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A new species of leucosiid crab (Decapoda: Brachyura: Leucosiidae) from the Arabian Gulf

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Abstract

The Indo-West Pacific genus *Coleusia* Galil 2006, was recently described and now comprises seven species. We describe a new species from the western Arabian Gulf, *Coleusia janani* n. sp. The new species is closely related to the congener *C. biannulata* (Tyndale-Biscoe & George, 1962), and can be distinguished from other species at these genus congeners mainly by the straight upward apical shape of the male first pleopod (G1). An updated identification key to the species of *Coleusia*, as well as an overview of the geographical distribution of the species included in the genus are also presented.

Key words: marine biodiversity, Qatar, taxonomy

Introduction

Species included in the subfamily Leucosiinae Samouelle, 1819, are grouped into six genera: *Euclosiana* Galil 2003, *Coleusia* Galil 2006, *Leucosia* (Weber 1979), *Seulocia* Galil 2005a, *Soceulia* Galil 2006, and *Urnalana* Galil 2005 (Galil, 2003, 2005a, 2005b, 2006; De Grave *et al.*, 2009; Galil & Ng, 2010). *Coleusia* was described by Galil (2006) to include five species: *Coleusia biannulata* (Tyndale-Biscoe & George, 1962), *C. magna* (Tyndale-Biscoe & George, 1962), *C. rangita* Galil 2006, *C. signata* (Paulson, 1875), and *C. urania* (Herbst, 1801). A sixth species *Coleusia huiliana* Promdam, Nabhitabhata & Galil 2014, was described more recently, whilst the taxonomy of *C. urania* was recently resolved by (Ng *et al.* 2014).

The present contribution describes a new species of *Coleusia* from the western Arabian Gulf, the seventh species within the genus.

Specimens of leucosiid crabs were collected during a cruise on board Qatar University's RV *Janan* during November 2014. Sampling was undertaken using a 0.25 m² Petersen grab of as well as a biological beam trawl with a 2 m opening and 5 mm mesh. Granulometric data from the sampled sites was also included. Specimens are deposited in the marine collections of the Environmental Science Centre at Qatar University (ESCMC) and in the Oxford University Museum of Natural History (OUMNH). Size is expressed as carapace length (cl) in mm.

Systematics

Family Leucosiidae Samouelle, 1819

Subfamily Leucosiinae Samouelle, 1819

Genus *Coleusia* Galil, 2006

Coleusia janani sp. nov.

(Figs. 1–3)

Type material. *Qatar.* **Holotype.** male (cl 13.6 mm), ESCMC 00161, 22 m, near offshore oyster bed in Qatar Marine Zone within the Arabian Gulf, 25°45'0.612"N 51°52'24.599"E, grab survey, 12.xi.14. **Paratypes.** female juvenile (cl 9.5 mm), ESCMC 00162, 22 m, near offshore oyster bed in Qatar Marine Zone within the Arabian Gulf, 25°45'0.612"N 51°52'24.599"E, grab survey, 12.xi.14; female (cl 13.1 mm), ESCMC 00163, 27 m, offshore soft substrate peripheral to oyster bed in Qatar Marine Zone within the Arabian Gulf, 25° 33' 31.32"N 52°01'0.48"E, grab survey, 11.xi.14; female (cl 12.8 mm), OUMNH.ZC.2016-01-112, same data; male (cl 14.2 mm [broken triangular rostrum and lacking red circles]), OUMNH.ZC.2016-01-113, 26m, offshore soft substrate peripheral to oyster bed in Qatar Marine Zone within the Arabian Gulf, 26°01'50.988"N 51°46'9.012"E, trawl survey, 13.xi.14.

Description. *Holotype.* Carapace globose to rhomboidal, (Figs. 1, 2A) 1.19 times longer than wide; dorsal surface shiny, smooth, closely punctate only in anterior central area; posteriorly slightly punctate. Large, concave margin in hepatic region, about 0.6 times as large as maximum carapace width. Antero-lateral border sharply crenulated (Figs. 2 A, G). Lateral margin of carapace with sequential granules, minutes anteriorly, increasing in size medially above the thoracic sinus, ending above third pereiopod (Figs. 2A, D). Posterobasal margin laterally expanded, forming small wings responsible for square shape of posterior carapace (Figs. 1, 2H); line of granules extending to basolateral margin in line with the granules at thoracic sinus, overlapped with anterolateral line of granules between chelipeds, third walking pereiopod (Fig. 2D). Pterygostomial region smooth (Figs. 2A, D). Thoracic sinus plain, pterygostomial invagination with shallow, subtle Y-shaped cavity; with 4 perliform granules above cheliped basis (Figs. 2A, B, D).

Frontal region of carapace produced upward, up-curved, forming central longitudinal, triangular elevation; concave dorsolaterally (Figs. 2A, G). Frontal margin medially unidentate, small triangular rostrum with anterior margin rounded (Fig. 1). Antennular fossa and orbit in line at the upward margin; antennular fossa sealed by short antennae (Fig. 2G). Orbit small, with a dorsolateral spine in the outer orbital margin, up the small fossa. Eyes retractable, small eyestalk. Width of upward frontal region (between orbits) about 0.21 times shorter than total carapace width. External maxillipeds flat, concealing trapezoid buccal opening; endopod with long triangular merus, passing ventral edge of antennular cavity in frontal margin of carapace (Fig. 1G); merus 1.27 times longer than ischium. Exopod of external maxillipeds with merus 1.6 times longer than ischium.

Thoracic sternites, abdomen punctate. Abdomen, smooth with narrow somites 1, 2; somites 3–6 fused with 2 convex (Fig. 2F), rounded protuberances proximally (Fig. 2H); somite 6 separated from proximal segments by suture, dorsally smooth with subparallel lateral margins converging distally only near the 4/5 of its length; telson triangular, slightly elongated, 1.1 times longer than wide (Fig. 2F). Abdominal cavity nearly reaching buccal cavity (Figs. 2F, G). Male first pleopod (G1) with shaft coiled three times on its axis; with apical process pointed, straight, upward, not curved (Figs. 2A, C, E).

Chelipeds with merus, carpus, chela punctate. Cheliped merus trigonal; 0.6 times as long as carapace; anterior, posterior margins lined with perliform granules that slightly diminishing in size distally in approximately 5/6 of its length; upper surface with 6 small granules grouped proximally, followed by 2 large perliform granules, distal 3/4 smooth (Figs. 1, 2A); lower surface, with anterior margin dense granulated proximally, decreasing distally, smooth posteriorly (Fig. 2F). Carpus smooth, without granules (Figs. 1, 2A). Palm elongated; propodus 1.3 times longer than wide, its upper margin rounded, lower margin with row of small granules; dactyls almost as long as propodi (Figs. 1, 2A, F). Walking pereiopods unequal in size, decreasing from second to fifth (Figs. 1, 2A, F). Larger second pereiopod reach the cheliped carpus, 0.8 times length of carapace. Pereiopodal meri with margin lined with minute granules along upper margin. Pereiopodal carpi rounded, smooth; propodi dorsally, ventrally carinate.

Female paratypes (Figs. I–L): Shorter front 0.19 times width of carapace. Third maxilliped (Fig. 2J) setose along endopod, margin of exopod merus; keel-like ischium of endopod, longitudinal convex (not flattened) elevation. Chelipeds proportionally short (Fig. 2I), with merus 0.47 times the length of carapace, shorter propodi. Pereiopods shorter than male pereiopods, with longer second pereiopod 0.7 times length of carapace. Abdomen with somites 3–6 fused, greatly enlarged; thick, convex, shield-like shape covering entire thorax; suture separating segment 6 absent; segment 1, 2, telson free (Fig. 2I). Abdominal cavity reaching buccal cavity with telson overlapping part of endopod of third maxilliped (Figs. 2 I, J, K). Gonopore (vagina) semicircular, in sternite 5;

strong inner edge, rounded and with deeper groove; outer edge more straight with longitudinal fissure (Figs. 2K, L).

Colour in life (Fig. 1). Carapace with bright orange/greyish background. Pair of large ocelli on the gastric region on each side of the carapace; with small white centres and lined by thin red outer rings overlapped with an inclined 8-shape. Intestinal region with reddish blotches on either side and without lined margins. Carapace with three bright orange markings, two anterolateral and one posterolateral, on lateral margins. Chelipeds and walking pereiopods with orange transversal bands. Meri of chelipeds with white granules and large proximal orange band covering 4/5 of its length; orange articulations in the carpi; propodus with light orange band proximally; dactyls with white tips and bright red band on the proximal region. Walking pereiopod white with one bright orange band per segment.

Type locality. Arabian Gulf; off Qatar.

Etymology. In recognition of the Qatar University Oceanographic RV *Janan* used in the collection of the present material.

Distribution. Currently only known from the type locality.

Ecology. Offshore zones with sandy mixed substrates of gravel and mud; depth between 22 and 27 m. Material collected with water temperature that varied between 27 and 28°C and salinity between 39 and 41 ppt.



FIGURE 1. *Coleusia janani* n. sp., holotype male (carapace length 13.6 mm) (ESCMC 00161). Dorsal view of carapace, colours in life.

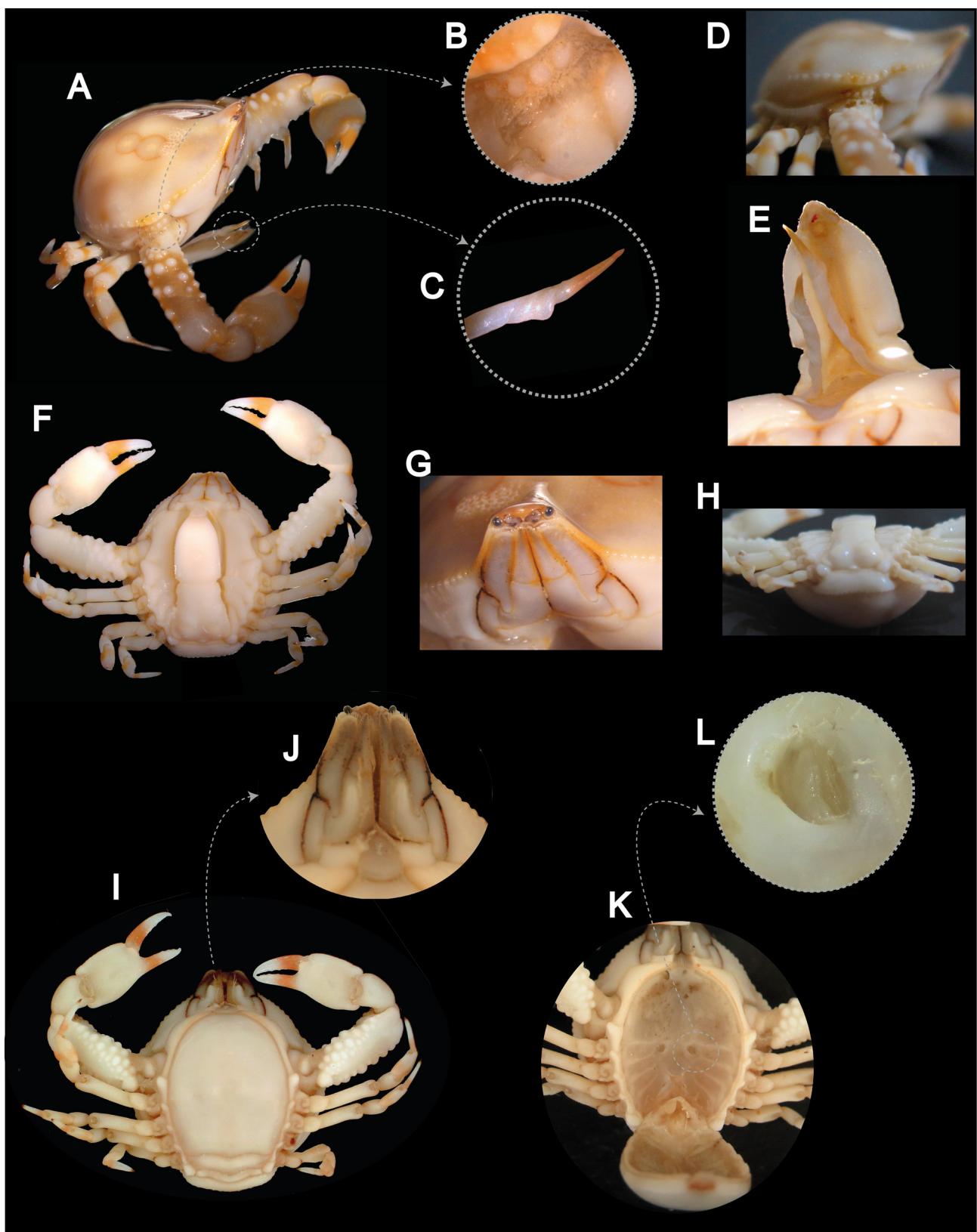


FIGURE 2. *Coleusia janani* n. sp., holotype male (carapace length 13.6 mm; ESCMC 00161), A, lateral view; B, details of the thoracic sinus; C, apical detail of male first pleopod; D, thoracic sinus and pteryostomal region; E, abdomen and both male first pleopods; F, ventral view; G, frontal region and external maxiliped; H, posterior region. Paratype female (carapace length 13.1 mm; ESCMC 00163), I, ventral view; J, external maxilliped; K, opened abdomen with sternites and gonopores; L, right gonopore. Photos: Najat H. Al-Omary (A, B, E-G, I), BWG (C, D, H, J, K, L).

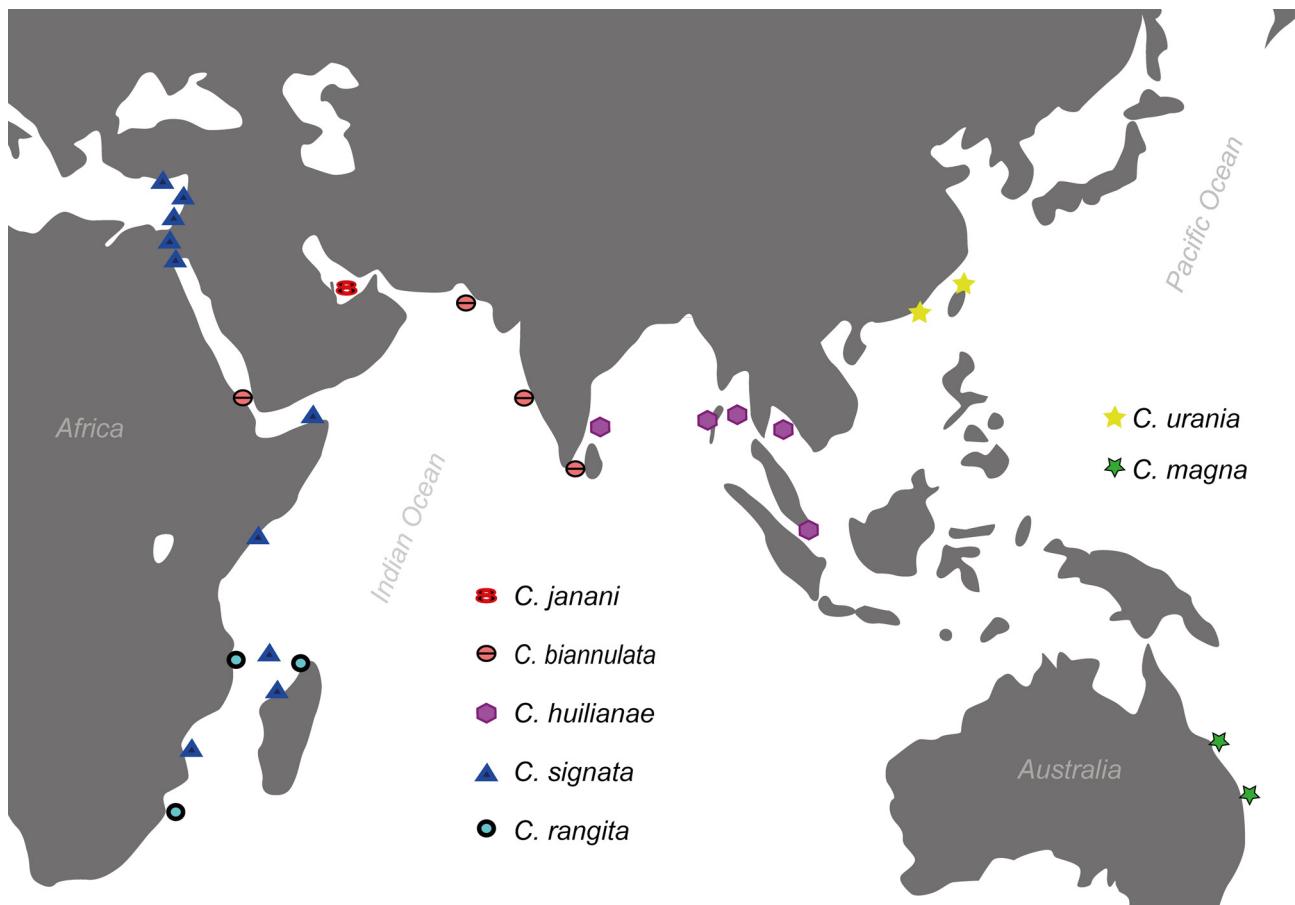


FIGURE 3. Geographical distribution of the species of *Coleusia* Galil, 2006.

Remarks. The present study increases to seven the number of species within the genus *Coleusia* (Galil 2006; Ng *et al.* 2008, 2014; Promdam *et al.* 2014). *Coleusia janani* n. sp. differs from all other species in the genus in the apical shape of the male G1 (Figs. 1F, 2E), which is pointed, straight, and not curved (Galil 2006; Ng *et al.* 2014; Promdam *et al.* 2014). *Coleusia janani* n. sp. is otherwise similar to *C. biannulata* in some features, such as the thoracic sinus with a row of four perliform granules, and in the colour pattern, with a pair of large orange ocelli on the gastric region, with very broad red outer rings. *Coleusia janani* n. sp., however, differs from *C. biannulata* in the straight upward apical shape of the G1, being twisted and curved outwards in the latter; the palm of *C. janani* being less elongated (1.3 times as long as wide in contrast to 1.4 in *C. biannulata*); the carapace being only densely punctate in proximal regions of *C. janani* n. sp. and only being sparsely punctate in *C. biannulata*; and in thin six reddish spots, which are more anteriorly positioned than in *C. biannulata*.

The physicochemical and biological parameters in the waters of the eastern coast of the Arabian Gulf are similar to those found in the Gulf of Oman and the Pakistani coast where *C. biannulata* occurs (Fig. 3). There are nevertheless considerable differences in the waters of the western Arabian coast (Bosch *et al.* 2008; Riegl & Purkis 2012; Al-Ansari *et al.* 2015; Al-Maslamani *et al.* 2015). It is quite possible that *C. biannulata* and *C. janani* co-occur in some regions of the Arabian Gulf where environmental conditions overlap. Conversely the dissimilarities in temperature and salinities between the east and west coast are certainly extreme enough to create a biogeographic barrier could be isolating the populations and thereby maintaining vicariance. For this reason, we do not dismiss the presence of *C. biannulata* in the Arabian Gulf as reported by Alcock (1896, as *Leucosia longifrons* var *neocalledonica* A. Mine Edwards, 1874).

Distribution of *Coleusia* Galil 2006

The current distribution of all species of the genus *Coleusia* (based in Galil 2006; Ng *et al.* 2014; Promdam *et al.* 2014) is illustrated in Figure 3 and can be summarised as follows:

- C. biannulata*—northwestern Indian Ocean: Red Sea, Arabian Sea (Karachi), Persian Gulf?, India/Sri Lanka (Bombay, Palk Straits).
- C. huiliana*—northeastern Indian Ocean: India (Tamil Nadu and Andaman Is.), Gulf of Thailand, Andaman Sea, Singapore.
- C. janani* n. sp.—West Arabian Gulf: Qatar.
- C. magna*—southwestern Pacific Ocean: Australia (NW coast and Queensland).
- C. rangita*—western Indian Ocean: Madagascar, Mozambique, South Africa (Natal).
- C. signata*—western Indian Ocean and East Mediterranean: Red Sea (Egypt, Somalia), Tanzania, Mozambique, Madagascar, Comoro Is; Turkey, Lebanon, Israel (entering Mediterranean Sea through the Suez Canal).
- C. urania*—southwestern Pacific Ocean: China and Taiwan.

Key to species of *Coleusia*

1. Cheliped merus bearing conic granules; pterygostomial region with a beaded crest; fourth thoracic sternite with a granular band anteriorly; telson lunulate; greatly elongated apical process on male first pleopod, not spatulate *C. rangita*
- Cheliped merus bearing perliform granules; pterygostomian region smooth; fourth thoracic sternite smooth; telson triangular; apical process on male first pleopod not greatly elongated, and when long with spatulate shape 2
2. Large-size, cl > 30 mm; palm lenticular, 1.1 times as long as wide; prominently granular pereiopodal meri and expanded, leaf-like pereiopodal propodi; broad pale stripe medially on the carapace, with two large rust-coloured blotches posteriorly, and two smaller ones postero-laterally 3
- Carapace length < 30 mm; palm elongate, 1.3–1.4 times as long as wide; pereiopodal propodi carinate; no broad pale stripe medially on the carapace and no rust-coloured blotches on the posterolateral margins 4
3. Perliform granules of posterior margins of cheliped merus diminishing in size distally; dense granulation on ambulatory meri, and on lower external surface of the palm; male first pleopod with beak-like apical process and interiorly curved.. . *C. urania*
- Perliform granules of posterior margins of cheliped merus disappearing distally; smaller and sparser granulation on ambulatory meri, absent from lower external surface of the palm; male first pleopod with apical process cornute, digitate, and curved externally. *C. huiliana*
4. Frontal margin tridentate; thoracic sinus with row of 8–9 elongate granules above cheliped basis, anterior margin straight; carapace with a pair of dark markings on gastric region; carapace with thin orange stripes and with Y-shaped orange mark posteriorly; spatulate apical process on the male first pleopod *C. magna*
- Frontal margin unidentate; thoracic sinus with no more than 5 granules above cheliped basis, anterior margin rounded; colour marking of carapace otherwise; no orange stripes and straight lines 5
5. Upper margin of palm rounded (not cristate); thoracic sinus with row of 4–5 perliform granules; gastric region with a pair of large ocelli on each side of the carapace (8-shaped) lined by thin red outer rings, with small white centres 6
- Dorsal surface of carapace punctate anteriorly; upper margin of palm cristate; thoracic sinus with row of 4–5 elongate, flat-topped granules; carapace with dark indistinct patches; looped apical process of the male first pleopod *C. signata*
6. Palm more elongate, 1.4 times as long as wide; dorsal surface of carapace closely punctate; male first pleopod with apical process distally spatulate, twisted, curved outwards at right angle to shaft. *C. biannulata*
- Palm less elongate, 1.3 times as long as wide; carapace closely punctate only at proximal regions, slightly punctate posteriorly; male first pleopod with apical process distally straight and upward (not curved) *C. janani*

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