

Two new genera of the family Pilumnidae (Crustacea : Decapoda : Brachyura) from Queensland, Australia

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Two new genera of Pilumnidae each with a single new species are described from southeastern Queensland waters. *Priapilumnus* is defined by the greatly swollen base and simple blunt apex of the male first pleopod and the concomitant posteriorly protruding, bilobed, third abdominal segment. *Takedana* is separable by the very short spinous anterolateral margins, the swollen branchial regions, the moderately short walking legs, and the strongly spined chelae. *Actumnus pugilator* is reassigned to *Bathypilumnus* Ng and Tan, 1984.

KEYWORDS: Crustacea, Brachyura, Pilumnidae, *Priapilumnus*, *Takedana*, *Parapilumnus*, *Bathypilumnus*, genus nov., species nov., Australia.

Introduction

The Pilumnidae is a large family of usually small, relatively similar looking crabs. The genus *Pilumnus* in particular is very large and has for many years been a 'catch-all' for a great variety of species even though it is clear that it is far from a homogeneous assemblage. Identification of pilumnids is still difficult as there has been no significant revisionary work and so many of the early descriptions were poor, with little account of intraspecific variation, and either unaccompanied by, or with very poor illustration. Many of the genera are poorly and only subjectively defined and no key exists to separate them adequately. It could be argued that in such a climate of taxonomic uncertainty the erection of new genera is a little precipitate, however, on the contrary, such work is slowly helping to focus attention on the characters that are important for a later full revisionary study. Papers such as Galil and Takeda (1988), in which *Glabropilumnus* was shown to be a complex of five genera, emphasize the magnitude of the problem.

In the course of work on the Australian Xanthoidea, being supported by a grant from the Australian Biological Resources Study, two new species belonging to the Pilumnidae were discovered in the collections of the Queensland Museum. They are both quite distinctive and defy attempts to lump them into any existing genus. They are therefore placed into two new genera here described.

All material is housed in the Queensland Museum, Brisbane (QM) and the Museum National d'Histoire Naturelle, Paris (MP); dimensions unless otherwise stated are of carapace width, and all drawings were made with the aid of a camera lucida.

Priapilumnus gen. nov.

Diagnosis. Carapace a little broader than long, moderately convex from side to side and from front to back, but with markedly convex frontal region. Regions apparent but not strongly indicated. Carapace, chelae, and walking legs all evenly covered in short setae but not so as to hide shell features. Front with broad convex median lobes and strong pre-orbital spines. Supraorbital margin with median notch; inferior margin with lateral sulcus and large triangular tooth at inner end which is visible in dorsal view. Anterolateral borders a half, or a little more, the length of posterolateral borders; cut into four tuberculate teeth. Chelae of similar shape, one slightly the larger; covered in stout, broad evenly-spaced spines; fingers pointed. Walking legs relatively short and stout. Sternum narrow, sternite eight hidden by abdomen, union between sternite seven and its episternite also hidden by abdomen. Male genital openings coxal. Male abdomen projects markedly behind carapace, with segment three laterally bulbous. Male first pleopod extremely swollen over basal two-fifths, apex simple and bluntly pointed; second pleopod correspondingly dilated distally. Palatal ridges extend to anterior border of buccal cavern.

Remarks. The type-species is *Priapilumnus nimbus* sp. nov.

The most important characters distinguishing this genus are the enormously swollen base of the first male pleopod and the corresponding protuberant and laterally bulbous abdomen. The first male pleopod ends in a blunt point instead of having the tip reflexed as is typical of many pilumnids, although this character is far from uncommon in the family. The closest relatives would seem to be species currently considered to belong to *Parapilumnus* (*sensu* Balss, 1933). This is based simply on carapace and leg proportions, relative hairiness, and a tendency towards similar tuberculation of the chelae.

Etymology. The name is derived from Priapus, the Roman god of fertility, and refers to the swollen gonopods. Gender is masculine.

Priapilumnus nimbus sp. nov.

(Figs 1 a–h, 2 a–c, 5 a)

Material examined. HOLOTYPE, QM W14872, ♂ (9.3 mm), trawled Stn 19, 'Nimbus' Cruise 1/68, 26°49'S, 153°37'E, 184 m, 27.vii.1968, A. J. Bruce.

ALLOTYPE, QM W12417, ovig. ♀ (11.8 mm) same data as holotype.

PARATYPES, QM W12418, ovig. ♀ (11.0 mm), trawled Stn 11, 'Nimbus' Cruise 1/68, 26°31'S, 153°43'E, 184–188 m, 26.vii.1968, A. J. Bruce. QM W12416, 2♀ (9.0, 8.6 mm) trawled Stn 25 'Nimbus' Cruise 1/68, July 1968, A. J. Bruce, no further data. QM W12403, 3♂ (7.4, 8.7, 9.7 mm) trawled Stn 26, 'Nimbus' Cruise 1/68, 27°00'S, 153°39'E, 184 m, 28.vii.1968, A. J. Bruce. QM W12419, 1♀ (8.7 mm), trawled 30 miles due east of Mooloolabah, SE Queensland, 128 m, 13.viii.1967. R. Elks. QM W12279, ♂ (15.6 mm), trawled 'Soela' Cruise 6, Stn 65, Coral Sea, 17°35'S, 149°56'E, 302 m, 3.xii.1985, P. Davie. QM W12366, ♂ (10.3 mm), trawled 'Soela' Cr 6, Stn 66, Coral Sea, 4.xii.1985, P. Davie. QM W12281, ♂ (12 mm), 2 ovig. ♀ (10.4, 15.7 mm), trawled 'Soela' Cr. 6, Stn 87, 100 km NE of Lucinda, 18°07'S, 147°11'E, 200 m, 9.xii.1985, P. Davie.

Description

Carapace. c. 1.25–1.3 × broader than long, evenly but moderately convex from side to side across the branchials with slight upturning of anterolateral angles. Slightly convex longitudinally but with markedly convex frontal region. Regions apparent but

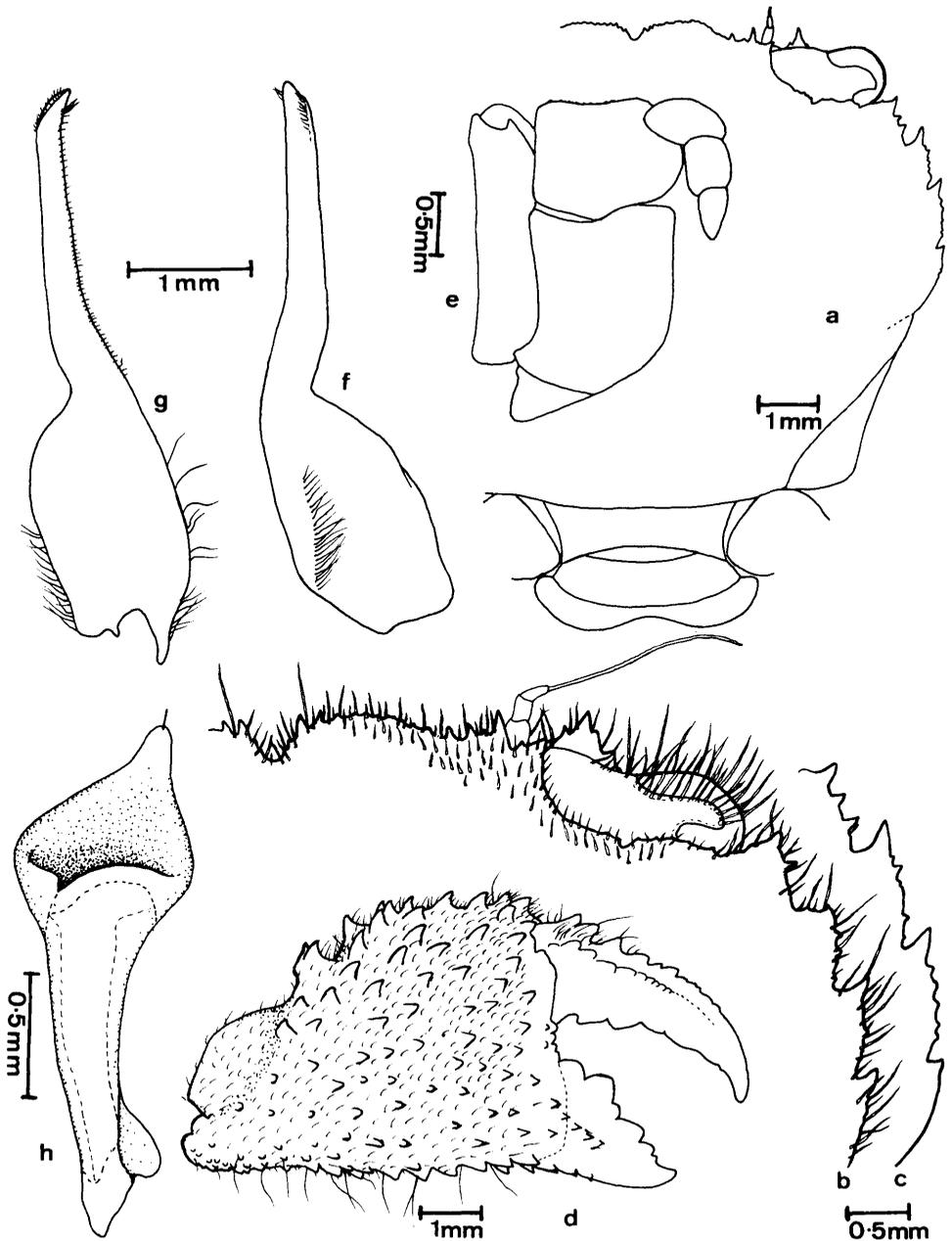


FIG. 1. *Priapilumnus nimbus* sp. nov., male paratype (QM W12279): a, carapace outline (denuded); b, carapace, right front and anterolateral border; c, anterolateral border of a second paratype male showing variation in dentition; d, right chela; e, third maxilliped (denuded); f, male first pleopod, abdominal face; g, same, sternal face; h, male second pleopod.

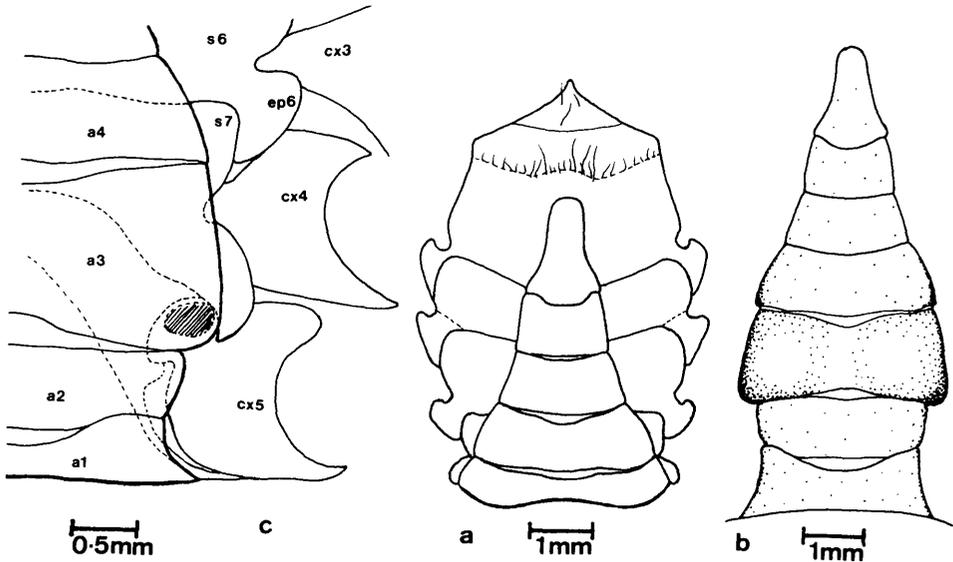


FIG. 2. *Priapipilumnus nimbus* sp. nov., male paratype (QM W12279): a, ventral view of male abdomen and sternal plastron; b, male abdomen; c, lateral view showing conformation of male abdomen, coxae of walking legs, sternal plates and position of gonopore.

not strongly indicated, and separated by broad shallow furrows. Evenly covered in short stiff golden setae, slightly longer at the margins; between setae surface is smooth and shiny. Front sinuous, with clearly defined convex median lobes; margin tuberculate, tubercles slightly more strongly developed at inner edge of each lobe near the broad median sulcus, a single long stout bristle on either side of median sulcus is obvious; and tubercles also enlarged laterally with a large pre-orbital spine. Inner orbital angle acute, upper margin with distinct median notch, laterally sinuous, finely tuberculate. Inferior border with lateral sulcus; tuberculate, with tubercles increasing in size medially; inner end formed into very large triangular tooth, clearly visible in dorsal view, and with sharp accessory tubercles. Basal antennal joint with 2–3 spinous tubercles on distal border which are also visible in dorsal view.

Anterolateral border is relatively short, a half or a little more than half the length of the posterolateral borders (c. 0.5–0.6); cut into four teeth each capped by a strong spinous tubercle, the first three are broad and of similar size, the fourth is much smaller; all have small accessory tubercles. Greatest carapace width at level of third or sometimes fourth anterolateral teeth. Posterolateral margins convergent; in larger specimens carapace may be a little swollen behind fourth tooth but in most specimens posterolateral margins are quite straight.

Third maxilliped with merus wider than long, antero-external angle square-cut, inner border rounded, c. 0.64 × length of ischium; ischium c. 0.8 × as wide as long, stout long setae lining inside edges of merus and ischium, otherwise only sparsely haired. Palatal ridges well developed and extending to anterior border of buccal cavern.

Chelae, similar although one, usually the right, is slightly larger; the larger chela has a noticeably enlarged tooth differentiated in the proximal half, whereas the teeth of the smaller chelae are of a more even height. Palm is covered in evenly-spaced, stout, broad spines, these continue as a row on to the proximal half of the fixed finger. Between the spines are short setae like those on the carapace. The moveable finger has three rows of

spines along the proximal two-thirds of the dorsal margin which decrease in size distally. Fingers pointed, length of moveable finger about equal to length of palm in mid-line. Inner face of palm smooth and glabrous. Merus short and stout, subequal in size to carpus. Hind margin smooth with predistal notch, anterior, inferior, and superior margins with low crenulations. Carpus with dorsal furrow parallel to articulation, low spines either side of furrow continue around borders distally; behind these spines the surface is smooth and finely punctate; whole surface covered in low golden setae like those on the claws and carapace.

Sternum relatively narrow; sternite eight reduced and completely hidden by abdomen; sternite seven also reduced with episternite appearing separated from main sternite when viewed with abdomen in place. Male genital openings are coxal.

Ambulatory legs relatively short and stout. Merus of fourth leg *c.* 2.3 × longer than wide; merus and carpus both stout and broad, carpus *c.* 1.2 × longer than wide; dactylus about same length as carpus, pectinate tip. Second pair of legs the longest (*c.* 1.35 × longer than carapace width) and relatively narrower than fourth pair; dactylus longer than carpus. All legs fringed with closely set fine bristles and covered with short setae; otherwise smooth and glabrous.

Male abdomen with first three segments projecting behind the carapace so that they are clearly obvious in dorsal view. Segments one and two both quite long and of similar dimensions. Third segment the widest, and laterally bulbous. Segments four, five, and six of similar length, tapering. Telson relatively long and thin (length *c.* 1.4 × width), rounded apex.

Male first pleopod extremely swollen for about the basal two-fifths of its length (width about one quarter of total length), then suddenly constricted and of more normal dimensions distally; distal three-fifths relatively straight, slightly tapering, apex simple and bluntly pointed; bristles and setae are disposed as shown on accompanying figure. Male second pleopod extremely dilated distally, tapering quickly to blunt rounded apex; a single short bristle at tip. The swollen base of gonopod 1 corresponds with the laterally bulbous and protruding third abdominal segment.

Colour after alcohol preservation is a uniform creamy yellow; the fingers of the chelae show no evidence of darker colouring as is common amongst the Xanthoidea.

Distribution. Only known from eastern Queensland.

Habitat. No information is available concerning bottom type, however all specimens were trawled from depths between 128 and 188 metres so it is a moderately deep water species.

Etymology. The specific name is taken from the research vessel that was used during the collection of the specimens.

Takedana gen. nov.

Diagnosis. Carapace broader than long, regions not defined but branchial regions swollen; anterolateral border very short and not clearly separated from posterolateral border, armed with three small pointed tubercles behind the exorbital spine which are hardly distinguishable from other accessory tubercles. Frontal border broadly bilobate, and with small preorbital tubercles. Antennal peduncle included in the orbital hiatus. Third maxilliped with merus much smaller than ischium. Chelae unequal but not markedly and of different form; both armed with rows of large thorn-like spines which may be blunted and flat-topped on the larger chela; larger chela with thick covering of setae on at least part of the surface, smaller chela naked except for scattered

setae. Ambulatory legs of moderate length, and may be armed with spinules on anterior border of carpus and propodus. Male genital openings coxal; sternite eight hidden beneath abdomen. Abdomen relatively narrow and evenly tapering, with telson longer than broad. Male first pleopod long slender and sinuous with simple pointed tip; not recurved.

Remarks. The type-species is *Takedana eriphioides* sp. nov.

The affiliations of *Takedana* are difficult to ascertain. It shows superficial likeness to members of *Viaderiana* Ward, 1942, and *Parapilumnus* Kossmann, 1877 (*sensu* Balss, 1933). *Viaderiana* has been reviewed by Serène (1971), Takeda (1971), Türkay (1986), and Ng (1987) and is apparently polyphyletic and in need of revision. Nevertheless all species currently included in that genus differ from the present species by: the much longer, much more slender legs; the lack of strong armament on the chelae which are generally slighter and with more elongate fingers; and the presence of a fringe of long fine hairs across the front.

The short almost parallel anterolateral borders lacking strongly defined teeth, the swollen branchial regions, and the straight non-recurved tip of the first male pleopod, are sufficient to preclude *Takedana eriphioides* from *Pilumnus*. Indeed these characters are also quite sufficient to preclude its alliance with *Parapilumnus* although some species of *Parapilumnus* show slight similarities. There are further good reasons to avoid placing it, even for convenience, within that genus. Türkay and Schuhmacher (1985) have discussed *Parapilumnus* at length and reiterated the views of Monod (1956) and Peyrot-Clausade and Serène (1976) that *Parapilumnus* as defined by Balss (1933) is heterogeneous and nomenclaturally untenable. Monod (1956) pointed out that none of the species Kossmann (1877) included in the subgenus *Parapilumnus* belong to *Parapilumnus* in the later sense. Türkay and Schuhmacher (1985) decided not to introduce a new name to replace *Parapilumnus* because of the heterogeneity within that group of species. The old concept of *Parapilumnus* has been gradually eroded over the last two decades as species have been reallocated to new or existing genera. Türkay and Schuhmacher (1985) recognized a group containing *quadridentatus* de Man, 1895, *truncatospinosus* de Man 1914, *trispinosus* Sakai, 1965, *nefissurus* Garth and Kim, 1983 and perhaps *Halimede delagoae* Barnard, 1954, as being probably homogeneous and currently lacking a name. All other species that have been included in *Parapilumnus* are now in other genera (see Table 1).

Türkay and Schuhmacher (1985) suggest that three of the *Parapilumnus* species can be attributed to *Pilumnopeus* (see Table 1) on the grounds of the presence of small lateral lobules on the frontal margin. *Takedana eriphioides* also has these lobules and so within *Parapilumnus* it would need to be allied with these species. Their '*Pilumnopeus*' grouping, in my opinion still lacks cohesiveness. While it is conceded that *P. malardi* and *P. verrucimanus* show certain similarities to *Pilumnopeus* the evidence for *P. euryfrons* is less convincing. *Takedana eriphioides* bears very little resemblance to any recognized *Pilumnopeus* species, and of the three mentioned above only *P. euryfrons* begins to approach the armature of the anterolateral borders. This species however is unlikely to be congeneric with *T. eriphioides* as it lacks the swollen branchial regions, the region 3M is clearly defined, the anterolateral margins are of similar length to the posterior, and the tip of the first male pleopod is recurved. Türkay and Schuhmacher (1985) also ally *Pilumnus barbatus* A. Milne Edwards, 1873, with the '*Pilumnopeus*' species, but this needs to be argued further. Nevertheless *P. barbatus* does not resemble *T. eriphioides* in any obvious way. Davie (1989) has reviewed some species of the genera *Heteropanope* and *Pilumnopeus*, including their respective type species, and has

Table 1. Present generic allocation of species described under, or attributed to *Parapilumnus* Kossmann, 1877 (*sensu* Balss, 1933), following Türkay and Schuhmacher (1985).

No Available Name

- P. quadridentatus* (de Man, 1985)
- P. truncatospinosus* (de Man, 1914)
- P. trispinosus* Sakai, 1965
- P. nefissurus* Garth and Kim, 1983
- P. delagoae* (Barnard, 1954) (described as a *Halimede*)

? *Pilumnopeus* A. Milne Edwards, 1863

- P. malardi* (de Man, 1914)
- P. euryfrons* Garth and Kim, 1983
- P. verrucimanus* (Klunzinger, 1913)

Nanopilumnus Takeda, 1974

- P. boletifer* Monod, 1956
- P. coralliophilus* Takeda and Miyake, 1969
- P. hondai* Takeda and Miyake, 1969

Latopilumnus Türkay and Schuhmacher, 1985

- P. tuberculosus* Garth and Kim, 1983

Serenepilumnus Türkay and Schuhmacher, 1985

- P. leopoldi* Gordon, 1934
- P. pisifer* (McLeay, 1834)

Viaderiana Ward, 1934

- P. incertus* Takeda and Miyake, 1969
-

clarified their generic definitions. The results of that work suggest that the species in the 'Pilumnopeus' grouping of Türkay and Schuhmacher (1985) will not prove to truly belong to that genus.

I agree with Türkay and Schuhmacher (1985) in their view that *Nanopilumnus* must be restricted considerably from the conception of Takeda (1974), but I believe even the relationships of the four species they consider to still belong in that genus must be carefully reappraised in relation to the type species of the genus, *N. rouxi* (Balss, 1935).

In reviewing the shapes of male first pleopods within the Pilumnidae as a whole, the straight non-recurved type is rare although it does occur. Two species of *Actumnus*, *A. intermedius* Balss, 1922, and *A. pugilator* A. Milne Edwards, 1874, are of this type but appear to be aberrant within the genus. In particular *A. pugilator*, which has, in addition, a tuberculation on the palm of the chelipeds similar to *T. eriphioides*, is not a true *Actumnus* but properly belongs in the genus *Bathypilumnus* Ng and Tan, 1984. This genus is very clearly defined by the characteristically long, narrow and very straight male first pleopod, and the long narrow seventh abdominal segment which is much longer than the preceding one and extends nearly to the suture between sternites two and three. *Actumnus* is in need of major revision but *T. eriphioides* cannot be placed within it because of the lack of any regional definition on the carapace. Non-recurved pleopods also occur in some of the 'rhizopine' genera such as *Rhizopa* Stimpson, 1858, and *Typhlocarcinus* Stimpson, 1858, but these genera are far removed from *Takedana*.

Etymology. This genus is named in honour of Dr Masatsune Takeda for the extremely valuable contribution he has made to the taxonomy of the Pilumnidae. Gender is feminine.

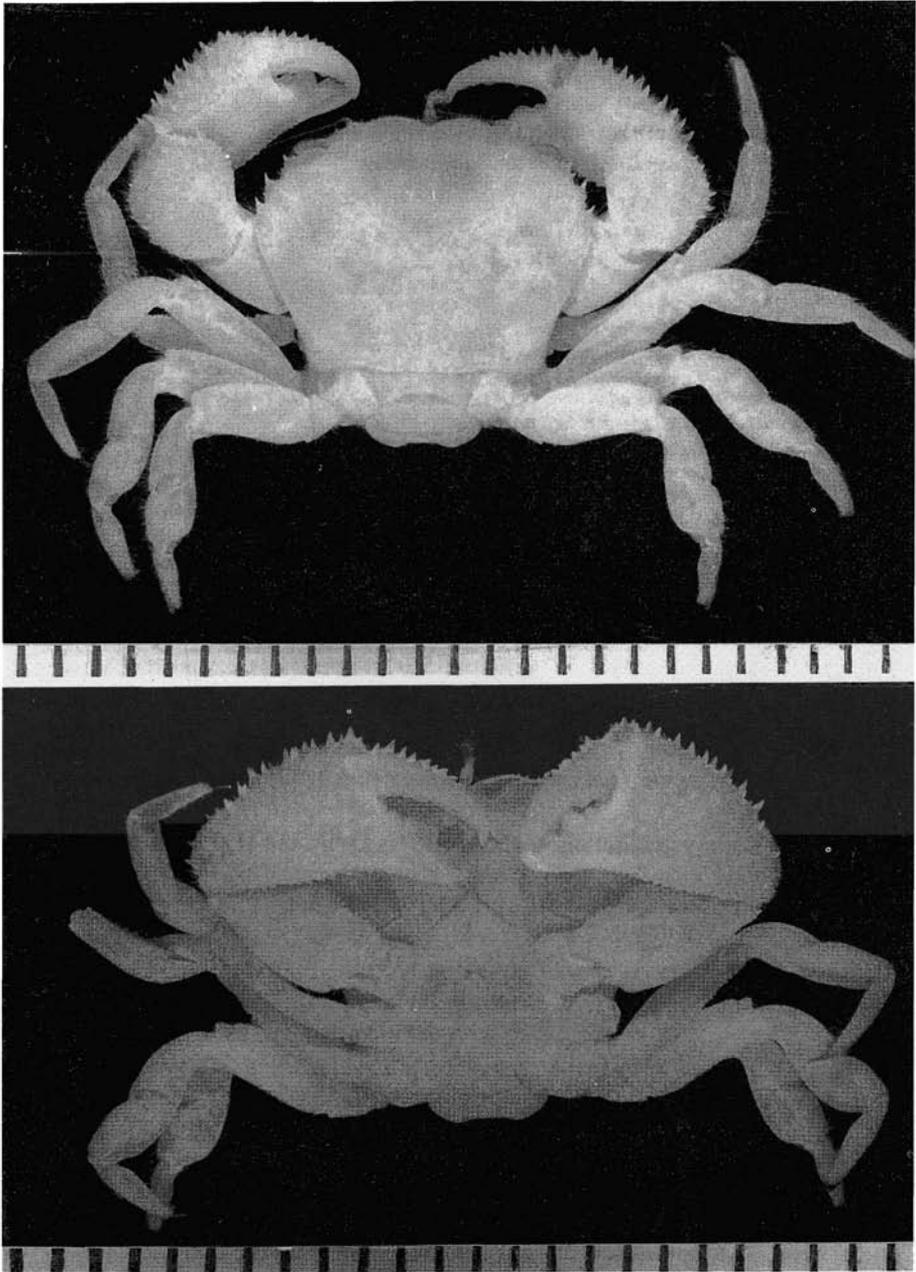


FIG. 3. *Priapilumnus nimbus* sp. nov., male holotype: dorsal and ventral views. Scale lines in mm.

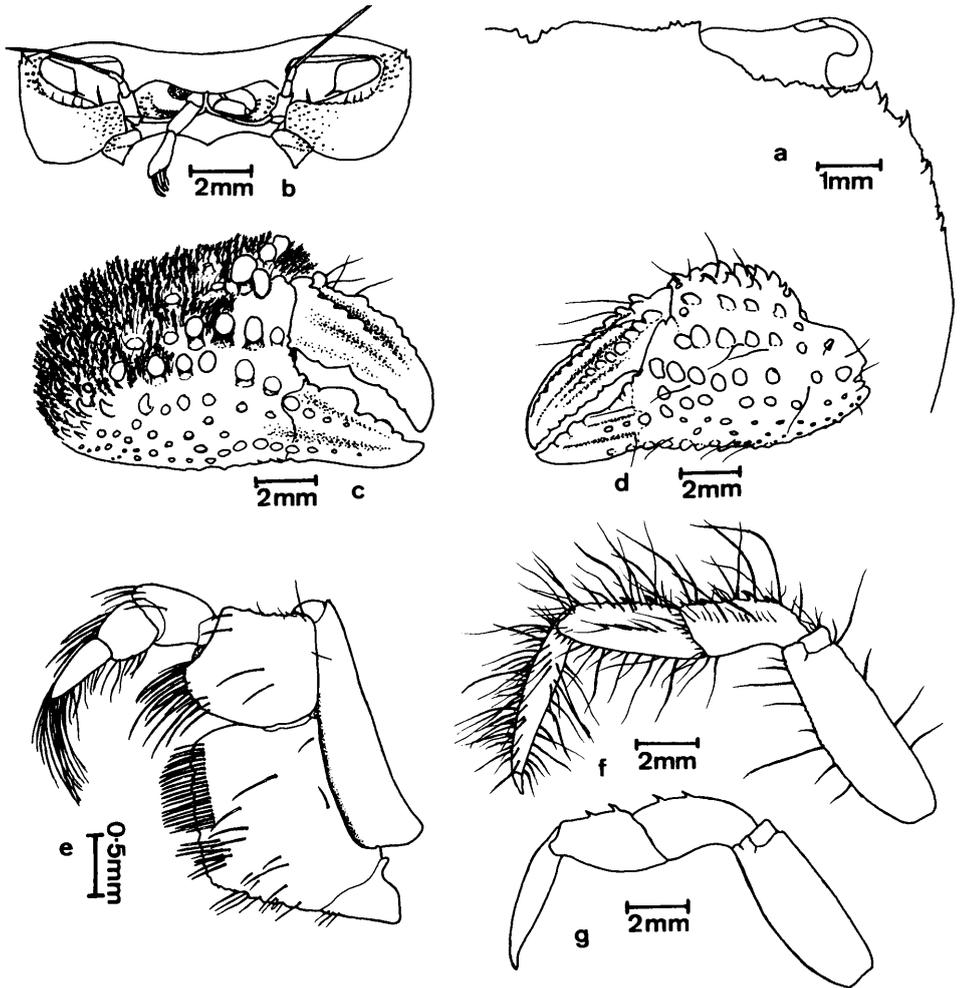


FIG. 4. *Takedana eriphioides* sp. nov., male holotype: a, carapace, right front and anterolateral border, showing on the right variation of a paratype; b, frontal view of orbits, antennae, and showing the swollen anterior branchial regions; c, right chela; d, left chela; e, third maxilliped; f, second left walking leg; g, fourth left walking leg (denuded).

Takedana eriphioides sp. nov.

(Figs 3 a–g, 4 a–e, 5 b)

Material examined. HOLOTYPE, QM W14877, 1♂ (12.1 mm), trawled Swain Reefs, ME. Qld, 21°40'2"S, 152°14'7"E, 54 m, 26.vi.1980, Queensland Fisheries Service.

PARATYPES, QM W15492, 1 ovig. ♀ (12.7 mm), dredged Chesterfield Reefs, 19°21'51"S, 158°45'33"E, 70 m, 23.vii.1988, P. Davie and B. Richer de Forges. QM W15493, ♂ (13.0 mm), trawled Chesterfield Reefs, 19°23'54"S, 158°43'64"E, 62 m, 28.vii.1988, P. Davie and B. Richer de Forges. QM W15494, 2 juv. ♀ (7.5, 5.7 mm), dredged Chesterfield Reefs, 19°18'57"S, 158°39'91"E, 71 m, 24.vii.1988, P. Davie and B. Richer de Forges, MP B20796, ♂ (11.0 mm), 2♀ (10.4, 11.1 mm) data as for QM W15494.

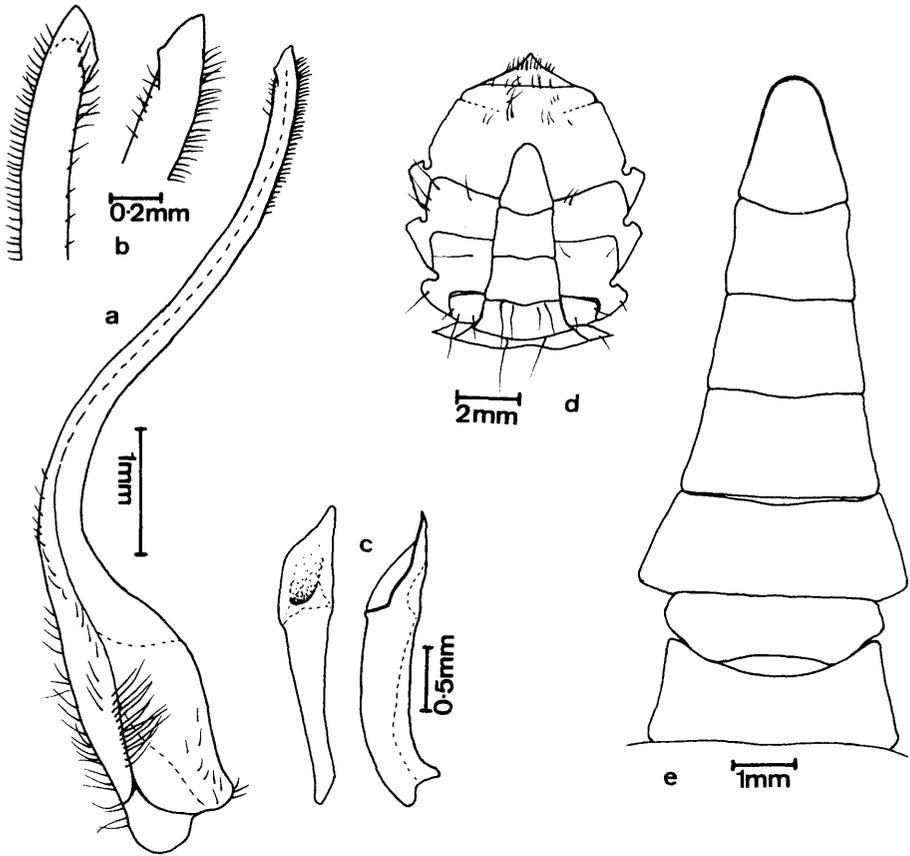


FIG. 5. *Takedana eriphoides* sp. nov., male holotype: a, abdominal view of male first pleopod; b, abdominal and sternal views of tip; c, male second pleopod; d, ventral view of male abdomen and sternal plastron; e, male abdomen.

Description.

Carapace. Distinctly broader than long ($1.27 \times$ in holotype); regions are not defined, but gastro-cardiac groove weakly indicated; branchial regions swollen; carapace surface smooth and glabrous except for a few low tubercles adjacent to anterolateral spines; lateral margins evenly convex such that distinction between antero- and posterolateral borders is indistinct; anterolateral borders with three main spines behind the exorbital spine which reduce in size from first to third, the third being little more than a low tubercle. Accessory tubercles are usually present between, and on the sides of, these anterolateral spines, but they are variable in size and position from side to side; posterolateral margin smooth; supraorbital border finely tuberculate, becoming more prominent and spinous laterally, with small U-shaped sulcus adjacent to proximal border of cornea; frontal border broadly bilobate, with small sharp tubercles in the median sulcus, and also laterally so as to form small pre-orbital spines. Anterior half of carapace with long setae, some of which are feathered; between these and on the posterior half of the carapace are shorter fine setae of variable length but mostly very low.

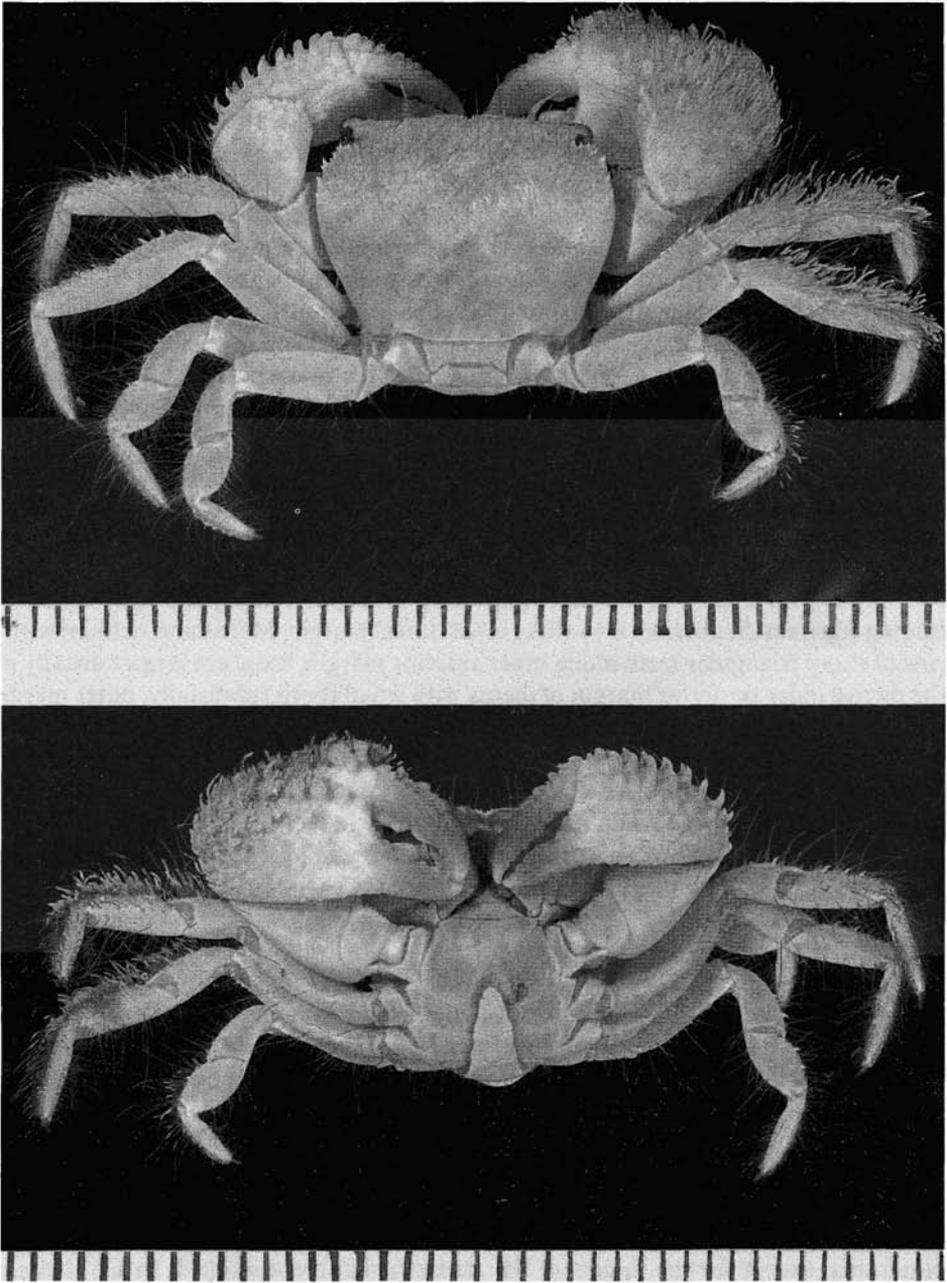


FIG. 6. *Takedana eriphioides* sp. nov., male holotype: frontal view showing chelae, and dorsal view. Scale lines in mm.

Inferior orbital border concave, finely tuberculate, no lateral sulcus; with a row of widely spaced stout bristles. Antennal peduncle included in orbital hiatus, basal segment with tubercle on median distal border, flagellum relatively long, extending past cornea to about level of first anterolateral tooth (when viewed from the front). Sub-hepatic region with prominent round granules below inner edge of orbit down to buccal frame, otherwise smooth. Basal antennular segment with prominent raised

granulate crest below horizontally folded flagellum; also with scattered pointed granules laterally.

Third maxilliped with merus much smaller than ischium (c. 0.6 times); outer edge of merus smooth, the rest of the margin coarsely granulate. Ischium with inner edge scalloped, a row of long coarse setae running parallel with inner edge; width c. $0.73 \times$ length. Palm of right chela with about seven distinguishable rows of tubercles, below which across the outer ventral quarter, the tubercles become random; tubercle size increases dorsally and shape changes from simple round tubercles to distally bent and flattened shapes. Fixed finger with enlarged molar in proximal half. Dactyl with three rows of tubercles; largest proximally but becoming indiscernible by distal quarter. Dorsal surface and front of palm behind an oblique line from fixed finger to proximal ventral margin, covered in a thick mat of short feathered setae through which the tops of the tubercles are visible, this mat of setae extends on to carpus. Inner face smooth and with only a few long simple setae.

Left chela slightly smaller, and palm of different form; dorsal tubercles in the form of thorns and not flat-topped; surface with only a few longer, simple, stout setae, otherwise bare; inner face smooth except for 2 or 3 larger tubercles in proximal upper half; fixed finger without large molar, and both fingers with generally finer dentition.

Carpus with a spine on the inner angle and with spines along and just behind the leading edge; small tubercles also along inner dorsal margin. Merus and ischium with a row of sharp triangular teeth along inner anterior margin, these are largest distally on the merus; inner posterior margin of merus with small tooth subdistally, outer margin granulate becoming toothed distally.

Ambulatory legs of moderate length, slender; second pair the longest and about $1.6 \times$ the carapace breadth, length of merus c. $3.2 \times$ breadth; dactyls long and slender, particularly on the first two pairs, and considerably longer than propodi; fourth pair the stoutest, with length of merus c. $2.6 \times$ breadth; leading edge of both carpus and propodus of all legs with 2–5 small sharp tubercles. Long stout setae on legs, thickest along anterior half of carpus, propodus and dactylus; such setae are interspersed with feathered setae on carpus and propodus.

Sternum relatively narrow, sternite eight completely hidden by abdomen. Male genital openings coxal. Male abdomen narrow, evenly tapering from segment 3 which is widest ($2.86 \times$ wider than long); segments 3, 4 and 5 of similar length, segment 6 slightly shorter; telson longest ($1.34 \times$ length of sixth segment), and itself longer than broad at base ($1.23 \times$).

Male first pleopod long, slender, and sinuous; obliquely truncated pointed tip, not recurved, simple short setae as figured. Second male pleopod relatively slender, being not greatly enlarged distally, and with a slender pointed apex.

Colour after alcohol preservation is a uniform creamy yellow, with no evidence of patterning, except for the fingers of the chelae which are darkened. In life they are orange, sometimes but not always with a speckling of fine, very tiny red spots. On the subhepatic region of the sidewalls is a horizontal white stripe at about the level of the subdistal spine of the merus of the cheliped and which may just be visible dorsally behind the anterior branchial swelling.

Distribution. Only known from the Coral Sea – from the Queensland coast to as far east as the Chesterfield Reefs.

Habitat. Live in relatively shallow water (54–71 m) in the vicinity of coral reef. A number of specimens were found sheltering in the apertures of dead shells such as *Xenophora* but it is possible they entered these while in the dredge or on the sorting table.

Etymology. The specific name has been coined because of the remarkable superficial resemblance this species has to species of the genus *Eriphia* (family Menippidae).

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