

LYCAENIDAE AUSTRALASIAE III.

On *Nacaduba kurava* MOORE, and other species of *Nacaduba* (Lep. Lycaenidae).

by *

L. J. TOXOPEUS, Amsterdam.

The name *Nacaduba kurava* MOORE has to replace that of *N. atrata* HORSFIELD (nec FRUHSTORFER) for the following reasons:

In Part I of his „Descriptive Catalogue of the Lep. Ins. cont. in the Museum of the Hon. E.-Ind. Comp.” (1828), HORSFIELD described a *Lycaena atratus* on page 78, quoting „*Papilio atratus* CRAMER, pl. 365, fig. A. B. (?)”.

Now this species was not called „*atratus*” by CRAMER, but „*aratus*”, so, having discovered the superfluous „t”, MOORE corrected HORSFIELD’s mistake in a subsequent publication, the „Cat. of the Lep. Ins. in the Mus. of the Hon. E.-I. Comp.” by HORSFIELD and MOORE (1857). At page 22 I find:

„10. *Lycaena aratus* *), CRAMER Sp.

♀ *Papilio aratus*, CRAMER, Pap. iv. t. 365, f. A.B. ? (1782).

Lycaena atratus, HORSFIELD, Cat. Lep. Mus. E.I.C., p. 78; WESTWOOD, in Doubleday and HEWITSON’s Diurnal Lep. p. 490, No. 29.

a. ♀ Java. From Dr. HORSFIELD’s Collection.

If new, *L. kurava*, MOORE.

*) This species was named *aratus* by CRAMER, not *atratus* as quoted by authors.”¹⁾

The „?” already added by HORSFIELD to his quotation of CRAMER’s species, was expressed by MOORE in the new name *kurava*, „if the species might finally prove to be other than CRAMER’S”. This was right. CRAMER described a *Lampides* from Amboyna, HORSFIELD a *Nacaduba* from Java. The chief and very important difference between these genera is, that *Lampides* has a frenum between the subcosta and the 1st radialis, and *Nacaduba* has not, but its subcosta and 1st radialis partly fuse.

Though the mistake of HORSFIELD is very obvious in this case, and has been corrected since, the name *atratus* still haunts all modern literature.

Let us first see what species has to bear the name *kurava* MOORE, and afterwards deal with those species that now bear or formerly were endowed with the erroneous name *atratus* HORSFIELD.

After comparison of the type ♀ (in good condition in the British Museum of Nat. Hist.) with *Nacaduba* females from Java I can state that there is only

¹⁾ This plural denotes that, besides HORSFIELD, others also should have spelled „*atratus*”. this, however, holds good for GODART only, who mentions *atratus* CR. (*Polyommatus atratus*, — as the ♀ of *P. celeris* F. = *ceteno* CR. — p. 654, No. 124) and quotes CRAMER and HERBST, but these authors write *aratus* quite correctly.

one species that can be called *kurava* MOORE; it is the one whose many races have been arranged by FRUHSTORFER as subspecies of *perusia* FELDER. One of these subspecies is *prominens* MOORE from Ceylon, MOORE's type of the genus *Nacaduba*. There can no longer be any doubt therefore that *L. kurava* is a true *Nacaduba*.

The subspecies of *Nacaduba kurava* are the following:

a) *Nacaduba kurava prominens* MOORE 1881, Ceylon.

(*N. perusia prominens*, FRUHSTORFER, Zoöl. Med. II, p. 133; id. SEITZ, p. 919; *N. atrata*, SWINHOE, Lep. of India, p. 80, Wet-season Brood, Pl. 658, f. 3, 3a, 3b — not Dry-season Brood f. 3c, 3d, as cited by FRUHSTORFER: this is another species!; *N. atrata prominens*, EVANS, Identif. Ind. Butt. VII, J. B.N.H.S. 1925, p. 612, f. H, 30, 8; idem, TOXOPEUS, Tijdschr. Ned. Dierk. Ver. XX, afl. 1, 1925, p. VIII). A series in my collection, don. W. ORMISTON.

b) *Nacaduba kurava canaraica* subsp. nov.

♂ UPP., lighter, gloss stronger than that of *N. prominens* MOORE. UND., white markings narrower, especially the submarginal ones; black ocellus larger, orange ring much darker and broader.

♀ UPP., light part of fore-wing wedge-shaped, distally whitish (more blue in *N. prominens*); hindwing with very little blue suffusion, submarginal spots narrowly, black lunules internally not, or only very faintly encircled with greyish white. UND., grey with more yellow tint than *prominens*-♀, white markings more sharply defined. Eyespot round, less broadly orange ringed than in *prominens*-♀.

♂. Type, Karwar, 7—VI—1922, bred by Mr. T. R. D. BELL, ♀ Paratype, idem, 22—2—1924. Described from 3 ♂♂ and 4 ♀♀, don. W. ORMISTON.

D.S.F. 1) forma *belli* nov.

♀ UPP., white area much extended, wing border narrower. Hindwing more suffused with blue scales, white internal margins of black lunules well developed. UND., a shade lighter, white margins broader.

2 ♀♀ Coorg, V-1913. W. H. EVANS don. 2).

c) *Nacaduba kurava euplea* FRUHST. 1916.

Sikkim, Assam, Bhutan, Burma.

(*N. perusia euplea* FRUHST. l.c.; id. SEITZ l.c.).

W.S.F. ♂, darker than *N. prominens* and bluer, without the reddish gloss of the latter and of *canaraica* m.

3 ♂♂, 1 ♀ from Thandaung, X—1924; id. 1 ♂, 1 ♀, 7—XI—1920; 2 ♂♂ Kambauk; 24—XI—1920; 2 ♂♂ Maymyo, VII—1913; 1 ♂ Assam, VIII—1921; don. W. H. EVANS.

D.S.F., forma *evansi* nov.

♂ UND., groundcolour more sandy, all markings fainter, black ocellus reduced.

1) D. S. F. = Dry Season Form; W. S. F. = Wet Season Form.

2) Type specimens from the material, which Col. W. H. EVANS presented to me, will be preserved in the British Museum of Natural History.

♀ UPP., light parts much extended, touching the submarginal series of spots, these much flattened. UND., groundcolour whitish buff, all markings fainter, as in ♂, ocellus reduced.

2 ♂♂, 1 ♀ (type), East-Dawnas, 500', 14—I—1921, don. W. H. EVANS.

Specimens from Sikkim, the first-named habitat of FRUHSTORFER, are unknown to me. It is possible that these are different from Assam individuals, as the rains form from Sikkim nearly always displays a black border, narrow in the ♂♂, very broad in the ♀♀. Should this be so, then it will be better to restrict FRUHSTORFER'S name to the Sikkim specimens, and to restrict the name *evansi* m. to the Dawna subspecies, the rains form of which would then require a new name. The variability of the species really forces one to distinguish these numerous subspecies.

d) *Nacaduba kurava ataranica*, subsp. n.

D.S.F. ♂. UND. buff, markings faint, eye-spot very large, rather broadly encircled with orange. ¹⁾

♀. More like ♀ D.S.F. *canaraica* f. *belli* m. than ♀ D.S.F. *euplea* f. *evansi* m. UND. eye-spot round, orange ring very broad.

♂ (Type), Ataran Valley, Tenasserim, I—1925 (Kukysan Kynochang ?), ♀ (Paratype), id. II—1925 (Taung Waing ?), don. W. H. EVANS.

W.S.F. unknown to me, presumably und. darker, and with still larger and more broadly encircled ocellus.

This may be the Siam form also.

One ♂ specimen from Hai-nan Isl., leg. ZOBRY'S WOLTER, is too old and rubbed to base a new subspecific name upon. It has a large black ocellus and may prove hardly to differ from the Tenasserim W.S.F.

e) *Nacaduba kurava thersasia* FRUHST. 1916, Formosa.

(*N. perusia thersasia* FRUHST. l.c. ; id. SEITZ, l. c. Pl. 152 k, ♂ Upp. & Und.; *N. prominens* BETH. B., Ent. Mitt. 1914, p. 124).

1 ♂, Taihan raku, Formosa, 7/19—VI—1908, H. SAUTER leg.

According to FRUHSTORFER and SEITZ there seem to be seasonal forms in Formosa also.

f) *Nacaduba kurava* subsp.

Andamans (EVANS, l.c.p. 612).

g) *Nacaduba kurava nicobarica* (ORMISTON in litt.) subsp. n.

Nicobars. Bingham, Fauna Ind. Lep. II, p. 389 ; (EVANS, l.c.). A very distinct subspecies !

♂. UPP. Purple with a reddish gloss.

UND. groundcolour brownish, eyespot most conspicuously enlarged, oval, well margined with orange, anal black spots inwardly defined with a broad metallic light blue line, followed by an orange line. All wing markings dirty light grey, not white, and very narrow.

♀. UPP. blue area wedgeshaped in forewing ; much extended in hindwing

¹⁾ In the type specimen bleached to yellowish.

and rather dark, not getting lighter in its proximal parts. Hindwings with very prominent white marginal line, broken at veins. Submarginal spots large. UND. lighter brown than ♂, but with the same big oval ocellus, markings white.

♂ (Type), Nicobars, IV—1904, ex coll. BINGHAM, marked „*N. atrata*” (by BINGHAM ?) and „*N. atrata nicobarica*, valvae same as *prominens*” (by ORMISTON), don. W. ORMISTON. This may be BINGHAM’s specimen mentioned in his well-known book.

♀ (Paratype), Kar Nicobar, XI—1923, don. W. H. EVANS.

This subspecies displays all the peculiarities, acquired by the species of *Nacaduba*, *Lampides* and *Jamides* inhabiting this very interesting group of small oceanic islands.

h) *Nacaduba kurava* subsp.

Philippine Is. (NOT *N. beroë* FELDER = *N. perusia beroë* FRUHST. l.c. pag. 134; id. SEITZ l.c.).

It is almost certain a *kurava* subspecies will be discovered in the Philippine Is., but so far we do not definitely know of one, lest some of SEMPER’s *beroë* specimens should prove to be that species; but the Trustees of the Senckenberg Museum, did not allow me a nearer examination of the SEMPER collection’s specimens, so that I feel not absolutely sure. The name *Nacaduba beroë* FELDER which has included half a dozen distinct *Nacadubas* during half a century, belongs to the species now known as *N. akaba* DRUCE, as I was able to ascertain when in Frankfort a/Main, where there is preserved one of FELDER’s co-types, upon which SEITZ based his name *N. perusia beroë*, in the said SEMPER collection.

i) *Nacaduba kurava* subsp.

Palawan ?

It is quite possible that STANDINGER’s *Lycaena beroë* (Lep. von Palawan, Iris 1889, p. 98) denotes a subspecies of *N. kurava*, though it may just as well indicate any one of five other *Nacaduba* species with the „subbasal brand.”

j) *Nacaduba kurava nemana* FRUHST. 1916.

Sumatra, Penang, W. Borneo (FRUHST.).

(*N. perusia nemana*, FRUHSTORFER l.c.p. 134, not *N. beroë* of Distant, Rhop. Mal. Tab. XX, fig. 17, ♂, fig. 18, ♀, which represent the *N. calauria* FELD. subsp. from Malacca).

1 ♂, 1 ♀ in coll. „Artis”, Amsterdam, Deli, N. E. Sumatra, WALDECK don. 1904, (*Lycaena atratus* HORSF. = *prominens* MOORE, Snellen det. 1907); 1 ♂ (with very small ocellus), marked *em B.* (indjei ?), IV—1894, leg. MARTIN: in my collection.

k) *Nacaduba kurava niasica* subsp. nova.

♂ UPP. as in *N. nemana* FRUHST., but wings slightly more rounded, and having a beautiful royal gloss. UND., groundcolour rather dark buffish, white lines broad and sharply defined, black ocellus large, round-oval, orange ring broader than in *N. nemana*.

♀ unknown.

Type, unique, ex. coll. THIEME.

This specimen shows beautifully the general Nias peculiarities, viz. prominent white markings and clear broad orange ring.

1) *Nacaduba kurava* subsp.

Enggano (*N. perusia nemana*, FRUHSTORFER l.c., *N. prominens*, id. Berl. Ent. Z. XLIX, 1904, p. 205).

It is quite impossible that a Macromalayan race should exist in the oceanic Isle of Enggano, so that FRUHSTORFER'S name has to be changed in future. However, specimens from Enggano are unknown to me.

m) *Nacaduba kurava kurava* MOORE ¹⁾ 1857. W. Java.

(*Lycaena atratus* CRAMER ?, HORSFIELD errore l.c.; *Lycaena aratus*? MOORE nec CRAMER, l.c.; *L. kurava* MOORE l.c.; *Nacaduba perusia agorda* FRUHSTORFER, l.c.; id. SEITZ l.c.; *Lycaena atrata*, PIEPERS in P. & SNELLEN: Rhop. of Java, p. 38, tab. XXI, f. 51a, ♂ — nec ♀, f. 51b — *partim*).

1 ♂, Buitenzorg, W. Java, XI—1919 (ex Mus. Btzg.), 2 ♂♂, Buitenzorg, 8 & 20 — V — 1922, leg. L. J. TOXOPEUS.

One very old ♀ specimen in coll. „Artis”, Amsterdam, undated, marked „Java”.

I possess some specimens of this very distinct subspecies caught at the considerable altitude of 1500 M. (4950'), which have a character of their own, i.e. a much reduced black ocellus; the ♀ adds a uniform light blue upper surface, very narrowly bordered, to this underside feature, so that it is altogether distinct from the low-country form. This ♀ has been regarded as the typical Javanese ♀ by FRUHSTORFER (which is not true), but the name *agorda* being bestowed on the Javan mountain-form, it may stand for this form only, whilst the low-country form has to bear the name *kurava* MOORE.

Thus: *N. kurava kurava* f. *agorda* FRUHST. 1916, high mountains of W. Java.

Djampang, near Sukabumi, (FRUHST.); 2 ♂♂, 1 ♀, Tjibodias, W. Java, 1500 M., V—1922, leg. L. J. TOXOPEUS.

There are some old and worn specimens from E. Java (Mount Arjuno) in the „Artis” Collection in Amsterdam, but it is better not to name them.

n) *Nacaduba kurava baweana* FRUHST. 1916.

Bawean. (*N. perusia baweana*, FRUHSTORFER l.c.).

o) *Nacaduba kurava astapa* FRUHST. 1916.

Bali. (*N. perusia astapa*, FRUHSTORFER l.c.). I do not know this form. The E. Javan specimens in the „Artis” Collection and referred to above may belong to it.

p) *Nacaduba kurava laurina* FRUHST. 1916.

Lombok. (*N. laura*, FRUHSTORFER, Berl. Ent. Z. 1897, p. 7; *N. perusia laurina*, FRUHSTORFER, Zoöl. Med. Leiden II, p. 135; id. SEITZ, p. 920).

The Australian group of subspecies, characterised by the extension of the

¹⁾ Not HORSF. & MOORE, as MOORE only is responsible for the systematic part of the quoted work: S. introduction!

white filling of the underside markings, most developed in the ♀♀, begins with the Lombok form. DOHERTY mentioned a *N. laura* from Bali also, but this must be erroneous.

q) *Nacaduba kurava laura* DOHERTY 1891. Sumba, Sumbawa (?).

(*N. laura*, DOHERTY, J. As. Soc. B. LX, pt. II, no. 2, p. 182, f. 11, ♀ (nec 9) — Sumba —; id. PAGENSTECHE, Beiträge XII, Jahrb. Nass. Ver. f. N. 51, 1898, p. 193, — „Sambawa ?” —; *N. perusia laura*, FRUHSTORFER, Zoöl. Med. Leiden II, 1916, p. 134, — „Sambawa” —; id. SEITZ l.c.).

1 ♀, Sumbawa 1896, (marked *Cupido puspa* !!), don. Mus. München, in my collection.

r) *Nacaduba kurava cerbera* FRUHST. 1916. Ké Is. (Key Tual etc.).

(*N. perusia*, DE NICÉVILLE, in de NIC. & H. KÜHN, „An Annotated List &c”, J. As. Soc. B., LXVII, Part II, No. 2, 1898, p. 268; *N. perusia cerbera* FRUHST. l.c.; id. SEITZ l.c.).

1 ♀, Elat, Kei Isl., 1922, leg. H. C. SIEBERS, don. Mus. Buitenzorg.

This is a very small form, like most Lepidoptera from Ké Is.

s) *Nacaduba kurava* subsp.

Timor. It would be very astonishing if Timor should prove to be devoid of a *kurava*-subspecies.

This is however *not* the species *Polyommatus dion* GODART, which has often been taken as the Australian *kurava*-subspecies. Were that the case this name, as the oldest available, would have to take the place of *kurava*, but GODART'S diagnosis, simple as it is, does not agree in any respect with the white-banded *kurava*-forms. It runs as follows:

„Polyommatus dion.

Pol. alis supra coerulescenti-violaceis: subtus albis, punctis simplicibus lineolisque fuscis; posticis ocellis duobus anguli ani pupilla coerulea. (Mas.).

Il a un peu plus d'un pouce d'envergure. Le dessus des ailes est d'un violet-bleuâtre, avec une légère bordure brune & une frange blanche.

Le dessous est blanc, avec de simples points et quelques traits transversaux d'un brun-noirâtre. L'angle interne des secondes ailes offre en outre deux yeux noirs à prunelle bleue. L'oeuil intérieur est bordé en avant par une lunule fauve.

Nous ne connoissons point la femelle, & nous n'avons vu qu'un mâle en mauvais état.

De l'Australasie”.

The bluish-violet wings, white underside, brown single points and lines, and the orange-bordered ocellus with blue iris are common to many species, whilst the fact, that *P. dion* was placed in the group of tailless species is of no value owing to the bad condition of the type, which may have lost those appendices; however, we may be satisfied to believe that GODART would not have described a *kurava*-form in this way!

Having mentioned Australasia as its habitat, he has not definitely given a locality, but before the type has been examined, nobody can tell whence it originated. So FRUHSTORFER was not right in restricting the name *dion* to a Timor insect, and in bestowing another name on an Australian one, which he thought to be conspecific with the GODARTIAN *dion*.

My opinion is, that *dion* denotes a worn specimen of *Catochrysops strabo* F. ♂, or *Euchrysops cnejus* F. ♂, which latter has no white under surface, but gets bleached after having been on the wing a long time.

WATERHOUSE & LYELL, Butt. of Australia, p. 96, have expressed the opinion, that *P. dion* GODART „represents *boeticus* rather than a race of *perusia*”. This is impossible, as *Lampides boeticus* L. was well known to GODART, and besides he mentions brown single points and streaks on the under surface, which *boeticus* does not bear at all.

t) *Nacaduba kurava felsina* WAT. & LYELL 1914.

W. Australia. (*N. perusia felsina*, WATERHOUSE & LYELL, l.c. p. 96).

This subspecies comes nearest to *N. kurava laura* DOHERTY, and may have reached Australia from Sumba or Timor, as many other W. Australian species of butterflies. I know its description only.

u) *Nacaduba kurava albofasciata* RÖBER 1885.

Aru Is. (*Plebeius albofasciatus*, RÖBER, Iris I, 1886, p. 65, t. 4, fig. 21, ♂; *Nacaduba perusia albofasciatus* FRUHSTORFER, l.c. p. 136, id. SEITS, l.c.).

v) *Nacaduba kurava cyaneira* FRUHST. 1916.

Central New Guinea. (*Nacaduba dion*, ROTHSCHILD, Lep. Woll. Exp. 1915, p. 28, ♀; *Nacaduba perusia*, VAN EECKE, Nova Guinea, p. 78; *N. perusia cyaneira* FRUHSTORFER l.c. Pl. V, f. 8 — ♂ genit. —; id. SEITZ l.c.)

1 ♂, N.-W. New-Guinea, 1912 — '13, J. G. BAGGELAAR leg., in Mus. „Artis” Amsterdam.

w) *Nacaduba kurava parma* WAT. & LYELL 1914.

N. E. Australia, from Cape York to Richmond River (W. & LYELL).

(*N. dion*, WATERHOUSE, Proc. L. Soc. N. S. W. 1903, Part I, p. 222; *Lampides perusia*, HERRICH-SCHÄFER, Stett. Ent. Z. XXV, 1869, p. 73; id. SEMPER, J. Mus. GODEFFROY, 1878, p. 20; id. MISKIN, Catalogue 1891, Ann. Qu. Mus. I, p. 51; *Nacaduba perusia parma*, WATERHOUSE & LYELL, l.c. p. 95, fig. 290, 291 ♂, Upp. & Und., 292, 293, ♀, Upp. & Und.; *Nacaduba perusia syrias*, FRUHSTORFER 1916, l.c.p. 136; id. SEITZ, l.c.).

1 ♀, Kuranda, Queensland, X — 1900, don. A. JEFFERIS TURNER.

„Seasonal variations are prevalent, those of the dry season being smaller with markings reduced” (W. & LYELL).

This agrees perfectly with what is known of the Indian forms.

My ♀ specimen belongs to the D.S.F.

x) *Nacaduba kurava perusia* FELDER 1860. S. Molucca's.

(*Lycaena perusia*, FELDER, Sitz. Ber. K. Ak. Wiss. Wien, p. 459, ♂;

Lycaena niconia, FELDER, idem, ♀; *Cupido perusia*, PAGENSTECHE, Beiträge I, Jahrb. Nass. Ver. f. N. 1884, p. 46, ♂; *Nacaduba albofasciatus*, HOLLAND, Nov. Zool. 1900, p. 73; *Nacaduba dion*, ROTHSCHILD, Nov. Zool. 1915, p. 139; *N. perusia perusia*, FRUHSTORFER, l.c. p. 136; id. SEITZ l.c.; *N. atrata pertusia*, TOXOPEUS, l.c.).

Amboyna (auct. div.), Ceram (ROTHSCHILD) — FRUHSTORFER cites RÖBER, but I can not detect any paper, in which RÖBER mentions this species from Ceram—, Buru (HOLLAND, TOXOPEUS).

The last named locality requires attention, as it induced prof. A. SEITZ to utter his astonishment that two forms of the same species, namely *beroë* and *albofasciatus*, should fly in the same district, and he concludes therefrom, that all the other subspecies of FRUHSTORFER are questionable! To dispel his doubt, I may say that most probably *beroë* of HOLLAND consists of no less than four distinct species, even if *kurava* be excluded, which he no doubt mentioned as *N. albofasciatus* RÖBER. *N. perusia* FELDER, HOLLAND does not mention, although SEITZ tells us he did!

6 ♀, 4 ♂, Buru 1921—1922 (1 ♀, Tifu, coast; 1 ♂, 1 ♀, Fakal, 1100 M!), leg. L. J. TOXOPEUS; 1 ♂, 1 ♀, Buru, Mt. Mada, 3000', IX—1898, leg. DUMAS, Tring Mus.

In Central Buru *N. kurava* is not rare at all.

It loves low open forest and frequently visits flowers. I could detect no seasonal variation, though the extent of blue and white in the ♀ varies somewhat.

y) *Nacaduba kurava* subsp.

Batjan. (*Plebeius perusia*, RIBBE, Iris, I, No. 4, 1887, p. 205).

z) *Nacaduba kurava* subsp.

Celebes. (*Cupido perusia*, SNELLEN, Tijdschr. v. Ent. XXI, 1878, p. 23).

The other islands near Celebes and between Celebes and New Guinea no doubt support many other *kurava*-forms.

aa) *Nacaduba kurava* (?) *lydia* FRUHST. 1916.

Louisiade Is. (♂ Fergusson, ♀ Kiriwina — Fruhst.).

(*N. perusia lydia*, FRUHSTORFER l.c.; SEITZ l.c.).

bb) *Nacaduba kurava rothschildi* subsp. nova.

♂ UPP., very delicately shining bluish purple, slightly transparent. UND. much like *N. kurava cyaneira* FRUHST. from N. Guinea, but orange ring round ocellus **very narrow** and **chestnut colour**. Interspace between submarginal markings and postdiscal series of fasciolae (in this subspecies completely filled up with white, except for anal ones) on hindwing getting wider towards anal region, so that this postdiscal series stands at a very oblique angle.

♀ unknown.

♂ Type unique, St. Aignan (Louisiade Arch.), XI—1897, leg. A. S. MEEK, Tring Mus. It does not show the least affinity to *N. kurava* f. *agorda* (Javan.) from which *N. kurava lydia* can hardly be separated according to FRUHSTORFER.

cc) *Nacaduba kurava ariitea* FRUHST. 1916.

Bismarck Arch. (*Plebeius perusia*, PAGENSTECHER, Lep. Bism. Arch. 1899, p. 112; *Nacaduba perusia*, RIBBE, Iris XII, 1899, p. 229; *N. perusia ariitea* FRUHSTORFER, l.c. p. 137; SEITZ l.c.).

dd) *Nacaduba kurava* subsp.

Rubiana Is., Ugi Is. — and other Solomon Is.? — (*Nacaduba dion*, H. H. DRUCE, P. Z. S. 1891, p. 363).

FRUHSTORFER overlooked the fact, that DRUCE mentioned *Nacaduba dion* from the Solomon Islands, referring to 4 ♀♀ in the words „differing slightly from that sex of *N. dion* from N. Australia by having two large black spots with broad orange borders and metallic silvery-blue scales at the anal angle of hind wing below”. *Nacaduba eureses* DRUCE, which FRUHSTORFER declared a *perusia* subspecies (l.c. p. 137), looks to me more likely a *berenice* subspecies, or else a good species of far-eastern, perhaps exclusively Pacific distribution.

ee) *Nacaduba kurava pacifica* subsp. n.

♀ UPP., forewing as in *N. kurava perusia* FELD., but blue disc sharply wedgeshaped. Hindwing divided by an oblique line in an outer black and an inner blue and white half, the white part of which is subtriangular with base on costa, reaching to bottom of cell.

UND., like *N. kurava cyneira* FRUHST., but orange ring round ocellus very narrow and chestnut colour, and submarginal black lunules very narrowly margined with clear white inwardly.

♂ Unknown.

♀ Type unique, Goodenough Isl. (d'Entrecasteaux Is.), 2500 — 4000', IV — 1913, leg. A. S. MEEK, Tring Museum.

ff) *Nacaduba kurava* subsp.

New Hebrides. (*Lampides perasia* (errore !), BUTLER, P. Z. S. 1875, p. 616, No. 28, ♂ & ♀, Tanna, New Hebrides; *Nacaduba dion*, H. H. DRUCE, P. Z. S. 1892, p. 439).

About this subspecies DRUCE tells us ;

„Both sexes of this insect agreeing well with Australian specimens ; two females, however, have slightly narrower black borders and consequently a larger area of white, whilst another is quite normal.

„*Lycaena perasia*, auct. (nec FELDER), from Australia, in my opinion equals *N. dion*. I have not seen a specimen from Amboina, whence FELDER's type was obtained, but his figure seems to point to a form which has the brown borders on the underside much broader than any Australian specimens I have seen, and consequently a less extent of white” (DRUCE l.c.).

So here we meet with a similar error again as with *aratus-atratus*, BUTLER mentions a *perasia* FELDER, and DRUCE fixes this obvious printer's mistake to the New-Hebrides' subspecies, although referring to the Amboynese form at the same time ! This confusion can only be put to an end by redescribing and renaming the above-mentioned material of the B.M. collection, which

no doubt will show a good many of distinguishing characters against the Australian forms.

* * *

Herewith I have exhausted the various forms of *Nacaduba kurava* MOORE of which I have knowledge either from specimens in my private collection, or in other collections, or from literature only. Some few words may be devoted to the other species of *Nacaduba* which have been called *atrata* by various authors.

1° MOORE. This author seems ultimately to have forgotten that he himself emended the mistake of HORSFIELD in the Catalogue of 1857, for he afterwards stuck to the erroneous name of *atrata*. By that name he called a *Nacaduba* species, very common in Ceylon, with rather small, rounded transparent wings in the ♂, whilst the ♀ displays a white disc. It has (in both sexes) very broad white markings on the underside of which the submarginal ones of the forewings run more or less zigzag. This species was figured by SWINHOE, Lep. Ind. Pl. 658, f. 3c, d, as the D.S.F. of *N. atrata* SWINHOE = *N. kurava* MOORE, and was afterwards described as *Nacaduba berenice ceylonica* by FRUHSTORFER in 1916, l.c. p. 127 (id. SEITZ, p. 918) and as *sinhala* ORMISTON (Butt. of Ceylon 1924, Pl. VII, f. 8, —not text p. 49, 53, 54: *atrata*!) FRUHSTORFER's diagnosis fits this species in every detail, except for the „broad, abnormal annulus”, which may be a case of careless investigation. Neither in the Ceylonese *berenice*, nor in *ceylonica* have I found a broad ring such as attracted FRUHSTORFER's attention.

Therefore we may take *ceylonica* as the *Nacaduba* species, named *atratus* by MOORE.

I have probably got the same species from Java and recently received it in some numbers from Borneo (leg. H. C. SIEBERS during the Central E. Borneo exp. 1925), so that it has a rather wide distribution.

2° DE NICÉVILLE. „*Nacaduba atrata* HORSFIELD = *prominens* MOORE”, DE NICÉVILLE never got weary of proclaiming, and in certain respects he was right. In 1890 (Butt. of India) he still believed he could distinguish between *atrata* (MOORE nec HORSFIELD!) and *prominens*, but, finding intermediates, he felt no longer quite sure of it. Now that we know there are in Ceylon five species of *Nacaduba* of this group with subbasal fascia, we are no longer astonished that de NICÉVILLE was nor able to divide his material into two sharply limited groups. Later, in Butt. of Sumatra 1895, and in subsequent papers DE NICÉVILLE added *atrata* to *prominens* and repeatedly reiterated this statement, to the scorn of FRUHSTORFER.

3° FRUHSTORFER, misled no doubt by the name *atrata*, „the darkened”, took for this a species called *akaba* by DRUCE (1873), which species generally possesses a darker blue gloss and greyish, not whitish underside markings. Its name must however be *beroë* FELDER 1865, although it is not certain this name covers one species only. But FELDER's description and his cotype in the SENCKENBERG Museum show us a species, of which *akaba* from N. Borneo, described 8 years afterwards, is a subspecies.

It is most amusing to read FRUHSTORFER'S opinion of DE NICÉVILLE on this subject and I feel obliged to cite some words of it as a warning to show how quickly a judge may himself become a criminal in questions of synonymy:

„Es macht den unbefangenen Nachfolgern DE NICÉVILLE'S jetzt sicher Vergnügen zu constatieren, mit welcher Hartnäckigkeit DE NICÉVILLE, wo immer er konnte und die Bemerkung sogar zwecklos war, zu citieren „*N. atrata* = ' *promitens* MOORE". Die Anatomie und die Nachwelt haben gerichtet! Als SIEGER ist, wie in so vielen Fällen, MOORE aus dem Streite hervorgegangen, dessen Auge viel mehr als jenes seiner RICHTER feine Unterschiede zu erkennen geübt war" (l.c. pag. 133). Literature and Posterity have judged again, and FRUHSTORFER is declared guilty; *atrata* HORSFIELD is declared the same species again as *promitens* MOORE!

The species *beroë* FELDER is very common in Ceylon. It is much smaller and somewhat darker than the continental forms and may be named *Nacaduba beroë minima* nov. (fig. 3).

Type (Holoedotype) ♂, Kandy, Ceylon, 600 M., 1923 leg. W. ORMISTON (gen. praep. No. 132).

Thanks to the very great kindness of Mr. W. ORMISTON there is a large series in my collection, which allowed me to state the constancy of the above-named characters.

The other subspecies of *beroë*, enumerated by FRUHSTORFER, are:

1) *gythion*: Assam (Type), Sikkim, S. India. (possibly containing more than one form);

2) *neon*: N. E. Sumatra;

3) *jedja*: Nias;

4) *atrata*, E. and W. Java, Bali, Lombok, Ké Isles.

(this name must be dropped, in stead of it I propose *javana*, nomen nov., and restrict it to the W. Java form.

A large, probably the finest, subspecies, with clear grey underside and rather prominent white markings.

♂ Type, Tjibodas, W. Java, 1500 M., V-1922; 1 ♂ id. VI-1922, L. J. TOXOPEUS legit, 1 ♂ Djampang W. Java, V - 1917, ex Mus. Buitenzorg.

This subspecies mounts to the same altitudes as *N. kurava*. The forms of the other localities, to which I can add Sumba—1 ♂, leg. DR. K. W. DAMMERMAN, Kambara, N. E. Sumba, III-1925—deserve new names, but everywhere except in Ceylon this species seems to be rare, and a subspecific name should not be based on a single worn specimen only!).

5) *akaba* DRUCE 1873: Borneo;

6) *proxima* ROTHSCH. 1915: Nw.-Guinea (*an recte* ?!);

7) *asakusa*: Formosa;

8) ? *mallicollo* H. H. DRUCE 1892: New Hebrides.

Further the species is present in Kar Nicobar (1 ♀ IV-1924, don. W. H.

EVANS); Celebes (Leyden Museum, leg. H. KAUDERN); Buru (private collection, leg. L. J. TOXOPEUS 1921/1922) and presumably in all the other intermediate countries.

The typical subspecies *N. beroë beroë* FELDER 1865 flies in Luzon. The ♂ genitals of the subsp. *neon* FRUHST. 1916 have been well figured at Pl, V, No. 7, of Zoöl Med. II.

Other authors (BINGHAM, SWINHOE, EVANS, ORMISTON, a.o.) have all taken *atrata* as the right name for the collective species *kurava* MOORE.

I will add here notes on two other species which possibly were also included in DE NICÉVILLE's series. One of these is the wide-spread *berenice* HERRICH-SCHÄFFER 1869. Now the name *ceylonica* FRUHSTORFER having been taken as a specific name for the species called *sinhala* by ORMISTON, the *berenice* subspecies deserves a new name. DE NICÉVILLE named it (before he added it to the compound species *atrata* [DE NIC. nec MOORE nec HORSFIELD]) *Nacaduba plumbeomicans*, but this is the subspecies from the Andaman Is. only, and very distinct from the Ceylonese one (big ocellus!). For the latter I propose here the name *N. berenice ormistoni* (fig. 4), to express my great respect for the author of the Lepidoptera of Ceylon, 1925, and his ceaseless activity in enriching our knowledge of the butterflies of Ceylon.

The fifth *Nacaduba* species with subbasal fascia (*Six-lined blues* of EVANS) from Ceylon is a very rare one, of which I have only received one ♂ so far. Mr. W. ORMISTON informed me he had once during his investigations met with a genital system which agreed with fig. 5, but took it for a *berenice* ab. This view, however, is incorrect: the fact is, that he dissected a specimen of *Nacaduba calauria* at that time. This beautiful species has a distribution as wide as *N. beroë* at least, but is either very rare or has been overlooked. I have it from Ceylon, Sumatra, Java, Borneo, Buru (♂ & ♀ caught in copula!), and can trace it from Malacca (Distant), Amboyna (FELDER's original collecting place), and Ceram (RÖBER). I hope soon to add more particulars, but restrict myself now to a description of the Ceylonese subspecies, which I propose to name *Nacaduba calauria evansi* subsp. n.

♂. UPP. brownish purple with a deep and very dark gloss, wings slightly more pointed and less shining than in *N. berenice ormistoni*. UND. much like *berenice ormistoni* but submarginal lunules arranged in a sharply zigzagged line. Genitalia as in fig. 5.

♀. UPP. dark greyish brown with a wedged shaped purple disc on forewing and purple base to hindwing, radiating as far as end of cell. Fringes same as groundcolour.

UND. groundcolour darker and browner than in *Nacaduba beroë minima* ♀, markings rather whiter, broader and straighter, submarginal lunules rather dark brownish grey, linking together to form a sharp-edged zigzag line. Eyespot

round, very faintly ringed with orange, which is partly replaced by white scales.

♂ (Type), ♀ (Paratype), Kandy, Ceylon, 600 M, 1923, acq. & don. W. ORMISTON.

The ♀ of this subspecies is on its upper surface hardly distinct from that sex of *N. beroë minima*, but the blue parts of its hindwings are much more extended (*beroë minima* ♀ bears barely any suffusion); on its underside it is well marked by the dark zigzag line, a specific character of *N. calauria*. This zigzag line is continuous along the whole margin, and does not get fainter towards the apex, which it does in *berenice* subspecies from the Eastern parts of Australasia, but *not* in the far Western districts (e.g. Ceylon).

Though the underside of *calauria evansi* ♀ bears more likeness to ♀ *berenice ormistoni* than to *beroë minima*, and might be confused with the former, the dark purple disc of the upper surface separates it at once from that species. The ♂ genitalia have a high flat bowl-shaped valva, without any trace of a harpa, in all subspecies. There are enough obviously distinct details in each part of the system to prevent confusion with any other *Nacaduba* species.

I have figured the ♂ genitalia of the five „Six-line Blues” of Ceylon, so that even an unskilled eye can appreciate the abundant differences. They prove how helpful dissection can be in this group. The differences hold good throughout the whole range of each species, though small changes in outline, number of spines and bristles will be seen in subspecies inhabiting countries lying far apart or long separated. This isolation however, viewed from the standpoint of genealogical separation must have brought to bear an equally important influence on the amount of departure from the original form. A comparison of Fig. 1 of this paper with FRUHSTORFER's photo reproduction of *N. kurava cyaneira* (l.c. pl. V. fig. 8), i.e. between the Ceylonese and the New-Guinean *kurava* subspecies will be sufficient to illustrate this. Though one glance is enough to see that they are not specifically different, one notes immediately in the Ceylonese *N. kurava prominens* the longer and thinner headlike portion of its valva, its thin neckpart and much elongated body distally armed with shorter spines. The Javan *N. kurava kurava* tends more towards the New-Guinea form, though the pattern of the wings shows much more likeness to *N. kurava prominens*, thus giving a strong support to the opinion, that we are dealing with one species only here. In fact, except for two out of many subspecies (*beroë* and *euretes*) and for the collective name FRUHSTORFER's compilation was right.

EXPLANATION OF THE PLATE.

- Fig. 1. ♂ genitalia of *N. kurava prominens* MOORE (Kandy XII — 1923).
" 2. " " " *N. beroë minima* TOX. (Kandy 1923).
" 3. " " " *N. ceylonica* FRUHST. (Kandy XII — 1923).
" 4. " " " *N. berenice ormistoni* TOX. (Kandy 1924).
" 5. " " " *N. calauria evansi* TOX. (Kandy 1923).

hatched : *cerci* (*scaphium*)

densely dotted : *harpe*.

The Aedoeagus is slightly darker than the rest.

Note the small chitinous hairs on the Furca of 2 and 4!

All figs. $\times 54$, drawn with LEITZ drawing prism fixed on LEITZ microscope.
Slides in Canada balsam. In Fig. 1, one valva omitted.

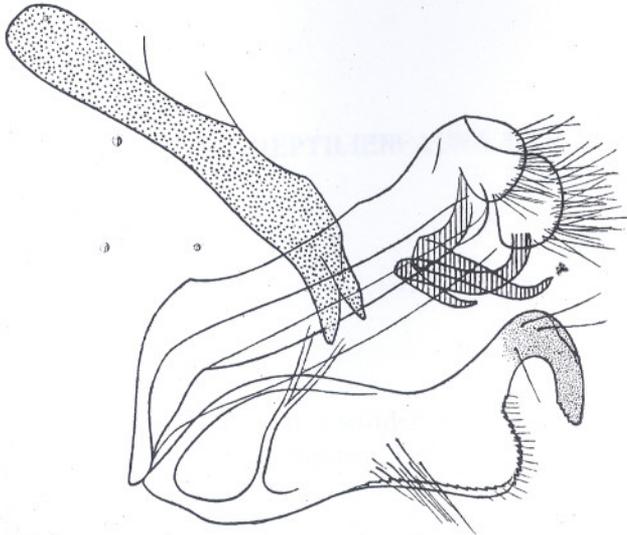


Fig. 1.

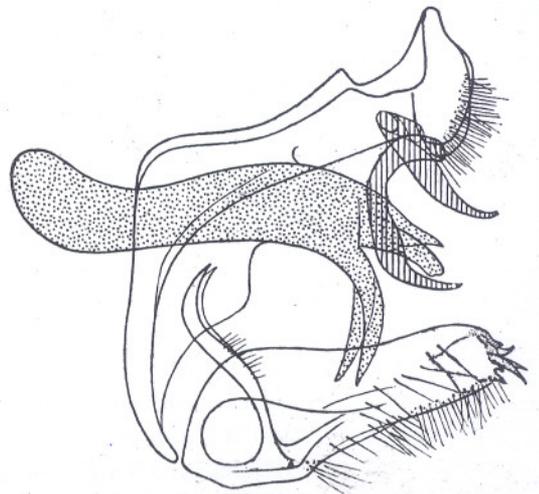


Fig. 2.

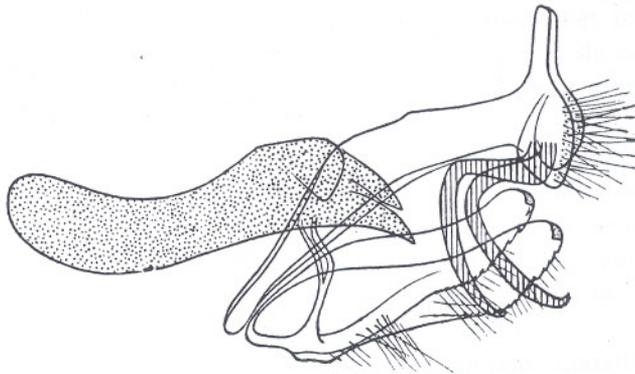


Fig. 3.

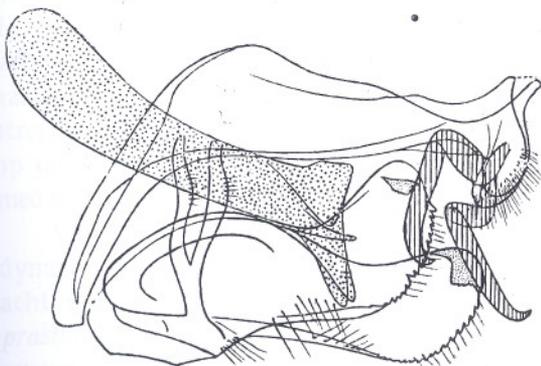


Fig. 4.

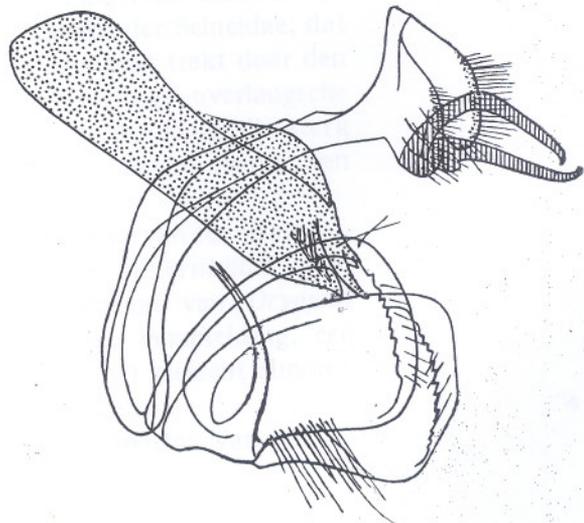


Fig. 5.