

On one new genus and three new species of freshwater crabs (Crustacea: Decapoda: Brachyura: Potamidae and Grapsidae) from Lanjak-Entimau, Sarawak, East Malaysia, Borneo

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Key words: Crustacea; Decapoda; Brachyura; Potamidae; Grapsidae; freshwater crabs; taxonomy; new species; Sarawak; Borneo.

The freshwater crabs obtained from the Lanjak-Entimau area in Sarawak, East Malaysia, Borneo, are reported upon. One new genus (*Ibanum*) and two new species of Potamidae (*Ibanum aethes* and *Isopotamon stuebingi*) and a new species of Grapsidae (*Geosesarma katibas*) are described. The identity of *Potamon* (*Geothelphusa*) *bicristatum* De Man, 1899, originally described from the upper Kapuas in Kalimantan is also clarified, and is here assigned to the new genus, *Ibanum*.

Introduction

Recently, Robert Stuebing passed me a small but very interesting collection of crabs he obtained from Lanjak-Entimau, an area of undisturbed rainforest in Sarawak. I subsequently received for identification, two crabs obtained from the stomach of a large forest frog, *Rana ibanorum* (Anura: Ranidae) collected from Lanjak-Entimau Wildlife Sanctuary by C.H. Diong. Although only three species (Potamidae and Grapsidae) were collected, all proved to be undescribed, and include a new genus of Potamidae. The present paper serves to describe these new taxa, as well as to comment on their taxonomy.

The abbreviations G1 and G2 are used for the male first and second pleopod respectively. Measurements provided are of the carapace width and length respectively. The terminology used essentially follows that used by Ng (1988). Specimens studied during this study are deposited in the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore; Sarawak Museum (SM), Kuching, Sarawak, Malaysia; and Nationaal Natuurhistorisch Museum (was Rijksmuseum van Natuurlijke Historie) (RMNH), Leiden, The Netherlands.

Descriptive part

Family Potamidae

Ibanum gen. nov.

Type species: *Ibanum aethes* spec. nov. by present designation.

Diagnosis.— Carapace distinctly broader than long, surfaces smooth, regions

poorly defined; postorbital and epigastric cristae weak, not confluent, postorbital cristae short, not reaching anterolateral margin; anterolateral margin arcuate, granulated to gently serrate; epibranchial tooth not obvious or absent; external orbital angle not discernible; frontal margin entire, frontal median triangle absent. Third maxilliped quadrate; exopod with distinct flagellum which reaches across width of merus. Mandibular palp of mandible 2-segmented; terminal segment simple, not bilobed. Suture between sternites 2 and 3 deep, complete; suture between sternites 1 and 2 distinct but shallow thoracic. Male abdomen triangular, 7-segmented. Terminal segment of G1 conical, not clearly demarcated from subterminal segment. G2 very long, twice as long as G1; distal segment elongate, longer than basal segment; tip bifurcated.

Remarks.— In the form of the carapace, general physiognomy and G1 structure, *Ibanum* gen. nov. is closest to *Cerberusa* Holthuis, 1979, established for two troglobitic species (*C. tipula* Holthuis, 1979 [type species], and *C. caeca* Holthuis, 1979) from caves in northern Sarawak. *Ibanum* however, differs in possessing distinct epigastric cristae (against weak), well defined postorbital cristae (against weak or absent), presence of a distinct flagellum on the exopod of the third maxilliped (against absent), proportionately shorter legs and chelipeds, presence of a sharp spine on the inner angle of the carpus of the cheliped (against only a small or weak tooth), and a proportionately longer G2, with the distal segment longer than the basal segment (-against subequal) and the tip bifurcated (against rounded/flared).

Etymology.— The name is derived from the Iban people of Sarawak. Gender neuter.

Ibanum bicristatum (De Man, 1899)
(figs. 1-3)

Potamon (*Geothelphusa*) *bicristatum* De Man, 1899: 127, Pl. 12 fig. 15.

Potamon (*Geothelphusa*) *bicristatus*; Rathbun, 1905: 209.

Material.— Lectotype: ♀, 17.6 by 12.3 mm (RMNH D 1552a), Mt. Liang Koeboeng, Kapuas, Kalimantan, Borneo, coll. J. Büttikofer, Borneo Expedition 1894. Paralectotype: ♀, 17.3 by 12.5 mm (RMNH D 1552b), same data as lectotype.

Diagnosis.— Carapace transverse, lateral regions of carapace smooth to gently rugose; postorbital cristae weak, separated from low epigastric cristae; anterolateral margins gently serrated, epibranchial tooth and external orbital angle undiscernible. Carpus of cheliped with distinct tooth on inner distal angle. G1 and G2 not known.

Remarks.— De Man (1899: 127) described this species from two females. The larger syntype female (17.6 by 12.3 mm) (RMNH D 1552a) is here designated as the lectotype.

The generic placement of this species has not been dealt with before, and was not treated or listed by Bott (1970). The species does bear a superficial resemblance to *Thelphusula* Bott, 1969, but the carapace is more rectangular in shape and the exopod of the third maxilliped has a shorter flagellum than in known *Thelphusula* species (see Bott, 1970: 58-62; Ng & Stuebing, 1990: 45). The simple terminal segment of the mandibular palp however, excludes this species from the Gecarcinucoidea, and

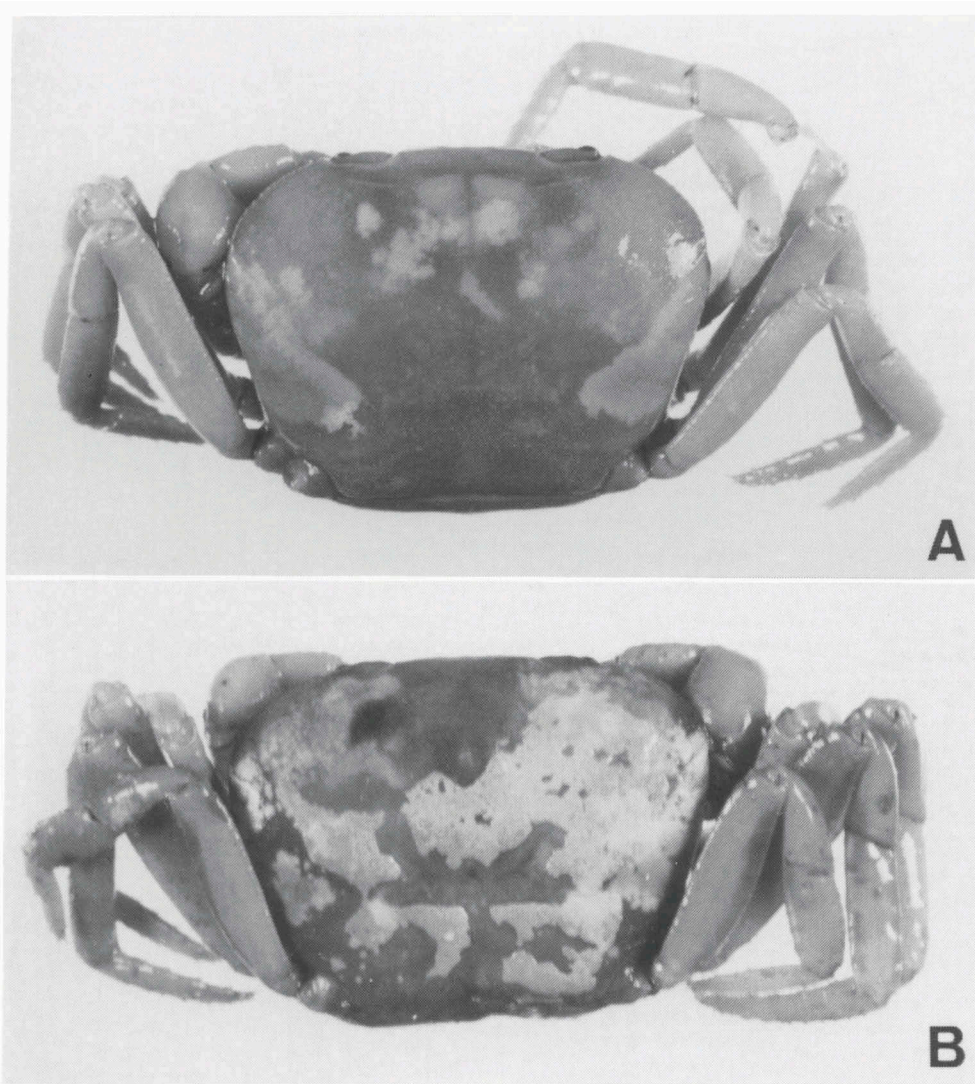


Fig. 1. *Ibanum bicristatum* (De Man, 1899). A, lectotype ♀ (17.6 by 12.3 mm) (RMNH D 1552a); B, paralectotype ♀ (17.3 by 12.5 mm) (RMNH D 1552b). Both from Mt. Liang-Koeboeng.

places it in the Potamoidea instead.

Nobili's (1903: 17) and Colosi's (1920: 34) record of this species from Matang, Sarawak, is uncertain. In the Sarawak Museum are two adult females (largest 19.0 by 13.3 mm) from Matang (not in good condition) which are close to *I. bicristatum* and *I. aethes*, but differ in having the carapace more inflated and smoother. It is however, not possible to be sure if they are conspecific with either species until better specimens or preferably males can be obtained. Similarly, there is also a young female specimen from Gunong Temiang, Sarawak, in the ZRC which cannot be identified with either species with certainty. These specimens, as well as Nobili's and Colosi's records are placed under *Ibanum* sp. for the moment.

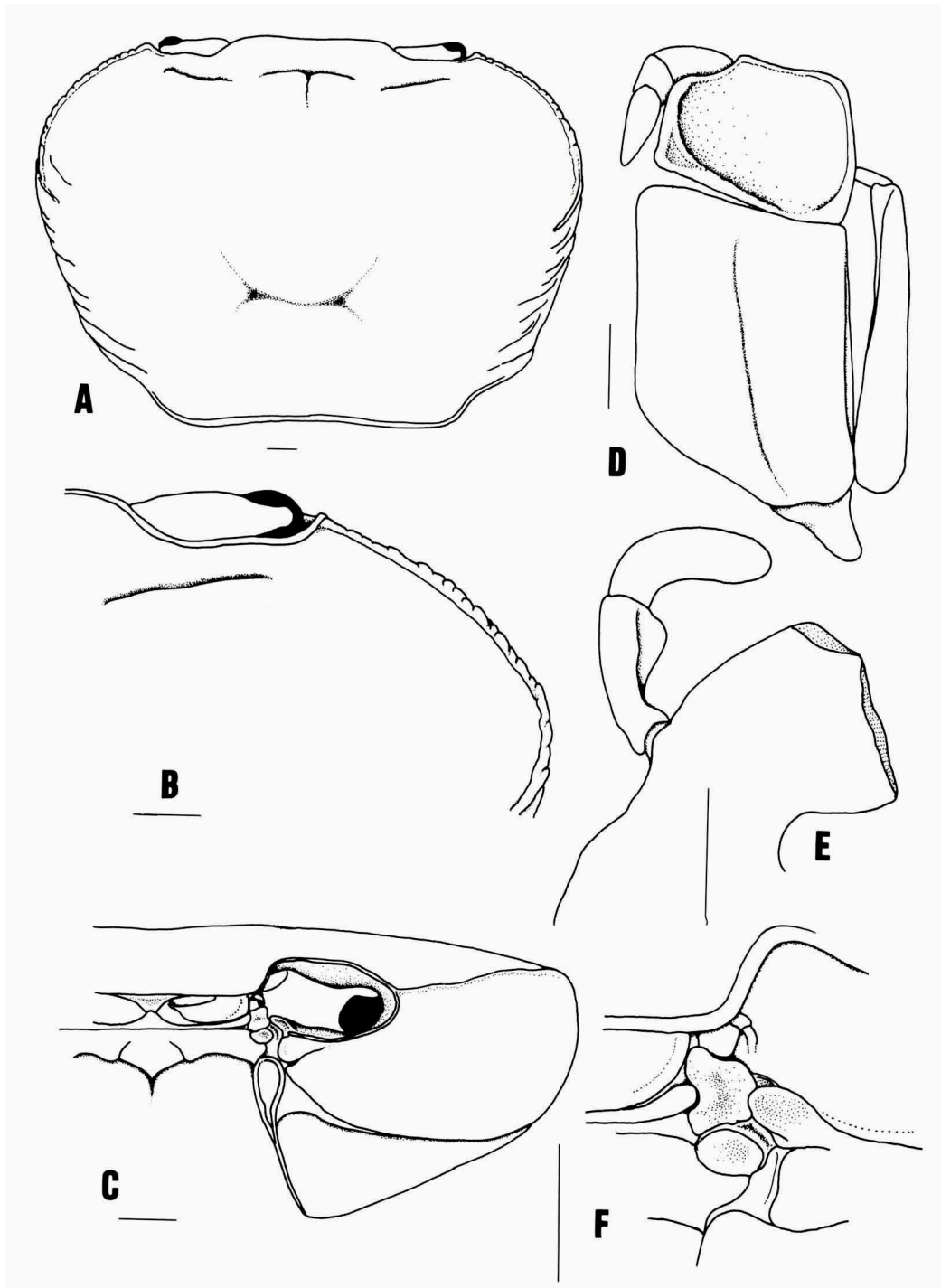


Fig. 2. *Ibanum bicristatum* (De Man, 1899). Lectotype ♀ (17.6 by 12.3 mm) (RMNH D 1552a), Mt. Liang-Koeboeng. A, carapace; B, frontal part of carapace; C, frontal view of carapace; D, left third maxilliped; E, right mandible and palp; F, antenna. Scales = 1.0 mm.

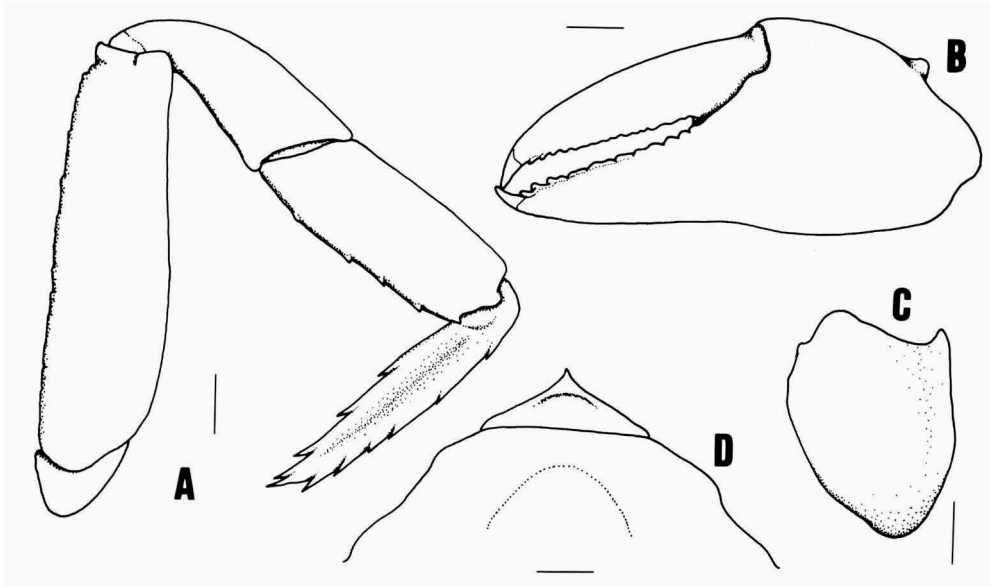


Fig. 3. *Ibanum bicristatum* (De Man, 1899). Lectotype ♀ (17.6 by 12.3 mm) (RMNH D 1552a), Mt. Liang-Koeboeng. A, fourth right ambulatory leg; B, left chela; C, left carpus of cheliped (dorsal view); D, anterior thoracic sternum. Scales = 1.0 mm.

Colour.— De Man (1899: 131) describes his specimens as being lead coloured, with yellowish-marmorate legs.

Ecology and habits.— De Man (1899: 127) records one specimen was caught in the forest. It is probably semiterrestrial in habit, but no other details are available.

Ibanum aethes spec. nov.
(figs. 4-6)

Material.— Holotype: ♂, 18.8 by 14.3 mm (ZRC), Lanjak-Entimau Wildlife Sanctuary, Sarawak, Borneo, in stomach of frog (*Rana ibanorum*, Ranidae), coll. C.H. Diong, 17-23.v.1994. Paratype: ♀, 14.8 by 10.8 mm (ZRC), station 90, Sungai Sekerang, Lanjak Entimau, coll. R.B. Stuebing, 8.x.1993.

Diagnosis.— Carapace transverse, lateral regions of carapace rugose; postorbital cristae weak, almost confluent with indistinct rugose epigastric cristae; anterolateral margins gently serrated, epibranchial tooth and external orbital angle absent. Carpus of cheliped with very well produced sharp spine on inner distal angle. G1 relatively stout, terminal segment bent sharply outwards, tapering to rounded tip. G2 very long, ca. 2.3 times length of G1; distal segment elongate, 1.1 times length of basal segment.

Remarks.— *Ibanum aethes* spec. nov. differs from *I. bicristatum* mainly in the form of the carapace. In *I. aethes*, the carapace is more distinctly rugose, especially along the anterolateral regions, the anterolateral teeth are more pronounced, and the inner distal angle of the carpus of the cheliped has a longer and sharper spine. The type of *I. aethes* is a male, and the enlarged chelae, absent in *I. bicristatum* (known only from

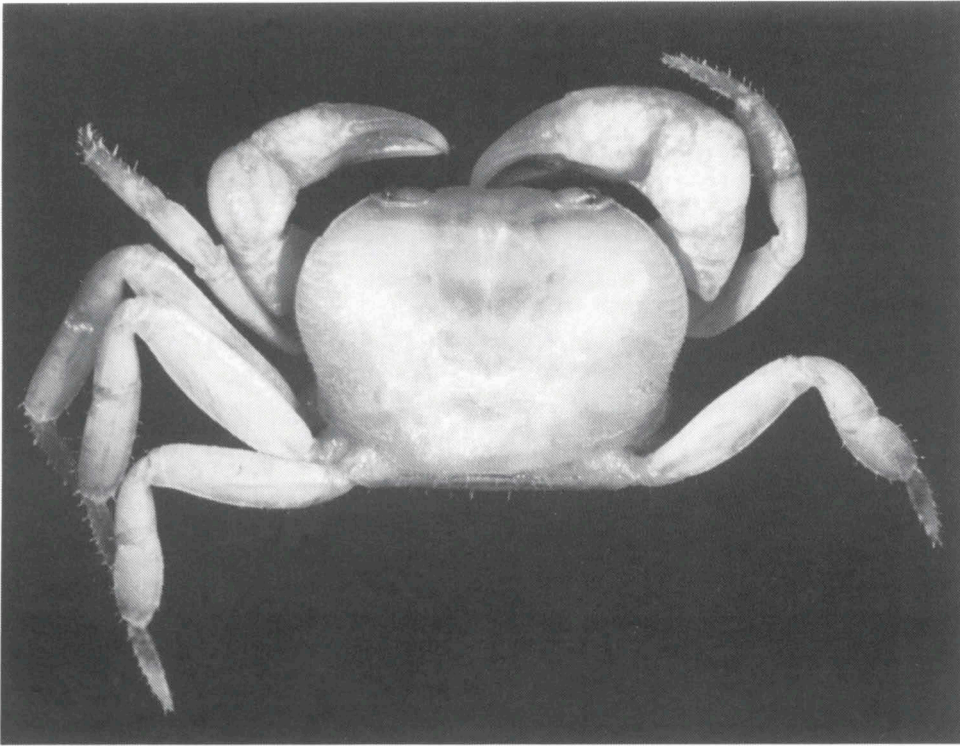


Fig. 4. *Ibanum aethes* spec. nov. Paratype ♀ (14.8 by 10.8 mm) (ZRC), Lanjak-Entimau.

females), is probably a sexual character. More differences can be expected once males of *I. bicristatum* are obtained.

Ibanum aethes was obtained from the Katibas area, which is only about 130 km northwest of Mt. Liang-Koeboeng, the type locality of *I. bicristatum*. There is however, a large area of peat swamps and streams (Kapuas lakes area) separating the two sites, and the differences observed between the two species are thus not unexpected.

Etymology.— The name is derived from the Greek "aethes" for strange and unusual. Used as a noun in apposition.

Ibanum spec.

Potamon (*Geotelphusa*) *bicristatum*; Nobili, 1903: 17; Colosi, 1920: 34.

Material.— 1 young ♀: 9.7 by 6.8 mm (ZRC), Gunong Temiang, Sadong, 500 feet asl, Sarawak, Borneo, leg. N.S. Haile, 1952. 2 females: largest 19.0 by 13.3 mm (SM 1986.1-2), Gunong Matang, Sarawak, Borneo, ca. 600 m asl, no other data.

Remarks.— The identity of the Sarawak *Ibanum* specimens, as well as Nobili's (1903: 17) and Colosi's (1920: 34) records of *I. bicristatum* from Sarawak have been discussed earlier under that species.

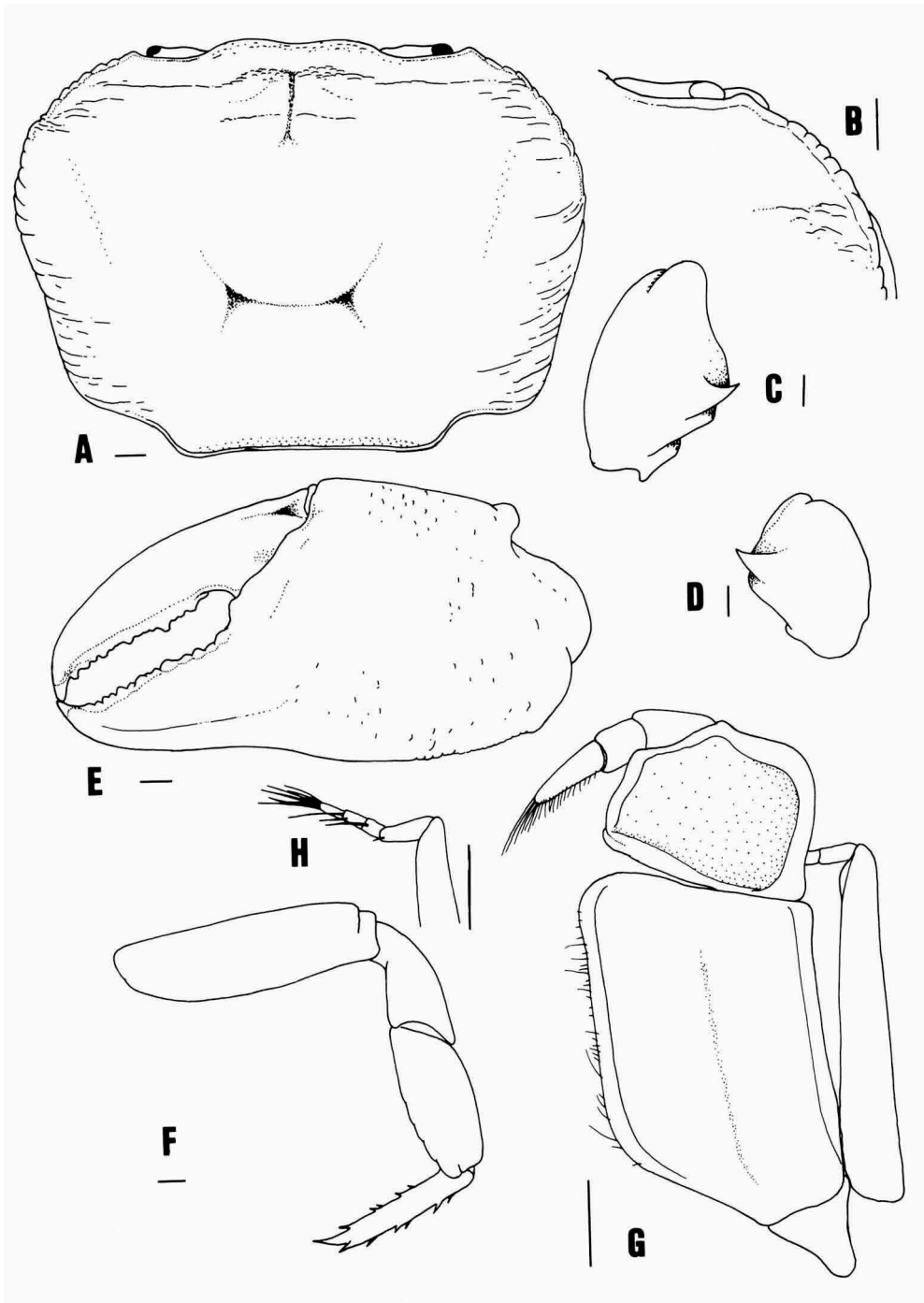


Fig. 5. *Ibanum aethes* spec. nov. Holotype ♂ (18.8 by 14.3 mm) (ZRC), Lanjak-Entimau Wildlife Sanctuary. A, carapace; B, frontal part of carapace; C, left carpus (dorsal view); D, right carpus (dorsal view); E, left chela; F, fourth right ambulatory leg; G, left third maxilliped; H, flagellum of exopod of left third maxilliped. Scales = 1.0 mm.

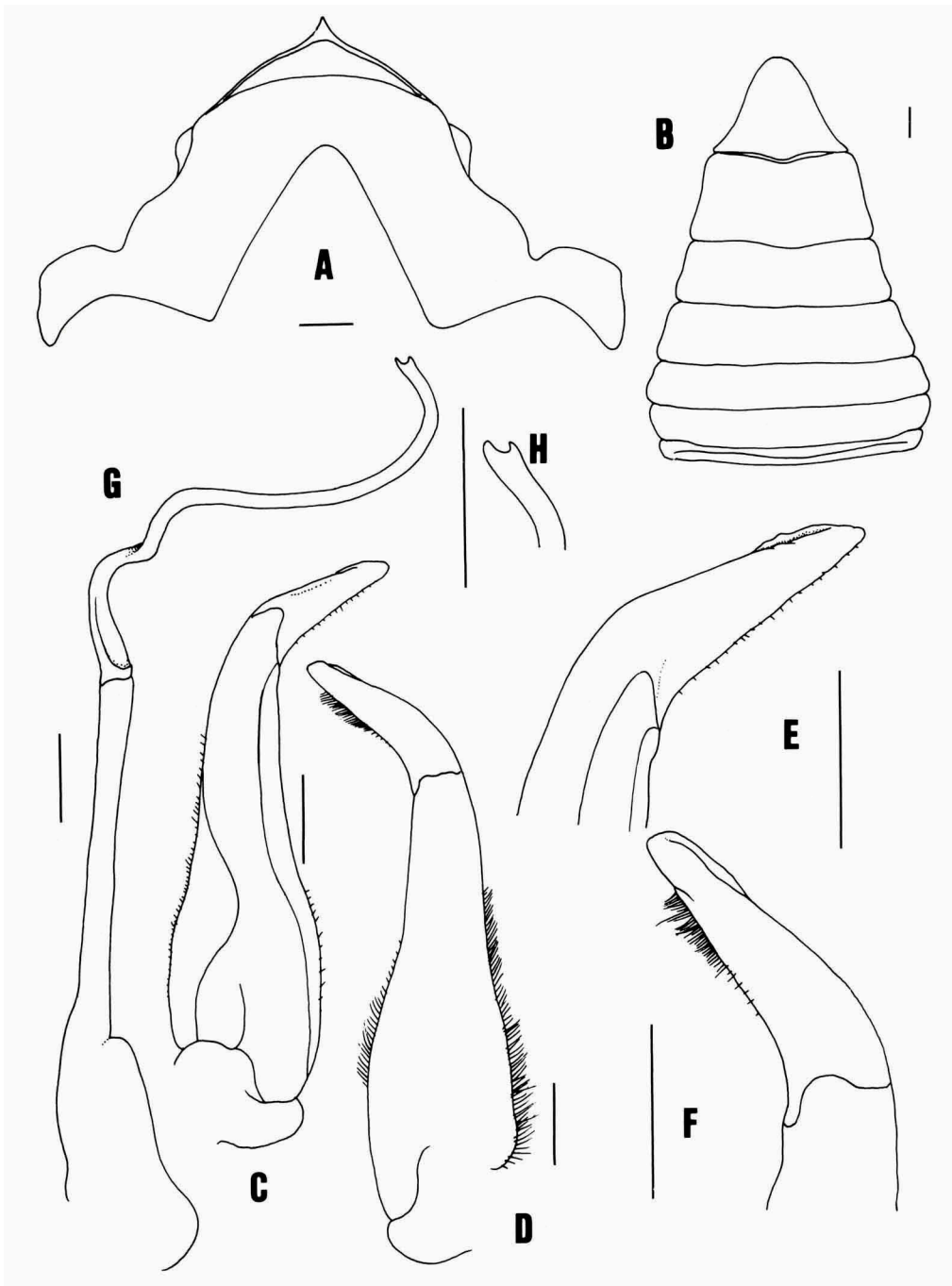


Fig. 6. *Ibanum aethes* spec. nov. Holotype ♂ (18.8 by 14.3 mm) (ZRC), Lanjak-Entimau Wildlife Sanctuary. A, anterior thoracic sternum; B, abdomen; C, left G1 (ventral view); D, left G1 (dorsal view); E, distal part of left G1 (ventral view); F, distal part of left G1 (dorsal view); G, left G2; H, distal part of distal segment of left G2. Scales = 1.0 mm.

Genus *Isolapotamon* Bott, 1968

Isolapotamon stuebingi spec. nov.
(figs. 7, 8A-E)

Material.— Holotype: ♂, 22.0 by 16.7 mm (ZRC), station 90, Sungai Sekerang, Lanjak-Entimau, Sarawak, Borneo, coll. R.B. Stuebing, 8.x.1993. Paratype: ♂, 20.5 by 15.0 mm (RMNH D 46129), Lanjak-Entimau Wildlife Sanctuary, Sarawak, Borneo, in stomach of frog (*Rana ibanorum*, Ranidae), coll. C.H. Diong, 17-23.v.1994.

Diagnosis.— Carapace transverse, dorsal surfaces flat, regions rugose to granulose, especially lateral regions, anterolateral margins distinctly granulated, epibranchial tooth distinct but low, separated from external orbital angle by cleft, external orbital angle broadly triangular, outer margin convex, granulated. Ischial sulcus on third maxilliped shallow. Dactylus of last ambulatory leg short. G1 gently sinuous, terminal segment shorter than subterminal segment, tip subtruncate.

Paratype.— The paratype male was obtained from the stomach of a ranid frog, and is not in very good condition. The G1 is quite immature but the basic features agree relatively well with that of the larger holotype. The carapace of the paratype is relatively intact, and the external features agree well with that of the holotype.

Remarks.— In the general carapace physiognomy (i.e. shape and flatness) and

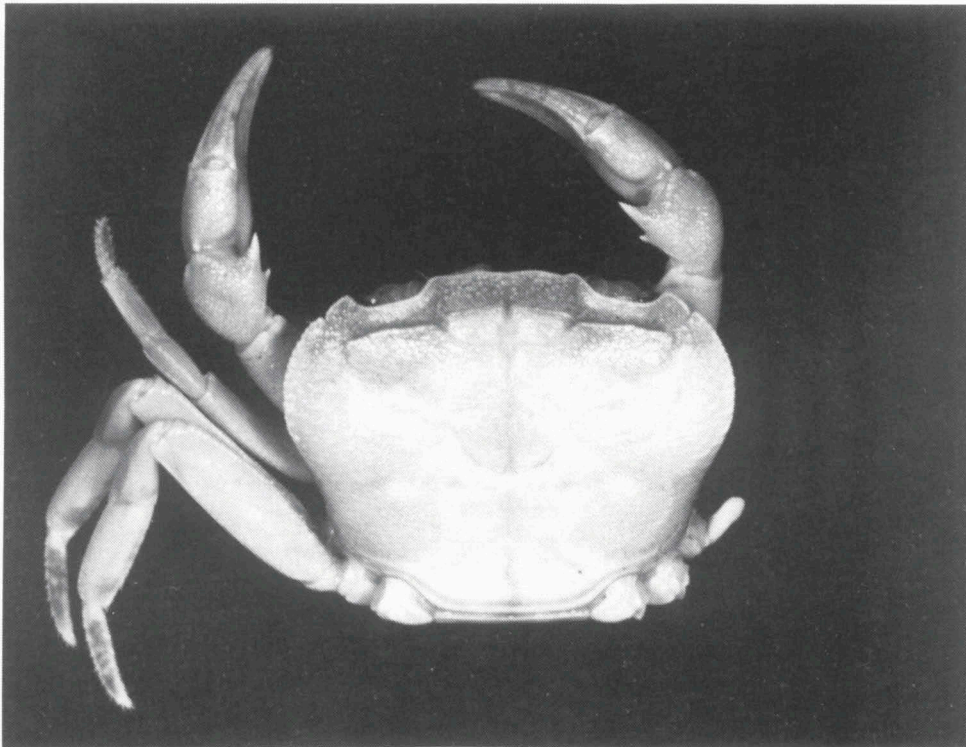


Fig. 7. *Isolapotamon stuebingi* spec. nov. Holotype ♂ (22.0 by 16.7 mm) (ZRC), Lanjak-Entimau.

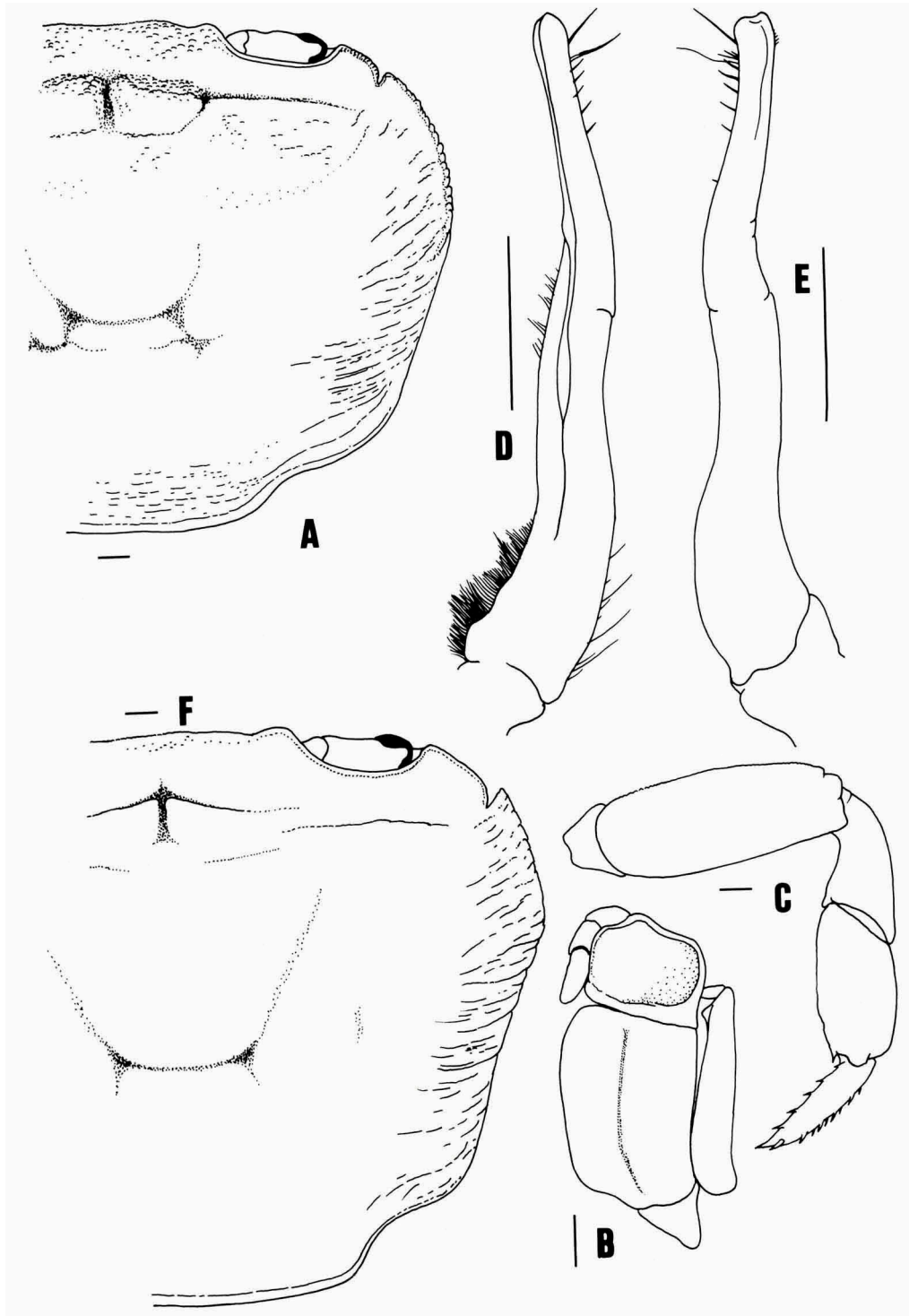


Fig. 8. A-E, *Isolapotamon stuebingi* spec. nov. Holotype ♂ (22.0 by 16.7 mm) (ZRC), Lanjak-Entimau. F, *Isolapotamon consobrinum* (De Man, 1899) (24.0 by 18.0 mm) (ZRC), Kuching area, Sarawak. A, F, carapace; B, left third maxilliped; C, right fourth ambulatory leg; D, left G1 (ventral view); E, left G1 (dorsal view). Scales = 1.0 mm.

slender exopod of the third maxilliped, *I. stuebingi* spec. nov. seems to be closest to *I. consobrinum* (De Man, 1899), a species known from northwestern Kalimantan and southern Sarawak. *Isolapotamon stuebingi* however, differs clearly from *I. consobrinum* in having the dorsal surface of the carapace much more rugose and granulose, the epigastric cristae rugose (against sharp), lower epibranchial teeth, more sinuous G1, with the tip not flattened and dilated but subtruncate instead (Fig. 8F, see also Ng, 1987: 140-142). In the form of the G1, the species also differs from all other congeners.

It is important to note however, that the type specimen is rather small, only 22.0 by 16.7 mm, and the adult size is probably at least twice this size. *Isolapotamon* species are among the largest potamid crabs known (see Ng, 1987: 146). The structure of the G1 however, normally does not change substantially once the male crab reaches about 20-30 mm in carapace width. In the case of the type male of *I. stuebingi*, the G1 is already quite well chitinised, with the hairs on the base of the subterminal segment and distal part of the terminal segment already developed, characters which suggest that the G1 is almost mature as well. Juvenile males have weakly chitinised gonopods, with the hairs being absent or very sparse.

Etymology.— I take pleasure in naming this species after an old friend, Rob Stuebing, who has helped me on so many occasions over the years.

Family Grapsidae

Genus *Geosesarma* De Man, 1902

Geosesarma katibas spec. nov. (figs. 9-12)

Material.— Holotype: ♂, 13.5 by 13.5 mm (RMNH D 46130), among dead leaves, quadrat about 50 m from Sungai Katibas, east bank, about 100 m from mouth of Melinau, Ulu Katibas, Song District, Sarawak, Borneo, coll. R.B. Stuebing, 25.iii.1994. Paratypes: ♂, 13.2 by 13.1 mm (ZRC), same data as holotype. 1 young ♀ (SM), east bank of Sungai Ulu Katibas, Sarawak, Borneo, coll. R.B. Stuebing, 22.iii.1994.

Diagnosis.— Carapace squarish; dorsal surface smooth, regions very well defined, with deep grooves. Frontal margin strongly deflexed, gently sinuous; post-frontal cristae sharp, distinct. External orbital angle acutely triangular, directed obliquely forwards, separated from first epibranchial tooth by distinct cleft, first epibranchial tooth very low, rounded, second epibranchial tooth indistinct, almost undiscernible, marked only by small notch. Merus of third maxilliped rounded; exopod slender, without flagellum, inner margin of distal part strongly setose. Outer surfaces of palm of chela rugose or covered with small granules, especially on upper half; upper margin of dactylus with 11 sharp, anteriorly directed granules, reaching to just before tip; fingers slightly longer than palm. Second ambulatory leg longest; meri of all legs slender, each with a sharp subdistal dorsal spine. Male abdominal segment 7 slightly longer than segment 6; lateral margins of segments 6 and 7 gently convex. G1 terminal segment straight, relatively short, stout, distal part bent outwards, dorso-ventrally flattened.

Paratypes.— The slightly smaller paratype male from Ulu Katibas agrees with



Fig. 9. *Geosesarma katibas* spec. nov. Paratype ♂ (13.2 by 13.1 mm) (ZRC), Sungai Katibas.

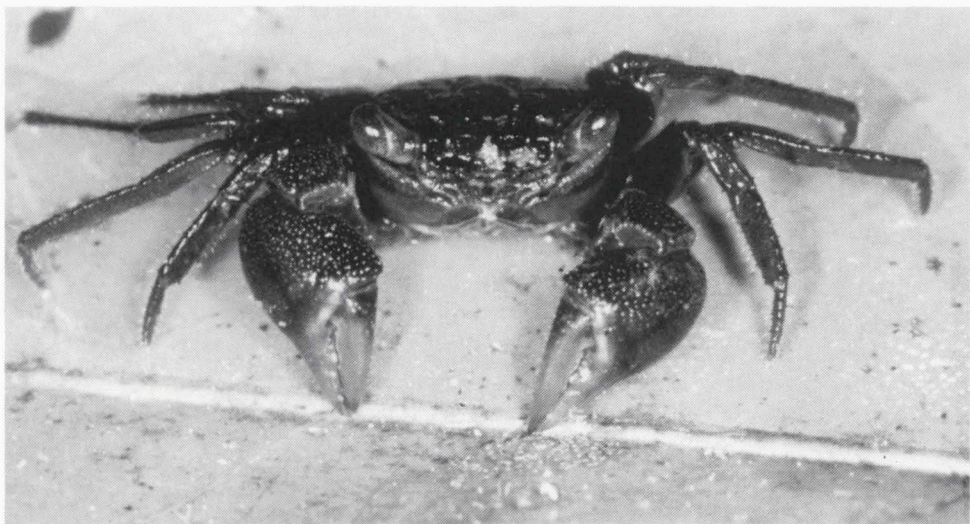


Fig. 10. *Geosesarma katibas* spec. nov. Holotype or paratype ♂, Sungai Katibas. Photograph: R.B. Stuebing.

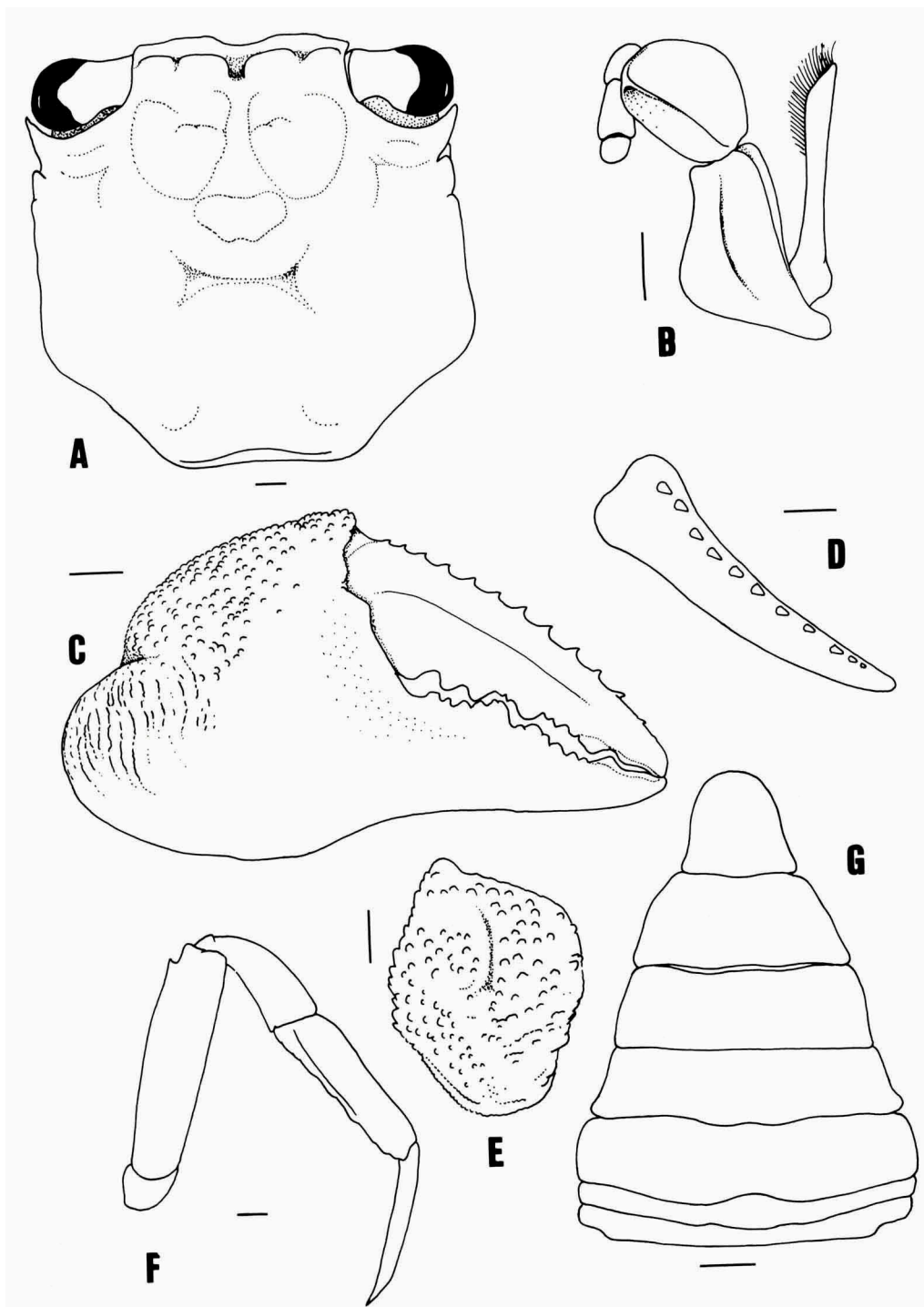


Fig. 11. *Geosesarma katibas* spec. nov. Holotype ♂ (13.5 by 13.5 mm) (RMNH D 46130), Sungai Katibas. A, carapace; B, left third maxilliped; C, right chela; D, dorsal view of dactylus showing anteriorly directed granules; E, right carpus (dorsal view); F, right fourth ambulatory leg; G, abdomen. Scales = 1.0 mm.

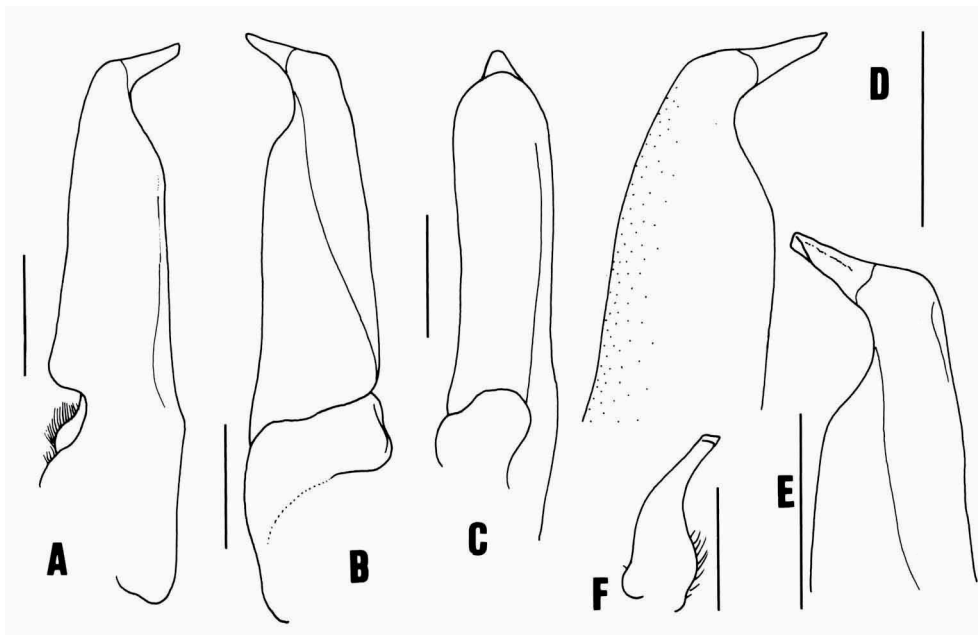


Fig. 12. *Geosesarma katibas* spec. nov. Holotype ♂ (13.5 by 13.5 mm) (RMNH D 46130), Sungai Katibas. A, left G1 (ventral view); B, left G1 (dorsal view); C, left G1 (dorso-marginal view); D, distal part of left G1 (ventral view); E, distal part of left G1 (dorsal view); F, left G2. Scales = 1.0 mm.

the holotype in all aspects. The number of granules on the dorsal margin of the dactylus of the chela in both the adult males is very consistent, being 11 for both chelae of both specimens.

Remarks.— *Geosesarma katibas* spec. nov. appears to be closest to *G. gracillimum* (De Man, 1902) from the Baram and Mulu areas. De Man (1902: 522, pl. 19 fig. 19) provided an excellent description of *G. gracillimum* and Holthuis (1979: 44) supplemented his descriptions and illustrations with figures of its male abdomen and G1. I have examined the specimen of *G. gracillimum* reported by Holthuis (1979) from Mulu, and its chela and G1 is figured here in detail (present fig. 13) to enable a proper comparison with *G. katibas*. Compared to *G. gracillimum*, *G. katibas* differs in having the regions on the carapace much more clearly defined, with the grooves very deep and distinct, the outer margin of the external orbital angle is distinctly convex and is directed somewhat forwards (against the outer margin being straight to gently concave and directed obliquely outwards), the merus of the third maxilliped is more rounded (against oval), the granules lining the upper margin of the dactylus of the chela are asymmetrical and are directed anteriorly (against symmetrical and directed upwards), the male telson is proportionately more elongate, with the lateral margins less concave, and the G1 is proportionately shorter and distinctly more stocky, with the distal part more strongly bent.

Etymology.— The species is named after the type locality, Katibas River. The name is used as a noun in apposition.

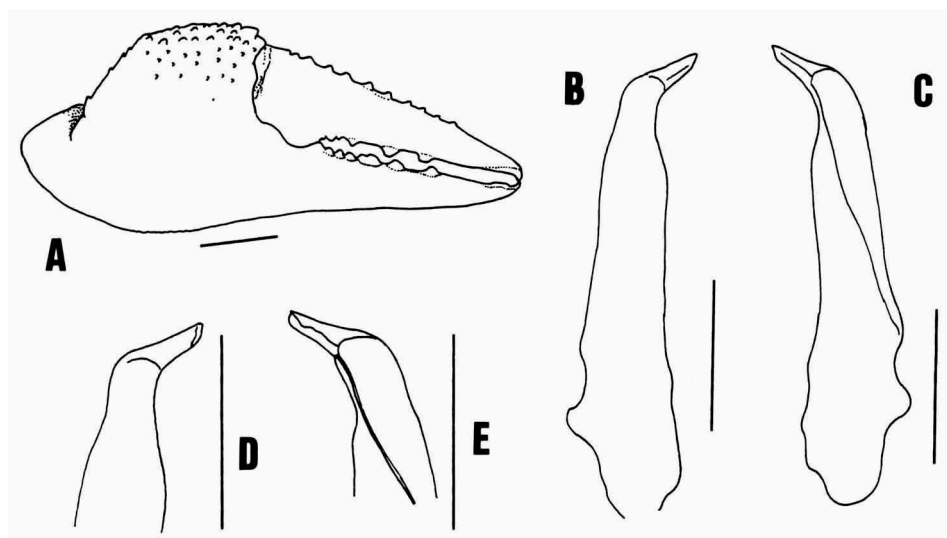


Fig. 13. *Geosesarma gracillimum* (De Man, 1902). ♂ (9.3 by 8.7 mm) (RMNH D 31961), soil core, from frequently flooded alluvial forest, Gunung Mulu National Park, Baram District, 4th Division, ca. 4°03'N 114°56'E, coll. N.M. Collins, 1978. A, right chela; B, left G1 (ventral view); C, left G1 (dorsal view); D, distal part of left G1 (ventral view); E, distal part of left G1 (dorsal view). Scales = 1.0 mm.

Acknowledgements

I am most grateful to Rob Stuebing (International Timber Trading Organisation, Kuching, Sarawak) for passing me this interesting material for study. Thanks are also due to S. H. Tan who first brought to my attention the key specimen of *Ibanorum aethes* during his sorting of food items consumed by *Rana ibanorum*, and to C. H. Diong for allowing me to retain the specimen for the ZRC. I am also grateful to Lipke Holthuis and Charles Fransen for sending me the specimens of *Ibanorum bicristatum* and *Geosesarma gracillimum* for study. Tommy Tan took the monochrome photographs. The study has been partially supported by research grant RP900360 from the National University of Singapore.

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