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ON A NEW GENUS AND SPECIES OF XANTHID CRAB (CRUSTACEA: DECAPODA: BRACHYURA) FROM CHESTERFIELD ISLAND, CORAL SEA

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Abstract.—A new genus and species of xanthid crab, *Cranaothus deforgesi,* is described from Chesterfield Island. *Cranaothus* appears to be closely related to *Paramedaeus, Metaxanthops, Macromedaeus, Medaeops, Neoxanthops, Glyptoxanthus* and *Lipaesthesius,* but differs in the form and sculptures on the carapace, as well as structures of the sternum, male abdomen and male first pleopod. The larger cheliped of *Cranaothus* also possesses a specialized basal cutting tooth on its dactylus.

A collection of Brachyura from Chesterfield Island was deposited in the Muséum national d'Histoire naturelle (MNHN), Paris, by ORSTOM (Institut Français de Recherche Scientifique pour le Dévelopement en Coopération). Among these specimens was an interesting crab from Chesterfield Island with several peculiar features distinguishing it from all other known genera and species in the family Xanthidae MacLeay, 1838 (sensu Guinot 1978).

The description of this new genus and species forms the text of the present paper. Abbreviations G1 and G2 are for the male first and second pleopods respectively. Measurements are reported in millimeters, in the sequence carapace width by carapace length.

Systematic Account

Family Xanthidae MacLeay, 1838 (sensu Guinot, 1978)
Subfamily Euxanthinae Alcock, 1898 (sensu Serène, 1984)
Cranaothus, new genus

Diagnosis.—Carapace quadrate, regions not well defined; dorsal surfaces with very small squamiform granulations; branchial, gastric, cardiac and intestinal regions with eroded vermiform granulated ridges; front distinctly produced; lobes truncatiform, separated by deep fissure extending to epigastric region; external orbital angle low, indistinct, not clearly demarcating beginning of anterolateral margin, joining series of smaller granules curving gently downwards below supraorbital margin, across suborbital region and towards buccal cavity; anterolateral margin not lobulated or toothed, anterior ⅔ arcuate, posterior ⅓ subparallel to median longitudinal carapace axis; posterolateral margins gently concave. Sternites 2–4 broad, sternal suture 1 and 2 complete, sternal sutures 2 and 3, and 3 and 4 interrupted medially. Chelipeds distinctly asymmetrical, fingers sharp, without pigmentation, larger cheliped with pronounced molariform basal cutting tooth on dactylus. Lateral margins of fused male abdominal segments 3–5 entire, continuous; segment 7 semicircular, lateral margins strongly convex, tip rounded.

Type species.—*Cranaothus deforgesi,* new species, by monotypy.

Etymology.—The generic name is derived from the Greek "kranaos" for "rugged and rocky" (alluding to the eroded carapace surface), in arbitrary combination with a final syllable of many xanthid genera. Gender masculine.

Remarks.—In its external features *Cranaothus,* new genus, appears to be closest to the genus *Paramedaeus* Guinot, 1967; however, it differs in that the anterolateral margin is not cut into distinct teeth (weak or otherwise), the front is very produced and lamellar, with the median fissure very deep; sternites 2–4 distinctly broader, sternal suture 1 and 2 being distinct (absent in *Paramedaeus*), sternal suture 2 and 3 interrupted medially (entire in *Paramedaeus*); male abdominal segment 7 semicircular in shape (distinctly triangular in *Paramedaeus*); distal part of the G1 is long, slender and strongly tapering, the tip being relatively sharp (distal part stout and tip rounded in *Paramedaeus*) (Guinot 1967, Serène 1984).

With regard to the shape of the carapace, *Cranaothus* resembles Indo-West Pacific genera such as *Metaxanthops* Serène, 1984, *Macromedaeus* Ward, 1942, and *Neoxanthops* Guinot, 1968, but differs in many key aspects. The front margin of *Cranaothus* is somewhat similar to that of *Metaxanthops,* with two broad and truncate lobes separated by a deep median fissure. *Metaxanthops* however, differs from *Cranaothus* in having well developed and distinct epibranchial teeth and a much smoother carapace surface. The general shape of the G1 in *Metaxanthops,* although similar, is distinctly stouter and the distal part is not slender and tapering (Serène 1984: fig. 129). The anterolateral margin of *Cranaothus* resembles *Macromedaeus nudipes* (Milne Edwards, 1867), but the structure of the front is different, with the lobes more sinuous and less projected forward in *Macromedaeus.* In *Macromedaeus,* the two frontal lobes are also separated only by a cleft, without the deep fissure present in *Cranaothus.* While the regions are well defined in *Macromedaeus,* they are only vaguely so in *Cranaothus.* The G1 of *Cranaothus* differs substantially from those of *Macromedaeus,* being proportionately shorter, stouter and different in shape (Serène 1984: figs. 101–104).

The carapace shape of *Cranaothus* is perhaps closest to *Neoxanthops,* especially in species like *N. cavatus* (Rathbun, 1907) which also has ridges on the dorsal surface. In *N. cavatus,* however, the frontal lobes are separated only by a shallow cleft, not a deep fissure, and the anterolateral margin is cut into distinct lobes. The G1 of *Cranaothus* is also proportionately shorter, with a different shape, and the distal part is tapered and very slender, compared to that of typical *Neoxanthops* (see Serène 1984: figs. 127, 128). *Neoxanthops cavatus* is not a typical member of *Neoxanthops* and should probably be transferred to a new genus. It differs markedly from the type species of the genus, *N. lineatus* Milne Edwards, 1867, in many aspects, viz. the anterolateral margin gradually becomes more obscure and gently curves to end below the orbits, and does not meet the external orbital angle or supraorbital margin; the frontal margin is not distinctly produced beyond the internal angle of the supraorbital margin; the anterolateral margin is not distinctly cristiform; the surface is more distinctly domed, distinctly sculptured, appears eroded, and instead of gently convex and completely smooth; the fingers of the chelipeds are very short instead of pigmented; and the subdistal part of the G1 has only a few short, simple hairs, moderately long, setose hairs.

Cranaothus also differs from *Macromedaeus, Neoxanthops* and *Metaxanthops* in that the dactyls of the larger cheliped have a molariform basal cutting tooth absent in the other genera.

With regard to the sculpturing on the carapace surface, *Cranaothus* somewhat resembles the genus *Glyptoxanthus* Milne Edwards, 1873–1881, which is represented in the Indo-West Pacific region by *G. meandrinus* (Klunzinger, 1913). The anterolateral margin of *Glyptoxanthus,* however, is cut into distinct teeth, the front is not projecting but is about level with the orbits, the frontal lobes are not separated by a deep fissure, the dactylus of the cheliped lacks the

special basal cutting tooth, and the last male abdominal segment is distinctly triangular, with a sharp tip and the lateral margins almost straight (Odhner 1925: pl. 4 fig. 1, Guinot 1979: pl. 6 fig. 7). In *Cranaothus,* the last male abdominal segment is semicircular. There is also some resemblance to crabs of the genus *Medaeops* Guinot, 1967, although the shapes of the carapaces differ. Interestingly, *Medaeus granulosus* (Haswell, 1882) has a weak basal cutting tooth on the dactyls of the chelipeds.

The shape and form of the carapace of *Cranaothus* also bears a marked similarity to an eastern Pacific monotypic genus, *Lipaesthesius* Rathbun, 1898, represented by *L. leeanus* Rathbun, 1898. Like *Cranaothus,* the surface of the carapace in *Lipaesthesius* is covered by many small granules, forming uneven patterns. *Lipaesthesius* differs from *Cranaothus* in the following aspects: point of attachment of antennal flagellum concealed by upper margin of basal segment (point of attachment of flagellum distinct and not concealed in *Cranaothus*); granule patterns on dorsal surface of carapace not vermiform; front not produced forward and without deep median cleft; posterolateral margin strongly concave (more so than in *Cranaothus*), forming distinct "waist"; junction between antero- and posterolateral margins not clearly demarcated, the anterolateral margin gradually curving posteriorly; carpus of cheliped very elongate; chelae symmetrical; fingers of cheliped long and slender and pigmented dark brown (Rathbun 1930:272, pl. 112).

Serène's (1984) separation the subfamilies Euxanthinae Alcock, 1898, and Xanthinae MacLeay, 1838, is not satisfactory as there appears to be a degree of overlap in some of the characters used by him. The establishment of *Cranaothus* further complicates matters because, while the genus seems to belong to what Serène (1984) defined as Euxanthinae (cf. *Medaeops, Paramedaeus, Glyptoxanthus*), it also bears a striking resemblance to some members of the Xanthinae (cf. *Neoxanthops, Metaxanthops, Macromedaeus*). The genus is placed in the Euxanthinae based on the absence of a clearly defined anterolateral margin behind the external orbital angle in *Cranaothus,* with the row of granules curving along the suborbital region toward the buccal cavity.

Cranaothus deforgesi, new species
Figs. 1–3

Paramedaeus noelensis.—? Serène & Umali, 1972:68, pl. 7 figs. 7–9 [nec *Paramedaeus noelensis* (Ward, 1934)].

Material examined.—Holotype male (carapace 8.0 by 5.9 mm), (MNHN), Chesterfield Island, Coral Sea, station 144, 19°27.73′S, 158°23.28′E, ca. 50 m depth, sand and *Halimeda* algae substrate, dredge, leg. B. Richer de Forges, 30 Aug 1988.

Description of holotype male.—Carapace regions not well defined, grooves separating gastric and branchial regions shallow, 2F, 1M, 3M regions low but discernible, 4M indistinct, L and R not defined; H-shaped groove separating cardiac and gastric regions distinct; dorsal surfaces covered with very small squamiform granulations; branchial, gastric, cardiac and intestinal regions with uneven eroded ridges, forming vermiculated pattern; pterygostomial, suborbital and sub-branchial regions granulose. Density of granules and granulations somewhat obscures sutures between pterygostomial, sub-branchial and suborbital regions as well as base of chelipeds, ambulatory legs and sternum. Front distinctly produced beyond imaginary line connecting internal supraorbital angle; distinctly bilobed, lobes separated by very deep fissure extending back to epigastric region; surfaces smooth, margin truncatiform, gently concave. Supraorbital margin with clearly defined rounded inner angle, separated from front by distinct groove; external orbital angle low, indistinct, not clearly demarcating beginning of anterolateral margin; rest of supraorbital

margin entire, gently sinuous. Internal infraorbital angle with distinct tooth visible from dorsal view. Anterolateral margin arcuate along anterior ⅔, becoming straight along posterior ⅓ (approximately parallel to median longitudinal axis of carapace); not divided into distinct lobes or teeth, without any distinct cristate borders or clefts; 1 tubercle visible shortly behind external orbital angle, followed by 3 larger ones on arcuate part of margin; straight part of anterolateral margin marked by blunt tubercle on each edge; anterolateral margin distinctly separated from gently concave, converging posterolateral margins. Posterior margin of carapace gently convex. Antennules folding transversely, antennular fossae partly covered by protruding front from frontal view. Antennal flagellum short, attached to stout basal segment occupying entire space between antennular fossa and internal orbital angle. Endostome with weak median longitudinal ridge and strong, oblique ridge on either side of posterior part, adjacent to mouth.

Entire outer surface of third maxilliped finely granulose, that on merus appearing more eroded; ischium rectangular, median oblique sulcus very shallow, indistinct; merus quadrate, with median oblique patch of eroded granules; outer surface of carpus rounded, granuliform; exopod reaching anterior edge of merus, with blunt triangular subdistal tooth on inner margin, flagellum long.

Sternum broad, entire surface covered with eroded granules, appearing squamate; suture between sternites 1 and 2 distinct, complete, sutures between sternites 2 and 3, and 3 and 4 shallow, interrupted medially, sutures between sternites 4 and 5, 5 and 6, and 6 and 7 incomplete; abdomen reaching to imaginary line joining posterior bases of chelipeds. Gonopore coxal, opening below abdominal segment 3.

Chelipeds distinctly asymmetrical; outer surfaces of merus, carpus and chelae covered with very small scale-like granulations and vermiform eroded ridges; carpus short, rounded, inner distal angle with distinct blunt tooth and uneven anterior subdistal serrations; fingers not pigmented black or brown, appearing white in preservative; larger cheliped with pronounced molariform basal cutting tooth on dactylus directed obliquely outward; minor cheliped with elongated fingers.

Abdomen with segments 3–5 completely fused, sutures separating these segments not discernible, lateral margins entire, without any clefts or discontinuity; segments 1–3 trapezoidal, segment 6 squarish, lateral margins straight, parallel; segment 7 semicircular, lateral margins strongly convex, tip rounded; surfaces of all segments slightly rugose to squamate.

G1 relatively short and stout, proximal part gradually tapering, distal part straight, very slender, distinctly tapering to sharp tip; lateral margins of slender distal part lined with short spines; subdistal part with numerous long, stout setiferous hairs. G2 short, slender, distal part with petaloid process.

Etymology.—The species is named after Bertrand Richer de Forges, who so kindly made the ORSTOM specimen available for study.

Remarks.—The single known specimen of *Cranaothus deforgesi,* new species, is mature despite its small size because the gonopods are fully developed. The vermiform ridges on the carapace and chelipeds are formed by patches of very small granules and are easily chipped and scraped off. This accounts for the species' eroded appearance.

Cranaothus deforgesi bears a striking resemblance to a specimen from the Philippines identified as *Paramedaeus noelensis* (Ward, 1934) by Serène & Umali (1972). Serène & Umali's (1972:68, pl. 7 figs. 7–9) specimen, was a male 8.5 by 5.5 mm from Maluso Bay, collected from a depth of 25 m by the Pele Sulu Expedition in 1964. The specimen has a very produced and lamellar

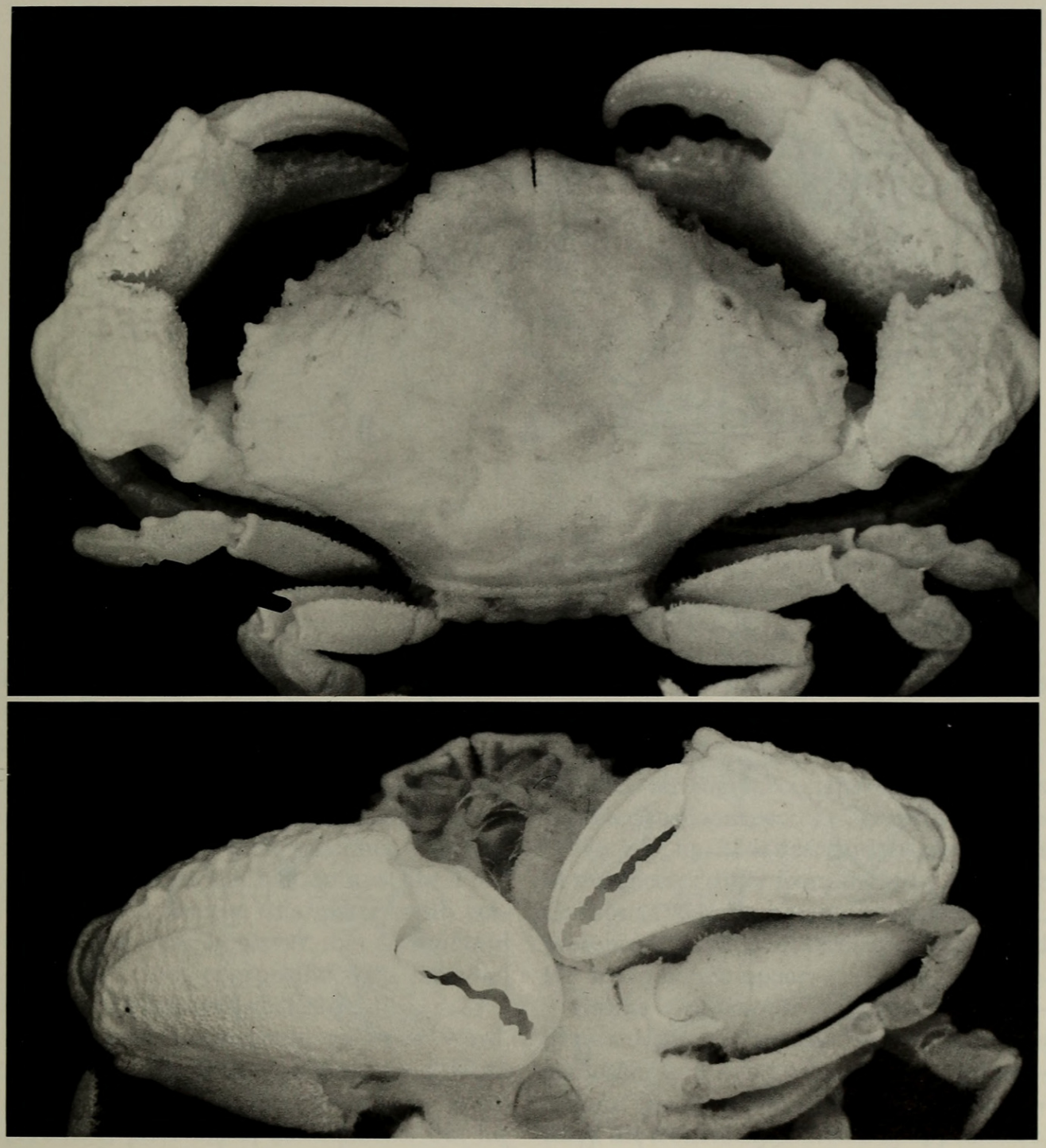

Fig. 1. *Cranaothus deforgesi,* new genus and species. Holotype male, carapace 8.0 by 5.9 mm, MNHN, Chesterfield Island. A, dorsal view; B, chelae.

front, and the median fissure appears to be very deep. The shape of the carapace, sculpture of the surface (covered with granulated vermiculations) and form of the postero-lateral margin, also resemble *C. deforgesi.* Serène & Umali (1972:69) commented on the differences between their Philippine specimen and Ward's (1934) description of *P. noelensis,* noting that in their specimen ". . . the postero-lateral border is concave instead of being straight . . . [t]he breadth is 1.41 its length instead of 1.47, the proportion in the specimen of Forest & Guinot (1961). . . . the front in our specimen is more salient, more pointed medially with the sinus more open." It appears that Serène &

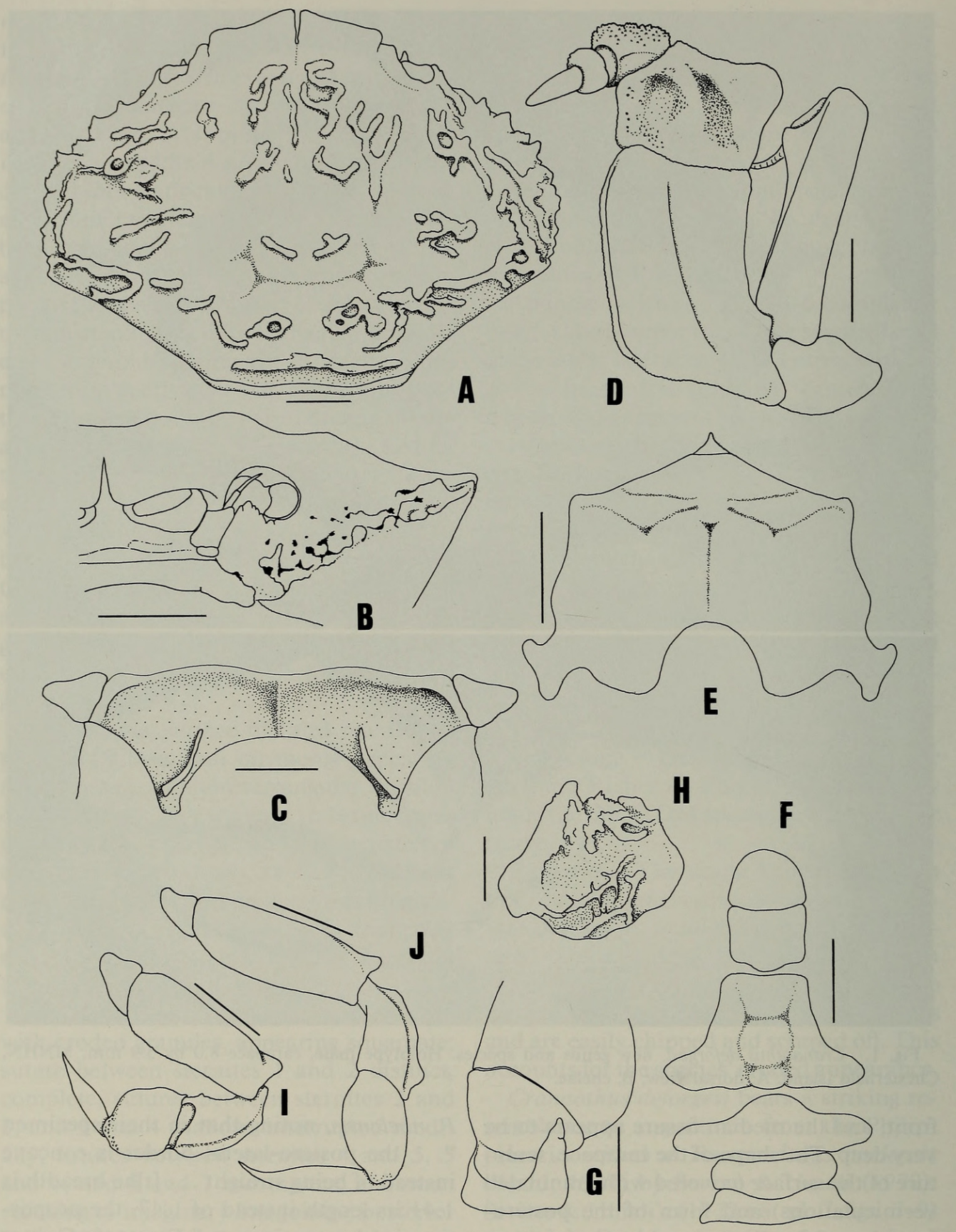

Fig. 2. *Cranaothus deforgesi,* new genus and species. Holotype male, carapace 8.0 by 5.9 mm, MNHN, Chesterfield Island. A, dorsal view of carapace; B, frontal view of carapace; C, buccal cavity showing endostomial ridges; D, left third maxilliped (denuded, most of granulation not shown); E, sternites 1–4; F, abdomen; G, coxa, basis-ischium and merus of left cheliped; H, right carpus of cheliped (dorsal view); I, right fourth ambulatory leg; J, right third ambulatory leg. Small granules and squamate structures on surfaces of carapace, third maxilliped, sternum, chelipeds and abdomen omitted. Scales: A, B, E–J, 1.0 mm; C, D, 0.5 mm.

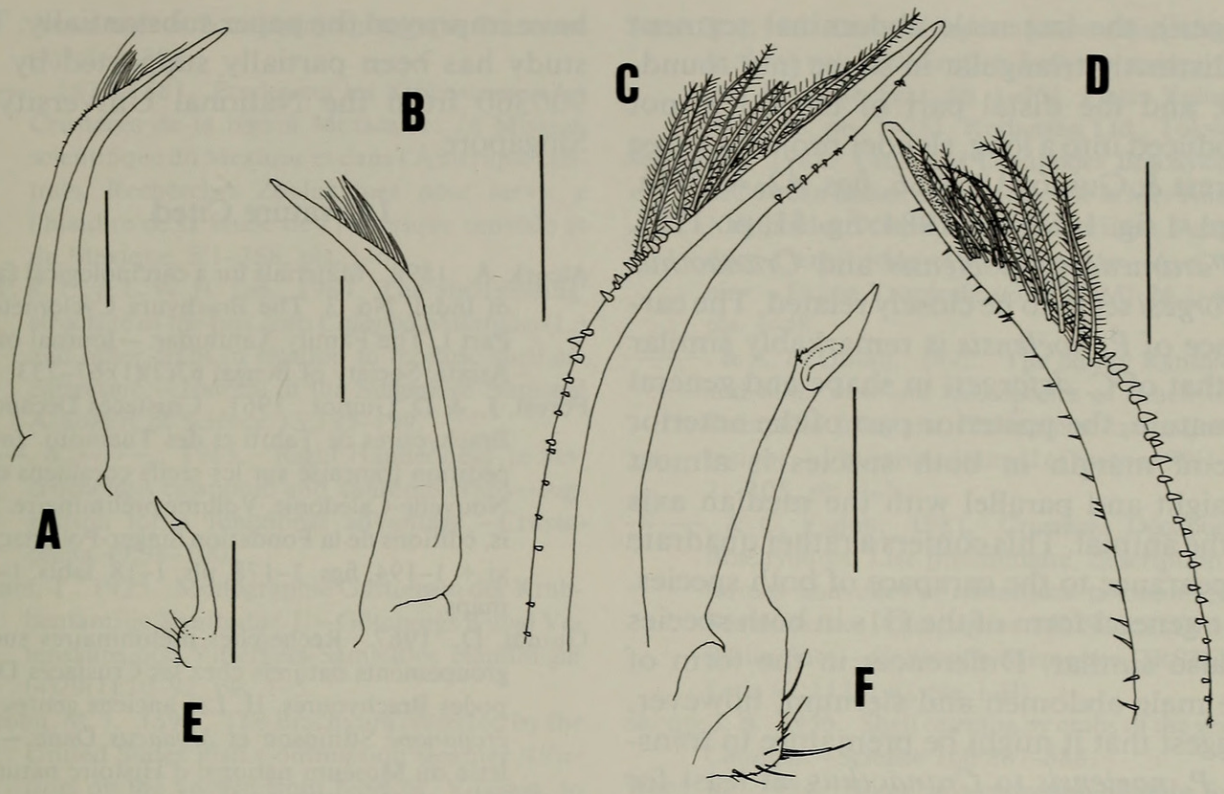

Fig. 3. *Cranaothus deforgesi,* new genus and species. Holotype male, carapace 8.0 by 5.9 mm, MNHN, Chesterfield Island. A–D, left G1; E, F, left G2. A, C, F, ventral view; B, D, E, dorsal view. Scales: A, B, E, 0.5 mm; C, D, F, 0.25 mm.

Umali's (1972) specimen is actually conspecific with *Cranaothus deforgesi.* Only a re-examination of their specimen (supposedly in the National Museum of the Philippines) will resolve this matter with certainty. It is clear, however, that *Cranaothus deforgesi* is not conspecific with *Paramedaeus noelensis* (Ward, 1934).

As regards *Paramedaeus noelensis* (Ward, 1934), the species was described from Christmas Island, Indian Ocean, by Ward (1934:17, pl. 1 fig. 1) as *Medaeus,* but his descriptions are brief and his figures rather schematic. Forest & Guinot (1961:56, pl. 1 fig. 1, text figs. 42, 43, 44a, b) redescribed and refigured the species after examining the type and additional specimens from Upolu and Tahiti. Guinot (1967) subsequently proposed transferring the species to a new genus, *Paramedaeus,* and this was followed by Sakai (1976) and Serène (1984). The species is known from Christmas Island, Madagascar, Upolu, Tahiti, Japan and the Philippines. However, there are doubts as to whether all the specimens of this species reported are conspecific. Certainly, Sakai's (1976:426, fig. 224) descriptions and figures of the species differ from those by Forest & Guinot (1961) in having a shorter front, presence of distinct anterolateral teeth, and the smoother carapace.

Unlike *Cranaothus deforgesi,* the carapace surface of *Paramedaeus noelensis* is smoother and has no granulated vermiculations; the carapace regions are more distinct; the front is not lamellar in appearance, is less produced and lacks the deep median fissure; the posterolateral margin is almost straight to slightly convex (distinctly concave in *C. deforgesi*); the outer surfaces of the carpus of the cheliped are less rugose; the sternal structure has a distinctly wider space between sternal sutures 2 and 3, and 3 and 4; the second male abdominal segment has no transverse ridges; the lateral edges of the fused male abdominal segments three and four have a distinct deep cleft on each side (entire and continuous in *C. de-*

forgesi); the last male abdominal segment is distinctly triangular in shape (not rounded); and the distal part of the G1 is not produced into a long, slender projection (see Forest & Guinot 1961:56, figs. 42, 43, 44a, b, pl. 1 fig. 1; Serène 1984: fig. 51, pl. 12F).

Paramedaeus noelensis and *Cranaothus deforgesi* seem to be closely related. The carapace of *P. noelensis* is remarkably similar to that of *C. deforgesi* in shape and general armature, the posterior part of the anterior lateral margin in both species is almost straight and parallel with the median axis of the animal. This confers a rather quadrate appearance to the carapace of both species. The general form of the G1s in both species is also similar. Differences in the form of the male abdomen and sternum, however, suggest that it might be premature to transfer *P. noelensis* to *Cranaothus,* at least for the time being.

The unusual molariform basal cutting tooth on the dactylus of the cheliped is reminiscent of that in crabs of the genus *Calappa* (Calappidae) which is used for "peeling" gastropod shells (Shoup 1956, Ng & Tan 1984). In these crabs, the right cheliped is almost always the larger one and possesses the basal cutting tooth. Ng & Tan (1985) suggested that this was because marine gastropods have dextral coiling. The well developed condition of the cutting tooth in *Cranaothus* strongly suggests that the crab is also a "peeler" like *Calappa.* Interestingly, in the specimen recorded by Serène & Umali (1972) (as *Paramedaeus noelensis*) from the Philippines, the right chela is also the larger and has a basal cutting tooth.

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