Sabah Museum Journal, Vol. 1 No. 2 (1994)

ON A COLLECTION OF FRESHWATER DECAPOD CRUSTACEANS FROM THE KINABATANGAN RIVER, SABAH, MALAYSIA, WITH DESCRIPTIONS OF THREE NEW SPECIES

Peter K. L. Ng

Department of Zoology
National University of Singapore
Singapore 0511

ABSTRACT

14 species of freshwater decapod crustaceans, including three new species, belonging to four families are reported from the lower part of the Kinabatangan River, the largest river in the state of Sabah, Malaysia. They include seven species of palaemonid prawns of the genus *Macrobrachium* (*M. equidens* (Dana, 1841), *M.* cf. *gua* Chong, 1989, *M.* cf. *lanchesteri* (De Man, 1911), *M. mirabile* Kemp, 1917, *M.* rosenbergii (De Man, 1879), *M. sabanus* sp. nov., *M.* cf. *sintangense* (De Man, 1898)), four species of atyid prawns of the genus *Caridina* (C. aff. *brachydactyla* Bouvier, 1925, *C.* aff. *brevicarpalis endehensis* De Man, 1892, *C.* aff. *serratirostris* De Man, 1892, and *C.* aff. *typus* H. Milne Edwards, 1837), two species of parathelphusid crabs of the genus *Parathelphusa* (*P. ovum* sp. nov. and *P. valida* Ng & Goh, 1987), and one hymenosomatid crab (*Hymenicoides microrhynchus* sp. nov.).

INTRODUCTION

In April 1994, the Sabah Museum, in conjunction with staff from the Fisheries Department (Sabah) and the Department of Zoology, National University of Singapore, conducted a two week zoological survey of the lower stretch of the Kinabatangan River (Figure 1), the longest river in Sabah. Although the main task was to ascertain the ichthyofauna present, a good collection of prawns and crabs were also collected. These were subsequently referred to me for study.

Although the Kinabatangan collection is relatively small and contains only a few species, it is nevertheless quite interesting systematically. 14 species (seven palaemonid prawns, four atyid prawns, two parathelphusid crabs and one hymenosomatid crab) are recorded of which one prawn and two crabs are new. One of the new crabs (Hymenosomatidae), is also the first record of the family from Sabah, and the first freshwater species known from Borneo.

Specimens are deposited in the Sabah Museum (SSM), Kota Kinabalu, Sabah; Jabatan Perikanan Sabah (Sabah Fisheries Department) (JPS), Kota Kinabalu, Sabah; and the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore. Abbreviations used are G1 for the male first pleopod, G2 for the male second pleopod, cl for carapace length (measured from behind orbit to posterior margin of the carapace), and tl for the total length. The rostral formula follows that used by Holthuis (1950) and Chace & Bruce (1993). The measurements of the crabs are of the carapace width and length respectively. Unless otherwise specified, the specimens were collected by Kelvin K. P. Lim, H. H. Tan, S. H. Tan, H. K. Lua and C. Y. Chang.

TAXONOMY

Family Palaemonidae

Macrobrachium equidens (Dana, 1841)

Material: 3 specimens (1 ovigerous) (ZRC 1994.4203), 2 specimens (SSM), 1 specimen (JPS), Danau Biandum, coll. 8 April 1994. --- 8 specimens (3 with bopyrid, 3 ovigerous) (ZRC 1994.4210), 9 specimens (SSM), 9 specimens (JPS), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994. --- 2 specimens (1 ovigerous) (ZRC 1994.4219), 1 specimen (SSM), Danau Biandum, coll. 8 April 1994. --- 7 specimens (4 ovigerous, 1 with bopyrid) (ZRC 1994.4202), 5 specimens (3 ovigerous) (SSM), 6 specimens (JPS), Kinabatangan River, floating platform at Kampung Batu Puteh, campsite, coll. 7-13 April 1994.

Remarks: This is a very wide ranging species which is typically associated with high salinity brackish waters (Johnson, 1973), and is rarely found far inland or in complete fresh water (Ng, 1990). The present specimens are all from some distance inland, but the area is apparently still under tidal influence. Most of the specimens are large and many females are ovigerous. The rostrum of most of the specimens is rather unusual in that the distal part of the dorsal margin of the rostrum is unarmed (except for the subdistal spine); (more extreme than that figured by Chace & Bruce, 1993: 26). In most of the specimens I have seen from Singapore, Malaysia and Borneo, the entire dorsal margin of the rostrum is evenly armed with teeth. This character however, is known to be variable and not completely reliable. In young specimens, the rostrum is also much more elongate and slender in comparison to the carapace than in adults.

Many specimens were infected with bopyrid isopods. *Macrobrachium equidens* was the only palaemonid prawn in the area so infected.

Macrobrachium cf. gua *Chong*, 1989

Material: 1 specimen (large chela only) (SBM), Danau Biandum, coll. 8 April 1994.

Remarks: Only the second pereiopod (major chela) is available. The cheliped is clearly of the *M. pilimanus* type, but it is not possible to assign the chela to a species in the absence of the

body. Chong (1989) described a new species in the group, *M. gua* from the Gomantong area of Sabah, and it seems likely that the present chela belongs to this species.

***Macrobrachium* cf. *lanchesteri* (De Man, 1911)**
(Fig. 2)

Material: 3 specimens (2 ovigerous females) (ZRC 1994.4205), near Batu Tulug, behind Danau Biandum, coll. 12 April 1994. --- 2 specimens (1 ovigerous) (ZRC 1994.4207), 1 specimen (SBM), 2 specimens (JPS), Safoda Oil Palm Plantation, coll. 7-13 April 1994. --- 3 specimens (largest cl 11.8 mm) (ZRC 1994.4208), 2 specimens (SBM), 1 specimen (JPS), Kolam across road, Kampung Batu Puteh, lake by main road, coll. 12 April 1994. --- 1 specimen (JPS), Safoda Oil Palm Plantation, after 10 km mark, near Kampung Batu Puteh, coll. 13-14 April 1994.

Remarks: The presence of this species in eastern Borneo is rather surprising as it is previously known from mainland Southeast Asia, Peninsular Malaysia and Singapore. The specimens agree quite well with the definition of this species (Holthuis, 1950; Chong & Khoo, 1988), especially in the shape and armature of the rostrum, but the absence of adult males makes a precise determination rather difficult. The chelae of adult *M. lanchesteri* (see Chong & Khoo, 1988) is very diagnostic. If the present specimens prove to be really *M. lanchesteri*, it is possible that they were introduced from the mainland.

The rostral formula of the Sabah specimens varies from 1-2+5-6/3-4 (total 6-8/3-4), well within the range reported by (Chong & Khoo, 1988). The eggs are large, measuring 0.9 by 0.7 mm (eyed).

***Macrobrachium mirabile* Kemp, 1917**
(Fig. 3)

Material: 1 male (cl 14.8 mm) (SSM), Danau Biandum, coll. 8 April 1994.

Remarks: The remarkably long fifth pereiopods of this species and characteristic rostrum shape immediately distinguishes it from all other congeners. It has been recorded from East Kalimantan by Holthuis (1950). It is otherwise known from the Ganges, Burma and Thailand.

***Macrobrachium rosenbergii* (De Man, 1879)**

Material: 1 male (cl 50.8 mm), 1 young male (ZRC 1994.4200), 1 ovigerous female (SBM) (cl 42.7 mm), Safoda Oil Palm Plantation, after 10 km mark, near Kampung Batu Puteh, coll. 13-14 April 1994. --- 1 specimen (SBM), Danau Biandum, coll. 8 April 1994. --- 1 female (ZRC 1994.4209), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994. --- 1 young specimen (SSM), Danau Biandum, coll. 8 April 1994. --- 2 specimens (ZRC 1994.4218), 1 specimen (SSM), 1 specimen (JPS), waterfall stream, off Safoda Oil Palm Plantation, between 5 and 10 km marks, coll. 13 April 1994.

Remarks: This widely distributed species is important for food. The present specimens do not include any adult males.

Macrobrachium sabanus **new species**
(Figs. 4, 5)

Material: *Holotype* - Male (cl 13.4 mm) (SSM), waterfall stream, off Safoda Oil Palm Plantation, between 5 and 10 km marks, coll. 13 April 1994. *Paratypes* - 2 males (larger cl 15.9 mm), 2 ovigerous females (ZRC 1994.4216), 2 specimens (SSM), same data as holotype. *Non-types* - 1 juvenile (JPS), Kinabatangan River, floating platform at Kampung Batu Puteh, campsite, coll. 7-13 April 1994. --- 2 specimens (largest cl 5.3 mm) (ZRC 1994.4215), 2 specimens (SSM), 2 specimens (JPS), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994.

Diagnosis (male holotype): Rostral formula 4+6/2, carapace surfaces smooth, glabrous. Second pereiopods unequal but larger chela not strongly inflated; carpus distinctly shorter than merus and chela; surfaces of segments covered with very small granules; chela covered with dense pubescence, especially on the distal part of the palm and proximal part of the fingers, including the cutting edges which is completely obscurred by the setae; proximal one-quarter of cutting edges with denticles, no large teeth, rest of cutting edges blade-like. Eggs ca. 1.4 by 1.0 mm in size.

Etymology: The species is named after the state of Sabah. The name is used as a noun in apposition.

Remarks: *Macrobrachium sabanus* seems to be closest to the widely distributed *M. latimanus* (Von Martens, 1868), especially with regards to the proportions of the carpus of the second pereiopod and shape of the major chela, but differs in several key aspects, viz. the rostral formula is different, with more postorbital rostral teeth (3-4, vs. 1-2 in *M. latimanus*), less setose propodus of the third pereiopod, and very pubescent palm and fingers of the major second pereiopod.

The number of teeth on the dorsal margin of the rostrum of *M. sabanus* varies somewhat, from 3+6 to 4+7, but the number of ventral teeth is constant at 2. The strength of the denticles on the cutting edges of the major chela is somewhat variable in size, and in the larger male paratype and females, they are larger and almost tooth-like.

The six specimens from Kinabatangan River and the small specimen from the campsite area are all juveniles but probably belong to *M. sabanus*. The dorsal margin of their rostrum however, has more teeth (13-15) compared to the type series (9-11). It is possible that smaller specimens of this species have more rostral teeth.

The eggs are relatively large, about 1.4 by 1.0 mm in size, but are slightly smaller than those of species with completely abbreviated developments. The larval development of *M. sabanus* is probably either of the completely abbreviated or semi-abbreviated type.

***Macrobrachium* cf. *sintangense* (De Man, 1898)**
(Fig. 6)

Material: 2 specimens (1 ovigerous, cl 8.7 mm) (ZRC 1994.4217), 1 specimen (SBM), 1 ovigerous female (JPS), waterfall stream, off Safoda Oil Palm Plantation, between 5 and 10 km marks, coll. 13 April 1994.

Remarks: The present specimens are all rather small, and there are no adult males so the identity is rather tentative (see Holthuis, 1950; Chong et al., 1987). The shape of the carapace and rostrum seems to ally them with *M. sintangense* (type locality Kapuas), a widely distributed Southeast Asian species. The rostral formula of the specimens is rather constant. In the largest specimen (an ovigerous female), it is 3+9/3, with the range for all the specimens 2-3+7-11/3. Only when an adult male is caught can the identity of the specimens be confirmed. Two of the females are ovigerous, with a egg size of about 1.4 by 1.0 mm, suggesting that the development is semi-abbreviated.

Family Atyidae

The taxonomy of the genus *Caridina* is very difficult, and with the large number of described species, elucidating the identities of the present Sabah specimens is not possible until many poorly described species are re-examined. As such, the identities of most of the species must be regarded as tentative.

***Caridina* aff. *brachydactyla* Bouvier, 1925**
(Fig. 7)

Material: 6 specimens (largest, ovigerous female, cl 6.8 mm) (ZRC 1994.4212), 4 specimens (SSM), 5 specimens (JPS), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994.

Remarks: *Caridina brachydactyla* is a very widely distributed species, and the present specimens appear closest to this taxon.

***Caridina* aff. *brevicarpalis endehensis* De Man, 1892**
(Fig. 8)

Material: 5 specimens (2 ovigerous, larger cl 7.5 mm) (ZRC 1994.4211), 3 specimens (SBM), 2 specimens (JPS), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994.

Remarks: The specimens on hand agree best with the description and figures of this subspecies provided by De Man (1892) (see also Holthuis, 1978), but probably belong to a separate taxon as the armature of the ventral margin of the rostrum is quite different (fewer teeth set further

apart).

***Caridina* aff. *serratirostris* De Man, 1892**
(Fig. 9)

Material: 3 specimens (largest, ovigerous female, cl 4.5 mm) (ZRC 1994.4213), 2 specimens (SSM), 1 specimen (JPS), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994.

Remarks: The specimens resemble this species, but the armature of the ventral margin of the rostrum is unusual in that the teeth are set further apart.

***Caridina* aff. *typus* H. Milne Edwards, 1837**
(Fig. 10)

Material: 2 specimens (ZRC 1994.4214), 2 specimens (SSM), 1 specimen (JPS), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994.

Remarks: *Caridina typus* is widely distributed species in the Indo-West Pacific, with a rather variable rostrum, both in shape and ventral dentition (see De Man, 1892). The present specimens however, have a much sharper rostrum than in any of the specimens I have seen, and the ventral margin has not only more, but much sharper teeth. The specimens were collected some distance from the sea, but the area is clearly under some tidal influence.

Family Parathelphusidae

***Parathelphusa ovum* new species**
(Fig. 11)

Material: *Holotype* - Male (24.2 by 19.5 mm) (SSM), near Batu Tulug, behind Danau Biandum, coll. 12 April 1994. *Paratypes* - 1 male, female (30.3 by 23.5 mm) (ZRC 1994.4204), 1 female (SSM), same data as holotype. --- 2 males, 2 females (ZRC 1994.4206), 1 male, 2 females (SSM), 2 males, 2 females (JPS), Safoda Oil Palm Plantation, coll. 7-13 April 1994.

Diagnosis (male holotype): Carapace rounded, swollen, branchial and gastric regions distinctly convex; anterolateral margin strongly arcuate, epibranchial teeth small but sharp, last tooth distinctly turned forwards; epigastric and postorbital cristae fused, outer edges reaching to before base of first epibranchial tooth. G1 stout, distal part gently bent outwards, tip truncate.

Etymology: The name is derived from the Latin "ovum" for egg, alluding to the general shape and appearance of the species. The name is used as a noun in apposition.

Remarks: In the general physiognomy (swollen carapace and low epibranchial teeth), *P. ovum* is closest to *P. convexa* De Man, 1879, a Javan species common in ricefields. *Parathelphusa ovum* however, differs significantly in being much smaller, maturing at only half the size of adult *P. convexa*. The G1 of *P. ovum* also differs significantly in being bent medially outwards, and the tip is truncate (not rounded) (see Bott, 1970).

From *P. valida*, which occurs in the same area, *P. ovum* is easily separated in having a more inflated carapace, smaller epibranchial teeth and the last tooth is curved forwards (not obliquely outwards). The G1 of *P. valida* is also distinctly straighter.

***Parathelphusa valida* Ng & Goh, 1987**
(Fig. 12)

Material: 1 male (41.8 by 33.5 mm) (ZRC 1994.4201), 1 male (SSM), Danau Biandum, coll. 8 April 1994.

Remarks: The two specimens obtained agree very well with *P. valida*. The cleft on the outer proximal part is somewhat more pronounced, but this is not significant as the G1 of the type also has a slight cleft.

Family Hymenosomatidae

***Hymenicoides microrhynchus* new species**
(Figs. 13, 14)

Material: *Holotype* - Male (5.3 by 4.6 mm) (SSM), Kinabatangan River, at jetty to Danau Girang, coll. 10-11 April 1994.

Diagnosis (male holotype): Carapace rounded, rostrum very small; grooves on body deep, distinct; lateral margins unarmed. Merus of third maxilliped elongate, distinctly longer than ischium. Ventral margin of dactylus of ambulatory legs armed with 8-9 spines (increasing in size distally). Abdomen 7-segmented, all segments movable; telson trilobate. G1 distinctly bent outwards, distal part with distinct fork-shaped structure.

Etymology: The name is derived from the Latin, alluding to the very small rostrum present in this species.

Remarks: *Hymenicoides microrhynchus* new species is very close to *H. naiyanetri* (Chuang & Ng, 1991) from Thailand, but differs in several aspects. *Hymenicoides microrhynchus* possesses a very short but visible rostrum (absent in *H. naiyanetri*), a proportionately longer merus of the third maxilliped, the pattern of grooves on the cardio-intestinal region is different (see Chuang & Ng, 1991), and the G1 is more slender (unpublished data).

Chuang & Ng (1991) established a new genus, *Limnopilos*, for a new freshwater species, *L. naiyanetri*, from Thailand, and distinguished it from *Hymenicoides* Kemp, 1917 (type species

by monotype, *H. carteri* Kemp, 1917), in not having a trilobate male telson and simpler G1 structure. Although the male telson of *L. naiyanetri* is only vaguely trilobate and not as distinct as that on *H. carteri* and the G1 is less intricate (see Kemp, 1917; Lucas, 1980), this is insufficient grounds for separating *Hymenicoides* and *Limnopilos*, and both should be synonymised.

The genus *Hymenicoides* now contains three freshwater species - *H. carteri* from Burma, *H. naiyanetri* from Thailand, and *H. microrhynchus* from Borneo.

ACKNOWLEDGEMENTS

I am grateful to Kelvin Lim, H. K. Lua (ZRC), Tan Heok Hui, Tan Swee Hee and Chang Chia Yi for making the present collections. Rob Stuebing initiated the plans for the Kinabatangan foray, while Anna Wong (SSM) implemented the expedition. Kelvin Lim prepared the map. The study is partially supported by a research grant, RP 900360, from the National University of Singapore and by a grant to the Sabah Museum (WER 93-23152A) from the John D. and Catherine T. MacArthur Foundation.

REFERENCES

Bott, R. 1970. Die Susswasserkrabben von Europa, Asien, Australien und ihre Stammesgeschichte. Eine Revision der Potamoidea und Parathelphusoidea (Crustacea, Decapoda). Abh. Sencken. Naturf. Ges., Frankfurt, 526: 1-338, Pls. 1-58.

Bouvier, E. - L. 1925. Recherches sur la morphologie, les variations et la distribution systematique des crevettes d'eau douce de la famille des Atyides. Encyclopedie Entomologique, 4: 1-370.

Chace, F. A. Jr. & A. J. Bruce. 1993. The caridean shrimps (Crustacea: Decapoda) of the Albatross Philippine Expedition 1907-1910, Part 6: Superfamily Palaemonoidea. Smithsonian Contr. Zool., 543: i-vii, 1-152

Chong, S. S. C. 1989. A new species of freshwater prawn, *Macrobrachium gua* sp. nov. (Decapoda, Caridea, Palaemonidae) from Sabah, East Malaysia, Borneo. Crustaceana, Leiden, 56(1):31-38.

Chong, S. S. C., H. W. Khoo & P. K. L. Ng, 1987. Presence of the Japanese freshwater prawn *Macrobrachium nipponense* (De Haan, 1849) (Decapoda, Caridea, Palaemonidae) in Singapore. Zool. Med., Leiden, 61(22): 313-317.

Chong, S. S. C. & H. W. Khoo. 1988. The identity of *Macrobrachium lanchesteri* (De Man, 1911) (Decapoda, Palaemonidae) from Peninsular Malaysia and Singapore, and a description of its first zoea. Crustaceana, Leiden, 54(2): 196-206.

Chuang, C. T. N. & P. K. L. Ng. 1991. Preliminary descriptions of one new genus and three new species of hymenosomatid crabs from Southeast Asia (Crustacea: Decapoda: Brachyura). Raffles Bull. Zool., Singapore, 39(2): 363-368.

Holthuis, L. B. 1950. Subfamily Palaemonidae. The Palemonidae collected by the Siboga and Snellius Expeditions with remarks on other species. I. The Decapoda of the Siboga Expedition. Part X. Siboga Exped. Monogr., 39(a9): 1-268.

Holthuis, L. B. 1978. A collection of Decapod Crustacea from Sumba, Lesser Sunda Islands, Indonesia. Zool. Verh., Leiden, 162: 1-55.

Johnson, D. S. 1973. Notes on some species of the genus *Macrobrachium* (Crustacea: Decapoda: Caridea: Palaemonidae). J. Singapore Natn. Acad. Sci., 3(3): 273-291.

Kemp, S. 1917. Notes on Crustacea Decapoda in the Indian Museum. X. Hymenosomatidae. Rec. Indian Mus., 13: 243-279.

Lucas, J. S. 1980. Spider crabs of the family Hymenosomatidae (Crustacea; Brachyura) with particular reference to Australian species: systematics and biology. Rec. Austr. Mus., 33(4): 148-247.

Man, J. G., De. 1892. Decapoden des Indischen Archipels. Zool. Ergebnisse einer Reise in Niederlandisch Ost-Indien, 2: 265- 527.

Ng, P. K. L. 1990. The Freshwater Crabs and Prawns of Singapore. In: *Essays in Zoology*. Eds. L. M. Chou and P. K. L. Ng. Department of Zoology, National University of Singapore. Pp. 189-204.

Ng, P. K. L. & R. Goh. 1987. Cavernicolous freshwater crabs (Crustacea Decapoda, Brachyura) from Sabah, Borneo. Stygologia, Leiden, 3(4): 313-330, Pls. 1-3.

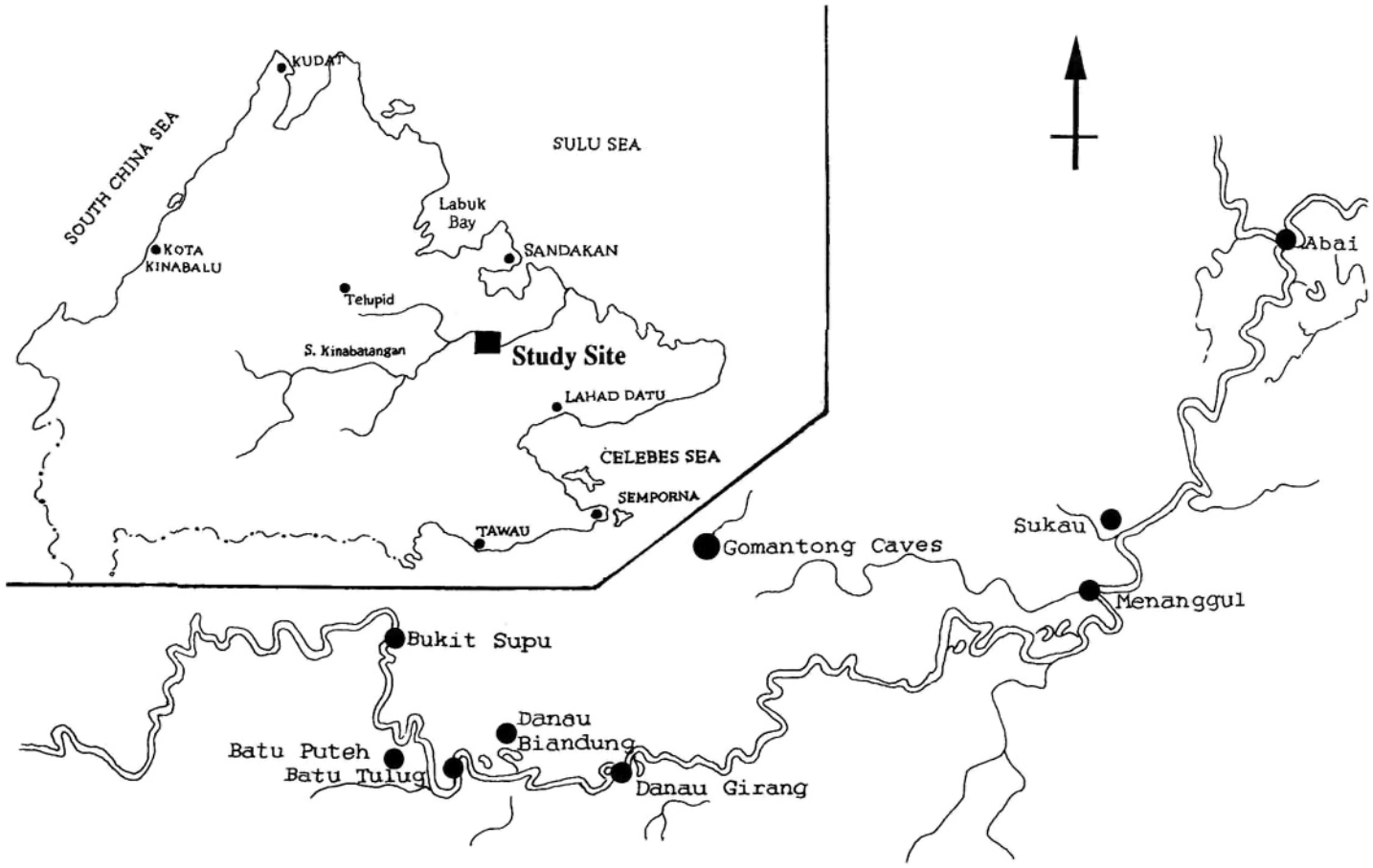

Figure 1: Map of Sabah showing study area.

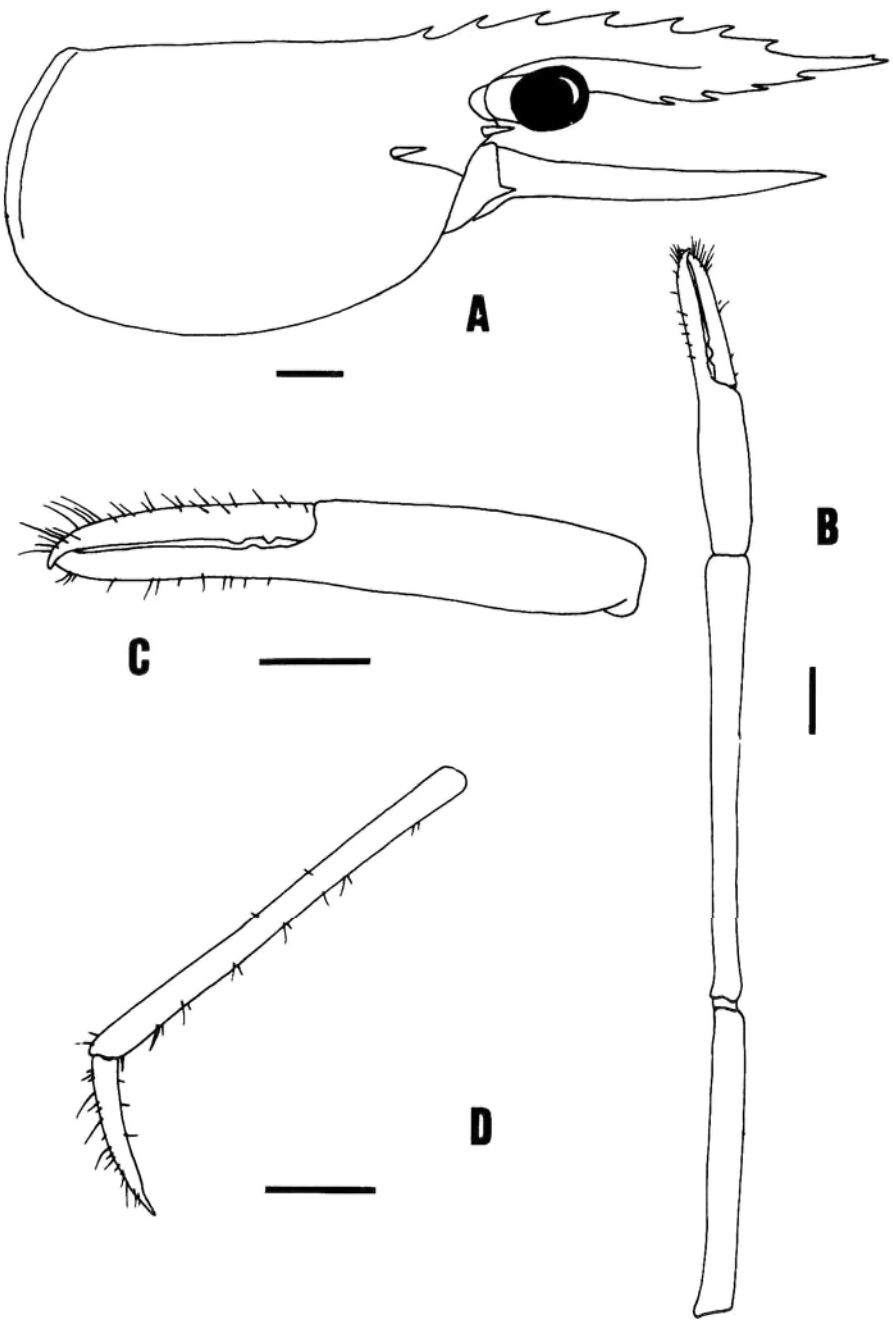

Figure 2: *Macrobrachium lanchesteri*. Ovigerous female (cl 11.8 mm) (ZRC 1994.4208). A, carapace; B, left cheliped; C, left chela; D, left third pereiopod. Scales = 1.0 mm.

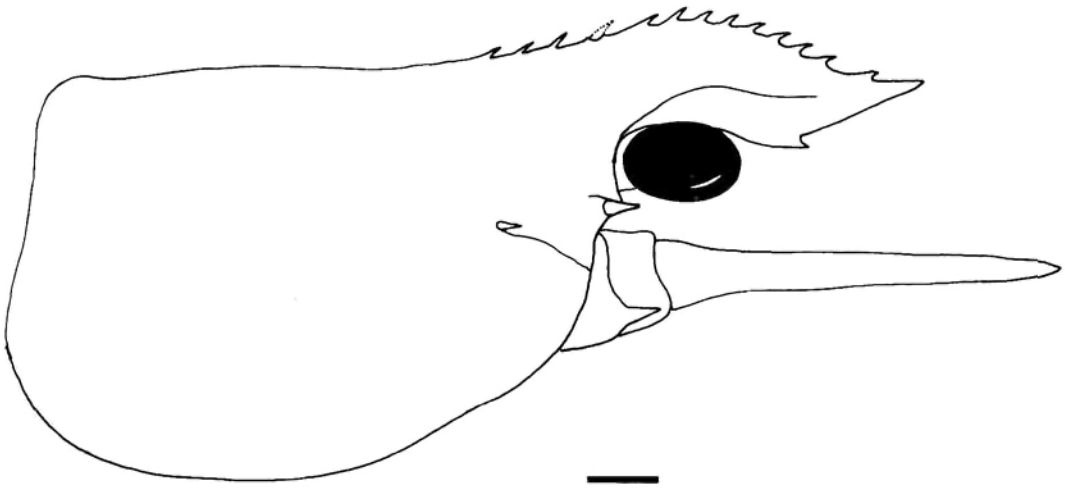

Figure 3: *Macrobrachium mirabile*. Male (cl 14.8 mm) (SBM), carapace. Scale = 1.0 mm.

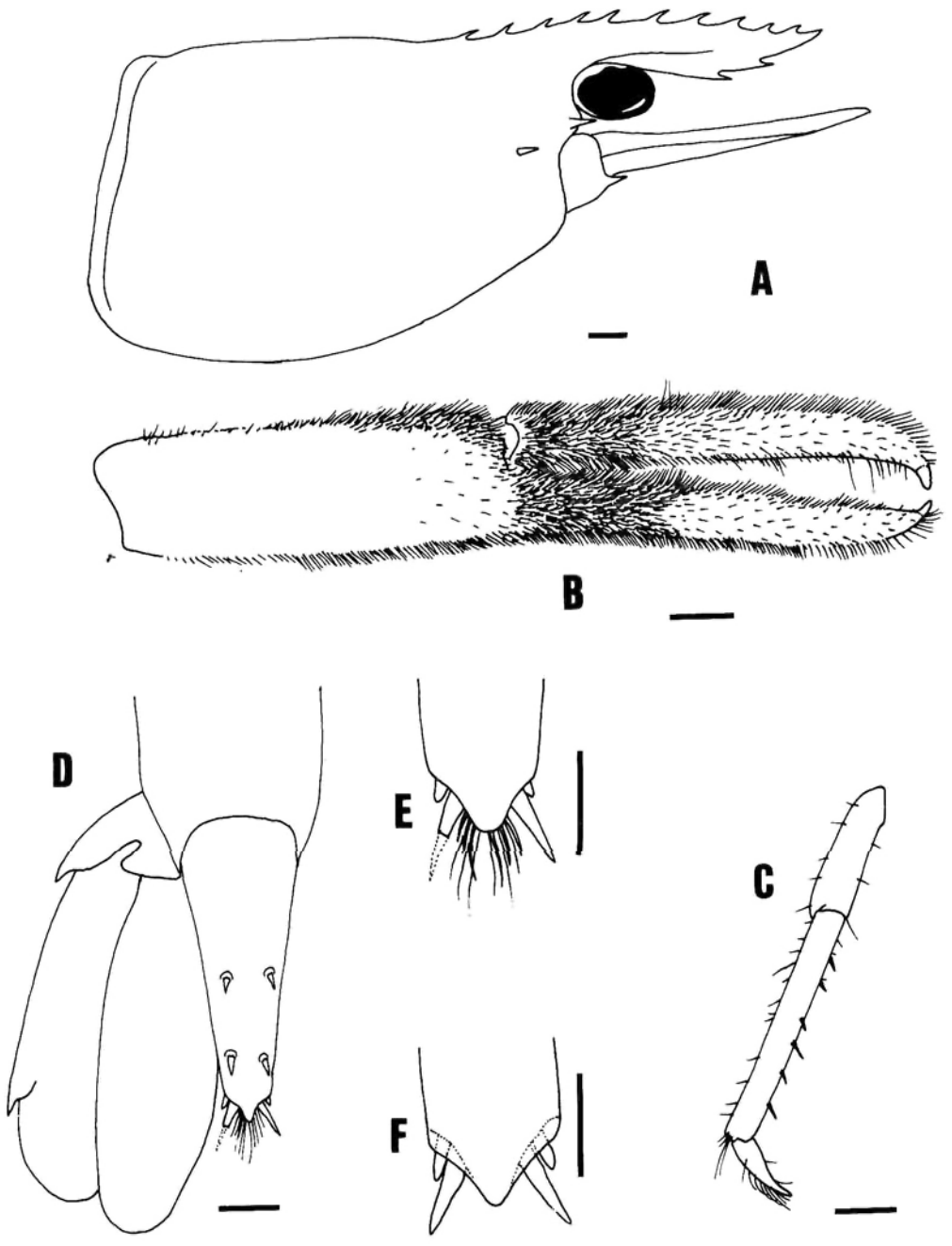

Figure 4: *Macrobrachium sabanus* sp. nov. A-E, holotype male (cl 13.4 mm) (SBM); F paratype male (cl 15.9 mm) (ZRC 1994.4216). A, carapace; B, left chela; C, left third pereiopod; D, telson and uropods; E, tip of telson; F, tip of telson (hairs denuded). Scales = 1.0 mm.

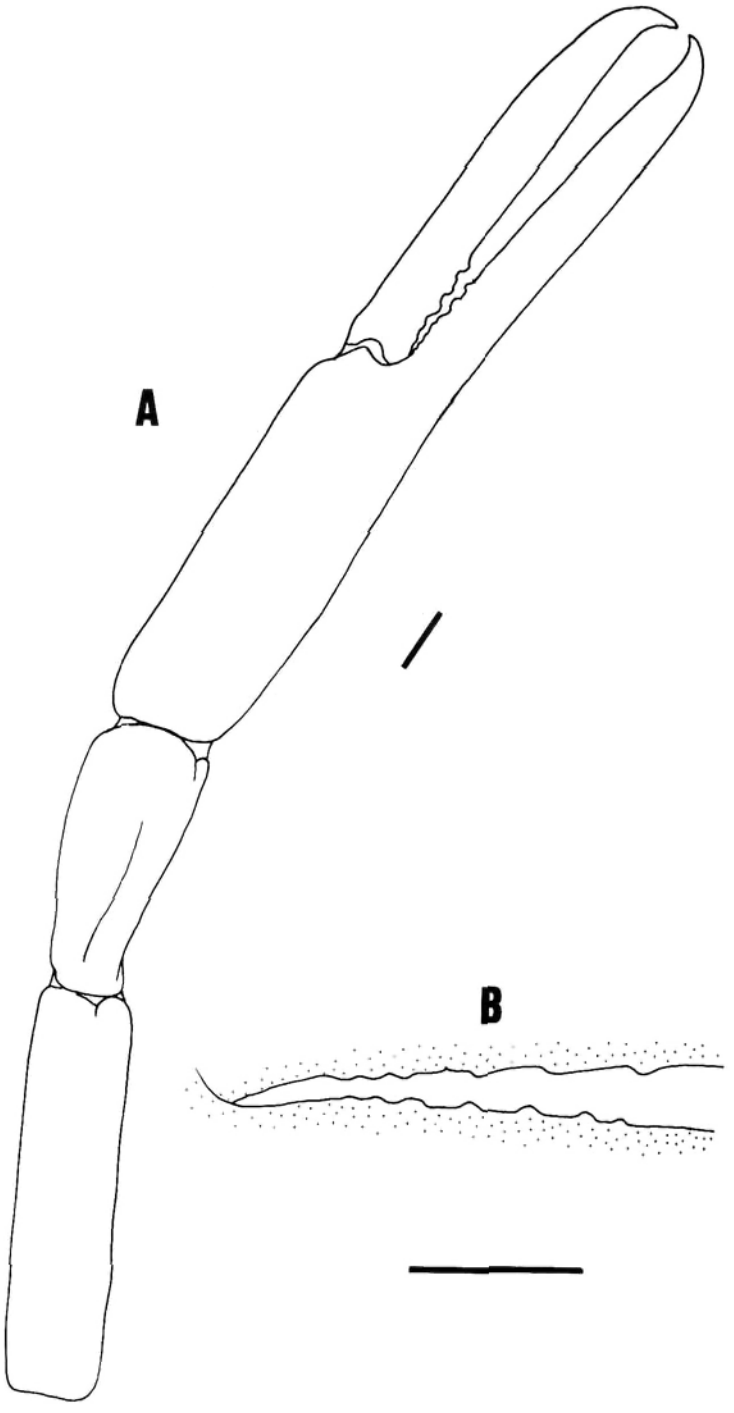

Figure 5: *Macrobrachium sabanus* sp. nov. Holotype male (cl 13.4 mm) (SBM). A, left cheliped (hairs denuded); B, proximal part of left chela showing denticles on cutting edges. Scales = 1.0 mm.

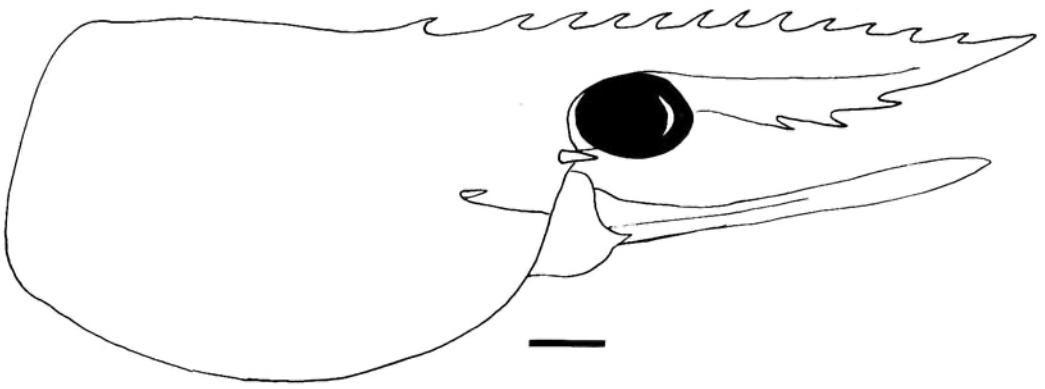

Figure 6: *Macrobrachium* aff. *sintangense*. Ovigerous female (cl 8.7 mm) (ZRC 1994.4217), carapace. Scale = 1.0 mm.

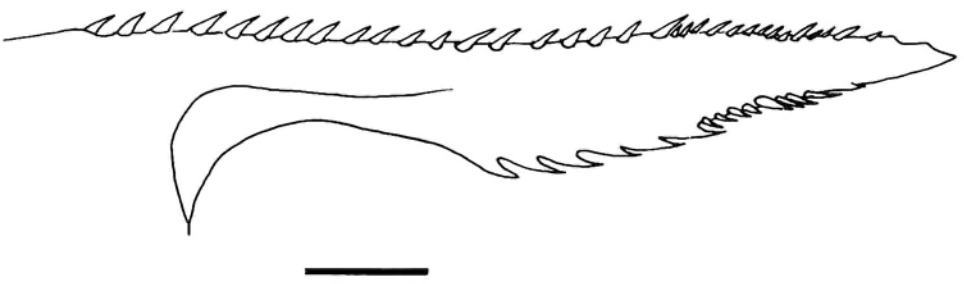

Figure 7: *Caridina* aff. *brachydactylus*. Ovigerous female (cl 6.8 mm) (ZRC 1994.4212), carapace. Scale = 1.0 mm.

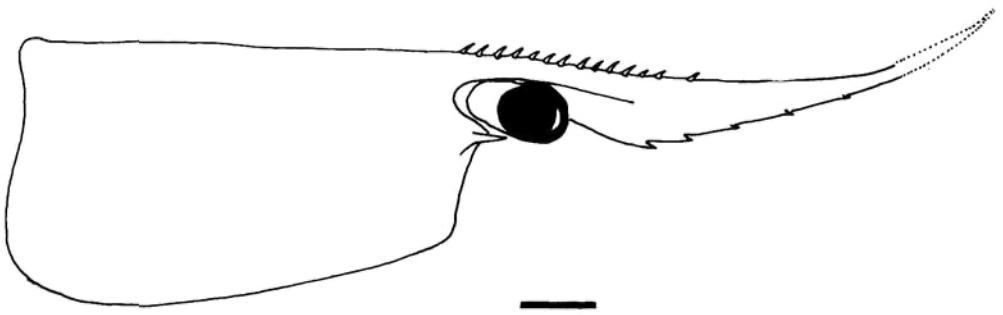

Figure 8: *Caridina* aff. *brevicarpalis endehensis*. Ovigerous female (cl 7.5 mm) (ZRC 1994.4211), carapace. Scale = 1.0 mm.

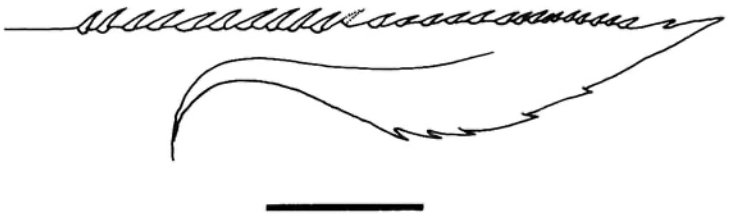

Figure 9: *Caridina* aff. *serratirostris*. Ovigerous female (cl 4.5 mm) (ZRC 1994.4213), carapace. Scale = 1.0 mm.

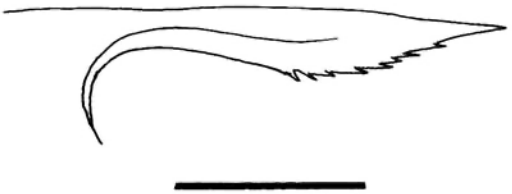

Figure 10: *Caridina* aff. *typus*. Female (cl 4.5 mm) (ZRC 1994.4214), carapace. Scale = 1.0 mm.

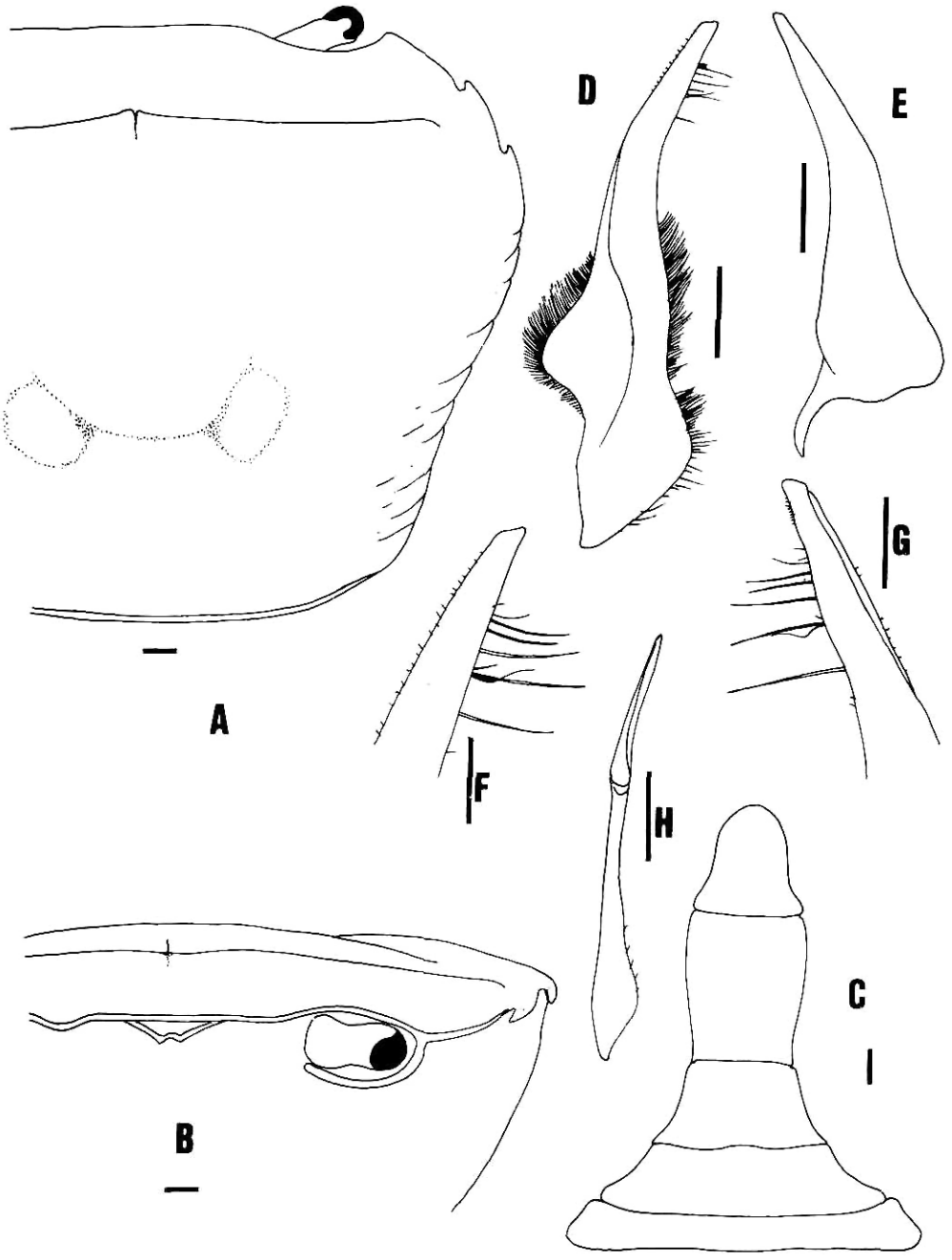

Figure 11: *Parathelphusa ovum.* Holotype male (24.2 by 19.5 mm) (SBM). A, carapace; B, frontal view of carapace; C, abdominal segments 3-7; D, left G1 (ventral view); E, left G1 (dorsal view, hairs denuded); F, distal part of left G1 (ventral view); G, distal part of left G1 (dorsal view); H, left G2. Scales: A-H = 1.0 mm; F, G = 0.5 mm.

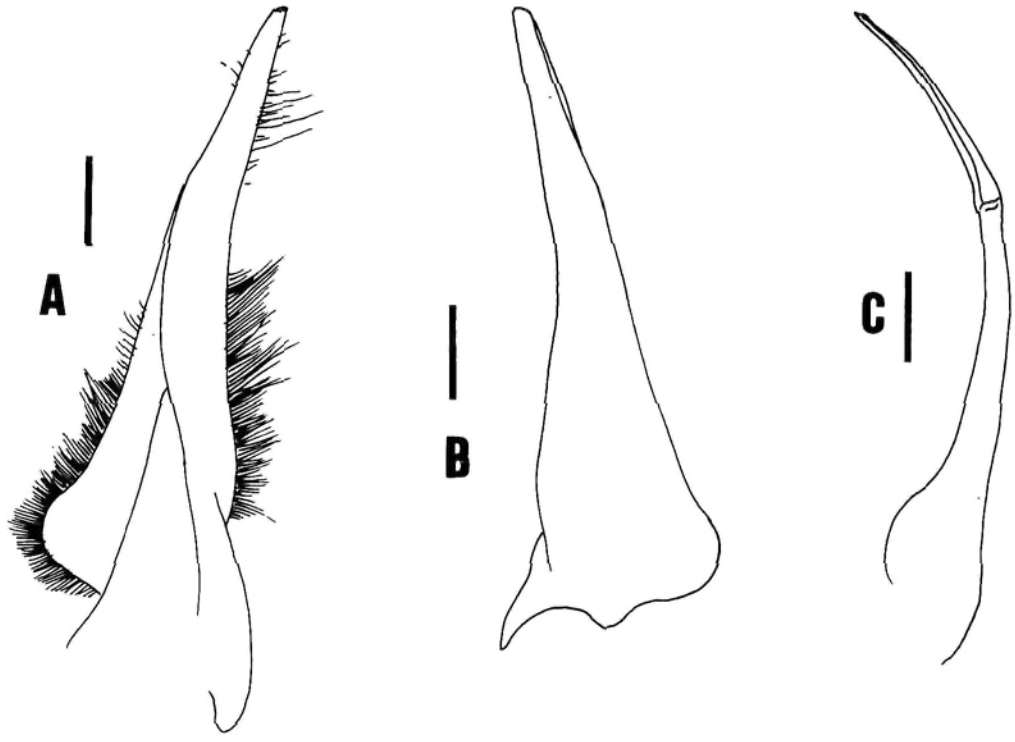

Figure 12: *Parathelphusa valida*. Male (41.8 by 33.5 mm) (ZRC 1994.4201). A, left G1 (ventral view); B, left G1 (dorsal view, hairs denuded); C, left G2. Scales = 1.0 mm.

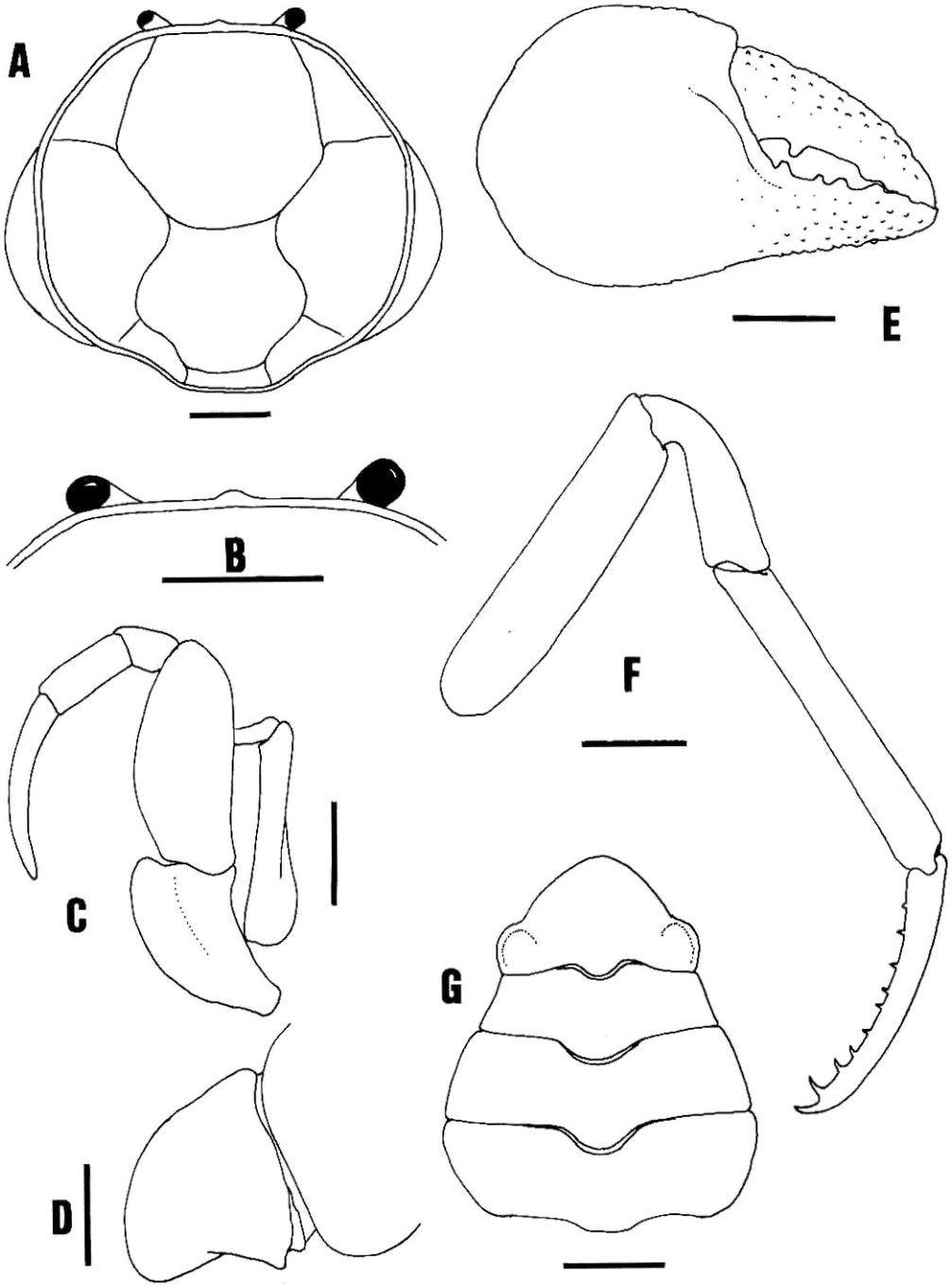

Figure 13: *Hymenicoides microrhynchus* sp. nov. Holotype male (5.3 by 4.6 mm) (SBM). A, carapace; B, frontal margin; C, left third maxilliped; D, right carpus of cheliped (dorsal view); E, right chela; F, second right ambulatory leg; G, abdominal segments 3-6. Hairs denuded on all structures. Scales: A, B, D-F = 1.0 mm; C, G = 0.5 mm.

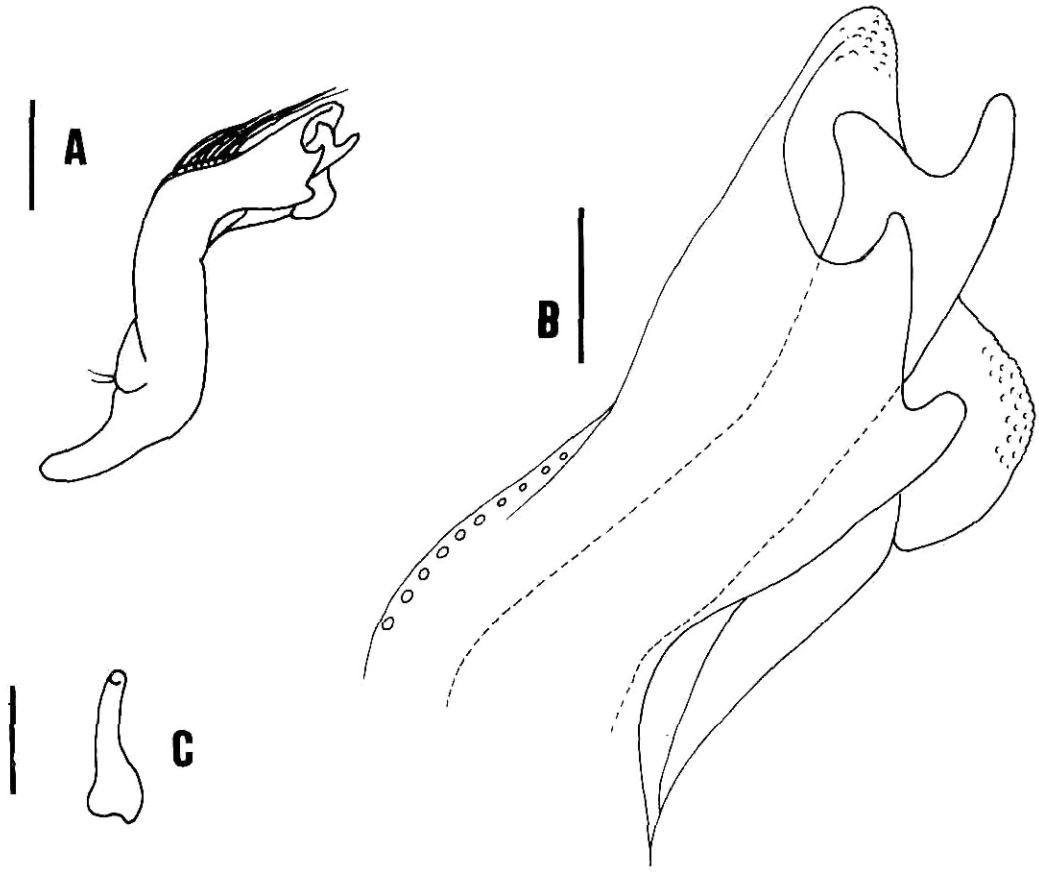

Figure 14: *Hymenicoides microrhynchus* sp. nov. Holotype male (5.3 by 4.6 mm) (SBM). A, left G1 (ventral view) (hairs not drawn); B, tip of left G1; C, right G2. Scales = 0.5 mm.