15–18.

Received: 21. v. 2015

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Nachrichten des Entomologischen Vereins Apollo](#)

Jahr/Year: 2016

Band/Volume: [37](#)

Autor(en)/Author(s): Tennent John W.

Artikel/Article: [A review of *Danis danis* \(Cramer, 1775\) \(Lepidoptera, Lycaenidae\), with descriptions of seven new subspecies from Indonesia and Papua New Guinea 117-138](#)