The *Arhopala centaurus*-group of Evans (1957) in Papua, Indonesia (Lepidoptera: Lycaenidae)

Stefan Schröder

Auf dem Rosenhügel 15,
50977 Köln, Germany
Email: ste.schroeder@gmx.net

Suara Serangga Papua **9**(1): 1-22

Abstract: Currently available information concerning distribution and taxonomy of the *Arhopala centaurus*-group in West Papua is reviewed, along with new information concerning *Arhopala admete* (Hewitson). *Arhopala sorena* **spec. nov.** is described as a new species and photographic illustrations of the type specimens of *A. kiriwinii*, *A. hylander* and *A. philander pratti* are given for the first time. *Arhopala eucolpis* **stat. rev.** is raised to species rank. A new combination *Arhopala eucolpis sudesta* **comb. nov.** is proposed.

Rangkuman: Informasi yang saat ini tersedia menyangkut distribusi dan taksonomi dari *Arhopala centaurus*-group di Papua ditinjau kembali, sekaligus dengan informasi baru mengenai *Arhopala admete* (Hewitson). *Arhopala sorena* **spec. nov.** dipertelakan sebagai spesies baru dan foto-foto dari type spesimen dari *A. kiriwinii*, *A. hylander* dan *A. philander pratti* disajikan untuk pertama kalinya. *Arhopala eucolpis* **stat. rev.** diberikan status spesies. Kombinasi baru *Arhopala eucolpis sudesta* **comb. nov.** diusulkan.

Keywords: West Papua, *Arhopala sorena* **spec. nov.**, *Arhopala eucolpis* Kirsch, 1877 **stat. rev.**, indo-australian Theclini, *Arhopala fulla*-group.

Introduction

One of the least understood taxonomic group within the large indo-australian theclinid genus *Arhopala* Boisduval, 1832 is the *centaurus*-group sensu Evans (1957). During recent years, taxonomy of the genus in some of the faunistically less known regions was reviewed by Parsons (1998), Tennent (2002) and Tennent & Rawlins (2010), covering Papua New Guinea, the Solomons and the Maluku region. However,

distribution of many species is still insufficiently known and only few illustrations are available for records from West Papua (Gotts & Pangemanan 2010, Tim Redaksi KEP 2010, van Mastrigt & Rosariyanto 2005, van Mastrigt & Warikar, 2013) and a first overview is given here for the *centaurus*-group, generally regarded as one of the more difficult groups of *Arhopala*. The status of the taxa comprising *Arhopala admete* (Hewitson) is also discussed.

Because of the wide variability of underside wing-markings, determination and separation of many closely related species remains difficult. Depending on the different evaluation of characters or their combination, it is likely that different results in determining specimens are achieved. In part this is also due to insufficiently illustrated type specimens.

In the past, "radically different views on grouping" (Megens *et al.,* 2004) have been applied in an attempt to unravel the confused situation and a good example for the diverging views are the publications of Evans (1957) vs. Parsons (1998). Parsons strongly criticized Evans' revision concerning P.N.G. taxa of the *centaurus*-group and regards his work as rather useless, as – in Parsons view – Evans had frequently assigned specimens wrongly or mixed them up. On the contrary, the review of Parsons is not without errors and his descriptions or combination of specific characters is not unequivocal in all cases; sometimes even contradictory.

Parsons also mistakenly includes the tailless species *A. azenia* and *A. admete* at the end of his *centaurus*-group, continuing to describe the *fulla*-group as "4 distinctive tailless species". He then goes on to state that "3 species (of the *fulla*-group) are represented in PNG" but then details only one. The other two, *A. admete* and *A. azenia*, are viewed here as part of the *fulla*-group.

Several of Parsons' determinations and conclusions can be similarly questioned. This explains the very different views concerning the validity of species, and numerous taxonomic problems in the *centaurus*-group exist to this day. Clear illustrations of many species are still missing, which are fundamental for any reliable interpretation.

The purpose of this paper is to sum up the available information, to assist in understanding taxonomy and to give aid in determination of species in the *centaurus*- and *fulla*-groups occurring in West Papua. Aspects of possible hybridisation or the extensive homoplasy in this group (Megens *et al.,* 2004) are beyond the scope of this review.

Abbreviations

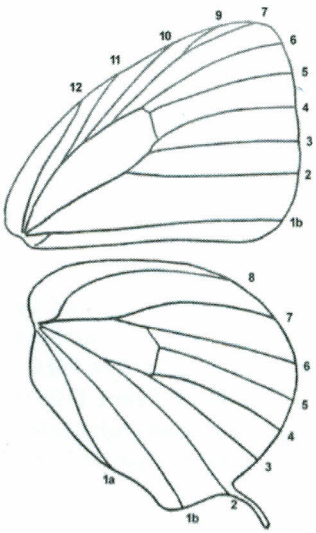
BMNH	– Natural History Museum, London, U.K.
CSSK	– Collection Stefan Schröder, Köln. Germany
KSP	– Koleksi Serangga Papua, Jayapura, Indonesia
P.N.G. (PNG)	– Papua New Guinea
TL	– Type Locality.

Systematics

Arhopala centaurus-group

Arhopala adherbal Grose-Smith, 1902 (pl. 2, figs 9-11)
(= *Arhopala appianus* Grose-Smith, 1902)

The holotype of *Arhopala adherbal* was described from Milne Bay in Papua New Guinea. Grose-Smith referred especially to the pinkish-brown wing underside colour and the large postmedian spots in spaces 5 and 6 of the hindwing. The same applies to his *A. appianus* Grose-Smith, 1902 (TL = Humboldt Bay) which was later synonymized with *adherbal* (Evans, 1957: 115). The specimen of *A. appianus* figured by Grose-Smith (1902) has slightly smaller hindwing spots in spaces 5 and 6, but they are still in line with the inner margin of the cell end bar. The dark submarginal patch on the hindwing is not as strong as in *adherbal* but this is obviously not a character that can stand alone.
Within the *centaurus*-group several species are characterized by this more or less developed dark patch at the hindwing margin in spaces 4 and 5. This was used by Parsons (1998) as one character to separate closely related species. These are *A. adherbal, kiriwinii, madytus* and *leander* in descending order. *A. adherbal* is characterized by a strong, rounded, submarginal dark patch. Like *A. kiriwinii* Bethune-Baker, 1903, *A. adherbal* is a broadly marked species, the hindwing postmedian band is very broad and spots in spaces 5 and 6 appear almost square.



Venation as used in text
(taken from Eliot in Corbet & Pendlebury 1992)

The forewing postmedian band is usually of constant width, only slightly curved and well separated from the discocellular spot.

Separation of *A. adherbal* from *A. kiriwinii* is based on the forewing postmedian band, which is inclined towards the discocellular spot in *kiriwinii*, often touching it, and the cell spots being outlined with some metallic blue scales (Parsons, 1998: 388). The dark marginal patch is stronger in *adherbal*. *A. madytus* has comparably narrower wing markings and the forewing postmedian band is narrowing towards the costa. A species very closely related to *A. adherbal* is *A. lata* Evans, 1957, (pl. 2, fig.12), described from a short series of five males from Halmahera and which was subsequently also recorded from Morotai, which lies just north of Halmahera (Tennent & Rawlins, 2010). Principally, *lata* differs from *adherbal* in having a broader forewing discal band and a ("unique") hindwing spot at the base of space 6. This spot seems to be variably developed and may be present on one hindwing only; so it is possible that *lata* may be conspecific with *adherbal* (Rawlins, pers. comm. 2014), which also occurs on Halmahera (Evans, 1957: 115).
A. adherbal is widely distributed in West Papua as records from Waigeo, Sarmi, Sorong, Timika and Jayapura (Yos-Sudarso Bay) suggest [KSP data]. Specimens from Sorong (Western Doberai Peninsula) and Timika (pl. 2, figs 9, 11) show a strong pinkish suffusion of the underside, which corresponds very well with the original figures of Grose-Smith in Grose-Smith & Kirby (1902: pl. 3, figs 3-4). Most specimens from Sorong also have the "whitish area between the discal spots in spaces 6, 7 and the central spots" on the hindwing, as noted by Evans (1957: 115) and even the angular sub-basal spot in space 7 is likewise developed; characters not present in the P.N.G. specimens figured by Parsons (1998: pl. 56, figs 1523-1526) but in the specimen figured by D'Abrera (1977: 311). It can not be excluded that the P.N.G. specimens of Parsons (pl. 56, figs 1523-1526) belong to a separate race close to *A. kiriwinii* as they are morphologically much closer to *kiriwinii* than to *adherbal*.

Arhopala aexone Hewitson, 1863 (pl. 2, figs 13-14)

This is a very distinctive species and easy to identify. It is characterized by almost plain brown to blackish brown undersides with only weak markings and is widely distributed from Halmahera, Buru and Waigeo to Eastern P.N.G. Based on the width of the underside forewing discal band, Evans (1957) recognized two subspecies: one from Halmahera (ssp. *chrysoana* Fruhstorfer, 1914), with a wide band and a second, nominotypical ssp. with a narrow band from New Guinea and outlying islands.

Arhopala alkisthenes Fruhstorfer, 1914 (pl. 3, fig. 15)

A. alkisthenes is only rarely recorded from West Papua. Its phenotype is intermediate between *A. aexone* and *A. micale* and this taxon may be regarded as a faintly marked form of *micale*, but Parsons (1989: 392) retained its species status, stating that it is a "fairly distinctive species". The "male" figured in Parsons (1998: pl. 58, fig. 1581) is in fact a female. In comparison to *A. micale*, underside markings are notably washed out and the fore wing cell spots are not outlined with blue scales.

Arhopala ander Evans, 1957 (pl. 3, fig. 16)

Initially described as a subspecies of *A. philander* Felder, 1865 from Kapaur (near Fak-Fak), Parsons (1998) raised *ander* to species status. The hindwing underside is characterized by a dark band reaching from the base along spaces 4 and 5 to the wing-margin. A specimen from Sorong, figured herein (pl. 3, fig. 16) is remarkable because of its very narrow forewing postmedian band, but which otherwise fits well in the variation known from this rare species.

Arhopala eupolis Miskin, 1890 (pl. 3, figs 19-20)

Vane-Wright & Gaonkar (2005) determined rightly that the name *Arhopala centaurus* (Fabricius, 1775) cannot be applied to a species occurring in New Guinea. The type locality of *A. centaurus* is Java and populations from New Guinea, as well as from Australia, which may previously have been called "*centaurus*" are instead determined as *A. eupolis* Miskin, 1890.

Evans (1957:114) treated *philtron* Fruhstorfer (TL = Yule Is., New Guinea), *eupolis* (TL = Queensland) and *asopus* Waterhouse & Lyell (TL = N.W. Australia) as subspecies of *A. araxes* Felder, 1865 (TL = Sulawesi).

Parsons (1998: 386), along with many other taxonomists at that time, treated *eupolis* as a synonym of *centaurus*, with which he also synonymized ssp. *philtron*. Vane-Wright & Gaonkar returned *eupolis* to species rank, following their location and designation of the Fabrician lectotype, and that name is applicable to appropriate specimens from New Guinea and Australia.

A. eupolis is characterized by the irregular postmedian band on the hindwing underside, being usually in contact with the discocellular spot. In addition, the discal spot in space 6 is usually outwardly concave.

Even though widely distributed, *A. eupolis* is rare in West Papua. Variation is wide and there are rather heavily marked specimens as well as such with only weakly discernible markings. The forewing postmedian band is usually straight and narrow.

Arhopala hylander Grose-Smith, 1894 (pl. 5, figs 27-28)

To Evans (1957), this species was known only from the type specimen (figured herein, pl. 5, figs 27-28), as well as from two further males and one female from Biak Is., West Papua. It appears to be a rather small, weakly marked species with plain brown wing undersides and a small, dark marginal hindwing patch. Bethune-Baker, (1903:31) remarked that *hylander* is a close relative of *philander*, differing only in having the "transverse band broken at the upper median nervule", which is repeated by Evans (1957: 115): "the forewing discal band is irregular and broken at vein 4". The figure in Grose-Smith & Kirby (1898: pl. XV, Arhopala II, fig. 7) is a good reproduction of the type specimen, which shows a faintly developed dark patch on the hindwing margin similar to *meander* or, less so, *philander*. The forewing postmedian band in *hylander* is more like *philander* than *meander*, which has the bands straight and narrow. According to Grose-Smith (1894: 582): *hylander* "scarcely differs from *periander*" (which is regarded as a synonym of *meander* Boisduval, 1832; see below).
The character that traditionally separates *hylander* from *philander* is the dislocated postmedian forewing band, but some of the various subspecies of *philander* illustrated by Parsons (1998: pl. 57) also show some degree of irregularity in this respect. It is possible that *hylander* may in future be treated as a synonym of *philander*. However, new topotype material from Biak is needed to understand variability or to ascertain that the broken forewing band is a reliable character of this species.

Arhopala kiriwinii Bethune-Baker, 1903 (pl. 5, figs 29-32)

In his description of the underside, Bethune-Baker (1903: 38) noted the "extremely large" almost square spots in spaces 6 and 7 on the hindwing, "touching the spot closing the cell". His figure shows the prominent cell spots as well as the forewing postmedian band, which is inclined towards the cell, almost touching the discocellular spot. These characters are also mentioned by Parsons (1998: 388). The underside colour of the type specimens, especially in the male, is quite dark brown, (pl. 5, figs 30, 32; Bethune-Baker 1903: pl. 1, fig. 10), but colouration may vary and aside of the dark brownish (sometimes washed with purple) coloured specimens, there are also specimens with greenish undersides (Parsons, 1998: 391). The forewing cell spots are generally outlined with some blue scales (as in *A. micale*, a character which is usually not present in *adherbal, leander* and only occasionally in *madytus*). The brown marginal hindwing patch is not obvious in the figure of Bethune-Baker, but all the specimens figured by Parsons (1998: pl. 58, figs 1572, 1574) and D'Abrera

(1977: 311) show such a patch almost as well developed as in *A. adherbal*. The combination of a well developed patch, wide underside bands and the strong inclination of the forewing postmedian band towards the cell spot seems typical for *kiriwinii*.
Evans (1957) stressed in his keys that the hindwing postdiscal spot in space 6 overlaps the cell-end bar, but this is only really noted in the males in the type specimens (pl. 5, figs 29-32) and in other specimens figured by Parsons. In females the spots just touch. A useful character in determining *A. kiriwinii* may be the hindwing postdiscal band, being only slightly dislocated at vein 1b.

Distribution of *A. kiriwinii* was known to be restricted to southeastern P.N.G. The type series of Bethune-Baker was collected on the Trobriand and Fergusson Islands (southeast P.N.G.; formerly known as "Kiriwina Islands") and so far, *A. kiriwinii* has not yet been recorded with certainty from West Papua. The assignment of the specimen figured herein from West Papua to *A.* cf. *kiriwinii* (pl. 5, fig. 34) is with some reservation, as the spots of the forewing post median band are less angular and not trapezoidal as in the type specimens, where the outer boundary of the band appears almost as a zigzag line. In addition, it seems that the rather broadly marked species are predominantly a characteristic eastern element of the fauna, being much closer to species like *A. eurisus* than to the species groups occurring in West Papua.
Possibly this specimen is representing a western ssp. of *kriwinii*, but as only a single one is available, its systematic status remains unresolved.

Arhopala leander Evans, 1957 (pl. 5, fig. 33)

Originally described as a subspecies of *A. philander* C. & R. Felder, 1865, Parsons (1998) raised it to species rank. According to Parsons, separation from *philander* is mainly based on the narrow forewing underside postmedian band which is said to be straight and parallel-sided and not convex as in the other species of the *centaurus*-group. It also has a dark submarginal hindwing patch in spaces 4 and 5. This is a wide interpretation and not understandable in regard to the holotype of *A. leander* (Humboldt Bay, West Papua), as this specimen (Parsons, 1998: pl. 58, fig. 1557) shows a postmedian band which is slightly angled and narrowed at vein 4, described as "abnormal" by Parsons. Evans had more than one-hundred specimens available when describing *leander* and it is unlikely he selected a type-specimen which was abnormal. The two specimens figured by Parsons (1998: pl. 58, figs 1558-1561) do not belong to this species. A specimen of the same phenotype - again without the broken forewing postmedian band - is figured by D'Abrera (1977: 313).

The hindwing postmedian band is very irregular in the holotype of *leander*, giving the band a rather ragged appearance (Parsons, 1998: pl. 58, fig. 1557), with individual spots being displaced and much more prominent than in other related species. The inner edge of the postmedian spot in space 5 is in line with the outer edge of the spot in space 6 and the spot in space 6 is much narrower at base than at top. These characters serve to distinguish *leander* from *philander* in West Papua.

Arhopala madytus Fruhstorfer, 1914 (pl. 6, figs 35-38)

Fruhstorfer (1914: 159) described *A. madytus* based on material from Australia (Queensland). The Australian race is generally characterized by a pinkish ground colour with some whitish/greyish areas between the postmedian bands and the wing margin. The forewing postmedian band tapers toward the costa and usually there is a dark marginal patch in spaces 3 and 4 of the hindwing (Braby, 2000: pl. 48, fig. 2). Evans pointed out that the complete dislocation of the band at vein 1b on the hindwing underside is characteristic for *madytus*, but unfortunately this is a variable character. The specimens figured by Parsons (1998: pl. 57, figs 1537-1538) correspond quite well to this phenotype. In comparison to *kiriwinii* and *adherbal, madytus* has much narrower postmedian bands, and the forewing band narrows towards the costa. According to Parsons, there are never any pale iridescent blue scales in the two forewing underside cell spots in specimens from P.N.G., but specimens from Sorong or from the Aru Isl. clearly show such scales.
A. madytus shows a very high degree of infraspecific variability, especially in regard to its underside colouration (ranging from pink to green), the width of the postmedian bands and the dark hindwing patch. Specimens from Sorong have very dark undersides, with a slight greyish-greenish tinge, which is even stronger in specimens from Waigeo.

Arhopala meander Boisduval, 1832 (pl. 6, figs 39-40)
(= *periander* Grose-Smith, 1894; TL= Jobi)
(= *anicius* Fruhstorfer, 1914; TL = "Solomons")

This species closely resembles *A. madytus*, from which it differs mainly in having even narrower and more regular postmedian bands. According to Evans' keys (1957: 115), the hindwing band in *meander* is more or less in line from space 2 to space 5 and the underside hindwing discal band is "more or less constricted at vein 1b" rather than "completely dislocated" as in *madytus*. However, this character alone seems not to be reliable enough to separate *madytus* from *meander*. In general, *meander* may be regarded as a species of the *madytus*-type with narrower and straighter markings.

Arhopala micale Boisduval, 1853 (pl. 4, figs 21-26)

The enormous phenotypical variation known from this species led to the description of numerous local races and Evans (1957: 116) listed 16 different subspecies (several of doubtful status), ranging from Sulawesi to Australia. For West Papuan races four names are currently in usage: ssp. *novaeguianae* Strand, 1912 [sic!] (TL = "Teba, New Guinea", located at the mouth of the Mamberamo River in N West Papua), ssp. *bosnika* Evans, 1957 (TL = Schouten Isl./Biak), ssp. *jona* Evans, 1957 (TL = Mioswar Isl., also occurring on Yapen and Numfor) and ssp. *selymbria* Fruhstorfer, 1914 (TL = Waigeo Isl., also known from Misool Isl.).
Female specimens from Waigeo and Kaimana (pl. 4, figs 23, 25) show a lighter sky blue upperside colour with rather narrow hindwing borders. Specimens from Yapen Island (pl. 4, fig. 24) have a similar upperside colour, but the dark brown wing margins are much wider. The underside of Yapen specimens is almost plain brown and does not show the whitish areas which are typical for most of the other subspecies. In contrast to this, females from Sorong are dark blue with a much wider border (pl. 4, fig. 22), almost approaching the phenotype occurring on the Aru Is. (pl. 4, fig. 26) (ssp. *ribbei* Röber, 1886, which is characterized especially by the whitish areas above the hindwing cell). Evans pointed out in his keys for *micale* subspecies, that ssp. *bosnika* has the whitish areas on either side of the discal bands "streaked".
In general, *A. micale* s.l. is easy to determine but it seems difficult to define stable subspecies (D'Abrera, 1977: 314, Parsons, 1998: 391), as both individual and regional variability is yet to be established. A complete revision of this species is needed. The only character that seems not to be variable is that forewing cell spots are generally outlined with blue scales. Just a few representative specimens from West Papua are figured herein to show the range of possible variation.

Arhopala philander C. & R. Felder, 1865

A. philander is not easy to characterize. Evans (1957) used a combination of its forewing postmedian band tapering towards the costa, a constricted but not dislocated hindwing band at vein 1b and "more or less" irregular markings. All these characters vary and the approach of Parsons (1998) seems to be more reliable in separating *philander* from other species of the *centaurus*-group, in particular *madytus* and *meander*: wing underside markings are rather faintly developed and the dark marginal patch is only barely visible.
The specimens figured by Parsons likewise constitute a rather inhomogeneous group and some closely resemble other species, e.g. *madytus*, *meander* or his fig. 1548 on pl. 57, which is almost indistinguishable from a specimen of *A. kiriwinii* figured on pl. 58, fig. 1572.

ssp. *gander* Evans, 1957 (TL = Fergusson Island)
(pl. 7, figs 43-44)

Following Parsons (1998: 389), *A. philander gander* is regarded here as the mainland race of *philander* and specimens from Yapen (pl. 7, figs 43-44) are provisionally included, as they do not differ considerably from specimens occurring at Timika or Sorong.

ssp. *pratti* Evans, 1957 (TL = Mioswar Island)
(pl. 6, figs 41-42)

The underside postmedian bands are remarkably wide and regularly curved in the holotype specimen (pl. 6, figs 41-42) and for the present it seems justified to retain the subspecific name *pratti* for the Mioswar Island race.

Arhopala sorena **spec. nov.** (pl. 7, figs 45-50)

Material: Holotype male (pl. 7, figs 45-46), 70km NNE Sorong [in coll. KSP]. 5 Paratypes [in coll. CSSK]: 1 ♂ 70km NNE Sorong, 1 ♂ Timika, 2 ♂♂, 1 ♀ Aru Isl., Dobo.

Description: Males (mainland West Papua) are medium to large sized (fwl = 24-25mm) with bright blue wing-upperside and a very narrow black border. Hindwing spaces 1, 1a and upper part of space 7 brown, with a narrow streak of blue along vein 7 (a character not present in *adherbal* or *madytus*). A long tail at vein 2. The female has broad dark brown margins on the upperside, narrowing to 4mm in space 2 on the forewing and to 2mm in space 3 on the hindwing.
Underside colour predominantly brown with greenish, occasionally light brown, or purple-brown areas at forewing apex and the hindwing median area. Discal bands and cell spots dark chocolate-brown.
Arrangement of the underside markings typical for the group. The two forewing cell spots always bearing some iridescent blue metallic scales. Forewing postmedian band tapering slightly towards the costa and the inner edge of the spot in space 3 extending towards the end-cell bar, more noticeably in the male, but not touching it. There is small sub-costal spot in space 10. On the hindwing the postmedian band broadening towards the costa and dislocated at vein 2. Spots in spaces 6 and 7 large and quadrate, their inner edges in line. The spot in space 6 just touching the end-cell bar, and overlapping half of the spot in space 5. The submedian spot in space 7 enlarged, outwardly convex but with a straight inner margin. A rounded, dark submarginal patch clearly developed in spaces 4 and 5 on the hindwing.

Distribution: West Papua, Waigeo. Maluku, Aru Is. Specimens occurring on Waigeo are slightly smaller (18mm) and only tentatively assigned to this species.

Etymology: The name *sorena* is derived from "Soren", which is the name for Sorong in Biak language.

Remarks: Classification of this species is difficult and apparently specimens were previously assigned to *A. adherbal* or *A.* cf. *kiriwinii*. However, they differ in several respects from both, the latter, being basically an eastern P.N.G. faunal element. *A. adherbal* is known from West Papua as well as from Halmahera and Aru (Evans, 1957), but no illustrations are available for these island populations and the species is also not mentioned in the recent review by Tennent & Rawlins (2010).

A. kiriwinii and *A. adherbal* are generally characterized by broad forewing bands which are fairly constant in width and slightly curved. In *sorena*, this band is narrowing towards the costa and the post-discal hindwing band is less broad and thus not overlapping the end-cell bar. Another key element is the clear sub-costal spot in space 10 of the forewing, which is uncommon for *Arhopala* in general and not present in *adherbal* nor *kiriwinii*.

Forewing cell spots in *sorena* are much more strongly outlined with blue scales than in *adherbal*; the forewing post-discal spot in space 3 is clearly produced toward the end-cell bar, especially so in males, and the hindwing band is less constricted at vein 1b. On the hindwing the post-discal band is almost completely dislocated at vein 2, which is not a character of *kiriwinii* or *adherbal*. The Mimika-specimen figured as *adherbal* in Gotts & Pangemanan (2010: 237) is very similar to *A. sorena*, with the forewing band clearly tapering towards the costa and the spot in space 3 strongly inclined towards the cell. However, it does not show the forewing costal spot in space 10.

A. madytus closely resembles *A. sorena* but differs in having the underside band completely dislocated at vein 1b (Evans, 1957: 115), (vein 2 in *sorena*), and lacking the costal spot in space 10. *A. leander* has generally much narrower underside bands, the spots in space 6 and 7 are not enlarged and the markings are usually more irregular. The holotype of *leander* (Parsons: 1998: pl. 58, fig. 1557) has the postdiscal spot in space 6 not quadrate, wider at vein 7 than at vein 6 and not touching the end-cell bar.

Underside colouration may vary considerably and is usually not regarded as a stable character in *Arhopala*. Especially *Arhopala herculina* Staudinger, 1888, is known to be very variable concerning its underside ground colour. The greenish underside colour of the *sorena* holotype is therefore not of any diagnostic significance.

Arhopala wanda Evans, 1957

Arhopala wanda is one of the least understood species in the *centaurus*-group. Evans (1957) described *A. wanda* from a single female collected at Wandesi in the Geelvink Bay (West Papua) and the unique holotype was illustrated for the first time by Parsons (1989: pl. 57, figs 1529/30). It is a comparably small female specimen that shows a very narrow postmedian forewing band, more or less reduced to a string of small rounded spots, tapering towards the tornus. The male specimen from Kiunga assigned to *A. wanda* by Parsons (1998: pl. 56, figs 1527/28) does not correspond well with the holotype of *wanda*, but could represent *A. hylander* Grose-Smith, 1894.
Parsons discusses a synonymy of *wanda* with *hylander*, which is doubtful as it is based on the tentative assignment of the above mentioned specimen. He does not exclude the possibility that both names may be synoyms of *A. leander*, which seems rather unlikely. *A. leander* is a comparably small species, but differs in having the forewing underside band strongly dislocated at vein 4.

Arhopala fulla-group

Arhopala admete (Hewitson, 1863) (pl. 1, figs 1-4)

The subspecific arrangement of *admete* as proposed by Evans (1957) was based on three allopatric taxa:

1) ssp. *admete* Hewitson, 1863, originally described from the Moluccas (TL = Seram) and with dark brown wing undersides (Hewitson 1863: pl. 3, figs 18-19).

2) ssp. *eucolpis* Kirsch, 1877, which was known to Evans only from mainland New Guinea and some outlying islands (TL = Yapen), which is characterized by purple-brown undersides (Kirsch 1877: 128, pl. 6, figs 6, 6a. [= *waigeoensis* Bethune-Baker, 1903]

3) ssp. *sudesta* Evans, 1957, only known from the Louisiade Group in the Morobe Province (TL = Sudest Isl.) of southeast P.N.G.

Since then a lot of new records were added and the subspecific differentiation above can no longer stand in regard to *admete s.str.* and *eucolpis*. According to Tennent & Rawlins (2010: 15), nominotypical *admete* is recorded from the Moluccas (Halmahera, Bacan, Obi, Seram, Ambon, Morotai, Kasiruta and Kelang). However, both forms, the one with brown and the one with purple undersides have a sympatric occurrence in the Moluccas as well as in Papua (e.g. Sorong).

Males of both subspecies are very similar on the uppersides but females differ. The blue in *eucolpis* females is usually lighter than in *admete* and females of *eucolpis* have a narrower black border in spaces 1b to 5 on the hindwing lack the heavily black-dusted veins in this area (pl. 1, fig. 3).
On the undersides of both sexes, the marginal and submarginal white lunules are clear in *admete* but are diffuse in *eucolpis*. The forewing postmedian band is more sharply angled in *eucolpis* and its ground colour shows a more reddish hue in the examples from Sorong. From viewing a number of allopatric specimens, however, the exact tone of the underside brown areas is somewhat variable and may not carry great significance. These differences remain within the sympatric populations of both taxa in Sorong, and so it appears that these two similar taxa can no longer be considered to be conspecific.

Arhopala eucolpis Kirsch, 1877 **stat. rev.** (pl. 1, figs 5-8)

Because of its sympatry with *admete*, *A. eucolpis* is hereby raised to species rank. It is widely distributed from the Moluccas and mainland New Guinea to the Louisiade Archipelago. The characteristic purple underside colour varies from specimens with almost pink undersides to forms with a metallic grey to greenish-pink hue. Parsons has already pointed out that ssp. *sudesta* might eventually be regarded as a separate species (Parsons 1998: 393), but the specimen figured by him (1998: pl. 59, figs 1595, 1596) closely resembles male *eucolpis*. He shows only the upperside of female *sudesta* and this shows a much lighter blue than typical *eucolpis*. It is noteworthy that Parsons does not mention the *eucolpis* form with the brown undersides, but it seems unlikely that he was only aware of *eucolpis* with the greyish, pink washed-undersides. However, his male *sudesta* is of the brown-underside form illustrating again, the variability of this character. The KSP collection includes one typical male *eucolpis* [KSP 10989] from Abepura (south of Jayapura) which clearly belongs to the brownish form, indicating that this is also occurring in P.N.G.
Based on this evidence, I recognise the close relation between *eucolpis* and *sudesta* by making the new combination *Arhopala eucolpis sudesta* Evans, 1957.

Arhopala azenia (Hewitson, 1863) (pl. 3, figs 17-18)

Taxonomy of *A. azenia* as well as its relation to *A. acron* (Hewitson, 1862) was discussed recently by Tennent & Rawlins (2010), who also added a new subspecies from Obi Isl. *A. azenia* is easy to identify and a very characteristic but uncommon faunal element in collections from West Papua. Compared to members of the *fulla-* or *centaurus*-groups, individual variation is low.

Acknowledgements

I am grateful to Henk van Mastrigt (Jayapura) and Alan Cassidy (Maidenhead) for discussing various matters concerning *Arhopala* and for reviewing the manuscript. Blanca Huertas (London) helped in obtaining photographs of some type-specimens deposited in the BMNH [photos © of the trustees of the Natural History Museum]. Andrew Rawlins (Maidstone) provided specimens from his collection and Henk van Mastrigt provided photographs and distributional data for specimens deposited in KSP.

References

Bethune-Baker, G. T. 1903. A revision of the *Amblypodia* group of butterflies of the family Lycaenidae. – Trans. zool. Soc. Lond. **17**(1): 3-164, 5 pls.

Braby, M. F. 2000. Butterflies of Australia: their identification, biology and distribution. – Collingwood, Victoria : CSIRO.

D'Abrera, B. 1977. Butterflies of the Australian region, 2nd Edt. – Landsdown, Melbourne, Vic., 415p.

Evans, W. H. 1957. A revision of the *Arhopala* group of Oriental Lycaenidae (Lepidoptera: Rhopalocera). – B.M.N.H., Entomology, Bulletin, **5** (3): 85-141; London.

Gotts, R. & N. Pangemanan. 2010. Mimika Butterflies. – A guide to the butterflies of the Mimika Region of Papua. PT Freeport Indonesia, Timika, 287p.

Grose-Smith, H. 1894. An account of a collection of diurnal Lepidoptera made by Mr. Doherty... (part iii). – Novit. zool. **1**: 571-583.

Grose-Smith, H. & W. F. Kirby. 1887-1902. Rhopalocera Exotica. Vol. 3. Gurney & Jackson, London.

Hewitson, W. C. 1863-1878. Illustrations of diurnal Lepidoptera, Lycaenidae. van Vorst, London, x + 229 pp.

Kirsch, T. 1877. Beitrag zur Kenntnis der Lepidopteren-Fauna von Neu Guinea. – Mitt. zool. Mus. Dresden, issue 2: 103-134, 3 pls.

Megens, H. J., W. J. van Nes, C. H. van Moorsel, N. E. Pierce, & R. de Jong. 2004. Molecular phylogeny of the Oriental butterfly genus *Arhopala* (Lycaenidae, Theclinae) inferred from mitochondrial and nuclear genes. – Systematic Entomology, **29**: 115-131.

Parsons, M. 1998. The butterflies of Papua New Guinea: their systematics and biology. Academic Press, London, xvi + 736p, xxvi + 136 pls.

Tennent, W.J. 2002. Butterflies of the Solomon Islands. – Storm Entomological Publications, 413p, 84 pls.

Tennent, W.J. & Rawlins, A. 2010. Notes on *Arhopala* Boisduval, 1832 from Sulawesi and Maluku, including new subspecies of *A. argentea* Staudinger, 1888, *A. chamaeleona* Bethune-Baker, 1903, and *A. azenia* (Hewitson, [1863]) (Lepidoptera, Lycaenidae). – Nachrichten des entomologischen Vereins Apollo, N.F., **31** (1/2): 9-16; Frankfurt am Main.

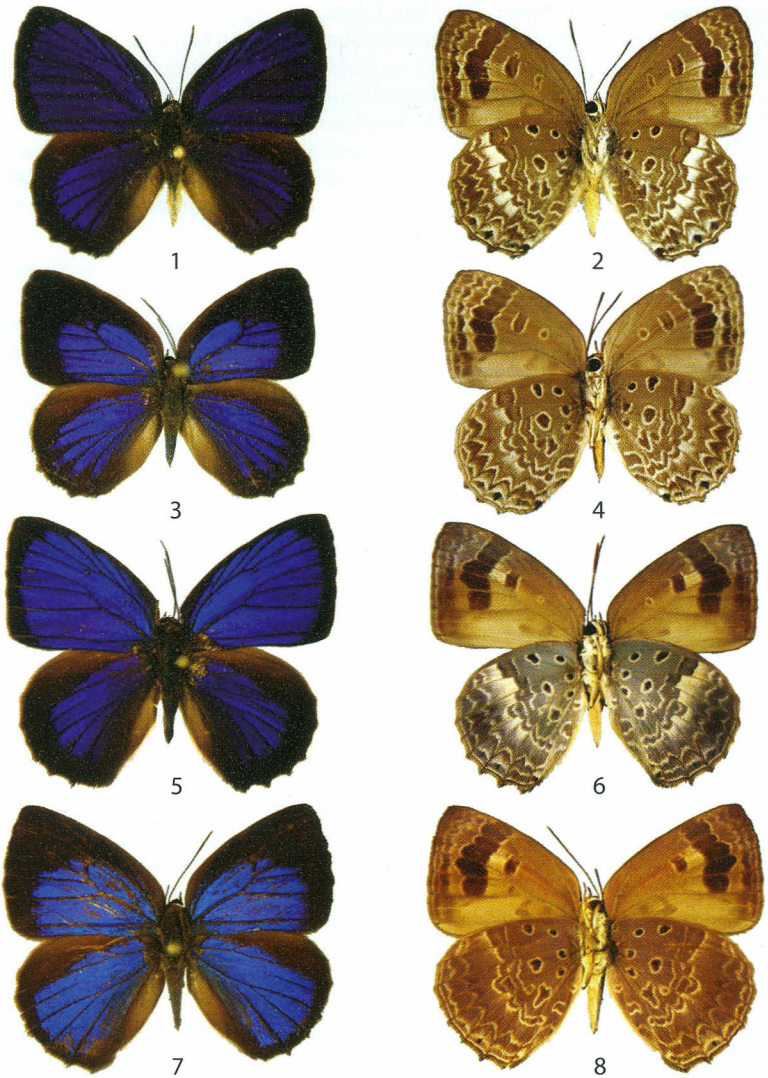
Tim Redaksi KEP. 2010. Kupu-kupu untuk Wilayah Kepala Burung Termasuk Pulau-pulau Provinsi Papua Barat. KEP, Jayapura, 196p.

Vane-Wright, R. I. & H. Gaonkar. 2005. The *Arhopala* butterflies described by Fabricius: *A. centaurus* is from Java, *A. democritus* from Phuket (Lepidoptera: Lycaenidae). – Entomological Science, **9**: 295-311, 7 figs; Tokyo.

van Mastrigt, H. & E. Rosariyanto. 2005. Buku Panduan Lapangan Kupu-kupu Untuk Wilayah Mamberamo Sampai Pegunungan Cyclops [Field guide to the butterflies of Mamberamo to the Cyclops Mountains]. Conservation International, Jakarta, 146p.

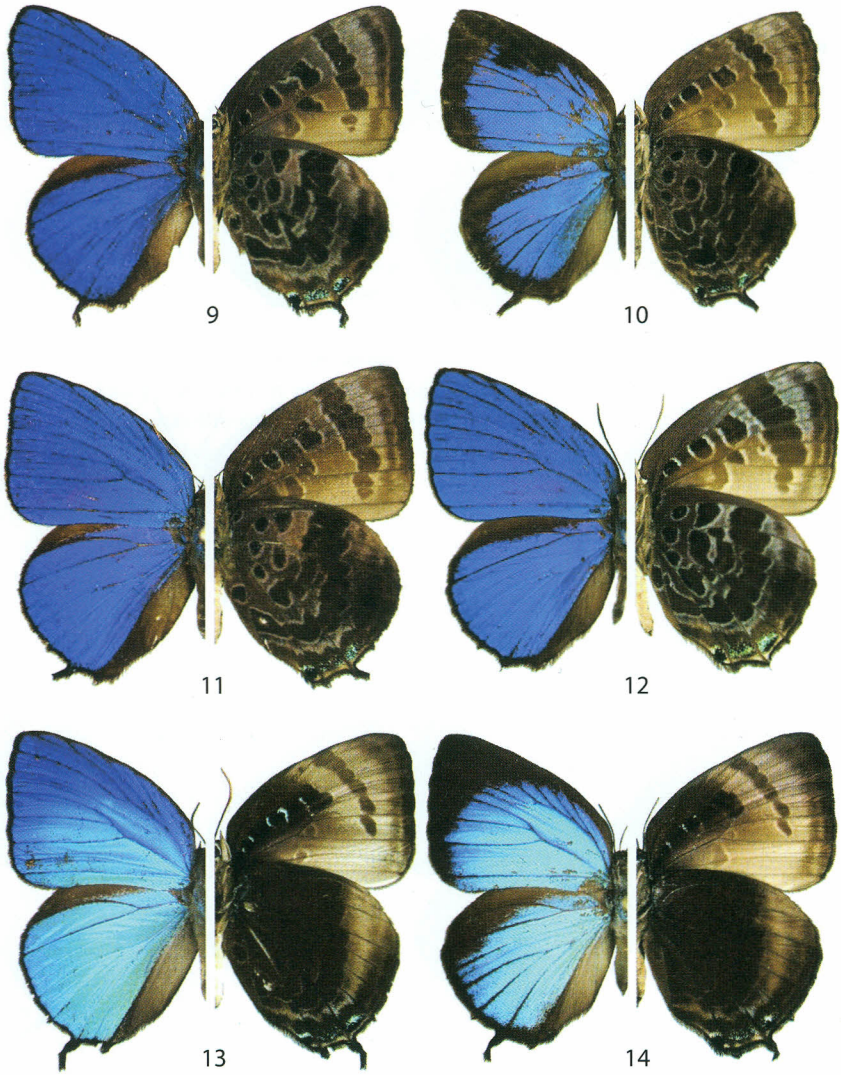
van Mastrigt, H. & E. L. Warikar. 2013. Buku Panduan Lapangan Kupu-kupu untuk Wilayah Pulau-pulau Teluk Cenderawasih, terfokus pada Numfor, Supiori, Biak dan Yapen (the butterflies on the Islands in the Cenderawasih Bay (former Geelvink Bay), especially the islands Numfor, Supiori, Biak and Yapen). KEP, Jayapura, 181p.

Plate 1



Figs 1-4. *Arhopala admete*, upper- and underside: 1-2. ♂, Sorong; 3-4. ♀, Sorong.
Figs 5-8. *Arhopala eucolpis*, upper- and underside: 5-6. ♂, Sorong; 7-8. ♀, Sorong.
All figures x 1,2 magnification [all in CSSK]

Plate 2



Figs 9-11. *Arhopala adherbal*, upper- and underside: 9.♂, Sorong; 10.♀, Yapen Is.; 11.♂, Timika. **Fig. 12.** *Arhopala lata*, upper- and underside♂, Halmahera. **Figs 13-14**. *Arhopala aexone*, upper- and underside: 13.♂, Sorong. 14.♀, Sorong. All figures x 1,2 magnification [all in CSSK]

Plate 3

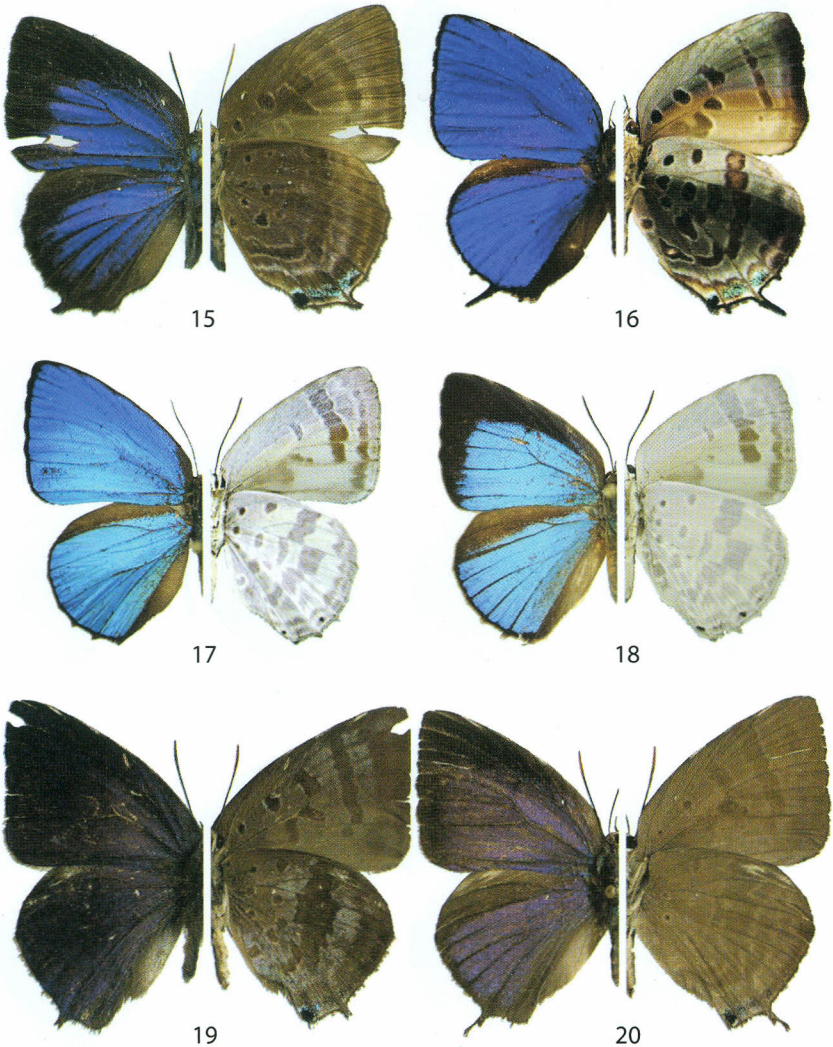
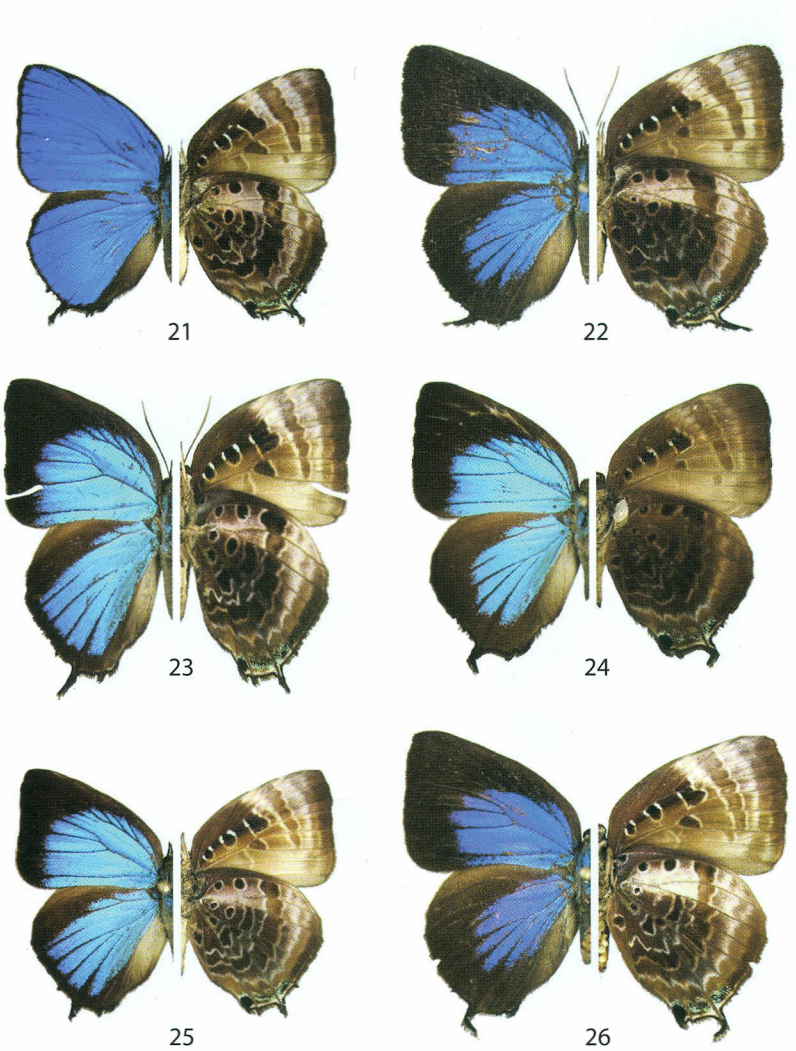


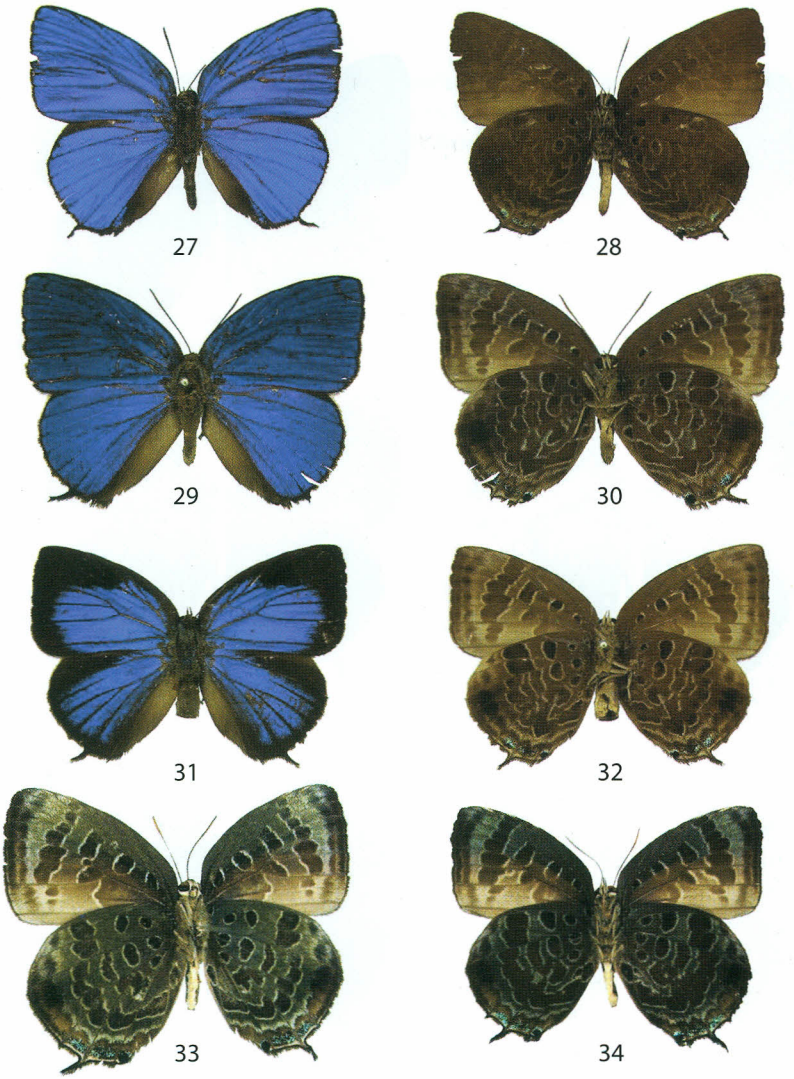
Fig. 15. *Arhopala alkisthenes*, upper- and underside, ♀, Nabire [KSP 10932]. **Fig. 16.** *Arhopala ander*, upper- and underside ♂, Sorong [CSSK]. **Figs 17-18.** *Arhopala azenia* upper- and underside: 17. ♂, Sorong [CSSK]; 18. ♀, Sorong [CSSK]. **Figs 19-20.** *Arhopala eupolis* upper- and underside: 19. ♂, Nabire [KSP 10934]. 20. ♀, Nabire [KSP 10827]. All figures x 1,2 magnification

Plate 4



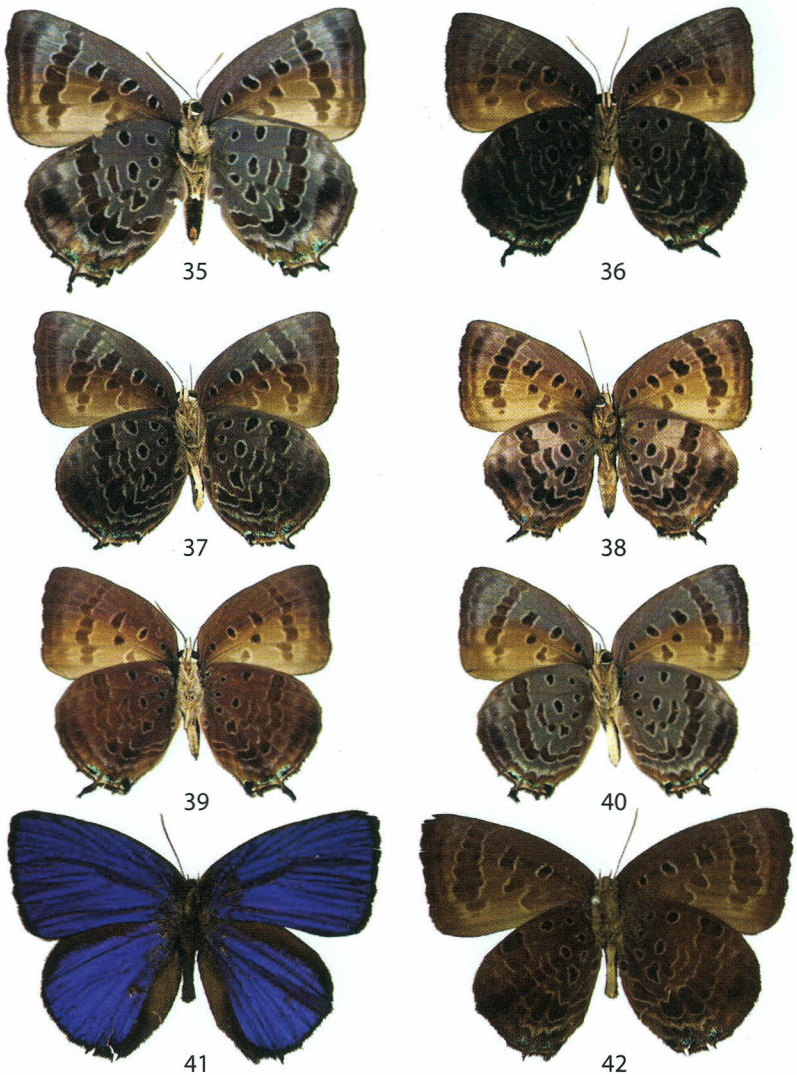
Figs 21-26. *Arhopala micale*, upper- and underside: 21.♂, Batanta Isl.; 22.♀, Sorong; 23.♀, Kaimana; 24.♀, Yapen Is.; 25.♀, Waigeo; 26.♀, Aru Is.
All figures natural size [all in CSSK]

Plate 5



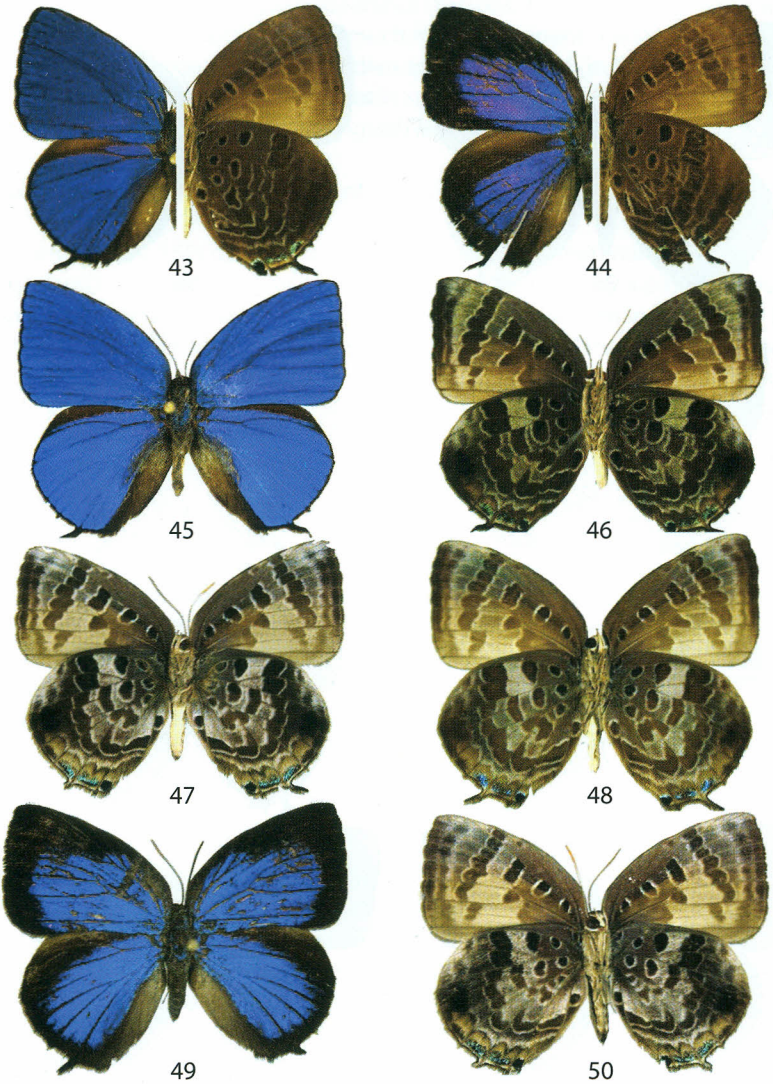
Figs 27-28. *Arhopala hylander* Grose-Smith, 1894. upper- and underside ♂, Holotype, Biak, © BMNH (E) 1498340. **Figs 29-32.** *Arhopala kiriwinii* Bethune-Baker, 1903, upper- and underside: 29-30, ♂, Holotype, Kiriwini, Trobriand Isl., © BMNH (E) 1498338; 31-32. ♀, Allotype, Kiriwini, Trobriand Isl., © BMNH (E) 1498339. **Fig. 33.** *Arhopala leander*, underside ♂, Sorong [CSSK]. **Fig. 34.** *Arhopala* cf. *kiriwinii*, underside ♂, Sorong [CSSK].
All figures natural size.

Plate 6



Figs 35-38. *Arhopala madytus* Fruhstorfer, 1914, underside: 35. ♂, Aru Isl.; 36. ♂, Sorong; 37. ♂, Waigeo Isl.; 38. ♀, Batanta Isl. **Figs. 39-40.** *Arhopala meander* Boisduval, 1832, underside: 39. ♂, Waigeo Isl.; 40. ♂, Waigeo Isl. **Figs. 41-42.** *Arhopala philander pratti* Evans, 1957, upper- and underside ♂, Holotype, Mioswar Is., © BMNH (E) 1498341. All figures natural size.

Plate 7



Figs 43-44. *Arhopala philander gander* Evans, 1957, upper- and underside: 43. ♂, Yapen Isl.; 44. ♀, Yapen Isl. **Figs 45-50.** *Arhopala sorena* **spec. nov.**: 45-46. upper- and underside ♂, Holotype, Sorong; 47. underside ♂, Aru Isl.; 48. underside ♂, Timika; 49-50. upper- and underside ♀, Aru Isl.
All figures natural size. [all in CSSK, except figs 45-46, in KSP].