

**PUMILIOPSIS SPATHEPEDES SP. NOV., A CYCLOPOID COPEPOD  
PARASITIC ON THE EYE OF *SARDINELLA SIRM***

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**ABSTRACT**

The female of a new species of copepod parasite, *Pumiliopsis spathepedes* is described from the eye of the sardine, *Sardinella sirm* from Tuticorin, South East Coast of India. It was been compared with the only other known species in this genus namely *P. sardinellae*. The species can easily be distinguished from all the other bomolochids hitherto known by the enormously developed fifth leg.

During the course of my investigations on the sardines of the South East Coast of India I collected several bomolochid parasites from the eye of *Sardinella sirm* (Walbaum) at Tuticorin. These specimens, though congeneric with *Pumiliopsis* Pillai (1967) differ markedly from *P. sardinellae* (Bennet) and are hence described as a new species. In this connection it may be mentioned that from Indian waters four eye-parasites have hitherto been recorded. They are *Pumiliopsis sardinellae* (Bennet 1964), *Pseudorbitacolax varunae* (Bennet 1966), *Bomolochus jonesi* Bennet (1967) and the present new species. Two of them were made the type of two new genera (Pillai 1967 and 1971). The present species also shows characters which perhaps justify the creation of a new genus but in view of its extreme similarity with *P. sardinellae* it is described as a new species of *Pumiliopsis* Pillai.

**PUMILIOPSIS PILLAI**

*Pumiliopsis spathepedes* sp. nov.

**Material:** Fifty specimens, all females from the eye ball of *Sardinella sirm* (Walbaum) collected at Tuticorin, South East Coast of India.

Holotype female and a paratype female are deposited in the reference collection museum of the Central Marine Fisheries Research Institute. Other specimens are with the author.

**Description of female:** The body (Figs. 1&2) is of the general form found in the bomolochid eye-parasites, rather elongated and slender. Length varies from 2.70 mm to 3.52 mm. General shape of the body cyclopoid, cephalon swollen and

laterally expanded; Thoracic somites successively narrowing backwards. Abdomen steadily narrowing backwards. Head and first thoracic somite fused to form the cephalic somite: broader than long and partly overlapping the second thoracic somite. Cephalic somite laterally slightly curved ventralwards to produce a concavity accommodating the cephalic appendages. The antennules and first pair of legs clearly visible in dorsal view. Posterior part of the cephalic somite carries the first pair of legs. Median eye present antero-medially as a reddish speck in the fresh specimens. Rostral lobe short, curved ventralwards, ending in a pair of short knobs, in dorsal view transversely oblong.

Behind the cephalic somite are four free thoracic somites, much narrower than the cephalic somite, their lateral parts little developed so that the basipods of legs 2 to 5 are clearly visible. First free thoracic segment nearly twice as broad as long. Second very slightly broader than long and the third and fourth as broad as long.

Genital somite not much expanded, wider than long. Three small hairy setae originating from the genital segment represent the sixth leg. Abdominal somites successively narrowing; furcal rami longer than wide, slightly narrowing caudally, each ramus with five setae, two at the outer margin and three terminal; middle terminal seta stout and very long, all the setae devoid of hairs.

Egg sacs ovate and elongated, about two thirds the length of the animal; eggs large and multiseriate.

Antennules composed of a three-segmented basal portion and three-segmented flagellum. Segments one and two much enlarged and flattened. Basal portion with 15 stout plumose sensory setae and one non-plumose long seta. Terminal seta of last segment longer than the others.

Antenna small, with the basic structure found in *P. sardinellae* (Bennet). It has a long enlarged coxa and short basis, both devoid of setae or spines. Endopod consisting of two fused segments, folded over the coxa. First endopodal segment with rows of small teeth and a short digitiform process which also has small teeth; second segment with four apically curved digitiform setae and a fine straight seta.

Mouth parts situated at ventro-median region of the cephalic somite; labrum rounded, with two patches of minute spines; mandible with a swollen base bearing a pair of unequal blades; maxillule is small and bears three setae of which one is long, one hairy. Paragnath not observed. Maxilla with two minutely hairy blades.

Maxillipede strong and stout, situated lateral to other mouth parts, middle segment enlarged, with two long minutely hairy setae. Terminal claw strong, stout and slightly curved; without any auxillary spine or seta, its base produced forwards.

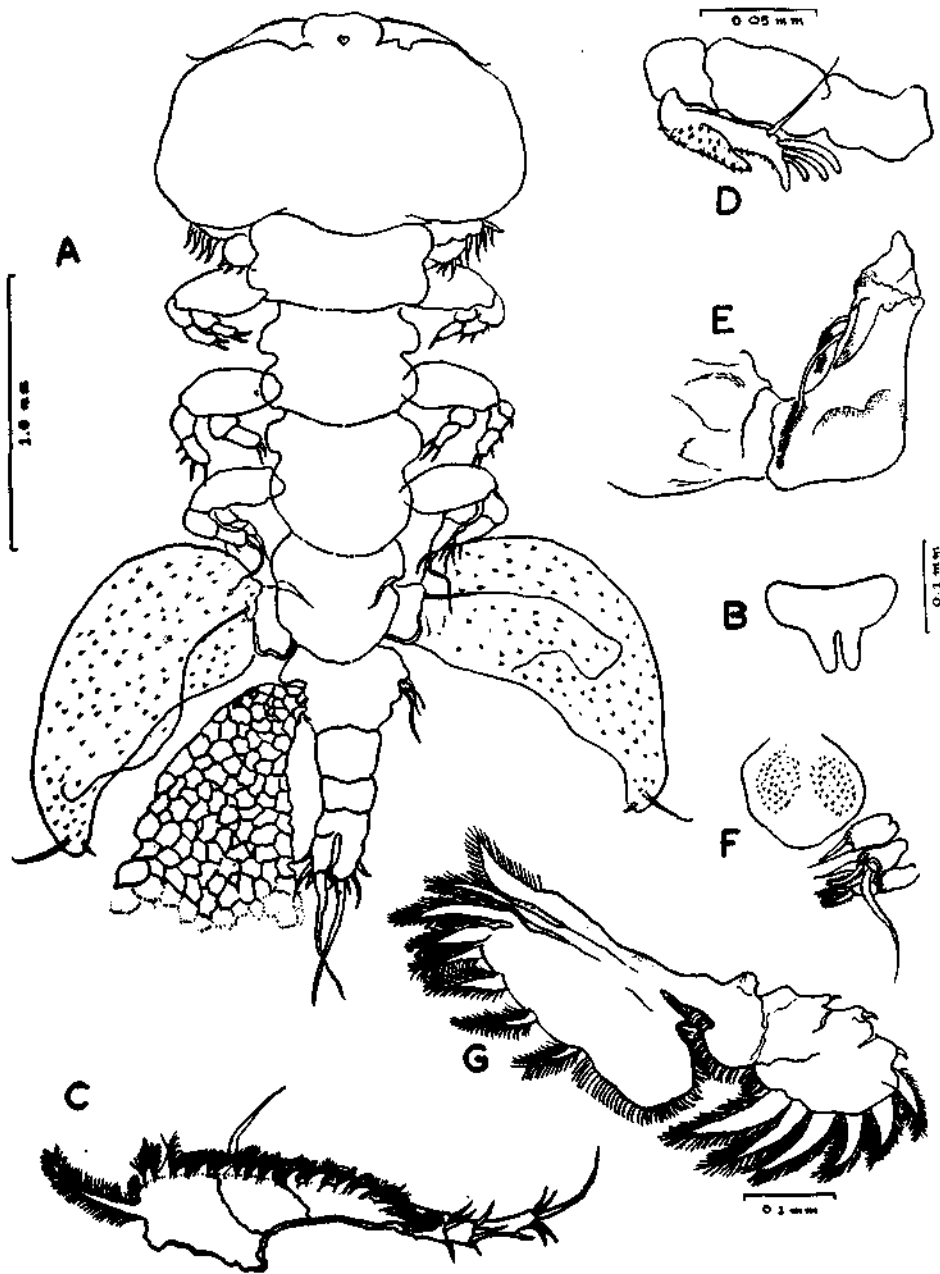


FIG. 1. *Pumiliopsis spathepedes* sp. nov.; A, female, dorsal view; B, rostrum, ventral view; C, antennule; D, antenna; E, maxilliped; F, oral appendages; G, first leg.

Thoracic legs follow the general pattern seen in *P. sardinellae*. First leg with both endo and exopods three segmented, segments fused, much flattened and enlarged; basal and middle segments of endopod with one seta each and the terminal endopod segment with six setae. The setae and the outer margin of

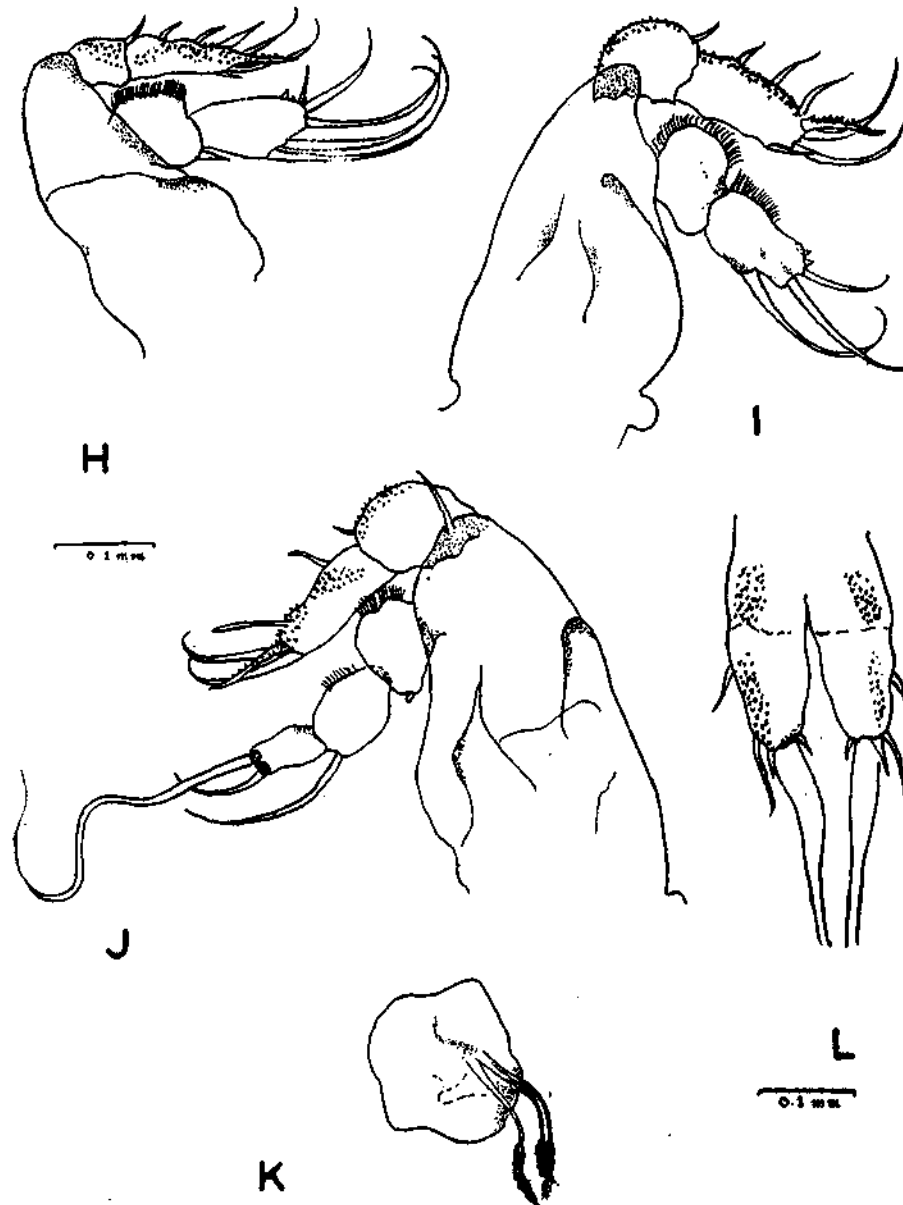


FIG. 2. *Pumiliopsis spathepedes* sp. nov; female, H, second leg; I, third leg; J, fourth leg; K, sixth leg (setae on genital segment); L, furcal rami.

the terminal segment are hairy. Basal and middle exopod segments with one spine each and the terminal exopod segment with one spine and six hairy setae. Legs two and three are normally developed, basipods much enlarged and without armature, rami two segmented. Basal exopod segments of legs 2 and 3 with one spine; distal segment with one stout barbed apical spine and three marginal spines. There are two long curved terminal setae and one short seta on the distal exopod segment of legs 2 and 3; the setae are unarmed. Basal endopod segment of leg 2 with one spine at the inner distal angle; second segment with one outer spine and three small spinules; terminally the second segment bears four simple curved setae. Basal endopod segment of leg 3 without spine; distal segment with two spinules and three simple setae, curved at the tip. Fourth leg is different from the preceding two. Basipod of leg 4 stout and armed with a distal seta. Basal exopod segment of leg 4 with one outer spine; distal segment with a stout barbed apical spine and two simple spines at the outer border, of which one is blunt. Distal exopod segment of leg 4 ends in two simple curved setae as in the preceding two legs; Endopod of leg 4 three segmented, unlike the preceding two legs; basal segment with a stout blunt spine at the inner distal angle, middle segment with one simple seta, distal segment terminally with two unarmed setae of which one is very long and whip-like as seen in *Pseudorbitacolax varunae*. Outer margin of exopod segments of legs 2 to 4 with minute spines; basal endopodal segments flattened and hairy at the outer margin; minute hairs present at the outer margin of second endopod segments of legs 3 and 4. Fifth leg uniramous, two segmented and very prominent. The small basal segment bears a long unarmed flagelliform seta; terminal segment 1.2 mm long, spatulate and spathe-like, surface with minute spines; at the distal end there are two simple setae of which one is longer than the other. The sixth leg is represented by three long hairy setae protruding from near each genital orifice.

Setal and spinal formula (spines in roman and setae in arabic numerals)

	<i>endopodite</i>	<i>exopodite</i>
leg 1	1+0 . 1+0 . 6+0	0+I . 6+I . 6+I
leg 2	0+I . 4+I	0+I . 3+IV
leg 3	0+0 . 3+0	0+I . 3+IV
leg 4	0+I . 1+0 . 2+0	0+I . 2+III

The genus *Pumiliopsis* includes but one species, *P. sardinellae* (Bennet). *P. spathepedes* resembles *P. sardinellae* in the general shape of the antennules, antenna, mouth parts, in the absence of accessory structures on the maxillipedal claw and in the segmentation of the thoracic legs. However *P. spathepedes* differs from *P. sardinellae* in the following respects. The rostrum is longer than broad in *P. sardinellae* whereas, in *P. spathepedes* it is curved ventralwards and ends in a pair of short knobs. The distal endopod segment of the first leg of *P. sardinellae* has five plumose setae, in *P. spathepedes* this segment bears six plumose setae.

The apical seta of the terminal endopod segment of leg 4 is only moderately long in *P. sardinellae*, whereas, in *P. spathepedes* the apical seta is very long and whip-like. Leg 5 shows extreme modification in *P. spathepedes*. The seta on the basal segment in *P. spathepedes* is very long and flagellar, in *P. sardinellae* it is of normal size. The terminal segment of leg 5 in *P. spathepedes* is spatulate, enlarged and bears two setae at the apex; in *P. sardinellae* this segment is normally developed, with four setae.

The present new species can at once be distinguished from *P. sardinellae*, in fact from all the bomolochids hitherto recorded, by its enormously expanded fifth leg.

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