

New species of *Acanthochondria* Oakley, 1930 and *Chondracanthus* Delaroche, 1811 (Copepoda: Cyclopoida: Chondracanthidae) parasitizing marine fishes from Indian waters

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ABSTRACT

This paper describes two new species of parasitic copepods of the family Chondracanthidae H. Milne Edwards, 1840. *Acanthochondria krishnai* sp. n. is described from Dollfus' stargrazer, *Uranoscopus guttatus* Cuvier, collected from Muttom and Colachel, Tamil Nadu, and *Chondracanthus kabatai* sp. n. from Silvery john dory, *Zenopsis conchifer* Lowe, collected from Neendakara, Quilon, Kerala, both along the southwest coast of India. Both the species are described and illustrated based on the fresh female and male specimens collected from India. Both the species are the first Indian representative of the respective genera. The checklist of Indian species of the family Chondracanthidae is also presented.

KEYWORDS

Chondracanthids, *Chondracanthus kabatai* sp. n., *Zenopsis conchifer*, *Acanthochondria krishnai* sp. n., *Uranoscopus guttatus*, Checklist.

INTRODUCTION

The family Chondracanthidae H. Milne Edwards, 1840 is composed of more than 160 species under 51 valid genera (Tang *et al.*, 2007; Braicovich *et al.*, 2013; Gomez *et al.*, 2018; Ohtsuka *et al.*, 2019; Walter and Boxshall, 2019). The genus *Acanthochondria* Oakley, 1930 is the largest genus in this family with 52 valid species, followed by *Chondracanthus* Delaroche, 1811 represented by 41 valid species (Tang *et al.*, 2007; Braicovich *et al.*, 2013; Gomez *et al.*, 2018; Ohtsuka *et al.*, 2019). The family Chondracanthidae

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remains little studied in India, with only nine species belonging to the five genera described thus far, without any representatives from the genera *Acanthochondria* and *Chondracanthus*.

The parasitic copepod fauna infesting the commercial fishes are comparatively well studied in India, especially from the southwest coast. The families such as Bomolochidae, Caligidae, Ergasilidae, Lernaeopodidae, Lernanthropidae, Pandaridae, Pennellidae, and Taeniacanthidae are well documented (Gnanamuthu, 1953; Rangnekar, 1960; Sebastian, 1967; Pillai, 1985), while the family Chondracanthidae is less studied. Pillai (1985) recorded five species of chondracanthids, *viz.*, *Bactrochondria hoi* (Pillai, 1985) (described as *Ceratochondria hoi*), *Heterochondria pillaii* Ho, 1970; *Medesicaste penetrans* Heller, 1868; *Protochondracanthus alatus* (Heller, 1868) and *P. trilobatus* (Pillai, 1964). Later Ho *et al.* (2000) added a new genus and four species including three new species (*viz.*, *Heterochondria petila* Ho, Kim and Kumar, 2000, *Bactrochondria papilla* Ho, Kim and Kumar, 2000, and *Acanthochondria zebrae* [= *Heterochondria zebrae* (Ho, Kim and Kumar, 2000); transferred by Tang *et al.*, 2010] and a new genus, *Bactrochondria* Ho, Kim and Kumar, 2000. Recently Kizhakudan *et al.* (2015) reported *P. alatus* from the captive stock of *Psettodes erumi* (Bleeker and Schneider). The total number of species of chondracanthids thus far recorded from India is only nine.

In the present study two new species (*Acanthochondria krishnai* sp. n. and *Chondracanthus kabatai* sp. n.) collected from three fish landing centers from the southwest coast of India are described, with a review on Indian species of the family Chondracanthidae.

MATERIALS AND METHODS

Fresh specimens of chondracanthids were collected from three fish landing centers on the southwest coast of India, namely Muttom and Colachel (Kanyakumari district, Tamil Nadu coast) (8°07'48.00"N 77°19'12.00"E) and Neendakara (08°30.0'N 76°53.30'E), Quilon district, Kerala coast. The chondracanthids were collected from the

host fish, fixed in 5% formaldehyde, preserved in 75% ethanol (after Aneesh *et al.*, 2018) and subjected to identification. Methods for dissection, mounting, and drawings of appendages were according to the techniques described in Aneesh *et al.* (2018). Drawings were digital inked using Adobe Illustrator and WACOM CTL-472/K0-c drawing pad. The specimens were microphotographed using multi-focusing dissection microscope Leica-M205A and image capturing software (Leica Application Suit). Morphological details of the parasite were also examined using a scanning electron microscope (Zeiss EVO 18 SEM). Fish taxonomy and host nomenclature were performed according to FishBase (Froese and Pauly, 2020). The types and voucher specimens are deposited in the Western Ghat Field Research Centre of Zoological Survey of India, Kozhikode (ZSI/WGRC).

TAXONOMY

Order Cyclopoida Burmeister, 1834

Family Chondracanthidae Edwards, 1840

Genus *Acanthochondria* Oakley, 1930

Type species. *Acanthochondria cornuta* (Müller O.F., 1776) (by original designation).

Acanthochondria krishnai sp. n. (Figs. 1–6)

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Material examined: 23 females (16 ovigerous), all with immature/mature males.

Type material. Holotype: 1 female (17 mm) (ZSI/WGRC/IR/INV/11733), from *Uranoscopus guttatus* Cuvier, from Muttom, southwest coast, India, coll. P.T. Aneesh on 17 March 2018. — Paratypes: same information as holotype, 1 female (15 mm) (ZSI/WGRC/IR/INV/11734; 1 male (0.5 mm) (ZSI/WGRC/IR/INV/14048).

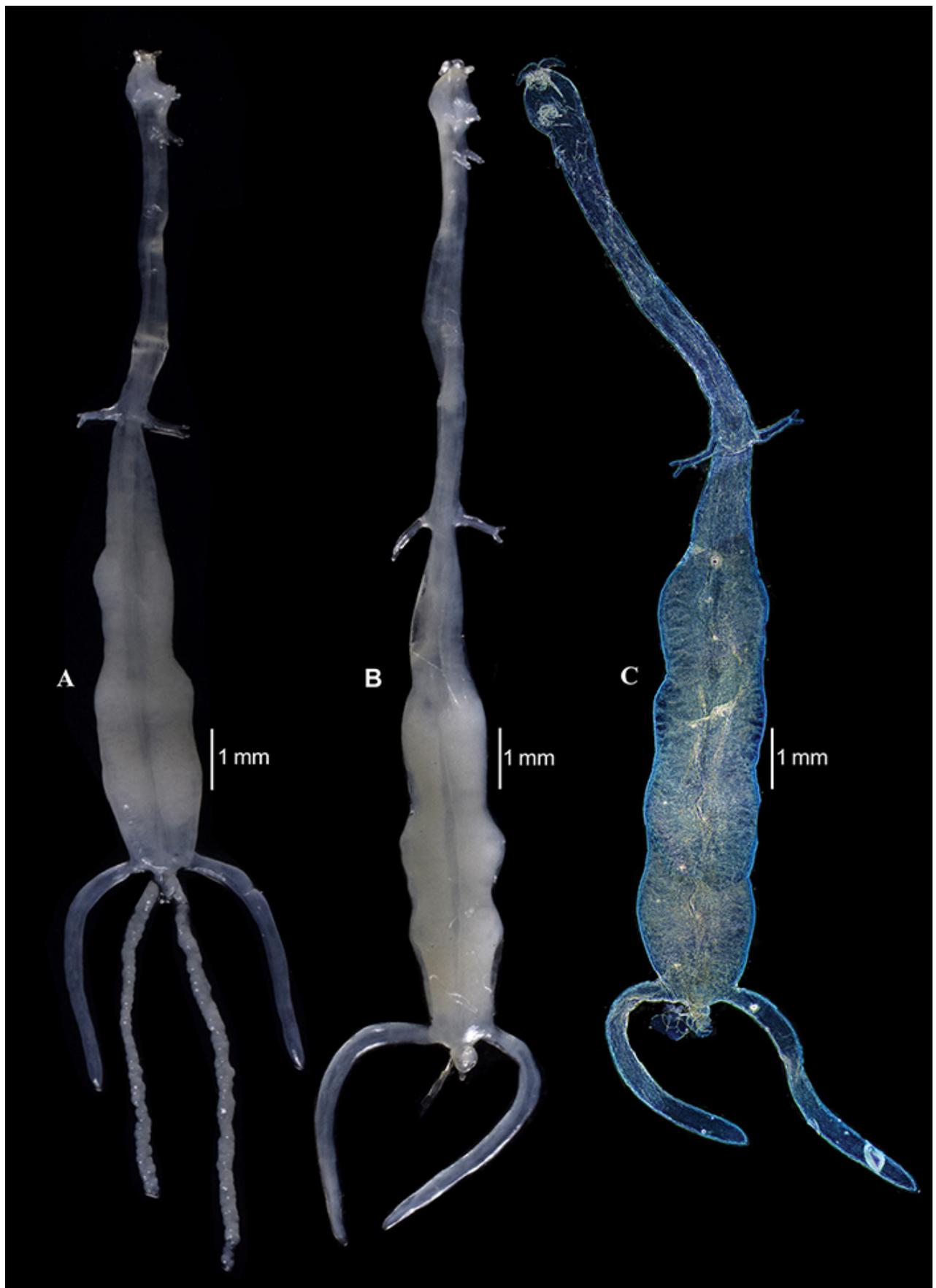


Figure 1. *Acanthochondria krishnai* sp. n., female from *Uranoscopus guttatus* Cuvier. **A, B.** Dorsal view. **C.** Ventral view.

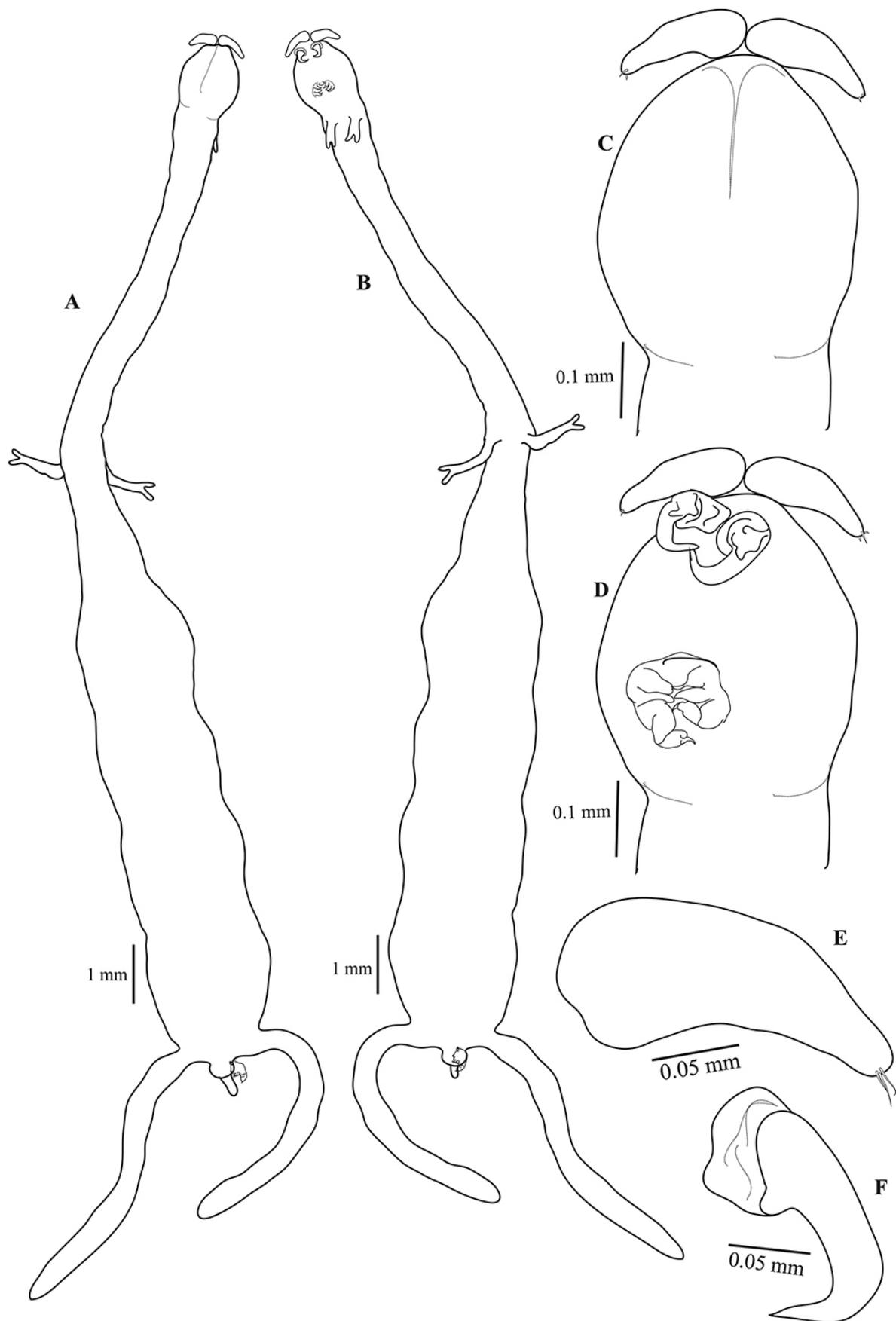


Figure 2. *Acanthochondria krishnai* sp. n., holotype, female from *Uranoscopus guttatus* Cuvier. **A.** Dorsal view. **B.** Ventral view. **C, D.** Cephalon, dorsal and ventral views. **E.** Antennule. **F.** Antenna.



Figure 3. *Acanthochondria krishnai* sp. n., non-type female from *Uranoscopus guttatus* Cuvier. **A.** Cephalon ventral view showing cephalic appendages. **B.** Antennule (arrow). **C.** Antennules (arrows). **D.** Cephalic appendages. **E.** Leg 1. **F.** Leg 2. **G–J.** Genito-abdomen. **G.** Lateral view with rami. **H.** Ventral view with rami. **I.** Dorsal view with male. **J.** With rami. (a1- antennule, a2- antenna, mxp- maxilliped, max- maxilla; L1- leg 1, L2- leg 2, m- male, r- rami).

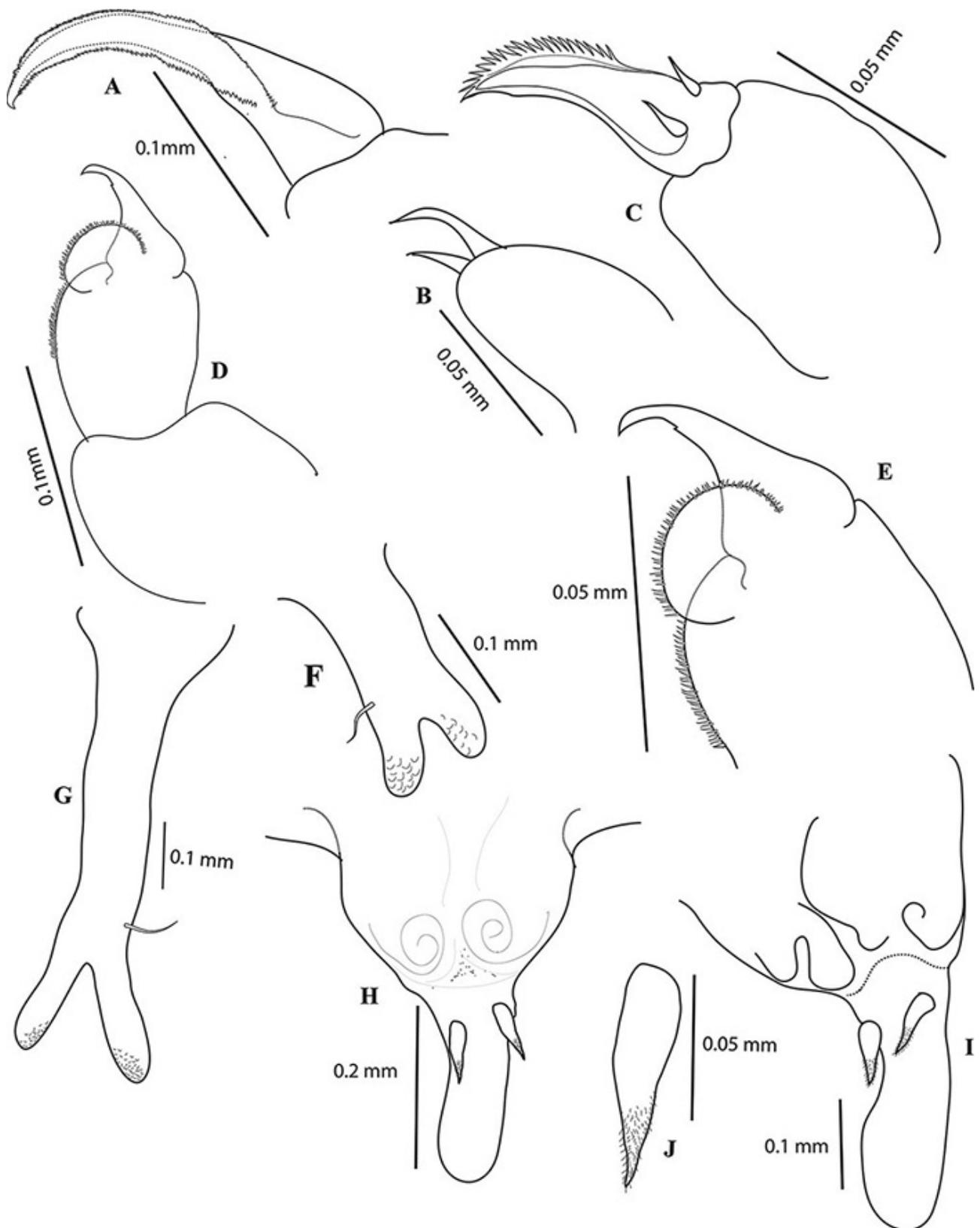


Figure 4. *Acanthochondria krishnai* sp. n., paratype, female from *Uranoscopus guttatus* Cuvier. **A.** Mandible. **B.** Maxillule. **C.** Maxilla. **D.** Maxilliped. **E.** Maxilliped apex. **F.** Leg 1. **G.** Leg 2. **H, I.** Genito-abdomen with rami, ventral and ventro-lateral views. **J.** Rami.

Description. Female (Figs. 1–4): Body long and slender (16–18 mm) (excluding egg strings; from anterior margin of head to distal end of posterior processes), divisible into short head, much elongated neck, stout trunk with prominent constrictions on posterior half, as long as neck, bearing a pair of posterior processes, small genito-abdomen and abdomen with the prominent process which extends to the posterior tip of caudal rami. Cephalon, small, 1.2 times longer than wide, attached to neck; postero-ventral region swollen, with mouthparts. Neck greatly

elongated (8–9 mm) and gradually jointed into trunk. Trunk as long as neck, postero lateral margin with pair of long processes (4–5.5 mm) directed laterally, posterolaterally, or posteriorly. Genito-abdomen (0.45–0.5 mm, long; total length including the median projection, the abdomen), funnel-shaped, longer than wide, basally wider (0.28–0.30 mm wide), with median projection (the abdomen) (0.25–0.28 mm long and 0.06 mm wide) gradually narrowing posteriorly, with curved apex. Genital complex with pair of setules in midventral region bearing egg strings.



Figure 5. *Acanthochondria krishnai* sp. n., non-type male from *Uranoscopus guttatus* Cuvier. **A.** Habitus lateral view. **B.** Antennule. **C.** Antenna.

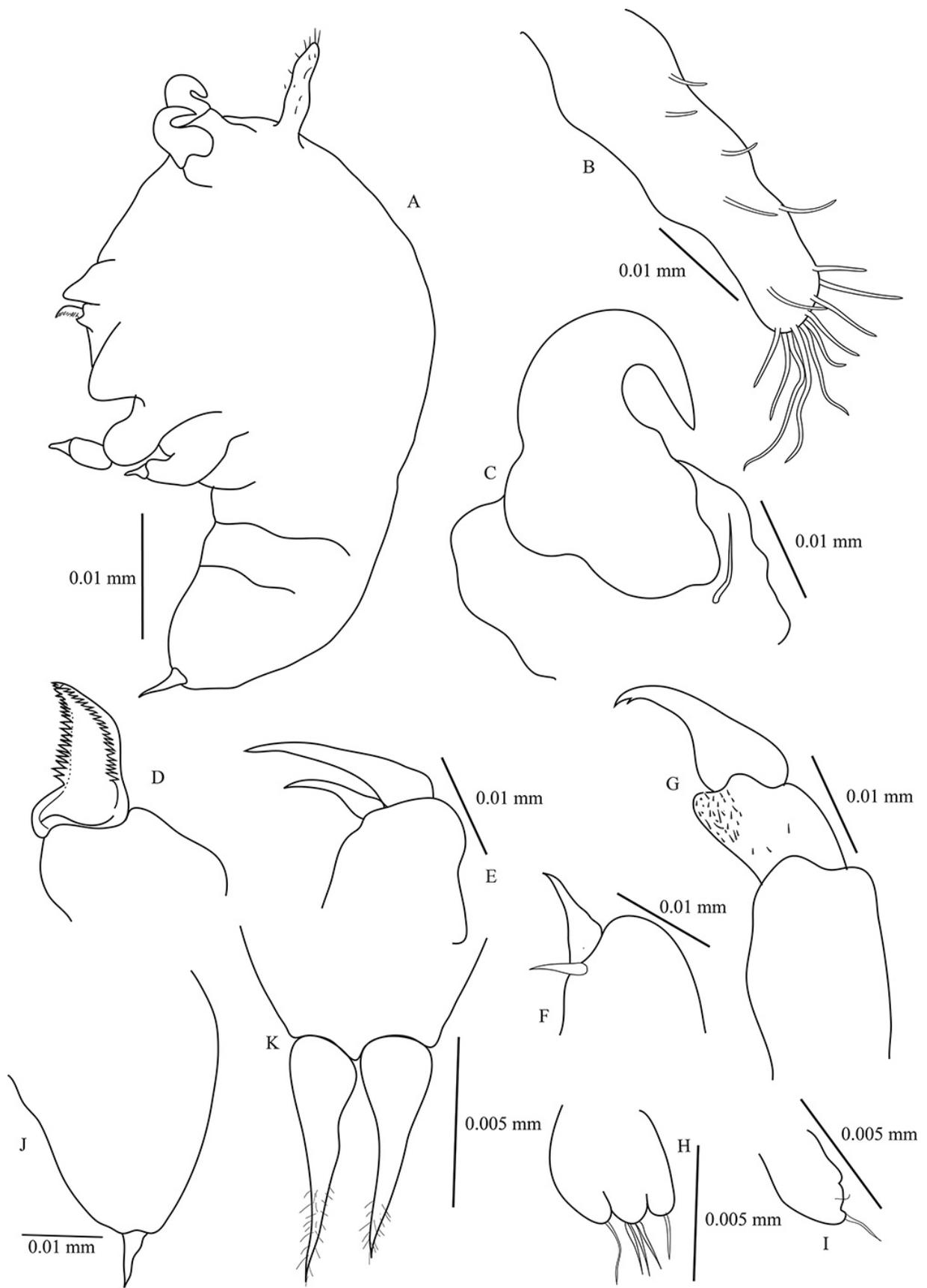


Figure 6. *Acanthochondria krishnai* sp. n., non-type male from *Uranoscopus guttatus* Cuvier. **A.** Habitus lateral view. **B.** Antennule. **C.** Antenna. **D.** Mandible. **E.** Maxillule. **F.** Maxilla. **G.** Maxilliped. **H.** Leg 1. **I.** Leg 2. **J.** Lateral view of genito-abdomen. **K.** Ventral view of genito-abdomen.

Egg strings cylindrical, not coiled and longer than trunk; eggs multiseriate. Number of eggs per string ranged from 170 to 240, dependent on length of the string. Genital complex carrying pair of conical rami with numerous spinules on terminal portion.

Antennule cylindrical and fleshy, without division, basally swollen, and distally slender with few terminal setae. Antenna, usual form with heavily sclerotized and unarmed basal segment and strongly curved, pointed terminal claw. Mandible with many teeth (55–60) on convex side and 40–44 teeth on concave side. Maxillule with spinulose inner-terminal surface; distal margin with 2 unequal setae. Two-segmented maxilla; first segment greatly broad and unarmed; terminal segment with more or less equal robust seta in basal region, and the outer margin claw-like, armed with row of 28–32 denticles. Maxilliped 3-segmented; first segment stout, largest, unarmed; second segment with two patches of denticles on medial surface and protruded medio-distal corner, partially overlapping base of the distal segment; terminal segment ending in curved claw-like structure with small, sub-terminal hooklet on inner surface. Legs biramous, protopod with one seta, leg 1 (0.25 mm); both rami bearing spinules/pectinate scales on terminal portion. Leg 2 (0.4 mm) much longer than (1.8 times) leg 1.

Male (Figs. 5–6): Body, 0.45 mm long (excluding caudal rami), 0.25 mm wide, ventrally curved, cephalothorax, more than half the length of total body. Metasome cylindrical, with indistinct metamerism. Genital segment with pair of ventral genital ridges. Caudal ramus similar to that of female.

Antennule elongated, with armature formula 2, 1, 2, 2, and 8–9. Antenna, solid, robust and strongly curved, sharp claw; with seta on dorso-lateral surface. Mandible with 16–18 teeth on convex side and 12–14 teeth on concave side. Maxillule with 2 setae, more or less similar to female. Maxilla without teeth on terminal process. Maxilliped article 2 with few denticles. Legs bilobate, leg 1 larger than leg 2; with few long lateral setae, larger in leg 1; endopods reduced to lobes.

Body size: Female (15–18 mm); male (0.45–0.50 mm).

Color: White after fixation.

Distribution: Known from Muttom (the type locality) and Colachel, Tamil Nadu coast, India; Neendakara, Quilon, Kerala coast, India.

Host: The type host *Uranoscopus guttatus* Cuvier.

Site of attachment: Attached to floor of oral cavity.

Etymology: This species is named in honor of late Prof. N. Krishna Pillai, Department of Aquatic Biology & Fisheries, University of Kerala, an expert crustacean taxonomist from India, who has consolidated knowledge on parasitic copepods of marine fishes of India.

Genus *Chondracanthus* Delaroche, 1811

Type species: *Chondracanthus zeii* Delaroche, 1811 (by original designation)

***Chondracanthus kabatai* sp. n.**

(Figs. 7–14)

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Material examined: 37 females (30 ovigerous), all with immature/mature males.

Type material. Holotype: 1 female (6.5 mm) (ZSI/WGRC/IR/INV/11728) from *Zenopsis conchifer* Lowe, Neendakara, Quilon, India, coll. P.T. Aneesh and A. Biju Kumar on 26 February 2018. — Paratypes: same information as holotype, 1 female (8 mm) (ZSI/WGRC/IR/INV/11729); 1 male (0.5 mm) (ZSI/WGRC/IR/INV/14049); 1 female (8 mm) (ZSI/WGRC/IR/INV/11730); 1 female (7.5 mm) (ZSI/WGRC/IR/INV/11731); 1 female (8 mm) (ZSI/WGRC/IR/INV/11732).

Description. Female (Figs. 8–14): Body 4.8–8.0 mm length (without egg strings, from anterior margin of head to distal end of longest posterior processes on trunk), unsegmented, divisible into head, short neck, stout trunk and genito-abdomen. Cephalon having cephalosome, as long as wide, with two pairs of elongated and fusiform, pedunculate ventro-lateral processes, the second process about 1.8–2 times longer than process 1. Cephalon dorsally bearing medial longitudinal sclerotized bar. Neck, short and narrow

without processes. Trunk much broader, armed with elongated, narrow, fusiform processes; three pairs of anterior, three pairs of posterior and single postero-medial. Anterior processes including (1) pair of dorsal (1.0–1.2 mm long), horn-like, on either side close to the lateral margin, directed forward; (2) pair of long (2.1–2.4 mm long), laterally directed, from the lateral margin; and (3) pair of much longer, bifurcate (outer one (3.1–3.2 mm long), inner one much longer (4.2–4.4 mm long)), from the ventral side near to either side of second pair of legs. Posterior processes including (1) pair of ventro-lateral, from the corner (3.5–3.7 mm long); (2) pair at posterior corner, much longer, trifurcate (outer one (3.3–3.4 mm long), middle (3.5–3.6 mm long), and inner (3.9–4.2 mm long)); (3) single, median processes (3.8–4.1 mm long) (much reduced in two specimens (Fig. 9 c)) on dorsal side, apparently intersect the lateral processes; (4) a paired, long process on ventral surface (3.5–3.6 mm long), close to either side of median line, just above genito-abdomen. Genito-abdomen (0.25–0.3 mm, long; 0.2 mm wide) globular, longer than wide. Genital complex with pair of setules in midventral region bearing egg strings. Abdomen 2 times wider than long (0.16 mm wide, 0.08 mm long). Caudal ramus conical, directed ventrally and armed with two ventral setae, one dorsal seta and apical conical spinulose papilla.

Egg strings cylindrical, yellow colored, irregularly coiled and extremely longer than trunk; eggs multiseriate. Number of eggs per string ranged from 370 to 440, depending on length of the string.

Antennule, cylindrical, unsegmented and fleshy, basally swollen, and distally slender with few marginal setae, apex with 5–6 long and 2–3 short terminal setae. Antenna, usual form with unarmed basal segment; distal segment, strongly curved, heavily sclerotized, marked by band of transverse surface striations at the base, apex, pointed and curved terminal claw. Mandible, distal segment apically curved, with many teeth (118–124) on convex side and 80–86 teeth on concave side. Maxillule, lobate, tipped with two unequal apical spinules. Two-segmented maxilla; first segment unarmed; terminal segment with a robust seta in basal region, and the outer margin claw-like, armed with row of 16–22, 11–16 denticles. Maxilliped, 3-segmented; first segment robust, unarmed; second segment with a patch of minute spinules on inner edge; distal segment, small, ending in curved claw-like structure with small, subterminal hooklet on inner surface. Legs biramous, both rami bearing spinules/pectinate scales on terminal portion, protopod bearing outer seta. Leg 1 (0.7–0.9 mm long) slightly larger than leg 2 (0.6–0.7 mm long), situated ventrally on trunk region.

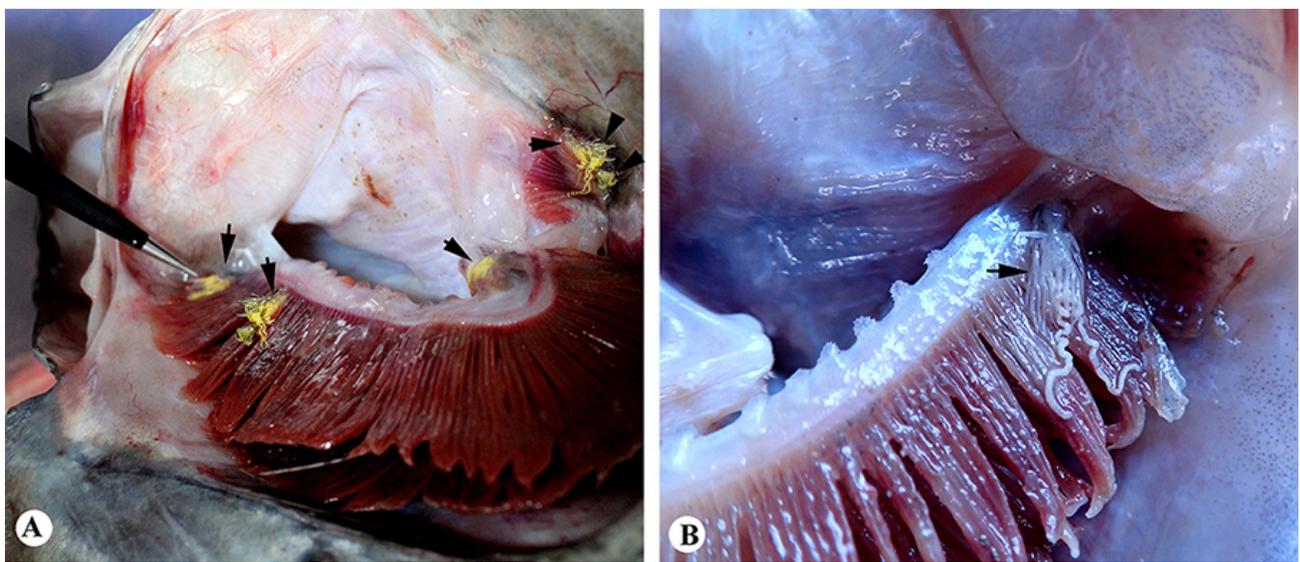


Figure 7. A, B. Site of attachment of *Chondracanthus kabatai* sp. n. (arrows) on its host fish *Zenopsis conchifer* Lowe.

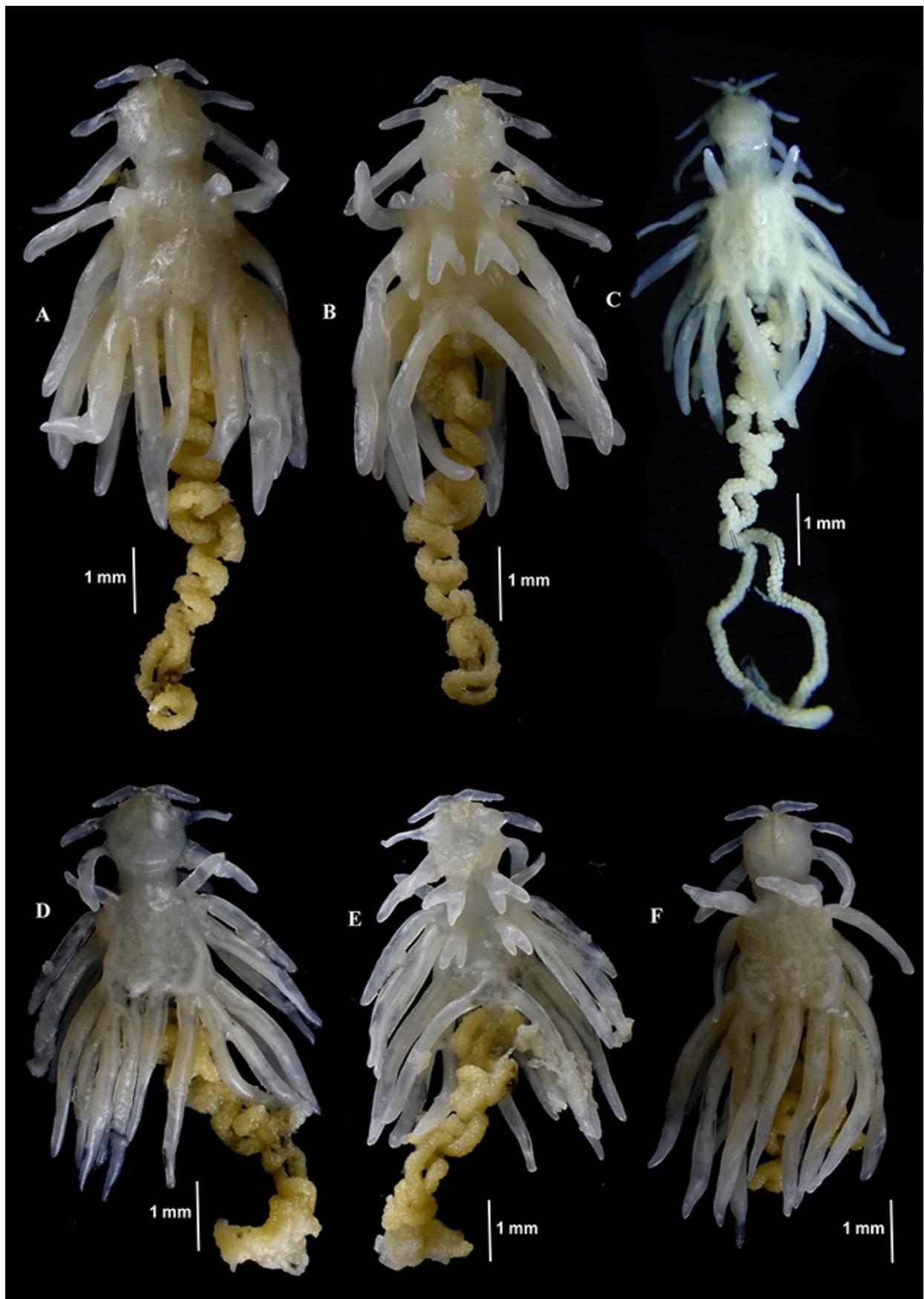


Figure 8. *Chondracanthus kabatai* sp. n. from *Zenopsis conchifer* Lowe. **A–C.** Holotype, female, dorsal, ventral and lateral views. **D–F.** Paratype, female, dorsal, ventral and dorso-lateral views.

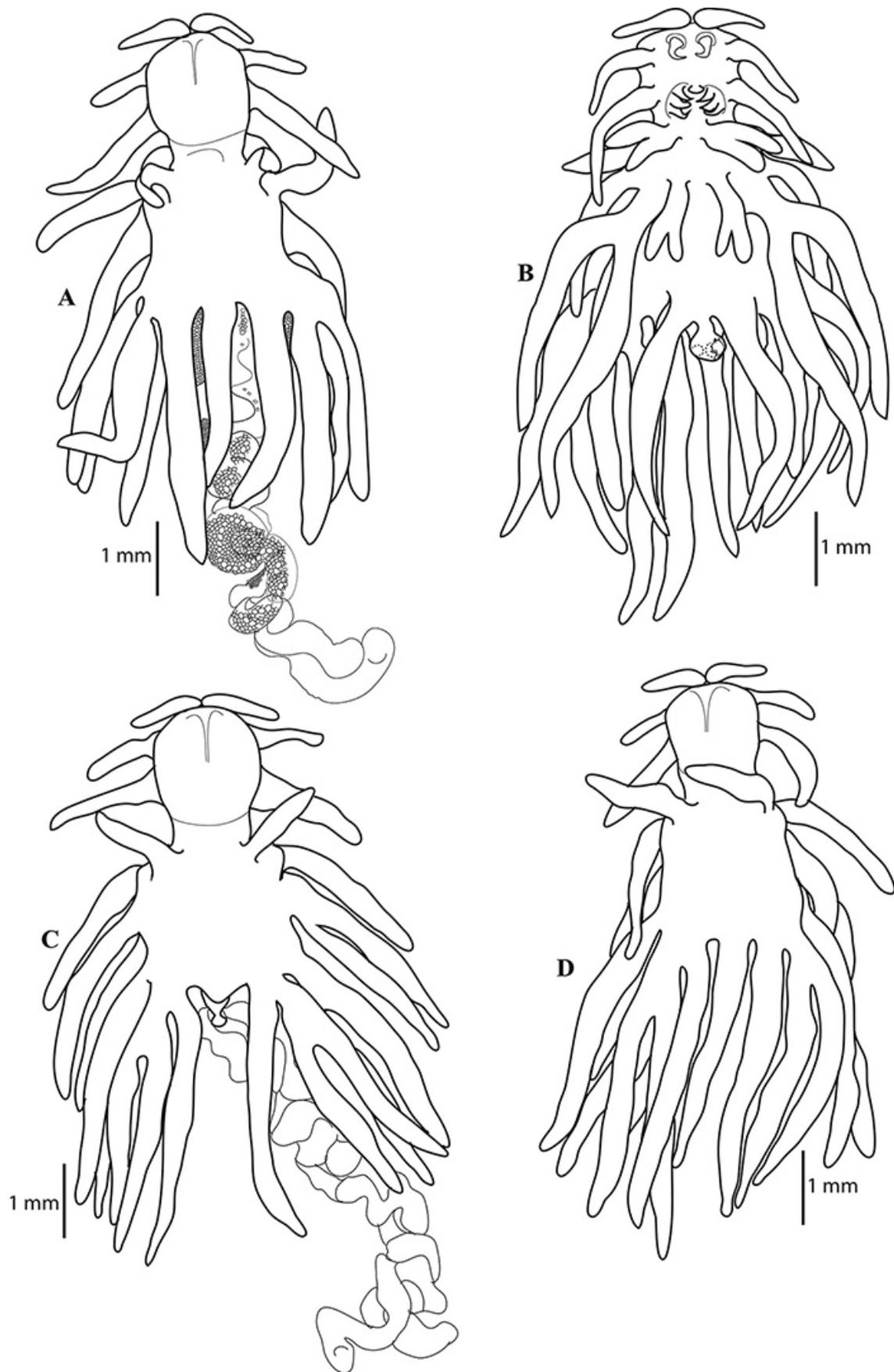


Figure 9. *Chondracanthus kabatai* sp. n. from *Zenopsis conchifer* Lowe. **A, B.** Holotype, female, dorsal and ventral view. **C.** Paratype, female (ZSI/WGRC/IR/INV/11732), dorsal view, **D.** Paratype, female (ZSI/WGRC/IR/INV/11729), dorso-lateral view.

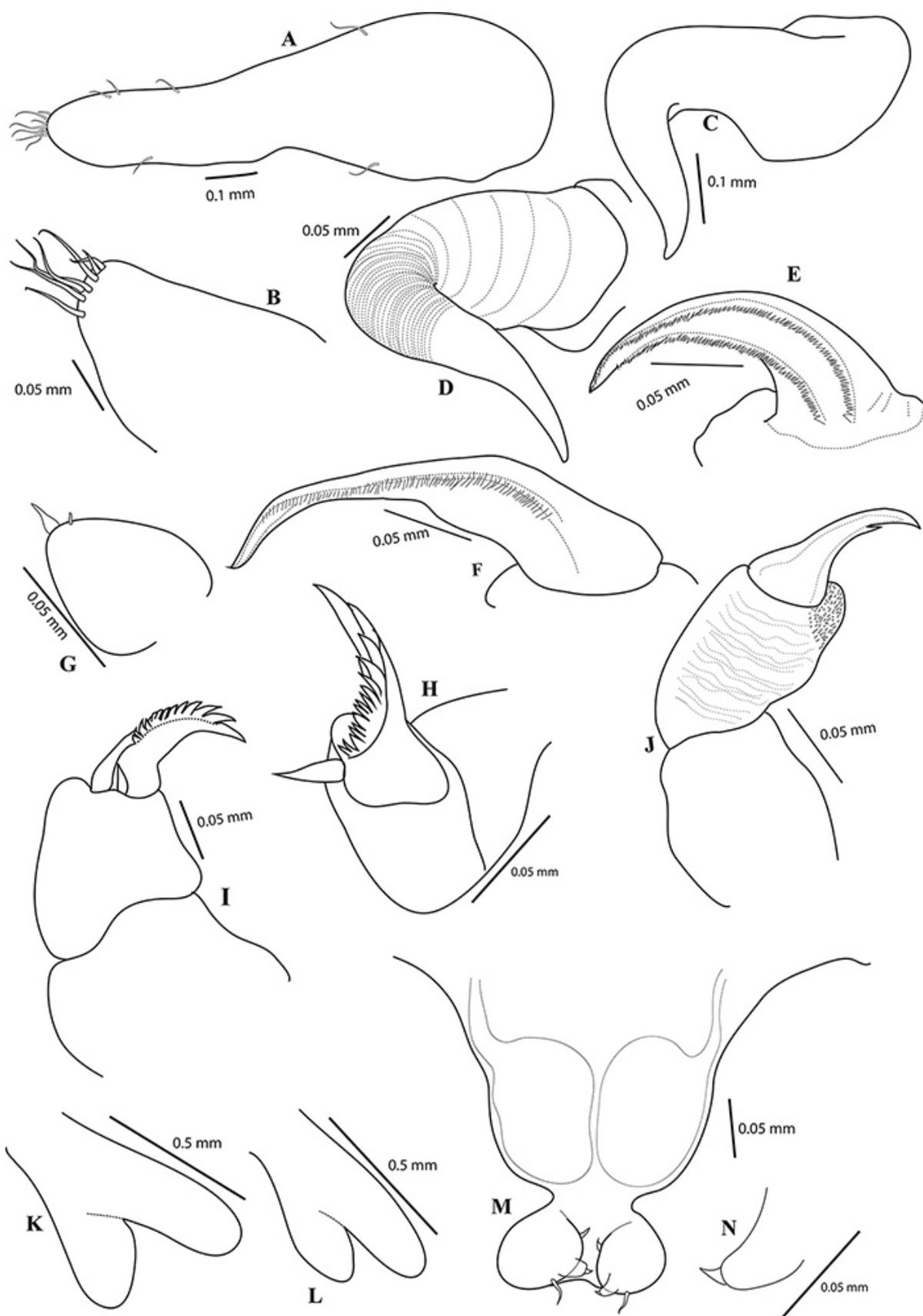


Figure 10. *Chondracanthus kabatai* sp. n., non-type female from *Zenopsis conchifer* Lowe. **A.** Antennule. **B.** Antennule apex. **C,** **D.** Antenna. **E, F.** Mandible. **G.** Maxillule. **H, I.** Maxilla. **J.** Maxilliped. **K.** Leg 1. **L.** Leg 2. **M.** Ventral view of genito-abdomen. **N.** Caudal ramus.

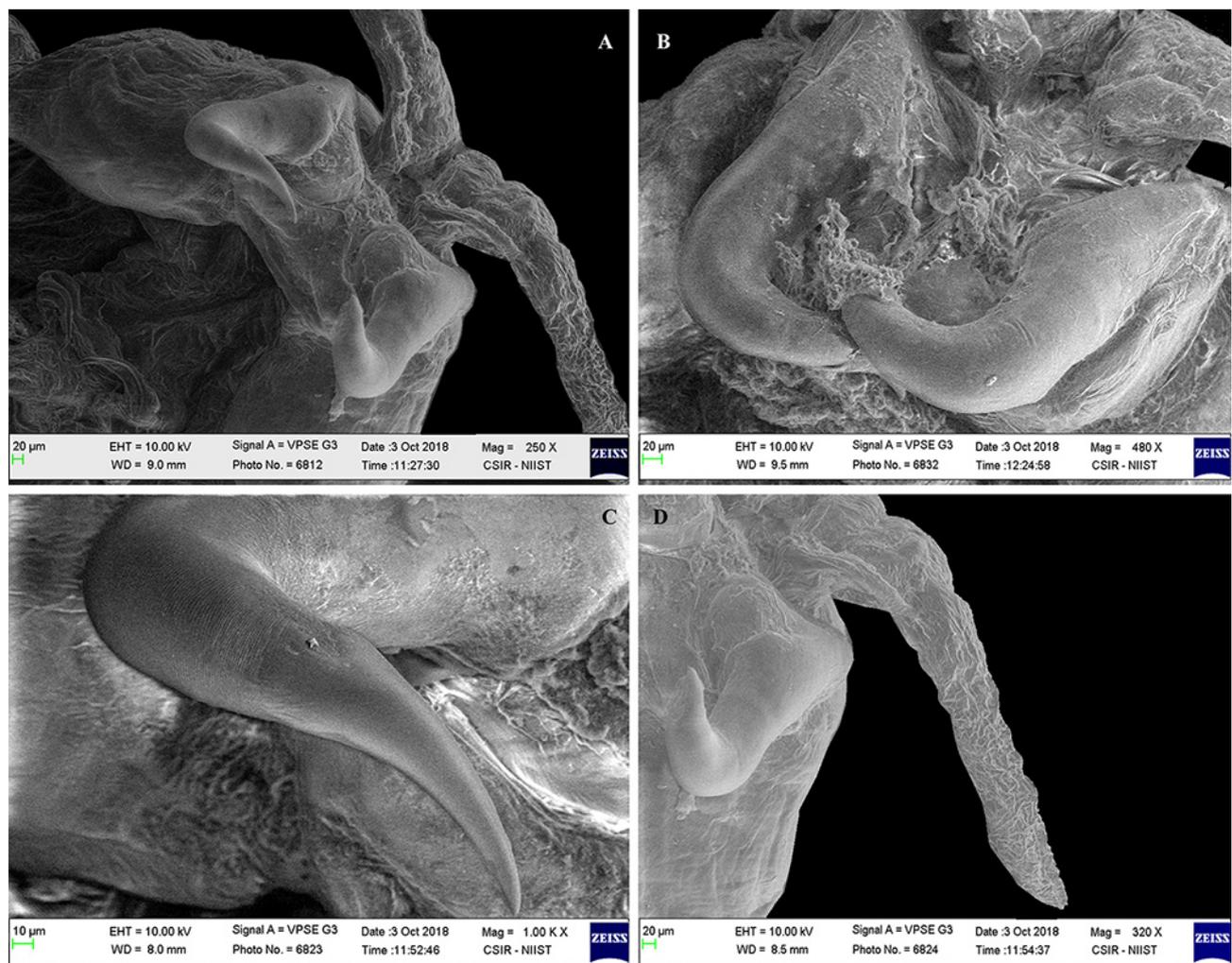


Figure 11. Scanning electron micrographs of *Chondracanthus kabatai* sp. n., non-type female from *Zenopsis conchifer* Lowe. **A.** Head ventral view showing antennule and antenna. **B, C.** Antenna. **D.** Antennule.

Male (Figs. 13–14): Body 0.4–0.5 mm long (including caudal rami), 0.23 mm wide, curved ventrally, cephalothorax, more than half length of total body; metasome cylindrical, with indistinct metamerism. Genital segment with pair of ventral genital ridges. Caudal ramus directed posteriorly.

Antennule elongated, with armature formula 1 and 7–8. Antenna, robust, strongly curved, sharp claw. Mandible with 16–20 teeth on convex side and 14–16 teeth on concave side. Maxillule with 2 setae. Maxilla without teeth on terminal process. Maxilliped article 2 with few denticles. Legs bilobate, legs 1 and 2 subequal, with a long lateral seta; endopods reduced to lobes.

Size. Ovigerous female (4.8–8.0 mm length).

Color: White after fixation, with yellow egg sac.

Host: *Zenopsis conchifer* Lowe.

Distribution: Known only from the type locality at Neendakara, Southwest coast, India.

Site of attachment: Attached to the floor of the buccal cavity, over the gill.

Etymology: This species is named in honor of recently deceased Prof. Zbigniew Kabata, one of the pioneer researchers on parasitic copepods of fish and world-renowned fish parasitologist.

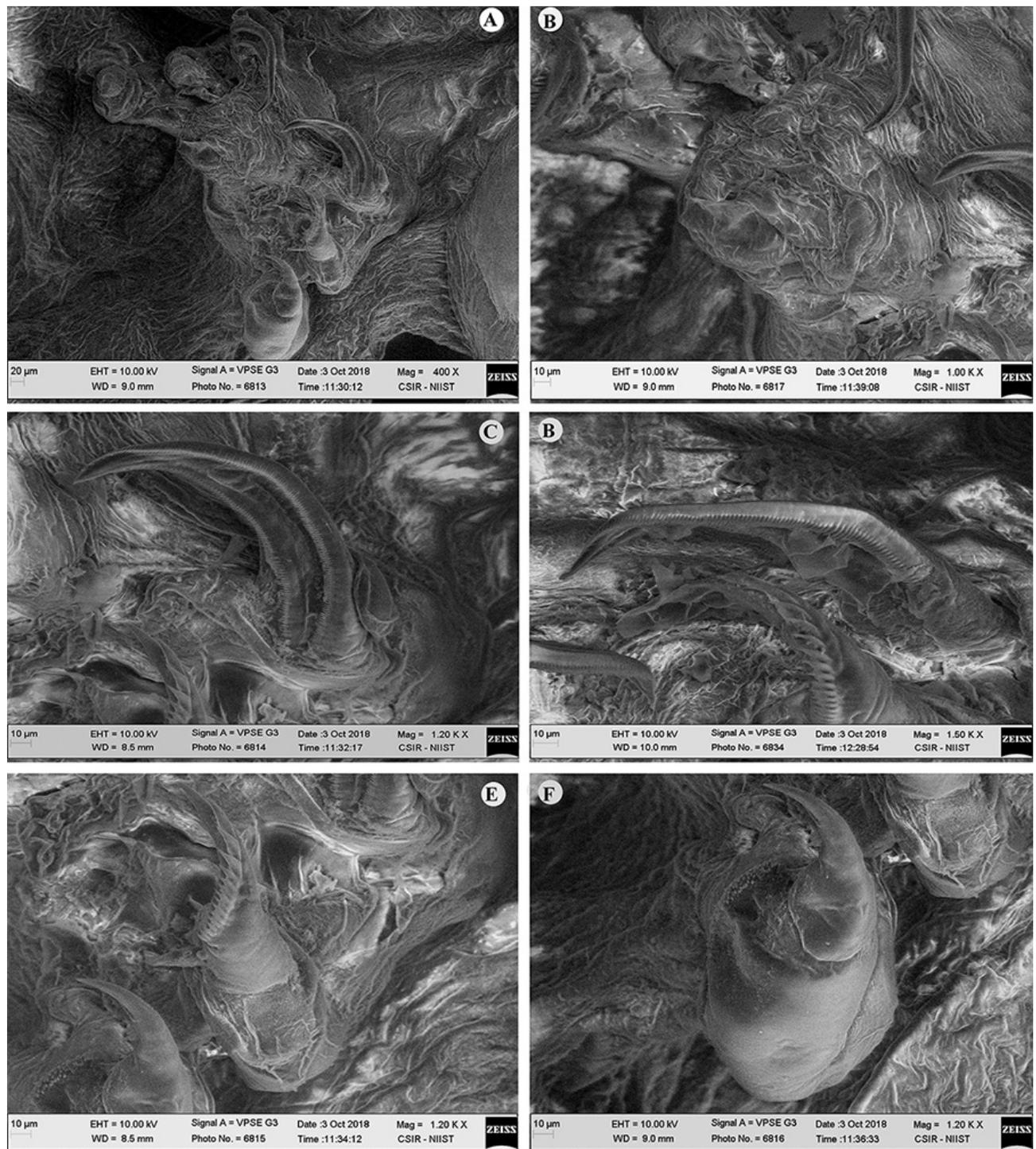


Figure 12. Scanning electron micrographs of *Chondracanthus kabatai* sp. n., non-type female from *Zenopsis conchifer* Lowe. **A, B.** Cephalic appendages. **C, D.** Mandible. **E.** Maxilla. **F.** Maxilliped.

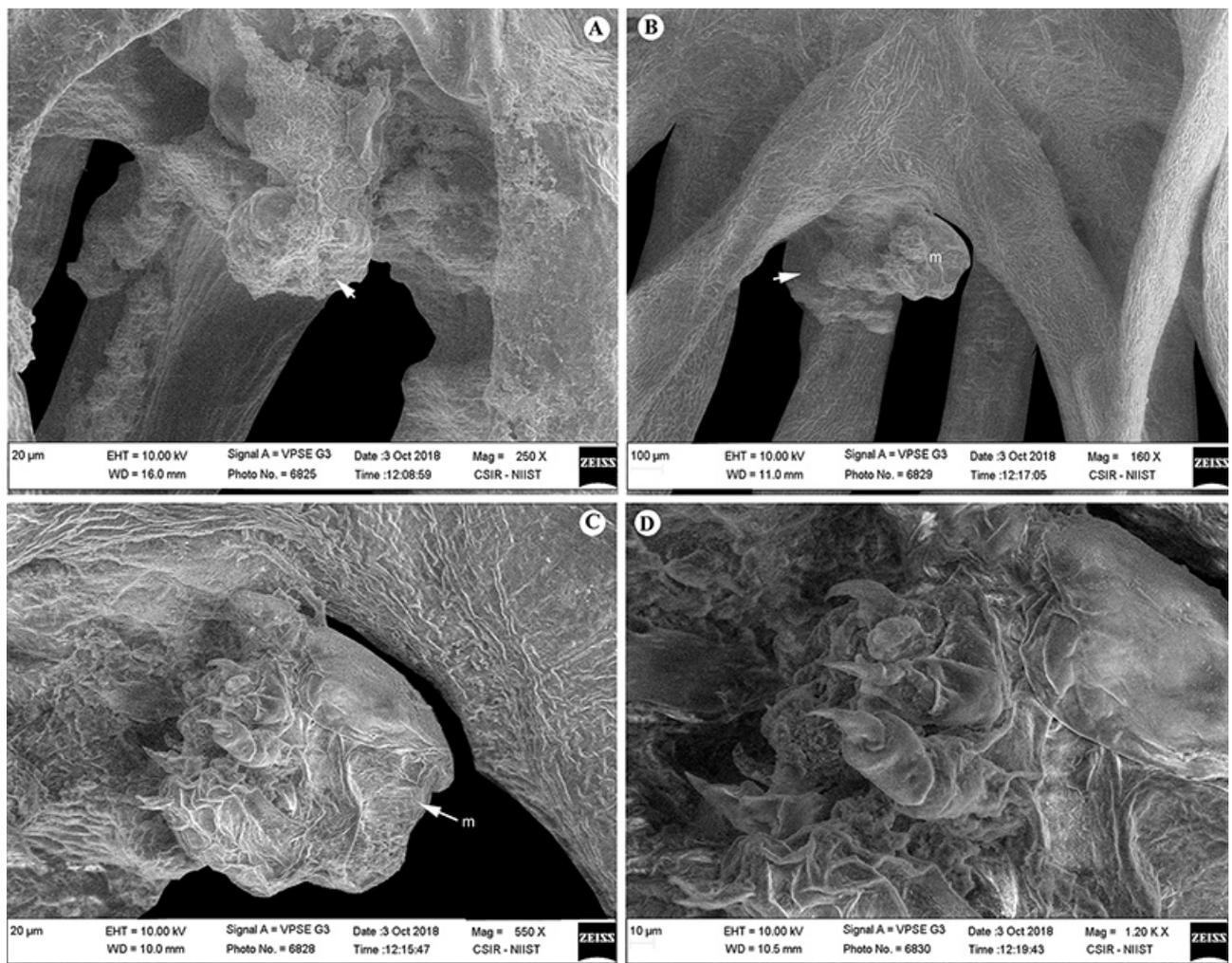


Figure 13. Scanning electron micrographs of *Chondracanthus kabatai* sp. n. from *Zenopsis conchifer* Lowe. **A.** Genito-abdomen ventral view (arrow). **B–D.** Male attached to genito-abdomen of female. (m- male)

DISCUSSION

The family Chondracanthidae H. Milne Edwards, 1840, can be recognized by the following combination of characters: body segmentation largely concealed, cephalon, with or without processes, not fused with any of the trunk segments; neck formed from first two pedigerous segments, trunk with or without processes; genital segment and abdomen fused; antennule fleshy and the antenna is strongly prehensile; two pairs of highly modified, fleshy and bi- or trilobate legs; dwarf male attached to the genito-abdomen of female (Ho, 1970; Kabata, 1979; Pillai, 1985; Ho and Kim, 1995; Cantatore and Timi, 2010).

Ho (1970) revised the family by excluding 12 old genera and also provided the key to the remaining 30 valid genera. Later, another 12 new genera have been erected by various authors and a revised key for 42 genera has been provided by Ho (1994), two

among them later became synonyms. After Ho (1994), another eight new genera (*viz.*, *Argentinochondria* Etchegoin, Timi and Sardella, 2003, *Bactrochondria* Ho, Kim and Kumar, 2000, *Bereacanthus* Huys, 2009, *Bobkabata* Hogans and Benz, 1990, *Brasilochondria* Thatcher and Pereira Júnior, 2004, *Paraperpicola* Ho, Liu and Lin, 2011, *Pseudolernentoma* Luque and Alves, 2003, *Ttetaloia* Uyeno and Nagasawa, 2012) were erected and three older genera (*viz.*, *Immanthe* Leigh-Sharpe, 1934, *Lernaesolea* Wilson 1944, *Pharodes* Wilson C.B., 1935) were restored. Now the family Chondracanthidae includes 51 valid genera, among them only four genera were previously known from India. With the current description of two new species, the genera *Acanthochondria* Oakley, 1930 and *Chondracanthus* Delaroche, 1811 are also represented in fishes of the Indian coastline. The list of current species of Chondracanthidae, its host fishes and distribution records are presented in [Tab. 1](#).

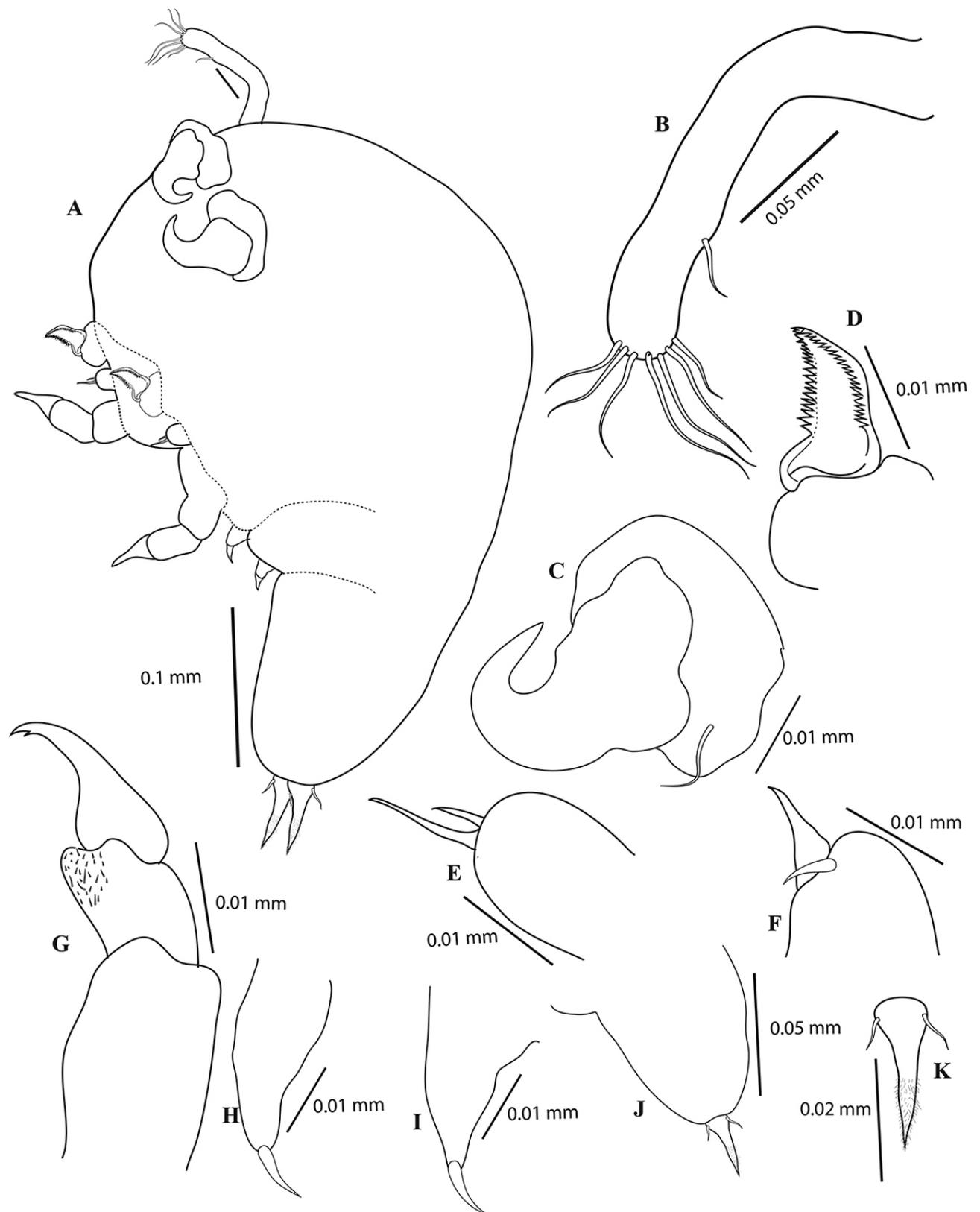


Figure 14. *Chondracanthus kabatai* sp. n., paratype male from *Zenopsis conchifer* Lowe. **A.** Habitus, lateral view. **B.** Antennule. **C.** Antenna. **D.** Mandible. **E.** Maxillule. **F.** Maxilla. **G.** Maxilliped. **H.** Leg 1. **I.** Leg 2. **J.** Lateral view of genito-abdomen. **K.** Rami.

Table 1. List of chondracanthid copepods from India, with their fish hosts and distribution records.

Chondracanthid copepods			Host fish [Family]	Localities in India	References
Genus	species	Synonyms			
<i>Acanthochondria</i> Oakley, 1930	1 <i>A. krishnai</i> sp. n.		<i>Uranoscopus guttatus</i> Cuvier [Uranoscopidae]	Muttom (the type locality) and Colachel, off South-west coast, India; Neendakara, Quilon, Kerala coast.	Present study
<i>Bactrochondria</i> Ho, Kim and Kumar, 2000	2 <i>B. papilla</i> Ho, Kim and Kumar, 2000		<i>Cynoglossus dubius</i> (Regan) [Cynoglossidae]	Kerala	Ho et al., 2000
	3 <i>B. hoi</i> (Pillai, 1985)	<i>Ceratochondria hoi</i> Pillai, 1985	<i>Cynoglossus lida</i> (Bleeker) [Cynoglossidae]	Kerala	Pillai, 1985; Ho et al., 2000
<i>Chondracanthus</i> Delaroche, 1811	4 <i>C. kabatai</i> sp. n.		<i>Zenopsis conchifer</i> Lowe [Zeidae]	Neendakara (type locality), Quilon, Southern Coast, India	Present study
<i>Heterochondria</i> Yu, 1935	5 <i>H. petila</i> Ho, Kim and Kumar, 2000		<i>Pseudorhombus javanicus</i> (Bleeker), <i>P. triocellatus</i> (Bloch), <i>P. arsius</i> (Hamilton) [Paralichthyidae]	Kerala	Ho et al., 2000
	6 <i>H. pillai</i> Ho, 1970		<i>Cynoglossus lida</i> (Bleeker) and <i>C. dubius</i> (Regan) [Cynoglossidae], <i>Pseudorhombus javanicus</i> (Bleeker), <i>P. triocellatus</i> (Bloch), <i>P. elevatus</i> Ogilby, and <i>P. arsius</i> (Hamilton) [Paralichthyidae]	Kerala	Pillai, 1985; Ho et al., 2000
	7 <i>H. similis</i> (Yu and Wu, 1932)		<i>Crossorhombus azureus</i> (Alcock) [Bothidae]	Kerala	Ho et al., 2000
	8 <i>H. zebriae</i> (Ho, Kim I.H. and Kumar, 2000)	<i>Acanthochondria zebriae</i> Ho, Kim I.H. and Kumar, 2000 (Transferred to <i>Heterochondria</i> by Tang et al., 2010)	<i>Crossorhombus azureus</i> (Alcock) [Bothidae]	Kerala	Ho et al., 2000
<i>Medesicaste</i> Krøyer, 1863	9 <i>M. penetrans</i> Heller, 1868		<i>Trigla</i> sp., <i>Trigla capensis</i> [= <i>Chelidonichthys capensis</i> (Cuvier)] [Triglidae]	Kerala	Pillai, 1985
<i>Protochondracanthus</i> Kirtisinghe, 1950	10 <i>P. alatus</i> (Heller, 1868)	<i>Chondracanthus alatus</i> Heller, 1865 <i>Protochondracanthus psettodis</i> Kirtisinghe, 1950	<i>Psettodes erumi</i> (Bleeker and Schneider) [Psettodidae]	Kerala, Tamil Nadu	Pillai, 1985; Ho et al., 2000; Kizhakudan et al., 2015
	11 <i>P. trilobatus</i> (Pillai, 1964)	<i>Chondracanthus trilobatus</i> Pillai, 1964	<i>Psettodes erumi</i> (Bleeker and Schneider) [Psettodidae]	Kerala, Tamil Nadu	Pillai, 1985; Ho et al., 2000; Kizhakudan et al., 2015

Acanthochondria krishnai sp. n.: most species of *Acanthochondria* possess a short neck (Kabata, 1979; Ho and Kim, 1995; Cantatore and Timi, 2010). By having a very long neck (at least 12–14 times longer than wide) the female of *A. krishnai* sp. n. can be distinguished from most of its congeners. Only three species described earlier, such as *A. helicoleni* Cantatore and Timi, 2010, *A. uranoscopi* Ho and Kim, 1995 and *A. diastema* Kabata, 1965 exhibit these characteristics. The new species is well distinguished from most of its congeners by: a much elongated body, presence of

a pair of long distal process on trunk, funnel shaped genito-abdomen complex. The new species differs from *A. helicoleni* and *A. diastema* in having (1) the neck indistinguishably fused into the trunk; (2) presence of a pair of long, slender postero-lateral processes; (3) presence of much longer legs. *Acanthochondria krishnai* sp. n. is very close to *A. uranoscopi* by the presence of a pair of long, slender postero-lateral processes and the elongated neck and trunk. But the new species is very distinct from *A. uranoscopi* in: the shape of genito-abdomen, it is longer than wide and funnel shaped;

abdomen with the prominent process which extends to the posterior tip of caudal rami (*vs* wider than long in *A. uranoscopi*); presence of prominent constrictions on posterior half of the trunk (*vs* constrictions not visible in *A. uranoscopi*); the comparative size of trunk, wider in *A. krishnai* (*vs* comparatively narrower in *A. uranoscopi*); the leg 2 and the posterior processes in *A. krishnai* is comparatively larger than *A. uranoscopi*.

Chondracanthus kabatai sp. n.: Tang *et al.* (2007) provided a key to the species of *Chondracanthus*, which includes 39 valid species. Later Braicovich *et al.* (2013) described *Chondracanthus hoi* Braicovich, Lanfranchi, Incorvaia, Inés and Timi, 2013 from northern Argentina and very recently, Gomez *et al.* (2018) described another species *Chondracanthus dibranchi* Gómez, Aguirre-Villaseñor and Morales-Serna, 2018 from Eastern Central Pacific. With the addition of *C. kabatai* sp. n., the genus *Chondracanthus* now comprises 42 valid species. According to the latest keys to species of *Chondracanthus* by Tang *et al.* (2007), and its amendment by Gomez *et al.* (2018), the divergence within the genus is mainly based on certain key characters of the female, which includes: presence or absence and the number of cephalic processes; presence or absence of dorsal/lateral/ventral outgrowths or processes on the trunk; relative length of processes; legs 1 and 2, unilobate/bilobate/trilobate condition of legs 1 and 2 (Kabata, 1979; Boxshall and Halsey, 2004; Tang *et al.*, 2007; Gomez *et al.*, 2018). The new species *C. kabatai* can be separated from most of its congeners by having: the cephalon with two pairs of lateral processes; legs 1 and 2 bilobate; the trunk region with a pair of dorsal, horn-like processes, on either side close to the lateral margin; bearing more than two pairs of lateral processes; the abdomen not extended posteriorly. Braicovich *et al.* (2013) suggested that the close resemblance of *C. distortus* (collected from *Zeus faber* Linnaeus and *Zenopsis nebulosa* (Temminck and Schlegel) and *C. hoi* (from *Z. conchifer*) may be due to the phylogenetic relatedness of host fishes, *i.e.*, zeids. Corroborating this observation, the present new species is also collected from a zeid fish, *Z. conchifer*. *Chondracanthus kabatai* n. sp. is closely related to *C. distortus* and *C. hoi* by having the two pairs of cephalic processes. Nevertheless, the new species *C. kabatai* can be differentiated from both *C. distortus* and *C. hoi*

in having a pair of dorsal, long, horn-like processes (0.5 times as long as lateral processes), on either side close to the lateral margin on trunk (*vs* dorsal processes absent in *C. hoi* and short and bluntly rounded in *C. distortus*); the cephalic process, much elongated and the posterior process is almost twice as long as anterior one (*vs* processes are blunt, pedunculate in *C. hoi* and shorter and process 2 is sub-equal in length to process 1 in *C. distortus*); antero-lateral processes twice as long as dorsal processes (*vs* absent in *C. hoi* and smaller in *C. distortus*); abdominal processes are invariably much elongated (both smaller as well as larger specimens [4.8 mm–8 mm]) (*vs* stout, robust and shorter in both *C. distortus* and *C. hoi*); egg strings, narrow, cylindrical, irregularly coiled and extremely longer than trunk (*vs* broad, comparatively shorter in *C. hoi* and uncoiled, broad and short in *C. distortus*).

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