A NEW SPECIES OF CALIGUS (COPEPODA: CALIGIDAE) FROM KERALA

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ABSTRACT

A new species of Caligus collected from Caranx sansun (Forskal) is described in detail with illustrations.

INTRODUCTION

During the course of a detailed survey of copepod fish parasites of the Kerala coast one of the authors (NKSP) collected the under-mentioned new species from the branchial cavity of the fish Caranx sansun (Forskal).

Caligus zylanica sp. nov.
(Figs. 1-3)

Material: Four females and one male were collected from the branchial cavity of Caranx sansun (Forskal) caught at Cochin. The holotype and allotypes will be deposited in the Indian Museum, Calcutta, and paratypes will be lodged in the Dept. of Industrial Fisheries, Cochin University of Science and Technology, Cochin - 682016.

Female (Fig. 1, a): The carapace shield-like, slightly broader than long, with maximum width just below the median line. The frontal plates prominent with a median suture. Lunules are fairly large and circular. Median transverse ribs shifted far backwards, lengthening the cephalic area. The posteriomedian and lateral lobes are almost of the same width, lateral lobes not reaching beyond the main lobe. Lateral lobes posteriorly rounded and curved inwardly,
the posterior sinuses not closed. Fourth thoracic segment broader than long and almost completely fused with the genital segment. Genital segment large, pear-shaped and posterio-laterally rounded. Abdomen indistinctly two-segmented. Segments broader than long. Anal lamina nearly squarish with four long plumose setae and two short spines.

First antenna (Fig. 1, b) two-segmented, basal segment stout, with a row of marginal plumose and inner very short setae. Setae at the distal end naked on the marginal row. Second segment long and slender with a tuft of naked setae at the distal end. Second antenna (Fig. 1, c) three-segmented.

FIG. 1. Caligus zylanica sp. nov.

a. Female entire; b. first antenna; c. second antenna; d. post-antennal process; e. post-oral process; f. maxilla; g. maxilliped; h. sternal fork.
basal segment sub-cylindrical with a backwardly directing process. Second segment stout, longer than broad, distal segment long and slender, apically pointed and curved with a sub-median spine. Post-antennal process (Fig. 1, d) swollen at the base with a distally blunt, winged claw, with three setiferous papillae at the base. Postoral process (Fig. 1, e) has a roughly triangular base and a distally winged claw, an accessory claw at the base of the main claw. The basal papillae with three naked setae. The maxilla (Fig. 1, f) two-segmented, basal segment comparatively stout and strong, distal segment longer than the basal and slender, with two spine-like processes having serrated marginal membranes. Maxilliped (Fig. 1, g) two-segmented; basal segment stout with backwardly directed process. Distal segment curved, distal half heavily corrugated with a sub-median spine. Base of sternal fork (Fig. 1, h) stout and swollen, rami blunt at the distal end, inwardly curved and winged.

First leg (Fig. 2, a) uniramous, rudimentary endopod nearly cylindrical with an apical spine. Exopod two-segmented, basal segment long and stout, with a small papilla at the upper distal end. Distal segment (Fig. 2, b) nearly rectangular and with three claws and an elongated spine at the distal end and three plumose setae at the inner margin, second and third claw having a sub-apical spine. Second leg (Fig. 2, c) is biramous, exopod three-segmented, first segment elongated with a stout winged claw at the outer margin and a plumose seta at the inner margin. Second segment small, broader than long and bears a stout claw (Fig. 2, d) at the outer margin and a plumose seta at the inner margin. Distal segment longer than broad and with three claws, one small and winged, another large and winged and the third elongated, winged on one side and plumose on the other side. It also bears five plumose setae. Endopod three-segmented. First segment (Fig. 2, e) comparatively large and with one plumose seta, outer margin with a circular row of short spines. Second segment elongated, broader at the distal end and with two plumose setae. Distal segment short and with six plumose setae. Third leg (Fig. 2, f) apron highly flattened with a circular patch of strong denticles above the endopod, outer margin corrugated. Exopod segment short, with a basal strongly curved claw. Second segment with an outer spine and an inner seta. Distal segment with three naked spines, one comparatively large, and four plumose setae. Endopod two-segmented, basal segment with a single plumose seta and the distal segment with six plumose setae. Fourth leg (Fig. 2, g) uniramous, four-segmented, basal segment large and apically bears a spine. Second, third and fourth segments are almost of same size. Second and third segments (Fig. 3, a) with single spine and the third segment with three spines. Fifth and sixth legs are rudimentary, represented by small papillae with plumose setae at the posterior-lateral margins of the genital segments. Caudal lamina (Fig. 3, b) small, with two short spines laterally and four plumose setae distally.
FIG. 2. *Caligus zylanica* sp. nov. Female

- **a.** First leg; **b.** first leg — exopod of third segment enlarged; **c.** second leg; **d.** second leg exopod enlarged; **e.** second leg endopod first and second segments enlarged; **f.** third leg; **g.** fourth leg.

**Male (Fig. 3, c):** The carapace similar to that of female. The frontal plates are prominent and projecting. Posterior-median lobes are broader than the lateral lobes. Genital segment barrel-shaped. Abdomen broader than long. Most of the appendages are similar to that of female. The basal segment of the second antenna (Fig. 3, **d**) elongated, having a row of corrugations. The second segment stout and strong, longer than the basal segment, also having a row of corrugated ridges on the upper margin. The third segment is claw-like, sharply pointed and strongly curved distally. Postoral process (Fig. 3, **e**) comparatively shorter than that of female, the claw not winged, but with a row of
corrugated ridges. The basal papilla with three unequal spines. Maxilliped (Fig. 3, f) basal segment strong and stout, second segment distal claw sharp and strong with a basal spine:

FIG. 3. Caligus zylanica sp. nov.
  a. Female — fourth leg tip enlarged; b. anal lamina; c. male entire; d. second antenna; e. post-oral processes; f. maxilliped.

Remarks
In the general shape of the body and structure of appendages the new species shows similarity with Caligus cordyla Pillai (1963), C. brevicaudus Pillai (1963) and C. cornutus Heegard (1962). This similarity is particularly evident in the structure of the second antenna and the legs. The genital segment of the new species, Caligus zylanica, is entirely different from the others. In C. cordyla the genital segment has a neck-like constriction and gradually broadens backwards, whereas in C. brevicaudus the genital segment is nearly
similar, but varies in several other details. In *C. cornutus* the posterior margin of the genital segment is truncated whereas it is rounded in *C. zylanica*. The abdomen is partially segmented in *C. zylanica* but is unsegmented in *C. cordyla* and *C. breviceaus*. The structural details of the first leg in *C. breviceaus* and *C. zylanica* sp. nov. are different. In *C. breviceaus* the plumose setae are very small whereas, in the new species they are comparatively large and thickly plumosed. In *C. cornutus* the post-antennal process unflanged whereas in the new species it is well-flanged. The distal segment of the maxillicipede in the new species is corrugated whereas such modifications are lacking in *C. cordyla*, *C. breviceaus* and *C. cornutus*. The ramus of the sternal fork in *C. zylanica* sp. nov. is well-flanged and curved inwardly. In *C. cordyla* it is diverging and flanged at the tip only. In *C. breviceaus* the base of the sternal fork is nearly squarish and the tines flanged only externally. In the shape of the genital segment the new species shows similarities with *C. roundigenitalis* Yu (1933) and *C. djedabae* Rangnekar (1956). Even though the genital segment is swollen in *C. ajedabae*, it is posteriorly truncated, whereas it is rounded in the new species. Moreover, the sternal fork is unflanged and diverging. Also the structures of the postantennal and postoral processes show prominent variations. *C. zylanica* sp. nov. can be easily identified from other species of *Caligus* by the large, swollen genital segment, corrugated distal segment of maxillipede and the inwardly curved, well-flanged sternal fork.

The characters of the new species reveal that the species of *Caligus* parasitising the *Carangid* fishes possess certain identical character combinations; they have their first antenna with a slender, elongated distal segment, the distal segment of the second antenna modified into a strongly curved pointed claw and the post-oral process with a prominent accessory claw. Further, the first segment of the endopod of the second leg has a circular row of short spines at its outer margins and the apron of the third leg has a circle of small sharp denticles. The anal laminae are more or less small, nearly squarish with long plumose setae. Reasons for the evolution of these character combinations may be the host specificity.

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