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**On a new genus and species of eumedonid crab from the Gulf of Carpentaria, northern Australia (Crustacea: Decapoda: Brachyura: Eumedonidae)**

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A new genus and species of eumedonid crab from the Gulf of Carpentaria, northern Australia, *Zebridonus mirabilis*, is described. *Zebridonus* gen. nov. is allied to *Eumedonus* H. Milne Edwards, 1834, *Gonatonotus* White, 1847, and *Zebrida* White, 1847, but differs from *Eumedonus* and *Gonatonotus* in the following aspects: (1) the lateral lobes of the carapace are sublamelliform and upturned; (2) presence of two sublamelliform teeth on the chelipedal carpus; (3) presence of a sharp spine at the distal end of the anterior margin of the ambulatory merus; (4) the thoracic sternum is flatter and smoother; and (5) having a proportionately broader abdomen. *Zebridonus* differs from *Zebrida* White, 1847, in having fewer spines on the chelipedal carpus, absence of a subcheliform process formed by the ambulatory dactylus and propodus, the posterior margin of the epistome is lower, the rostrum is not as deeply clefted and the orbit is straight instead of oblique.

**KEYWORDS:** *Zebridonus mirabilis*, n. gen. n. sp., taxonomy, Crustacea, Decapoda, Brachyura, Eumedonidae, Australia.

**Introduction**

A recent examination of material from the family Eumedonidae Dana, 1852, in the Queensland Museum, Brisbane, Australia, has led to the discovery of a new genus and species from the Gulf of Carpentaria, northern Australia, here named *Zebridonus mirabilis*. The new genus is closely related to *Eumedonus* H. Milne Edwards, 1834, *Gonatonotus* White, 1847, and *Zebrida* White, 1847.

The present study is part of an on-going revision of the family Eumedonidae. The abbreviations G1 and G2 are used for the male first and second pleopods respectively. The type specimen is deposited in the Queensland Museum (QM), Brisbane, Australia. The length of the carapace (cl) was measured from the tip of the rostrum to the posterior margin of the carapace; the width (cb) from spine to spine. All measurements of the length and width are in millimeters.

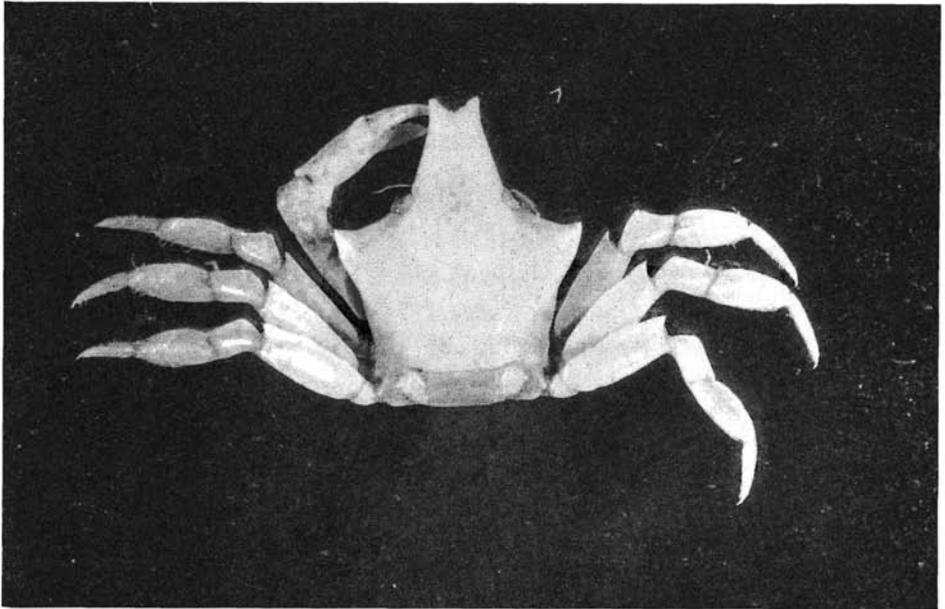


FIG. 1. *Zebridonus mirabilis*, n. gen. et n. sp., holotype male, cl 7.4 mm, cb 6.8 mm, dorsal view (QM W17404).

## Taxonomy

### *Zebridonus* n. gen.

(Figs 1-2, 3C)

*Diagnosis.* Lateral lobes of carapace sublamelliform, directed obliquely anteriorly and gently upturned, front forming sublamelliform, narrow, clefted rostrum. Carpus of cheliped with 2 well-developed sublamelliform teeth, one on outer proximal margin, the other on inner distal margin. Dorsal margins of all ambulatory meri ending in a sharp spine; first leg not distinctly longer than second leg; last leg shortest; all ambulatory legs with distinct dactylopropodal articulation. Thoracic sternum appearing flat with very slight depression between sternites 3 and 4, suture between sternites 1 and 2 absent, suture between sternites 2 and 3 deep, complete, suture between sternites 3 and 4 interrupted medially. Abdomen triangular, medially broad; ratio of maximum width to maximum length of segments 4-7 0.74; segment 3 broadest. G1 long, slender, sinuous. G2 very short, sigmoid, distal part short, spatula-shaped.

*Type species.* *Zebridonus mirabilis*, sp. nov. by present designation and monotypy.

*Etymology.* The name is derived from the arbitrary combination of the two generic names, *Zebrida* and *Eumedonus*, alluding to the proximity of the type species to these two genera. Gender masculine.

*Remarks.* *Zebridonus* seems to be closely related to *Eumedonus* H. Milne Edwards, 1834, *Gonatonotus* White, 1847, and *Zebrida* White, 1847.

For the purpose of discussion, the status of *Eumedonus* and *Gonatonotus* will have to be touched on briefly. Gordon (1934: 65) stated that the genus *Gonatonotus*

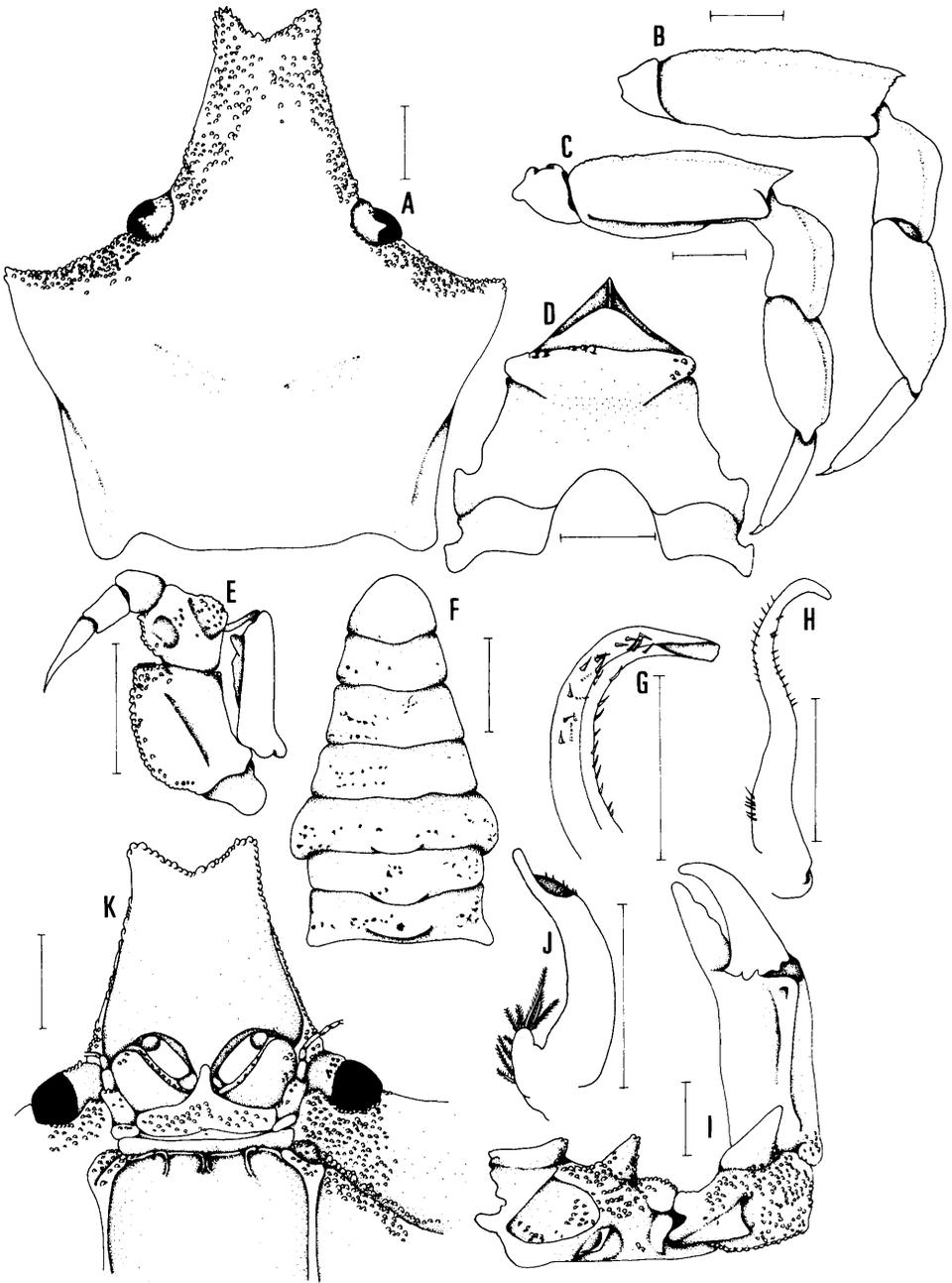


FIG. 2. *Zebridonus mirabilis*, n. gen., n. sp., holotype male, cl 7.4 mm, cb 6.8 mm (QM W17404): A carapace; B 3rd ambulatory leg; C 4th ambulatory leg; D anterior sternites; E left 3rd maxilliped; F abdomen; G dorsal view of tip of left G1; H dorsal view of right cheliped; I ventral view of left G2; J face of carapace. Scales for A-F, H-I, K = 1.0 mm; for G, J = 0.5 mm.

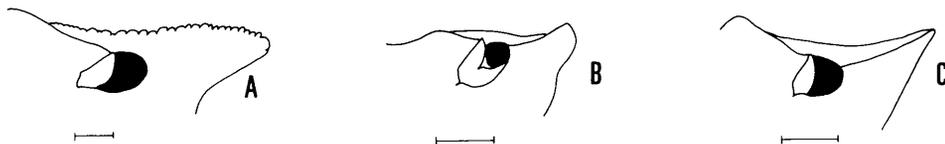


FIG. 3. Schematic drawings showing lateral lobes of the carapace and orbits: A *Eumedonous niger* H. Milne Edwards, 1834, male, cl 12.1 mm, cb 11.8 mm, SW of Cloates, Western Australia, coll. CSIRO, Station 187, 1527h, 134 m, 7 October 1963, beam trawl, echinoids, starfish, molluscs (Western Australian Museum, Australia, 112-93); B *Zebrida adamsii* White, 1847, male, cl 6.9 mm, cb 6.4 mm, Johore Shoals, Singapore, coll. D.S. Johnson, 17 June 1954 (Zoological Reference Collection, Singapore, 1984.7860); C *Zebridonus mirabilis*, n. gen., n. sp, holotype male, cl 7.4 mm, cb 6.8 mm (QM W17404). Scales = 1.0 mm.

'differs from *Eumedonous* only as regards the rostrum which is much shorter and unforked at the apex and should probably be included in *Eumedonous* ...'. We have examined the types, as well as a large series of specimens of all described species of *Eumedonous* and *Gonatonotus*, and found that the length of the rostrum can be quite variable and thus should not be used as a generic character. Moreover, there is an undescribed species of *Eumedonous* from the New Caledonia which has a relatively short rostrum like that of *Gonatonotus pentagonus*, but in every other aspect is an *Eumedonous* s. str. We therefore agree with Gordon that use of the rostrum as a character is unreliable. For the purposes of the present study, *Gonatonotus* is regarded as a junior synonym of *Eumedonous*. The matter will be discussed in detail in the forthcoming revision of the Eumedonidae.

In the general shape of the rostrum, ambulatory legs and orbits, *Zebridonus* is closer to *Eumedonous* than *Zebrida* (Table 1). Although there is a similarity in the shape of the rostrum, they are quite different, with that of *Zebridonus* being sublamelliform (Fig. 2A) while that of *Eumedonous* being sturdy and thick. The dorsal margins of all ambulatory meri of *Zebridonus* end in a sharp spine (Figs 1, 2B, C), while in *Eumedonous* the dorsal margin is cristate, sinuous and entire. As for the orbits, they are straight in both genera (Fig. 3A, C). Other differences as in the structures of the lateral lobes, chelipedal carpus, thoracic sternum and posterior margin of the epistome are listed in Table 1.

In the smoothness of the carapace, lateral lobes, general form of the chelipeds, thoracic sternum and abdomen, *Zebridonus* resembles *Zebrida*. *Zebridonus* has a generally smooth carapace, except for the small flat granules lining the frontal margins along the rostrum. The lateral lobes of both genera are of a similar texture and shape, both of which are sublamelliform and directed gently upwards (Fig. 3B, C). The chelipeds of both genera are also similar in appearance except for the number of teeth on the carpus. *Zebridonus* has two teeth (Fig. 2I) while *Zebrida* has three. The thoracic sternum is smooth and flat for both genera but there is a very slight depression between sternites 3 and 4 in *Zebridonus* (Fig. 2D). The abdomens of both genera are rather broad compared with that of *Eumedonous*. However, unlike *Zebrida*, *Zebridonus* lacks the subcheliform process formed by the ambulatory dactylus and propodus. The rostrum of *Zebridonus* is also not as deeply clefted as that of *Zebrida*. In *Zebrida*, the rostrum is deeply split into two distinct triangular lobes. Other differences between *Zebridonus* and *Zebrida* are listed in Table 1.

This unusual new genus contains only one species, *Zebridonus mirabilis* sp. nov.

Table 1. Differences between *Zebridonus* gen. nov., *Eumedonous* H. Milne Edwards, 1834 and *Zebrida* White, 1847

Species/ characters	<i>Zebridonus</i> gen. nov.	<i>Eumedonous</i> H. Milne Edwards, 1834	<i>Zebrida</i> White, 1847
Lateral lobes	Sublamelliform, gently upturned.	Thick, directed outwards.	Sublamelliform, gently upturned.
Carpus of cheliped	Two well-developed sublamelliform teeth, one on outer proximal margin and the other on inner distal margin.	One thick tooth on inner distal margin.	Three well- developed sublamel- liform teeth, one on outer proximal mar- gin, one outer distal margin and one on inner distal margin.
Ambulatory leg	Dorsal margin end- ing in a sharp spine for all ambulatory legs. No subcheli- form process.	Dorsal margin not ending in a sharp spine for all ambu- latory legs but rounded off in a lobe. No subcheli- form process.	Dorsal margin end- ing in a pronounced spine for all ambu- latory legs. Dactyl- lus and propodus of ambulatory legs forming a subcheli- form process.
Thoracic sternum	Flat with very slight depression between sternites 3 and 4.	Deeper depression between sternites 3 and 4.	Flat with not much depression between sternites 3 and 4.
Ratio of maximum width to maximum length of abdominal segments 4-7	Broad = 0.74 mm	Long and narrow = 0.60 mm	Very broad = 0.83 mm
Posterior margin of epistome	Median part very low.	Median part high.	Median part high.
Rostrum	Rostrum narrow, not deeply clefted, only tip slightly bifurcated, rostrum sublamelliform.	Rostrum narrow, not deeply clefted, frontal margin sometimes gently sinuous; rostrum thick.	Rostrum broad, deeply clefted to form two distinct triangular lobes, rostrum sublameli- form.
Orbit	Straight.	Straight.	Oblique.

*Zebridonus mirabilis* n. sp.

(Figs 1-2, 3C)

*Material examined.* Gulf of Carpentaria, far north Queensland, Australia, 15°31.4'S, 139°11.6'E, dredged, coll. Commonwealth Scientific and Industrial Research Organisation (CSIRO), vessel FRV *Southern Surveyor*, 45 m, 29 November 1990, 1 ♂, cl 7.4 mm, cb 6.8 mm (QM W17404) (HOLOTYPE).

*Diagnosis.* Carapace longer than broad, pentagonal in shape; rostrum sublamelliform, long, clefted medially to form two lobes at tip; inner supraorbital teeth absent; regions very poorly defined, gastric grooves shallow, indistinct; surfaces of

carapace very smooth except for small flattened, granules lining frontal and anterolateral margins, surfaces not covered with any pubescence. Antero- and posterolateral margins clearly demarcated; anterolateral margin entire, without any teeth or lobes; lateral carapace lobe triangular, sublamelliform, directed obliquely anteriorly and gently upturned. Antennae well-developed, basal segment large, rectangular, occupying orbital hiatus but movable, not fused to margins, second antennal segment short, *ca* 0.2 × length of basal segment. Antennules large, folding obliquely, *ca* 45° from horizontal; Inter-antennular septum distinct, lined with numerous small granules. Posterior margin of epistome with median triangular lobe, medially clefted; lateral part sinuous with 2 small clefts; anterior margin smooth with scattered granules. Endostomial ridges distinct, edge of buccal cavity rough, covered with many small granules. Pterygostomial regions rough, granulated. Third maxilliped quadrate; inner margin of ischium granulated; antero-external angle of merus granulated, rounded, not auriculiform; exopod with well-developed flagellum. Chelipeds granulated on most surfaces; chela stout, length 2 × length of fingers dorsal margin with a smooth triangular, lamelliform crest, distal dorsal margin with distinct elongate tooth, fingers not carinate, pollex not bent downwards, left pollex with distinct ridges; carpus with two well-developed teeth, one on outer proximal margin, the other on inner distal margin; merus with one tooth on inner proximal margin, one on inner median margin, another on distal end, outer margin with a median tooth; all teeth cristate, sublamelliform. Dorsal margins of merus, carpus and propodus of ambulatory legs strongly cristate, surfaces smooth; dorsal margins of all ambulatory meri ending in sharp spine, lined with several minute spinules along the distal margin in ambulatory legs 1–3. Thoracic sternum broad, surface smooth, suture between sternites 3 and 4 lined with few granules, flat, with very slightly depressed medially. Abdomen, surfaces appearing smooth with some tiny pits, flattened granules. G1 tip bending slightly downwards; distal surfaces lined with short spines or short, plumose setae.

*Etymology.* The name is derived from the Latin for wonderful, alluding to the peculiar features of the species.

*Remarks.* The only known specimen of *Z. mirabilis* is an adult male which has lost all trace of colour and pattern. The host of *Zebridonus* is not known since the specimen was collected by dredging without host information. The only other eumedonid specimens obtained from the same locality as the holotype are three specimens of the crinoid symbiont, *Rhabdonotus* A. Milne Edwards, 1879 (Eumedonidae). On the basis of the external morphology, *Zebridonus* is most probably an echinoid symbiont, as it has similar chelipeds, carapaces and legs as the other echinoid symbiotic genera, namely *Eumedonus* (including *Gonatonotus*) and *Zebrida*. Genera which are associated with echinoids tend to have stout and short chelipeds with numerous strong teeth on the chelipedal merus and carpus and a rather high crest on the dorsal margin of the chela. These genera tend to have a well-developed rostrum and hence the carapace shape usually appears longer than broad. The legs of the echinoid symbionts are also stouter, flatter and not as cylindrical and the first pair of ambulatory legs are not longer than the second, all of which are very unlike the crinoid symbionts, *Harrovia* Adams and White, 1849, *Ceratocarcinus* White, 1847, *Rhabdonotus pictus*, A. Milne Edwards, 1879. For *Harrovia*, *Ceratocarcinus* and *Rhabdonotus*, members of these genera tend to have longer and slender chelipeds with fewer and smaller spines on the chelipedal merus and carpus. The carapace of the crinoid symbionts is also broader than long and the legs are slender, long and

cylindrical and the first pair of ambulatory legs are longer than the second. Only in *Harrovia egeriae* Gordon, 1947, are some of these characters of typical crinoid symbiont absent, but this species is certainly not a true *Harrovia* and will be transferred to a new genus later in a forthcoming revision. An interesting feature to note is that the striped colour pattern on the crinoid symbionts is usually transverse in contrast to the longitudinal patterning found on the echinoid symbionts.

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