

REVISION OF THE *STENUS*-SPECIES
OF NEW GUINEA. PART I.
(Coleoptera : Staphylinidae)¹

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Abstract: This paper is a revision of the genus *Stenus* from New Guinea. Included are a key to the New Guinea species and descriptions of the following new species: *S. (S.) hypostenoides*, *S. (Tesusus) cupido*, *S. (T.) amor*, *S. (S.) nereis*, *S. (S.) delicatus*, *S. (S.) abilalamontis*, *S. (S.) abilalaensis*, *S. (Hypostenus) cyaneotinctus*, *S. (Parastenus) capitalis*.

The subfamily Steninae, one of the 30 of Staphylinidae, has 2 genera: *Stenus* Latr. and *Dianous* Leach of which the latter has about 100 species distributed in the Northern Hemisphere and the Northern Oriental Region. The genus *Stenus*—one of the largest in the animal kingdom (more than 1400 taxa)—is found all over the world except in New Zealand. Especially in the Southern Hemisphere, in tropical climates, this genus has an amazing number of different monophyletic groups and species. At present the fauna of the Ethiopian Region (Puthz 1971) and that of Australia (Puthz 1970b) have been revised under modern regards. This article treats the first portion of a revision of the *Stenus*-species of New Guinea, one of the largest islands of the world having a remarkable diversity of biota. Concerning *Stenus*, New Guinea has been nearly unexplored until the last 20 years. My dear colleague, Mr H. R. Last, recently did valuable work in describing most of the hitherto known species.

My revision is based on all hitherto known materials from New Guinea from the following collections: British Museum (Nat. Hist.) and University of Newcastle upon Tyne Expedition to New Guinea 1964-65; B. P. Bishop Museum, Honolulu; coll. Last; and of some other European institutions. These materials contain a number of new species which are described below. This revision does not give only new diagnoses, but also as far as our present knowledge is concerned, the relation of the species; i. e., monophyletic groups (sensu Hennig), and biogeographic remarks. It contains supplementary remarks on insufficiently described taxa, a list of all materials known from New Guinea with distributions, a key, and biogeographic remarks at the end of part II.

The revision is divided into sections. Part I comprises the usual subgenera *Stenus* s. str., *Nestus* Rey, *Tesusus* Rey, and *Parastenus* v. Heyden; part II (in preparation) treats the subgenus *Hypostenus* Rey.

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KEY TO *Stenus*-SPECIES FROM NEW GUINEA

- 1 (36). Tarsi simple 2
- 2 (21). 9th sternite of ♂ and valvifer of ♀ apicolaterally rounded or blunted (as in fig. 5, 8), not acutely tooth-like (as in fig. 2 f, e)..... **group 1 (prismalis-group)**
- 3 (10). Abdomen margined laterally ("*Stenus* s. str. + *Nestus*") 4
- 4 (5). Lateral margin of abdomen fine, line-like, cross-section of abdomen nearly cylindrical, abdominal puncturation coarse, punctures larger than section of 3rd antennal segment, coarse elytral puncturation transversely coalescent. ♂ unknown. Valvifer (fig. 5). 4.3-4.6 mm. NEW GUINEA : Morobe **hypostenoides** n. sp.
- 5 (4). Lateral margination of abdomen broader, cross-section of abdomen flatter, ellipsoid-like, abdominal puncturation very fine and sparse, punctures distinctly smaller than section of 3rd antennal segment, elytral puncturation not coalescent transversely 6
- 6 (7). Smaller, middle of front concave and flat, elytra mainly smooth only with some scattered punctures. ♂ : 8th sternite (fig. 24), 9th sternite (fig. 8), aedeagus (fig. 5, 6). 3.5-4.0 mm. NEW GUINEA : Sepik **sepikensis** Last
- 7 (6). Larger, middle of front distinctly but narrowly elevated, elytra mainly punctured ... 8
- 8 (9). Head in relation to elytra broader, elytral puncturation denser, slightly transversely to the sides. 4.5-5.5 mm. WEST IRIAN : Tjendrawasih, Bombarai ... **prismalis** Fauvel
- 9 (8). Head in relation to elytra narrower, elytral puncturation sparser, not transversely to the sides. ♂ : 8th sternite (fig. 5, Puthz 1968), 9th sternite (fig. 7, l. c.), aedeagus (fig. 8, l. c.). ♀ : 8th sternite (fig. 6, l. c.). 5.4-5.5 mm. NEW GUINEA : E. Highlands, Madang, Morobe ; PAPUA : Central, Northern ; WEST IRIAN : NE ; NEW BRITAIN **illiesi** Puthz
- 10 (3). Abdomen not margined laterally ("*Tesnus*") 11
- 11 (18). Puncturation of fore parts coarse 12
- 12 (17). Middle of front distinctly elevated and coarsely punctured 13
- 13 (16). Larger and broader, head in relation to elytra narrower (index : 0.90), abdominal puncturation very fine but distinctly coarser 14
- 14 (15). ♂ : 8th sternite (fig. 26), aedeagus (fig. 15, Last 1970). 4.2-4.6 mm (not 5 mm!). NEW GUINEA : W. Highlands, Madang, Morobe ; PAPUA : Central **fretus** Last
- 15 (14). ♂ : 8th sternite distinctly a little deeper excavated, aedeagus with apical portion of median lobe parallel-sided, apex button-shaped. 4.2 mm. NEW GUINEA : Morobe **cupido** n. sp.
- 16 (13). Smaller and narrower, head in relation to elytra broader (index : 0.99, ♀ ; in (unknown) ♂ probably slightly broader than elytra). 4.0 mm. WEST IRIAN : Biak Island **amor** n. sp.
- 17 (12). Middle of front flat and smooth. ♂ : 9th sternite (fig. 9, Puthz 1969a), aedeagus (fig. 10, l. c.). 4.0-4.7 mm. PAPUA : Western ; AUSTRALIA : Queensland **caviceps** Fauvel
- 18 (11). Puncturation of the fore parts fine and sparse..... 19
- 19 (20). Smaller and less robust, head and pronotum very finely and sparsely punctured, prothorax and abdomen violet. ♂ : aedeagus (fig. 1, Puthz 1970c). 4.0-4.3 mm. NEW GUINEA : Sepik, (Karimui) ; NEW BRITAIN **dahli** L. Benick
- 20 (19). Larger and more robust, head and pronotum less finely and denser punctured, prothorax and abdomen blue-green. ♂ unknown. 4.2-4.6 mm. PAPUA (Ighibirei) **naias** Puthz
- 21 (2). 9th sternite of ♂ and valvifer of ♀ apicolaterally with a distinct tooth, not rounded or blunted (fig. 2, 4 etc.) **group 2 (toxopei-group)**
- 22 (27). Head distinctly narrower than elytra 23

- 23 (24). Larger and more robust, abdominal puncturation moderately fine and sparse, interstices distinctly reticulated. ♂ : 8th sternite (fig. 4, Puthz 1968), 9th sternite (fig. 14), aedeagus (fig. 10). 4.7-5.7 mm. WEST IRIAN; NEW GUINEA : Morobe, Madang **toxopei** Cameron
- 24 (23). Smaller and distinctly narrower, abdominal puncturation coarse and dense, interstices smooth 25
- 25 (26). Middle of front flat, puncturation of head and abdomen dense but distinctly sparser than in the following species. ♂ : 8th sternite (fig. 23), 9th sternite (fig. 2), aedeagus (fig. 1). 4.0-4.6 mm. NEW GUINEA : W. Highlands, E. Highlands..... **cumatilis** Last
- 26 (25). Middle of front narrowly but distinctly elevated, puncturation of head and abdomen extremely dense. ♂ unknown, 2.8-3.0 mm. NEW GUINEA : Madang..... **nercis** n. sp.
- 27 (22). Head as broad or broader than elytra. Small species..... 28
- 28 (29). Middle of concave front flat (see also *michaelensis* !). ♂ : 8th sternite (fig. 30), 9th sternite (fig. 13), aedeagus (fig. 12). 2.5-3.0 mm. NEW GUINEA : Madang **delicatus** n. sp.
- 29 (28). Middle of concave front with a narrow and distinctly elevated median portion 30
- 30 (31). Abdominal puncturation very coarse and very dense, interstices at least as large as 1/2 the diameter of punctures. ♂ : 8th sternite (fig. 29), 9th sternite (fig. 4), aedeagus (fig. 3). 3.4-3.7 mm (not 4 mm). NEW GUINEA : E. Highlands... **coalitus** Last
- 31 (30). Abdominal puncturation fine or moderately coarse, interstices equal to or larger than diameter of punctures 32
- 32 (33). Larger species, exceeding 3.5 mm in length. ♂ : 8th sternite (fig. 28), 9th sternite (fig. 18), aedeagus (fig. 17). 3.5-4.0 mm. NEW GUINEA : Madang **abilalaensis** n. sp.
- 33 (32). Smaller species, less than 3.5 mm in length 34
- 34 (35). Puncturation coarser and more coalescent, insect more shining; abdominal puncturation finer, punctures somewhat smaller than section of 3rd antennal segment. ♂ : 8th sternite (fig. 27), 9th sternite (fig. 16), aedeagus (fig. 15). 2.9-3.4 mm. NEW GUINEA : Madang **abilalamontis** n. sp.
- 35 (34). Puncturation less coarse and less coalescent, insect less shining; abdominal puncturation coarser, punctures as large as section of 3rd antennal segment (or little larger). ♂ : 9th sternite (fig. 11), aedeagus (fig. 10). 2.6-2.8 mm. NEW GUINEA : Mt Michael (E. Highlands) **michaelensis** Last
- 36 (1). Tarsi distinctly bilobed 37
- 37 (50). 10th tergite distinctly pointed posteriorly (fig. 25) and/or abdomen laterally margined ("Hypostenus + Parastenus") **group 3 (gigas-group)**
- 38 (41). Abdomen laterally immargined or lateral margin incomplete and indistinct 39
- 39 (40). Sea-green shining, extremely coarsely and extremely densely punctured, the head too. ♂ : 8th sternite (fig. 3, Puthz 1970a), aedeagus (fig. 4, l. c.). 4.7-5.3 mm. NEW GUINEA : Morobe **thalassinus** Puthz
- 40 (39). Black-green shining, puncturation of head fine and sparse. 10th tergite (fig. 25). ♂ : 8th sternite (fig. 22), aedeagus (fig. 8, Last 1970). 5.0-6.0 mm. NEW GUINEA : E. Highlands..... **interfulgio** Last
- 41 (38). Abdomen laterally distinctly margined or with a distinct and complete line between tergites and sternites, which is sometimes very fine 42
- 42 (43). Puncturation of fore parts fine and sparse, pronotum and elytra very uneven. ♂ unknown. 6.5-7.0 mm. NEW GUINEA : Morobe **capitalis** n. sp.
- 43 (42). Puncturation of fore parts coarse and dense, often coalescent 44
- 44 (47). Large and broad species, head distinctly narrower than elytra 45
- 45 (46). Elytra lack distinct microsculpture at enlargement of 40 ×. ♂ : 8th sternite (fig.

- 20), aedeagus (fig. 19). 8.0-9.5 mm. NEW GUINEA : Morobe, Madang, E. Highlands ; PAPUA : (Moroka)..... **gigas** L. Benick
- 46 (45). At enlargement of $40\times$ elytra distinctly transversely microsculptured. ♂ unknown. 7.5-8.0 mm. NEW GUINEA : (Offafina, Ibusa Kagu) ; PAPUA : Southern Highlands **comptus** Last
- 47 (44). Little smaller and much narrower species, head distinctly broader than elytra..... 48
- 48 (49). 10th tergite distinctly pointed posteriorly. ♂ unknown. 6.0-6.5 mm. WEST IRIAN : Bombarai..... **cyaneotinctus** n. sp.
- 49 (48). 10th tergite indistinctly pointed posteriorly, not broadly rounded but without distinct tip. ♂ unknown. 6.3-7.0 mm. NEW GUINEA : Morobe **magnificus** L. Benick
- 50 (37). 10th tergite without distinct tip posteriorly, rounded or more/less concavely emarginated, smooth or differently shaped (serrated etc.) at posterior margin. Abdomen laterally immargined..... (“**Hypostenus**”)

This key will be continued in part II of the revision. The localities given above mean the provinces of New Guinea found in the Times World Atlas, Comprehensive Edition, 1968. Localities which could not be found in the maps I have are quoted in brackets.

1. *The prismalis-group*

This group is the same as the *cupreipennis*-group (see and compare Puthz 1970b) of Australia. Besides the simple tarsi this group is defined by characters of the last abdominal segments: 8th sternite of ♂ comparatively shallowly emarginated, 9th sternite and valvifer apicolaterally rounded, sometimes with an accumulation of setae, not tooth-like produced, 10th tergite rounded with smooth posterior margin. In the ♀ the 8th sternite sometimes shows a prominent rounded middle of the posterior margin. Femora in ♂ \pm enlarged, tibiae simple, lacking spines. Aedeagus inside with longitudinal expulsion-bands and strongly sclerotized expulsion-clasp (fig. 8), without tube-like or flagelliform internal sac, with short setae at ventral apex but not apicolaterally.

This group is a good example of phylogenetic relationship: it proves significantly that the usual subgeneric characters, like lateral margination of abdomen, are artificial because of species which show broad paratergites (*cupreipennis* etc.), narrower, line-like paratergites (*hypostenoides* n. sp.), and those in which lateral margins are absent (*dahli* L. Bck. etc.).

Although in other monophyletic groups also both characters of tarsi (simple and bilobed) are represented, this group seems to be uniform in having the tarsi simple.

Stenus (s. str.) **hypostenoides** Puthz, new species Fig. 5.

This species resembles some Australian species (*caviceps*, *neboissi* etc.). It is very remarkable because of the cylindrical but margined abdomen (resembling “*Tesnus*” and “*Hypostenus*”) and the simple tarsi.

Shining, dark green with a bluish tint, coarsely and densely punctured, not very distinctly pubescent. Antennae light brown, club darker. Palpi unicolorous light yellow. Legs yellowish red, knees (narrowly but not separated) and apices of tarsal segments infusate. Labrum dark brown, not very densely pubescent.

Length: 4.3-4.6 mm.

♀. Holotype (BISHOP 8791), NE New Guinea: Wau, Morobe District, 1050 m, 18.XII.

1961, J. & J. H. Sedlacek. In B. P. Bishop Museum, Honolulu.

Head little narrower than elytra (920 : 960 My), front moderately broad (average distance between eyes : 560), distinctly divided in 3 portions : the 2 side-portions, which decline moderately from inner eye-margins, and the deeply excavated middle-portion, which is nearly 1/2 as broad as each of the side-portions and convergent anteriorly. Middle-portion not flat but distinctly somewhat elevated. Punctuation coarse and sparse, diameter of a puncture as large as section of 3rd antennal segment, interstices on side-portions nearly as large as punctures themselves. Middle-portion in posterior 1/2 smooth, anteriorly with few punctures. Antennal tubercles long and distinctly smooth. *Antennae* slender, when reflexed extending to middle of pronotum, penultimate segments little longer than broad. *Prothorax* little longer than broad (740 : 690), broadest a little behind middle, sides to anterior margin convex, to posterior margin distinctly concavely narrowed. Punctuation coarser and denser than on head, diameter of punctures about as large as section of 2nd antennal segment, interstices at most narrower than 1/2 diameter of punctures, sometimes as large as. *Elytra* distinctly somewhat broader than head (960 : 920), little longer than broad (1010 : 960), humeri moderately prominent, sides somewhat divergent posteriorly, broadest in posterior 1/3, restricted posteriorly, posterior margin moderately deeply emarginated (length of suture : 720). Sutural impression short and shallow, humeral impression indistinct. Punctuation coarse and dense, coalescent transversely, punctures larger than those on pronotum, shining interstices smaller than 1/2 diameter of a puncture. *Abdomen* cylindrical, very finely but completely margined, basal furrows of first segments very deep, 7th tergite with a distinct membranous fringe apically. Punctuation coarse and moderately dense, on first tergites somewhat finer than on pronotum but distinctly coarser than on head, on 7th tergite abruptly finer, somewhat finer than on head and much sparser than on tergite 6. 10th tergite with a few very fine punctures. *Legs* slender, posterior tarsi more than 2/3 as long as posterior tibiae, first segment about as long as the 3 following together, 2 × as long as the last : 360-150-100-80-180, 4th segment simple.

The whole body lacks microsculpture.

♂ : unknown

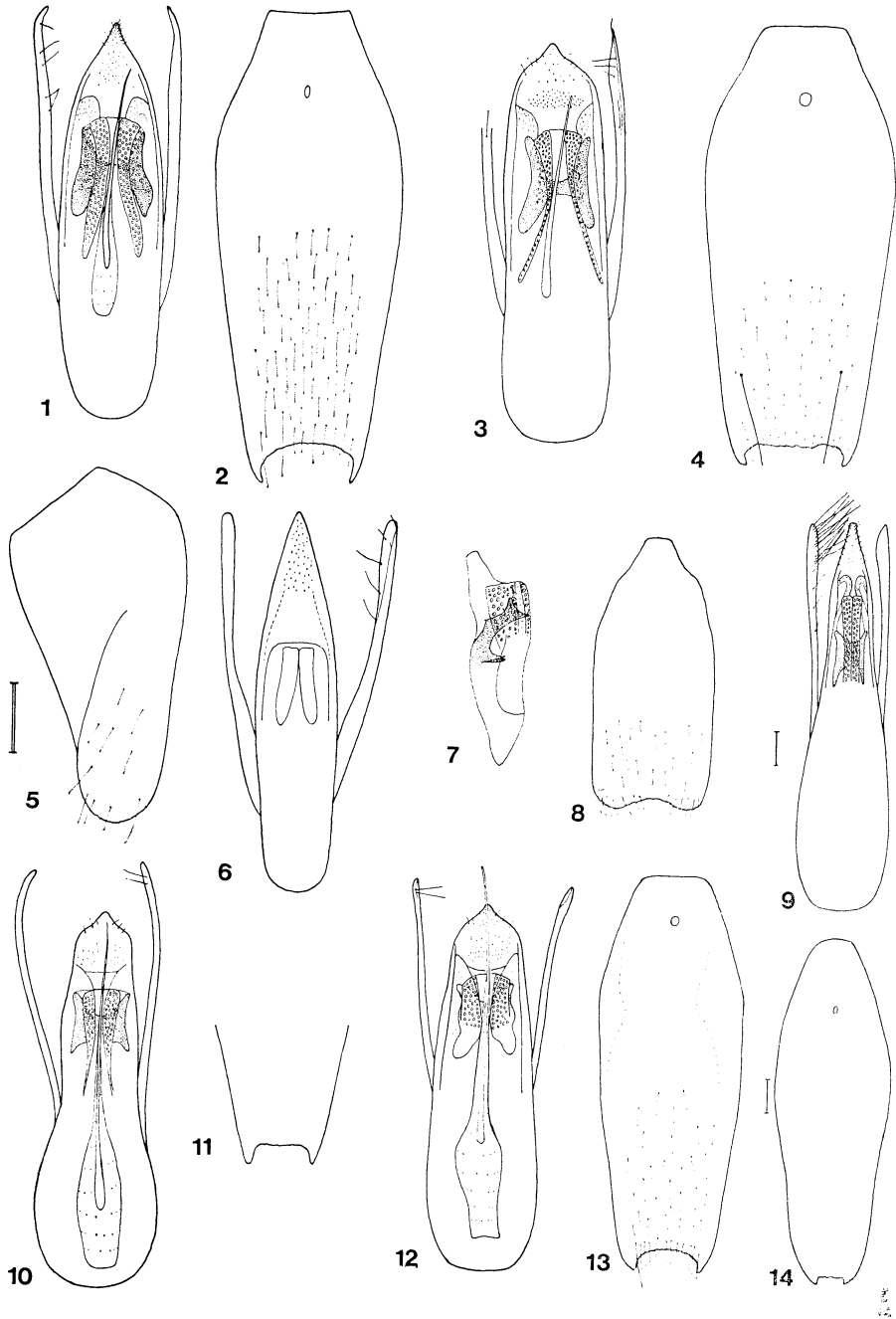
♀ : 7th sternite with a shallow but distinct emargination at posterior margin, and near it more finely and densely punctured and pubescent than fore-sternites. 8th sternite at membranous posterior margin broadly rounded, somewhat produced posteriorly in the middle. Valvifer (fig. 5). 10th tergite smooth at posterior margin and rounded.

At first this species appears to resemble some species of "*Hypostenus*" but has to be placed (after definition) into the subgenus *Stenus* s. str. Its sister-species is *caviceps* Fauvel, from which it can be distinguished by the lateral margination of abdomen and the greenish color.

***Stenus* (*Tenus*) *caviceps* Fauvel, 1877**

Stenus caviceps Fauvel, 1877, *Ann. Mus. Civ. Stor. Nat. Genova* **10** : 207 f.—Fauvel, 1878, l. c. **12** : 223.—L. Benick, 1928, *Ent. Mitt.* **17** : 177 f.—Puthz, 1969, *Bull. Inst. R. Sci. Nat. Belg.* **45** (9) : 15 f. figs.—Puthz, 1969, *Ann. Mus. Civ. Stor. Nat. Genova* **77** : 643.—Puthz, 1970, *Mem. Nat. Mus. Victoria* **31** : 63.

This species is common in Queensland but 1 ♀ is known from New Guinea : Katau near Fly River (Museo Civico di Storia Naturale di Genova). Lectotype in the same museum.



***Stenus (Tesusus) dahli* L. Benick, 1928**

Stenus Dahli L. Benick, 1928, *Ent. Mitt.* **17**: 177 f.

Stenus dahli: Last, 1970, *J. Nat. Hist.* **4**: 356 fig.—Puthz, 1970, *Steenstrupia* **1**: 84 figs.

Material studied: ♀ holotype (Museum für Naturkunde, Berlin); all specimens captured by R. Hornabrook and the Noona Dan Expedition and the Bishop Museum (BM, Bishop Museum, coll. Last, coll. m.). This species is widely spread over the Melanesian subregion.

***Stenus (Tesusus) naias* Puthz, 1969**

Stenus naias Puthz, 1969, *Ann. Mus. Civ. Stor. Nat. Genova* **77**: 643 f.

This species is only known from the ♀ holotype which is stored in the Genova-museum. The type-locality surely is situated in Papua but could not be found in maps available to me (Ighibirei).

***Stenus (Tesusus) fretus* Last, 1970** Fig. 26.

Stenus fretus Last, 1970, *J. Nat. Hist.* **4**: 356 f. fig.

Material studied: types (BM, coll. Last, coll. m.); 1 ♂: New Guinea (NE), Wana, Upper Jimmi Valley, 1500 m, 11.VII.1955, J. L. Gressitt; 1 ♀: New Guinea (NE), Finisterre Range, Saidor: Matoko, 29.VIII.–5.IX.1958, W. W. Brandt; 1 ♀: Wau, 1100 m, 19.IX., J. & M. Sedlacek; 1 ♀: Okapa, II.1968, R. Hornabrook; 1 ♂: Papua, Owen Stanley Range, Goilala: Tapini, 975 m, 16.–25.XI.1957, W. W. Brandt (Bishop Museum and coll. m.).

Additional remarks: The abdomen of this species is not very distinctly but visible punctured at 40 ×.

♂: Legs more robust than in ♀, femora distinctly thicker, puncturation of 4th sternite as fine but slightly denser than that of 3rd. 5th sternite shallow in posterior middle, little more densely punctured than 4th sternite. 6th sternite with a broad impression in posterior 1/2, the sides of which are distinctly carinated and divergent posteriorly, puncturation in middle fine and dense, sparser near posterior margin, which is broadly but shallowly emarginated. 7th sternite with a broad and subparallel impression, the sides of which are also carinated and produced posteriorly, puncturation fine and close, posterior margin moderately deeply emarginated. Sternite 8 (fig. 26) puncturation fine and moderately sparse. Sides of impressions of sternite 5–7 with long, dense, and erect pubescence. 9th sternite rounded at posterior sides. 10th tergite with smooth posterior margin and rounded.

Fig. 1–14. 1–2, *Stenus cumatilis* Last (paratype): 1, ventral aspect of aedeagus; 2, 9th sternite. 3–4, *S. coalitus* Last (holotype); 3, ventral aspect of aedeagus; 4, 9th sternite, left paramere partly damaged. 5, *S. hypostenoides* n. sp. (holotype), right valvifer. 6–8, *S. sepikensis* Last (paratype): 6, ventral aspect of aedeagus without internal structures; 7, lateral aspect of apical portion of internal structures with the expulsion-clasp in action; 8, 9th sternite. 9, *S. toxopei* Cameron (Moro): ventral aspect of aedeagus without internal sac. 10–11, *S. michaelensis* Last (paratype): 10, ventral aspect of weakly sclerotized aedeagus; 11, posterior portion of 9th sternite. 12–13, *S. delicatus* n. sp. (holotype): ventral aspect of aedeagus; 13, 9th sternite. 14, *S. toxopei* Cameron (Moro): 9th sternite, dorsal aspect. Scale=0.1 mm.

Variability: The shining metallic colors vary in different specimens; the specimen from Okapa is all over bright greenish.

This species is closely related to *S. aphrodite* Puthz, *S. aglaia* Puthz, *S. cupido* n. sp. and *S. amor* n. sp.; its sister-species should be *S. amor* n. sp.

***Stenus (Tesusus) cupido* Puthz, new species**

This new species was found among some paratypes of *S. fretus* Last which I got from the author for my collection. It lives sympatric with *S. fretus* and is phylogenetically closely related to *S. fretus* and *S. aphrodite*. A full description is not necessary because the new species seems nearly to be indistinguishable from *S. fretus* by characters of the general facies. Only the puncturation of head is a little coarser.

The specific differences are to be found in the ♂ sexual characters: in *fretus* the 8th sternite (fig. 26) has a narrow notch, which is distinctly less deep than that of *cupido* (length of sternite: depth of notch: *fretus* (56: 12), *cupido* (63: 16); in ♂♂ from the same locality).

The *aedeagus* is quite different: in *fretus* (fig. 15, Last 1970) the medianlobe has a narrow triangular shape, acute at apex, in *cupido* the medianlobe is triangularly narrowed till the foramen of the internal sac, from there to apex parallel-sided, the apex itself enlarged button-like. So in general shape *cupido* becomes similar to *aphrodite* (fig. 1, Puthz 1969b). But in *aphrodite* the apical portion of the medianlobe is broader, 2 × as broad as apex of parameres; in *cupido* it is only as broad as the apex of one paramere, also the "apex-button" in *aphrodite* is distinctly narrower than in *cupido*. Inside, the medianlobe is very similarly constructed in all 3 species.

♂. Holotype (BMNH). New Guinea: Buana, Sarawaget Range, 900 m (3000 ft), (20-30 miles) NW of Lae, III.1966, R. Hornabrook. In my collection.

***Stenus (Tesusus) amor* Puthz, new species**

This new species very closely resembles *S. fretus* Last and should be its sister-species. A full diagnosis is not necessary. I describe only the differences:

Shining, head greenish, pronotum greenish blue, elytra bluish violet, abdomen violet, foreparts very coarsely and densely punctured, abdomen almost impunctate, pubescence very indistinct. Antennae brownish, club darker. Palpi reddish yellow, apex of 2nd and 3rd segment infusate. Legs reddish yellow, knees scarcely infusate, apices of tarsal segments infusate. Labrum aeneous, with not very dense pubescence.

Length: 4.0 mm.

♀. Holotype (BISHOP 8792). West Irian: Biak Island: Mangrowawa, 50-100 m, 30. V.1959, T. C. Maa.

In all respects very similar to *fretus*, but elytra in relation to head broader and shorter (width of head: width of elytra: 0.99: *fretus*: 0.90). Prothorax less convex, nearly straight at the sides. Puncturation of pronotum and elytra somewhat coarser than in *fretus* and more regular. In *fretus* the puncturation of pronotum and elytra appears to coalesce transversely (but this is not so); in *amor* n. sp. no trace of confluence is to be seen, the interstices are more equal in width than in *fretus*. Abdominal puncturation almost invisible, 2 × as fine as in *fretus*. In *fretus* the punctures of tergite 5 are

about 1/2 as large or nearly as large as 1 inner eye-facet, in *amor* much finer and sparser.

Stenus amor n. sp., of which unfortunately the ♂ is unknown at present, is closely related to some Melanesian species; they can be distinguished as follows:

- 1 (2). Abdominal puncturation coarser, punctures of tergite 5 larger than 1 inner eye-facet.
♂: 8th sternite very shallowly emarginated, aedeagus (fig. 3, Puthz 1969b). 3.9–5.0 mm. SOLOMON ISLANDS **aglaia** Puthz
- 2 (1). Abdominal puncturation finer, punctures of tergite 5 smaller than 1 inner eye-facet ... 3
- 3 (6). Larger and broader, 2 species which at present can only be distinguished in the ♂ ... 4
- 4 (5). ♂: 8th sternite (fig. 26), apical portion of medianlobe has a narrow triangular shape, apex acute (fig. 15, Last 1970). 4.2–4.6 mm. NEW GUINEA, PAPUA **fretus** Last
- 5 (4). ♂: 8th sternite with a deeper notch, apical portion of medianlobe parallel-sided, apex button-shaped. 4.2 mm. NEW GUINEA **cupido** n. sp.
- 6 (3). Smaller and narrower 7
- 7 (8). Puncturation of abdomen nearly invisible, much finer, 1st segment of posterior tarsi nearly as long as the 3 following together. 4.0 mm. WEST IRIAN: Biak Island ... **amor** n. sp.
- 8 (7). Puncturation of abdomen visible at 40 ×, 2 × as coarse, 1st segment of posterior tarsi about as long as the 2 following together. Aedeagus (fig. 1, Puthz 1969b). 3.5–4.0 mm. SOLOMON ISLANDS **aphrodite** Puthz

Stenus (s. str.) **prismalis** Fauvel, 1878

Stenus prismalis Fauvel, 1878, *Ann. Mus. Civ. Stor. Nat. Genova* **12**: 222 f. — Puthz, 1968, *Dtsch. Ent. Z. (N. F.)* **15**: 453. — Puthz, 1969, *Ann. Mus. Civ. Stor. Nat. Genova* **77**: 640 f.

Material studied: ♂ holotype (Museum Genova); 1 ♀: West Irian: Fak Fak, S. coast of Bomberai, 10–100 m, 3.VI.1959, T. C. Maa (Bishop Museum).

This species is the sister-species of *illiesi* Puthz. Unfortunately we know only these 2 specimens. It is not impossible that *illiesi* represents the eastern subspecies of *prismalis*, but to decide this problem more material from West Irian is needed.

Stenus (s. str.) **illiesi** Puthz, 1968

Stenus illiesi Puthz, 1968, *Dtsch. Ent. Z. (N. F.)* **15**: 451 ff. figs.—Puthz, 1969, *Pacif. Ins.* **11**: 529. — Puthz, 1970, *Steenstrupia* **1**: 83.

Material studied: types (coll. m., Museum für Naturkunde, Berlin, BM); material from the Noona Dan Expedition (Museum Kopenhagen); 2 ♂♂: E. Highland District: Wana-tabe Valley near Okapa, ca 1.5 km (5000 ft), Stn. No. 174, 5.II.1965, M. E. Bacchus; 11 ♂♂, 13 ♀♀: Madang District: Moro-Gubelam Road, ca 2100 m (7000 ft), Stn. No. 94 (walking on surface of dead leaves), 10.XI.1964, M. E. Bacchus; 1 ♂: Madang District: Finisterre Mts, Moro, ca 1650 m (5500 ft), Stn. No. 83, 30.X.–15.XI.1964, M. E. Bacchus; 1 ♂: Morobe District: Herzog Mts, Vagau, ca 1200 m (4000 ft), Stn. No. 140 A, 4.–17.I.1965, M. E. Bacchus (all BM and coll. m.); 1 ♂: Morobe District: Wau, 1500 m, 27.VIII.1961, J. Sedlacek; 1 ♀: Wau, 7.X.1964, J. & M. Sedlacek; 1 ♀: Finisterre Range, Saidor: Matoko, 28.VIII.–5.IX.1958, W. W. Brandt; 3 ♂♂, 3 ♀♀: NE: Sepalakambang, Salawaket Range, 1920 m, 12.IX.1956, E. J. Ford, Jr. (Bishop Museum and coll. m.).

This species varies considerably in the strength of the elytral puncturation but is

distinctly separated from *S. prismalis* by different relations of head : elytra and its sparser elytral puncturation.

Stenus (s. str.) **sepikensis** Last, 1970 Fig. 6-8, 23.

Stenus sepikensis Last, 1970, *J. Nat. Hist.* 4: 357 f. fig.

Material studied : types (BM, coll. Last, coll. m.)

Additional remarks : This species closely resembles, that is true, *S. atrovirens* Fauvel from Australia. The puncturation of head is very fine and sparse but distinct, diameter of punctures smaller than 1 eye-facet. Also the pronotum is very finely and sparsely punctured, denser on the sides. The whole abdomen is very sparsely and finely punctured, with some coarse punctures at bases of first tergites.

Measurements : Head : 730 broad ; average distance between eyes : 400 ; prothorax : 520 broad ; 600 long ; distance between humeral angles : about 600 ; greatest width of elytra : 740 ; length of elytra : 790 ; sutural length : 660 ; posterior tarsi : 300-160-110-80-160. Slender antennae when reflexed extending to the posterior margin of pronotum, penultimate segments distinctly longer than broad.

♂ : Legs lack special sexual characters. Fore-sternites with a very fine and very sparse puncturation. 6th sternite a little more densely punctured than the 5th. 7th sternite with a distinct but shallow impression in middle of posterior 1/3, near apical margin, which has a shallow emargination, very finely and densely punctured and pubescent. 8th sternite very finely and sparsely punctured with a shallow notch posteriorly (fig. 24). 9th sternite nearly almost smooth (fig. 8). 10th tergite at posterior margin smooth and broadly rounded. Aedeagus (fig. 6) similar to those of related species, inside with a distinct expulsion-clasp (lateral view of expelled clasp : fig. 7). Parameres do not fully extend to apex of medianlobe.

2. *The toxopei-group*

This group is not represented in the Australian fauna. It is an Oriental group and probably consists of some different monophyletic groups. Besides the simple tarsi, it is defined by the shape of the 9th sternite and the valvifer, which are tooth-like produced apicolaterally. The emargination of the 8th sternite of ♂ varies : shallow to moderately deep. 10th tergite rounded at smooth posterior margin. In the ♂ the tibiae lack apical spines. The aedeagus is clearly different in shape and internal structure from those found in the *prismalis*-group. Inside there are longitudinal expulsion-bands, strongly sclerotized expulsion-mechanisms (clasps), which are connected in the middle. Medianlobe at apex with short lateral setae.

One portion of this group (monophyletic) has an internal sac which is flagelliform (cf. fig. 1, 3, 10, 12, 17) ; the other (paraphyletic) has no such tube (fig. 9).

All of the New Guinean species belonging to this group have the abdomen marginated.

At present the relationship with other Oriental groups is obscure because of insufficient knowledge of them.

***Stenus* (s. str.) *toxopei* Cameron, 1952** Fig. 9, 14.

Stenus toxopei Cameron, 1952, *Treubia* **21** : 245 f. — Puthz, 1968, *Dtsch. Ent. Z. (N. F.)* **15** : 450 f. fig.

Material studied : paratype (BM; the holotype should be stored in the Leiden Mus.); 1 ♂, 2 ♀♀ : Kunai-River, 1500 m, 10.X.1966, J. Illies (coll. m., coll. Benick); 2 ♀♀ : Morobe District : Edie Creek, ca (6 miles) SW Wau, 2100 m (7000 ft), Stn. No. 10 (under stones by stream), 17.IX.1964, M. E. Bacchus; 1 ♂ : Madang District : Finisterre Mts, Naho River Valley, Moro, (5500 ft), Stn. No. 78, 30.X.-23.XI.1964, M. E. Bacchus. (BM, coll. m.); 1 ♂ : (NE) : Yaibos, 2000 m, 12.VI.1963, J. Sedlacek (Bishop Mus.).

The aedeagus of this species was not figured in my 49th contribution. It is long and slender (fig. 9), the medianlobe at apex indistinctly button-shaped with numerous scattered setae on the ventral side apically. Inside there are longitudinal expulsion-bands and a strongly sclerotized expulsion-clasp. Parameres extending about to the apex of medianlobe, densely setous at apex. 9th sternite (fig. 14), 8th sternite (fig. 4, Puthz 1968).

***Stenus* (s. str.) *cumatilis* Last, 1970** Fig. 1, 2, 23.

Stenus cumatilis Last, 1970, *J. Nat. Hist.* **4** : 355 fig.

Material studied : types (BM, coll. Last, Hornabrook, coll. m.); 1 ♂ : NE : Tomba, 38 km W of Mt Hagen 2450 m, 21.-24.V.1963, J. Sedlacek (Bishop Mus.); 1 ♂ : Madang District : Finisterre Mts, Naho River Valley, Budemu, ca 1250 m (4000 ft), Stn. No. 51, 15.-24.X.1964, M. E. Bacchus; 1 ♀ : ibidem, 4150 m, Stn. No. 72 (ex rotting grass), 26. X.1964, M. E. Bacchus; 1 ♀ : Madang District : Finisterre Mts, Naho River Valley, Moro, 1700 m (5550 ft), Stn. No. 78, 30.X.-15.XI.1964, M. E. Bacchus (BM, coll. m.).

Additional remarks : ♂ : Legs lacking special sexual characters. Fore-sternites moderately densely punctate, interstices sometimes nearly as large as the punctures themselves. 7th sternite along middle very finely and densely punctured and pubescent, at posterior margin shallowly emarginated. 8th sternite finely and moderately densely punctured (fig. 23); 9th sternite (fig. 2); 10th tergite with smooth posterior margin, broadly rounded, surface nearly smooth. Aedeagus (fig. 1) moderately long, medianlobe anteriorly slightly concave at sides, apex ventrally with some short setae. Inside there are longitudinal expulsion-bands, a strongly sclerotized expulsion-mechanism, which is connected in the middle. The internal sac has a moderately long flagelliform tube which is to be seen coming out of the expulsion-ostium. Parameres distinctly extending the medianlobe, at apices curved, having few short setae.

***Stenus* (s. str.) *nereis* Puthz, new species**

This new species resembles *S. cumatilis* Last and *S. coalitus* Last. Little shining, nearly dull, with a dark blue tint, roughly, very coarsely, and rugosely punctured, indistinctly pubescent. Antennae reddish brown, the club nearly black. Palpi reddish brown. Legs yellowish brown, knees narrowly infusate. Labrum dark brown, moderately densely pubescent.

Length : 2.8-3.0 mm.

♀. Holotype (BMNH). New Guinea : Madang District, Finisterre Mts, Naho River Val-

ley, Moro, 1700 m (5550 ft), Stn. No. 85 (ex rotting vegetation), 4.XI.1964 (label with: 30.X.-15.XI.1964), M. E. Bacchus.

Head distinctly narrower than elytra (740 : 810), front broad (average distance between eyes : 550), with 2 longitudinal furrows enclosing the distinctly elevated median-portion which is very narrow, about as broad as $2 \times$ diameter of punctures, less than $1/2$ as broad as each of the side-portions. Elevated median-portion not extending to the niveau of inner eye-margins. Punctuation strong, coarse, and very close, diameter of a puncture distinctly larger than section of 3rd antennal segment, somewhat smaller than section of 2nd antennal segment, interstices less than $1/2$ diameter of punctures. Front not shining except antennal tubercles. *Antennae* short and slender, when reflexed not extending to middle of pronotum, penultimate segments about as broad as long, only the last longer than broad. *Prothorax* a little longer than broad (630 : 580), broadest a little behind middle, to anterior margin nearly straight, to posterior margin indistinctly concavely narrowed. Punctuation all over rough, coarse, and extremely dense and rugose, punctures about as coarse as on head. *Elytra* distinctly broader than head (810 : 740), about as long as broad (820 : 810), shoulders prominent, sides only a little and straightly divergent posteriorly, restricted in posterior $1/6$, posterior margin moderately deeply emarginated (sutural length : 630). Sutural depression narrow and moderately deep, humeral impression indistinct. Punctuation a little coarser and slightly less dense than on pronotum, interstices more distinct. *Abdomen* convex, slightly narrowed posteriorly, basal depressions of first tergites moderately deep, 7th tergite with a distinct membranous fringe apically (the insect is winged). Abdomen distinctly margined laterally, paratergites narrow, quite as broad as 2nd antennal segment, showing 2 backwards divergent lines. Punctuation conspicuously rough, coarse, and dense, also on 7th tergite, distinctly coarser than on head but narrow interstices more shining. *Legs* moderately slender, posterior tarsi somewhat longer than $2/3$ of posterior tibiae, 1st segment almost as long as 2nd and 3rd together, distinctly longer than the last; 4th segment completely simple.

The whole insect without microsculpture on surface.

♂ : Unknown.

♀ : 8th sternite rounded at posterior margin. Valvifera with a distinct tooth apicolaterally, 10th tergite at posterior margin smooth and rounded.

This new species can be distinguished from *S. cumatilis* by the elevated middle-portion of front, its length, and its much rougher and more rugose punctuation; from *S. coalitus*, which is its sister-species, by its dull appearance and distinctly denser punctuation of abdomen.

Stenus (s. str.) **coalitus** Last, 1970 Fig. 3, 4, 29.

Stenus coalitus Last, 1970, *J. Nat. Hist.* 4: 353 ff.

Revisional examination of the type revealed that the holotype of this species is a ♂ and not a ♀ as quoted in the diagnosis. So I give the ♂ sexual characters:

Legs without special sexual characters. Fore-sternites coarsely and densely punctured, interstices shining. 6th sternite with a somewhat sparser punctuation near middle of posterior margin. 7th sternite very finely and densely punctured along middle where there is dense pubescence. 8th sternite moderately coarsely and densely punctured (fig. 29). 9th sternite (fig. 4). 10th tergite, at posterior margin, smooth and broadly rounded, surface with some scattered but distinct punctures. Aedeagus (fig. 3) moderately long, medianlobe triangularly narrowed at apex, the sides somewhat concave there. Its apical portion has a transverse accumulation of fine setae ventrally and some longer setae apicolaterally. In the inner there are longitudinal expulsion-

bands, a strongly sclerotized expulsion mechanism, which is connected in the middle. The internal sac is (as in *cumatilis* and the related species) flagelliform. Parameres extending well beyond apex of medianlobe having only few moderately long setae.

The sister-species of *S. coalitus* is *S. nereis* n. sp.

Holotype in BMNH, paratypes in coll. Last, Hornabrook, and coll. m.

Stenus (s. str.) **michaelensis** Last, 1970 Fig. 10, 11.

Stenus michaelensis Last, 1970, *J. Nat. Hist.* 4: 355 f.

Examination of the types revealed that the "♀-paratype" is a ♂, valuable for learning the sexual characters. Although it is an immature specimen the aedeagus is well enough sclerotized for examination.

♂ : Legs lack special sexual characters. Fore-sternites moderately coarsely and densely punctured, width of interstices sometimes equal to diameter of punctures, smooth. 7th sternite slightly shallowed in posterior middle and finely and densely punctured and pubescent, with a shallow emargination at posterior margin. 8th sternite with an apical notch similar to that of *S. delicatus* n. sp. (fig. 30). 9th sternite (fig. 11). *Aedeagus* (fig. 10) from this immature specimen weakly sclerotized, principally built as in *delicatus* which is its sister-species, but the parameres are distinctly longer. *Head* with concavely excavated front, middle-portion of front about 1/2 as broad as each of the side-portions, not very distinctly but visibly elevated, not flat. Puncturation of abdomen strong but not dense, diameter of punctures quite as large as section of 3rd antennal segment, interstices in places as large as the punctures themselves but mostly a little smaller. 7th tergite with a rudimentary membranous fringe apically (the insect is brachypterous!). The whole surface without ground-sculpture.

Stenus michaelensis, although very close to *delicatus*, differs from that species by having much stronger puncturation of head and especially of the pronotum.

Stenus (s. str.) **delicatus** Puthz, new species Fig. 12, 13, 30.

This new species is closely related to *S. abilalamontis* n. sp. and resembles also *S. michaelensis* Last.

Shining, black-olive, coarsely and densely, somewhat rugosely punctured, indistinctly pubescent. Antennae light brown, the club darker. Palpi yellow. Legs light reddish brown, knees and tarsi infusate. Labrum dark brown, aeneous, moderately densely pubescent.

Length : 2.5-3.0 mm.

♂. Holotype (BMNH) and 1 ♂, 2 ♀♀ paratypes. New Guinea : Madang District (on labels the false quotation is "Morobe District") : Finisterre Mts, Upper Naho Valley, S. side of Mt Abilala, Lake Nahobina, 2800 m (9000 ft), Stn. No. 103 (grass tussocks), 19.-22.XI.1964, M. E. Bacchus. Paratypes in BMNH and my collection.

Head distinctly but not much broader than elytra (665 : 630), front moderately broad (average distance between eyes : 410), deeply excavated with median-portion, which is nearly as broad as each of the side-portions, entirely flat, not elevated. Puncturation coarse and very dense, diameter of a puncture distinctly larger than section of 3rd antennal segment but somewhat smaller than section of 2nd antennal segment, interstices smaller than 1/2 diameter of punctures,

at places even 1/2 as large as 1/2 diameter of punctures. *Antennae* short and slender, when reflexed extending to about the middle of pronotum, penultimate segments slightly broader than long, 11th segment distinctly longer than broad. *Prothorax* slightly longer than broad (550:520), broadest in the middle, nearly straightly to anterior margin, slightly concavely narrowed to posterior margin. Puncturation coarse and dense, diameter of a puncture about as large as section of 2nd antennal segment, shining interstices smaller than 1/2 diameter of punctures. *Elytra* small, distinctly narrower than head (630:665), shorter than broad (600:630), shoulders moderately prominent, sides backwards little divergent, straight, slightly restricted in posterior 1/6, posterior margin moderately deeply emarginated (sutural length: 450). No distinct impressions. Puncturation very coarse and irregularly coalescent, coarser than on pronotum. *Abdomen* convex, slightly narrowed to apex, basal furrows of first tergites moderately deep, 7th tergite with a distinct membranous fringe apically (nevertheless the insect is brachypterous). Sides of abdomen distinctly margined, paratergites as broad as 2nd antennal segment, smooth. Puncturation moderately coarse but not dense, diameter of punctures on tergites 3-7 as large as section of 3rd antennal segment, a little larger at bases, interstices in places as large as punctures, mostly a little smaller. Puncturation of 8th tergite finer and sparser. *Legs* moderately slender, posterior tarsi 3/5 as long as posterior tibiae, 1st segment a little longer than 2nd and 3rd together, somewhat longer than last segment: 135-70-56-50-115; 4th segment simple.

The whole insect without microsculpture on surface.

♂: Legs lack special sexual characters. Fore-sternites moderately coarsely and moderately densely punctured, interstices shining. 7th sternite in apical 1/2 along the middle finely and densely punctured and pubescent, posterior margin shallowly emarginated in middle. 8th sternite finely and moderately densely punctured (fig. 30). 9th sternite (fig. 13). 10th tergite with the posterior margin smooth and rounded. *Aedeagus* (fig. 12) principally as in *coalitus* and *michaelensis*, also internally, but tube-like internal sac (+ flagellum) longer, extending well beyond medianlobe which has a distinctly limited accumulation of small setae ventrally. Slender parameres extend beyond medianlobe, each having only 2 setae at apex.

♀: 8th sternite broadly rounded at posterior margin. Valvifera with a tooth apicolaterally. 10th tergite as in ♂.

Stenus delicatus n. sp. differs from its sister-species *michaelensis* by its finer puncturation of head and pronotum, narrower and less convex pronotum, and the middle-portion of front which is entirely flat; from *abilalamontis* n. sp. by finer puncturation of the fore-parts, the front's structure, and denser and deeper puncturation of elytra: from both by its sexual characters.

***Stenus* (s. str.) *abilalamontis* Puthz, new species** Fig. 15, 16, 27.

This new species resembles *S. delicatus*, *michaelensis*, and, very closely, *S. abilalaensis* n. sp. (see below).

Shining, black with an olive tint, very coarsely, densely, and on the elytra confluent-punctured, not very distinctly pubescent. *Antennae* brown, club darker. *Palpi* with the 1st segment, basal 1/2 of 2nd, and extreme base of 3rd segment yellow, the rest infusate, especially apical 1/2 of 3rd segment. *Legs* reddish brown, knees strongly infusate, tarsi dark brown. *Labrum* blackish, moderately densely pubescent.

Length: 2.9-3.4 mm.

♂. Holotype (BMNH) and 2 ♀♀ paratypes. New Guinea: Madang District (on label there can be seen a false quotation: Morobe District), Finisterre Mts, Upper Naho Valley, S. side of Mt Abilala, Lake Nahobina, (9000 ft), Stn. No. 103 (grass tussocks),

19.-22.XI.1964, M. E. Bacchus. 1 paratype in BMNH and 1 in my collection.

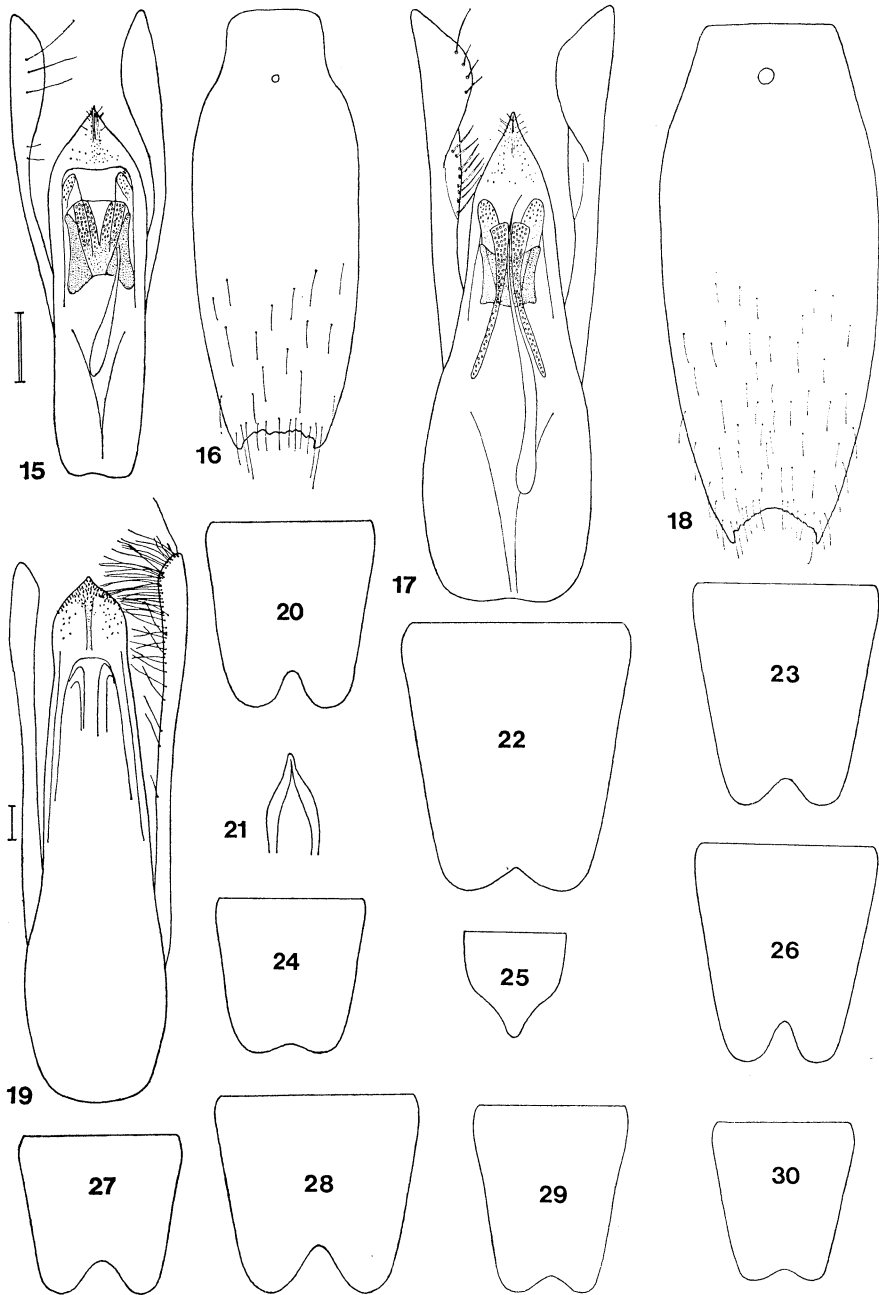
Head about as broad as elytra (750 : 755), front very broad (average distance between eyes : 510), concave with 2 distinct longitudinal furrows including the median-portion which is about 2/3 as broad as each of the side-portions, distinctly elevated but not reaching the level of inner eye-margins. Puncturation coarse and dense, diameter of largest punctures nearly as large as section of 2nd antennal segment, interstices smaller than 1/2 diameter of a puncture, larger on antennal tubercles and on anterior portion of elevated middle-portion of front. *Antennae* moderately robust and moderately long, when reflexed extending to the middle of pronotum, penultimate segments about as broad as long. *Prothorax* a little longer than broad (605 : 570), broadest in about middle, sides to anterior margin nearly straightly convergent, to posterior margin distinctly but shallowly concavely narrowed. Puncturation very coarse and dense, feebly coalescent, diameter of a puncture as large as section of 2nd antennal segment, shining interstices less than or (in places) 1/2 as large as diameter of punctures. *Elytra* small and short, about as broad as head, distinctly shorter than broad (620 : 755), shoulders rounded, sides distinctly but not strongly divergent posteriorly, restricted in posterior 1/4, posterior margin moderately deeply emarginated (sutural length : 480). No distinct impressions on surface. Puncturation very little coarser than on pronotum, not as deep, more irregular and more coalescent, conspicuously finer and sparser on sides, interstices on extreme base, near suture, nearly as large as diameter of punctures, on the rest, except the outer sides, about 1/2 as large as diameter of a puncture or larger, but not equal to a puncture. *Abdomen* broad, moderately narrowed posteriorly, basal restrictions of first tergites moderately deep, 7th tergite with a rudimentary membranous fringe apically (the insect is brachypterous). Sides distinctly margined, paratergites about as broad as 2nd antennal segment, smooth. Puncturation moderately fine and sparse, diameter of a puncture about as large as basal section of 3rd antennal segment, interstices larger than diameter of punctures, sometimes 2 × as large. *Legs* moderately slender, posterior tarsi about 2/3 as long as posterior tibiae, 1st segment a little longer than 2nd and 3rd together, distinctly but not much longer than the last : 160-70-55-50-130 ; 4th segment completely simple.

The whole insect without microsculpture on surface.

♂ : Legs without special sexual characters. Fore-sternites finely and sparsely punctured. 6th sternite at posterior margin broadly and nearly imperceptibly emarginated. 7th sternite with a shallow posterior median impression in which is a finer and denser puncturation and pubescence than on sternite 6, posterior margin distinctly but shallowly emarginated. 8th sternite (fig. 27). 9th sternite (fig. 16). 10th tergite at posterior margin smooth and broadly rounded. *Aedeagus* (fig. 15) similar to those of its relatives, but apex of medianlobe sharper, feebly carinated ventrally. Internal structures as in related species, but tube of internal sac shorter. Parameres larger and much longer, enlarged apically, with only a few setae.

♀ : 8th sternite rounded at posterior margin. Valvifera about as 1/2 the 9th sternite of ♂. 10th tergite as in ♂.

Stenus abilalamontis n. sp. differs from *delicatus* very distinctly by its much coarser puncturation of the fore-parts, from *michaelensis*, with which it agrees in general appearance, by the much coarser puncturation of pronotum and elytra, the puncturation of the latter being more coalescent but less strong, and the finer puncturation of abdomen ; from *abilalaensis* n. sp. by its length, stronger puncturation of head and abdomen ; from all by its sexual characters. It is the sister-species of *abilalaensis*, the stem-species of both should be the sister-species of the stem-species of *delicatus* and *michaelensis*.



***Stenus* (s. str.) *abilalaensis* Puthz, new species** Fig. 17, 18, 28.

This new species very closely resembles *S. abilalamontis* which is its sister-species.

Shining, olive-greenish, coarsely, densely, and (on elytra) a little coalescently punctured, not very distinctly pubescent. Antennae dark brown. Palpi with the 1st segment, basal 1/2 of 2nd, and extreme base of 3rd segment yellow, the rest infusate, nearly dark brown. Legs dark brown. Labrum black, moderately densely pubescent.

Length : 3.5-4.0 mm.

♂. Holotype (BMNH). New Guinea : Madang District, Finisterre Mts, Upper Naho Valley, Camp 8, S. foothills of Mt Abilala, (8000 ft), Stn. No. 100 (gravel bank of small river), 17.XI.1964, M. E. Bacchus.

Head little narrower than elytra (860 : 880), front very broad (average distance between eyes : 580), concave with 2 distinct longitudinal furrows, median-portion distinctly narrower than each of the side-portions, distinctly elevated but not reaching level of inner eye-margins. Puncturation coarse and dense, diameter of punctures larger than section of 3rd antennal segment but distinctly smaller than section of 2nd antennal segment, interstices smaller than 1/2 diameter of a puncture, larger on antennal tubercles and front's middle-portion. *Antennae* moderately robust, when reflexed extending little beyond the middle of pronotum, penultimate segments scarcely broader than long. *Prothorax* little longer than broad (710 : 690), broadest a little behind middle, laterally straightly narrowed to anterior margin, to posterior margin distinctly concavely narrowed. Puncturation very coarse and dense, feebly coalescent, diameter of a puncture little smaller than section of 2nd antennal segment, shining interstices mostly smaller than 1/2 diameter of punctures, near anterior margin in middle sometimes larger. *Elytra* very little broader than head (880 : 860), broader than long (880 : 830), shoulders prominent, sides distinctly but little divergent posteriorly, little restricted in posterior 1/5, posterior margin moderately deeply emarginated (sutural length : 670). Sutural and humeral impressions shallow. Puncturation irregular, coalescent, and less deep than on pronotum, more regular on sides, interstices of punctures mostly as large or little larger than 1/2 diameter of punctures. *Abdomen* broad, moderately narrowed to apex, basal furrows of first tergites deep, 7th tergite with a distinct membranous fringe apically (but the insect is brachypterous !). Sides distinctly margined, shining paratergites distinctly broader than 2nd antennal segment, having few fine punctures. Puncturation throughout fine and sparse, diameter of a puncture nearly as large as basal section of 3rd antennal segment, interstices larger than diameter of punctures, at places 2 × as large. *Legs* moderately robust, posterior tarsi about 3/5 as long as posterior tibiae, 1st segment about as long as 2nd and 3rd together, a little longer than the last : 190-110-90-80-175.

The whole insect without microsculpture on surface.

♂ : Metasternum with a distinct impression, moderately coarsely and sparsely punctured, in-

Fig. 15-30. 15-16, *Stenus abilalamontis* n. sp. (holotype) : 15, ventral aspect of aedeagus ; 16, 9th sternite. 17-18, *S. abilalaensis* n. sp. (holotype) : 17, ventral aspect of aedeagus ; 18, 9th sternite. 19-21, *S. gigas* L. Benick (Mt Missim) : 19, ventral aspect of aedeagus without internal structures ; 20, 8th sternite of ♂ ; 21, sclerotized clasp of the inner of medianlobe. 22-24, 8th sternite of ♂♂ : 22, *S. interfulgio* Last (paratype) ; 23, *S. cumatilis* Last (paratype) ; 24, *S. sepikensis* Last (paratype). 25, 10th tergite of *S. interfulgio* Last (paratype). 26-30, 8th sternite of ♂♂ : 26, *S. fretus* Last (paratype) ; 27, *S. abilalamontis* n. sp. (holotype) ; 28, *S. abilalaensis* n. sp. (holotype) ; 29, *S. coalitus* Last (holotype) ; 30, *S. delicatus* n. sp. (paratype). Scale=0.1 mm for aedeagus and 9th sternite, scale of 8th sternites the same, except in fig. 20 of which scale is 2 × as large as in fig. 22-30.

terstices shining. 3rd to 6th sternite along middle $2 \times$ as finely punctured than on sides, very shallowly emarginated at posterior margin. 4th and 5th sternite shallowed posteriorly. 6th sternite with a distinct semicircular impression. 7th sternite with a horseshoe-like impression in posterior 1/2, anterior to it shallowed in middle and with some coarser punctures, puncturation and pubescence in impression very fine and distinctly closer than in middle of fore-sternites, posterior margin narrowly but distinctly emarginated. 8th sternite (fig. 28). 9th sternite (fig. 18). 10th tergite at posterior margin smooth and broadly rounded. *Aedeagus* (fig. 17) principally resembling that of *abilalamontis*, but apical portion of medianlobe narrower and parameres larger, differently set with moderately long setae.

Stenus abilalaensis n. sp. differs from *abilalamontis* by its length, finer puncturation of head, darker legs, finer abdominal puncturation, and different sexual characters; from the other species of the *toxopei*-group as quoted in the key (see above).

3. *The gigas-group*

This group seems to me to be a monophyletic group in having a well sclerotized spermatheca and the 9th sternite or valvifer tooth-like produced apicolaterally. But the group itself is heterogenous, as it contains some smaller groups one of which is characterized by apomorphic characters of the 10th tergite (tipped at posterior margin) and hitherto known to me only from New Guinea, not from the Oriental region s. str. Species of this group and their sister-group possess a peculiar expulsion-clasp in the inner or the medianlobe (fig. 21). Those species are found in Australia (*guttulifer*-group, Puthz 1970b).

The only species which stands isolated is *Stenus capitalis* n. sp. of which the aedeagus is unknown. But related species from the Philippines lack the strongly and triangularly built expulsion-clasp of aedeagus.

As to my present knowledge the sister-group of the *guttulifer-gigas*-groups is the Oriental *gestroi*-group with large head, large eyes, narrow abdominal margination, and small expulsion-clasp.

The stem-species of *capitalis* n. sp. might be a stem-species of both groups named above and *capitalis*.

Stenus (Parastenus) gigas L. Benick, 1931 Fig. 19-21.

Stenus gigas L. Benick, 1931, *Neue Beitr. Syst. Insektenkunde* 5: 32 f. — Last, 1970, *J. Nat. Hist.* 4: 348.

Material studied: ♀ holotype (coll. Benick); 1 ♀: Karimui, 13.III.1966, R. Hornabrook (BM); 1 ♂: NE: 7°15' S, 146°48' E, Mt Missim, 1600 m, Malaise trap, 27.V.1966. J. L. Gressitt; 1 ♀: NE: Finisterre Range, Saidor: Matoko Village, 6.-24.IX.1958, W. W. Brandt (Bishop Museum, coll. m).

♂: Legs lack special sexual characters. Fore-sternites moderately coarsely and moderately densely punctured. 7th sternite shallowed in middle, with denser and finer puncturation and pubescence than 6th sternite, its posterior margin with a shallow but distinct emargination in shape broadly-bluntly-angular. 8th sternite (fig. 20). 9th sternite apicolaterally with a large tooth. 10th tergite with smooth posterior margin broadly rounded. *Aedeagus* (fig. 19) long, the medianlobe spatulate at apex with very dense short setae apicoventrally. Inside there are longitudinal expulsion-bands and a triangular, strongly sclerotized clasp (fig. 21). Parameres

distinctly longer than medianlobe, with long dense setae.

♀ : Fore-sternites as in ♂. 7th sternite more densely punctured along middle, as 6th sternite, scarcely emarginated at posterior margin. 8th sternite with the impunctate posterior margin narrowly rounded. Valvifer with a large tooth apicolaterally. Spermatheca not very distinct but present. 10th tergite as in ♂.

Stenus gigas varies from a bluish violet to a bluish green. It is very closely related to its sister-species *S. comptus* Last but differs by the less distinct and closer reticulation of elytra (at 100 × and more!), broader head, and somewhat finer abdominal puncturation; other characters seem to be variable. ♂ sexual characters of *comptus* unknown.

Stenus (Parastenus) comptus Last, 1970

Stenus comptus Last, 1970, *J. Nat. Hist.* 4: 348.

Material studied : ♀ holotype (BMNH) and ♀ paratype (coll. Last); 1 ♀ : New Guinea : Papua : S. Highlands : SE slope of Mt Giluwe, 2450 m, 12.X.1958, J. L. Gressitt (BISHOP).

Measurements of the holotype : Head : 1400 broad; average distance between eyes : 850; prothorax : 1090 broad, 1260 long; greatest width of elytra : 1660; length of elytra : 1620; sutural length : 1210; posterior tarsi : 430-160-110-280-340.

♀ : about as in *gigas*.

Although there are some differences in puncturation of the foreparts and the pronotum is a little shorter and more weakly impressed laterally. I believe that the specimen from Mt Giluwe belongs to *S. comptus*. Without seeing ♂♂ from both localities, that of the type and Mt Giluwe, it is impossible to decide whether there are specific differences between both (species is winged and therefore able to extend over a wide area).

Stenus (Parastenus) magnificus L. Benick, 1921

Stenus smaragdinus L. Benick, 1916, *Ent. Mitt.* 5: 250 ff. (nec Bernhauer, 1915).

Stenus magnificus L. Benick, 1921 (n. n.), l. c. 10: 194.

Material studied : ♀ holotype (Museum für Tierkunde, Dresden); 1 ♀ : Haus Copper, Wau, Mt Missim, 22. - 24.IV.1965, J. Balogh & J. J. Szent-Ivany (Museum Budapest); 1 ♀ : Wau, Morobe District, 1400 m, 17.VI.1961, J. Sedlacek (BISHOP).

Measurements of the holotype : Head : 1180 broad; average distance between eyes : 630; prothorax : 840 broad, 960 long; greatest width of elytra : 1110; length of elytra : 1090; sutural length : 780; posterior tarsi : 380-130-110-160-230.

Head distinctly reticulated, prothorax without microsculpture, elytra and abdomen very shallowly, nearly imperceptibly reticulate, somewhat more distinctly on the 7th tergite. 9th tergite with fine and shallow, moderately dense puncturation. 10th tergite weakly and irregularly reticulated.

♀ : ventrally as in *cyaneotinctus* n. sp. (see below). 10th tergite narrowly rounded at smooth posterior margin, not distinctly tipped as in *cyaneotinctus*.

Stenus (Hypostenus) cyaneotinctus Puthz, new species

This species is closely related to *S. interfulgio* Last, *S. thalassinus* Puthz, and *S. magnificus* L. Benick, the last of which is its sister-species.

Bluish violet, shining, coarsely, densely, and in parts coalescently punctured, not very distinctly pubescent. Antennae reddish brown, club somewhat infusate. Palpi unicolourous yellowish red. Legs yellowish red, knees feebly infusate. Labrum dark brown with the anterior margin lighter, moderately densely pubescent.

Length : 6.0-6.5 mm.

♀. Holotype (BISHOP 8793). New Guinea : West Irian : Vogelkop : Fak Fak, S. coast of Bomberai, 10-100 m, sweeping, 12.VI.1959, T. C. Maa.

Head distinctly broader than elytra (1150 : 990), front moderately narrow (average distance between eyes : 630), having 2 distinct but not deep longitudinal furrows, median portion about as broad as each of the side-portions, distinctly convex, nearly as high as level of inner eye-margins. Punctuation moderately coarse and moderately dense, diameter of a puncture about as large as section of 6th antennal segment, interstices posteriorly larger than diameter of puncture, anteriorly smaller. Antennal tubercles and middle-portion of front (except its apical 1/2) without puncturation, but the whole front distinctly, nearly isodiametrically, reticulated. *Antennae* moderately slender, extending somewhat beyond middle of pronotum, penultimate segments distinctly longer than broad. *Prothorax* distinctly longer than broad (950 : 800), sides nearly parallel-sided. Punctuation coarse and dense, transversely coalescent, diameter of a puncture distinctly larger than section of 3rd antennal segment but also distinctly smaller than section of 2nd antennal segment, shining interstices narrower than 1/2 diameter of a puncture. *Elytra* narrow and short, distinctly narrower than head (990 : 1150), about as long as broad, shoulders a little prominent, sides somewhat straightly divergent posteriorly, moderately restricted at posterior 1/6, posterior margin very deeply emarginated (sutural length : 660); without sutural, but a shallow humeral impression. Punctuation coarse and dense and confluent as on pronotum. Posterior margin finely marginated. *Abdomen* broad and cylindrical, slightly narrowed posteriorly, basal furrows of first segments deep, 7th tergite with a distinct but rudimentary membranous fringe apically (species is brachypterous). Laterally, the abdomen has a complete but very fine margination, but the margin does not separate tergites from sternites. Punctuation coarse and moderately sparse. Punctures of 5th tergite as large as those on front, interstices as large or little smaller than diameter of punctures, at places somewhat larger. Punctuation of 10th tergite less coarse and sparser. 10th tergite about as in *interfulgio* (see fig. 25) but the median tip a little narrower. *Legs* moderately slender. The holotype lost its posterior tarsi, but they should be as in *S. magnificus* or *S. interfulgio*.

Head distinctly, nearly isodiametrically reticulate. Pronotum without microsculpture. Elytra with a trace of extremely shallow reticulation at 160 ×. Abdomen distinctly but very shallowly reticulate at 40 ×.

♀ : Punctuation of fore-sternites coarse and moderately dense, that of sternite 6 scarcely finer in middle and a little sparser near posterior margin where a nearly indistinct emargination can be seen. 7th sternite with punctuation in the middle fine and moderately dense. 8th sternite with a punctuation as coarse as on sternite 5, distinctly and roundly produced at posterior margin. Valvifer distinctly produced tooth-like apicolaterally.

Stenus cyaneotinctus n. sp. differs from *S. interfulgio* Last by its coloration, more parallel-sided pronotum and elytra, and the microsculpture of abdomen; from *S. magnificus* L. Benick by its smaller elytra, coloration, and the sharper apical tip of tergite 10.

Stenus (Hypostenus) interfulgio Last, 1970 Fig. 22, 25.

Stenus interfulgio Last, 1970, *J. Nat. Hist.* 4: 351 fig.

Material studied : all types (BMNH, coll. Last, coll. m.).

♂ : Legs lack special sexual characters. Fore-sternites coarsely and moderately densely punctured. 7th sternite with the puncturation and pubescence fine and dense on posterior 2/3 in middle. 8th sternite along middle moderately coarsely and densely punctured, distinctly finer and denser than on the sides of sternite, emargination of posterior margin small (fig. 22). 9th sternite apicolaterally with a distinct and long tooth which is feebly curved in a ventral direction, ventrally punctured on sides, smooth in middle. 10th tergite at posterior middle conspicuously tipped (fig. 25), with only some moderately fine but scattered punctures on dorsal surface. *Aedeagus* about as figured in fig. 8 (Last 1970) but the medianlobe, in ventral aspect, with a distinct transverse connection in anterior 1/3 between the 2 side-rolls (there is not such a split as shown in Last's figure). The side-rolls are densely set with very short setae. In inner structure *S. interfulgio* is very near to *S. thalassinus* Puthz. Slender parameres distinctly longer than medianlobe having a few short setae at the apex.

In his diagnosis Last compares his species with *S. palawanensis* Wendeler. To that species *interfulgio* is only similar in general proportions, but its abdomen is immarginated, in *palawanensis* distinctly marginated ("*Parastenus*"). The head of *S. interfulgio* is distinctly but shallowly reticulated, the rest of surface without microsculpture. Head distinctly broader than elytra, not "much broader." Species is wingless.

Its sister-species should be the stem-species of *S. cyaneotinctus* and *S. magnificus*. It differs from both by the different coloration and the abdomen which has no trace of lateral margination and no microsculpture.

Stenus (Hypostenus) thalassinus Puthz, 1970

Stenus thalassinus Puthz, 1970, *Mem. Nat. Mus. Victoria* 31: 51 ff. figs.

Material studied : ♂ holotype (South Australian Museum, Adelaide), ♀ paratype (coll. m.).

This species is very remarkable by its sea-green coloration, its very coarse and close puncturation, also of the abdomen, and the 10th tergite which in both sexes has a posterior median tip.

Stenus (Parastenus) capitalis Puthz, new species

This new species belongs to an Oriental group of species of which it is the only one known from New Guinea. Related species are described from the Philippines.

Greasy shining, aeneous with a greenish tint on head, finely, shallowly, and sparsely punctured, indistinctly pubescent. Antennae yellowish red with the club reddish brown. Palpi entirely yellowish red. Legs reddish, apical 2/5 of femora nearly black, gradually changing, not sharply separated, tarsi also somewhat infusate. Labrum dark brown, anterior margin lighter, pubescence moderately dense.

Length : 6.5-7.7 mm.

♀ holotype (BMNH). New Guinea : Morobe District, Edie Creek, ca (6 miles) SW

Wau, Bulldog Road, (9700 ft), Stn. No. 12 (ex rotten wood), 20.IX.1964, M. E. Bacchus.

The whole insect is shallowly and about isodiametrically reticulate which gives it a greasy lustre.

Head distinctly broader than elytra (1410 : 1280) with moderately broad front (average distance between eyes : 820) distinctly but not deeply longitudinally furrowed, its median-portion as broad as each of the side-portions and distinctly but not much elevated, shallowed anteriorly and posteriorly, in middle not extending to level of inner eye-margins. Puncturation fine and sparse, irregular, diameter of a puncture about as large as basal section of 3rd antennal segment, interstices larger, often $2 \times$ as large as diameter of punctures. Antennal tubercles impunctate, middle-portion of front sparser punctured. *Antennae* moderately slender, when reflexed extending little beyond the middle of pronotum, penultimate segments scarcely longer than broad. *Prothorax* convex, distinctly but not much longer than broad (1200 : 1050), broadest about middle, sides to anterior margin convex, to posterior margin concavely narrowed. Surface with several impressions : 1 transverse impression near anterior margin, 1 near middle laterally, 1 at the sides near posterior margin. Three impressions dorsally : 1 longitudinal in middle 1/3, 2 oblique in anterior 1/3; these 3 together give dorsal surface appearance of a "Y," of which the upper branches are a bit separated from the main branch. Puncturation fine and sparse, about as on head, finer at sides. *Elytra* small and short, distinctly narrower than head (1280 : 1410), distinctly broader than long (1280 : 1080). No humeral angles, sides from base considerably convexly divergent posteriorly, restricted in posterior 1/3, posterior margin very deeply excavated (sutural length : 720). No distinct sutural impression, but a large and shallow depression in posterior 2/3 near suture, this depression becomes considerably deeper anteriorly, a narrow subhumeral depression in basal 2/5, 1 more depression at the sides in basal 2/5. Puncturation moderately fine, scarcely stronger than on head, more regular and denser than on pronotum, as large or little larger than diameter of punctures, puncturation of basal 1/3 and of the sides distinctly finer and sparser. *Abdomen* very broad, convex, basal furrows of first tergites very deep, 7th tergite with an extremely fine, rudimentary membranous fringe apically (the insect is brachypterous). Sides of abdomen completely line-like margined. Puncturation fine, sparse, and regular, diameter of a puncture of tergites 3-6 little smaller than basal section of 3rd antennal segment, interstices larger than diameter of punctures, but only exceptionally as large as $2 \times$ the diameter of a puncture. Puncturation of tergite 7 and 8 coarser and denser, punctures as large as basal section of 3rd antennal segment or scarcely larger, interstices a little larger than diameter of the punctures. Puncturation of the 10th tergite finer and sparser. *Legs* moderately slender, posterior tarsi about 2/3 length of posterior tibiae, first segment nearly as long as 3 following together, distinctly longer than last : 440-195-115-210-320, 4th segment deeply bilobed.

♂ : Unknown.

♀ : Fore-sternites moderately coarsely and moderately sparsely punctured, interstices as large as or feebly smaller than diameter of punctures. 3rd to 6th sternite in posterior middle sparser punctured. Middle of 7th sternite with the puncturation and pubescence fine and dense on posterior 2/3. 8th sternite little produced apically, rounded. Valvifer with a curved tooth apico-laterally. 10th tergite smooth at posterior margin and broadly rounded. Spermatheca consists of a rolled bag comparable with upper 2/3 of a violin-key.

Stenus capitalis n. sp. resembles some species from the Philippines (*azurescens* Bck., *chlorophanus* Bck., *cupreomicans* Bck., and *heterocerus* Bck.), mostly *azurescens*, from which it can readily be distinguished by the shorter pronotum and much finer puncturation of pronotum and elytra.

REFERENCES

- Benick, L.** 1916. Beitrag zur Kenntnis der Megalopinen und Steninen (Col., Staphyl.). *Ent. Mitt.* **5**: 238-52.
1921. Nomenklatorisches über Steninen (Col., Staph.). *Ent. Mitt.* **10**: 191-94.
1928. Alte u. neue Steninen aus Australien u. Ozeanien (Col. Staph.). *Ent. Mitt.* **17**: 177-82.
1931. Ein Riesen-*Stenus* aus Neu-Guinea. *Neue Beitr. Syst. Insektenkunde* **5**: 32-33.
- Cameron, M.** 1952. New species of Staphylinidae (Col.) from New Guinea and Misool. *Treubia* **21**: 241-56.
- Fauvel, A.** 1877. Les Staphylinides de l'Australie et de la Polynésie. *Ann. Mus. Civ. Stor. Nat. Genova* **10**: 168-298.
1878. Les Staphylinides de Moluques et de la Nouvelle Guinée. *l. c.* **12**: 171-315.
- Hennig, W.** 1965. Phylogenetic systematics. *Ann. Rev. Ent.* **10**: 97-116.
- Last, H. R.** 1970. A record of the species of the genus *Stenus* (Coleoptera, Staphylinidae) with descriptions of new species collected by Dr. R. Hornabrook in New Guinea. *J. Nat. Hist.* **4**: 347-62.
- Puthz, V.** 1968. Über indo-australische Steninen I (Coleoptera, Staphylinidae) 49. Beitrag zur Kenntnis der Steninen. *Dt. Ent. Z. (N. F.)* **15**: 445-74.
1969a. Revision der Fauvelschen *Stenus*-Arten, exklusive madagassische Arten 55. Beitrag zur Kenntnis der Steninen. *Bull. Inst. R. Sci. Nat. Belg.* **45** (9): 47 p.
1969b. The first *Stenus*-species from the Solomons (Coleoptera, Staphylinidae). *Pacif. Ins.* **11**: 525-34.
1969c. Staphylinidae (Coleoptera) from New Guinea. *Pacif. Ins.* **11**: 529-34.
1969d. Über Steninen aus dem Museo Civico di Storia Naturale di Genova (Coleoptera, Staphylinidae) 69. Beitrag zur Kenntnis der Steninen. *Ann. Mus. Civ. Stor. Nat. Genova* **77**: 640-57.
1970a. Two remarkable *Stenus* from New Guinea (Coleoptera: Staphylinidae). *Mem. Nat. Mus. Victoria* **31**: 51-54.
1970b. Revision of the Australian species of the genus *Stenus* Latreille (Coleoptera, Staphylinidae). *l. c.*: 55-80.
1970c. The Noona Dan Expedition, 1961-62. Steninae (Coleoptera, Staphylinidae) 63rd contribution to the knowledge of Steninae. *Steenstrupia* **1**: 83-90.
1971. Revision der afrikanischen Steninenfauna und Allgemeines über die Gattung *Stenus* Latr. (Coleoptera, Staphylinidae) 56. Beitrag zur Kenntnis der Steninen. *Ann. Mus. R. Afr. Centr. Set.* **8**^o. Zool. **187**: 376 p.
- Toxopeus, L. J.** 1940. Netherlands Indian-American Expedition to Netherlands New Guinea (3rd Archbold Expedition to New Guinea 1938-'39) List of Collecting Stations. *Treubia* **17**: 277-79.