

Ray  
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Peter D.

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NEW AND RARE CRABS OF THE SUBFAMILY DOTILLINAE (CRUSTACEA: OCYPODIDAE) FROM NORTHERN AUSTRALIA AND PAPUA NEW GUINEA

P.J.F. DAVIE

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Two new species of the previously monotypic genus *Tmethypocoelis*, *T. koelbeli* and *T. odontodactylus*, are described. They are separated from each other and from *T. ceratophora* (Koelbel) by their distinctive male pleopods, and cheliped characters. *Ilyoplax strigicarpus* is also described, and is separated from its closest ally, *I. orientalis*, by the shape of the lower orbit and the male first pleopod. *Ilyoplax dentatus* is discussed and the male and female abdomens and male pleopod are figured. □ Crustacea, Ocypodidae, Dotillinae, *Tmethypocoelis*, *Ilyoplax*, new species, Australia, Papua New Guinea.

P.J.F. Davie, Queensland Museum, PO Box 300, South Brisbane, Queensland 4101, Australia; 14 August, 1989.

The ocypodid subfamily Dotillinae has long been referred to as the Scopimerinae, but Manning and Holthuis (1981: 192) point out that Dotillidae Stimpson, 1858, is older than Scopimerinae Alcock, 1900, and therefore has priority. The dotillines are poorly represented in Australia; only *Scopimera inflata* A. Milne Edwards and *Ilyoplax dentatus* Ward have been previously recorded. This paper records two new species bringing the total number to four. All appear to be endemic. Only *Scopimera kochi* Roux, 1927, has been previously recorded from New Guinea. All specimens examined are in the collections of the Queensland Museum (QM), the Australian Museum (AM), or the Western Australian Museum (WAM).

Genus *Tmethypocoelis* Koelbel, 1897

*Tmethypocoelis* Koelbel, 1897, p. 715.\* (Type species: *Dioxippe (Tmethypocoelis) ceratophora* Koelbel, 1897, by original designation, subsequently elevated by Shen, 1935).

DIAGNOSIS

Scopimerinae with ocular peduncle prolonged beyond the cornea as a long styliform projection. Sub-orbital margin cut into two parts by a deep groove which runs obliquely and medially downwards; the inner part has two transverse granular ridges separated by a groove. The endopod of the second maxilliped has an ovate palp. Chelipeds subequal. Second maxilliped

\* Not seen, pagination follows Shen (1935) and others, although Tesch (1918) gives p. 573.

with the penultimate segment not expanded and with the ultimate segment attached terminally. Carapace with upper surface and lateral walls not conspicuously sculptured. Ambulatory legs with large tympana.

REMARKS

Within the Dotillinae, *Tmethypocoelis* shows closest affinities with the genus *Ilyoplax* and, indeed, it was originally considered a subgenus of *Ilyoplax* (then referred to by the preoccupied name *Dioxippe* de Man). *Tmethypocoelis* shares in common with *Ilyoplax*: subequal chelipeds; a similar type of second maxilliped that does not have the penultimate segment expanded, and has the ultimate segment attached terminally; and, the upper surface and lateral walls of the carapace are not conspicuously sculptured.

The most unusual character of *Tmethypocoelis* is the long styliform projection on the cornea. This character is not unique to *Tmethypocoelis* as it also occurs in a number of species of *Ocypode* and *Uca* (see Barnes, 1968; Hagen, 1970).

In itself the ocular projection would not be sufficient to delimit the genus, however, combined with the grooves of the sub-orbital margin and the extremely consistent overall appearance of the chelac and carapace, the three species now described must be considered generically distinct. Shen's (1935) diagnosis gave eight characters to separate *Tmethypocoelis* from *Ilyoplax*. My diagnosis is somewhat shorter because, in the light of the new species described here, I decided that several of his characters were useful only at the specific and not the generic level.

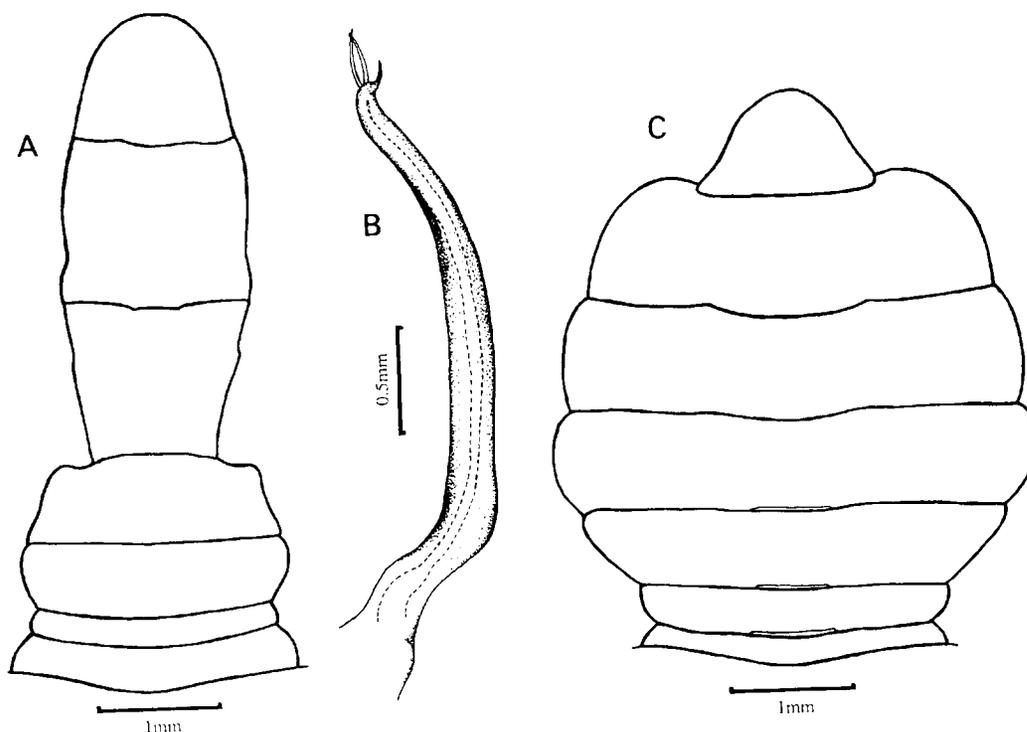


FIG. 1. *Tmethypocoelis koelbeli* sp. nov. A, male abdomen (paratype, QM W7982); B, male first pleopod (paratype, QM W7982); C, female abdomen (paratype, QM W7983).

***Tmethypocoelis koelbeli* sp. nov.**  
(Figs 1,2,6A)

**MATERIAL EXAMINED**

**HOLOTYPE:** QM W7981, ♂ (6.9 mm), South Alligator R., Northern Territory, P. Davie, 11.5.1979.

**PARATYPES:** QM W7982, 6♂♂ (7.3, 7.1, 7.0, 6.8, 5.9, 5.7 mm), same data as Holotype. QM W7983, 1♂ (5.5 mm), 3♀♀ (6.0, 5.8, 4.6 mm), East Alligator R., Northern Territory, P. Davie, 30.4.1979. QM W15085, 22♂♂ (5.3–8.2 mm), 1♀ (6.7 mm), Magela Ck, East Alligator River, Kakadu National Park, Northern Territory, 13.vi.1981, P. Davie.

**DESCRIPTION**

**Carapace:** Approximately pentagonal, somewhat flattened. Convex along mid-dorsal line, slightly convex laterally. About 0.6 as long as broad. Regions semi-defined; epigastric lobes slightly swollen, joined in a depressed arc behind front but separated behind. Ovoid mesogastric region prolonged anteriorly between epigastric lobes; cervical groove dividing gastric and car-

diac regions, short and distinct, narrow medially, widening laterally. Cardiac region with a slight central depression. Orbital, hepatic and branchial regions not distinctly separated; with undulating surface. Branchial region sloping, with irregular small setiferous tubercles. Sub-branchial region bulging, regularly hairy, separated from branchial region by sinuous lateral border which is hairy and minutely granular in its anterior half and with closely spaced short hairs posteriorly.

Front at base about one-fifth distance between external orbital angles. Side borders slightly convex, converging; frontal angles rounded. Anterior borders with sides oblique and shallowly concave; a central blunt prominence. Supra-orbital borders sinuous, sloping backward, microscopically beaded particularly towards external orbital angles. External orbital angle, with edges more or less serrulate; posteriorly followed by a broad U-shaped sinus which continues as a depressed oblique channel onto dorsal surface behind supra-orbital margin. Epibranchial angle capped by small tubercle.

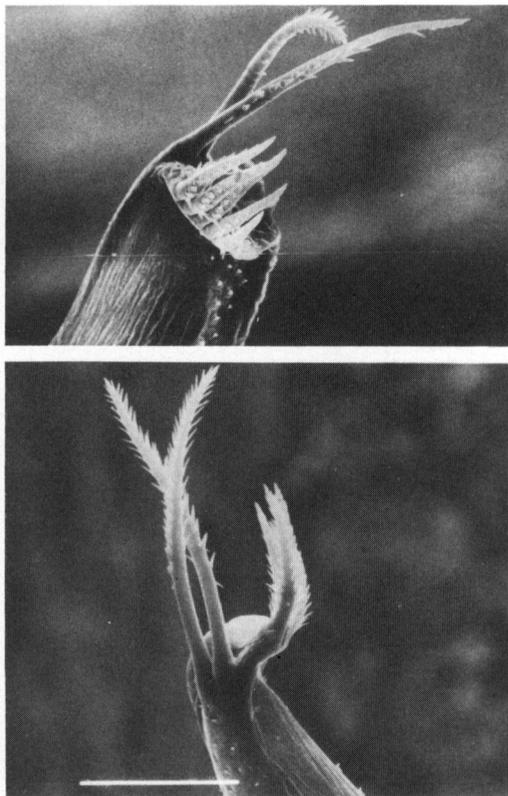


FIG. 2. *Tmethypocoelis koelbeli* sp. nov. S.E.M. photographs of apex of male first pleopod (paratype, QM W7982). Scale line = 0.1 mm.

Distance between epibranchial angles subequal or slightly less than between external orbital angles. Hind margin slightly concave and about two-thirds distance between external orbital angles; a fine ridge parallel with the hind margin forms a broad rim.

Infra-orbital border projects beyond supra-orbital, and is of two parts separated by a notch, from which on the pterygostome, runs an inwardly directed oblique channel. This channel forms a tilted Z-shape and terminates above the base of the chela. Inner part of infra-orbital border about equal in length to outer part and consists of two rows of large granules separated by a concavity. Anterior row follows the arc of the orbit, posterior row is slightly irregular, almost straight, and converges on but does not intercept the anterior row at the notch. Just behind this second row is a line of closely spaced long feathery hairs which extend from the base of the eyestalk and are longest behind the notch. Outer

part of infra-orbital border also granular; terminates just below external orbital angle such that a broad notch is formed. Undersurface of the external orbital angle with a brush of feathery hairs. Side walls perpendicular anteriorly but sloping outwards at the sub-branchials; regions not separated; setiferous tubercles over whole area.

*Eyestalks*: Widen distally; cornea bulging; medial thickening gives twisted appearance; usually reach level of external orbital angle. Eyestalk projects beyond the cornea in the form of a long style, which in adult males is equal to, or longer than cornea, but shorter in younger specimens. Female style short and fine, almost like a stout hair. Tip with two or three stiff hairs disposed in single file. Always a long stout hair placed just before cornea and projecting upwards.

*External maxillipeds*: Do not close buccal cavern, slightly vaulted. Ischium subquadrate, although antero-internal angle produced as an obtuse lobe. Dense fine hair longest on postero-internal curve and extending dorsally up inner side. Anterior margins slightly concave. A line of fine hair runs obliquely from anterior margin near antero-internal angle and then down outer margin, increasing in length so that are longest at the outer margin. Merus slightly larger than ischium. Lateral margins converge distally; inner margin straight with long feathered hairs, outer margin slightly convex with short pile. Merus and ischium covered with very short scattered hairs. Carpus occupies the narrow anterior margin of merus as with *T. ceratophora*. Dactylus slender and twice length of propodus. Long feathered hairs apically.

*Abdomen*: Terminal segment rounded. Penultimate segment slightly longer than fifth segment, and with slightly concave, parallel sides. Fifth segment with straight sides, narrowest at base. Fourth segment expanded. Female abdomen as figured.

*Chelipeds*: Massive; long but not remarkably; subequal. Merus is sharply three faced with serrulate borders; tympanum on inner surface, broadly oval; feathery hairs on whole inner surface including tympanum. Outer face granulate distally and with tympanum smaller and elongate. Carpus a little elongated in large males, but not so in smaller males and in females; distal internal angle is extended to form tooth-like articulation point with the palm; unarmed except for fine serrulation of inner and outer borders; inner face in large males with scattered, pointed granules

proximo-dorsally and a short near vertical ridge of large rounded granules ventrally. Palm bulky, length approximately three-quarters distance between outer orbital angles; height about half length, and about equal to length of immovable finger; outer surface granulate dorsally, granules largest distally; smooth ventrally. Large granules down edge of gape between fingers, on both outer and inner surfaces. Inner surface evenly and finely granulate on upper half. These granules extend over the dorsal curve to the sharply cut superior border of the outer surface. Both upper and lower borders finely granulate. Lower border extends onto, and is obvious, for about half length of immovable finger. Small group of long hairs on upper surface just behind the articulation joint of dactylus. Fingers gaping at base. Both fingers curved inwards, expanded distally to form spooned tip. Cutting margins with even rows of teeth, however on moveable finger of smaller males, a raised platform of teeth is differentiated in proximal half and some trace of this is usually evident in fully mature chelae. Inside surface of moveable finger with short irregular line of large tubercles just above cutting margin near base. Band of fine granules on dorsal surface takes the same form as palm. Superior border straight, extending three-quarters length of finger; terminates in an overhanging 'shelf' because of sharp inward turning of tip. Outer surface with two subregular lines of granules originating at base; development of granules and length of line variable. Superior one may extend three-quarters of length to tip, lower one a little less. Inner margin at tip of both fingers with a short row of 6–10 stout hairs. Spooned tips with corneous edge. Chelipeds of females of small and simple 'ocypodid' type.

*Ambulatory legs:* Meri approximately two and a half times as long as broad, as long as the next two joints together. Upper and lower margins convex. Upper margin slightly crenulate distally, otherwise smooth. Provided both sides with oval tympana. Tympana large and of same relative size on anterior surface of all meri; on posterior surface, become progressively smaller from 1st to 4th legs. Second pair of legs the longest, second and third pairs both longer than first; fourth pair the shortest. First pair a little longer than distance between external orbital angles. Carpo- and propodites with fine bristles. Dactyli nearly straight, flattened dorso-ventrally, pointed, shorter than propodites. Closely spaced fine hairs laterally, not extending to tip. Length of hairs tapering distally.

Hairy edged pouch present between bases of first and second, and second and third walking legs. Hair tufts are long, thick, and conspicuous and extend to bases of meri.

*First male pleopod:* As figured.

*Colour:* Chestnut brown to grey with white chelae.

#### HABITAT

Burrow in soft moist mud banks in upper estuary, low salinity, mangrove situations.

#### REMARKS

This species is only known from the Alligator Rivers System, Northern Territory. It differs most conspicuously from *T. ceratophora*, by being not quite as broad (c. 0.6 as long as broad, as opposed to c. 0.5 in *T. ceratophora*); having a distinctive first male pleopod; and having the carpus of cheliped not as elongated in adult males. It differs from *T. odontodactylus* by the shape of the first male pleopod and the form of the chelae.

#### *Tmethypocoelis odontodactylus* sp. nov. (Figs 3,6B)

#### MATERIAL EXAMINED

HOLOTYPE: WAM 953-88, ♂ (7.7 x 4.5mm), Mouth of Gogol River, South of Madang, Papua New Guinea, sand, intertidal, I.vii.1987, G.J. Morgan.

PARATYPES: WAM 218-88, 8♂♂ (6.1–9.3mm), 5♀♀ (5.6–7.6mm), data as for holotype. QM W15385, 2♂♂ (6.2, 8.6mm), 1♀ (6.6mm), data as for holotype.

#### DESCRIPTION

*Carapace:* Approximately pentagonal, evenly convex longitudinally, slightly convex laterally; about 0.6 (0.57–0.61) times as long as broad; regions semi-defined. Frontal region furrowed; epigastric lobes small, not joined anteriorly; mesogastric region ovoid and slightly swollen; cervical groove separating gastric and cardiac regions is quite wide and widens into depressed areas laterally bordering the cardiac region; intestinal region separated by a shallow furrow. Orbital, hepatic, and branchial regions not distinctly separated from each other, marked by several short lateral, setiferous ridges and the whole area laterally with short strong setae. Sub-branchial region bulging, regularly hairy, separated from branchial region by a sinuous lateral border of short stout setae.

Front at base about one-fifth distance between

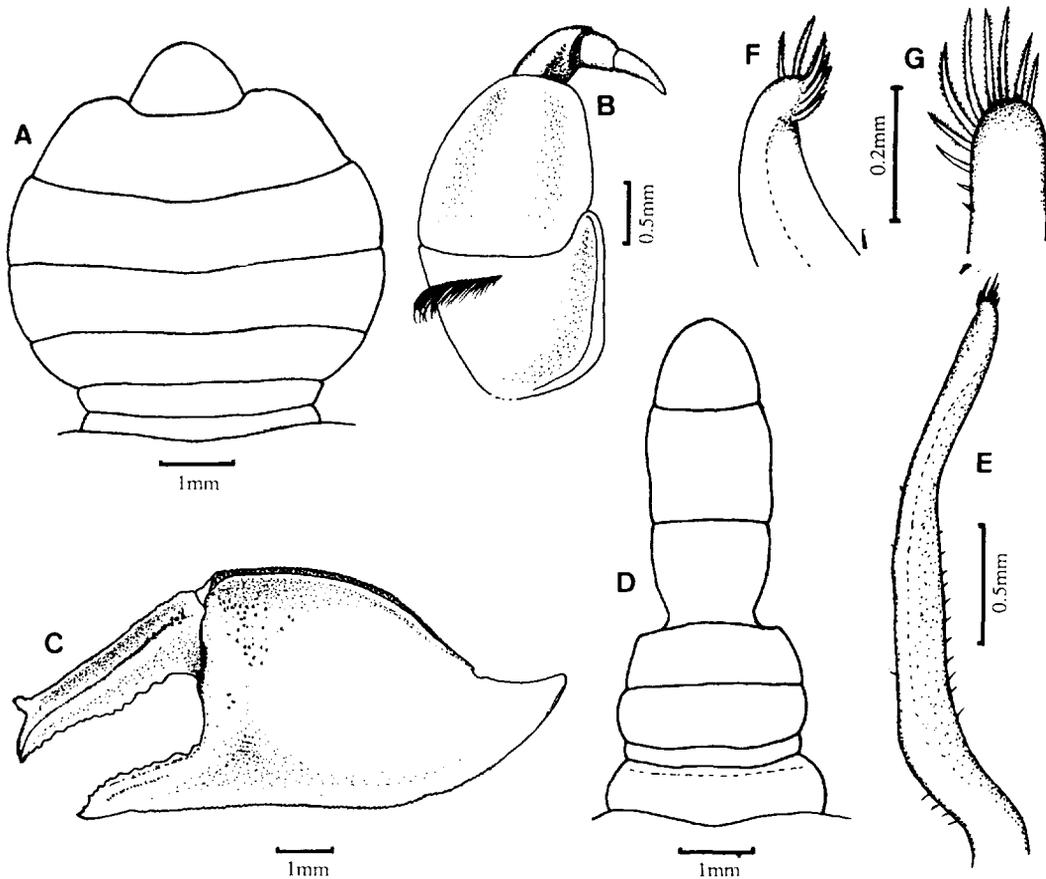


FIG. 3. *Tmethypocoelis odontodactylus* sp. nov. A, paratype WAM 218-88 (7.6 mm), female abdomen; B-D, paratype male, WAM 218-88 (9.1 mm); B, third maxilliped (denuded); C, left chela; D, abdomen; E-G, holotype male, WAM 953-88 (7.7 mm), first pleopod, and magnifications of apex.

external orbital angles; lateral borders slightly convex, converging; anteriorly concave either side of a central blunt point. Supra-orbital borders sinuous, sloping backward, microscopically beaded. External orbital angle bluntly pointed, granulate; followed by U-shaped sinus which forms a depressed oblique furrow onto dorsal surface behind outer half of orbit. Epibranchial angle blunt and at the same level as external orbital angle although may be slightly more protruding on small specimens. Hind margin slightly concave, about two-thirds of the distance between the external orbital angles; with a broad smooth rim.

Infra-orbital border projects beyond supra-orbital and consists of outer and inner sections of about equal length, and separated by a notch;

inner part consists of two rows of granules separated by a deep furrow, outer part with small granules on border, terminating below the external orbital angle such that a broad notch is formed; ventral margin of external orbital angle with a brush of feathery hairs. Side walls perpendicular anteriorly but sloping outwards at the sub-branchials; covered in short stout setae.

*Eyestalks:* Widen distally; slight medial thickening, cornea bulging; usually reach level of external orbital angle. Style projects beyond cornea in males; length variable but usually slightly more than length of cornea; tipped with two or three long bristles. A stout hair usually placed on stalk just before the cornea, and projecting upwards.

*External maxillipeds:* Do not close buccal

cavern; slightly vaulted; internal margins and palp with thick lining of fine setae; outer margins with short sparse setae. Ischium subquadrate, a little broader than long, and with the internal superior angle produced as an obtuse lobe. Merus distinctly larger than ischium, lateral margins convergent distally; palp occupies the narrow anterior margin.

*Abdomen:* Telson rounded, about the same length as fifth segment; sixth segment longest; fifth segment basally constricted; fourth segment expanded; second segment a thin strip. Female abdomen a wide flap as figured.

*Chelipeds:* Massive in males, subequal; merus trihedral with serrulate borders; broadly oval tympanum on proximal two-thirds of inner face; outer face with a smaller elongate tympanum near lower border. Carpus elongated (length c. 1.5 times breadth), sub-rectangular, granulate borders. Palm bulky, height about half total length, and equal to length of moveable finger; outer surface finely granulate mid-dorsally, granules largest distally, smooth ventrally, larger granules along edge of gape. Lower border granulate except for distal portion of immovable finger. Upper half of inner surface evenly and finely granulate, granules extending over the dorsal curve to the sharply defined superior border of the outer face. Both fingers curved inwards distally, and expanded distally to form spooned corneous tips; cutting margins are evenly toothed although on the proximal half of the moveable finger the teeth are a little more elevated. Moveable finger with a medial granulate ridge running the whole length and another granulate crest on the superior margin which terminates subdistally in a strong upturned tooth. Chelipeds of females of small and simple 'ocypodid' type.

*Ambulatory legs:* Similar to *T. koelbeli*; tympana on anterior surface of meri are large and of similar relative size, on posterior surface becoming progressively smaller from first to fourth legs. Second pair of legs longest. Hairy edged pouch present between bases of first and second, and second and third walking legs.

*Colour:* Chestnut brown, with lighter chelae becoming white on the fingers. Some specimens have large lateral cream patches extending over the orbital floor, and the hepatic and anterior branchial regions but not onto the frontal and protogastric regions.

*First male pleopod:* As figured.

#### HABITAT

Found on intertidal sand at the mouth of the

Gogol River and so would appear to be more tolerant of high salinity than *T. koelbeli*.

#### REMARKS

This species is only known from the type locality. It is distinguished from both the other species by the remarkable subdistal tooth on the anterior margin of the moveable finger of the chela, and by the distinctive tip of the first male pleopod. Both *T. odontodactylus* and *T. koelbeli* differ from *T. ceratophora* in having the carpus of the cheliped rather short and not remarkably elongated.

#### *Ilyoplax strigicarpus* sp. nov.

(Figs 4,6D)

#### MATERIAL EXAMINED

**HOLOTYPE:** QM W14944, ♂ (7.1 mm), near the Australian Institute of Marine Science, Cape Ferguson, Townsville, NEQ, Nov. 1980, N. Zucker.

**PARATYPES:** QM W11258, 2♂♂ (6.4, 6.4 mm), data as for Holotype. QM W2996, 1♂♂ (4.9, 5.0 mm), Pioneer River, Mackay, MEQ, B. Campbell, 4.ii.1965. QM W4584, 2♂♂ (5.0, 5.3 mm), 2♀♀ (4.9, 5.9 mm), Redbank Ck, Trinity Inlet, Cairns, NEQ, R. Timmins, 11.xii.1974. QM W4625, 1♂ (4.2 mm), Bogimbah Ck, Fraser Island, SEQ, Australian Littoral Society, 3.i.1973. QM W4776, 3♂♂ (4.6, 5.9, 6.5 mm), Bogimbah Ck, Fraser Island, SEQ, Australian Littoral Society, 1.i.1974. QM W5383, 1♂ (5.2 mm), Pulgul Ck, Hervey Bay, SEQ, P. Davie, 19.vii.1975. QM W15083, 1♂ (4.7 mm), 3♀♀ (3.8, 4.1, 5.3 mm), Point Farewell, East Alligator River, Kakadu National Park, Northern Territory, 11.vi.1981, P. Davie. WAM 185-80, 1♂ (5.8 mm), Main Channel, Broome, N.W. Australia, between Broome Pearls Ck and Roebuck Hotel Ck, 25.ix.1980, D.S. Jones and R.W. George. WAM 219-80, 1♂ (6.0 mm) 1♀ (5.4 mm), Main Channel, Broome, N.W.A., 2.x.1980, D.S. Jones and R.W. George.

**OTHER MATERIAL:** AM Unreg. 1♂ (5.3 mm), mouth of Nungbalgari Ck, NT, mudflat burrows, 22.viii.1975, D. Grace (Messel). AM Unreg. 1♂ (4.2 mm), Hutchinson Strait, 10 km W/B, mudfloor, *Rhizophora* forest, 25.ix.1975, D. Grace/Green. AM Unreg. 3♂♂ (5.5, 5.9, 5.0 mm) Wurugois Ck, NT, 19.viii.75, mudbank, burrow, D. Grace.

#### DESCRIPTION

*Carapace:* Sub-rectangular, regions poorly defined; smooth or microscopically granular, with sparsely scattered small hairs. Front relatively broad (approx. 0.29 × distance between external orbital angles), slightly deflexed; lateral

borders converging, angular; a blunt median prominence; distinctly concave dorsally. Gastrocardiac groove well defined; cardiac region with a low swelling either side of the mid-line; branchial regions with three short, low, horizontal crests posterolaterally above the articulation of the last walking leg, each with a row of short hairs. Posterior border slightly concave, and with a very broad rim. Side walls divergent; greatest carapace width at about the first walking leg.

Supra-orbital borders, sinuous, sloping backward, minutely granular on central convexity otherwise smooth. External orbital angles pointed although not sharply, posteriorly followed by broad U-shaped notch. Lateral borders slightly divergent, straight or slightly concave, sharp and clearly defined in anterior half then becoming indistinct.

Infra-orbital border projects beyond supra-orbital; smooth; slightly sinuous, and is continuous with the lower edge of the external

orbital angle laterally; the anterolateral edge has a tooth capped by a molar-like pectination and from this tooth a ridge extends almost to the outer lobe of the epistome so forming a horizontal, triangular, concave shelf anterior to the orbit.

*Eyestalks*:  $c. 0.36 \times$  distance between external orbital angles, cornea bulging.

*External maxillipeds*: Merus longer than ischium ( $c. 1.3 \times$ ). Antero-internal angle of ishium produced along edge of merus. Anterior half of ishium with a line of microscopic granules slanting down toward external border and equipped with feathery hairs longest near external border.

Maxilliped slightly bulging and completely closing the buccal cavity.

*Abdomen*: Terminal segment rounded triangular, slightly shorter than penultimate. Penultimate with sub-parallel margins. Fifth segment subequal in length to penultimate, characteristically constricted near base. Fourth and third segments divergent, fourth longer than

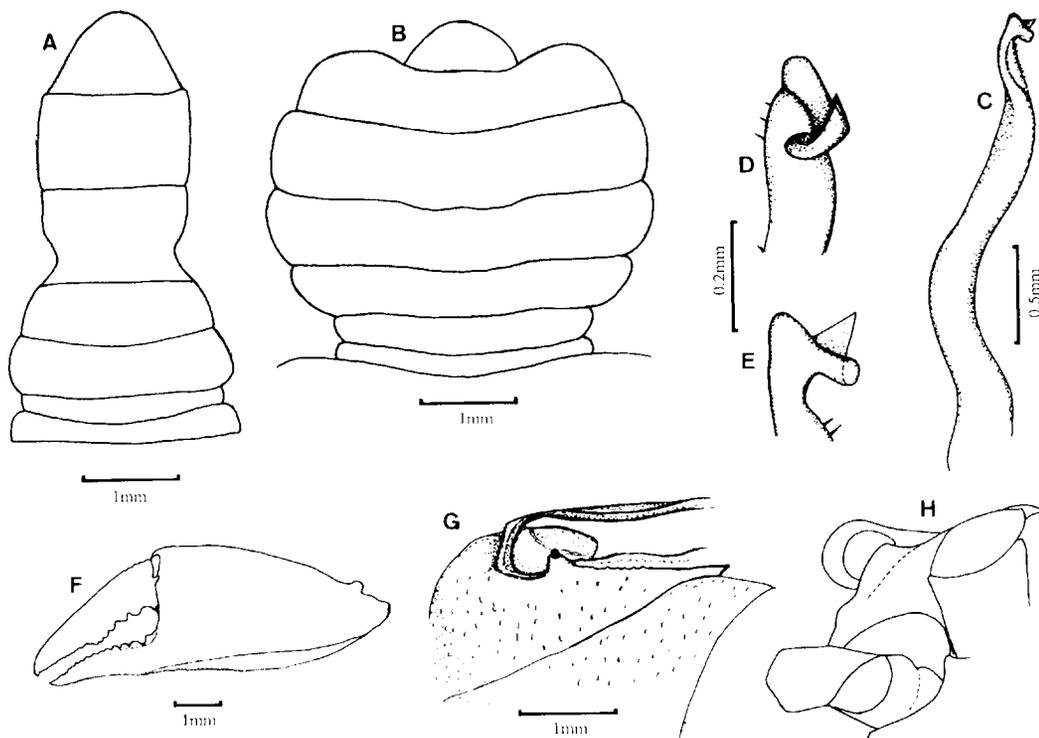


FIG. 4. *Ilyoplax strigicarpus* sp. nov. A, C–G, holotype male; A, male abdomen, B, female abdomen, paratype (QM W4564; 5.9 mm c.b.); C, male first pleopod; D, E, magnifications of apex; F, left chela; G, suborbital border showing chitinous peg on tip of outer orbital tooth; H, suborbital margin of *Ilyoplax orientalis* (Zool. Ref. Coll., University of Singapore; Cat. No. 1965.7.19.192–196; ♂ (4.2 mm c.b.), Pandan Forest Reserve Singapore, coll. Sept. 1934).

third. Second segment constricted. First with horizontal keel subparallel to anterior margin. Female abdomen as figured.

*Chelipeds*: Massive, very long (c. 3 × distance between external orbital angles); equal; merus trihedral, inner margin granulate, outer margin serrated; posterior border rounded. Posterior face with squamiform markings except for a smooth band down outer edge. Carpus greatly elongated (c. 2 × as long as wide); and about as long as length of carapace; widest proximally, tapering distally. This elongation is typical in males over 6 mm carapace breadth however length is variable with age being not nearly so long in smaller males; in females it is short and quadrate. The internal proximal angle possessess an obtuse tooth which on its inner edge bears a series of ridges which extend in a band along the proximal lower edge of the carpus. These ridges, in association with the tooth on the inferior orbital border would appear to be a stridulatory apparatus. Above the stridulatory ridges is a row of fine hairs, longest distally.

Chela considerably elongated (length c. 2.6 × height). Dorsal margin of palm rounded, marked by a line of fine granules which continue down about two-thirds of the inside face. Upper surface of outside face slightly roughened by a series of low wrinkles, ridges or flattened tubercles, otherwise outer face is smooth. Ventral margin formed by a fine granulate line arising from the tip of the immovable finger and extending c. two-thirds distance toward articulation. An accessory line of granules also arises from the tip of the finger and extends the whole length of the lower outer face. The lower surface of the immovable finger between these two lines is also finely granulate. A granulate ridge also arises near the tip on the inside of the finger and curves upwards behind the gape for about one-third the length of the palm. This forms one side of an approximately triangular smooth area directly behind the gape.

Fingers hollowed but with a brush of hairs on inside edge near tip; pointed; immovable finger slightly down-turned; cutting margin convex, armed with an even row of teeth that range from large and rounded proximally to tiny points distally.

Upper margin of movable finger granulate; cutting margin with similar dentition to fixed finger except for the differentiation of a medial protuberance.

*Walking legs*: Meri c. 4 × as long as wide; about as long as the last three segments. There

appear to be faint signs of large oval tympana on both sides of the meri but these are not as distinct as are those of other members of this genus.

The second leg slightly the longest. Dense hair is present on the carpi and propodi of the first and second pairs of walking legs however the extent of coverage is variable. The propodi may be completely covered except for a small bare area on the postero-ventral edge behind the dactylar joint, and the carpi similarly, may be well covered except for the dorsal proximal third and the ventral surface. There does not appear to be any relationship between extent of coverage and size or sex.

*First male pleopod*: As figured.

#### REMARKS

In overall appearance *I. strigicarpus* is almost identical with *Ilyoplax orientalis* and cannot be distinguished from the type description and illustration. The differences are: the presence of a pectinate tooth on the projecting lobe of the outer orbital border; the stridulatory ridges on the proximal inner tooth of the carpus; and the form of the first male pleopod. It falls into the Group I species of Serène and Lundoer (1974), which includes *I. orientalis*, *I. tansuiensis*, *I. gangeticus* and *I. longicarpus*. The species of this group have long ambulatory legs without obvious tympana. *I. orientalis* and *I. longicarpus* share with *I. strigicarpus* a similarly formed first male pleopod characterised by an apex distally divided into several short lobes. The gonopods of the other two species are still unknown.

#### HABITAT

Common on very soft mud flats at the mouths of estuaries, and sheltered bays.

#### DISTRIBUTION

Northern Australia from Hervey Bay in Queensland, north and westwards to Broome in NW Australia.

#### *Ilyoplax dentatus* Ward, 1933 (Figs 5,6C)

*Ilyoplax dentata* Ward, 1933, p. 391, pl. xxii, figs 5, 6.  
Tweedie, 1935, p. 53; 1937, p. 148 (in key).

*Ilyoplax dentatus*: Serène and Lundoer, 1974, pp. 4,5.

#### MATERIAL EXAMINED

HOLOTYPE: AM P10638, ♂ (6.0 mm), Port Curtis, Queensland, M. Ward, June 1929.

OTHER MATERIAL: QM W7428, 1 ♂ (5.1 mm), Trinity

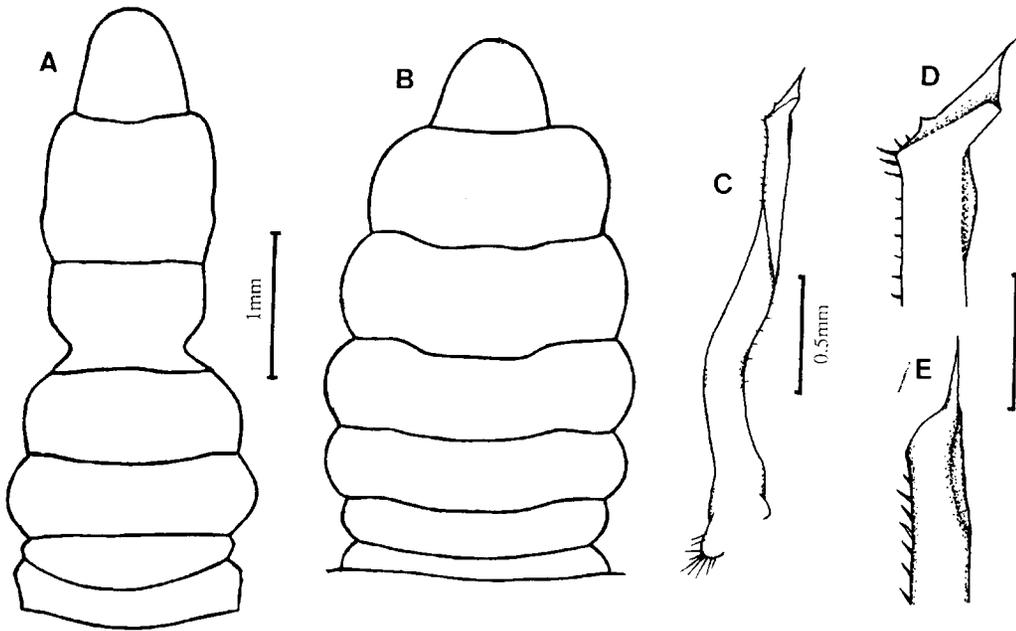


FIG. 5. *Ilyoplax dentatus* Ward; A, male abdomen (QM W7428); B, female abdomen (QM W8565); C, male first pleopod (QM W12964); D,E, magnifications of tip.

Inlet, Cairns, NEQ, R. Timmins, 14.xii.1975. QM W8565, 1 ♀ (5.2 mm), Murray River, north of Cardwell, NEQ, P. Davie, 19.v.1978. QM W8566, 1 ♀ (3.8 mm), same data as QM W8565. QM W12964, 18 ♂♂ (3.4–4.8 mm), 8 ♀♀ (3.8–4.7 mm), Murray River, NEQ, upstream of Tates Landing, exposed bank, P. Davie and J. Short, 19.iii.1987. QM W8567, 3 ♀♀ (3.9, 4.5, 6.5 mm), 1 ♂ (4.1 mm), Calliope R., Gladstone, SEQ, P. Saenger, July 1979. QM W8570, 1 ♂ (3.4 mm), same data as QM W8567. QM W8568, 1 ♀ (5.8 mm), Oct. 1975, same data as QM W8567. QM W8569, 1 ♀ (4.5 mm), 2 juveniles (2.6, 2.8 mm), May 1977, same data as QM W8567.

#### REMARKS

Although Ward's description is short, this species is quite distinctive; the large spine on the inner angle of the carpus of the chela is diagnostic. Some further description and notes on variability are warranted.

Lateral margins of carapace sinuous, bifid anteriorly such that a straight edge continues to the base of the third ambulatory leg and clearly separates the sub-branchial region. External orbital angles rounded, the distance between them less than between epibranchial angles, which are

also rounded. The margin between these angles continuous, depressed and shallowly concave. The underside of the external orbital angle forms a sub-acute tooth produced into the orbit laterally.

A supplementary row of granules is present on the lower portion of the chela. This is not mentioned by Ward but is vaguely indicated as a ridge on the right chela in his figure. It arises about midway along the outer surface of the immovable finger and is prominent for only a short distance (about one-quarter length of chela) before fading to an indistinct ridge proximally. This, however, is variable as the granulate row may extend the full length of the smaller chelae of females and juvenile males.

The first two pairs of walking legs may have a thick short fur on the dorsal anterior surfaces of the carpi and propodi. When present this fur extends from the joint but varies in extent of cover.

In well preserved specimens the tympana are large and obvious on both the inner and anterior surface of the merus of the cheliped, and although not as distinctive on the other legs nevertheless occupy most of the width and about

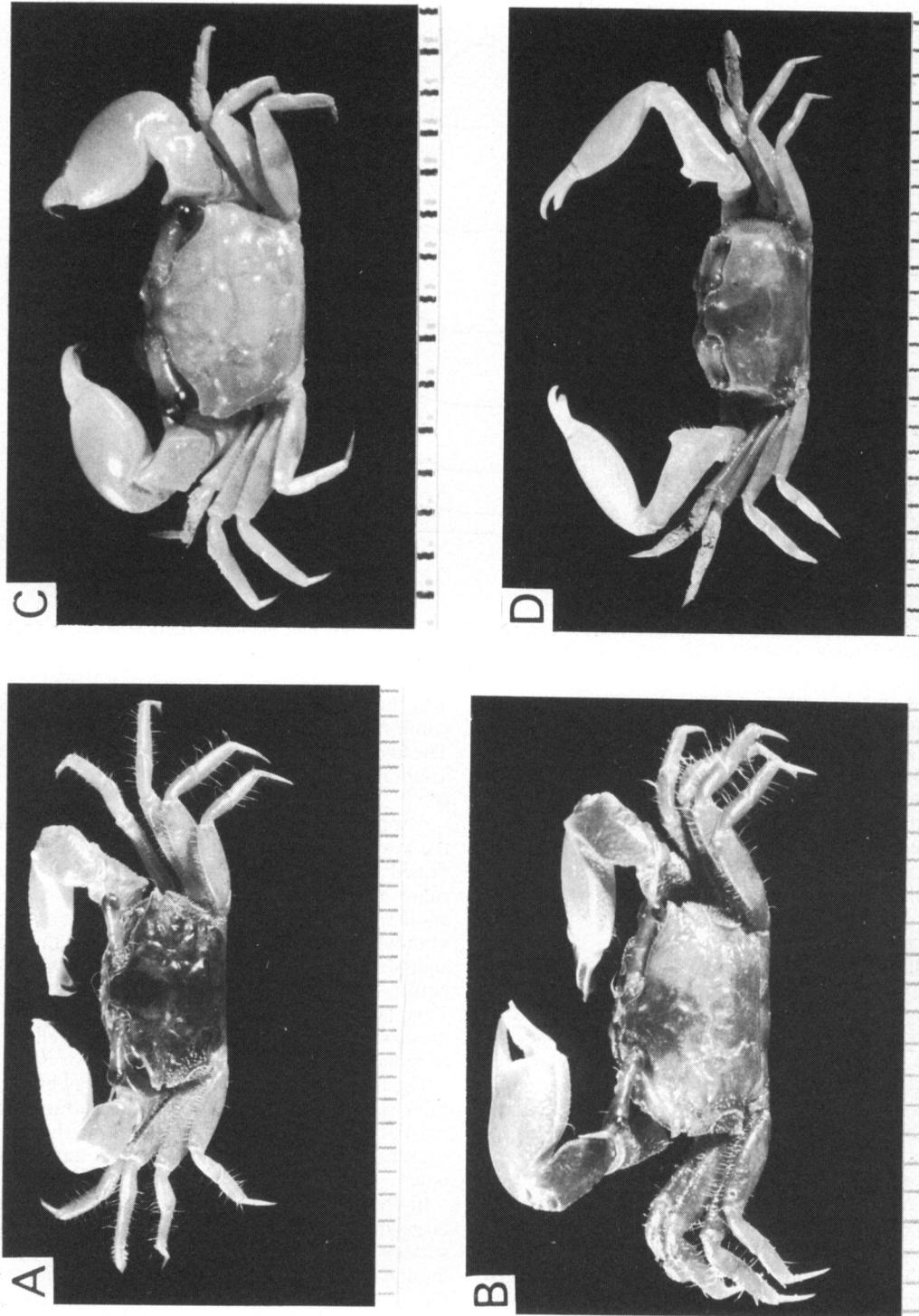


FIG. 6. A, *Tmethypocoelis koelbeli* sp. nov., paratype male (QM W15085); B, *Tmethypocoelis odontodactylus* sp. nov., paratype male (WAM 218-88); C, *Ilyoplax dentatus* Ward, male (QM W7428); D, *Ilyoplax strigicarpus* sp. nov., holotype male (QM W14944). Scale line in mm.

two-thirds the length on both sides of the meri of the first to third pairs of legs and about a half the width and length of the last pair.

*Ilyoplax dentatus* is a little difficult to place into one of the groups of Serène and Lundoer (1974). The presence of the tympana on the legs must place it in their 'Group III' but the form of the first male pleopod is not particularly like those so far figured for other species in this group, except perhaps for that of *I. formosensis*. According to Serène and Lundoer (1974), 'Group III' species have a male first pleopod characterised by a narrow tongue-like apex, and a stem with a longitudinal row of setae on one side, and a subdistal lobe with long setae on the other side. *I. dentatus* does not have an obvious subdistal lobe.

#### HABITAT

Most common on firm mud banks of mid- to upper-estuary.

#### DISTRIBUTION

Eastern Australia between Port Curtis and Cairns.

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