

THE INDO-PACIFIC PILUMNIDAE VII. NOTES ON *HETEROPILUMNUS*
SASEKUMARI (SERÈNE, 1971) AND *CRYPTOLUTEA* WARD, 1936 (CRUSTACEA:
DECAPODA: BRACHYURA)

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A redescription of the poorly known pilumnid crab *Heteropilumnus sasekumari* (Serène, 1971) is provided, including the first known males of the species. *H. sasekumari* is only the second rhizopine species known to occur predominantly in mangroves, with a wide range from Peninsular Malaysia to Borneo and northern Australia. *Cryptolutea lindamanensis* is redescribed and the genus rediagnosed. A primary diagnostic character is the denticulated plate produced from the coxa of each ambulatory leg. *Serratocoxa* Ng, is considered a junior synonym of *Cryptolutea* Ward. *Cryptolutea* now contains *C. lindamanensis* Ward, *C. sagamiensis* (Sakai), *C. granulosa* (MacGilchrist), and *C. teschi* (Serène). □ Crustacea, Brachyura, Pilumnidae, mangrove-dwelling, Indo-West Pacific.

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The Indo-West Pacific pilumnid subfamily Rhizopinae Stimpson, 1858, is comprised of small, usually mud-dwelling crabs, that are often cryptic. Their taxonomy has been under extensive review in recent years (Ng, 1987) but some problems remain to be resolved. In particular *Cryptolutea* Ward, 1936, has been poorly known. It was included in the Rhizopinae for the first time by Ng (1987) but he was unable to adequately diagnose it, and expressed some doubts as to its validity.

Heteropilumnus sasekumari was originally described on the basis of a single female from the mangroves of western Peninsular Malaysia under *Rhizopa* Stimpson, 1858, by Serène (1971). Ng (1985) queried the placement of this species in *Rhizopa* and refigured the species. He also added a new record (a female) from Labuan, northern Borneo. Davie (1985) then recorded the species as *Rhizopa sasekumari* in his checklist of mangrove crabs from northern Australia. He incorrectly recorded the species from Singapore. Ng (1987) subsequently transferred the species to *Heteropilumnus* De Man, 1895, restricting *Rhizopa* to *R. gracilipes* Stimpson, 1858.

Males of *Heteropilumnus sasekumari* have not previously been collected. In view of the importance of the male gonoduct positions, form of the male first pleopod, and structure of the male abdomen in xanthoid and pilumnid taxonomy,

opportunity is taken here to describe the first known males of *Heteropilumnus sasekumari* from Australia. This species is also unusual with regard to its ecology – all specimens have been recorded from mangroves and appear to prefer this habitat. This would make it only the second mangal rhizopine species known (see Ng, 1990).

G1 and G2 indicate the male first and second pleopods, respectively. All measurements are of the carapace width and length, respectively. Specimens are deposited in the Queensland Museum (QM) and Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore.

***Heteropilumnus sasekumari* (Serène, 1971)**
(Figs 1, 2)

?*Rhizopa sasekumari* Serène, 1971: 915–16, Pl. 5A.
Rhizopa sasekumari: Guinot, 1971: 1078; Ng, 1985: 631, Fig. 2; Davie, 1985: 261, 262.
Heteropilumnus sasekumari: Ng, 1987: 73, 79, 96.

MATERIAL EXAMINED

HOLOTYPE: ZRC 1969.12.2.7, ♂, littoral zone, Port Swettenham, western Peninsular Malaysia, A. Sasekumar, 28 Oct. 1968.

OTHER MATERIAL: ZRC 1965.11.23.49–50, 2 ♀♀, Prai, Province Wellesley, western Peninsular Malaysia, Dec. 1938 (det. R. Serène, 1962). ZRC

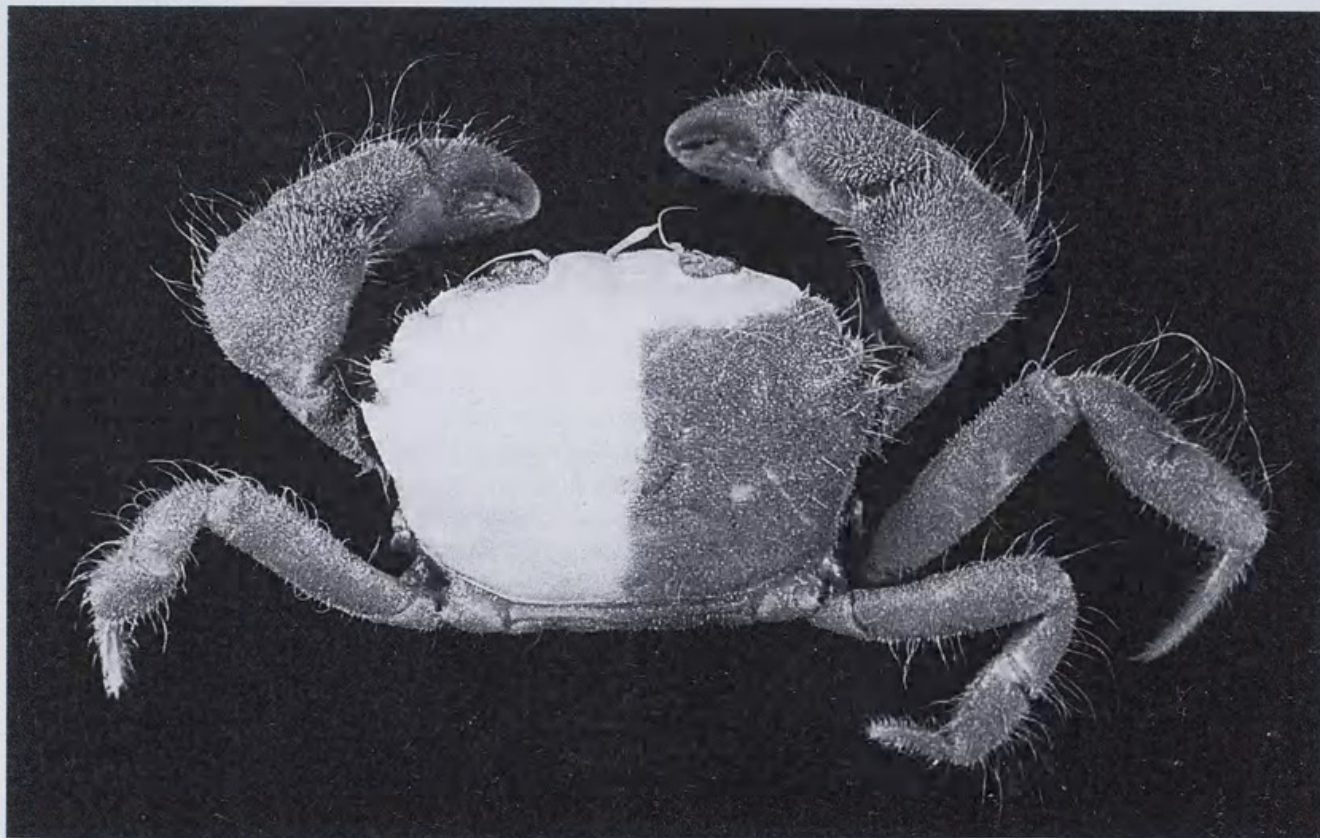


FIG. 1. *Heteropilumnus sasekumari* (Serène, 1971). Male, 18.0 x 13.5 mm, Queensland (QM W4596).

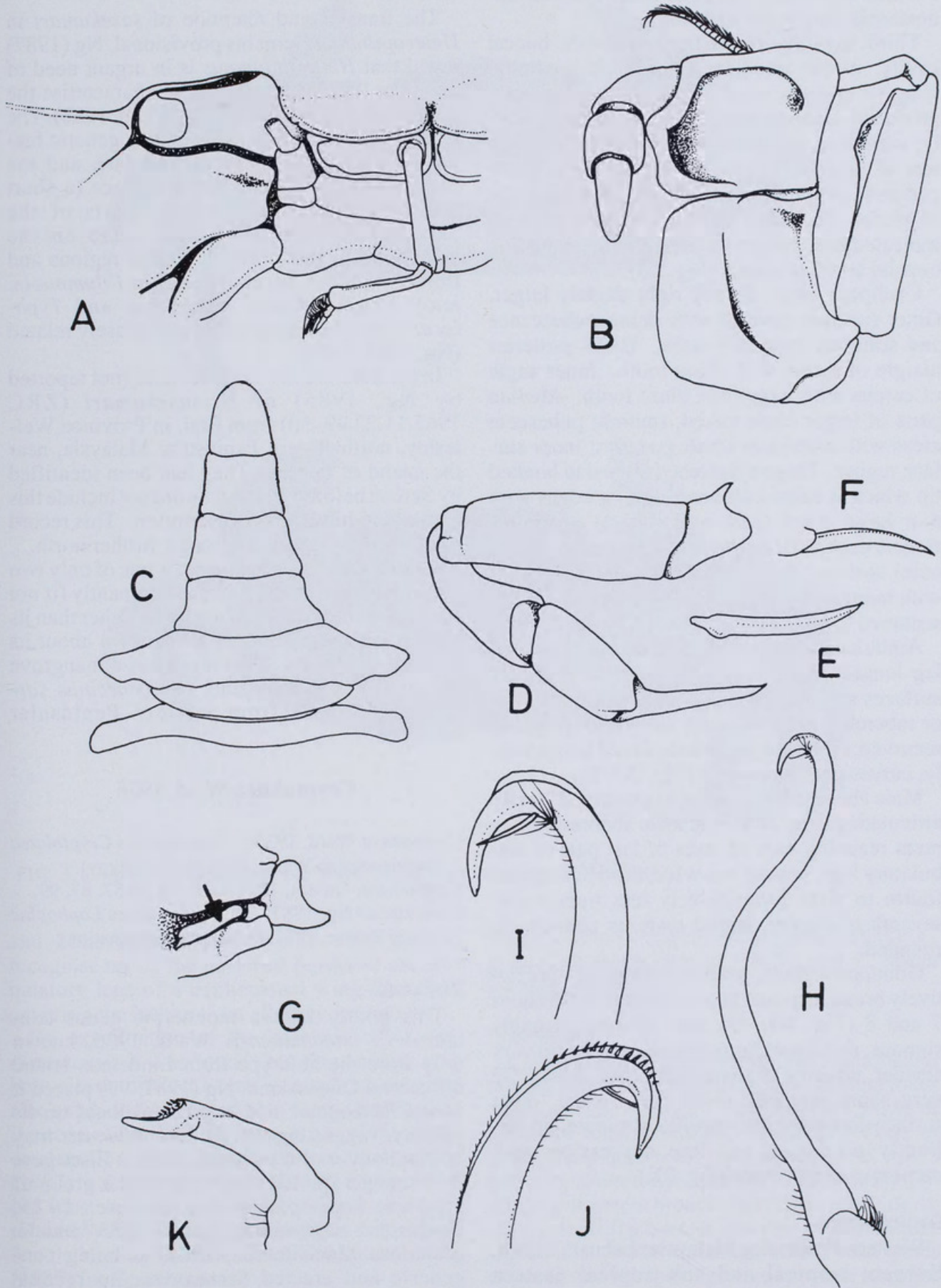
1965.11.23.51, ♀, mangrove, Labuan, Sabah, Borneo, 1938 (det. R. Serène, 6 Dec. 1969). QM W4596, ♂, (18.0 x 13.5 mm), Trinity Inlet, C. 2.5 km from mouth of Redbank Creek, Cairns, Queensland, R. Timmins, 13 Dec. 1974. QM W3852, ♂, Calliope River, SE Queensland, Australia, 4 Aug. 1978. QM W7887, ♀, Susan River, Hervey Bay, SE Queensland, Australian Littoral Society, 24 Dec. 1971.

DESCRIPTION

Carapace quadrilateral, distinctly broader than long. Dorsal surface densely pubescent, with numerous scattered long hairs; pubescence does not completely obscure indentation on anterolateral margin. Frontal margin deflexed, divided into two gently convex lobes by shallow cleft, external angle not obvious. Orbital margins smooth, outer edges of supra- and infraorbital margins separated by deep, very narrow incision. Eyes well developed, filling orbital space, cor-

nea distinct, pigmentation present. Basal antennal segment movable, filling most of wide orbital hiatus (Fig. 2A). Antennular fossae wide, occupying most of space below frontal margin, separated by very narrow gap. External orbital angle well defined, broadly truncate, outer margin gently sinuous, inner margin very short, separated from first epibranchial tooth by deep but narrow notch; first epibranchial tooth broadly triangular, inner margin half length of outer, outer margin gently sinuous, separated from second epibranchial tooth by triangular notch, second epibranchial tooth triangular, curved obliquely forwards, inner margin concave, outer distinctly convex, tip rounded, separated from third epibranchial tooth by deep V-shaped notch, third epibranchial tooth triangular, directed obliquely outwards, tip sharp. Posterolateral margins almost straight, distinctly converging towards gently convex posterior carapace margin. Posterior margin of epistome sinuous, distinctly

FIG. 2. *Heteropilumnus sasekumari* (Serène, 1971). Male, 18.0 x 13.5 mm, Queensland (QM W4596). A, frontal view. B, left third maxilliped (denuded). C, abdomen. D, left fourth ambulatory leg (denuded). E, dactylus of left fourth ambulatory leg, lateral view. F, dactylus of left fourth ambulatory leg, dorsal view showing curvature. G, left male gonopore and penis (arrow). H, left G1. I, J, distal part of G1. K, left G2.



cut into four lobes, incisions deep, distinct. Endostomial ridges not apparent.

Third maxillipeds occupying entire buccal cavity, merus quadrate, depressed medially, margins cristate, outer distal margin distinctly produced; ischium wider proximally than distally, with deep median sulcus, inner margin with row of short stiff hairs, outer margin distinctly concave; exopod long, reaching external angle of merus, distal one third of inner edge with truncated lobe, setose flagellum long, extending beyond width of merus (Fig. 2B).

Chelipeds stout, usually right slightly larger. Outer surfaces covered with dense pubescence and scattered long stiff setae. Distal posterior margin of merus with sharp tooth. Inner angle of carpus with large low, blunt tooth. Median parts of larger chela naked, smooth; pubescent areas with numerous small granules; inner surface rugose. Fingers darkened almost to hooked tip which is beige-coloured; cutting edges with 5–6 large blunt teeth and several denticles; fingers each with one low longitudinal ridge on outer surface; dorsal proximal part of dactylus with numerous small granules, pubescence, and scattered long setae (Ng, 1985: Fig. 2C, D).

Ambulatory legs setose as on carapace, second leg longest, meri, carpi and propodi unarmed, surfaces smooth when denuded, without spines or tubercles. First to fourth dactyli long, gently recurved, fifth dactylus, when placed horizontally, curves gently upwards (Fig. 2D–E).

Male abdomen with seven segments, all freely articulating (Fig. 2C). First male abdominal segment reaching base of coxa of last pair of ambulatory legs, second less wide, third hexagonal, fourth to sixth progressively less trapezoidal, seventh triangular, lateral margins convex, tip rounded.

Gonopores coxal, penis reaching G1 via relatively broad, exposed groove formed by sternites 7 and 8 (Fig. 2G). G1 very slender, strongly sinuous, distal part hooked downwards, tip very slender, tapering to sharp point (Fig. 2H–J). G2 very short, sigmoid, distal part dilated, inner surface depressed into cup-like structure, tip distinctly produced, cup-like depression with numerous short spines (Fig. 2K).

DISTRIBUTION

Western Peninsular Malaysia; Labuan, Sabah, Borneo; tropical and sub-tropical eastern Queensland, Australia.

REMARKS

The transfer and retention of *sasekumari* in *Heteropilumnus* remains provisional. Ng (1987) noted that *Heteropilumnus* is in urgent need of revision; the characters used to characterise the genus being inadequate (Ng and Tan, 1988). The carapace provides the only reliable generic features the shape (almost rectangular), and the pattern of setae on the dorsal surface (a short pubescence on the posterior parts of the carapace, with much longer setae on the anterolateral, supra-orbital, frontal regions and frontal margins). Several species in *Pilumnus* (*s. lato*), *Cryptocoeloma*, *Viaderiana* and *Typhlocarcinus* also appear to be very closely related (Ng, 1987, 1989).

In the ZRC are two more females (not reported by Ng, 1985) of *H. sasekumari* (ZRC 1965.11.23.49–50) from Prai, in Province Wellesley, northwestern Peninsular Malaysia, near the island of Penang. They had been identified by Serène before 1971, but he did not include this material in his original description. This record thus extends the species' range further north.

Heteropilumnus sasekumari is one of only two pilumnids known to occur predominantly (if not wholly) in littoral mangrove areas. Other than its habitat, almost nothing else is known about its biology and habits. The other known mangrove pilumnid is the rhizopine, *Luteocarcinus sordidus* Ng, 1990, from western Peninsular Malaysia.

Cryptolutea Ward, 1936

Cryptolutea Ward, 1936: 1 (type species *Cryptolutea lindemanensis* Ward, 1936, by monotypy).

Cryptolutea: Guinot, 1969: 247; Ng, 1987: 87, 99.

Serratocoxa Ng, 1987: 101 (type species *Lophoplax teschi* Serène, 1971, by original designation).

REMARKS

This poorly known monotypic genus contained *C. lindemanensis* Ward, 1936, known only from the holotype from Lindeman Island off central Queensland. Ng (1987: 99) placed it in the Rhizopinae and expressed doubt on its validity, suggesting that *C. lindemanensis* may be a synonym of *Ceratoplax luteus*. Elsewhere in that paper (p. 101) he recognised a group of species, *Lophoplax teschi* Serène, 1971, *Ceratoplax sagamiensis* Sakai, 1935, and *C. granulosa* MacGilchrist, 1905, as being congeneric and erected *Serratocoxa*, to receive them. This had earlier been suggested by Serène

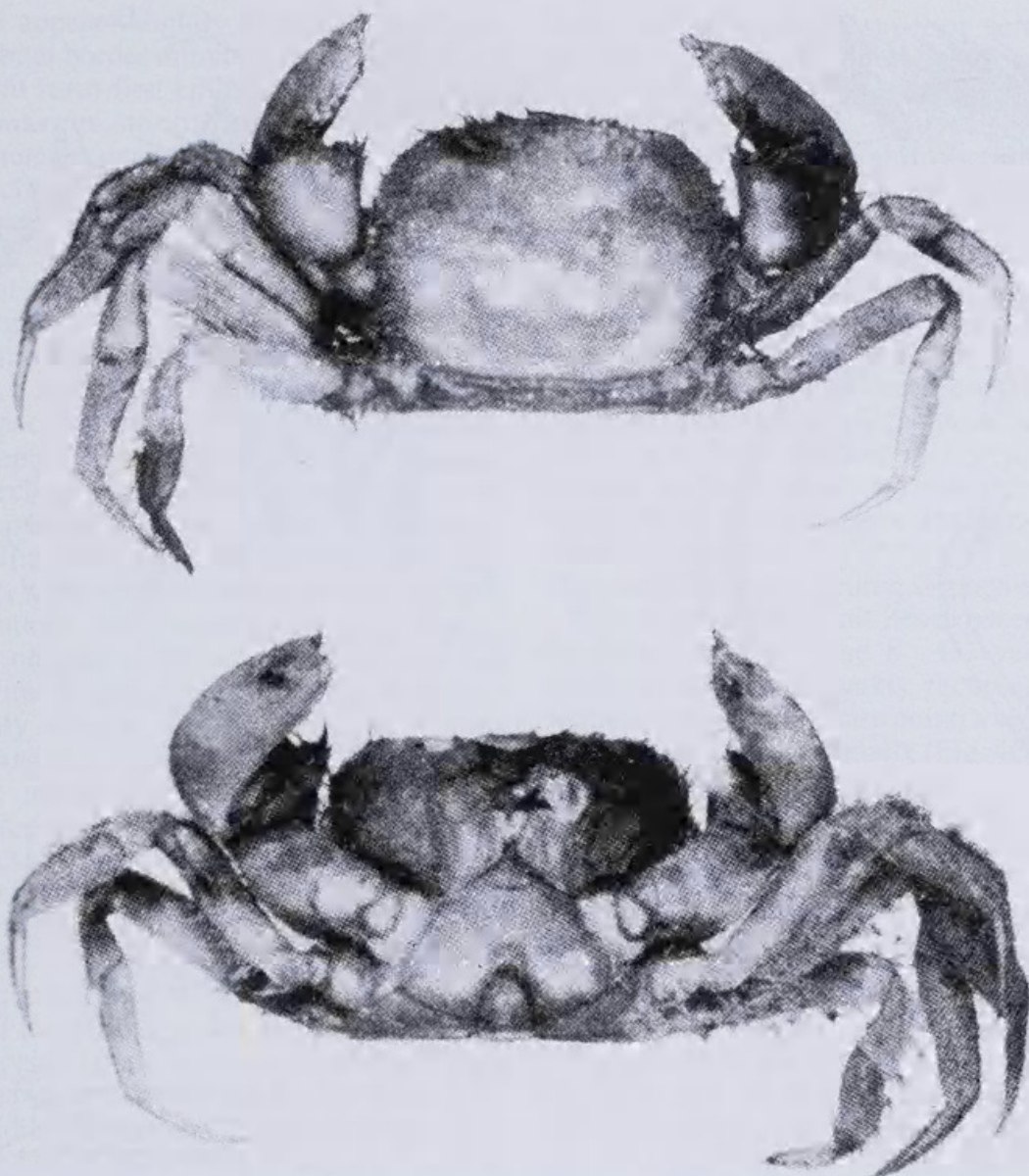


FIG. 3. *Cryptolutea lindemanensis* Ward, 1936. Male holotype (QMW744).

and Lohavanijaya (1973) who were first to recognise on '... the posterior border of the ambulatory legs of a denticulated wing-like plate covering the ischium' on all three species.

On examination of the holotype of *C. lindemanensis* it was found that this species was both clearly distinct from *Ceratoplax luteus* and also exhibited the remarkable wing-like plate on the coxa of the walking legs. It is without doubt congeneric with the other species included by Ng (1987) in *Serratocoxa* and therefore *Serratocoxa* Ng must become a junior synonym of *Cryptolutea* Ward. A diagnosis is given here which is only slightly modified from that given by Ng (1987) for *Serratocoxa*.

Cryptolutea now contains *C. lindemanensis*

Ward, 1936; *C. sagamiensis* (Sakai, 1935); *C. granulosa* (MacGilchrist, 1905), and *C. teschi* (Serène, 1971).

DIAGNOSIS

Carapace distinctly quadrate, the anterolateral margin arcuate, almost entire, or with blunt lobes more or less distinct. Anterolateral angle of merus of third maxilliped produced. Coxa of ambulatory legs with denticulated plate which partially covers the ischium. First male abdominal segment broader than third, reaching, or almost reaching base of last pair of ambulatory legs; male genital openings coxal, with penis exposed and lying in a groove between sternites 7 and 8. G1 slender, sinuous; G2 short, sinuous.

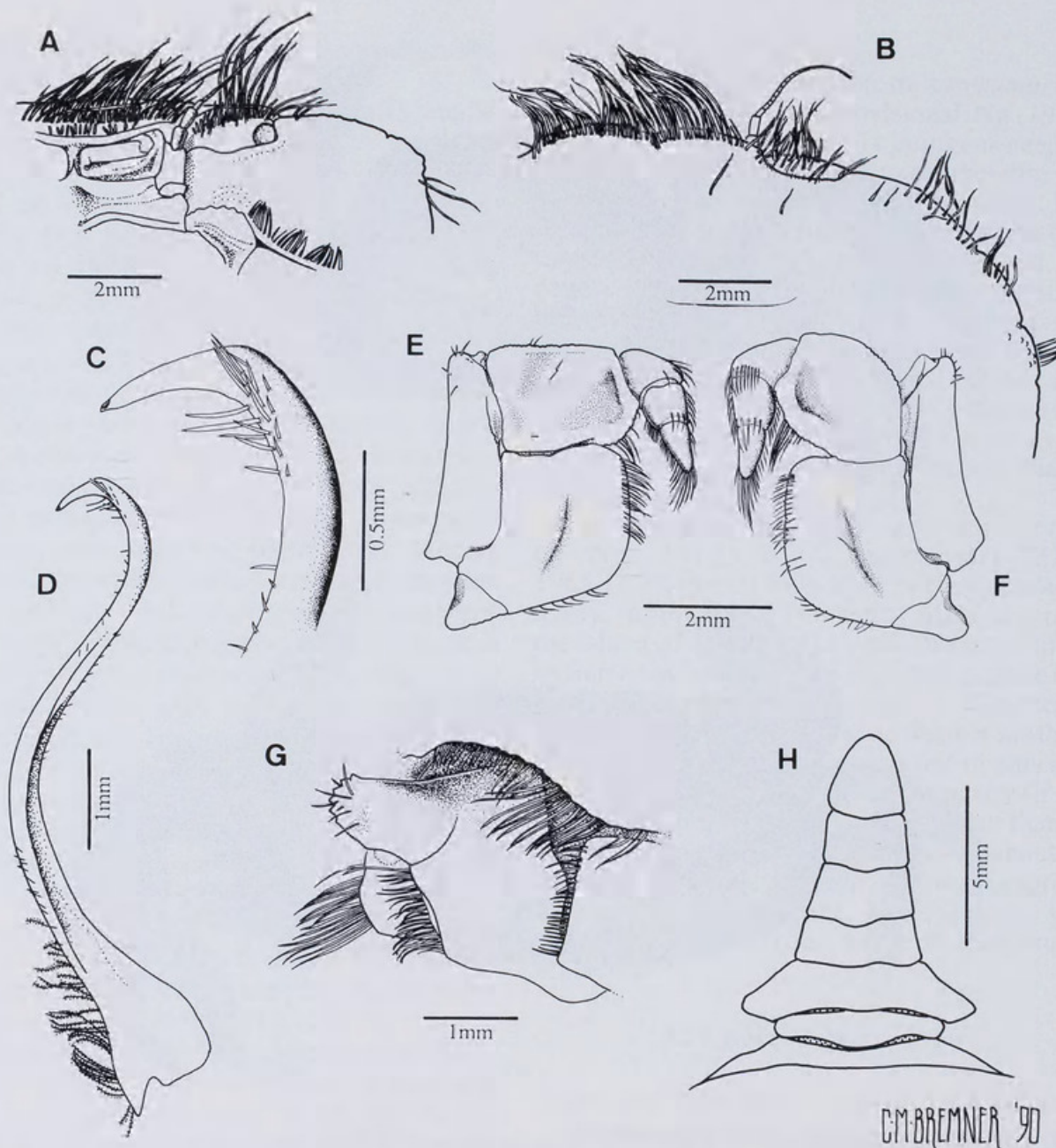


FIG. 4. *Cryptolutea lindemanensis* Ward, 1936. Male holotype (QM W744). A, frontal view. B, frontal and anterolateral margin. C, tip of left G1. D, left G1. E, right third maxilliped. F, deformed left third maxilliped. G, denticulated plate on the coxa of fourth ambulatory leg. H, abdomen.

***Cryptolutea lindemanensis* Ward, 1936**
(Figs 3, 4)

Cryptolutea lindemanensis Ward, 1936: 1-2, pl.1, figs 1-3; Ng, 1987: 79, 99.

MATERIAL EXAMINED

HOLOTYPE: QMW744, 1♂ (15.8 x 12.4 mm) Lindeman Is., Whitsunday Passage, ME. Queensland, M. Ward.

DESCRIPTION

Carapace quadrilateral, 1.27 times broader than long. Dorsal surface glabrous, but edged by a fringe of moderately long, soft setae, particularly prominent across frontal lobes and onto ocular peduncles. Regional definition not obvious except for transverse gastro-cardiac groove, and associated short concave longitudinal grooves. Frontal margin deflexed, slightly concave viewed from front, laterally rounded without antennal notches; frontal region with shallow, median, longitudinal groove so

that front appears slightly bilobed from above. Supra-orbital border minutely granular, laterally rounded to form first epibranchial lobe. Infra-orbital margin smooth; laterally rounded, without notches or incisions; blunt lobe at inner edge, reaching level of distal end of basal antennal segment. Ocular peduncles fill the orbital space; not freely movable; corneas relatively small, not visible from above; distinct but not darkly pigmented in holotype. Basal antennal segment movable, inner distal margin just reaching front. Antennular fossae wide, occupying most of space below frontal margin, separated by narrow septum. Anterolateral margin granular, evenly arched, divided into 3 confluent broad lobes separated by two small but distinct notches; first lobe longer than second, third lobe not clearly separated from posterolateral margin. Posterolateral margins slightly convergent. Posterior margin, very broad, only slightly less than maximum carapace width; costate; slightly and evenly convex. Posterior margin of epistome, triangular medially with distinct median incision; medio-lateral incisions vestigial; lateral margins, straight, oblique. Endostomial ridges present, confined to lower half of efferent branchial canal.

Third maxillipeds occupying most of buccal cavity. Merus quadrangular, c. 1.4 times broader than long; outer distal margin produced (Fig. 4E) (left third maxilliped of the holotype (Fig. 4F) has an apparently aberrant merus). Ischium with lateral margins sub-parallel except near base where width increases; c. 1.8 times longer than width medially; inner margin slightly convex, granular over distal third, becoming smooth proximally, armed with a row of stiff setae originating behind margin. Exopod reaching external angle of the merus.

Ambulatory legs fringed with long setae; third pair longest; unarmed except for serrated coxal plate (Fig. 4G), which is produced to lie over proximal part of ischium. Dactyli relatively long, subequal in length to propodi; armed with long slender terminal claw; bearing 5 thick rows of long setae, one along dorsal mid-line, and two pairs spaced evenly on anterior and posterior surfaces. Dactyli of first three pairs gently recurved; dactyli of fifth pair curved slightly upwards.

Chelipeds stout, left slightly larger. Merus armed on posterior margin with blunt, granulated, sub-distal tooth. Carpus with inner angle granulate, bearing a broad fringe of long setae, otherwise naked. Chela naked except for broad

band of long setae on superior surface which extends onto dactylus for about its proximal third. Dactylus with longitudinal groove running most of its length. Both fingers darkened for approximately distal four-fifths, fingers pointed; crossing at tips; evenly serrated. Fixed finger with longitudinal groove for most of its length; with a few short setae in the groove. Outer face of chela naked; smooth except for two or three rows of low scattered tubercles near the inferior margin; and a few granules proximally.

Male abdomen with seven free segments. First segment broader than third, almost but not quite reaching to base of coxa of last pair of legs. Second segment much narrower than first or third. Fourth to sixth segments tapering. Telson rounded triangular, slightly longer than broad at base, longer than preceding segments.

Gonopores coxal; penis lies exposed in groove between sternites 7 and 8. G1 very slender, sinuous; distal part weakly recurved, tip very slender, tapering to a sharp point; a series of stout setae present sub-proximally (Fig. 4C). G2 very short, sigmoid, tip very long and slender, armed with single long, fine seta terminally.

DISTRIBUTION

Only known from the type specimen from Lindeman Is., mid-eastern Queensland.

REMARKS

The merus of the left third maxilliped of the holotype may be considered aberrant. Unlike the right merus, that on the left has the outer distal margin rounded and not produced at all. The inner proximal margin is also more obliquely receding than that on the right (Fig. 4F). Both these differences give the merus a more ovoid shape and the third maxilliped a much less quadrate appearance (Fig. 4E, F). The left maxilliped agrees with the right in all other aspects. It is probable that the shape of the left merus is a result of previous damage and aberrant regrowth. The form of the outer distal margin of the third maxilliped merus has been used extensively in rhizopine taxonomy (Ng, 1987), and the present observations of asymmetrical third maxilliped meri in *C. lindemanensis* indicates that it may sometimes be less reliable than previously believed; especially when only single specimens are known.

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