

THE GENUS *GLYPTOCARCINUS* TAKEDA, 1973,
WITH DESCRIPTIONS OF A NEW SUBFAMILY,
TWO NEW GENERA AND TWO NEW SPECIES
FROM NEW CALEDONIA
(CRUSTACEA: DECAPODA: BRACHYURA: XANTHIDAE)

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ABSTRACT. - The poorly known western Pacific genus *Glyptocarcinus* Takeda, 1973, is revised. One genus and two new species, *Antrocarcinus petrosus*, new genus and species, and *Glyptocarcinus politus*, new species, are described from New Caledonia. The identities of *G. lophopus* Takeda, 1973, and *G. truncatus* (Rathbun, 1906) are clarified, and the latter is referred to a new genus, *Cyrtocarcinus*. *Glyptocarcinus*, *Antrocarcinus* and *Cyrtocarcinus*, previously placed in the Eumedonidae Dana, 1853, is shown to belong to the family Xanthidae MacLeay, 1838, *sensu* Serène, 1984, instead. A new subfamily, Antrocarcininae, is established for these three genera. Antrocarcinines are characterised mainly by their elongate second antennal segment, having pigmentation only on the tips and cutting edges of the fingers of the chelipeds, interrupted posterolateral margins, swollen cardiac regions, deep cardio-intestinal grooves, and presence of a postero-sub-branchial channel which joins the cardio-intestinal groove.

INTRODUCTION

The genus *Glyptocarcinus* was established by Takeda (1973) for *G. lophopus* Takeda, 1973, from Japan. Sakai (1974, 1976) however, synonymised *Glyptocarcinus* under *Harrovia* Adams & White, 1849 (type species *Harrovia albolineata* Adams & White, 1849), and *G. lophopus* under *Harrovia truncata* Rathbun, 1906 (type locality Hawaii). Takeda (1976) tentatively followed Sakai's action but later (Takeda, 1979), after examining specimens of *H. truncata* from Hawaii, provided sufficient evidence to resurrect *Glyptocarcinus* as a valid genus. He also showed that *G. lophopus* and *H. truncata* were not conspecific, and both should be classified in *Glyptocarcinus*. Takeda (1979) placed both *Glyptocarcinus* species in the Eumedoninae (family Parthenopidae MacLeay, 1838, *sensu* Serène *et al.*, 1958). Števčić *et al.* (1988) recently recognised the eumedonines as a distinct family, and provisionally retained *Glyptocarcinus* in the Eumedonidae (no specimens examined), in a new subfamily, Ceratocarcininae (Števčić *et al.*, 1988: 1318).

Despite the peculiar features of *Glyptocarcinus*, no one has questioned its taxonomic position in the Parthenopidae. The form of the sternum and structure of the male pleopods have never been described or figured.

In the present paper, the genus *Glyptocarcinus* is revised after examining an important series of specimens from New Caledonia. The identities of *G. truncatus* (Rathbun, 1906) and *G. lophopus* Takeda, 1973, are clarified, two new genera, *Cyrtocarcinus* and *Antrocarcinus*, and two new species, *Glyptocarcinus politus* and *Antrocarcinus petrosus*, are also described from New Caledonia. *Glyptocarcinus* (and *Cyrtocarcinus* and *Antrocarcinus*) is removed from the Eumedonidae and transferred to a new subfamily, Antrocarcininae, in the family Xanthidae MacLeay, 1838, *sensu* Serène, 1984, instead.

The abbreviations cb and cl for the carapace width and length respectively. Specimens examined are deposited in the Muséum national d'Histoire naturelle (MNHN), Paris, France; Bernice P. Bishop Museum (BPBM), Honolulu, Hawaii, U.S.A.; National Science Museum, Tokyo (NSMT), Japan; and the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore.

FAMILY XANTHIDAE MACLEAY, 1838, *sensu* Serène, 1984

NEW SUBFAMILY ANTROCARCININAE

Type genus. - *Antrocarcinus*, new genus, by present designation.

Diagnosis. - Carapace hexagonal; cardiac region swollen, may be expanded to form distinct fold which partly covers deep to very deep cardio-intestinal groove; intestinal region rectangular, raised, plate-like or depressed; anterolateral margin, with 3 lobiform teeth, continuous with supraorbital margin and external orbital angle, distinctly demarcated from cristate posterolateral margin; posterolateral margin interrupted, posterior part of sub-branchial region with distinct channel which connects to end of posterolateral margin, at junction which it curves into metabranchial region. Antennular fossa oblique, antennules folding obliquely. Basal antennal segment large, rectangular, subequal in length to elongate second segment. Epistome divided into two parts; anteromedian part depressed; posterior margin of epistome cristate, median part divided into 2 distinct truncate lobes which may be partially fused. Lateral margin of posterior part of epistome distinctly expanded to form granulose swelling. Endostome with weak oblique ridges. Ischium of third maxilliped with deep, broad median sulcus; antero-external angle of merus auriculiform. In both sexes: suture between sternites 1 and 2 absent but may be demarcated by row of granules; suture between sternites 2 and 3 distinct; suture between sternites 3 and 4 deep to very deep, interrupted medially. Only tips and cutting edges of fingers of chelipeds pigmented. Male abdominal segments 3-5 immovable, but sutures between segments deep, distinct. First male pleopod stout to relatively slender, distal margins lined with short, sharp spines, without long, setose subdistal hairs; second male pleopod short, distal segment 28-38% length of basal segment.

Remarks. - The external features of *Antrocarcinus*, *Glyptocarcinus* and *Cyrtocarcinus* are such that they preclude classification into any of the extant xanthid families. While the general facies of the three genera are xanthoid, they also possess many peculiar features, notably in the carapace, structure of the sternum, male abdomen and form of the fingers of the chelipeds. Takeda (1973), in describing *Glyptocarcinus*, commented on that in the "...

reticulated ornamentation of the carapace, chelipeds and ambulatory legs, the overhanging thin anterolateral border of the carapace, the imperfect orbits and the chelae with dark-coloured, blade-like cutting edges", the genus was characteristic of the Parthenopidae. The carapace and gonopods of parthenopids however, differs markedly from *Glyptocarcinus* (as well as *Antrocarcinus* and *Cyrtocarcinus*) (see later). The carapace and gonopods of *Glyptocarcinus* and its allies are closer to xanthoid crabs, especially of the Xanthidae MacLeay, 1838, *sensu* Serène, 1984, and these genera are here referred there.

The type of *Cyrtocarcinus truncatus* (Rathbun, 1906) (as a *Harrovia*) is a young specimen and bears a superficial resemblance to typical *Harrovia* species, the carapace being squarish in shape and the anterolateral teeth lobiform. It is thus not at all surprising that *C. truncatus* has remained in the genus *Harrovia* (Eumedoninae, Parthenopidae) for so long. Even with the discovery of larger specimens of *C. truncatus* by Edmondson (1951) and of *Glyptocarcinus lophopus* by Sakai (1974, 1976) (incorrectly as *Harrovia truncata*), the taxonomic position of these species has hardly been questioned.

The peculiar form of the interrupted posterolateral margin with the posterior sub-branchial channel, very swollen cardiac region which may overhang the deep cardio-intestinal groove, plate-like intestinal region, the fingers of the chelipeds being pigmented only at the tip and along the cutting edges, a sternite 4 with a transverse median ridge, elongate second antennal segment and the male abdominal segments 3-5 being immovable despite having all the sutures deep and distinct, are very unusual, and warrant the establishment of a separate subfamily for *Antrocarcinus*, *Glyptocarcinus* and *Cyrtocarcinus*.

The sternal structures of *Antrocarcinus*, *Glyptocarcinus* and *Cyrtocarcinus* are also unusual in that the lateral clefts demarcating sternites 3 and 4 are very deep, much more so than in any described xanthid subfamily.

The pigmentation of the fingers of the chelipeds is very distinctive for antrocarinines in that only the tips and cutting edges are coloured dark brown. In xanthids, the fingers are either unpigmented, pigmented on the distal part only, and in some cases, on the entire finger and even onto the distal part of the palm. The pigmentation in antrocarinines strongly resembles that of parthenopids, but whether this character has any phylogenetic importance cannot be ascertained at the moment.

The male pleopods of both species of *Glyptocarcinus* are not known, both being represented only by females. As for the male pleopod structures of *Cyrtocarcinus* and *Antrocarcinus*, the stout first male pleopod lined with short, stout spines, second male pleopod structure and immovable male abdominal segments 3-5 necessitate the transfer of these genera out of the Eumedonidae. Eumedonids have long, sinuous, relatively slender first male pleopods lined with hairs, as do their closest relatives, the Pilumnidae. Eumedonids and pilumnids also have very short second male pleopods, which are proportionately much shorter than those of *Glyptocarcinus* and *Antrocarcinus*. The first male pleopods of *Cyrtocarcinus* and *Antrocarcinus* however, closely resemble those of some xanthids (especially members of the Euxanthinae, Xanthidae). The peculiar structure of the cardiac region and posterolateral margin of the carapace however, argues against including *Antrocarcinus*, *Glyptocarcinus* and *Cyrtocarcinus* in the Euxanthinae for the time being. Moreover, euxanthines typically have the "... antero-lateral margins of the carapace are poorly indicated behind the exorbital angles; a feeble crest (line) in a sub-orbital position (sub-hepatic) is directed not towards the orbit but towards the frame of the buccal cavity" (Serène, 1984: 16). In antrocarinines, the

anterolateral margin is cristate throughout its length and clearly reaches the orbits. It must be noted however, that the definition of the Euxanthinae is still quite unsatisfactory and must be revised (Ng, 1993), during which time it may be necessary to redefine the subfamily so that it includes *Antrocarcinus*, *Glyptocarcinus* and *Cyrtocarcinus* as well. For the moment, the authors feel that it is better to separate these three genera into a group of their own considering their distinctive characters.

The male abdomen of *Cyrtocarcinus truncatus* has been figured by Edmondson (1951: fig. 21f) and shows seven clearly demarcated segments, typical of the xanthoid families Menippidae, Pilumnidae, Eumelonidae and Platyanthidae. The male abdominal segments 3-5 of *Antrocarcinus* and *Cyrtocarcinus* however, are immovable, effectively forming a single structure. The sutures between the segments are evident only externally. Internally, the sutures are incomplete, with several parts of the sutures of all three segments ankylosed. In larger male specimens, the entire suture is ankylosed and from the internal view, appears completely fused. In *Antrocarcinus petrosus*, segments 3-5 are partly ankylosed, along the inner surfaces and externally. These three segments seem to be free but are effectively immovable. The male abdominal segments 3-5 of the Parthenopidae s. str. (Parthenopoidea) are fused, and the rather broad male abdomen of *Cyrtocarcinus* and *Antrocarcinus* bear a distinct similarity. The first and second male pleopods of parthenopids however, are very different, with the first male pleopod usually being very stout and cylindrical and the second male pleopod long.

The Antrocarcininae also bears a resemblance to some members of the Liomerinae Sakai, 1976 (Xanthidae s. str.), especially to *Actites* Lanchester, 1901. *Glyptocarcinus* and *Antrocarcinus* resemble *Actites* in the form of the carapace, front and structure of the cristate ambulatory legs. There is also a distinct but shallow transverse groove separating the cardiac and intestinal regions in *Actites*, which could be a "precursor" to the much more extreme condition present in *Glyptocarcinus* and *Antrocarcinus*. Antrocarcinines however, differ from *Actites* in that the 2M region is entire and not divided longitudinally into two halves by a groove, the anterolateral margin consists of three distinct teeth (rounded lobes in *Actites*), the posterolateral margin stops abruptly two-thirds from the start and curves downwards towards the intestinal region (normal and entire in *Actites*), the cardiac region is swollen and separated from the intestinal region by a deep transverse groove with the posterior part overhanging the groove (against a normal cardiac region which is separated from the intestinal region by shallow groove in *Actites*), the intestinal region is raised and plate-like or distinctly depressed and sloping anteriorly (gently convex in *Actites*), the second antennal segment is elongate and subequal in length to the basal segment (second segment very small and reduced in *Actites*), the antero-external angle of the merus of the third maxilliped is auriculiform (rounded and not expanded in *Actites*), the posterior margin of the epistome consists of two median truncate lobes with a deep median fissure (against a triangular median lobe in *Actites*), the margins of the ambulatory legs are more strongly cristate, the tips of the fingers are sharp (tips dilated and somewhat spoon-like in *Actites*), pigmentation on the fingers are along the cutting edges and tips only (distal pigmentation or entire finger faintly pigmented in *Actites*), the sutures of male abdominal segments 3-5 are deep and distinct (only the edges of the sutures are still visible in *Actites*), the distal part of the first male pleopod is not covered with long, setose hairs, and the second male pleopod basal segment is proportionately longer (distal segment length 28-38% that of basal segment vs. 28-29% in *Actites*).

While characters like the structures of the 2M carapace region, posterior margin of the epistome, margins of the ambulatory legs, fingers of the chelipeds, distal part of the first

male pleopod, shape of the antero-external angle of the merus of the third maxilliped, degree of fusion of the male abdominal segments 3-5, and proportions of the second antennal segment, are generic in level, the unusual structures of the sternum (with deep clefts between sternites 3 and 4), very swollen cardiac region, interrupted posterolateral margin and presence of a posterior sub-branchial channel are more difficult to assess, and suggest that *Antrocarcinus*, *Glyptocarcinus* and *Cyrtocarcinus* are not closely related to *Actites* and not consubfamilial.

Serène (1984: 55) regarded *Actites* as a subgenus of *Liomera* Stimpson, 1859, and to this taxon assigned two species, *Actites erythrus* Lanchester, 1901 (type species), and *Carpilodes lophopus* Alcock, 1898 (including *Carpilodes lophopus* var. *boninensis* Odhner, 1925). In these species, two characters, the shape of the carapace and the stout first male pleopod combine to form a distinct group within the Liomerinae. Therefore, *Actites* should be assigned full generic status.

General biology. - As far as is known, antrocarcinines are free-living. This fact had created doubt about the placement of the genus *Glyptocarcinus* in the Eumedonidae which are otherwise, strict symbionts of echinoderms (Števčić *et al.*, 1988). The available evidence makes it extremely unlikely that antrocarcinines are associated with any organisms. Xanthoid symbionts like trapezids, cymoines, chlorodiinines, and certainly all eumedonids (unpublished data) have a specialised dactylo-propodal process on their ambulatory legs, in which a knob on each side of the proximal part of the dactylus is able to lock into a depression on each side of the inner distal edge of the propodus. Once the knob on the dactylus is locked into its corresponding process on the propodus, both segments become very rigid. The process presumably helps the eumedonid crabs maintain a strong grip on their hosts. Antrocarcinines lack this dactylo-propodal process.

The peculiar structure of the posterolateral margin and cardiac region in antrocarcinines might be associated with respiration. In antrocarcinines, the posterolateral margin curves suddenly inwards towards the metabranchial region and cardio-intestinal groove, with the intestinal region forming a separate plate or structure. The posterior part of the outer margin of the metabranchial region is thus no longer distinct from dorsal view. In xanthid crabs, the posterolateral margins form the outer lateral margins of the metabranchial regions, and join the posterior margin of the carapace; and the metabranchial regions are separated from the intestinal region by a shallow oblique groove.

In antrocarcinines, below the cristate posterolateral margin, on the posterior part of the sub-branchial region, is a distinct channel, lined with scattered spines and sharp tubercles on its anterior part. This channel is linked to the end of the posterolateral margin, at the junction which it curves into the metabranchial region. The deep cardio-intestinal groove is thus connected to the posterior sub-branchial channels via the end of the posterolateral margins. It seems likely that water currents are brought in via the posterior dorsal part of the carapace, via the posterior sub-branchial channels to the Milne Edwards' openings. The sculpture and form of the carapace of antrocarcinines strongly suggest that they have cryptic habits and probably hide under mud or rubble. Most of the recent specimens of *Glyptocarcinus politus* and *Antrocarcinus petrosus* collected from New Caledonia are covered in mud and other sediments. With such habits, a specialised mechanism for bringing in oxygenated water would be an advantage. Some xanthid crabs (e.g. *Hypocolpus*, *Carpoporus*, *Hepatoporus*, *Euxanthinae*) have a special depression on the anterior part of their sub-branchial region

which is also believed to aid respiration. In a similar fashion, burrowing crabs like *Trichia* (Trichiinae, Xanthidae) and *Calappa* (Calappidae) use their chelipeds to help channel in the afferent respiratory current.

KEY TO THE GENERA AND SPECIES OF ANTROCARCININAE

- 1a. Frontal margin with deep, broad, V-shaped cleft, frontal lobes usually directed obliquely outwards, inner supraorbital lobes present; anterolateral margin normal, not strongly lamelliform and plate-like from frontal view; cardio-intestinal groove deep, cardiac fold not over-reaching groove; dorsal margin of chela with inward folding crest, median part with several spines or teeth; surfaces of male and female abdominal segments 2-4 with three large, transverse, granulated swellings, median one largest, segments 5 and 6 with large median granulated swelling
..... *Antrocarcinus*, new genus (monotypic, *A. petrosus*, new species)
- b. Frontal margin with deep, narrow fissure, frontal lobes directed anteriorly, inner supraorbital lobes indistinct or absent; anterolateral margin strongly lamelliform and plate-like from frontal view; cardio-intestinal groove very deep, cardiac fold over-reaching and partly covering groove; dorsal margin of chela not distinctly cristate, median part without spines or teeth; surfaces of all male and female abdominal segments smooth, without large swellings 2
- 2a. Anterolateral teeth low, broadly triangular, lobiform; posterior part of cardiac fold in adults subtruncate in shape; intestinal region appears depressed and sloping anteriorly into cardio-intestinal groove, posterior margin of carapace sunken below margin of last abdominal segment; inner surface of chela distinctly swollen, surfaces rounded; carpus with only 1 broad, blunt tooth at inner distal angle; posterior part of sternite 4 sloping suddenly downwards forming strong transverse ridge and deep median depression *Cyrtocarcinus*, new genus (monotypic, *C. truncatus*)
- b. Anterolateral teeth well developed, acutely triangular, sharp; posterior part of cardiac fold in adults broadly triangular in shape; intestinal region raised, plate-like, margins appear cristate, posterior margin of carapace raised well above margin of last abdominal segment; inner surface of chela raised, with median part forming a low longitudinal ridge; carpus with 1 large, sharp tooth at inner distal angle and 1 small but distinct sub-basal tooth; posterior part of sternite 4 sloping gradually anteriorly, forming low transverse ridge and median depression *Glyptocarcinus*
- 3a. Dorsal surface of carapace uneven, with numerous small granules and punctations, especially on epibranchial, gastric and branchial regions forming reticulate-pattern; intestinal region with distinct median groove; fourth ambulatory merus stout, length ca. 1.8 times width *G. lophopus*
- b. Dorsal surface of carapace appears smooth, without distinct granules, or reticulate-pattern, punctations sparse; intestinal region entire, without median longitudinal cleft or groove; fourth ambulatory merus slender, length ca. 2.1 times width *G. politus*, new species

Antrocarcinus, new genus

Type species. - *Antrocarcinus petrosus*, new species, by present designation, monotypy.

Diagnosis. - Carapace transverse, broader than long; regions very distinct, well defined, grooves deep; surfaces distinctly punctate to rugose; front distinctly bilobed, with deep, broad, V-shaped cleft, frontal lobes usually directed obliquely outwards, supraorbital lobe low but clearly demarcated; cardiac region swollen, with distinct transverse median ridge, does not form cardiac fold, does not cover deep cardio-intestinal groove from dorsal view; intestinal region rectangular, plate-like, posterior margin with distinct median longitudinal cleft; posterior margin of carapace distinctly raised above margin of last abdominal segment; anterolateral margin with 3 distinct teeth, anterior 2 larger; posterolateral margin distinctly converging, not continuous, anterior two-thirds straight, then curving sharply into metabranchial region forming low, short transverse ridge; posterior part of sub-branchial region with distinct channel which connects to end of posterolateral margin (at junction which it curves into metabranchial region). Posterior margin of epistome truncate, median lobes usually fused marginally. Ischium of third maxilliped rectangular, width ca. 65% length; antero-external angle of merus auriculiform. Dorsal margin of chela with inward folding crest lined with several spines or teeth, median part of inner surface of chela gently convex. Suture between sternites 2 and 3 prominent, lined with small granules; suture between sternites 3 and 4 interrupted medially; sternite 4 with low transverse median ridge. Male abdomen 7-segmented; sutures between segments 3-5 distinct on external surface but incomplete internally, with segments partially ankylosed and completely immovable; external surfaces of male and female abdominal segments 2-4 with 3 large, transverse, granulated swellings, median one largest, segments 5 and 6 with large truncate median granulated swelling. First male pleopod stout, proximal half almost straight, distal margins lined with short, strong spines; second male pleopod relatively short, distal segment ca. 38% length of basal segment.

Etymology. - The genus name is derived from the Greek "antrum" for cave or hollow, in combination with "carcinos" (for crab), alluding to the deep grooves on the carapace of the type species. Gender masculine.

Remarks. - The genus is monotypic. The differences between *Antrocarcinus* and other antrocarcinine genera have been outlined in Table 1 and in the key. *Antrocarcinus* seems to be the least specialised of all antrocarcinine genera, and bears the closest resemblance to more typical xanthid genera, especially in its well defined regions, less inflated cardiac region which does not overhang the more shallow cardio-intestinal groove, and possession of distinct inner supraorbital lobes.

Antrocarcinus petrosus, new species
(Figs. 1-4, 10A)

Material examined. - Holotype - male (cb 12.0 mm, cl 8.8 mm) (MNHN), SMIB 8: station DW 174, 23°39.94'S, 168°00.55'E, New Caledonia, 235-240 m depth, coll. B. Richer de Forges, 29.i.1993.

Paratype - 1 female (cb 12.3 mm, cl 9.3 mm) (MNHN), same data as holotype. — 1 young female (cb 8.8 mm, cl 6.5 mm) (ZRC), 1 female (cb 13.6 mm, cl 9.5 mm) (specimen dismembered, only carapace intact) (MNHN), station DW 170, 23°41.23'S, 168°00.56'E, New Caledonia, 241-244 m depth, coll. B. Richer de Forges, 29.i.1993.

Table 1. Differences between *Glyptocarcinus*, *Cyrtocarcinus* and *Antrocarcinus*

Character	<i>Glyptocarcinus</i>	<i>Antrocarcinus</i>	<i>Cyrtocarcinus</i>
Carapace	distinctly broader than long; carapace width 1.34-1.39 times carapace length	squarish, carapace width 1.32-1.36 times carapace length	distinctly broader than long; carapace width ca. 1.41 times carapace
Frontal margin	with deep, narrow fissure, frontal lobes directed anteriorly outwards	with deep, broad, V-shaped cleft, frontal lobes directed obliquely	with deep, narrow fissure, frontal lobes directed anteriorly
Cardio-intestinal region	very deep, cardiac fold groove over-reaching and partly covering groove	shallow, cardiac fold not over-reaching groove	very deep, cardiac fold over-reaching and partly covering groove
Intestinal region	raised, plate-like, margins cristate	raised, plate-like, margins cristate	depressed, not raised, sloping anteriorly into cardio-intestinal groove, not plate-like, margins not distinct or cristate
Sternum	posterior part of sternite 4 sloping gently towards anterior part	posterior part of sternite 4 sloping gently towards anterior part	posterior part of sternite 4 slopes very suddenly downwards, forming distinct transverse ridge and depression in median part of sternite
Third maxilliped	relatively long, width of ischium ca. 60% length	relatively short, width of ischium ca. 65% length	relatively long, width of ischium ca. 63% length
Chela	dorsal margin of chela slightly cristate; inner surface gently convex but not distinctly swollen	dorsal margin of chela with inward folding crest, median part with several spines or teeth; inner surface gently convex, not distinctly swollen	dorsal margin of chela rounded, not cristate; inner surface strongly swollen
Male and female abdomen	surfaces of all segments smooth, without large swellings	surfaces of segments 2-4 with three large, transverse, truncate swellings, median one largest, segments 5 and 6 with large median truncate swelling	surfaces of all segments smooth, without large swellings
First male pleopod	not known	relatively stout, proximal half almost straight	relatively slender, C-shaped
Second male pleopod	not known	relatively short, distal segment ca. of basal segment	relatively long, distal segment ca. 28% length of basal segment

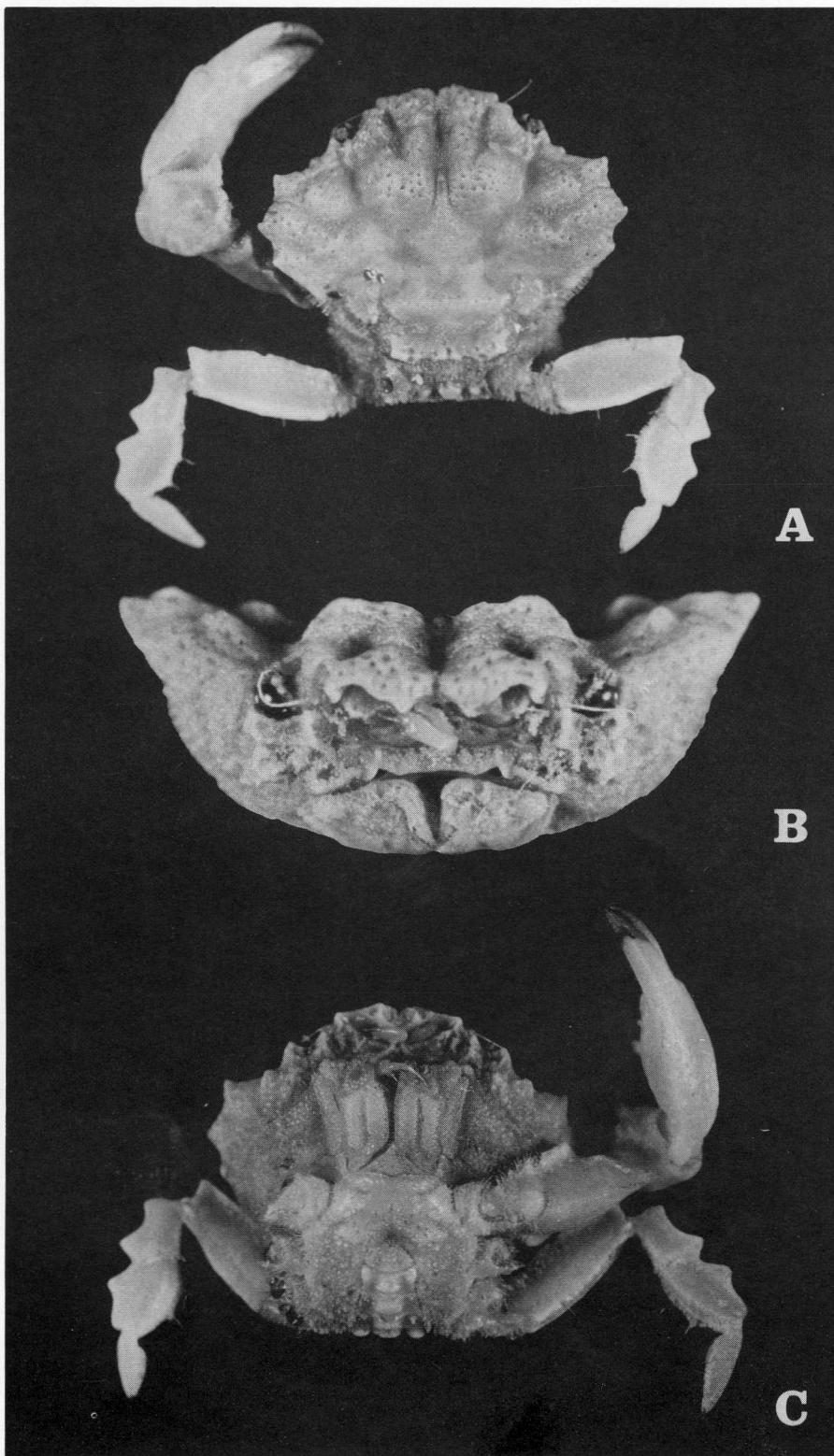


Fig. 1. *Antrocarcinus petrosus*, new genus and species. Holotype male, cb 12.0 mm, cl 8.8 mm (MNHN). A, dorsal view; B, frontal view; C, ventral view.

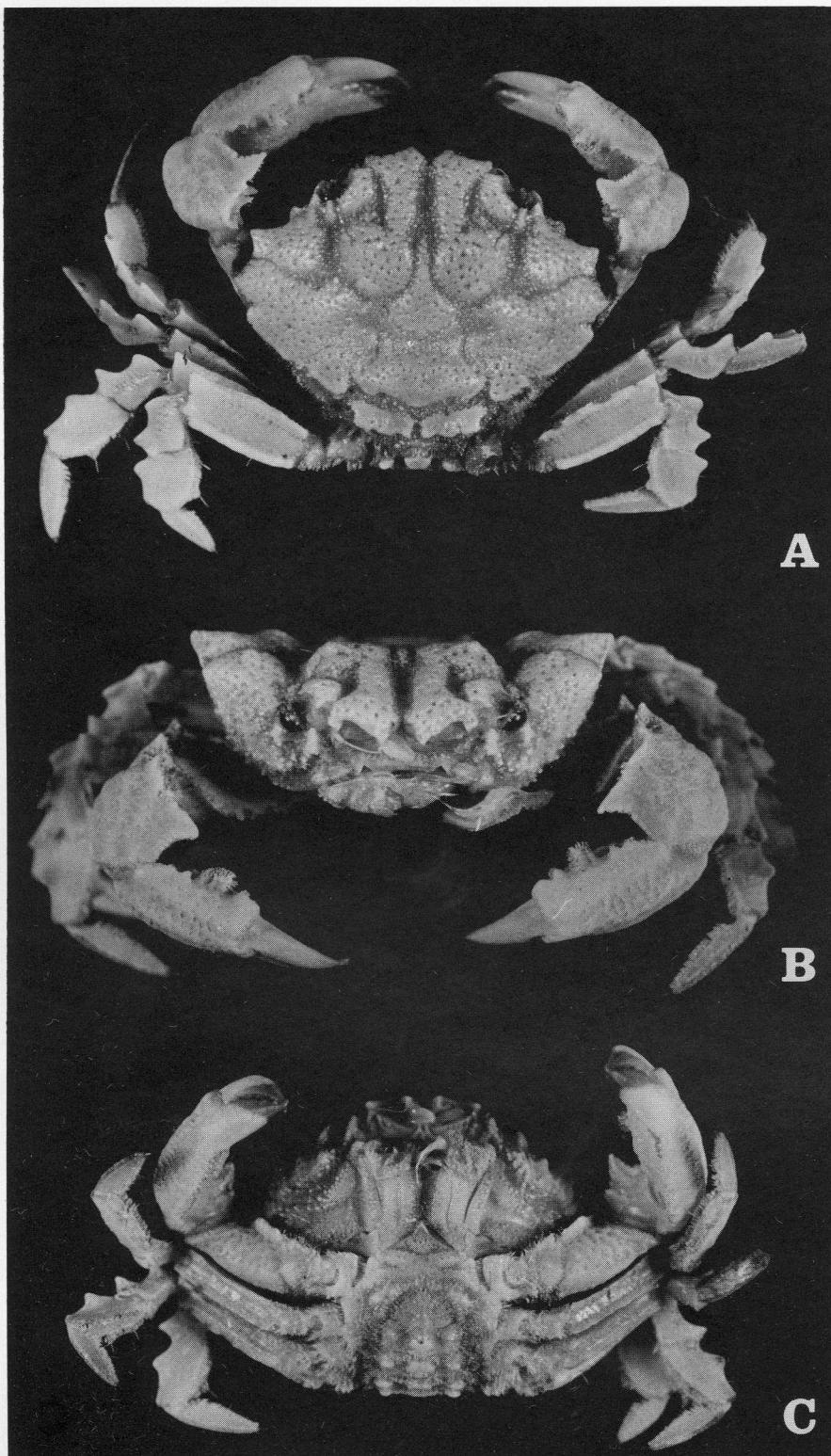


Fig. 2. *Antrocarcinus petrosus*, new genus and species. Paratype female, cb 12.3 mm, cl 9.3 mm (MNHN). A, dorsal view; B, frontal view; C, ventral view.

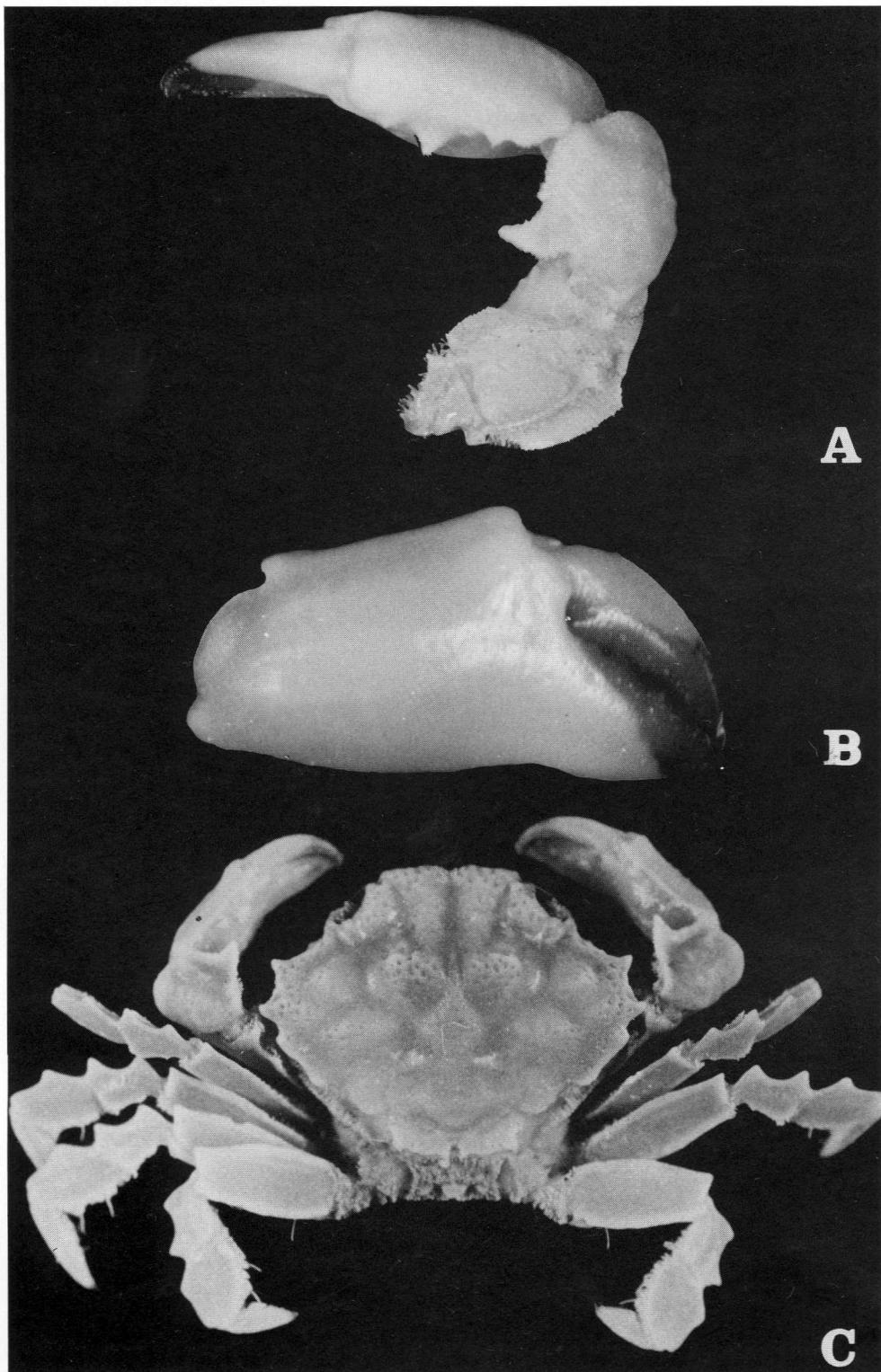


Fig. 3. *Antrocarcinus petrosus*, new genus and species. A, B, holotype male, cb 12.0 mm, cl 8.8 mm (MNHN); C, paratype female, cb 8.8 mm, cl 6.5 mm (ZRC). A, dorso-marginal view of cheliped; B, front view of right chela.

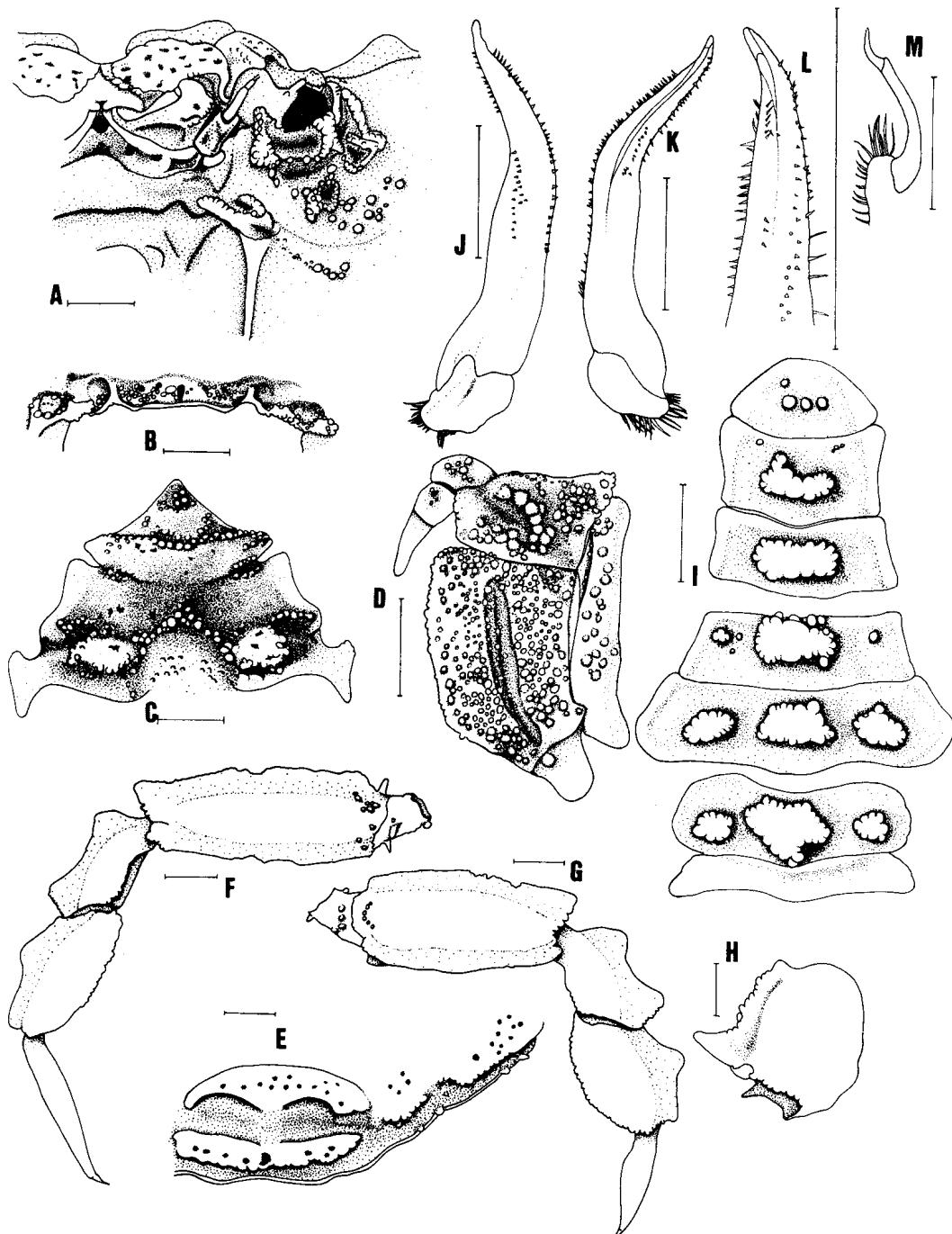


Fig. 4. *Antrocarcinus petrosus*, new genus and species. Holotype male, cb 12.0 mm, cl 8.8 mm (MNHN). A, face of carapace; B, posterior margin of epistome; C, anterior sternites; D, left third maxilliped; E, posterior part of carapace (dorsal view); F, third ambulatory leg; G, fourth ambulatory leg; H, carpus of right cheliped; I, abdomen; J-L, left male first pleopod; M, left male second pleopod. J, dorsal view; K, L, ventral view. Scales = 1.0 mm.

Diagnosis. - Frontal margin with deep, broad, V-shaped cleft, frontal lobes usually directed obliquely outwards, inner supraorbital lobes rounded, behind frontal lobes; anterolateral margin not strongly lamelliform and plate-like from frontal view; cardio-intestinal groove deep, cardiac region distinctly swollen but no cardiac fold evident, cardiac region not over-reaching cardio-intestinal groove from dorsal view. Dorsal margin of chela with inward folding crest lined with several spines or teeth, median part of inner surface gently convex. Length of ambulatory merus ca. 2.4 times width.

Description of male holotype. - Carapace dorsal surfaces distinctly punctate to rugose and eroded; regions well defined, grooves deep, prominent; cardiac region evenly swollen, forming low transverse median ridge at highest point; cardio-intestinal groove deep, but not overhung by cardiac region; intestinal region raised, plate-like, with distinct median longitudinal cleft. Pterygostomial, subhepatic, suborbital and sub-branchial regions with numerous rounded granules and granulated projections. Frontal margin with deep, broad, V-shaped cleft, frontal lobes usually directed obliquely outwards, inner supraorbital lobes low, rounded, behind frontal lobes, separated by distinct notch. Supraorbital margin granulated, with 2 short, deep median fissures. Infraorbital margin strongly cristate, sub-lamelliform, heavily granulated. Anterolateral margin not strongly lamelliform and plate-like from frontal view, with 3 distinct teeth; first 2 teeth larger than third. Posterolateral margins distinctly separated from anterolateral margins, strongly converging; divided into anterior and posterior parts by swollen cardiac region and deep cardio-intestinal groove; anterior part of margin distinctly higher than posterior part, separated by rounded lobe. Antennular fossa oblique. Antenna free, does not fill orbital hiatus, reaching into orbit; basal segment rectangular. Eyes well developed, filling orbit; cornea distinct, pigmented. Anterior surface of epistome depressed; posterior margin appears entire because of 2 fused truncate median lobes, lobes; junction of pterygostomial region and epistome with strong granulated sub-lamelliform projection. Third maxillipeds quadrate, outer surfaces, especially ischium, merus and exopod strongly granulated; ischium rectangular, width ca. 65% length, inner margin granulated, median oblique sulcus deep, broad, granulated; merus squarish, antero-external angle expanded to form auriculiform structure; exopod just reaches antero-external edge of merus.

Chelipeds asymmetrical, right larger; outer surfaces gently rugose and punctate. Basis and ischium fused, suture visible. Merus short, proximal part of dorsal margin with broad lamelliform tooth. Carpus with strong, gently outwardly curving lamelliform tooth at inner distal angle and smaller sub-basal tooth, margins granulated. Outer surface of chela appears evenly convex, with three faint longitudinal ridges; inner surface gently convex, not swollen, dorsal margin of chela with inward folding crest lined with several spines or teeth. Fingers shorter than palm, stout, surfaces rounded, smooth, only distal part and cutting edges pigmented brown; cutting edges lined with numerous teeth and denticles.

Ambulatory legs short, first and second pair longest. Coxa with blunt tubercle on outer distal angle; basis and ischium fused, basis with sharp median tubercle on ventral margin; ischium with 2-4 tubercles or spines on outer margin; merus broad, length ca. 2.4 times width, cristate, dorsal margin with high crest which slightly folds inwards, ventral margin with 2 parallel crests forming deep trough between them, margins of crests gently serrated to entire, proximal part of outer surface with row of tubercles; proximal edge of dorsal margin with large spine on legs 1-3 but absent on leg 4. Carpus with very high, bilobed crest on dorsal margin. Propodus short, with high dorsal crest. Dactylus relatively short, laterally flattened, blade-like, tip hooked, corneous.

Suture between sternites 1 and 2 undiscernible but segments marked by row of small granules, suture between sternites 2 and 3 distinct, shallow, marked by granules, suture between sternites 3 and 4 interrupted medially, lateral clefts deep; sternite 4 with low transverse median ridge, anterior part gradually sloping forwards.

Abdomen 7-segmented, sutures for all segments visible but segments 3-5 immovable; external surfaces of abdominal segments 2-4 with 3 large, transverse granulated swellings, median one largest, segments 5 and 6 with large median transverse granulated swelling, segment 7 with scattered rounded granules.

First male pleopod stout, proximal half almost straight, distal margins lined with short, strong spines, groove for second male pleopod ventral in position, tip gently bent upwards; second male pleopod relatively short, distal segment distinct, ca. 38% length of basal segment

Paratypes. - The female specimens agree with the holotype male in most respects, and all the female abdominal segments are free and movable. The external surfaces of the female abdominal segments 2-6 have the same arrangement of large, transverse granulated swellings as in the holotype male. There is some variation in the sculpture of the carapace and degree of punctuation on the regions. In females, the carapace surface tends to be more eroded and more punctate in larger specimens. The form of the frontal margin also seems to vary somewhat, from being directed obliquely outwards to almost forwards.

Colour. - Dorsal surfaces generally bright orangish- to brick-red, with scattered patches of white, especially on cardiac region and legs (Fig. 10A).

Etymology. - The species name is derived from the Greek "petra" for rock, alluding to the appearance of the species.

Remarks. - See **Remarks** for the genus.

General biology. - The specimens were collected near a volcanic vent. Nothing else is known about their habits.

Glyptocarcinus Takeda, 1973

Harrovia - Sakai, 1974: 86 (*partim*); Takeda, 1976: 105, 107 (*partim*) (nec Adams & White, 1849).
Glyptocarcinus Takeda, 1973: 31; Takeda, 1979: 68 (*partim*); Stević et al., 1988: 1311 (*partim*).

Type species. - *Glyptocarcinus lophopus* Takeda, 1973, by monotypy.

Diagnosis. - Carapace transverse, distinctly broader than long; regions poorly developed or distinct; front prominent, distinctly bilobed, with deep median fissure or cleft, no supraorbital lobe or tooth present, at best a small, indistinct lobule discernible; cardiac region swollen, posterior part expanded to form cardiac fold which covers very deep, cardio-intestinal groove from dorsal view, posterior part of cardiac fold broadly triangular in shape; intestinal region distinctly rectangular, plate-like; posterior margin of carapace distinctly raised above margin of last abdominal segment; anterolateral margin strongly lamelliform and plate-like from frontal view, with 3 lobiform teeth (usually sharp), second tooth largest; posterolateral margin distinctly converging, not continuous, anterior two-thirds straight, then curving sharply into metabranchial region forming distinct lamelliform flap. Posterior margin of epistome truncate,

median truncate lobes separated by deep grooves, not fused. Ischium of third maxilliped distinctly rectangular, width ca. 60% length; antero-external angle of merus distinctly auriculiform. Carpus of chelipeds with 1 large tooth on inner distal angle and 1 smaller sub-basal tooth, margins granulose; dorsal margin of chela slightly cristate, without spines or teeth, median part of inner surface gently convex, not swollen. Suture between sternites 2 and 3 prominent, lined with small granules; suture between sternites 3 and 4 interrupted medially; sternite 4 without obvious transverse median ridge but median part distinctly depressed. Male abdomen not known; surfaces of all female abdominal segments smooth. First and second male pleopods not known.

Remarks. - The history of the genus *Glyptocarcinus* has already been discussed. Two species are recognised in the genus as redefined, *G. lophopus* Takeda, 1973 (Japan) and *G. politus*, new species (New Caledonia). The differences between *Glyptocarcinus* and other antrocarcinine genera are outlined in Table 1 and in the key. It is unfortunate that only female specimens are known for both species and many useful characters (e.g. male abdomen and male pleopods) cannot be ascertained.

***Glyptocarcinus lophopus* Takeda, 1973**
(Figs. 5, 6)

Glyptocarcinus lophopus Takeda, 1973: 31, fig. 1 (off Yome-shima Island, Ogasawara Islands, Japan). *Harrovia truncata* - Sakai, 1974: 86, Frontispiece 1 (coast of Wago, Shima Peninsula, Japan); Sakai, 1976: 299, colour frontispiece [1], text fig. 167 (no new record); Takeda, 1976: 105, 107 (no new record) (nec Rathbun, 1906).

Glyptocarcinus lophopus - Takeda, 1979: 68 (no new record); Števčić *et al.*, 1988: 1311 (list only).

Material examined. - Holotype - female (cb 12.2, cl 8.6 mm) (NSMT-Cr. 1167), off Yome-shima Island, Ogasawara Islands, Japan, 180 m depth, coll. S. Kihara, 12.viii.1969.

Diagnosis. - Carapace surface covered with small granules or pits, especially on epibranchial, gastric and branchial regions, forming semi-reticulated pattern (more pronounced in smaller specimens); regions defined by shallow grooves; anterolateral margins horizontal, flat, margins not upturned; cardiac region swollen, posterior part expanded into broadly triangular fold which covers anterior part of cardio-intestinal groove; intestinal region with distinct longitudinal groove. Carpus of cheliped with pitted inner surfaces, inner angle with a large, sharp tooth and smaller sub-basal tooth. Fourth ambulatory merus stout, length ca. 1.8 times width.

Colour. - Dorsal anterior half of carapace, external surfaces of chelipeds orange-brown, margins of carapace, inner surfaces of chelipeds and posterior parts of the carapace white to cream; ambulatory legs beige with white flecks (*fide* Sakai, 1974: frontispiece [1]).

Remarks. - This species was described from one small female 12.2 by 8.6 mm (Takeda, 1973: 34). Sakai (1974, 1976) subsequently reported a larger female specimen (23.0 by 15.5 mm) (under the Japanese name "Hiraashi-Komachigani") from the coast of Wago in the Shima Peninsula, Japan. No males are known. Sakai (1976: 299), in his material examined, listed only one male collected by N. Yamashita in November 1973. For the caption of his figure of the species however, (Sakai, 1976: text fig. 167), he stated that the specimen was a female. It is evident that Sakai's (1976: 299-300) record of the species was based on only one specimen, and it is the same one he reported in 1974, the male reported in his 1976 study been the result of a typographical error.

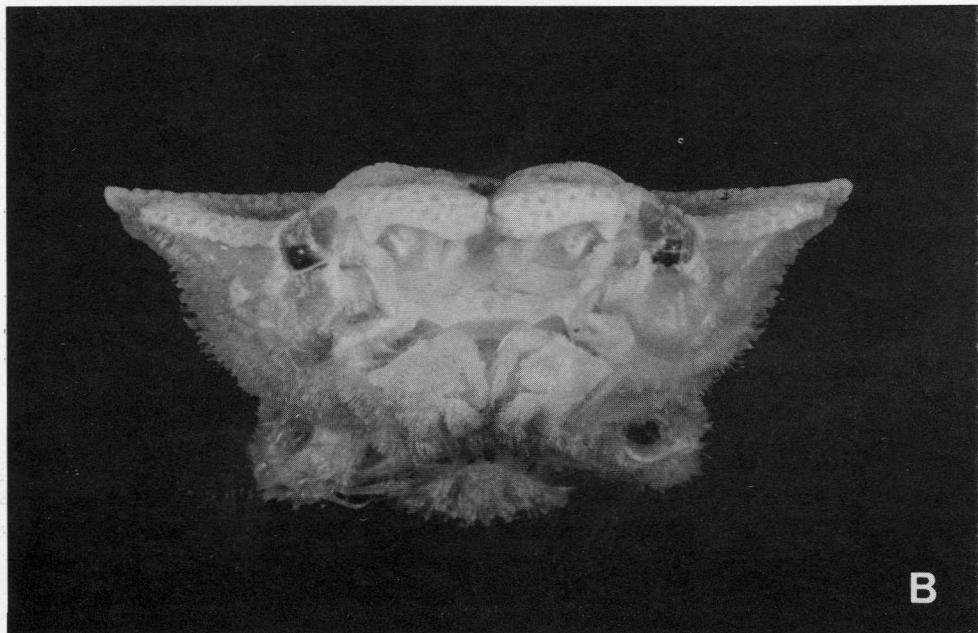
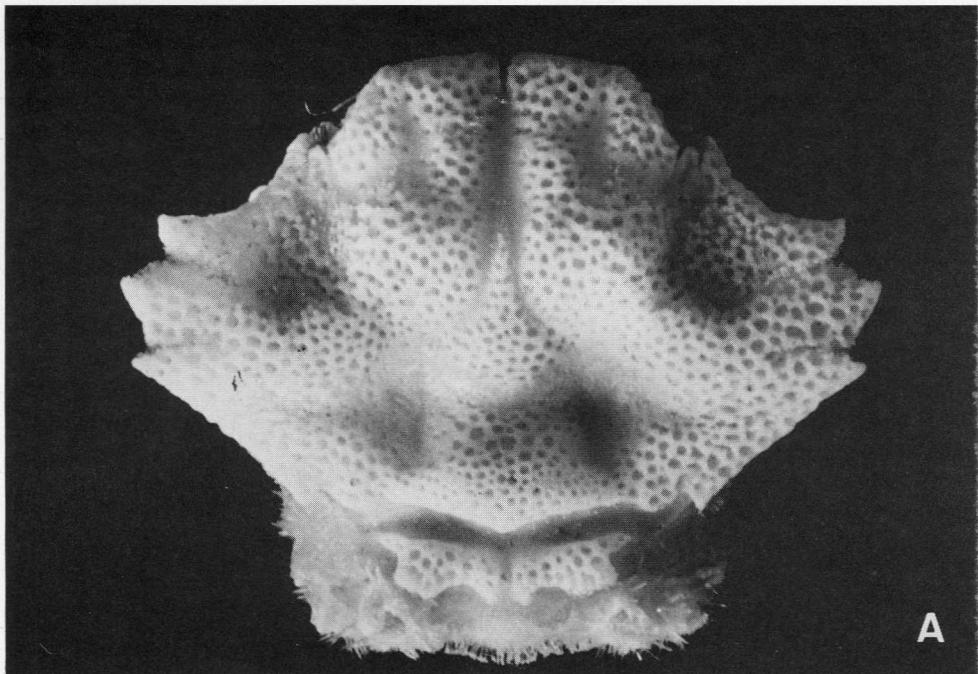


Fig. 5. *Glyptocarcinus lophopus*. Holotype female, cb 12.2 mm, cl 8.6 mm (NSMT-Cr. 1167). A, dorsal view; B, frontal view.

There appears to be age and size-related variation in the degree of erosion and punctuation on the regions of the carapace in *G. lophopus*, with smaller specimens (e.g. the holotype) being more eroded and punctate. In the larger specimen reported by Sakai (1974, 1976), the regions are generally smoother. This seems to be in contrast to *Antrocarcinus petrosus*, in which the carapaces of larger specimens tend to be more pitted.

General biology. - Very little is known about the biology of this species. Takeda's (1973: 34) specimen was collected from a depth of 180 m while Sakai (1974: 86) obtained his from the refuse of a commercial lobster net. Sakai (1976: 300) commented that the habitat of this species was "... Rocky bottoms, 35 to 70 metres deep. Whether this crab is associated with *Comanthus* species as in other congeners, or not is unknown".

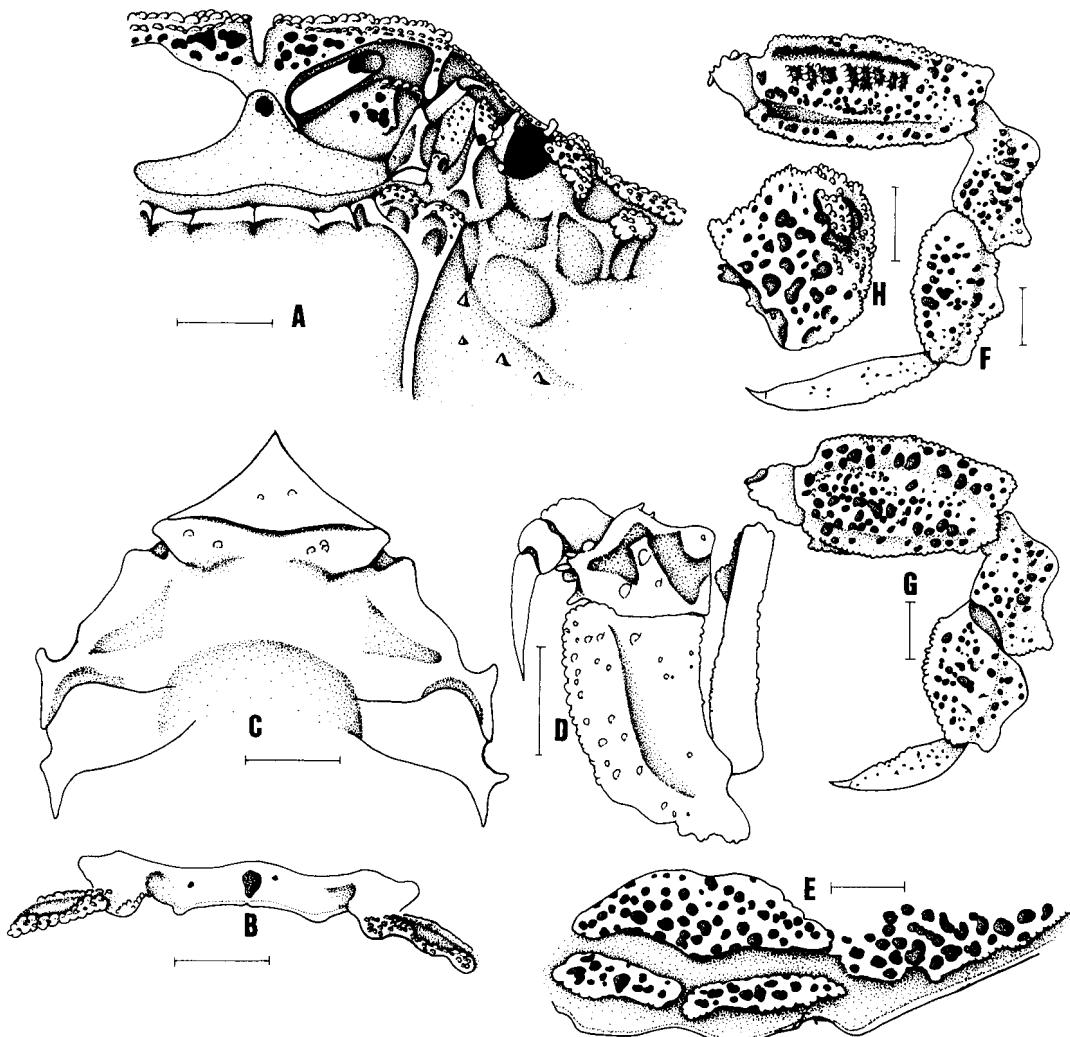


Fig. 6. *Glyptocarcinus lophopus*. Holotype female, cb 12.2 mm, cl 8.6 mm (NSMT-Cr. 1167). A, face of carapace; B, posterior margin of epistome; C, anterior sternites; D, left third maxilliped; E, posterior part of carapace (dorsal view); F, third ambulatory leg; G, fourth ambulatory leg; H, carpus of right cheliped. Scales = 1.0 mm.

***Glyptocarcinus politus*, new species**
(Figs. 7-9, 10B, C)

Material examined. - Holotype - female (cb 15.3 mm, cl 11.4 mm) (right anterolateral margin damaged) (MNHN), VOLSMAR: station DW 48, 21°00.1'S, 170°03.3'E, New Caledonia, 150-200 m depth, coll. B. Richer de Forges, 4.vii.1989.

Paratype - 1 young female (cb 8.2 mm, cl 5.9 mm) (ZRC), station DW 156, 24°46.13'S, 168°08.14'E, New Caledonia, 262-275 m depth, coll. B. Richer de Forges, 28.i.1993.

Diagnosis. - Carapace surface appears almost smooth, indistinct pits present only on gastric and branchial regions; anterolateral margins horizontal, flat, not upturned; cardiac region with anterior part gently concave, not distinctly demarcated, confluent with posterior part of branchial regions to form low transverse ridge; posterior part expanded to triangular fold without cleft; cardio-intestinal groove almost completely overhung by cardiac fold, posterior part entire, without longitudinal groove or cleft. Carpus of cheliped with inner surfaces smooth, inner angle with a large, sharp tooth and smaller sub-basal tooth. Fourth ambulatory merus broad, length ca. 2.1 times width.

Description of female holotype. - Carapace dorsal surfaces smooth, mildly pitted or slightly rugose; regions poorly demarcated; postorbital regions gently depressed; progastric regions slightly raised, clearly separated from fused meso- and metagastric regions by shallow grooves; metabranchial regions sunken; urogastric region swollen, continuous with raised cardiac region; posterior part of cardiac region swollen, forming distinct broadly triangular cardiac fold which overhangs and covers most of very deep cardio-intestinal groove from dorsal view; intestinal region narrow, raised, plate-like, not divided longitudinally by grooves or clefts, posterior margin trilobulated, median lobe mildly granulated, gently sinuous, lateral lobes granulated. Pterygostomial, subhepatic, suborbital and sub-branchial regions with scattered small rounded granules; subhepatic region with 1 large granulated projection. Front divided into 2 truncate lobes by deep, narrow, median fissure, margin strongly deflexed and then curving inwards, frontal margin uneven, gently convex; external edge of each lobe with very low, indistinct lobule. Supraorbital margin granulated, with 2 short, deep fissures. Infraorbital margin cristate, lamelliform, with 2 large granulated tooth-like projections. Anterolateral margin with 3 distinct, sharp teeth; first 2 teeth acutely triangular, second tooth larger than first; third tooth smallest; edges of margin cristate, granulated, gently folding downwards, forming narrow overhang. Posterolateral margins distinctly separated from anterolateral margins, strongly converging; divided into anterior and posterior parts by broad cardiac fold and deep cardio-intestinal groove; anterior part distinctly higher than posterior part, separated from posterior part by small but distinct granulated lobe. Antennular fossa slightly oblique. Antenna free, does not fill orbital hiatus, reaching into orbit; basal segment rectangular. Eyes well developed, filling orbit; cornea distinct, pigmented. Anterior surface of epistome gently depressed; posterior margin divided into 2 truncate lobes, separated by deep median cleft; junction of pterygostomial region and epistome with strong granulated sub-lamelliform projection. Third maxillipeds quadrate, outer surfaces smooth; ischium rectangular, width ca. 60% length; inner margin uneven, median oblique sulcus deep, broad; merus squarish, antero-external angle expanded to form auriculiform structure; exopod just reaches antero-external edge of merus.

Chelipeds asymmetrical, right slightly larger; outer surfaces smooth to rugose, not granulose or eroded. Basis and ischium fused, suture visible; ischium with distinct distal tooth on dorsal margin. Merus short, proximal part of dorsal margin with broad, lamelliform tooth. Carpus

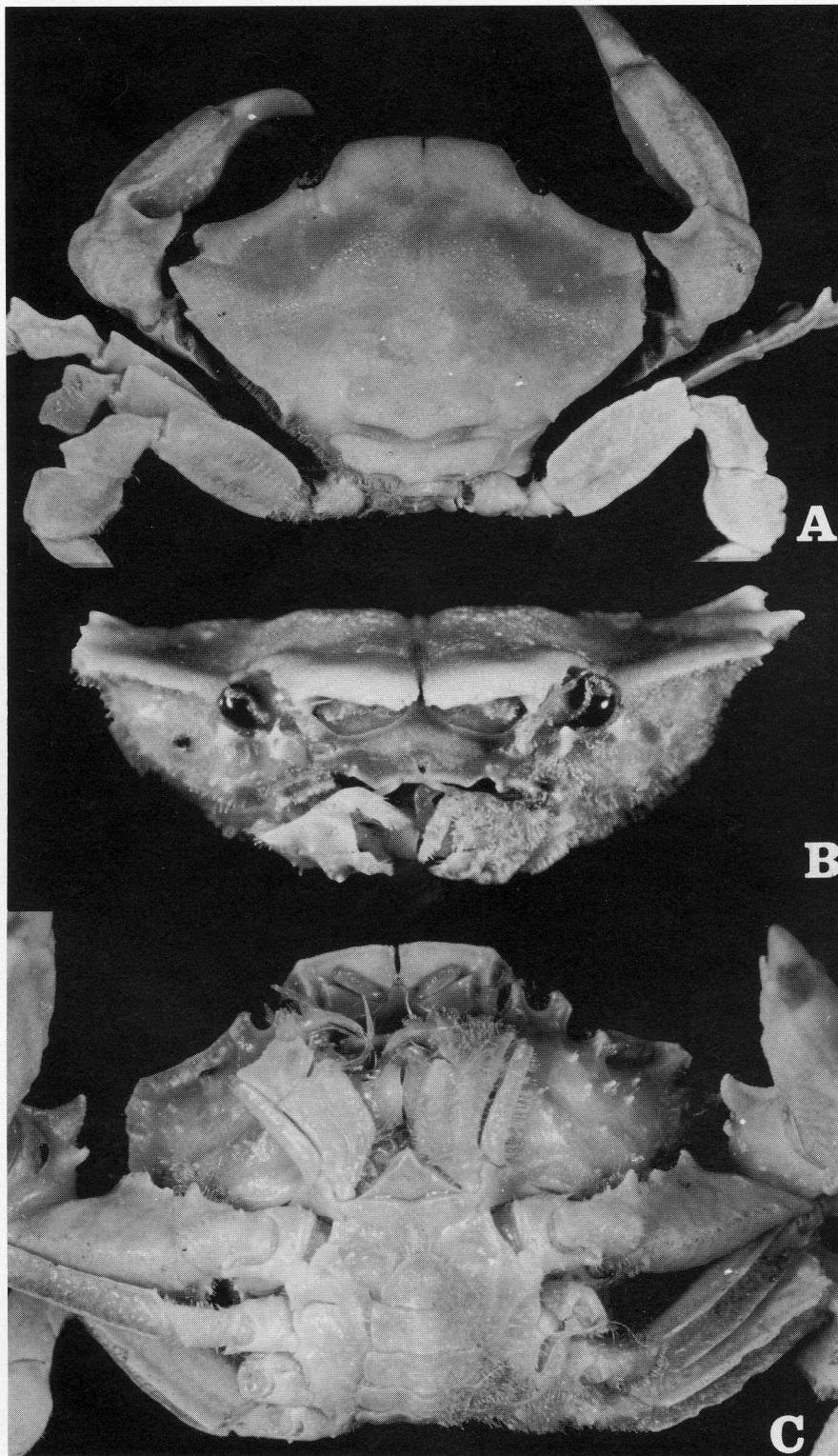


Fig. 7. *Glyptocarcinus politus*, new species. Holotype female, cb 15.3 mm, cl 11.4 mm (MNHN). A, dorsal view; B, frontal view; C, ventral view.

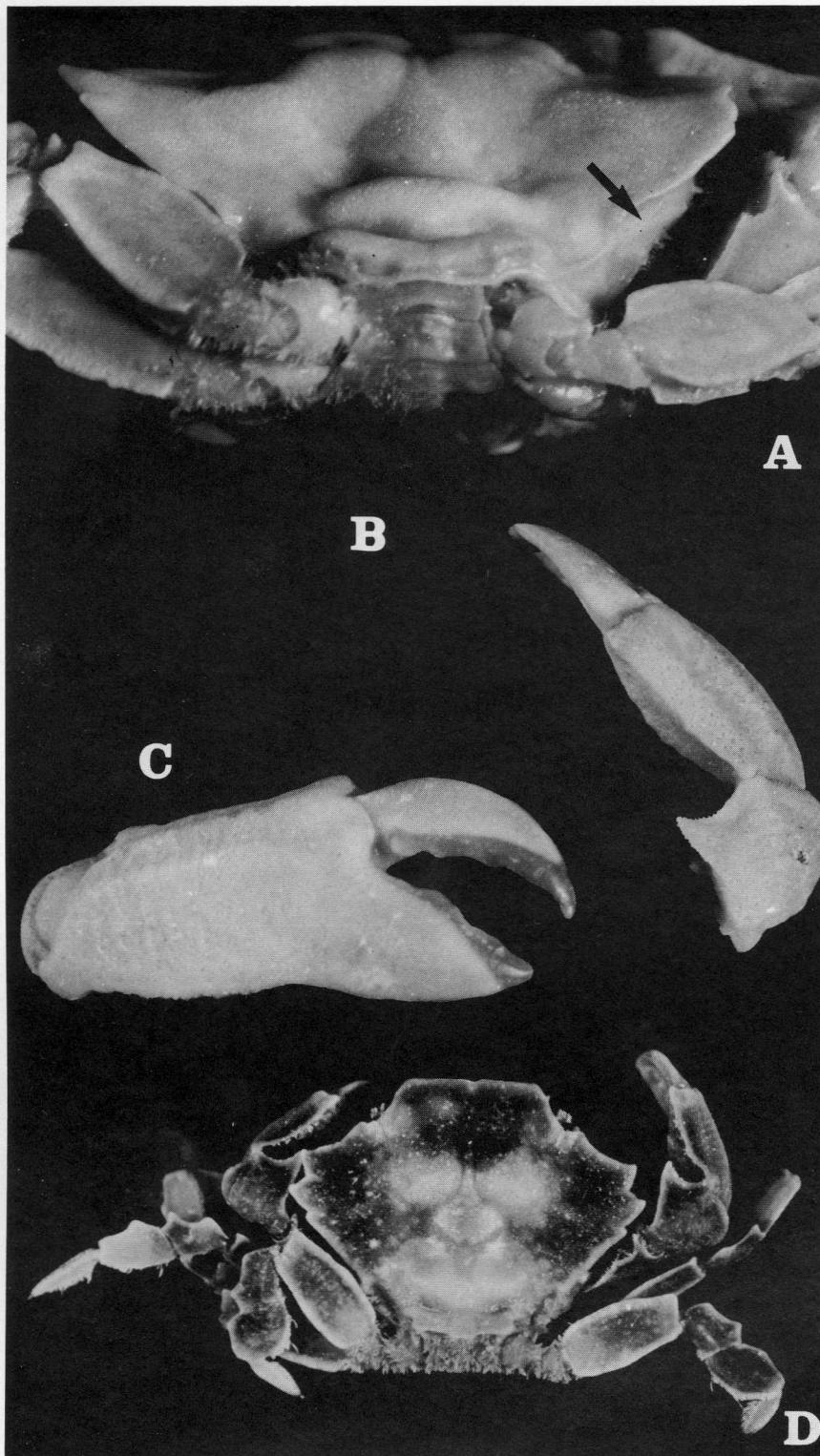


Fig. 8. *Glyptocarcinus politus*, new species. A-C, holotype female, cb 15.3 mm, cl 11.4 mm (MNHN); D, Paratype female, cb 8.2 mm, cl 5.9 mm (ZRC). A, posterior view of carapace showing postero-subbranchial channel (arrows); B, dorso-marginal view of cheliped; C, front view of right chela.

with strong, gently outwardly curving tooth at inner distal angle, base of posterior part with small blunt tooth; margins of both teeth lined with small but distinct granules. Outer surface of chela rugose, with 3 low, uneven longitudinal ridges on proximal two-thirds; inner surface raised, median part forming a low but distinct longitudinal ridge but no teeth or spines. Fingers shorter than palm, stout, surfaces rounded, smooth, only distal part and cutting edges pigmented brown; cutting edge of dactylus of larger chela with large rounded, inwardly-directed tooth, cutting edge of pollex with denticles; cutting edges of fingers of smaller chela uneven, blade-like for most of length, with several small denticles towards distal part.

Ambulatory legs short, first and second pair longest. Coxa with blunt tubercle on outer distal angle; basis and ischium fused, basis with sharp median tubercle on ventral margin; ischium with 2 small median tubercles on ventral margin; merus broad, cristate, dorsal margin with high crest which slightly folds inwards, ventral margin with 2 parallel crests forming

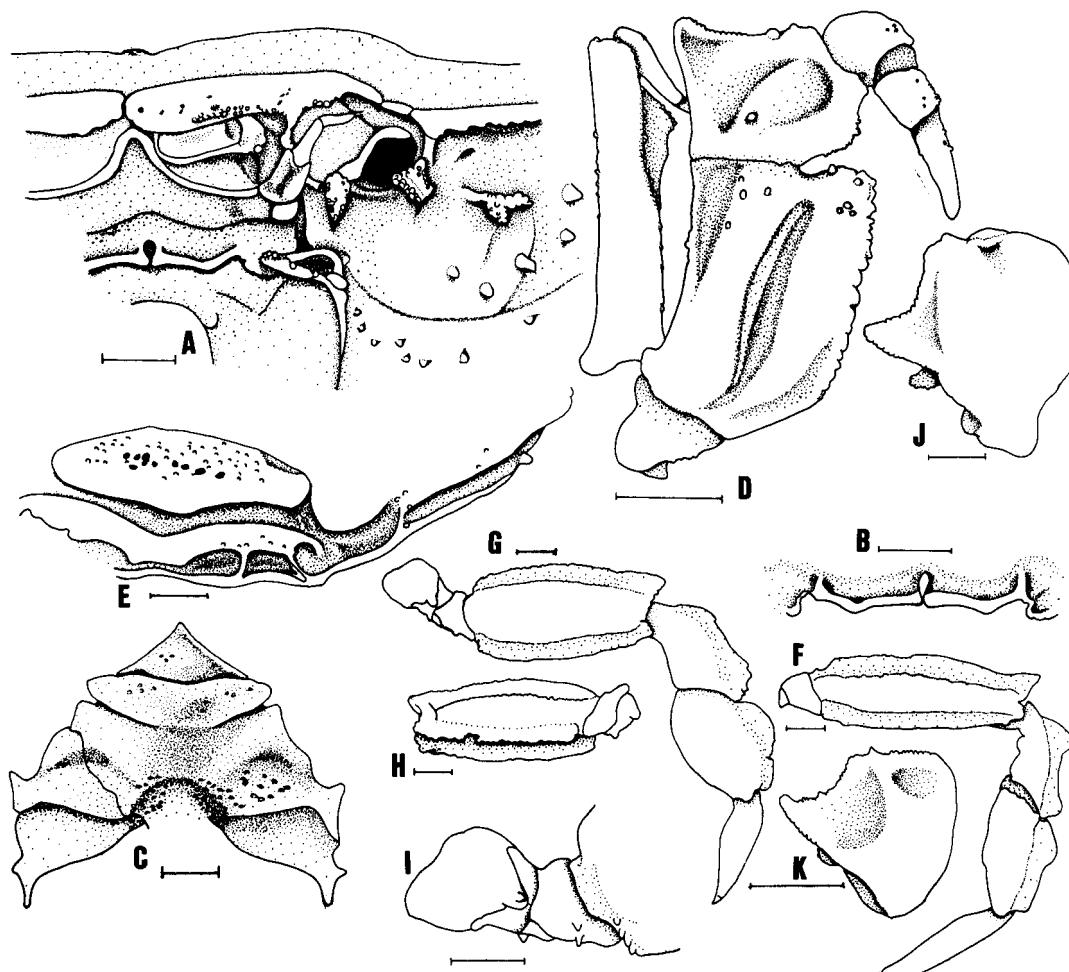


Fig. 9. *Glyptocarcinus politus*, new species. A-J, holotype female, cb 15.3 mm, cl 11.4 mm (MNHN); K, paratype female, cb 8.2 mm, cl 5.9 mm (ZRC). A, face of carapace; B, posterior margin of epistome; C, anterior sternites; D, right third maxilliped; E, posterior part of carapace (dorsal view); F, third ambulatory leg; G, fourth ambulatory leg; H, subventral margin of merus of third ambulatory leg; I, coxa of third ambulatory leg; J, K, carpus of right cheliped. Scales = 1.0 mm.

deep trough between them, margins of crests gently serrated to entire; ventral part of proximal edge with 3-5 tubercles. Carpus with very high, uneven crest on dorsal margin, crest uneven to entire, sometimes medially indented, appearing bilobed. Propodus short, with high median dorsal crest, margin entire or clefted. Dactylus relatively short, laterally flattened, blade-like, tip hooked, corneous.

Suture between sternites 1 and 2 absent, suture between sternites 2 and 3 deep, lined with small granules; suture between sternites 3 and 4 shallow, interrupted medially, lateral clefts deep; sternite 4 with distinctly depressed median part. Abdomen 7-segmented, all segments free, movable, covering about half of sternum; pleopods setose, fully developed.

Paratype. - The paratype female is small and juvenile and differs from the holotype female in having a darker live coloration, a more squarish carapace which is slightly more punctate, and having the cardio-intestinal groove shallower. The sub-basal tooth on the inner distal angle of the carpus of the cheliped is also small and indistinct from dorsal view. In other non-sexual aspects, it agrees well with the holotype female.

Colour. - In the adult holotype, the anterior part of the carapace and chelipeds are dark orangish- to brick-red, the posterior parts and legs being mottled red and white (Fig. 10B). In the smaller paratype female, the carapace is basically maroon with more distinct patches of white, the mottled effect being less striking (Fig. 10C).

Etymology. - The name is derived from the Latin "politus" for smooth, alluding to the smooth surfaces of the carapace.

Remarks. - This species is very close to *G. lophopus* but differs in several aspects of the sculpture on the carapace surface, form of the anterolateral margins, cardiac regions, intestinal regions, structure of the carpus of the cheliped and proportions of the ambulatory merus (see Table 2).

General biology. - The substrate where the specimens were collected from was very rough, with rocks and gravel. The area had several active submerged volcanoes. Nothing else is known about its biology.

Cyrtocarcinus, new genus

Harrovia - Rathbun, 1906: 886; Edmondson, 1951: 217; Serène *et al.*, 1958: 196 (*partim*); Serène, 1968: 63 (*partim*); Sakai, 1974: 86 (*partim*); Sakai, 1976: 299 (*partim*); Takeda, 1976: 105 (*partim*) (*nec* Adams & White, 1849).

Glyptocarcinus - Takeda, 1979: 68 (*partim*); Števčić *et al.*, 1988: 1311 (*partim*).

Type species. - *Harrovia truncata* Rathbun, 1906, by present designation.

Diagnosis. - Carapace transverse, distinctly broader than long; regions poorly developed; front prominent, distinctly bilobed, with deep median fissure, no supraorbital lobe or tooth discernible; cardiac region swollen, posterior part expanded to form cardiac fold which covers very deep, cardio-intestinal groove from dorsal view, posterior part of cardiac fold subtruncate in shape; intestinal region distinctly depressed, sloping anteriorly towards cardio-intestinal groove; posterior margin of carapace distinctly sunken below margin of last abdominal segment; anterolateral margin strongly lamelliform and plate-like from frontal view, with 3

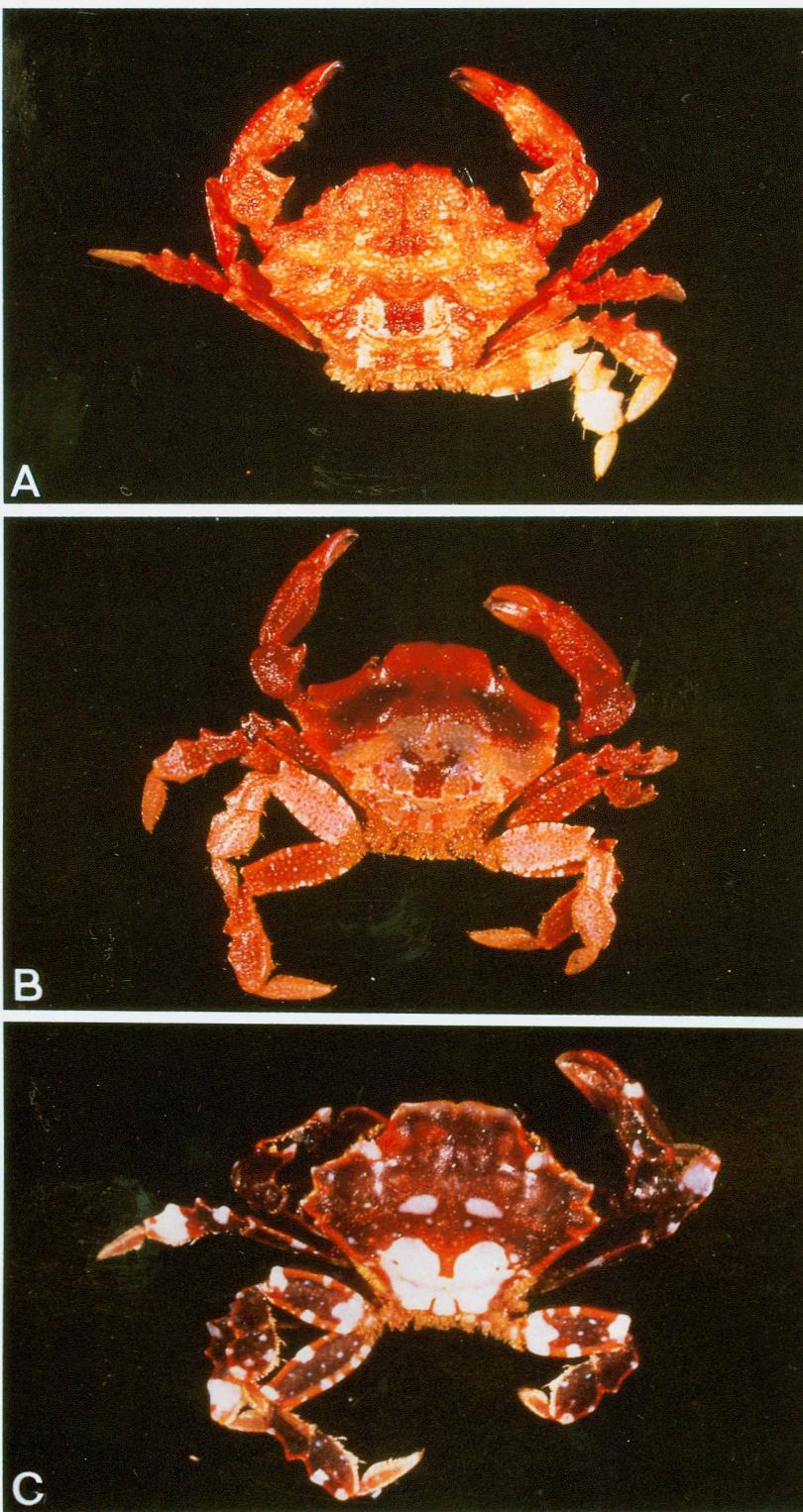


Fig. 10. A, *Antrocarcinus petrosus*, new genus and species; holotype male, cb 12.0 mm, cl 8.8 mm (MNHN). B-C, *Glyptocarcinus politus*, new species; B, holotype female, cb 15.3 mm, cl 11.4 mm (MNHN); C, paratype female, cb 8.2 mm, cl 5.9 mm (ZRC).

sharp lobiform teeth, the anterior 2 large, last much smaller; posterolateral margin distinctly converging, not continuous, anterior two-thirds straight, then curving sharply into metabranchial region. Posterior margin of epistome truncate, median lobes separated by deep grooves, not fused. Ischium of third maxilliped distinctly rectangular, width ca. 63% length; antero-external angle of merus distinctly auriculiform. Carpus of chelipeds with one large tooth on inner distal angle; dorsal margin of chela rounded, not cristate, median part strongly swollen, appearing bulbous, without spines or teeth. Suture between sternites 2 and 3 prominent, lined with small granules; suture between sternites 3 and 4 interrupted medially, lateral clefts very deep; sternite 4 with very high transverse median ridge, with anterior part sloping forwards very sharply. Male abdomen 7-segmented, with sutures between segments 3-5 distinct on the external surface but incomplete internally, segments being partially to completely ankylosed and immovable; surfaces of all male abdominal segments smooth, without large swellings. First male pleopod relatively slender, C-shaped, distal margins lined with short, strong spines; second male pleopod short, distal segment ca. 28% length of basal segment.

Etymology. - The genus name is derived from the Greek "kyrtos" for humpback, in combination with the name "carcinos" (for crab), alluding to the swelling of the cardiac region and depressed intestinal region of the type species. Gender masculine.

Table 2. Differences between *Glyptocarcinus lophopus* and *G. politus*

Character	<i>G. lophopus</i>	<i>G. politus</i>
Carapace surface	covered with small granules or pits, forming semi-reticulated pattern	appears almost smooth
Anterolateral margins	horizontal, flat, not upturned	horizontal, flat, not upturned
Cardiac region	anterior part distinct, convex, clearly demarcated, gently sloping posteriorly, forming a concave depression on each side	anterior part gently concave, not distinctly demarcated, confluent with posterior part of branchial regions to form low transverse ridge
Cardio-intestinal groove	anterior part covered by cardiac fold	most of groove covered by cardiac fold
Intestinal region	anterior part deeply excavated, partly overhung by cardiac fold; posterior part separated into 2 subregions by narrow but distinct groove	anterior part deeply excavated, almost completely overhung by cardiac fold; posterior part entire, without groove
Cheliped carpus	inner surfaces pitted, inner angle with a large, sharp tooth and smaller sub-basal tooth	inner surfaces smooth, inner angle with a large, sharp tooth and smaller sub-basal tooth
Fourth ambulatory merus	stout, length ca. 1.8 times width	slender, length ca. 2.1 times width

Remarks. - Serène *et al.* (1958) first suggested that *Harrovia truncata* might be referred to a separate genus, citing the lack of an inner supraorbital tooth, different structure of the orbit, short chelipeds and flattened ambulatory legs as possible distinguishing characters. Takeda (1973) established *Glyptocarcinus lophopus* for a new Japanese species without considering *H. truncata*, a species which Sakai (1974, 1976) later considered to be a synonym of *H. truncata*, effectively synonymising *Glyptocarcinus* and *Harrovia*. Takeda (1979) compared specimens of both species and concluded that *H. truncata* was a separate species of *Glyptocarcinus*, separate from *G. lophopus*. Re-examination of the specimens of *Harrovia truncata* from Hawaii and the type of *Glyptocarcinus lophopus* confirm Takeda's observations that *H. truncata* is not a senior synonym of *Glyptocarcinus lophopus*. The present study however, argues against including *Harrovia truncata* in the genus *Glyptocarcinus* as presently defined. *Harrovia truncata* possesses several peculiar features (see Table 1), notably in the structures of the intestinal region and sternum, which suggest that it requires a separate genus for itself.

***Cyrtocarcinus truncatus* (Rathbun, 1906) new combination**
(Figs. 11-13)

? *Harrovia truncata* Rathbun, 1906: 886, pl. 14 fig. 8, text fig. 40 (Kauai, Hawaii); Edmondson, 1951: 217, figs. 21, 22 (southwest coast of Oahu, Hawaii).

Harrovia truncata - Serène *et al.*, 1958: 196, 199, figs. 7 A (no new record); Serène, 1968: 63 (list only).

Glyptocarcinus truncatus - Takeda, 1979: 68 (Maili Point, Makua and off southwest coast, all in Oahu, Hawaii); Števčić *et al.*, 1988: 1311 (list only).

Material examined. - 1 male (cb 13.5 mm, cl 9.6 mm) (dried) (BPBM S8566), Oahu Island, Hawaiian Islands, under rocks, 75 feet deep, coll. E. H. Chave, 17.x.1976. — 2 males (cb 26.0 mm, cb 23.5 mm, cl of both specimens not determinable as posterior part missing, specimens dried and badly damaged) (BPBM S5632), "Makua": southwest coast of Oahu island, Hawaiian Islands, 40-350 feet depth, coll. Brock, 8.viii.1949.

Diagnosis. - Anterolateral teeth low, broadly triangular, lobiform (more produced in smaller specimens); cardiac region distinctly overhanging very deep cardio-intestinal groove. Inner surface of chela strongly swollen, dorsal surfaces rounded, not cristate; carpus with 1 broad, blunt tooth at inner distal angle. First male pleopod relatively slender, C-shaped, distal margins lined with short, strong spines, groove for G2 marginal, tip slightly turned upwards; second male pleopod short, distal segment distinct, ca. 28% length of basal segment.

Colour. - Edmondson (1951: 219) reported that the "... colour of living specimens white, with the exception of the chelipeds which are bright red". Takeda (1973: 69) reported that the dried coloration of one Hawaiian specimen (BPBM S8566) was "... whitish, with some brownish irregular mottles ... the chelipeds are entirely brick-red".

Remarks. - The fusion of male abdominal segments 3-5 in *C. truncatus* appears to be associated with size. In the smaller male from Oahu (cb 23.5 mm, BPBM S5632b), the sutures between the segments along the inner surface are still evident with some parts ankylosed, and the segments could still be broken off relatively easily. In the larger male (cb 26.0 mm, BPBM S5632a), all the sutures along the inner surface are fused. The male abdomen of the smallest male (cb 13.5 mm, BPBM S8566) was missing. The carapace regions of the smallest male is generally more punctate than those of the larger males.

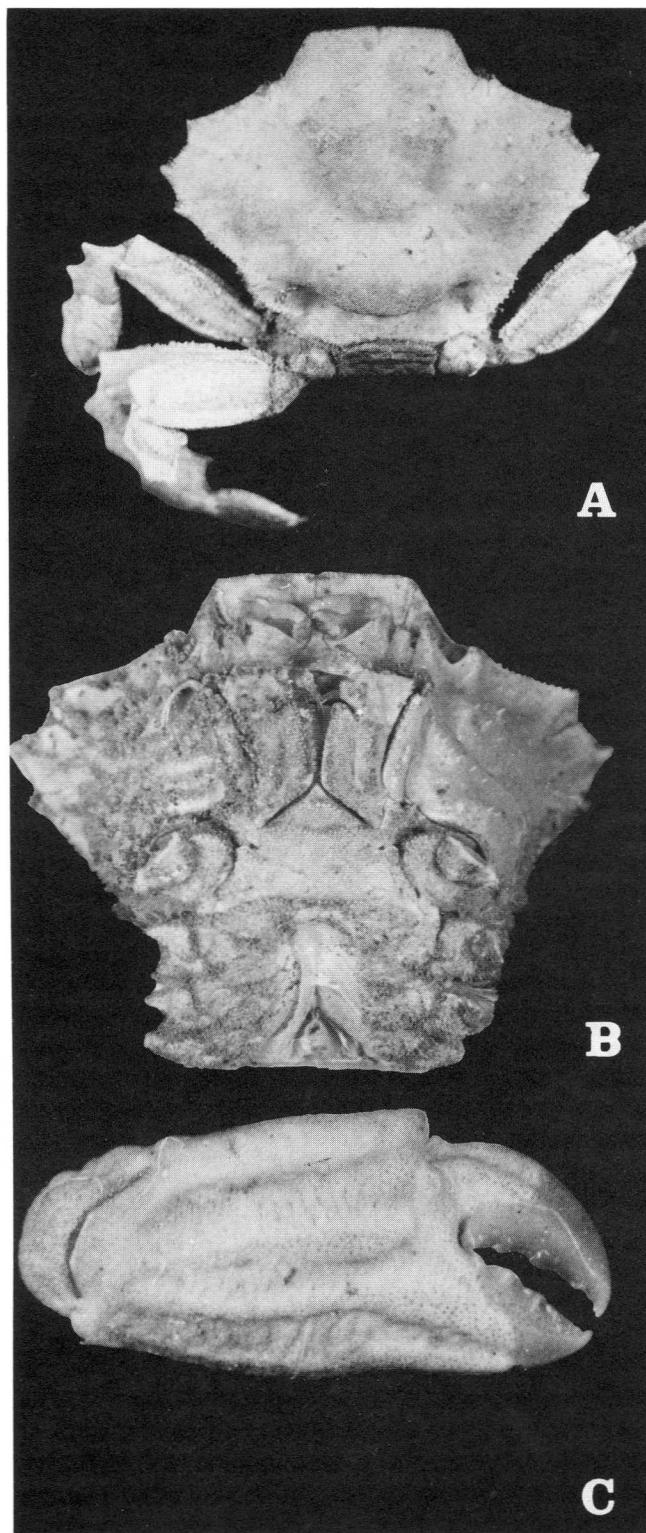


Fig. 11. *Cyrtocarcinus truncatus*. Male, cb 13.5 mm, cl 9.6 mm (BPBM S8566). A, dorsal view (posterior part of carapace broken off); B, ventral view; C, frontal view of chela.

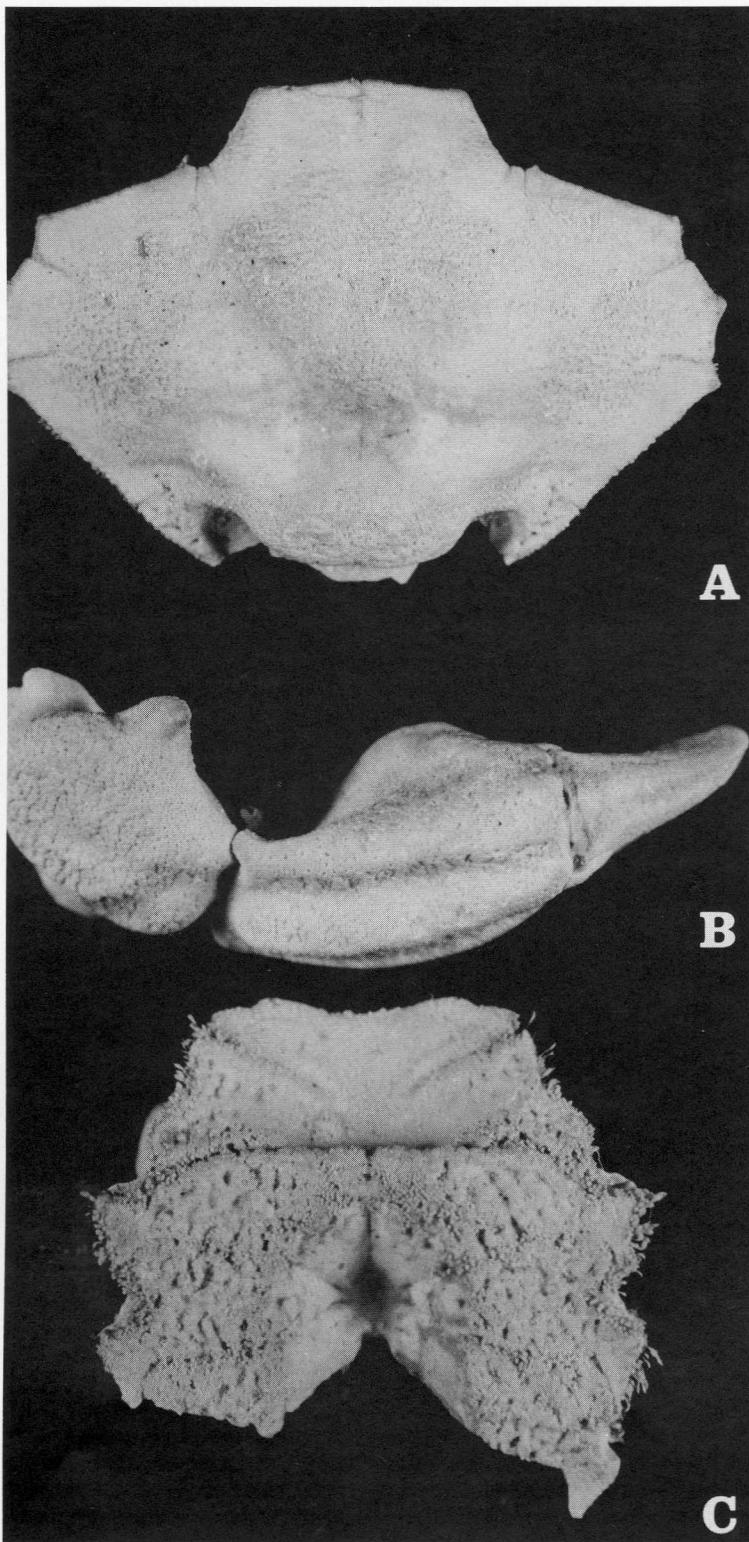


Fig. 12. *Cyrtocarcinus truncatus*. Male, cb 26.0 mm (BPBM S5632). A, dorsal view; B, dorso-marginal view of cheliped C, sternum (sternites 1 and 2 broken off).



Fig. 13. *Cyrtocarcinus truncatus*. A-G, Male, cb 13.5 mm, cl 9.6 mm (BPBM S8566); I, K, male, cb 26.0 mm (BPBM S5632); J, L-O, male, cb 23.5 mm, cl of both specimens not determinable as posterior part missing; H, P, Q (from either male cb 23.5 mm or cb 26.0 mm, not ascertainable as specimen dismembered). A, face of carapace; B, posterior margin of epistome; C, anterior sternites; D, left third maxilliped; E, posterior part of carapace (dorsal view); F, third ambulatory leg; G, fourth ambulatory leg; H, carpus of right cheliped; I, abdomen (ventral view); J, K, abdominal segments 3-5 (dorsal view); L-O, left male first pleopod; P, Q, left male second pleopod. L, O, dorsal view; M, N, ventral view. Scales = 1.0 mm.

General biology. - Rathbun (1906: 886) obtained the type from depths of 40-233 fathoms. Edmondson's (1951) specimens (BPBM S5632) had been collected by the "Makua", a government vessel which dredged at "... depths of 10 fathoms and beyond" (Edmondson, 1951: 183). The label on these specimens indicate a collection depth of between 40 to 350 feet. Takeda (1979: 68) reported two specimens in the BPBM which had been collected from much shallower water (10 and 75 feet depths).

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ERRATA

Van Weers, D. J., 1993. On the tooth morphology of the Long-tailed Porcupine *Trichys fasciculata* (Hystricida: Rodentia), with notes on the genera *Atherurus* and *Hystrix*. *Raffles Bulletin of Zoology*, 41(2): 251-261.

The enlargement factors in the figures should read as follow:

Fig. 1 (p. 253): Figure $\pm x12$.

Fig. 3 (p. 258): Figure $\pm x6$.

Fig. 4 (p. 258): Figure $\pm x9$.

Brandon-Jones, D., 1993. The taxonomic affinities of the Mentawai Islands Sureli, *Presbytis potenziani* (Bonaparte, 1856) (Mammalia: Primata: Cercopithecidae). *Raffles Bulletin of Zoology*, 41 (2): 331-357.

“Primata” in title (p. 331) should read as “Primates”.