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NOTES ON SPECIES OF *NANNOPHLEBIA SELYS* FROM THE MOLUCCAS AND NEW GUINEA (ODONATA)

by

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In this short paper notes and descriptions are offered of four new and two already known species of the Tetrathemine genus *Nannophlebia* Selys, all from the Moluccan islands and New Guinea.

I have found that the specific characters of the genotype, *lorquini* Selys, as they were apprehended up to this time, might give rise to confusion with allied species. Therefore, I have in this paper also given a re-description and figures of the two sexes of this species, including it in a new key to the identification of all species at present known from the Moluccas.

The sexes are often very difficult to correlate in this genus. Our collections contain no less than six species which I have been unable to locate: one from the Banggai Islands, one from Japen (off northern New Guinea), and four from the mainland of New Guinea. All of these are probably new to science, but as there seems little prospect of obtaining the males, I have refrained from describing them and giving them a name.

All members of *Nannophlebia* are found near running water, small clear streams and brooks in virgin forest affording the most suitable breeding places. Because of the apparently limited range of nearly all species, representatives are but rarely found in collections. Apart from this, the freely flying males are easily overlooked insects owing to their cryptic green-and-black colouring and their habit of keeping to dense foliage in close vicinity of their breeding place. They fly only short distances and rest on projecting twigs, usually in such inaccessible places like dark ravines and other damp situations. The females, on the other hand, are more often seen while ovipositing over the ripples in the stream bed. They sometimes congregate during this act in some numbers and under these circumstances are more easily caught.

References to the literature on the regional species have been given at the end of this paper.

***Nannophlebia lorquini* Selys (figs. 2-4)**

1948. Lieftinck, *Treubia*, 19: 235-237, 242 (key), figs. 5-6 (♀ thorax, Halmahera; ♂ anal apps., type "Moluques"). — ♂ ♀ "Moluques" (types); Ternate; ♀ Halmahera.

Additional material. — From the northern Moluccan islands H a l m a h e r a and B a t j a n. N. Halmahera: 6 ♀ (ad.), Tobelo, v. 1933, M. J. van Diejen;

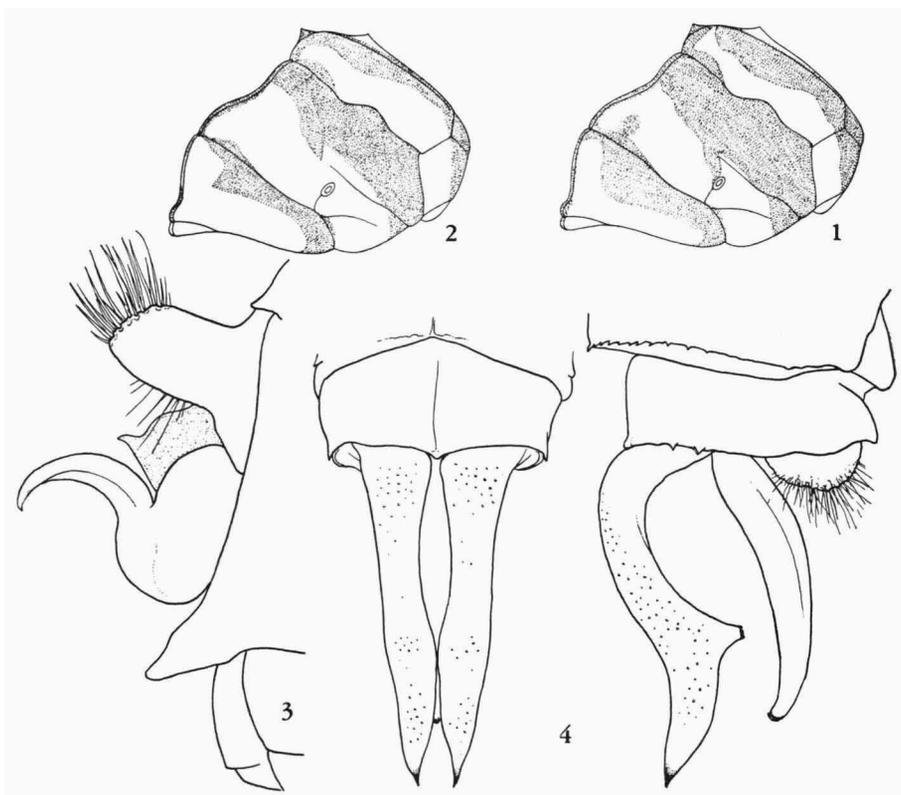


Fig. 1. Colour-pattern of male synthorax of *N. aerostiba*, sp.n., paratype (Ambon). Fig. 2. The same of *N. lorquini* Selys (Halmahera). Figs. 3-4. Genitalia, and anal appendages of *N. lorquini* Selys (Halmahera).

3 ♂, 3 ♀ (ad.), C. Halmahera, Tugauer Taso, 50-100 m, 23. ix. 1951 (2 ♂, 2 ♀), and Mt. Sembilan, 600 m, 22. ix. 1951 (1 ♂), native coll. 2 ♂, 4 ♀ (ad.), S. Batjan, Wajaua, sea-level, 22. vi. 1953 (1 ♀), Wajamiga and Salawaku Rivers, 0-100 m, 12. vi. — 7. vii. 1953 (2 ♂, 3 ♀), A.M.R. Wegner. Specimens in the Leiden Museum and in Mus. Zool. Bogor.

Though additional notes on *lorquini*, including a re-description of the types, were published already on an earlier occasion, these have now proved insufficient for its recognition in view of the fact that the anal appendages of the type were somewhat distorted. The fresh material now at hand enables me to supply better figures of these organs and a re-description of both sexes taken from a good series collected in Halmahera and Batjan. The revised key at the end of this paper may serve to recognize all five known species from the Moluccan islands.

Male (ad., Halmahera). — Labium pale greenish yellow, the lateral lobes with the apical margin narrowly, the inner margin more broadly bordered with black, the joint median black mark thus formed more or less T-shaped, the transverse portion of the T finely pointed on both ends and tapering away about half-way along apical margin; median lobe also somewhat obscured on middle. Mandibles greenish yellow, the apices and a narrow basal line along margin of compound eyes, black. Labrum shiny black. Clypeus light green. Frons almost wholly black, superficially and sparsely punctate on either side of the sulcus, marked on either side with a subtriangular green spot filling out the edge enclosed between clypeus and eye-margin, the diameter of this spot about one-third of the entire height of the frons measured along margin of compound eye. Vertex shiny black, sparsely punctate. Occipital triangle and rear of the head black, with a small circular median yellow twin-spot behind the eyes just beneath occipital triangle.

Prothorax with the anterior lobe green, the median lobe black, carrying a paired mid-dorsal spot and a somewhat larger comma-shaped spot on either side, the posterior lobe entirely black.

Synthorax light green and deep black, pattern as shown in fig. 2. Dorsal half of median carina, including the crest between the ante-alar triangles, light green. Ventral surface with the ventral prolongations of the black metepimeral bands sharply defined, wider than the lateral band and broadly fused mid-ventrally. Poststernum with conspicuous transverse black mark occupying more than the anterior half of the apical division.

Coxae black anteriorly, green posteriorly; trochanters and femora mainly black, a green interior stripe along basal two-thirds of anterior and basal one-fourth of intermediate femora, the posterior pair wholly black; anterior tibiae black, posterior two pairs bright yellow on the outside; tarsi black.

Wings hyaline, both pairs faintly tinged yellowish all over the membrane from base as far outwards as half-way between *q* and the nodus. Nodal index 5. 7. 7. 5-6 on fore wing, 5. 6. 5. on hind wing. Only one *Cux* in hind wing. Pterostigma deep black.

Abdomen very slender, spindle-shaped, the basal segments moderately

expanded in lateral, more strongly so in dorso-ventral dimension; apical segments, from distal two-thirds of segm. 6 backwards as far as the end of 7 gradually increasing in width, then again diminishing in width towards the end of 10, segm. 8 about $1\frac{1}{4}$ times higher than broad. Colour deep black and green on segm. 1-3, black and ochreous on the succeeding segments, as follows: 1 black above, green alongside; 2 with complete black basal and apical rings, the latter widening mid-dorsally and forming a blunt triangle whose point is attached (or nearly so) to the anterior stripe; 3 black including the intersegmental ring, carrying a narrow green ring that borders the transverse suture but is broadly interrupted on mid-dorsum, occupying only one-fourth of the lateral surface; 4-5 each marked with very minute, triangular ochreous postmedian latero-ventral spots, not visible from above; 6 with narrow median ring, usually finely interrupted in the median line, occupying hardly more than one-fifth of the segment's length when viewed laterally. Segm. 7-10 wholly black.

Genitalia of 2nd segment black, only the lower part of the main body of hamulus yellowish (fig. 3).

Anal appendages shaped as in fig. 4, colour pale orange-yellow, the apices only being black.

Female (ad.). — Specimens of this sex from Tobelo, N. Halmahera, were already described by me earlier. The fresh examples from Central Halmahera are closely similar and also tally with the above description of the male. All agree in having the posterior lobe of prothorax black and only the upper half of the dorsal thoracic carina striped with green. The pale lateral spots in front of frons are a trifle larger and less triangular than in the male, their diameter fully one-third of the total height of the frons.

Vulvar lamina very short, the lobes more widely distant than in *aerostiba*, separated from one another by a wide V-shaped incision, which is broader than the diameter of each lobe.

Anal appendages yellow, twice longer than 10th segment, cylindrical, the apices more evenly pointed than in *aerostiba*, the tips finely black.

The examples from Batjan are almost identical with the series from Halmahera, except that they average a little smaller in size.

Measurements: ♂ abd. + app. 21.3-21.7, hw. 21.0-21.2, pt. 1.4; ♀ 20.0-22.8, 22.0-23.6, 1.5-1.7 mm (Halmahera); ♂ 19.7-20.3, 19.6-20.6 mm, and ♀ 20.7-21.0, 21.3-22.2 mm (Batjan).

The male of this darkly coloured species is most easily recognized by the shape of its superior anal appendages. It comes nearest *aerostiba*, sp.n., from Ambon, which is still darker and which differs also from *lorquini* in having

the upper pair of appendages less strongly downcurved in their basal half, lacking the very prominent sub-apical inferior tubercle of *lorquini*. Both species are certainly closely allied.

N. lorquini is evidently the commonest *Nannophlebia* of the northern Moluccas, and although it was not represented in the insect collections recently brought home from Obi, it might turn up there also sooner or later.

***Nannophlebia arethusa* Liefstinck**

1948. Liefstinck, *Treubia*, 19: 234, 237-239, 243 (key), figs. 5, 7 (thorax, ♂ genit. & apps.). — Buru; Ambon; Saparua; Ceram.

Additional material. — A good series of both sexes from the southern Moluccan islands *A m b o n* and *O b i*. Ambon, various localities in low country, e.g. Laha and Passo, 0-200 m, 5. xi. 1948 and 12-25. x. 1949, M. A. Liefstinck. N.W. Obi, Laiwui, 0-200 m, ix-x. 1953, A. M. R. Wegner et al. Specimens in the Leiden Museum and in Mus. Zool. Bogor.

This is the species originally considered by Ris and myself to be identical with *lorquini*. As I have pointed out in the original description, *arethusa* is easily distinguished from that species and restricted to the islands of the southern Moluccas. The types are from Ambon, where it is fairly common locally. Judging from the material collected by others than myself in Buru, Ceram, Saparua and Obi, it is probably equally abundant in suitable localities of the surrounding islands.

Our series include relatively small-sized individuals from Obi, which otherwise can not be distinguished from those of Ambon. ♂ abd. + app. 17.7-18.0, hw. 18.5-19.3; ♀ 19.0-20.0, 19.0-20.2 mm.

***Nannophlebia aerostiba*, sp.n. (figs. 1 and 8-9)**

Material. — South Moluccas, *A m b o n* I.: 3 ♂, 3 ♀ (ad., including holo- and allotype), Soja di Atas, 400 m, 11 & 19. x. 1949, M. A. Liefstinck. Types and paratypes in the Leiden Museum.

Male (ad.). — Labium orange-yellow, the inner margin of each of the lateral lobes, including the intero-apical edges, narrowly bordered with black, the joint median black mark thus formed gradually expanded distally, its wing-like transverse portions finely pointed on both ends and extending only along the inner halves of the apical margin of the side lobes; median lobe unmarked. Mandibles greenish yellow, the apices and a basal line along margin of compound eyes, black. Labrum entirely shiny black. Clypeus bright ochreous. Frons greenish ochreous, finely and sparsely punctate on either side of the sulcus, marked on middle with a large sub-rectangular black patch, usually somewhat diffuse distally and at the sides, extending from base to

apex so as to save a pair of large, oval or subtriangular, greenish yellow spots, one on each side, fitting close against margin of compound eye, the diameter of these spots about one-half (or a little more than) the breadth of the median black patch. Vertex shiny black, sparsely punctate. Occipital triangle and rear of the head black, with a small circular median yellow twin-spot behind the eyes just beneath occipital triangle.

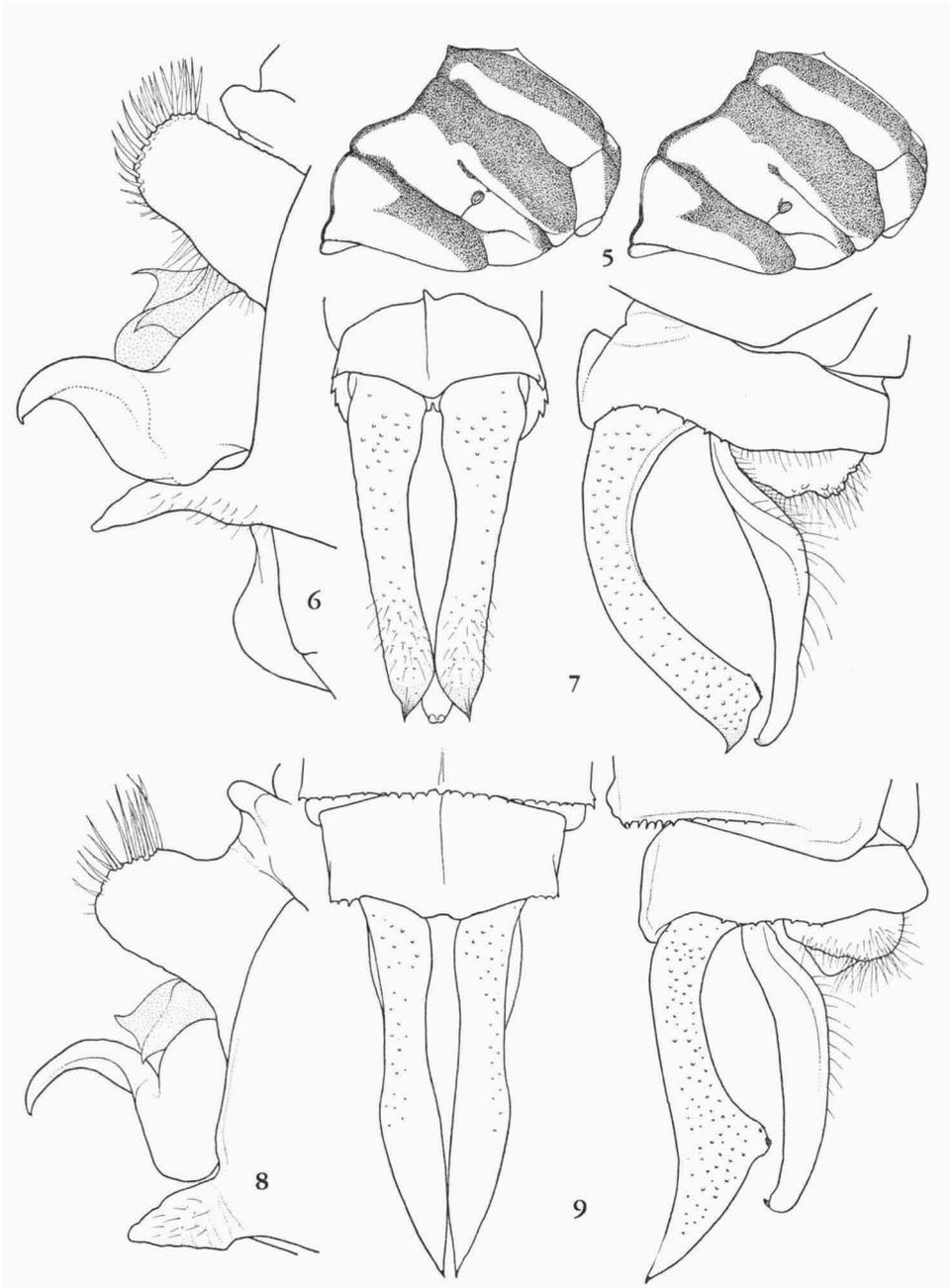
Prothorax with the anterior lobe green, the median lobe black carrying a paired mid-dorsal spot and a somewhat larger comma-shaped spot on either side, the posterior lobe black with a tiny green median spot or streak near base.

Synthorax bright greenish yellow and deep black, pattern very similar to that of *lorquini* and *buruensis*, but differing from both in that the black bands are considerably more extensive (fig. 1). Median carina, as far upwards as 0.3 mm before the ante-alar triangles, finely yellow, this line only little expanded ventrad so as to form a tiny triangular spot placed upon the junction of the transverse and mid-dorsal crests. Apex of antehumeral bands narrow, pointed and hooked inwards under a right angle (type and one paratype), or simply rounded above (4 paratypes). Mesepimeral black band about twice as broad as the antehumeral yellow stripe, its posterior border almost straight above the spiracle. Black band bordering second lateral suture with its posterior border evenly convex, but on the opposite side the band carries a distinct, marginally often diffuse, blackish offshoot near its upper end, which invades the light colour of the metepisternum. The two lateral thoracic bands are almost or entirely connected across the spiracle by a fine black line. Ventral surface with the transverse prolongations of the black metepimeral bands sharply defined and fused in the median line though narrower than the lateral band; anterior two-thirds or more of the apical portion of the poststernum also black, this mark more distinctly triangular in shape than in *lorquini* Selys.

Coxae and trochanters light green striped with black posteriorly, as in *lorquini*. Femora black, basal two-thirds or more with green interior stripe; tibiae black interiorly, lemon yellow exteriorly; tarsi black.

Wings hyaline, both pairs faintly tinged yellowish all over the membrane from base as far outwards as the quadrilateral. Nodal index 5-6. 7. 7. 5-6 on fore wing, 5-6. 6. 6. 5-6 on hind wing. Only one *Cux* in hind wing. Pterostigma deep black.

Abdomen long and very slender but not distinctly spindle-shaped, the basal segments moderately expanded in lateral, much more strongly so in dorso-ventral dimension; apical segments, from the terminal half of segm. 7 to its apex, gradually increasing in width, then parallel-sided towards the



Figs. 5-7. Colour-pattern of male and female synthorax (5), genitalia (6), and anal appendages (7) of *N. anacharis*, sp.n. (Halmahera). Figs. 8-9. Genitalia and anal appendages of *N. aerostiba*, sp.n., paratype (Ambon).

end of segm. 9, the 8th segment only about $1\frac{1}{4}$ times higher than broad. Colour deep black and green on segm. 1-3, black and ochreous on the succeeding segments, as follows: 1 black above, green alongside; 2 with complete black basal and apical rings, the latter widening mid-dorsally and carrying two forward prolongations, the green ring enclosed very narrow on mid-dorsum; 3 black including the intersegmental ring, but carrying a narrow ochreous ring, interrupted in the median line, which occupies barely one-third of the lateral surface; 4-6 each marked with very small ochreous postmedian rings, varying in extent but all of them strongly constricted and hardly visible from above, triangularly widened laterally, that on 6 widest though occupying hardly more than one-fifth to one-third of the segment's length measured along ventral margin of tergite. (These yellow marks in the type are so small as to be apparent in dorsal view only as vestiges on the 6th segment). Segm. 7-10 entirely black.

Genitalia of 2nd segment black, only the lower part of the main body of hamulus yellowish (fig. 8).

Anal appendages shaped as in fig. 9, colour throughout lemon yellow, only the extreme point of the apices black.

Female (ad.). — Resembling the male in almost every respect and differing only in details of coloration. Squarish black patch in front of frons larger, the yellow lateral spots a little less than one-half the diameter of the black mark on middle, reaching two-thirds the distance up along the eye-margin and often narrowly confluent with one another along clypeal suture. Antehumeral yellow bands not inwardly hooked apically.

Wings as in the male. Nodal index variable, 7-8 antenodals and 5-6 postnodals on fore wing, 6-7 and 5-6 respectively, on hind wing.

Yellow marks on abdominal segments 4-6 of the same small size as in the male but very variable in shape, either reduced to flat triangular streaks, drawn out longitudinally along lower margin of tergites 4-5 and absent altogether on 6, or placed more transversely and, though barely visible on 4-5, rather conspicuous on 6.

Vulvar lamina very short, with a deep U-shaped incision, the lobes rounded and much broader than the distance separating them.

Anal appendages light yellow, fully two times longer than 10th segment, cylindrical, the apices rather abruptly and acutely pointed, tips finely black.

Measurements: ♂ abd. + app. 22.4-22.8, hw. 21.0-21.5, pt. 1.3; ♀ 21.6-23.2, 22.0-22.8, 1.5-1.6 mm.

While searching for *Nannophlebia* at the shady streams in the foot hills around the capital Amboina (on the island Ambon), the small and brightly

coloured *arethusia* was the species most frequently met with near the sea coast. Further inland, the present new species made its appearance, immediately recognized by its larger size and almost black abdomen. Though it appeared very scarce even in the hills, it seemed to replace *arethusia* at higher elevations. Therefore, we may expect *aerostiba* to become increasingly more abundant at a greater altitude above the sea, the mountain forests of Ambon being still practically unexplored by entomologists.

***Nannophlebia anacharis*, sp.n.** (figs. 5-7)

Material. — North Moluccas, H a l m a h e r a I.: 2 ♂, 2 ♀ (ad.), C. Halmahera, Mt. Sembilan, 600 m, 8. x. 1951 (2 ♀), Tolewang, 50 m, 13. x. 1951 (2 ♂), Sundanese collectors. Holotype ♂: Tolewang, 13. x. 1951, allotype ♀: Mt. Sembilan, 8. x. 1951. — B a t j a n I.: 4 ♀ (ad.), S. Batjan, Salawaku River, 100 m, 12-14. vi. 1953, A. M. R. Wegner et al. Types and paratypes in the Leiden Museum, paratypes in Mus. Zool. Bogor.

Male (ad., Halmahera). — Labium pale ochreous with a vestigial blackish spot at the apex of the median lobe and a narrow black stripe along inner margin of each of the lateral lobes. Mandibles greenish yellow, the apices and a fine basal line along margin of compound eyes, black. Labrum wholly shiny black. Clypeus bright greenish yellow. Frons black, finely and sparsely punctate laterally, marked with a pair of curved, more or less comma-shaped yellow spots situated about half-way down, bent towards each other above and broadly attached below to the margin of compound eye. Vertex shiny black with a circular median yellow twin-spot behind the eyes just beneath occipital triangle

Prothorax with the anterior lobe green, the median lobe black carrying a paired, rather X-shaped, mid-dorsal spot and a somewhat larger comma-shaped spot on either side, the posterior lobe yellow-green, with a conspicuous circular black spot on either side of the middle, this spot sometimes tapering basad.

Synthorax bright yellowish green and deep bronzy black, pattern as in fig. 5. Median carina entirely yellow, this line abruptly expanded ventrad, forming a conspicuous, though rather small, almost circular spot placed upon the junction of the transverse and mid-dorsal crests. Ventral surface with the transverse prolongations of the black metepimeral stripes rather broad, fused in the median line and deep black in colour; oblique sutures separating the basal and apical portions of the poststernum also lined with black.

Coxae and trochanters light green; legs otherwise for the greater part also green marked with dark brown, as follows. Femora with a brown exterior stripe, sometimes rather diffuse and almost interrupted half-way

its length, but expanding apically so as to form broad dark apical rings, which, however, are occasionally incomplete and obliterated, the knees also finely yellow; tibiae either with rather diffuse blackish brown stripe along full length of the inner surface, or with traces only of a dark interior line restricted to the basal portion of the tibia; tarsi brownish black.

Wings hyaline, both pairs very faintly tinged with yellow all over the basal part of the membrane up to the quadrilateral. Nodal index 6. 8. 8. 6 or 6. 8. 9. 6 on fore wing, 5-6. 7. 7. 5-6 on hind wing. Two *Cux* in hind wing. Pterostigma deep black.

Abdomen long and of slender build, the basal segments moderately expanded in lateral, much more strongly so in dorso-ventral dimension; apical segments, from the terminal half of segm. 7 to its apex, very gradually increasing in width, then parallel-sided towards the end of segm. 10, but 8 almost $1\frac{1}{2}$ times higher than broad. Colour blackish brown and green on segm. 1-3, black and ochreous on the succeeding segments, as follows: 1-2 green save a brown basal line restricted to the dorsum on 1, a dark basal stripe and a low triangular brown apical spot, pointing forwards, on the middle of the dorsum of 2; 3 blackish brown including the intersegmental ring, with a broad ochreous ring occupying the median one-third of the dorsal surface and about one-half of the lateral surface of the segment; 4-6 each marked with conspicuous, uninterrupted, ochreous postmedian rings, varying in extent and ill-defined anteriorly as well as posteriorly, but occupying at least one-third (in the paratype more than one-half) of the length of each segment when looked at from aside, all rings being about equal in size though rather constricted mid-dorsally. Segm. 7 with a similar, though much smaller, postmedian ochreous ring, very narrow on mid-dorsum but strongly expanded on the sides and occupying more than one-third of the segment's length measured along ventral margin of the tergite. Segm. 8-10 black.

Genitalia of 2nd segment shaped as in fig. 6; all parts much obscured, only the anterior lobe and main body of hamulus green, the end-hook of the last mentioned as well as the lobus posterior black.

Anal appendages (fig. 7) pale ochreous, unmarked, only the apices slightly obscured.

Female (ad., Halmahera). — Very similar to the male and differing only in details of coloration. Joint stripe bordering the inner margin of the lateral lobes of labium slightly broader. Frons marked on either side with a well-defined, hook- or 7-shaped green spot which reaches further upwards than in the male, the stem of each of these spots longer and just touching the eye-margin at a point only about 0.5 mm distant from the fronto-clypeal suture.

Black lateral spots on posterior lobe of prothorax a little smaller. Colour-pattern of synthorax as in fig. 5, the stripe along second suture slightly variable in width.

Dark stripes along femora and tibiae usually somewhat deeper in tint and also a little broader.

Wing-membrane hyaline, bases hardly noticeably tinged with yellow and, if so, then only traces of yellow spots in *sc* and *cu* of posterior wing. Nodal index 6-7. 8-9. 8-9. 6-7 on fore wing, 6-7. 7. 7. 5-7 on hind wing. Invariably two *Cux* in hind wing.

Abdomen with the light markings rather similar in arrangement to those of the male, but differing in shape and size, as follows. The black spot on the dorsum of segm. 1 larger, extending from base to apex, the mark being divided into two rather trapezoidal portions by a yellow median stripe or spot; on segm. 2 the black apical triangle extends further basad so as to reach a fine black line that borders the transverse suture, most of the basal part of the dorsum being also black. Ochreous rings of segm. 3-6 smaller than in the male, that on 3 narrowly interrupted in the median line, those on 4 and 5 considerably less broad than that on 6, which occupies approximately one-third of the segment's length. Postmedian ring on segm. 7 again much smaller, finely interrupted in the median line and incomplete laterally, reduced to a transverse mark on the dorsal surface.

Vulvar lamina extremely short, with a very wide V-shaped incision, the lobes short, strongly divaricate, removed laterad, their margin slightly convex and somewhat swollen.

Anal appendages yellow, about $1\frac{1}{2}$ times longer than 10th segment, cylindrical, apices rather abruptly, shortly, but acutely pointed; tips finely black.

Measurements: ♂ abd. + app. 23.0-23.2, hw. 23.0-23.5, pt. 1.7-1.8; ♀ 23.0, 24.0-25.0, 1.9-2.0 mm (Halmahera); ♀ 21.5-22.0, 23.0-24.0 mm (Batjan).

The four females from Batjan resemble the examples of that sex from Halmahera in every respect save in the body-size, which is somewhat inferior, and in the number of ante- and postnodal cross-nerves, which is evidently unstable when good series are examined. In our series there are 8-9 antenodals and 5-7 postnodals on fore wing, 7-8 antenodals and 5-7 postnodals on hind wing.

This very distinct and attractive new species has no near allies. It can be distinguished from all others by the combined characters enumerated in the key; its large size and richly adorned body, combined with the characteristic shape of its genital organs affording easy recognition marks.

Key to the species of the Moluccan islands

1. Fore wing with 7-9, hind wing with 6-7 antenodal cross-nerves. Labrum wholly black 2
- 1'. Fore wing with only 6, hind wing with 5 antenodal cross-nerves. Only 1 *Cux* in hind wing. Labrum at least with some yellow colouring at base. Posterior lobe of prothorax broadly bordered with yellow. Antehumeral thoracic light band about equal in width to the mesepimeral black band, which is fused across the spiracle with the band along second suture. Metepisternum invaded postero-dorsally by a rudimentary black off-shoot (usually an isolated spot or diffuse patch) of the black band along second suture; this band moreover with distinct angular postero-dorsal projection invading the pale colour of the metepimeron. ♂ sup. anal apps. relatively short, widely distant, slightly curved inwards and downwards basally, with the tips meeting; sub-apical ventral projection of each obtuse-angulate, not very prominent, preceded by a row of extremely minute black denticles. Small species. Hab.: Buru; Ambon; Saparua; Ceram; Obi. *arethusia* Lieft.
2. Antehumeral green band narrow, only half as wide as the mesepimeral black band, its dorsal extremity very slender, straight, or with a tiny hook-like inward prolongation. Black band along second lateral suture only little narrower than the green metepisternal area anterior to it, its posterior border convex but not distinctly angulate, usually carrying a distinct black off-shoot which invades the green metepisternal area. Posterior lobe of prothorax black marked with a green central spot. A squarish black mark on middle of frons extending from base to apex; lateral greenish spot reaching two-thirds the distance up along the eye-margin. Only 1 *Cux* in hind wing. Fore wing with 7-8, hind wing with 6-7 antenodal cross-nerves. Yellow marks on abd.-segm. 1-6 very small, the ring on 3 interrupted in the median line; segm. 7-10 black. Genitalia and anal apps. of ♂ shaped as in figs. 8-9. Hab.: Ambon *aerostiba*, sp.n.
- 2'. Antehumeral green band broader, about equal in width to the mesepimeral black band, its dorsal extremity never hooked inwards. Black band along second lateral suture much narrower than the green metepisternal area anterior to it. Metepimeral black band nearly always with an angular projection along posterior border. Genitalia and anal apps. of ♂ not as above 3
3. Hind wing with 2 or even 3 *Cux* 4
- 3'. Hind wing with only 1 *Cux*. Fore wing usually with 7, hind wing with 6 antenodal cross-nerves. Frons wholly black save for a squarish, sub-circular, or more or less triangular spot of yellow placed on either side along eye-margin and filling out the angle between clypeal suture and margin of compound eye. Posterior lobe of prothorax entirely black. Usually only the upper half or less of the mid-dorsal carina of thorax yellow. Colour-pattern of synthorax as in fig. 2. Yellow rings on abd.-segm. 2-3 interrupted on mid-dorsum, those on 4-6 of small size; segm. 7 entirely black. Genitalia and anal apps. of ♂ shaped as in figs. 3 and 4. Hab.: Halmahera; Ternate; Batjan *lorquini* Selys
4. Fore wing with 7, hind wing with 6 antenodal cross-nerves. Frons predominantly yellow, with narrow black basal line and a transverse black mark along clypeal suture, this spot connected with the black along base by a fine median longitudinal line forming a well-defined T-spot; or the transverse part of this frontal mark obliterated so as to save a pair of isolated black spots close to anterior border. A yellow line along full length of mid-dorsal carina of thorax. Black epimeral bands

on thoracic pleurae fused across the spiracle by an oblique stripe. Metepisternum invaded postero-dorsally by a strongly protuberant off-shoot of the black band along second suture, this band distinctly angulate or even more or less forked posteriorly so as to enclose a circular spot of yellow. Segm. 7 of abdomen entirely black. Basal two-thirds of ♂ sup. anal apps. evenly and but slightly downcurved in profile view, the apical portion gradually tapering to a sharp point. Hab.: Buru *buruensis* Lieft.

- 4'. Fore wing with 8-9, hind wing with 7 antenodal cross-nerves. Frons predominantly black, marked on either side with an oblique, more or less comma-shaped and almost isolated, green spot at the eye-margin. Black epimeral bands on thoracic pleurae widely separated from one another. Black band along second suture lacking a postero-dorsal off-shoot invading the green area anterior to it, its posterior border, however, strongly angulate. Yellow marks on abd.-segm. 1-6 of relatively large size, well visible in dorsal aspect. Segm. 7 of abdomen with distinct though narrow postmedian yellow ring. ♂ sup. anal apps. strongly downcurved from base to apex, which is cut off abruptly and squarely, the tips slightly upturned and acutely pointed (fig. 7). Hab.: Halmahera; Batjan *anacharis*, sp.n.

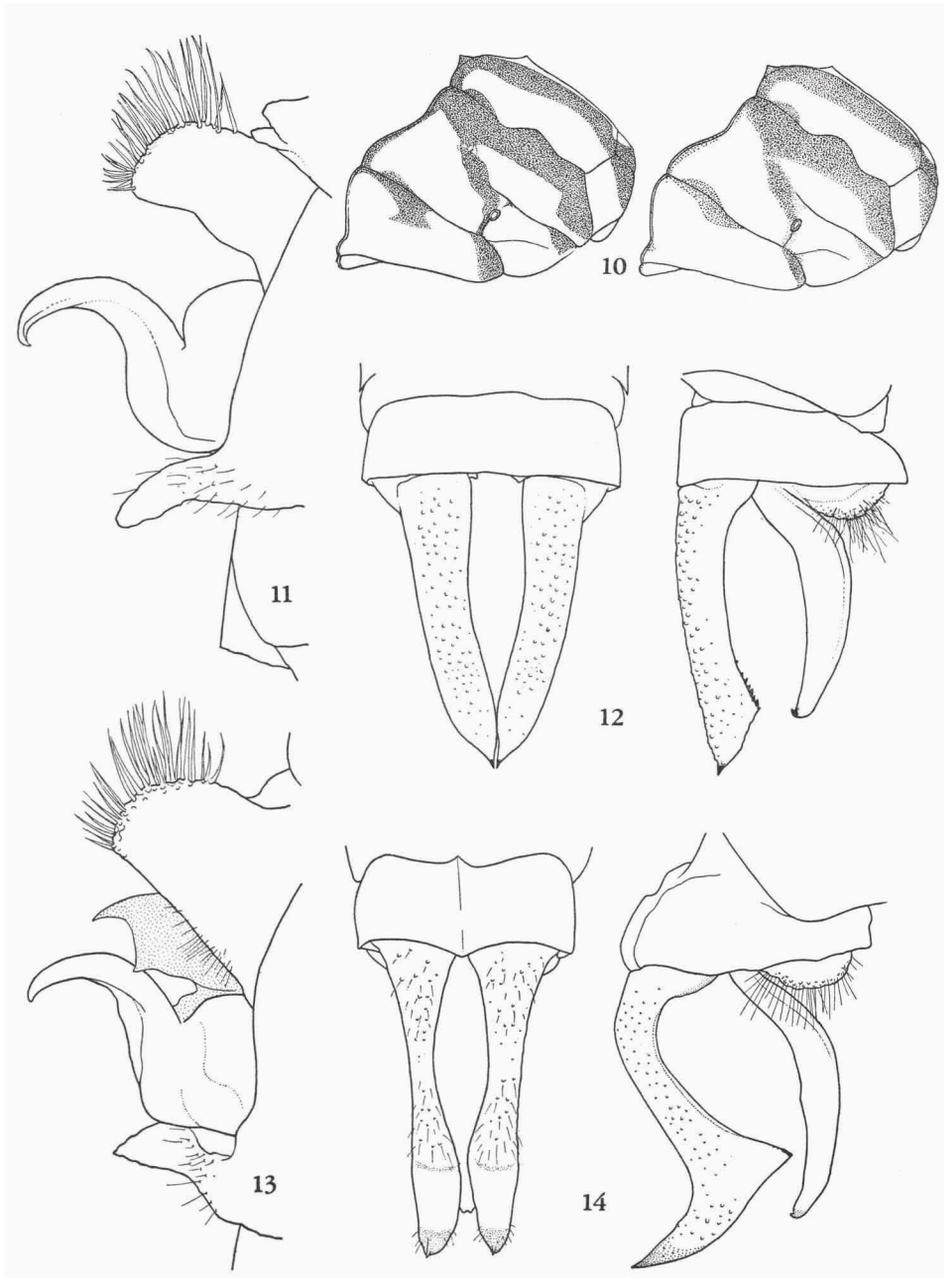
Nannophlebia amnosia, sp.n. (figs. 10-12)

Material. — West New Guinea: 4 ♂, 7 ♀ (ad.), Vogelkop, Sorong, near Remu, about 8 miles inland, 28.viii (1 ♂), 24-31.x.1948, M. A. Lieftinck. — Misool I., 1 ♂, 1 ♀ (juv.), 6 ♀ (ad.), Fakal, 50 m, 17-21.ix. 1948, M. A. Lieftinck. Holotype ♂ and allotype ♀, Sorong, 24-31.x.1948, in the Leiden Museum. Paratypes in Mus. Zool. Bogor.

Male (ad.). — Labium and face as in *amaryllis*, sp.n. Labrum yellow, but carrying a thick black mark along its anterior border, this spot irregular in shape and variable in size, widest mesially, its posterior margin with a V-shaped median indentation. Frons greenish yellow, marked along base with a narrow blackish stripe which descends about half-way down along margin of compound eye; on the middle of the frons a small black spot, roundish or subtriangular in outline, is attached to the basal stripe by means of a narrow short stalk, the spot itself extending almost to the fronto-clypeal suture, the whole marking being rather similar in form to that described for *ampycteria* Lieft., but it is decidedly narrower. Vertex brownish black, its whole surface punctate. Occipital triangle and rear of the head black, with a circular median chrome-yellow twin-spot behind the eyes just beneath the occipital triangle.

Prothorax with the anterior lobe green, the median lobe brown carrying a minute paired mid-dorsal spot and a somewhat larger comma-shaped spot on either side, the posterior lobe being yellowish brown in colour.

Synthorax light green, marked with brownish black as shown in fig. 10, the dark spot along upper portion of second lateral suture slightly varying in size and depth of colour. Yellow markings on mid-dorsum of thorax and ventral surface as described for the next species, *amaryllis*, sp.n.



Figs. 10-12. Colour-pattern of both male synthorax (10), genitalia (11) and anal appendages (12) of *N. ammosia*, sp.n. (Sorong, W. New Guinea). Figs. 13-14. Genitalia and anal appendages of *N. amaryllis*, sp.n. (Bewani, N. New Guinea).

Coxae and trochanters green; legs otherwise black marked with bright yellow: inner four-fifths of anterior femora, the basal half of the inner surface of intermediate and posterior femora, very small spots on the knees, and the entire outer surface of all tibiae; tarsi all black.

Wings hyaline, but bases of both pairs palely saffronated to a little beyond the quadrilateral, the boundary of the yellow tint very indistinct. Nodal index 5. 6. 6. 5 on fore wing, 5. 5. 5. 5 on hind wing. Only one *Cux* in the hind wing. Pterostigma deep black.

Abdomen very slender, the basal and apical segments moderately and about equally much expanded in lateral dimension, segm. 1-2 and base of 3 much more so in dorso-ventral dimension, 2 about two times higher than broad, the terminal segments widest at apex of 7, where the segment is about as high as it is broad. Colour dark brown and green on segm. 1-3, deep black and greenish yellow on the succeeding segments, as follows: 1 with the dorsum dark, the sides green; dorsum of 2 with dark basal stripe, tapering on both sides, and a slightly wider triangular mark along posterior border, the sides of the segment entirely green; 3 brownish black, including the intersegmental ring, with a yellow ring occupying its median one-third; 4-6 each marked with similar though narrower yellow ring, triangularly widened towards lower margin of the tergite, those on 4 and 5 almost or wholly interrupted in the median line and occupying only about one-eighth to one-ninth of the segment's length when viewed from aside, the ring on 6 almost twice as large as the preceding ones, taking about one-fourth of the entire length of segment. Segm. 7-10 black.

Genitalia of 2nd segment green, lower portion of main body of hamulus brownish, its apex shiny black (fig. 11).

Anal appendages shaped as in fig. 12, yellow, the extreme apices black, as are also the minute recurved marginal teeth on the underside before the inferior projection of the superior pair.

Female. — Closely resembling the male and differing only in details of coloration. Black spot in front of frons isolated, of smaller size, often ill-defined and restricted to the centre of the frons. Labrum with the black apical patch somewhat larger, the two basal prolongations on either side of the indentation sometimes almost reaching the base.

Wings as in the male, but bases in the specimens from Misool only very slightly tinged with yellow.

Abdomen marked similarly to the opposite sex, the yellow rings encircling segm. 4 and 5 not enlarged but noticeably more expanded downwards and prolonged for a short distance along margin of the tergite as yellow lines,

the ring on 6 not differing from that of the male except that it is a little smaller.

Vulvar lamina short, with a deep U-shaped incision, the lobes slightly divaricate and a little broader than the distance separating them, each sub-rectangular in outline, with rounded edges.

Anal appendages yellow, about twice as long as the 10th segment, cylindrical, apices evenly and finely pointed, black-tipped.

Measurements: ♂ abd. + app. 19.0-20.4, hw. 19.0-19.5, pt. 1.0; ♀ 19.0-20.5, 19.0-21.0, 1.2-1.5 mm.

Allied to *N. axiagasta* Lieft., *ampycteria* Lieft., and *adonira* Lieft. (all from the lowlands of northern New Guinea), but easily distinguished from these species by the reduction of the black mark on the second lateral suture of the thorax, the exceptionally long posterior genital lobe, and by the different shape of the appendages of the male. In *N. axiagasta* the sup. anal apps. are also inwardly curved, but the tips are upturned and acutely pointed, while the sub-apical inferior tooth is much more prominent than in *amnosia*. In *N. ampycteria* these organs are still more approximated basally and at the same time more drawn out than in *axiagasta*, thus differing even more from *amnosia* in this respect. Lastly, in *adonira*, the superior appendages, though resembling those of our new species in profile view, appear much wider at base, the whole structure being almost straight and sharply pointed when viewed from above.

N. amnosia is the first representative of the genus recorded from the Vogelkop. Since it has also been found in Misool, it is probably well distributed over the western area. It was very scarce wherever found, but this is doubtless due to the interior of the Vogelkop being still so very little known.

***Nannophlebia amaryllis*, sp.n. (figs. 13-14)**

Material. — North New Guinea: 2 ♂ (ad.), Bewani River territ., ca. 500 m, Fumb River, 26-27.iv.1937, W. Stüber. Holotype and paratype in the Leiden Museum.

Male (ad.). — Labium, mandibles and clypeus chrome-yellow, the apices of the mandibles ferruginous. Labrum deep black with a transverse chrome-yellow basal mark which in the type is shaped similarly to the labrum itself, occupying approximately its basal one-third, while in the paratype it is somewhat smaller in size. Frons greenish yellow, marked in the centre with three diffuse blackish spots, one on each side of the sulcus and a third, sub-rectangular and slightly larger, dot on the middle of its surface; in the paratype these spots are confluent, forming a subtriangular black dot in

front of the median ocellus. Vertex shiny black, its dorsal surface somewhat rugose. Occipital triangle and rear of the head black, with a circular median chrome-yellow twin-spot behind the eyes just beneath the occipital triangle.

Prothorax with the anterior lobe greenish, the median lobe brown carrying a minute paired mid-dorsal spot and a much larger comma-shaped spot on either side, the posterior lobe pale greenish brown.

Synthorax light green marked with dark reddish brown on the dorsum and beyond the humeral suture; colour-pattern almost identical with that shown in fig. 5 for *amnosia*, sp.n. Only the mid-dorsal carina yellow along its full length, this line abruptly expanded ventrally so as to form a large diamond-shaped yellow spot placed upon the junction of the transverse and mid-dorsal crests; dark spot at upper end of second lateral suture narrow and diffuse, lacking angular prominencies. Ventral surface unmarked save ill-defined, light brown, transverse prolongations of the dark stripe descending from the spiracle.

Coxae and trochanters light green; legs otherwise black marked with bright yellow, as follows. Femora black, inner surfaces of each with a yellow stripe extending to the basal half of the anterior and intermediate pair, the basal two-thirds of the posterior pair, the knees of the posterior femora also remaining yellow. Inner surfaces of all tibiae black, their outer surfaces bright yellow, but extreme apices ringed with black; tarsi all black.

Wings hyaline, both pairs with faintest indication of yellow suffusion from base as far outwards as the quadrilateral. Nodal index 5. 6. 6. 5 on fore wing, 5. 5. 5. 5 on hind wing. Only one *Cux* in hind wing. Pterostigma deep black.

Abdomen of the usual very slender build, rather strongly curved in natural position, the basal and apical segments moderately and about equally much expanded in lateral, much more so in dorso-ventral dimension; basal segments about two times higher than broad, the terminal segments widest at apex of 8, where the segment is about $1\frac{1}{4}$ higher than broad. Colour reddish-brown and green on segm. 1-2 or 1-3, deep black and orange-yellow on segm. 3-6, as follows: 1 with the dorsum dark brown, the sides green; dorsum of 2 with dark basal stripe, tapering on both sides, and a slightly wider semilunar transverse mark along posterior border, the sides of the segment entirely green; segm. 3, including the intersegmental ring, brownish black with a yellow ring occupying its median one-third; 4-6 each marked with similar and uninterrupted ochreous rings, narrow and strongly constricted mid-dorsally on 4 and 5, but expanded and almost twice wider on the sides, occupying about one-sixth to one-seventh of the segment's length when viewed laterally, the ring on 6 fully twice as large as the preceding

ones, occupying about one-third of the entire length of segment. Segm. 7-10 black.

Genitalia of 2nd segment green, lower portion of main body of hamulus brown, its apex shiny black (fig. 13).

Anal appendages pale orange-yellow, apices of superior pair black (in the paratype also the bases of the upper appendages are somewhat obscured), shaped as in fig. 14.

Measurements: ♂ abd. + app. 21.0, hw. 20.0, pt.fw. 1.0-1.2 mm.

Female unknown.

This handsome little species is strongly reminiscent of *N. amphicyllis* Lieft., from the Cycloop Mts., and at first sight might well pass for a very small and light-coloured specimen of it, the genitalia and anal appendages being also rather similar in the two species. Apart from its much larger size (abd. 24.0-26.0, hw. 25.0-26.0 mm) and the higher nodal index (6-7. 7-8. 7-8. 6-7 in fw., 7. 6. 6. 7 in hw.), *amphicyllis* can be distinguished from our new species by the very conspicuous squarish black mark on the middle of the frons, the broader mesepimeral and metepisternal black bands and by the smaller size of the ochreous abdominal rings. The superior anal appendages in *amphicyllis* are much thicker, less drawn out and distinctly outcurved on middle when viewed from above, with the apical portion shorter, more curved and decidedly less acutely pointed than they are in *amaryllis*.

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