An illustrated and annotated checklist of *Arhopala* Boisduval, 1832, taxa occurring in North Maluku and Maluku, Indonesia (Lepidoptera: Lycaenidae) — Part 1: Introduction, *anthelus* and *theba* species-groups

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Abstract: This paper presents an introduction to the forthcoming papers on the species and subspecies of the lycaenid genus *Arhopala* Boisduval, 1832 that occur in the Indonesian provinces of North Maluku and Maluku and deals with the *anthelus* and *theba* species-groups, *sensu* Evans (1957). Five described taxa (3 species) in the "*anthelus* species-group" and one taxon in the "*theba* species-group" are recognised as occurring there. Historical confusion over the status of *Arhopala viola* Röber, 1887 is examined and the taxon is revised to full species rank. The identity of the taxon *Arhopala viola* (*sensu* Semper 1890) is discussed. One new subspecies is described: *Arhopala viola* ***harmonica*** **ssp. n.** (holotype male, now coll. Yagishita, later to be deposited in Tokyo University Museum). The nomenclature and distribution of the Indonesian races of *Arhopala eridanus* Felder, 1860 are clarified. The history and current accepted meaning of the generic name *Arhopala* is briefly outlined. Some new island locality records are introduced, a map shows the islands discussed in the text and all taxa are illustrated in colour.

Keywords: Lepidoptera, Lycaenidae, Theclinae, *Arhopala*, *anthelus* species-group, *theba* species-group, *eridanus*, *viola*, new subspecies, new locality records, Indonesia, North Maluku, Maluku.

Illustriertes und kommentiertes Verzeichnis der *Arhopala*-Arten, die in den Nordmolukken und Molukken (Indonesien) vorkommen — Teil 1: Einführung, Artengruppen von *anthelus* und *theba*

Zusammenfassung: Dies ist die erste Publikation einer Serie über die Arten und Unterarten der Lycaenidengattung *Arhopala* Boisduval, 1832 aus den indinesischen Provinzen Nordmaluku und Maluku. Sie befaßt sich mit den Artengruppen von *Arhopala anthelus* und *theba sensu* Evans (1957). Drei Arten mit 5 beschriebenen Taxa der *anthelus*- Artengruppe sowie ein Taxon der *theba*-Artengruppe sind von dort bekannt. Das historische Durcheinander zum Status von *Arhopala viola* Röber, 1887 wird geprüft, und das Taxon wird zu vollem Artstatus revidiert. Die Identität des Taxons *Arhopala viola* (*sensu* Semper 1890) wird diskutiert. Eine neue Unterart wird beschrieben: *Arhopala viola* ***harmonica*** **ssp. n.** (Holotypus Männchen, ex coll. Yagishita, später in coll. Universitätsmuseum der Universität Tokio). Nomenklatur und Verbreitung der indonesischen Formen und Unterarten von *Arhopala eridanus* Felder, 1860 werden geklärt. Geschichte und aktuelle Bedeutung der Gattungsnamens *Arhopala* werden kurz dargestellt. Einige neue Inselnachweise werden gegeben, eine Karte zeigt die besprochenen Inseln, und alle Taxa werden farbig illustriert.

Introduction

***Arhopala* Boisduval, 1832** (Lycaenidae, Theclinae, Arhopalini) is the fifth genus to be published in NEVA in the series of annotated and illustrated checklists of the species and subspecies of the lycaenid genera of the Indonesian provinces of North Maluku (Maluku Utara) and Maluku. We have split this large genus into seven separate parts for publication. The parts largely follow Evans' (1957) species-groups. Here we present the *anthelus* and *theba* species-groups. We recognise five taxa, comprising three species, in the *anthelus* species-group and one taxon in the *theba* species-group, as occurring in the Maluku area. We describe one new subspecies in the *anthelus* species-group.

The taxon *Arhopala viola* Röber, 1887 is returned to full species rank, the identity of the taxon *Arhopala viola* (sensu Semper 1890) is discussed and the nomenclature and distribution of the Indonesian races of *Arhopala eridanus* Felder, 1860 are clarified.

The history and the current accepted meaning of the generic name *Arhopala* is outlined and clarified.

For the biogeography of the region see Rawlins et al. (2014: 5–8). In the final part, we will discuss this with particular reference to the genus *Arhopala* and provide a summary of all the *Arhopala* taxa and their distribution in North Maluku and Maluku.

For the purposes of this paper we make the following key points:

- We use the term Maluku to include both the Indonesian political Provinces of North Maluku (= Maluku Utara) and Maluku.
- The province North Maluku comprises: the Sula islands, the islands we term "northern Maluku" (see below), Obi and Gebe.
- The province Maluku comprises: the islands we term "central Maluku" (see below), the Gorong, Watubela and Tayandu Island groups, the Banda Islands, the Kei Islands, the islands of Southwest Maluku (including Wetar), the Tanimbar Islands and the Aru Islands.
- We use the biogeographical term "northern Maluku" to mean the islands of Morotai, Halmahera, Ternate, Bacan, Kasiruta and Mandioli and some associated smaller islands.
- We use the biogeographical term "central Maluku" to mean the islands of Buru, Ambelau, Manipa, Kelang, Buano, Seram, Ambon, Haruku, Saparua, Nusa Laut, Geser and Seram Laut.

A map shows these islands of Maluku and North Maluku. Here we note that the Indonesian western half of the Island of New Guinea along with its associated offshore islands (previously variously known as Irian, Irian Jaya, West Irian, Irian Barat) now consists of two political provinces: West Papua and Papua. We use the term "New Guinea" in its geographical sense to mean the whole island including these two Indonesian Provinces along with the mainland part of the country of Papua New Guinea.

Where available, both surfaces of both sexes of each taxon are illustrated. To reduce the number of plates needed, most specimens are illustrated "halved", showing the upperside on the left and the underside on the right. In general, we have depicted the left half of the butterfly, but where the right side is in significantly better condition, we have shown this and flipped the image to allow easier comparison of similar taxa.

We have examined the collections of the Natural History Museum, London (NHMUK) as well as specimens and photographs from some private collections.

Abbreviations used

CACM	Coll. A. Cassidy, Maidenhead, Berkshire, UK.
CARR	Coll. A. Rawlins, Rainham, Kent, UK.
CSSK	Coll. S. Schröder, Köln, Germany.
coll.	collection.
FwL	Forewing length.
HT	Holotype.
LT	Lectotype.
NHMUK	The Natural History Museum, London, UK.
PLT	Paralectotype.
PT	Paratype.
SMT	Senckenberg Museum für Tierkunde, Dresden, Germany.
ssp. n.	Subspecies nova.
stat. rev.	status revivisco (status revised).
TL	Type locality.

The genus *Arhopala* Boisduval, 1832

= *Narathura:* Moore (1879: 835).
= *Nilasera:* Moore (1881: 114).
= *Panchala:* Moore (1882: 251).
= *Satadra:* Moore (1884: 38).
= *Acesina:* Moore (1884: 41).
= *Darasana:* Moore (1884: 42).
= *Aurea:* Evans (1957: 126).
= *Iois:* Doherty (1899: 411) — *nomen nudum,* see note 3.

Type species: *Arhopala phryxus* Boisduval, 1832, designated by Scudder (1875: 120). Scudder selected this species by monotypy erroneously believing *phryxus* was the only species included in the genus by Boisduval. Nonetheless the designation stands, as pointed out by Hemming (1967: 57). The taxon *phryxus* is now regarded as a subspecies of *Arhopala thamyras* Linnaeus, 1758.

Note 1: Key works on *Arhopala*. There have been many significant papers dealing with the genus but the key works include "*A revision of the* Amblypodia *group of butterflies of the Family Lycaenidae*" (Bethune-Baker 1903), "*A revision of the* Arhopala *group of Oriental Lycaenidae*" (Evans 1957), The Lycaenidae volume of "*The butterflies of Borneo*" (Seki et al. 1991) and "*The butterflies of Papua New Guinea* (Parsons 1998).

Note 2: Evolution and current meaning of *Arhopala*. Boisduval (1832: 75) introduced the genus *Arhopala* and included just two taxa, both new — *A. phryxus* and *A. meander* Boisduval, 1832.

Moore (1879) created the genus *Narathura* immediately after his description of a new taxon of *Amblypodia* Horsfield, 1829. He placed three taxa under *Narathura*, all now included in *Arhopala.*

Moore (1881, 1882, 1884) subsequently introduced five more generic names which are now all considered synonyms of *Arhopala* — see above.

De Nicéville (1890: 226–228) gave a detailed description of the characteristics of the genus *Arhopala* and sank five of Moore's genera to synonyms of *Arhopala*. He reluctantly retained *Acesina,* noting the two species therein had peculiar underside markings. He considered *Arhopala* and *Amblypodia* distinct genera and noted that Dr. Staudinger correctly understood that the genus *Amblypodia* Horsfield, of which *narada* Horsfield, 1828 is the type, differed so completely from the vast majority of butterflies placed under the name *Amblypodia,* that it could not be used for them. Bethune-Baker (1903), as de Nicéville (1890), considered Moore's genera as synonyms of *Arhopala* and added *Acesina* as a synonym of *Arhopala*. They both also listed *Amblypodia* (auctorum) and *Flos* and *Ioi*s Doherty 1889 as synonyms of *Arhopala.*

Despite de Nicéville (1890) and Bethune-Baker (1903) treating *Amblypodia* and *Arhopala* as clearly distinct genera, several authors continued to use *Amblypodia* for what we now consider *Arhopala*, and Riley (1922: 25) created a new genus *Horsfieldia* to transfer the *Amblypodia* species into!

Rawlins & Cassidy (2017: 104) discussed this issue in some detail and pointed out that Corbet (1940: 4) finally resolved it by stating that *Arhopala* must be "resuscitated for the species grouped under *Amblypodia* in Seitz **9:** 947". *Amblypodia* is retained for the small group of species of which *narada* is the type species.

Evans (1957) then decided to re-divide the "*Arhopala* group" into five genera — *Arhopala*, *Narathura* (= *Nilasera, Satadra, Darasana*), *Panchala* (= *Acesina*), *Flos* and his new genus *Aurea*. Eliot (1973: 431) placed these genera in his "*Arhopala* section" and also included *Mahathala* Moore, 1878, *Thaduka* Moore, 1879 and *Apporasa* Moore, 1884. Parsons (1998: 380) regarded all these genera, including *Flos,* as synonyms of *Arhopala*.

The current understanding, and we believe the most cogent, of the genus *Arhopala* includes all the species considered by Evans in the genera *Narathura, Aurea, Arhopala* and *Panchala* but not the *Flos* species. For example, Eliot *in* Corbet & Pendlebury (1978: 299), Seki et al. (1991: 48 — English section), Vane-Wright & de Jong (2003: 121–125) and Treadaway & Schroeder (2012: 38) all treated *Arhopala* and *Flos* as distinct genera. The small group of approximately 15 species in the genus *Flos* are readily distinguishable from *Arhopala*. The genera *Mahathala*, *Thaduka* and *Apporasa* are also considered distinct.

Megens et al. (2004) did a detailed study on the molecular phylogeny of *Arhopala* and concluded (p. 129) that "Although many groupings made by Evans [1957] and Eliot [1963] are confirmed, some incongruencies occur that in part can be attributed to misinterpretation of morphological characters." They noted the "basal position of the apparent sister taxa *Flos* and *A. abseus*" and also noted that the relationship of many species-groups remained unresolved.

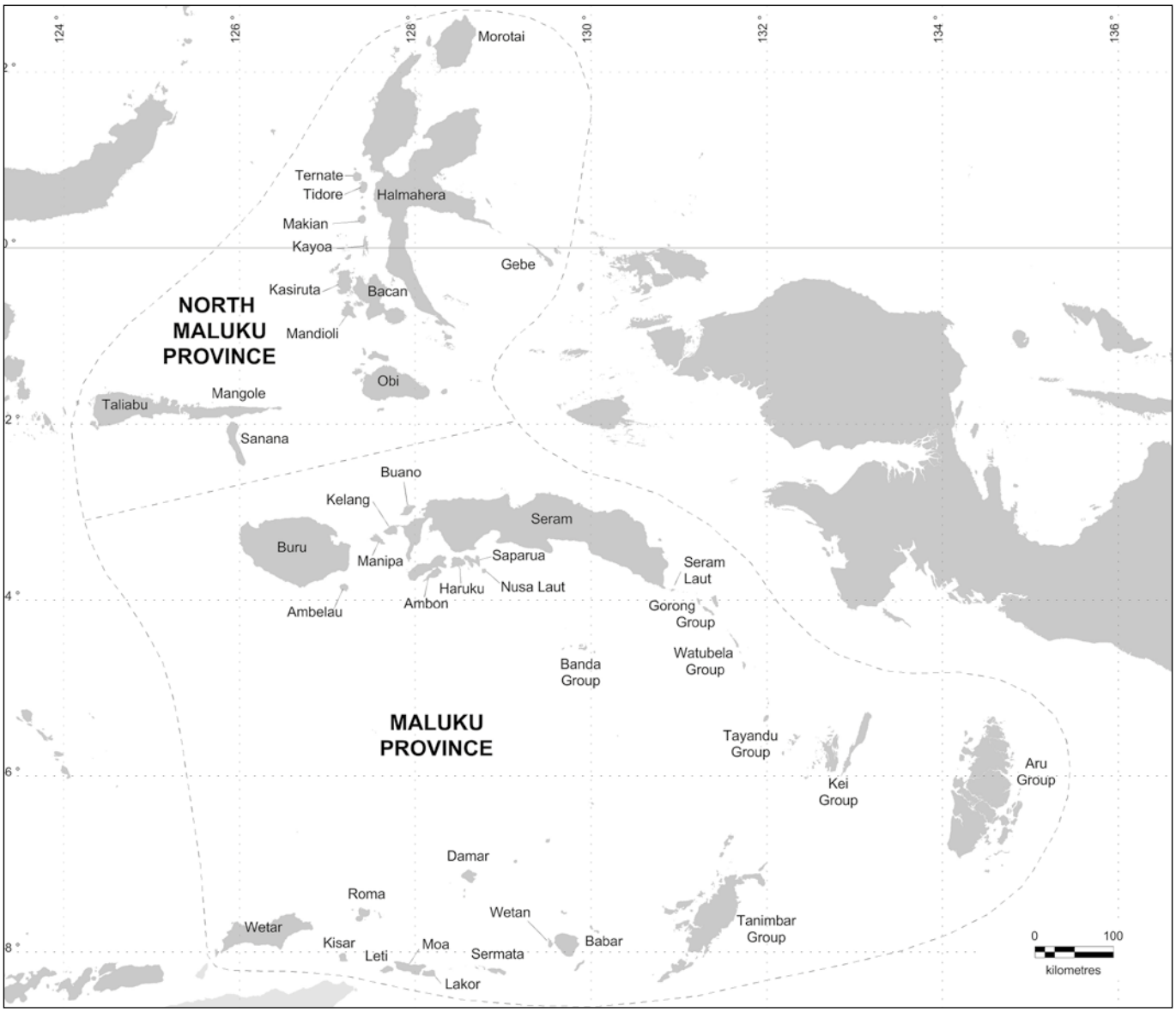
Evans divided his genus *Narathura* into 12 species-groups and these easily translate to *Arhopala* species-groups. His genus *Aurea* becomes the *Arhopala* "*aurea* species-group" named for the first species listed in the group: *aurea* Hewitson, 1862. His genus *Panchala* the "*ganesa* species-group" — also named for the first species he listed: *ganesa* Moore, 1858.

The small number of species he included under the genus *Arhopala* can be called the "*thamyras* species-group" — likewise named for the first species Evans listed.

We thus have 15 species-groups of *Arhopala* (we exclude *Flos*). In our papers on the *Arhopala* taxa of Maluku we will follow Evans' arrangement of the species-groups, though we note there are other interpretations, including Eliot (1963).

Eight of these 15 species-groups are found in Maluku.

Note 3: The genus *Ioi*s. Doherty (1889: 411) introduced the name *Ioi*s as a genus to hold "an *Arhopala*, apparently *inornata*, Felder, and one or two obscure allied species", based on a peculiarity with



Map: Provinces of North Maluku and Maluku with island names used in the text.

the eggs and unspecified peculiarities in the imago. It was not properly described and is therefore a *nomen nudum*. De Nicéville (1890: 226) synonymised it with *Arhopala*.

Note 4: Genus range and species numbers. This large genus is distributed throughout the Indo-Australian Region from Afghanistan and India in the west, to Japan in the northeast and through S.E. Asia and New Guinea as far as Australia and the Solomon Islands.

Evans (1957: 5) included 187 species in total in his *Arhopala* group, but 13 of these species belong in the genus *Flos*. Since then, there have been new species described, as well as changes in classification and there are now approximately 220 species of *Arhopala* and 15 species of *Flos* recognised.

The genus reaches its peak diversity in Sundaland (includes Malay Peninsula, Borneo, Java, Sumatra). For example, Corbet & Pendlebury (1978: 279–285) recorded 109 species in peninsular Malaysia and Seki et al. (1991: 55–67) noted 89 species in Borneo. The number of species decreases westwards, with 88 known from Thailand (Pinratana 1981: 75–103) and 47 known from India (Varshney & Smetacek 2015: 101–107), as well as eastwards, with approximately 42 species in New Guinea (Parsons 1998: 380) and just four in Australia (Braby 2004: 232–234). We record about 35 species in Maluku.

Parsons (1998: 380) noted *Arhopala* is predominantly a lowland genus (below 800 m) and this is also reflected in the Maluku species.

Some *Arhopala* species are difficult to identify with certainty from phenotypic characters, for example, those in the *epimuta* species-group (predominantly in Sundaland) and some in the *centaurus* species-group. Examination of male genitalia is relatively unhelpful in separating allied species in some groups.

Annotated checklist of the *Arhopala "anthelus* species-group" taxa of North Maluku and Maluku

Evans (1957: 88–94) divided the *anthelus* species-group into three subgroups with a total of 23 species. Parsons (1998: 381) transferred *Arhopala antharita* Grose Smith, 1894, from the *eumolphus* species-group to the *anthelus* species-group, noting its relationship to its "nearest relative *Arhopala auxesia salvia*". Two of the three subgroups have representatives in Maluku.

Evans (1957: 89) described *A. auxesia salvia* and designated a ♀ HT from Salawati. The HT ♀ of nominotypical *Arhopala auxesia* Hewitson, 1863 is in the NHMUK labelled "halm Wallace" indicating Halmahera, but Evans (1957: 89) considered the correct TL was also Salawati, He noted one further ♀ from New Guinea in

the NHMUK. Parsons (1998: 382) noted these were the only two specimens of nominotypical *auxesia* known. He stated that the ♀♀ of the two taxa were very different and because of their apparent sympatry may be distinct species, but noted the possibility that "the *auxesia* female is merely markedly dimorphic".

We are unaware of any records of the species from Halmahera or anywhere in Maluku and so exclude *Arhopala auxesia* from our checklist.

The *anthelus* subgroup of the *anthelus* species-group

Evans (1957: 88–90) included eight species in the *anthelus* subgroup. Parsons (1998: 381) added *Arhopala antharita* — see above. We raise *viola* Röber, 1887, from Evans' (1957: 89) placement as a synonym of *A. eridanus elfeta* Hewitson, 1869, to a full species, giving a total of 10 species in this subgroup. Just two species occur in Maluku.

Arhopala eridanus (C. Felder, 1860)

Amblypodia eridanus: C. Felder (1860: 452); TL: Ambon.

= *Amblypodia polita:* Röber (1887: 199, pl. 9, fig. 14); TL: Seram.

Range: Restricted to the Indonesian and Philippine archipelagos.

Note: Evans (1957: 89–90) listed five subspecies of *eridanus*. A further subspecies — *davalma* Schroeder & Treadaway, 2006 — was described from Mindanao. Three of the races are found in Maluku.

Arhopala eridanus eridanus (C. Felder, 1860)

(Fig. 1: ♂, Seram; Fig. 2: ♀, Haruku; Fig. 3: ♀ Type, Ambon; Fig. 4: ♂, Buru; Fig. 5: ♀, Ambon; Fig. 6: ♂ HT *polita* = *eridanus*, Seram.)

Amblypodia eridanus: C. Felder (1860: 452); TL: Ambon — see note 1.

= *Amblypodia polita*: Röber (1887: 199, pl. 9, fig. 14); TL: Seram — see note 2.

Range: central Maluku — Ambon, Seram, Seram Laut (NHMUK), Manipa, Kelang, Haruku (Tennent & Rawlins 2010). — New records: Buru (1 ♂, xii. 1999; 1 ♂, x. 2006, coll. Yagishita; 1 ♂, i. 2015, coll. Okubo) and Gorong Island (1 ♂, viii. 2012, CARR) – see notes 3, 5, 6.

Note 1: Felder (1860) described the *eridanus* ♀ in Latin and noted the specimen/s was in the Felder collection. In his review of the *Amblypodia* group, Bethune-Baker (1903: 49–50, pl. 1, fig. 14, pl. 4, figs. 13 & 13a) noted that Felder had only described the ♀ of *eridanus* and stated: "I have therefore described a male from that island [Ambon] and also a female agreeing almost exactly with the type". He illustrated the male and its genitalia. Evans (1957: 90) noted that the ♀ "Type" was in the NHMUK (Fig. 3).

Note 2: Röber (1887) described and illustrated the male of *polita,* supplied by Ribbe from Seram. Bethune-Baker (1903: 50) stated that Röber's *polita* from Seram was "absolutely the same as a specimen [of *eridanus*] from Amboina" and synonymised the taxa. Evans (1957: 90) also considered *polita* as a synonym of *eridanus*. Takanami (1989: 51) identified the *polita* HT ♂ in the SMT (Fig. 6) and illustrated both surfaces in figs. B-31a & B-31b. It is clear this taxon matches *eridanus*.

Note 3: Bethune-Baker (1903: 49) mistakenly considered Staudinger's var. *dilutior* as a synonym of *eridanus* and therefore included Palawan, Cagayan and Balabac Islands in the Philippines in the range for *eridanus*. Evans (1957: 89) treated *dilutior* Staudinger, 1889 as a distinct subspecies and we concur.

Note 4: Bethune-Baker (1903: 50) stated he had not seen specimens of *Arhopala carolina* Holland, 1900 but suspected it would turn out to be a slight variety of *eridanus* Felder. However Evans (1957: 127) treated *carolina* as a synonym of *thamyras* and we discuss this in the *thamyras* species-group.

Note 5: We have examined photographs of 3 ♂♂ from Buru. They are the same size (on average FwL of about 21 mm) and very similar to specimens from Ambon and Seram except they have slightly wider upperside forewing marginal borders — see Figs. 1 & 4 for comparison. They may represent a distinct race of *eridanus* but for now we place them with nominotypical *eridanus*. The status of the Buru population should become clearer after ♀♀ are found and examined.

Note 6: We have examined 1 ♂ from Gorong — the first record outside central Maluku. It is an unusually small specimen (FwL 18 mm) but otherwise indistinguishable from central Maluku specimens. This may just be an individual variation, as we illustrate also (Fig. 5) an unusually small (FwL 18.5 mm) and pale ♀ from Ambon. Most central Maluku *eridanus* specimens of either sex have FwL 22–24 mm.

Arhopala eridanus padus C. & R. Felder, 1865

(Fig. 7: ♂, Halmahera; Fig. 8: ♀, Halmahera; Fig. 9: ♂ HT, Halmahera.)

Arhopala padus: C. & R. Felder (1865: 230); TL: Halmahera — see note 1.

Range: endemic to northern Maluku — Halmahera (NHMUK), Morotai, Bacan, Kasiruta (Tennent & Rawlins 2010).

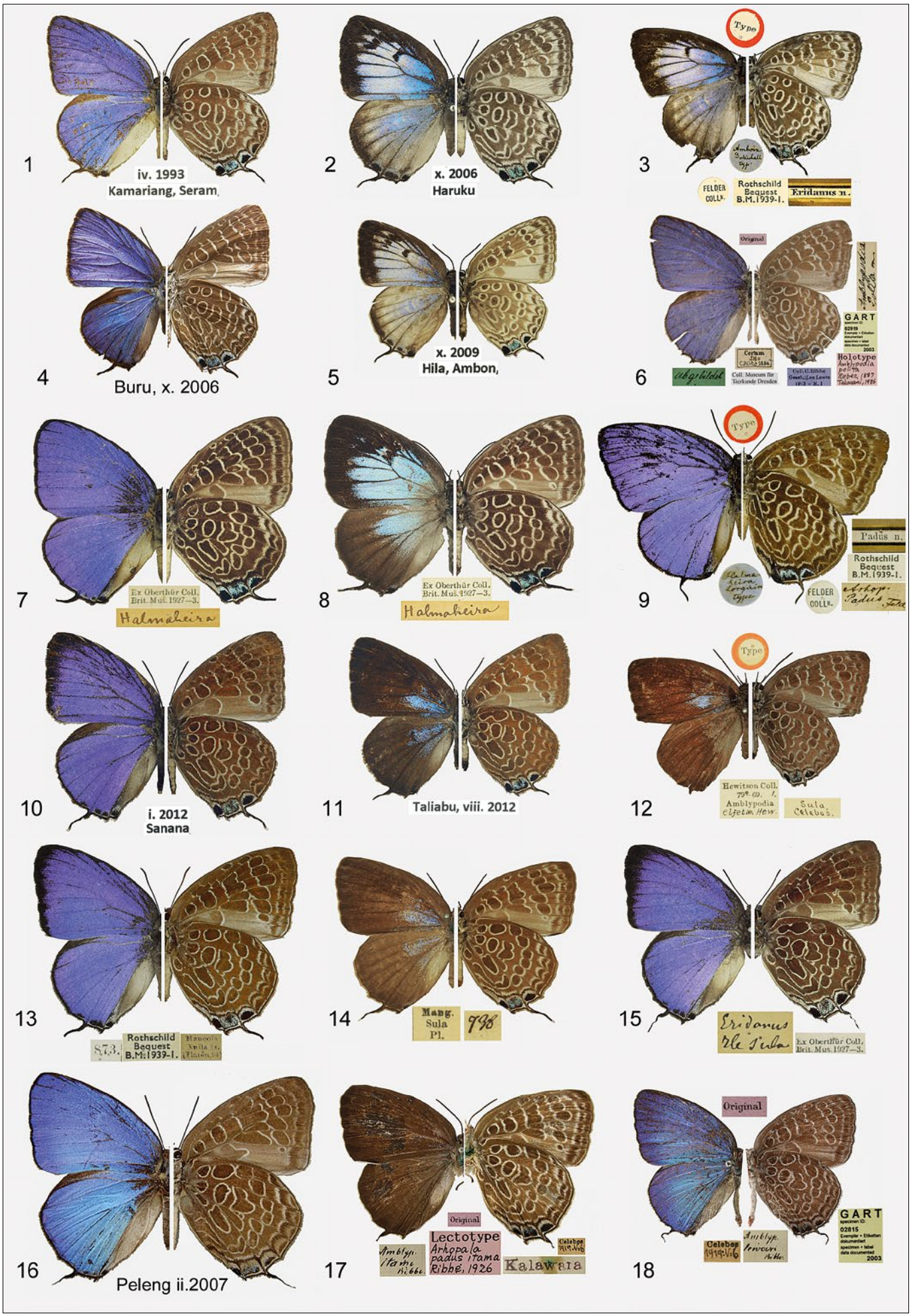
Note 1: Felder & Felder (1865) described the male of *padus* in Latin. The paragraph in German following the description indicates they had just one Lorquin specimen from Halmahera and that it was in the Felder collection. The HT ♂ is now in the NHMUK (Fig. 9).

Note 2: Bethune-Baker (1903: 46) gave a full description of both sexes from Halmahera and stated that "the male agrees quite with Felder's type". He provided excellent illustrations showing both surfaces of both sexes and the male genitalia (pl. 1, figs. 12 & 13; pl. 4, figs. 12 & 12a). He noted the similarity as well as the differences between specimens from Bacan and Mangole and as we will discuss under *Arhopala viola*, he mistakenly considered *viola* Röber a synonym of *padus.* We consider the Mangole specimens of *eridanus* to be subspecies *elfeta*.

Arhopala eridanus elfeta (Hewitson, 1869)

(Fig. 10: ♂, Sanana; Fig. 11: ♀, Taliabu; Fig. 12: ♀ Type, Sula Islands; Fig. 13: ♂, Mangole; Fig. 14: ♀, Mangole; Fig. 15: ♂, Sula Islands; Fig 29: ♂, Mangole.)

Plate 1, Figs. 1–18: Subspecies of ***Arhopala eridanus***. — **Figs. 1–6:** *A. eridanus eridanus:* **1:** ♂, ups./uns., Seram (Kamariang, iv. 1993, CARR). **2:** ♀, ups./uns., Haruku (x. 2006, CARR). **3:** ♀, Type, ups./uns., Ambon (Amboin[a], Doleschall, Felder Coll., NHMUK). **4:** ♂, ups./uns., Buru (x. 2006, coll. Yagishita). **5:** ♀, ups./uns., Ambon (x. 2009, CARR). **6:** ♂, ups./uns., Seram (HT *polita*, 1884, coll. C. Ribbe, SMT). — **Figs. 7–9:** *A. eridanus padus:* **7:** ♂, ups./uns., Halmahera (Halmaheira, Ex. Oberthür Coll., NHMUK). **8:** ♀, ups./uns., Halmahera (Halmaheira, Ex. Oberthür Coll., NHMUK). **9:** ♂, HT, ups./uns., Halmahera (Halmaheira, Lorquin, Felder coll., NHMUK). — **Figs. 10–15:** *A. eridanus elfeta:* **10:** ♂, ups./uns., Sanana (i. 2012, CARR). **11:** ♀, ups./uns., Taliabu (viii. 2012, CARR). **12:** ♀, Type, ups./uns., Sula islands (Sula, Celebas, Hewitson coll., NHMUK). **13:** ♂, ups./uns., Mangole (Mangola, Xulla Is, Platen. [18]94, NHMUK). **14:** ♀, ups./uns., Mangole (Mang. Sula, Pl[aten], NHMUK). **15:** ♂, ups./uns., Sula Islands (Ile Sula, Ex. Oberthür Coll., NHMUK). — **Figs. 16–18:** *A. eridanus lewara:* **16:** ♂, ups./uns., Peleng (ii. 2007, CSSK). **17:** ♀, ups./uns., Sulawesi (LT *itama,* 1919, Kalawara, Celebes, SMT). **18:** ♂, ups./uns., Sulawesi (Celebes, 1919, SMT). — The photographs of the NHMUK specimens are © Trustees of the Natural History Museum London, reproduced with permission.



Amblypodia eridanus elfeta: Hewitson (1869: 14b, pl. 3a, fig. 40); TL: Sula Islands – see note 1.

Range: endemic to the Sula Islands – Mangole (NHMUK). – New Records: Taliabu (1 ♀, viii. 2012, CARR; 1 ♀, i. 2003, coll. Okubo) and Sanana (1 ♂, i. 2012, CARR; 1 ♂, iii. 2013, coll. Yagishita).

Note 1: Hewitson (1869) described only the ♀ *elfeta* and illustrated the underside. He noted: "In the Collection of W. C. Hewitson, from Sulla (Celebes)." Evans (1957: 89) noted that the TL was "Sula Mangoli" and the ♀ "Type" was in the NHMUK. There is a ♀ (Fig. 12) in the NHMUK bearing a red type label, a Hewitson Coll. label and a handwritten label stating: "Sula, Celebas".

Note 2: Bethune-Baker (1903: 48) gave a full description of just the ♀.

Note 3: Evans (1957: 89) noted that the male upperside forewing black border was 3 mm at the apex to 0.5 mm at the dorsum in comparison to thread-like borders in *eridanus, padus* and *lewara*, so *elfeta* ♂♂ are easily distinguished from the other races.

Arhopala viola (Röber, 1887), stat. rev.

(Fig. 22: ♂, Peleng; Fig. 23: ♂, genitalia, Peleng; Fig. 24: ♀, Banggai – figure 148a from Seitz 1926; Fig. 30: ♂ LT, Banggai.)

Amblypodia viola: Röber (1887: 199, pl. 9, fig. 4); TL: Banggai Island – see note 2.

Range: Banggai (Röber, 1887). New records: Peleng (3 ♂♂, ii. 2007; 1 ♂, iv. 2007, coll. Yagishita) and Taliabu (new race – see below).

In the notes below we speculate on the identity of *Arhopala viola* (*sensu* Semper), discuss the Sulawesi Region races of *Arhopala eridanus*, raise the taxon *viola* Röber to a full species of *Arhopala* and document and describe a new, second race of *viola* Röber from Taliabu.

Note 1: Regarding *Arhopala viola* (*sensu* Semper). Semper (1890: 196), in German, listed *Arhopala viola* Röber in his paper on Philippine butterflies. He noted that the specimens (1 ♂, 2 ♀♀) in Staudinger's collection from Southeast Mindanao, were much smaller than Röber's typical specimens from Banggai, but he still could not separate them.

Bethune-Baker (1903: 46) treated *viola* Röber as a synonym of *padus*. He considered Semper's Mindanao specimens to represent a distinct taxon, listing them as "*Arhopala viola* Semp. (*non viola* Röber)" and described and illustrated (p. 51, pl. 1, fig. 7 & pl. 3, figs. 29 & 30) Semper's ♂ and both (different) ♀♀ from Mindanao. He stated that the females were different, noting on the figure captions "*viola* type ♀" for fig. 29 and "*viola* var. ♀" for fig. 30.

Evans (1957: 134) stated: "It has been ascertained from Dr. E. M. Hering of the Berlin Museum that the [Semper Mindanao '*viola*'] specimens were destroyed in the war." Evans added that Bethune-Baker's figures did not agree well with the few specimens in the NHMUK labelled as subspecies (*eridanus*) *dilutior* Staudinger, 1889 from the Philippines [Palawan], and that until more material became available, the creation of a name did not seem necessary.

We have examined Bethune-Baker's three painted figures and consider they represent at least 2, possibly 3, species. The underside pattern of the ♂ (pl. 1, fig. 7), particularly the forewing postdiscal band, is very different from the 2 ♀♀ (pl. 3, figs. 29 & 30). The ♀♀ have broadly similar underside patterns, but also differ in some features.

Schroeder & Treadaway (1978: 150) described and illustrated *Arhopala alexandrae* from just 1 ♀ from Mindanao. Their HT ♀ matches well with Bethune-Baker's *viola* (*sensu* Semper) ♀ in fig. 29. They did not mention *viola*.

Schroeder & Treadaway (2006: 201) described *Arhopala eridanus davalma* from Mindanao. Again, they did not mention *viola*. Their photographs of the HT ♂ and a PT ♀ do not match Bethune-Baker's figured paintings. But we note that Bethune-Baker's figures are not always accurate portrayals. Bethune-Baker compared the taxon to *eridanus* Felder, noting *viola* (*sensu* Semper) to be smaller and that the pale central area in the ♀ was very restricted. Bethune-Baker's description is consistent with Schroeder & Treadaway's illustrated *davalma* PT ♀, but not with his own figures. However, Bethune-Baker noted that in the male upperside, the apex and outer margin were broadly blackish, which corresponds better to his figure than to Schroeder & Treadaway's *davalma* HT ♂.

In their internet based checklist of Philippines Lycaenidae, Takanami & Seki considered both *nakamotoi* Hayashi, 1978 and *viola* (*sensu* Semper) synonyms of *A. alexandrae.* They referred to *viola* as "*viola* Bethune-Baker, 1903 nec Röber, 1887 nom. praeocc." In summary we consider that Bethune-Baker's ♀ in fig. 29, pl. 3 represents *A. alexandrae*, but are unsure of the identity of his "*viola*" ♂ (pl. 1, fig. 7) and the other ♀ (pl. 3, fig. 30).

In any case, *A. viola* (*sensu* Semper), *A. eridanus davalma* and *A. alexandrae* are only reported from Mindanao in the Philippines and so are not relevant to our Maluku checklist.

Note 2: Röber (1887: 199, pl. 9, fig. 4) described and illustrated *viola* from 3 ♂♂ brought by H. Kühn from "Bangkei" (= Banggai). Takanami (1989: 51) designated a LT ♂ (Fig. 30) in the SMT and illustrated both surfaces in figs. B-33a & B-33b. The TL of *viola* is "Bangkei" – which could mean Banggai Island itself or Peleng, the other major island in the Banggai group.

Note 3: In his revision of the *Amblypodia* group, Bethune-Baker (1903: 46–47) considered *viola* Röber only a slight local form of *padus* and therefore a synonym of *A. eridanus padus*, whilst Evans (1957: 89) treated *viola* as a synonym of *A. eridanus elfeta*.

Note 4: Ribbe (1926: 87), in German, introduced the name *lewara* for "*padus*" specimens from West Celebes (= C. W. Sulawesi) and described differences from Bacan *padus* specimens. He also noted that ♀♀ from West Sulawesi were dark, almost completely without blue and named these ♀♀ as *itama*. Ribbe (1926: 87–88) also compared *viola* Röber to *padus* and Sulawesi *lewara*. He disagreed with Bethune-Baker and considered *viola* altogether different from both. He noted the absence of cell end spots in *padus* (including "*padus*" *lewara*) but always well pronounced in *viola.* He added that the broad black tip of the wing, the broad blackish margin of both wings, deeper brown underside and the more pointed forewing immediately distinguish *viola* from *padus*.

Note 5: Röber (1887: 199) described only the ♂ of *viola* and neither Bethune-Baker (1903), nor Ribbe (1926) mentioned the ♀. Seitz (1926: 951, pl. 148a) treated *viola* as the Banggai race or form of *padus* and noted that the upperside hindwing of the ♀ did not exhibit the distinct bordering present in *padus*. The ♀ illustrated by Seitz (Fig. 24) is very different from *eridanus lewara* Peleng ♀♀ (Fig. 21). We do not know where this specimen is held and we have not seen any nominotypical *viola* ♀♀.

Note 6: Evans (1957: 89) synonymised *itama* with *lewara*, noting the ♀ as an "all brown form". Takanami (1989: 51) designated an *itama* LT ♀ (Fig. 17) in the SMT and illustrated both surfaces in figs. B-32a & B-32b.

Note 7: Vane-Wright & de Jong (2003: 122) listed two races of *eridanus* in the Sulawesi Region – *elfeta* from Mangole in the Sula Islands and *lewara* Ribbe, 1926 from "Sulawesi, Kep. Banggai (Peleng: Hayashi 1984)". "Kep." is an abbreviation for kepulauan (= island group), so Kep. Banggai means the Banggai Island group, which consists of Banggai Island and Peleng.

Detani (1983: 55) described *Narathura anarte hayashii* from Peleng. Hayashi (1984: 12) synonymised this name with *Arhopala eridanus lewara,* noting that he had received advice from J. N. Eliot and Y. Takanami.

The 3 *eridanus lewara* ♀♀ in the NHMUK from Sulawesi have uniformly brown uppersides with barely a hint of purple blue basal streaks. However, the extent and depth of colour of these basal streaks is a variable feature in both Sulawesi and Peleng *lewara* ♀♀ (CARR, CACM, coll. YAGISHITA). This is also the case in Sula Island *eridanus elfeta* ♀♀, but we have not seen any all brown examples. The male upperside forewing in Sulawesi and Peleng specimens has a thread-like black border, whereas that of *elfeta* (Sula Islands) is on average about 3 mm wide at the apex, narrowing gradually to 0.5 mm wide at the dorsum. We note that Sulawesi specimens are generally smaller than those from Peleng, but treat both the Sulawesi (Figs. 17, 18) and Peleng (Figs. 16, 19, 21) *eridanus* populations as subspecies *lewara*.

Note 8: Regarding *Arhopala viola* and *Arhopala eridanus* in Peleng/Banggai. We have examined photographs of 4 recently collected ♂♂ of the *viola* phenotype from Peleng (3 ♂♂, II. 2007; 1 ♂, IV. 2007, coll. YAGISHITA) which clearly match the *viola* LT ♂ (Fig. 30) and a PLT ♂ in the SMT.

1. We consider, as did RIBBE (1926: 87–88), that *viola* ♂♂ from Banggai and Peleng clearly differ from *eridanus lewara* from Sulawesi and Peleng. We note the following:

- The undersides are very similar.
- The upperside ground colour appears slightly more purple in *viola*.
- The forewing apex is sharper and less rounded in *viola.*
- Most noticeably, *viola* has clearly broader black borders on the forewing – approximately 6 mm at the apex and then continuing down the margin at a constant width of 4 mm until vein 2, whereas *A. eridanus lewara* specimens from both Peleng and Sulawesi have thread-like borders.
- Specimens of *viola* have an upperside forewing cell end spot or bar, absent (on very rare occasions vestigial) in *eridanus* races.
- Specimens of *viola* are generally significantly smaller. The FwL of the LT is 24.5 mm, the PLT 27 mm. A. YAGISHITA (pers. comm.) has measured the FwL of 4 *viola* ♂♂ from Peleng in his collection – 3 (all II. 2007) are 26 mm and 1 (IV. 2007) is 28 mm. On average the FwL of *viola* from Banggai and Peleng is 26 mm. H. DETANI (pers. comm.) has measured 11 specimens of *A. eridanus* from Peleng and they range from 26–32 mm with an average of 30 mm (♂♂ and ♀♀ the same size on average).

The taxa *viola* and (*Arhopala eridanus*) *lewara* are sympatric on Peleng and we therefore consider that *viola* is not a race of *eridanus* but a distinct species – *Arhopala viola* RÖBER, 1887.

2. H. DETANI (pers. comm.) informed us that the butterfly fauna differs in east and west Peleng. The Peleng endemics such as *Charaxes setan*, DETANI, 1983, and *Hebomoia leucippe detanii* NISHIMURA, 1983, are only found in east Peleng, and he believes *Arhopala viola* is also restricted to the east. Much of the forest in the east has been cut down now, so *Arhopala viola* may disappear from Peleng. He added that *Arhopala eridanus lewara* occurs in both east and west Peleng.

Note 9: Regarding *Arhopala viola* and *Arhopala eridanus* in the Sula Islands. EVANS (1957: 89) synonymised *viola* with *A. eridanus elfeta* without giving any reason. He listed 12 ♂♂ & 5 ♀♀ from Mangole in the NHMUK. We located 3 ♀♀ with Mangole labels and 1 ♀ with a label merely stating "Soela". All four are indistinguishable from the *elfeta* ♀ "Type" (Fig. 12) also present in the NHMUK.

Phenotypical separation of the ♂♂ of *eridanus lewara* (thread-like upperside forewing black marginal borders) and *viola* from Peleng is very simple, based on their very different upperside forewing black apical and marginal borders.

However, *eridanus elfeta* ♂♂ from the Sula Islands have broader upperside forewing black apical and marginal borders (EVANS 1957: 89, noted 3 mm wide at the apex, narrowing to 0.5 mm wide at the dorsum) than all other races of *eridanus* (including the Philippine subspecies) and therefore superficially resemble *viola* from Peleng. However, there are differences in the shape and width of the borders, and the other characteristics noted earlier to separate the species still apply – *viola* are smaller, with a sharper forewing apex and have an upperside forewing cell end spot or bar, that is absent or vestigial in *eridanus*.

We note that amongst these 12 ♂♂ (9 bearing Mangole labels, and 3 with Sula labels) in the NHMUK, a few specimens partially demonstrate a feature more typical of *viola*. For example, one (Fig. 29) has a slightly sharper forewing apex than typical *eridanus*. Another specimen has a very faint upperside forewing cell end spot. A third is unusually small for *eridanus*. But none comes close to matching *viola* from Peleng/Banggai and we consider them all to represent *eridanus elfeta*.

Note 10: Regarding a new *Arhopala* taxon from Taliabu. We have received photographs and the abdomen of an *Arhopala* specimen from Taliabu (Figs. 25 & 26 [genitalia], FwL 25 mm, VIII. 2002, coll. YAGISHITA). This specimen, confirmed as a male by genital dissection, is similar to the *viola* LT and other *viola* specimens from Peleng, but the upperside forewing black borders are clearly different. They are significantly wider, about 8 mm at the apex tapering *gradually* down the outer margin to 4 mm wide at vein 2, then tapering further to the dorsum. We have examined photographs of 6 *viola* ♂♂ (including the LT and a PLT) from Peleng or Banggai and they all have remarkably consistent black apical and outer marginal borders, all approximately 6 mm at the apex and then continuing down the margin at a *constant* width of 4 mm until vein 2, then abruptly narrowing to thread-like to the dorsum.

The undersides are very similar, but the pale patch on the forewing underside in spaces 1a and 1b is whiter in *viola* and contrasts more with the ground colour of the rest of the wings. In addition, the white edging to the spots is more pronounced in *viola*.

We have compared the genitalia of this ♂ (Fig. 26) with those of ♂♂ of nominotypical *viola* (Fig. 23) and *eridanus lewara* from Peleng (Fig. 20). There are minor differences, notably the more pointed apex of the gnathos in the Taliabu specimen and slight differences in the anterior tips of the aedeagi in all 3 specimens. We do not consider these small variations diagnostic and it seems that the genitalia of the *anthelus* species-group are very similar and not helpful in differentiating species. For other examples of the genitalia of taxa in the *anthelus* species-group, see BETHUNE-BAKER (1903: figs. 12, 13, 16) for *padus, eridanus* and *annulata*. PARSONS (1998: 382) transferred *Arhopala antharita* GROSE SMITH, 1894 from EVANS' placement in the *eumolphus* species-group to the *anthelus* species-group and illustrated (pl. XII) its genitalia.

We have also received images of a second, larger, but otherwise very similar, specimen from Taliabu (Fig. 27; FwL 30 mm, X. 2006, coll. YAGISHITA). It has very broad and more extended upperside black borders on both forewings and hindwings. The upperside forewing black apical markings are about 12 mm wide at the apex tapering gradually down the margin to 5 mm wide close to dorsum. The underside is identical to that of the first specimen. We have been unable to dissect the genitalia of this second specimen, but we believe it is a ♀.

We consider these 2 Taliabu specimens represent a new taxon. It is arguable whether this new taxon warrants full species status, but for now we treat it as a new race of *viola* which we describe here.

Arhopala viola harmonica ssp. n.

(Fig. 25: HT ♂, Taliabu; Fig. 26: its genitalia; Fig. 27: PT ♀, Taliabu.)

Holotype ♂: Indonesia, Sula Islands, Taliabu, VIII. 2002 (coll. YAGISHITA – see note 1).

Paratype (1 ♀): Indonesia, Sula islands, Taliabu, X. 2006 (coll. YAGISHITA).

Etymology: Viola is also the name of a musical instrument and this new name follows that theme.

Range: Taliabu in the Sula islands. Mangole[?] — see note 2.

Diagnosis and description

♂ (Fig. 25): FwL 25 mm. Upperside ground colour more purple than in *viola viola*. Forewing black border significantly broader, about 8 mm wide at the apex, tapering gradually down the outer margin to 4 mm wide at vein 2, then tapering further to the dorsum. Forewing black cell-end bar more prominent than in nominotypical *viola*. The outer part of hindwing space 6 black, space 7 predominantly black, only basally blue. A 5 mm long tail at vein 2. Veins dusted with black.

Underside ground colour medium brown, with markings of the typical *eridanus*/*viola* pattern, consisting of large lunules, outlined with white. The white outlines clearly less prominent than in nominotypical *viola*. The forewing post-discal band broken at vein 4, as in *eridanus* and nominotypical *viola*.

Outer part of space 1a and 1b slightly paler brown, but not whitish and strongly contrasting with remainder of wings as in nominotypical *viola*. Small post-discal spot in space 1b.

Hindwing underside post-discal band fully dislocated at vein 2, partially at vein 4, then following a regular curve to spot in space 7, except spot in space 4 shifted inwards, as in *eridanus* and nominotypical *viola*. A black tornal spot in space 1a; metallic blue scales on black marginal spot in space 2; black marginal spot in space 3, all as in *eridanus* and nominotypical *viola*.

♀ (Fig. 27): FwL 30 mm. Upperside as male but with broader black borders; on forewing starting almost centrally on the costa, about 12 mm wide at the apex tapering gradually down the margin to 5 mm wide near dorsum. Underside as male.

Note 1: The HT ♂ is currently in the collection of Akira Yagishita, but in the future will be deposited in the University Museum of the University of Tokyo.

Note 2: We have also examined photographs of a similar butterfly from Mangole (Fig. 28; FwL 25.5 mm, vii. 1992, coll. Seki). This specimen, confirmed as a male by Y. Seki, has broad and dark upperside forewing black apical markings, about 9 mm wide at the apex tapering gradually down the outer margin to 4 mm wide at vein 2, and then tapering further to the dorsum. It has the same size, wing shape and extent of black borders as the HT ♂ from Taliabu, however it has only a small cell end spot rather than the well-defined bar present in the *harmonica* HT & PT. We speculate that this specimen is an example of the new taxon but do not include it as a PT.

Note 3: This new taxon is sympatric with *eridanus elfeta* in Taliabu.

The *camdeo* subgroup of the *anthelus* species-group

Evans (1957: 90–92) included nine species in his *camdeo* subgroup, one of which occurs in Maluku.

Arhopala annulata (C. Felder, 1860)

(Fig. 31: ♂, Ambon; Fig. 32: ♂ PT, Ambon; Fig. 33: ♂ HT, Ambon; Fig. 34: ♀, Ambon.)

Amblypodia annulata: C. Felder (1860: 452); TL: Ambon — see note 1.

= *Amblypodia tristis:* Röber (1887: 200, pl. 9, fig. 9); TL: Banggai — see note 2.

= *Amblypodia erebina:* Staudinger (1889: 123, pl. 1, fig. 14); TL: Palawan — see note 3.

= *Narathura schroederi:* Hayashi (1981: 68, figs. 9–10); TL: Palawan — see note 4.

Range: Ambon, Buru, Sulawesi, Palawan, Philippines (NHMUK), Saparua (Staudinger 1889), Banggai (Röber 1887). — New records: Peleng (1 ♂, ii. 2007; 1 ♂, i. 2008; 1 ♀, vii. 2015; all coll. Yagishita) — see notes 4 & 6.

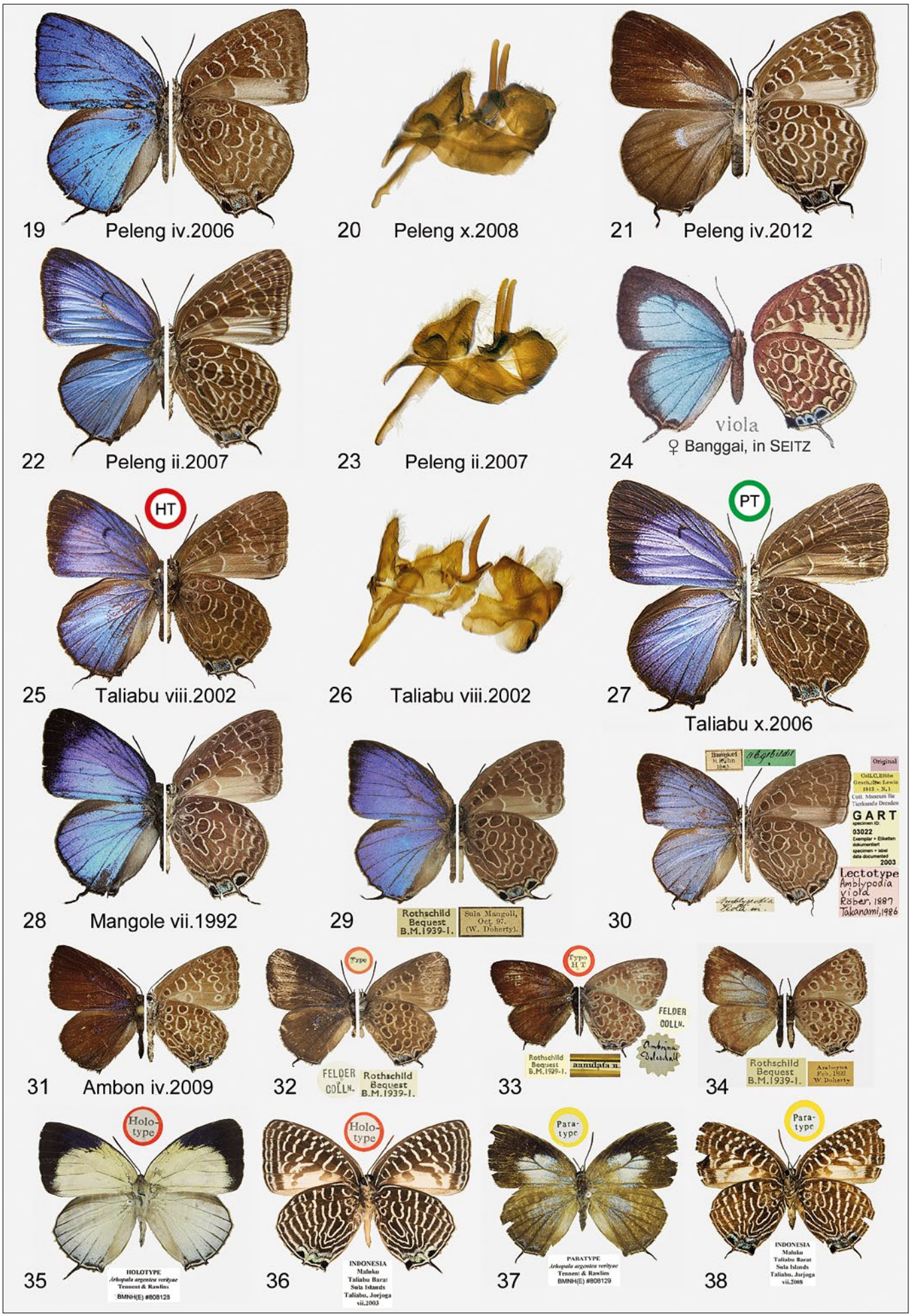
Note 1: Felder (1860) described both sexes in Latin and recorded that the specimens were in the Felder collection. Evans (1957: 90) noted the ♂ "Type" from "Amboina" and a further 14 ♂♂ & 3 ♀♀ from Ambon were in the NHMUK. There is 1 ♂ bearing a red HT label (Fig. 33) and a second bearing a red "Type" label (Fig. 32) which we consider to be a PT.

Note 2: Röber (1887), in German, described the ♀ of *tristis* from "Bangkei". He noted the specimen/s was in his collection and was supplied by H. Kühn. He illustrated both upperside and underside. Takanami (1989: 51 & 66, fig. B-34) designated a LT ♀ in the SMT and indicated that this LT was the specimen figured by Röber. Röber's description did not state the number of ♀♀ but in giving the wingspan he quoted a specific figure of 36 mm. In other descriptions where he indicated he had examined a series of specimens he usually gave a size range for the wingspan. Therefore, this LT may be the only type specimen.

Note 3: Staudinger (1889) described *erebina* in German, from 2 ♂♂ from Palawan, sent by Dr. Platen. He also stated he owned a pair from Saparua. Takanami (1989: 26 & 66, fig. A-23) designated a LT ♂ and noted a further PLT ♂ from Palawan in the Museum für Naturkunde, Berlin. He questioned the sex of his LT and noted (p. 66) the LT "male [?]" had lost its abdomen.

Note 4: Semper (1890: 196) synonymised *tristis* and *erebina* with *annulata.* Bethune-Baker (1903: 52, pl. 4, figs. 16 & 16a, genitalia) and Evans (1957: 909) also treated *tristis* and *erebina* as synonyms of *annulata.* Bethune-Baker gave the range as Ambon, Saparua, Banka, Palawan and Mindoro. His inclusion of Banka (a large island to the east of Sumatra) was a misinterpretation of Röber's TL of Bangkei = Banggai – the island and island group to the east of Sulawesi.

Plate 2, Figs. 19–21: ***Arhopala eridanus lewara:*** **19**: ♂, ups./uns., Peleng (iv. 2006, CSSK). **20:** ♂, genitalia, Peleng (x. 2008, CARR). **21:** ♀, ups./uns., Peleng (iv. 2012, CSSK). — **Figs. 22–28:** Subspecies of ***Arhopala viola*****. Figs. 22–24 & 30:** *A. viola* ***viola:*** **22:** ♂, ups./uns., Peleng (ii. 2007, coll. Yagishita). **23:** ♂, genitalia, Peleng (ii. 2007, coll. Yagishita; different specimen from Fig. 22). **24:** ♀, ups./uns., Banggai, from Seitz (1926: fig. 148a). **30:** ♂, LT, ups./uns., Banggai (Bangkei, 1885, H. Kühn, SMT). **Figs. 25–27:** *A. viola* ***harmonica*** **ssp. n.: 25:** ♂, HT, ups./uns., Taliabu (viii. 2002, coll. Yagishita). **26:** same specimen, genitalia. **27:** ♀, PT, ups./uns., Taliabu (x. 2006, coll. Yagishita). **Fig. 28:** ?*A. viola* ***harmonica*** **ssp. n.,** ♂, ups./uns., Mangole (vii. 1992, coll. Seki). — **Fig. 29:** ***Arhopala eridanus elfeta:*** ♂, ups./uns., Mangole (Sula Mangoli, x. [18]97, W. Doherty, NHMUK). — **Figs. 31–34:** ***Arhopala annulata:*** **31:** ♂, ups./uns., Ambon (Mt Tuna, iv. 2009, CSSK). **32:** ♂, PT, ups./uns., Ambon (Felder Coll., Rothschild Bequest, 1939-1, NHMUK). **33:** ♂, HT, ups./uns., Ambon (Amboina, Doleschall, Felder Coll., Rothschild Bequest, 1939-1, NHMUK). **34:** ♀, ups./uns., Ambon (Amboyna, ii. 1892, W. Doherty, NHMUK). — **Figs. 35–38:** ***Arhopala argentea verityae:*** **35–36:** ♂, HT, ups./uns., Taliabu (Jorjoga, Taliabu Barat, vii. 2003, NHMUK). **37–38:** ♀, PT, ups./uns., Taliabu (Jorjoga, Taliabu Barat, vii. 2008, NHMUK). — The photographs of the NHMUK specimens are © Trustees of the Natural History Museum London, reproduced with permission.



Note 5: Hayashi (1981) described and illustrated *schroederi* from 2 ♀♀ from Palawan and noted that the male was unknown. The HT ♀ is in the National Science Museum (Nat. Hist.), Tokyo. Takanami (1989: 66) formally synonymised *schroederi* with *erebina* (and hence with *annulata*) stating "I confirm that Staudinger's *erebina* and Hayashi's *schroederi* are the same species."

Note 6: It seems there have been very few recent records of *annulata* in Maluku, but 1 ♂ from Ambon (Mt. Tuna, 300–400 m, iv. 2009, CSSK – Fig. 31) confirms the recent occurrence of the species there.

Annotated checklist of the *Arhopala "theba* species-group" taxa of North Maluku and Maluku

Evans (1957: 99–100) included just four species in this group, only one of which is present in Maluku.

Arhopala argentea Staudinger, 1888

Arhopala argentea: Staudinger (1888: 281, pl. 96); TL: Sulawesi – see note 1.

= *Arhopala clarissa*: Grose Smith (1897: 366); TL: South Sulawesi – see note 2.

Range: Sulawesi, Peleng, Taliabu (NHMUK).

Note 1: Staudinger described both sexes and illustrated the male from specimens sent by Dr. Platen from Minahassa in N. Sulawesi. Takanami (1989: 28) designated a ♂ LT and a ♀ PLT in the Museum für Naturkunde, Berlin.

Note 2: Grose Smith described only the male of *clarissa* from Doherty material from "S. Celebes" in the Tring Museum. He noted "The antennae have unfortunately been destroyed", indicating there was only one specimen. Tring Museum entomological collections were incorporated in the NHMUK, but we were unable to find the type in the NHMUK collections. Both Bethune-Baker (1903: 57) and Evans (1957: 100) listed *clarissa* as a synonym of *argentea.*

Note 3: Tennent & Rawlins (2010: 12) described two further races of *argentea – boordi* from Peleng and *verityae* from Taliabu in the Sula Islands. All three subspecies are confined to the Sulawesi geographical region. The Sula Islands, while geographically part of the Sulawesi Region are in the Province of North Maluku and so *verityae* is included here.

Arhopala argentea verityae Tennent & Rawlins, 2010

(Figs. 35–36: ♂ HT, Taliabu; Figs. 37–38: ♀ PT, Taliabu.)

Arhopala argentea verityae: Tennent & Rawlins (2010: 12, figs. 11–15); TL: Taliabu – see note 1.

Range: Sula Islands, Taliabu – see note 2.

Note 1: Tennent & Rawlins (2010) described and illustrated both sexes of *verityae* from 3 ♂♂ and 1 ♀ from Taliabu. The ♂ HT and the ♀ PT are in the NHMUK (Figs. 35–38).

Note 2: We consider it likely that this race also occurs on the other Sula islands.

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