

**ARCHIDIAPTOMUS AROORUS, A NEW GENUS AND NEW SPECIES OF  
COPEPODA (CALANOIDA, PSEUDODIAPTOMIDAE)  
FROM COCHIN BACKWATERS, INDIA**

BY

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An analysis of zooplankton samples collected from Cochin backwaters showed the presence of 41 specimens of a hitherto undescribed copepod. Close examination revealed that, although they could be assigned to the family Pseudodiaptomidae, they possess many primitive features along with a combination of characters of the families Diaptomidae and Pseudodiaptomidae. Hence a new genus is being erected for these specimens which are assigned here to a new species.

**Archidiaptomus** new genus

The new genus differs chiefly from the genus *Pseudodiaptomus* in the following aspects: the first antenna of the female consists of 24 segments, the right geniculate antenna of the male has 4 terminal segments, and well developed endopods are present on the fifth legs of both sexes.

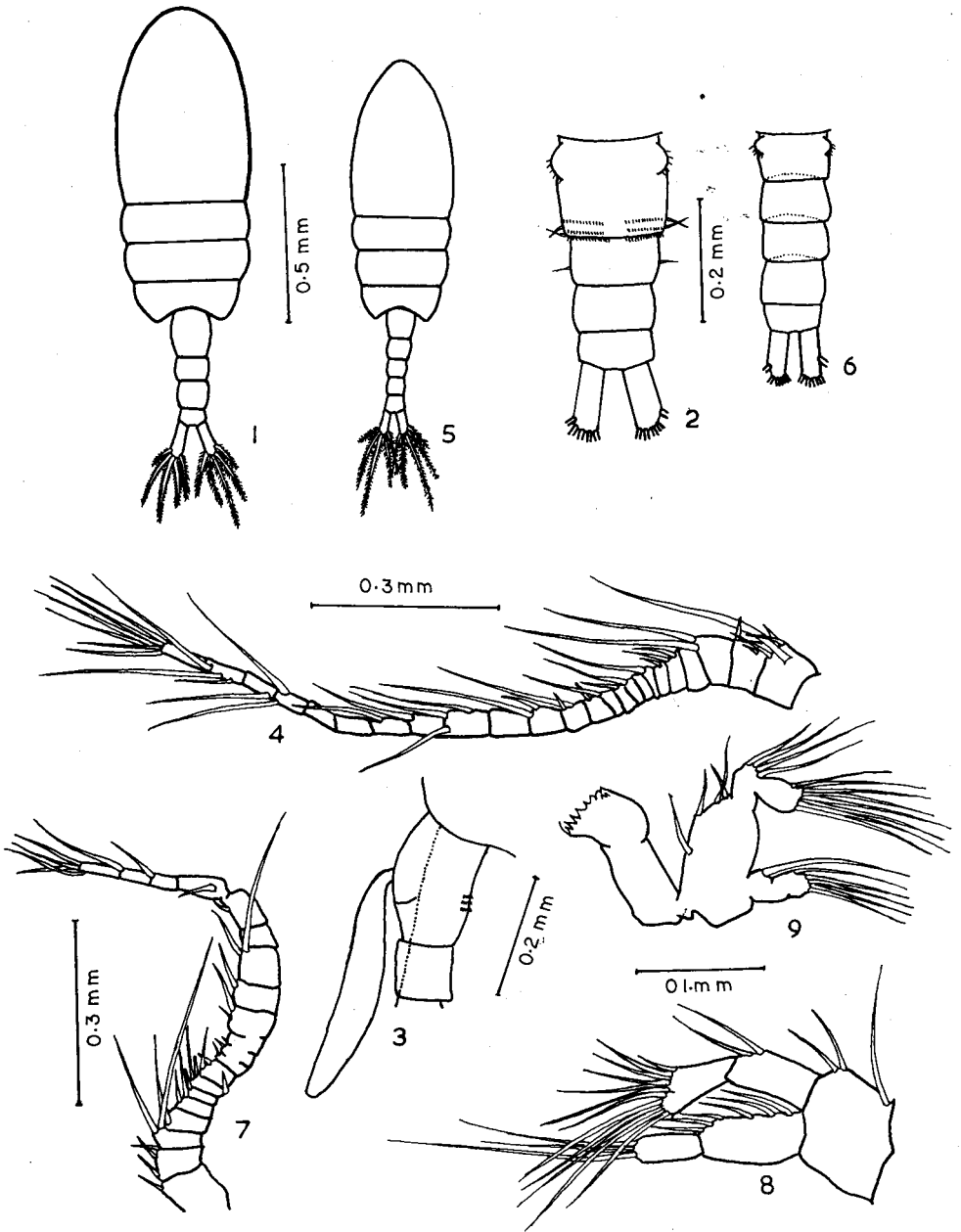
Type and unique species. — *Archidiaptomus aroorus* new species.

Etymology. — The genus is named *Archidiaptomus* for the primitive characters it possesses. The specific name is given after the locality "Aroor" from where it was collected.

**Archidiaptomus aroorus** new species (figs. 1-16)

Type material. — All the types are deposited in the reference collections of the Indian Ocean Biological Centre with the following catalogue numbers: Holotype ♀, IOBC-0242-08-46-1975; allotype ♂, IOBC-0243-08-46-1975; Paratypes 10 ♀, 5 ♂, IOBC-0244-08-46-1975. All types collected from Aroor, Cochin backwaters, India, 9°58'N 76°15'E on the 12th October, 1972 in oblique haul using HT net (mouth area 0.25 m<sup>2</sup>, mesh size 300 μm); salinity 0.5‰, temperature 29.1° C.

Description. — Female. Total length 1.44 to 1.50 mm (fig. 1). Prosome about twice the length of urosome, bluntly rounded anteriorly. Four segments of urosome and caudal rami (fig. 2) showing relative lengths of about 13.8 : 5 : 6.4 : 4 : 7.5. Caudal rami more than twice as long as wide, middle seta the longest. Genital segment slightly longer than wide, projecting ventrally (fig. 3) and having on the anteriolateral sides a pair of small lobes, each with a row of small spines. Distally on the dorsal side it bears 3 rows of spinules, incomplete in the middle, and 2 pairs



Figs. 1-9. *Archidiaptomus aroorus* n. g., n. sp. 1, female, dorsal view; 2, female, urosome, dorsal view; 3, female, genital segment, lateral view; 4, female, first antenna; 5, male, dorsal view; 6, male, urosome, dorsal view; 7, male, first antenna; 8, female, second antenna; 9, female, mandible.

of bristles on the lateral sides. A pair of small spines is present on the second urosome segment.

Antenna 1 (fig. 4) 24 segmented, extending to the end of the genital segment. Exopod of second antenna with two segments each. Gnathal lobe of mandible with 8 teeth and a small seta. Maxillae and maxillipede with setal armature as shown in the figures.

P1 with 3 segmented exopod and endopod. Third endopod segment with 6 setae and a small spine at the tip. P2 to P4 similar, first and second segments of exopods bear a small inner spine in addition to a longer one, on the outer side.

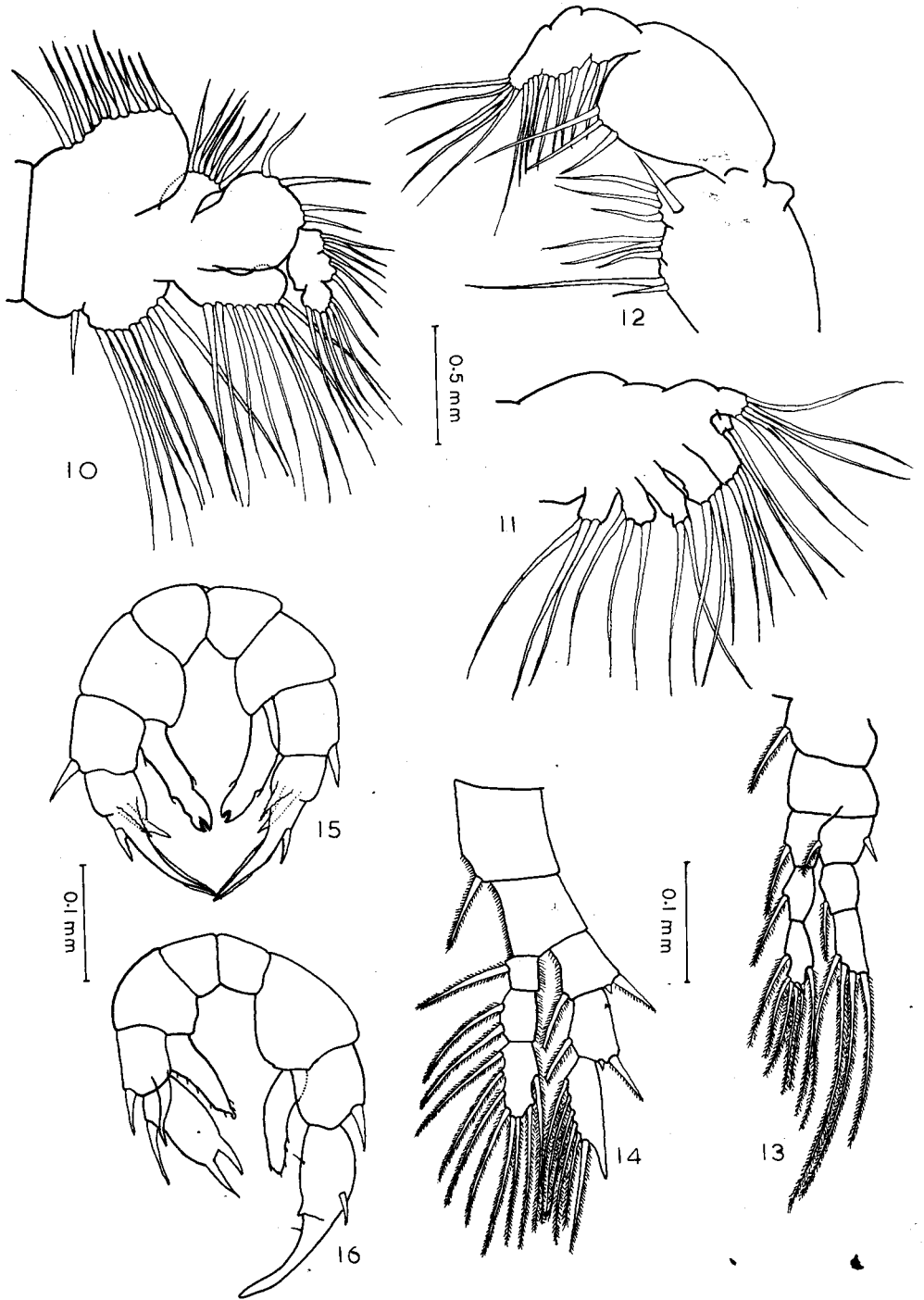
P5 biramous, symmetrical (fig. 15). Endopod single segmented, reaching the middle of Re2 with a claw-like process at the tip. Re1 bears a single long outer spine, Re2 with 4 spines, the terminal one the longest.

Male. Total length 1.08 to 1.18 mm (fig. 5). Prosome similar in shape to that of female. Urosome 5 segmented (fig. 6) relative lengths of urosome segments and caudal rami about 6.5 : 6 : 5.3 : 5 : 4.3 : 5.5. Right first antenna geniculate, 20 segmented, segments 7 to 12 and 17 with one spine each (fig. 7). A2 to P4 as in female.

P5 biramous, asymmetrical (fig. 16). Edopods on both sides extending to the middle of Re2 with bristles as figured. Left Re1 distally bears a spine on the outer side and a longer curved spine laterally. Re2 with a long proximal spine and the segment terminates into 2 claw-like spines. Right Re2 with an inner bristle and a spine two-thirds distally on its outer side. Segmentation between Re2 and Re3 indistinct, the latter forms a long spine with a bristle proximally on its inner side.

#### DISCUSSION

The family Pseudodiaptomidae includes the genus *Pseudodiaptomus* established by Herrick in 1884 to accommodate the species *P. pelagicus* which has not been recorded subsequently. Since then, the number of species in this genus has increased to 37. Marsh (1933) placed 9 species of the family under the genus *Schmackeria* Poppe & Richard, 1890, which, according to him, differs chiefly in the presence of a long curved projection on the inner border of the second basipod segment of the left fifth leg of the male. Johnson (1939) erected a new subgenus *Pseudodiaptallous* to include a new species *P. eurybalinus* from La Jolla, California. Sewell (1956) placed *Pseudodiaptomus* sensu stricto, *Schmackeria*, and *Pseudodiaptallous* as three subgenera of Herrick's original genus *Pseudodiaptomus* sensu lato. This classification is not always followed by taxonomists and *Pseudodiaptallous* appears to be the only valid subgenus under the genus *Pseudodiaptomus*. The reasons for the revival of *Schmackeria* as a separate genus from *Pseudodiaptomus* sensu lato by Marsh (1933), however, does not appear to be sustaining, especially as the two do not differ in the females except in the shape of the posterior corners of the last thoracic segment, a character which is too inapt to be considered in the diagnosis of generic differences.



Figs. 10-16. *Archidiaptomus aroorus* n. g., n. sp. 10, female, first maxilla; 11, female, second maxilla; 12, female, maxillipede; 13, female, first leg; 14, female, fourth leg; 15, female, fifth leg; 16, male, fifth leg.

The new taxon *Archidiaptomus aroorus*, although it has many features that are 'pseudodiaptomid' which would justify its inclusion in the family Pseudodiaptomidae, sharply differs from the existing species and the generic characters of the genus *Pseudodiaptomus*. It possesses many 'primitive' characters and strong affinities to the family Diaptomidae. Hence it is placed in a new genus.

The two-segmented exopod of the female fifth leg (though somewhat peculiar in form) is typical of the Pseudodiaptomidae. But it is unique in maintaining fully developed endopods of an unusually spinous form. This appears to be a primitive or generalised condition placing this genus very close to the Diaptomidae. The exopods of the right and left fifth legs of the male are fully developed as in the Pseudodiaptomidae (in the Diaptomidae the left one is usually smaller). But it is again unusual in maintaining the primitive feature of both endopods being fully developed whereas in *Pseudodiaptomus* the endopods of the male fifth legs are either rudimentary or lacking.

The urosome is 4-segmented in the female (3-segmented in the Diaptomidae) and 5-segmented in the male as in the Pseudodiaptomidae and the ornamentation of the genital segment is also somewhat pseudodiaptomid in character. The first antenna has a greater number of segments than the species of the genus *Pseudodiaptomus* (mostly 20 to 22, 23 in some) and in having 24 segments approaches the 25-segmented nature of the diaptomid first antenna, which is considered as a primitive condition in calanoid Copepoda. The right geniculate first antenna of the male has four terminal segments as is usually found in the Diaptomidae (2 to 3 in the Pseudodiaptomidae). The first swimming leg has a 3-segmented endopod typical of the Pseudodiaptomidae as against the 2-segmented condition in the Diaptomidae. While the unarmed nature of the outer margin of the second exopod segment of the first swimming leg is a feature shared by the species of both families, the rounded form of the posterior angles of the metasome and the long caudal rami of the present species are pseudodiaptomid characters.

The family Pseudodiaptomidae includes marine, brackish and freshwater species. Twenty-two species and one subspecies have been recorded from the Indian Ocean area (Pillai, 1970). The families Pseudodiaptomidae and Diaptomidae are remarkably diverse in the brackish and freshwater regions of India. Seven species and one subspecies of Pseudodiaptomidae and three species of Diaptomidae have been recorded from Cochin backwaters (Pillai, 1971; Madhupratap & Haridas, 1975). Species of Pseudodiaptomidae have been observed to be quite hardy, tolerating a wide range of salinity fluctuations (Grindley & Grice, 1969; Grindley, 1974). They certainly form a fascinating group of animals with the individual species having a wide and often curiously isolated distribution. Burekhardt (1913) suggested the probability of the species of Pseudodiaptomidae being in the process of migration from sea to freshwater. Sewell (1956) was of the opinion that the original 'home' of *Pseudodiaptomus* Herrick sensu lato was the western side of the Pacific Ocean from where they migrated to different areas during the late creta-

ceous and developed into different species. But the occurrence of *Archidiaptomus aroorus* in low salinity conditions would suggest a new angle of approach if it could be considered as the common ancestral form from which both Pseudodiaptomidae and Diaptomidae have evolved or as an intermediary form because of its strong affinities with both families.

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#### SUMMARY

A new calanoid copepod, *Archidiaptomus aroorus* n. g., n. sp., is being described from India. Though placed in the family Pseudodiaptomidae, the new genus shares many features with the family Diaptomidae. The remarkable intermediate position of *Archidiaptomus* between these two families is being discussed in morphological as well as in historical sense.

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