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A new species of *Hephthopelta* Alcock, 1899 (Crustacea: Brachyura: Chasmocarcinidae) from deep water off north-eastern Queensland, Australia

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ABSTRACT

A new species of deep water chasmocarcinid, *Hephthopelta potens*, is described from off north-eastern Queensland. It differs from its congeners by a combination of characters, including carapace shape and proportions, the structure of the abdomen and gonopods, and most obviously by the greatly swollen major chela of adult males. ❑ *Crustacea*, *Brachyura*, *Chasmocarcinidae*, *deep water*, *Indo-West Pacific*, *new species*.

In the late 1980s and early 1990s several cruises were undertaken off northern Queensland investigating deep water faunal community composition and biodiversity. The R.V. *Franklin*, under the direction of Professor Michel Pichon, carried out three cruises, (CIDARIS I–III), and employed beam trawls, Charcot dredges and sledges on the continental slope of the Great Barrier Reef and the Queensland basin (Alongi 1987; Pichon 1987; Richer de Forges 1986). In addition, the CSIRO conducted exploratory deep water trawling off north-eastern Queensland during December 1985 and January 1986, using the stern trawler R.V. *Soela* under the direction of Trevor Ward. Large collections of crustaceans were made during all these cruises and returned to the Queensland Museum. Amongst a number of new species that have been found, is an interesting new species of *Hephthopelta* Alcock, 1899 (family Chasmocarcinidae), and this is described here.

Abbreviations: QM, Queensland Museum, Brisbane; ZRC, Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore. cb, carapace breath; cl, carapace length; G1, G2, male first and second gonopods.

TAXONOMY

CHASMOCARCINIDAE Serène, 1964
CHASMOCARCININAE Serène, 1964

Hephthopelta Alcock, 1899

Hephthopelta Alcock, 1899: 76–77; 1900: 327; Rathbun, 1914: 149; Tesch, 1918: 232–233; Balss, 1957: 1.658; Serène, 1964: 239–242; Ng, Guinot & Davie, 2008: 76 (in list). [Synonymy not exhaustive].

Type species: *Hephthopelta lugubris* Alcock, 1899, by monotypy; gender feminine) [ICZN Opinion 85, Direction 37].

Hephthopelta potens sp. nov.

(Figs 1–4)

Material examined. HOLOTYPE: QM-W16974, ♂ (12.7×10.3 mm), off Tully Heads, 17°59′ 02" S, 147°03′01" E, trawled, 260 m, CSIRO, R.V. *Soela*, 13.01.1986. PARATYPES: QM-W16999, ♀ (13.1×10.5 mm), off Yeppoon, 22°56′01"S, 152°41′04"E, trawl, 225–282 m, CSIRO, R.V. *Soela*, 19.11.1985. QM-W17046, ♀ (7.1×6.2 mm), off Babinda, 17° 21′ 8" S, 146° 48′ 5" E, epibenthic sled, 296–302 m, F.R.V. *Franklin*, 15.5.1986. QM-W17047, ♀ (11.9×9.7 mm), off Tully Heads, 17° 59′09"S, 147°02′09"E, trawl, 250–252 m, CSIRO, R.V. *Soela*, 29.11.1985. QM-W17048, ♀ (7.6×6.6 mm), off Mission Beach, 17°54′03"S, 146°55′07"E, trawl, 212 m, CSIRO, R.V. *Soela*, 09.12.1985. QM-W17049, ♂

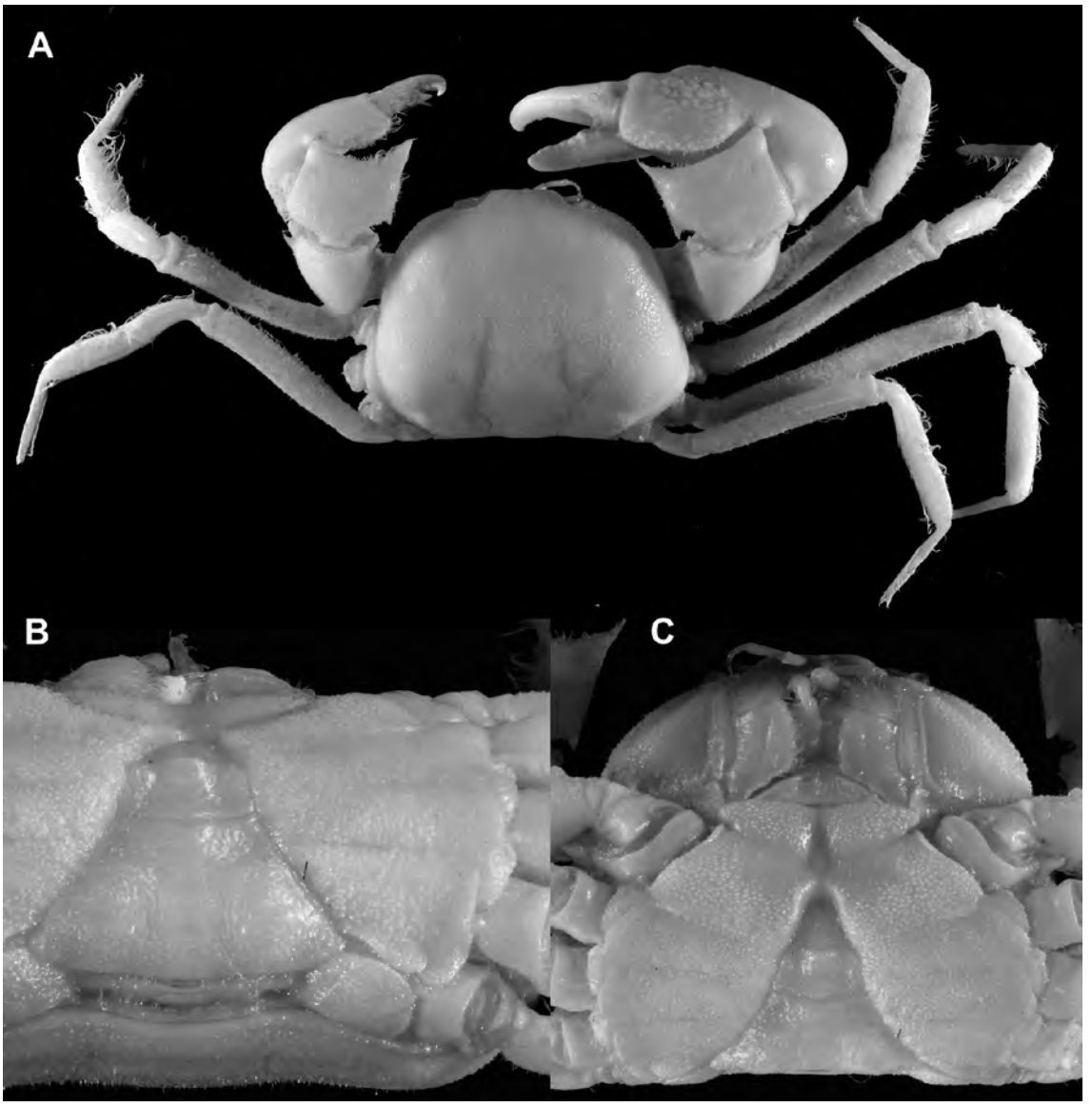

FIG. 1. *Hephthopelta potens* sp. nov., QM-W16974, holotype male (12.7×10.3 mm). **A**, Dorsal view of crab; **B**, sternal plastron and abdomen in postero-ventral view; **C**, sternal plastron and abdomen in ventral view.

(11.0×9.2 mm), off Tully Heads, 18°07′S, 147°02′02"E, trawl, 220 m, CSIRO, R.V. *Soela*, 18.01.1986. QM-W17050, 2 ♀♀ (8.2×7.1, 8.5×7.3 mm), off Tully Heads, 18°02′S, 147°01′06"E, trawl, 220–222 m, CSIRO, R.V. *Soela*, 12.01.1986. QM-W17051, ♂ (11.1×9.1 mm), off Tully Heads, 18°01′S, 147°01′03"E, trawl, 224–228 m, CSIRO, R.V. *Soela*, 09.01.1986.

Description. Carapace (Fig. 1A) semicircular, about 1.2–1.25 times broader than long in adults. Posterior margin costate, broad, very slightly sinuous in dorsal view, but noticeably concave in posterior view. Carapace broadest at point between coxae of second and third walking legs. Anterolateral and posterolateral borders not distinctly separated, nor demarcated from lateral carapace walls, surface of carapace finely granular laterally, with moderately long setae, particularly anteriorly. Front-orbital width *c*. 1.9–2.3 times maximum carapace width;

FIG. 2. *Hephthopelta potens* sp. nov., QM-W16974, holotype male (12.7×10.3 mm). **A**, chelipeds in frontal view; **B**, third maxillipeds and pterygostome; **C**, major right chela in antero-dorsal view.

orbits with lateral raised rim, superior inner orbital margin obtusely rounded, infra-orbital margin obliquely sloping with inner tooth developed; frontal margin appearing straight in dorsal view but tri-lobed in frontal view, median lobe smaller than lateral lobes. Eyestalk short, moveable, broadest in distal half; cornea darkly pigmented. Dorsal carapace regions poorly defined; gastric, cardiac, and intestinal grooves faintly indicated; posterior branchial groove continues onto lateral carapace walls.

Basal antennular segment globose; completely fills antennular fossa excluding flagellum. Basal antennal segment slightly longer than wide; does not make contact with front; flagellum lies within orbit, about as long as width of front.

Third maxilliped (Fig. 2B) with ischium slightly longer than wide; merus about as long as at widest point; palp inserted at antero-distal angle; exopod not quite reaching anterior border of merus. Pterygostomian (Fig. 2B) granular at junction with hepatic region; posteriorly with strongly produced crest above broad deep triangular sulcus expanded posteriorly. Male sternal plastron (Fig. 1B, C) broad, oval; sternite eight (Fig. 1B) with distinct broad anterior

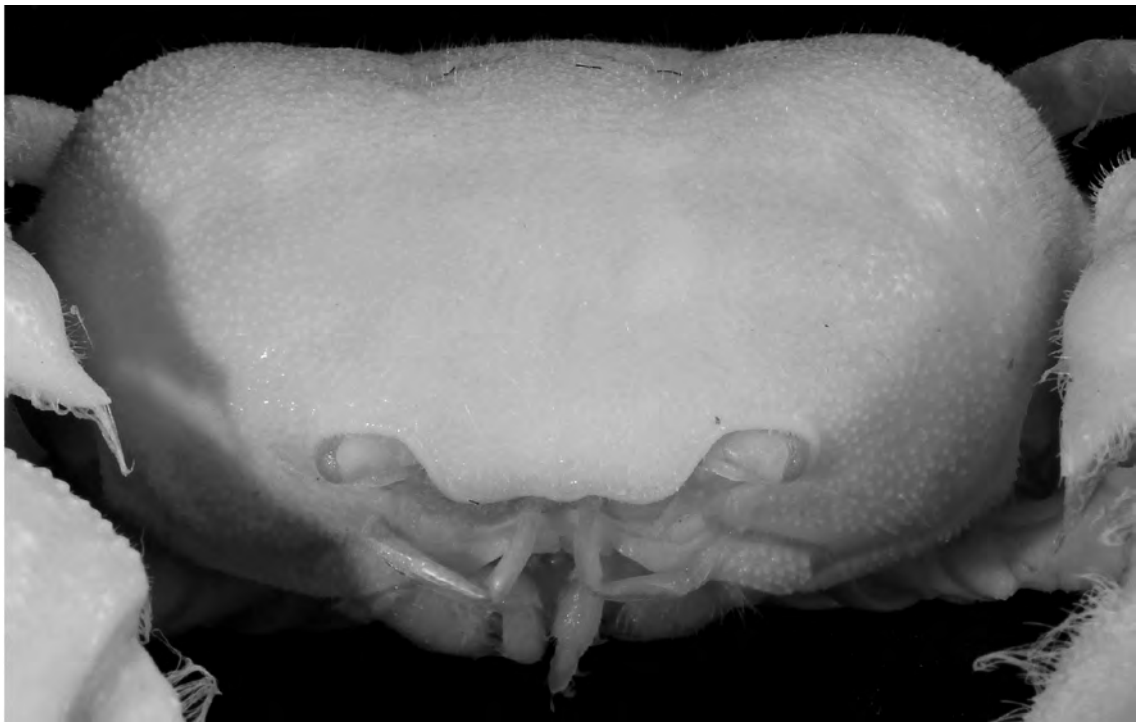

FIG. 3. *Hephthopelta potens* sp. nov., QM-W16974, holotype male (12.7×10.3 mm); antero-dorsal view of frontal margin, orbits and pterygostome.

supplementary plate, reaching from base of coaxa of legs to sternoabdominal cavity.

Chelipeds (Figs 1A, 2A, C) unequal in males. Merus of larger cheliped relatively short, triangular, with convex posterior face; rounded, unarmed on inner margin but with 3 or 4 spines on outer margin which increase in size distally. Carpus subquadrate in dorsal view, with strong acute spine at inner distal angle; smaller sharp spine, at slightly lower level, at inner proximal angle. Propodus very swollen, especially forming proximal protruding 'elbow', height about half length (including fixed finger) or slightly less; outer face convex; upper surface granular; similar raised, slightly granular patch behind gape on outer surface; fingers pointed, armed with blunt low molariform teeth; in adult males large gape left when fingers closed. Smaller cheliped (Fig. 2A) of similar form but less massive; with flatter fingers armed with sharper teeth; without gape when closed. Female chelipeds less massive, similar to minor cheliped of male.

Walking legs (Fig. 1A) relatively long, slender, unarmed. Second and third very similar, third slightly longer; fourth pair smallest. Total length of third leg twice maximum width of carapace; merus c. 6.6 times longer than wide; dactyl almost straight, acutely pointed, about three-quarters length of propodus. All legs fringed in setae, thicker and longer on distal segments.

Male abdomen (Fig. 4E) with somites 3–5 fused; widest at laterally bulbous somite three, then tapering evenly to rounded telson; somites one and two constricted, narrow, of similar width; telson c. 0.8 times as long as wide at base.

First male gonopod (Fig. 4A, B) very broad, short, tapering to simple pointed tip. G2 (Fig. 4C, D) slender, slightly longer than G1; terminal half of curved flagellum bent at strong angle; flagellum about two-thirds length of basal portion.

Remarks. There are currently ten species recognised within *Hephthopelta* (see Ng *et al.* 2008), *viz*. *H. apta* Rathbun, 1914; *H. aurita* Rathbun,

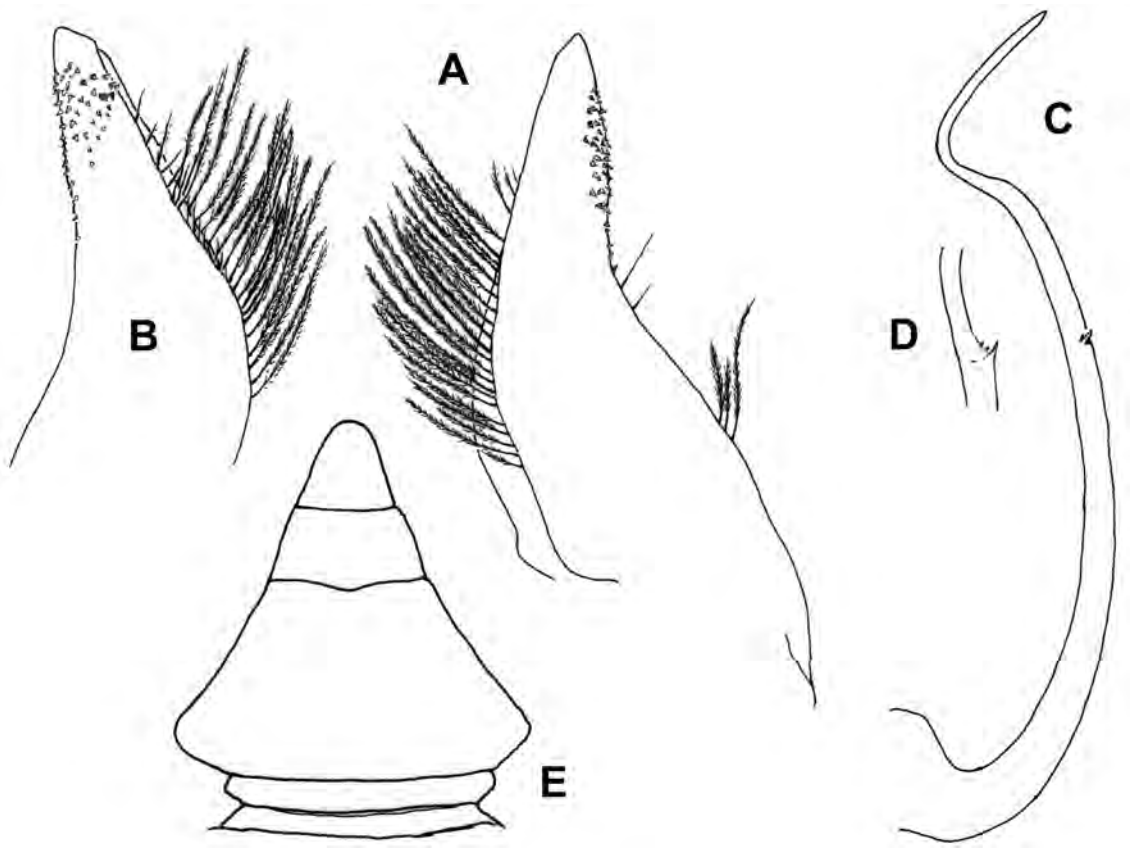

FIG. 4. *Hephthopelta potens* sp. nov., QM-W16974, holotype male (12.7×10.3 mm). **A**, **B**, G1 in abdominal and sternal views; **C**, G2; **D**, different view of base of palp of G2; **E**, abdomen. Gonopods 1 & 2 are drawn to the same scale relative to each other.

1932; *H. bruuni* Serène, 1964; *H. cavimana* (Rathbun, 1914); *H. cribrorum* Rathbun, 1932; *H. knudseni* Serène, 1964; *H. littoralis* Tesch, 1918; *H. lugubris* Alcock, 1899; *H. mortenseni* Serène, 1964; and *H. pubescens* Chen, 1998.

Hephthopelta potens sp. nov., by its carapace proportions (cb: cl = 1.15–1.25), is closest to the group including *H. bruuni* (cb: cl = 1.23), *H. apta* (1.21), *H. criborum* (1.26), *H. cavimanus* (1.24) and *H. aurita* (1.16) (proportions derived from the type descriptions). *Hephthopelta aurita* Rathbun, 1932, is immediately separable by its large anterolateral spines. *Hephthopelta apta* Rathbun, 1914, differs from other species by having the eyestalks moderately constricted next to the cornea, and in having the pigment spot of the cornea small and dull coloured. It differs particularly from the present species by the lack of spines on the outer border of the merus of the cheliped.

The male holotype of *Hephthopelta criborum* Rathbun, 1932, was supposedly figured by Sakai (1976, text-fig. 298a, b) and is clearly different from the present species in many characters including overall shape, shape of the carpus of the chelipeds, and shape of the front and orbits. However, P.K.L. Ng and P. Castro (*in litt.*) have also examined the type housed in the USNM in Washington, and in their opinion, 'Sakai's figure either shows another species or is a very very young specimen. His figure does not look like the types'. However, from the pictures they supplied me of the holotype, and of another specimen they have from Vanuatu, it

is clear that the above differences in carapace and chela shape still hold true. *Hephthopelta criborum* will be redescribed and discussed as part of the Castro and Ng revision which is currently being undertaken.

Hephthopelta cavimanus (Rathbun 1914) is separable from all other species, including the present one, by the presence on the inside of the palm of the minor cheliped of the male, of a large blunt compressed tooth which fits into a sinus on the inner margin of the arm.

Hephthopelta bruuni Serène, 1964, appears to be the closest relative of the present species. It is only known from the single female type specimen (5×4 mm) from Vietnam, but it can be easily distinguished from *H. potens* sp. nov. by the following differences. 1) The breadth to length ratio of *H. bruuni* is given by Serène (1964) as 1.25; our smallest specimen (~ 7.1×6.2 mm) is considerably larger than the holotype of *H. bruuni* but relatively narrower with a ratio of 1.15; while our larger specimens (<11 mm c.b.) vary from 1.2–1.25 broader than long. 2) The ratio of fronto-orbital width to carapace width in *H. bruuni* is c. 1.56 whereas in our new species it is approximately twice (1.9–2.26 times). 3) The orbit is relatively wider in relation to the front in *H. bruuni* with the ocular peduncles longer and more obvious dorsally. The lateral edges of the front also meet the supraorbital at an angle whereas in *H. potens* sp. nov., the orbit meets the front in an even curve (Figs 1A, 3). 4) The merus of the third maxilliped is comparatively quadrate in *H. potens*, with its basal width being equal to the anterior width of the ischium (Fig. 2B), whereas in *H. bruuni* it is constricted at the base.

Of the other species currently referred to the genus, *Hephthopelta lugubris* is proportionately narrower, being about as broad as long, but is also readily distinguished from all other species by the spinulose posterior borders of the meri of its first two pairs of walking legs. However, *Hephthopelta* aff. *lugubris* of Komai *et al*. (2012: fig. 7) does appear very similar to *H. potens* sp. nov., but although it was not described by Komai *et al*. in their paper, it clearly has much longer legs than *H. potens* sp. nov., and lacks the characteristic chela shape of our new species. Peter Ng and Peter Castro (pers. comm.) are currently revising *Hephthopelta* and will split it into several genera. As part of this work *H.* aff. *lugubris* of Komai *et al*. (2012), will be described as a new, along with a second new species, and it appears likely that our *H. potens* sp. nov. will be included with them in a new genus.

Hephthopelta mortensi, *H. littoralis*, *H. knudseni* and *H. pubescens* are all much broader than long (1.5 times), as well as each differing from *H. potens* sp. nov. in numerous other characters. They have no close affinities with *H. potens*, and thus further comparisons are deemed unnecessary, especially in the light of the Castro and Ng revision currently in progress.

Etymology. The specific name *potens* is Latin for powerful and refers to the markedly swollen claw.

Distribution. Only known from off north-east Queensland, Australia. Bathymetric range: 212–302 m.

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