

**BOMOLOCHUS VARUNAE, A NEW SPECIES OF PARASITIC
COPEPOD FROM *ANODONTOSTOMA CHACUNDA* (HAMILTON
BUCHANAN)***

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ONE hundred females and one male attached to a female were obtained from the eye of the fish *Anodontostoma chacunda* from the Arabian sea. The parasites were obtained from fish collected during the experimental fishing cruise of R.V. Varuna from Cochin to Karwar between February 10 to 14, 1965. Holotype female and allotype male are deposited at the Central Marine Fisheries Research Institute.

In live condition the parasites were reddish, lodged between the eye ball and the adipose lid of the host. When a small needle was introduced to remove the parasite into sea water they ran about over the eye ball evading the needle. It required patience in some cases, to exhaust the parasite before removing it from the eye intact. In most cases they shed the egg strings inside the eye. Normally each eye of the host contained one parasite and 98% of the fish examined had parasites.

FEMALE

General body form flat and abruptly narrowed behind the cephalothorax and as in *Bomolochus sardinellae* Bennet (1964) with a curve ventralwards, obviously to fit the contour of the eye ball of the host. Cephalothorax $1\frac{1}{2}$ times broader than long; antero-median part carries a short slightly bilobed rostrum which is broader than long; posterior border of the cephalothorax convex with rounded borders. First thoracic segment fused with head; second and third segments subequal, considerably broader than long, fourth segment narrowed and longer than the third, fifth segment about half the size of the fourth and about twice as broad as long; genital segment very short, lateral borders convex, becoming narrower posteriorly. Abdomen short and tapering, three segmented, equal in length to the third thoracic segment. First and third abdominal segments longer than the middle segment. Egg sacs long and narrow, longer than the length of the animal. Eggs large and arranged in three or four longitudinal rows.

First antennae six segmented, first two segments enlarged at base and bent at right angles; with thirteen plumose setae of which two are long and two non-plumose tactile hairs, other four segments with simple setae and the last segment with a long terminal seta. Second antennae stout and strong, three segmented, distal segment as long as the basal segment, surface roughened with minute teeth and ends in four apically curved digitate processes. Labrum is prominent and

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Setal formula

swimming legs	basipod segments				endopod segments						exopod segments							
	1		2		1		2		3		1		2		3			
	si	se	si	se	si	se	si	se	si	st	se	si	se	si	se	si	st	se
2	0	0	0	1	1	0	2	0	0	2	1	0	0	0	0	1	2	0
3	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	1	2	0
4	0	0	0	1	1	0	1	0	1	1	1	0	0	0	0	0	2	0

si, st, se. internal, terminal, external portions of segments.

well defined with short hairs, labium not distinct. Mandibles minute, with a stout base and pincer like blade, smooth and simple. First maxillae with swollen base and three divergent short hairy setae. Second maxillae two segmented, basal segment long and enlarged, the terminal segment in the form of a long hairy spine. Maxillipede just like that of *Bomolochus sardinellae*, outside the other mouth parts; terminal claw smooth and without accessory spine or seta.

First four pairs of swimming legs biramose, rami obscurely three segmented. In the first pair of legs rami are flattened and carry large plumose setae around the margin; outer margins of endopod segments hairy. Basipod of legs two to four two segmented, distal segment carries a single long seta. Exopods of second, third and fourth legs roughened with minute spines at the outer margin; basal and middle exopod segments with one spinule, distal exopod segments with two spinules at the outer margin and one stout barbed spine at the tip. Basal endopod segments hairy at the outer margin. Setal formula of second to fourth swimming legs are given below. Terminal setae of second to fourth exopod hairy. Fifth leg uniramous, two segmented, basal segment short with one simple seta; terminal segment much longer than the basal segment and bears four simple setae. Sixth leg rudimentary, in the form of three long non-plumose setae on the genital segment. Anal laminae narrow and elongated, twice as long as wide, tipped with a long median seta and three smaller setae of which two are terminal and one at the lateral margin.

Length of animal 1.7 mm.; length of egg strings 1.76 mm.; length of carapace .65 mm.; breadth of carapace 94 mm.; length of free thorax .7 mm.; length of abdomen .17 mm.

MALE

Male was damaged at the genital segment during observation; considerably more slender than the female. General body form more or less similar to that of the male of *Bomolochus sardinellae*. Rostrum not pronounced, broader than long and convex. First antennae weaker with the basal segments not much enlarged. Second antennae with four digitate claws at the terminal segment, surface spiny. Maxilliped large, three segmented, terminal claw simple, without accessory claw or seta and folding against the second segment along the inner margin. First swimming leg flattened, second third and fourth legs with two segmented rami, fifth leg uniramous and sixth absent. Abdomen three segmented, tapering, middle segment shorter than the other segments; third segment and anal laminae sculptured ventrally with minute spines. Anal laminae with long apical seta and three short setae.

REMARKS

There are now *B. sardinellae* and *B. varunae*, two clearly defined species of *Bomolochus* which are eye parasites of ctenophores. In both the forms the maxillipedal claw is devoid of accessory structures. In this character alone they differ from all the other species of *Bomolochus* hitherto described. *B. sardinellae* and *B. varunae* differ from each other in several characters. In *B. sardinellae* the rostrum is longer than broad, in *B. varunae* it is broader than long. Genital segment in *B. sardinellae* slightly enlarged and without rudimentary sixth legs, in *B. varunae* it is not enlarged and with sixth legs in the form of three long setae. Egg strings

in *B. sardinellae* roughly ovate whereas in *B. varunae* they are long and string like. Exopod segments of first four pairs of swim legs two segmented in *B. sardinellae*, they are three segmented in *B. varunae*.

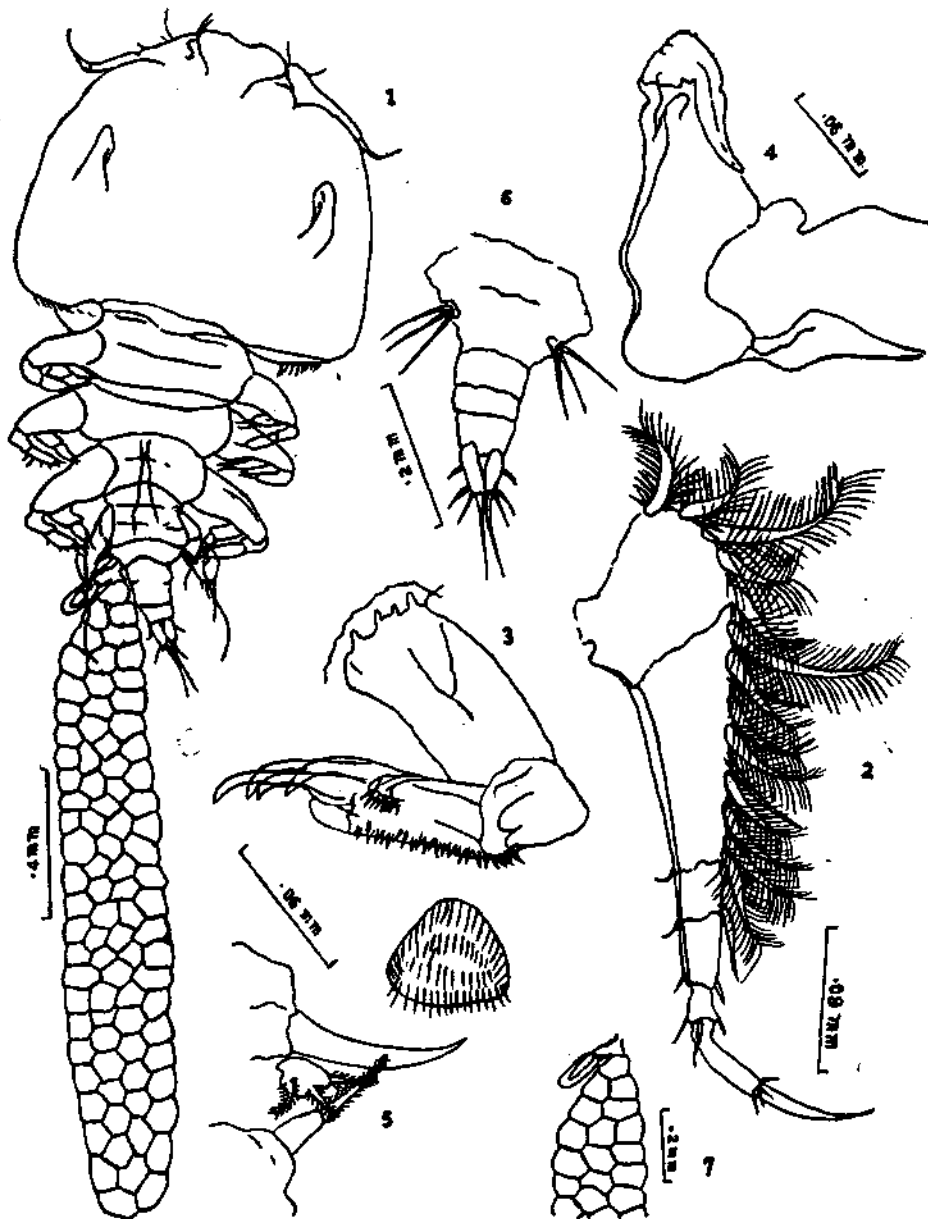


FIG. 1. *Bomolochus varunae* sp. nov. female, (1) dorsal view; (2) first antenna; (3) second antenna; (4) maxilliped; (5) mouth parts, ventral view; (6) genital segment and abdomen, dorsal view; (7) egg sac, anterior portion.

B. varunae shows some resemblances to *B. aculeatus* Pillai (1962) in the two antennae, maxillae and legs two to five. But the maxilliped, sixth leg, body shape

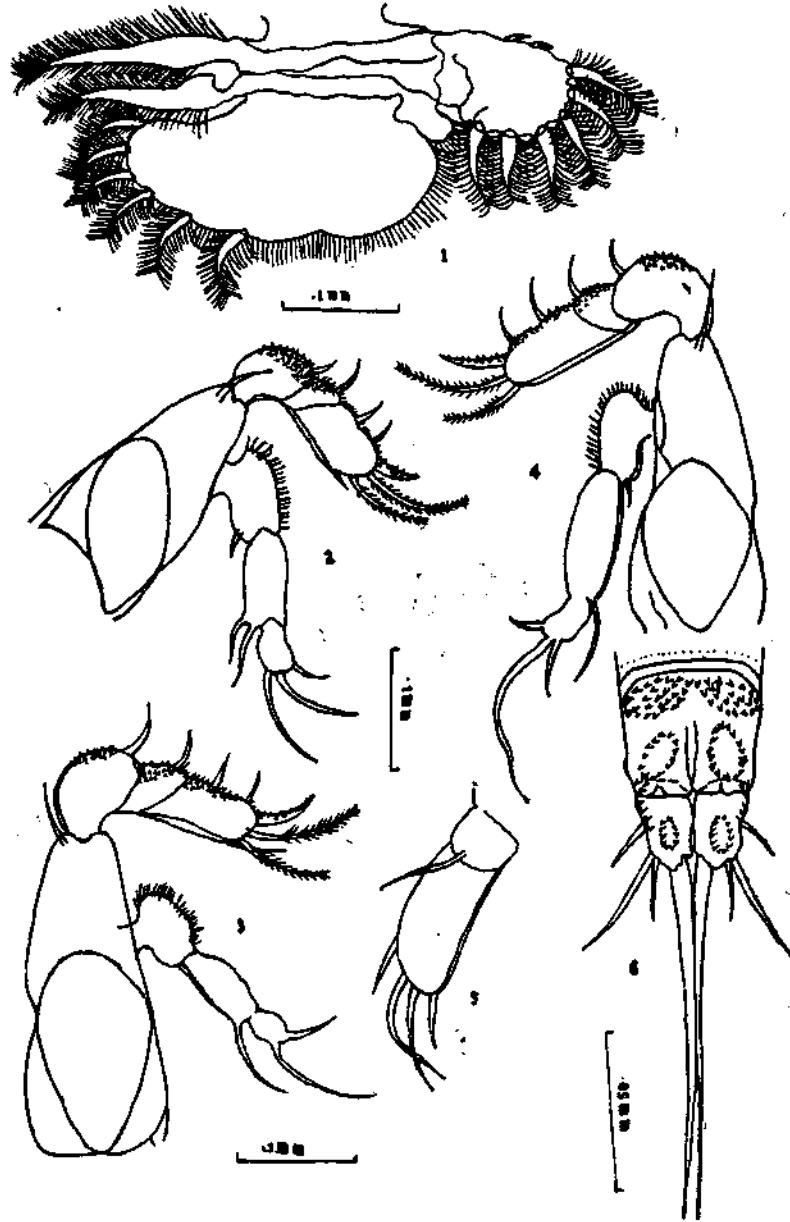


FIG. 2. *Bomolochus varunae* sp. nov. female (1) first leg ; (2) second leg ; (3) third leg ; (4) fourth leg ; (5) fifth leg ; (6) male, last abdominal segment, ventral view.

and egg sacs are totally different. In the second antennae, maxilla and legs two to six the species show some resemblances to *Orbitacolax uniunguis* Shen (1957),

However the maxilliped, first antennae, first leg, egg sacs and general shape of the body are different.

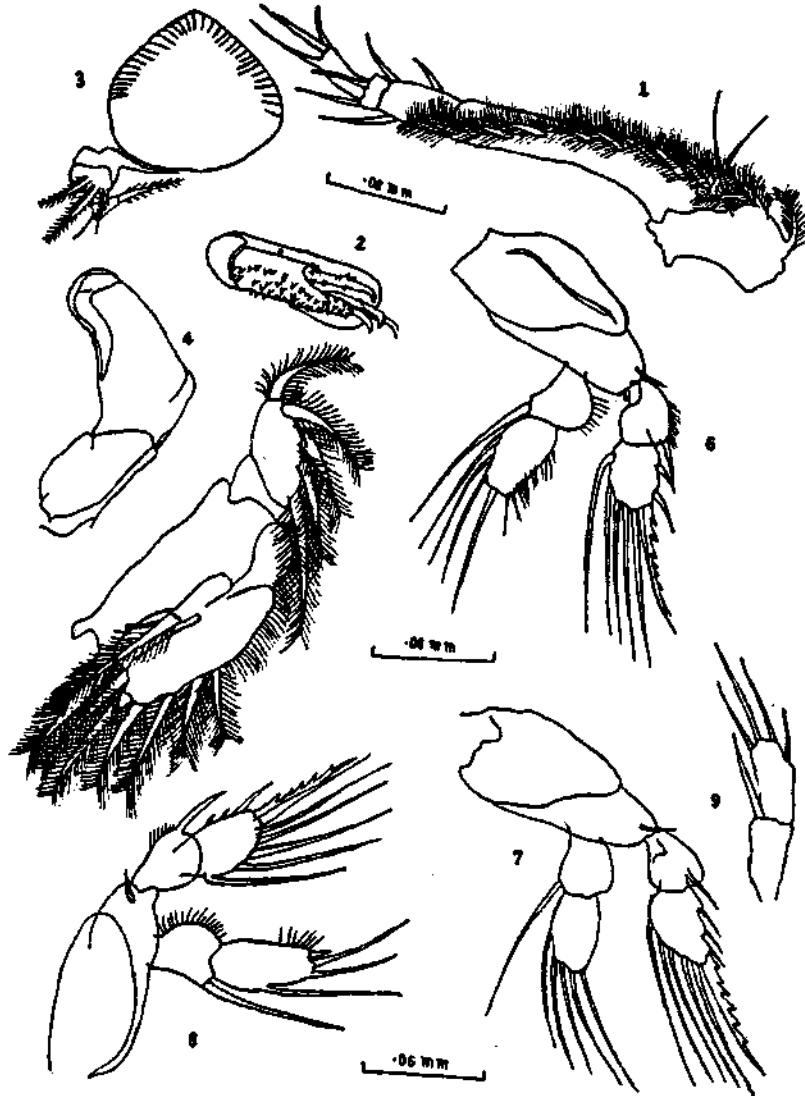


FIG. 3. *Bomolochus varunae* sp. nov. male (1) first antenna ; (2) second antenna ; (3) mouth parts, ventral view ; (4) maxilliped ; (5) first leg ; (6) second leg ; (7) third leg ; (8) fourth leg ; (9) fifth leg.

B. varunae is of particular interest because it shows some similarities to the members of the genus *Pseudoecanthus* Brian. *B. varunae* resemble *Pseudoecanthus* in not having any accessory structures on the terminal claw of the maxilliped, short genital segment with rudimentary sixth legs and in having string like egg sacs. Moreover *P. alosae* Brian is also an eye parasite. However it differs from *Pseudoecanthus* in the structure of the first antennae which in *Pseudoecanthus* is neither

enlarged nor curved at the base and destitute of tactile setae. Incidentally the structure of the first antennae is the important single character which separates the two genera. Though the egg strings are long the eggs are, unlike in *Pseudoecanthus* arranged in three or four rows.

The male of *B. varunae* though slender and resembles in general shape to the male of *B. sardinellae* differs from it in the structure of maxilliped and the three segmented abdomen.

SUMMARY

Female and male of a new species of *Bomolochus*, *B. varunae* parasitic on the eye ball of *Anodontostoma chacunda* Hamilton Buchanan from the West Coast of India are described. Notes on incidence and intensity of infection are given.

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REFERENCES

- BENNET, P. SAM. 1964. On *Bomolochus sardinellae* sp. nov. (Copepoda, Cyclopoida) parasitic on *Sardinella albella*. *J. Mar. biol. Ass. India*, 6(1) : 84-88.
- BRIAN, ALESSANDRO. 1906. *Copepodi Parasiti dei Pesci d' Italia* 21 Tav. Genova.
- PILLAI, N. KRISHNA. 1962. On a new species of *Bomolochus* (Copepoda) with remarks on *Orbitacolax* Schen. *Parasitology*, 48(4) : 610-612.
- SHEN, C. J. 1957. Parasitic copepoda from fishes of China, Part 1. Cyclopoida (1). *Acta Zool. Sinica*. 9 : 314-327.