

**FOUR SPECIES OF LERNAEOPODID COPEPODS
NEW TO THE FAUNA OF INDIA**

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ABSTRACT

Short illustrated descriptions of four species of lernaepodids namely *Thysanote nudibrachiata* n. sp., *Brachiella cybii* n. sp., *B. malabarica* n. sp., and *Clavella ovata* Yamaguti are given. Each species is of some special interest. *T. nudibrachiata* lacks processes on the maxillae, *B. cybii* is perhaps the largest on record and *C. ovata* is the first authentic record of the genus from the Indian waters.

INTRODUCTION

LERNAEOPODIDS inhabiting the Indian waters have been fairly well known. To date about twenty eight species have been recorded. The present report adds four more bringing the total to thirty two. Of the four species described three are of special interest. *T. nudibrachiata* lacks fimbriate processes on the maxillae. *B. cybii* is unlike any other known species and is perhaps the largest on record. *C. ovata* appears to represent the first authentic record of the genus from the Indian waters. Due to paucity of material we are unable to give detailed descriptions of *T. nudibrachiata* and *B. cybii*.

DESCRIPTION OF SPECIES

***Thysanote nudibrachiata* sp. nov. (Figs. 1 a, b)**

Material: A single female without egg sacs from the wall of the buccal cavity of *Epinephelus* sp. examined at Trivandrum. This specimen will be deposited in the Indian Museum, Calcutta as the holotype. Length 5.2 mm.

Female: Cephalothorax comparatively long, stout and prominently curved downwards, as long as the swollen part of the trunk and almost of uniform width throughout. Carapace indistinct or absent. Trunk nearly twice as broad as cephalothorax, demarcated from the latter by a feebly bilobed hump, posteriorly produced into a long conical lobe ending in a short digitiform process which can neither be described as a genital process or abdomen. Postero-lateral parts of trunk with nine pairs of subsimilar digitiform processes almost forming a girdle with a dorso-median gap. Ventro-median pair of processes uniramous, apparently representing the caudal rami. Other processes dichotomously branched, four on each side. Postero-median lobe of trunk with a pair of spermatophores attached to its ventral side. Egg sacs absent.

Maxillae as long as that part of cephalothorax in front of it, clearly narrower than cephalothorax and completely free, apically connected to a button-shaped bulla. Basal part of the maxillae housing maxillary glands somewhat swollen. No fimbriate processes on maxillae or on trunk adjacent to its base.

Remarks: One of the generic characters *Thysanote* is the presence of fimbriate process on the maxillae and the posterior part of the trunk. But out of the nineteen species the genus now contains the only one which lacks fimbriate processes on the maxillae is *T. gymnobrachiata*. The present species the twentieth lacks processes on the maxillae and in this respect resembles *T. gymnobrachiata*. Kabata (1968) suspected that the single specimen he had may not be mature but concluded that the specimen from its degree of development is not likely to develop the processes on the maxillae. This supposition is certainly valid. We have had occasion to study the growth stages of *T. appendiculata* in which the processes develop simultaneously on the trunk and the maxillae. This species lends support to Kabata's suggestion that the generic definition should be emended to include this character.

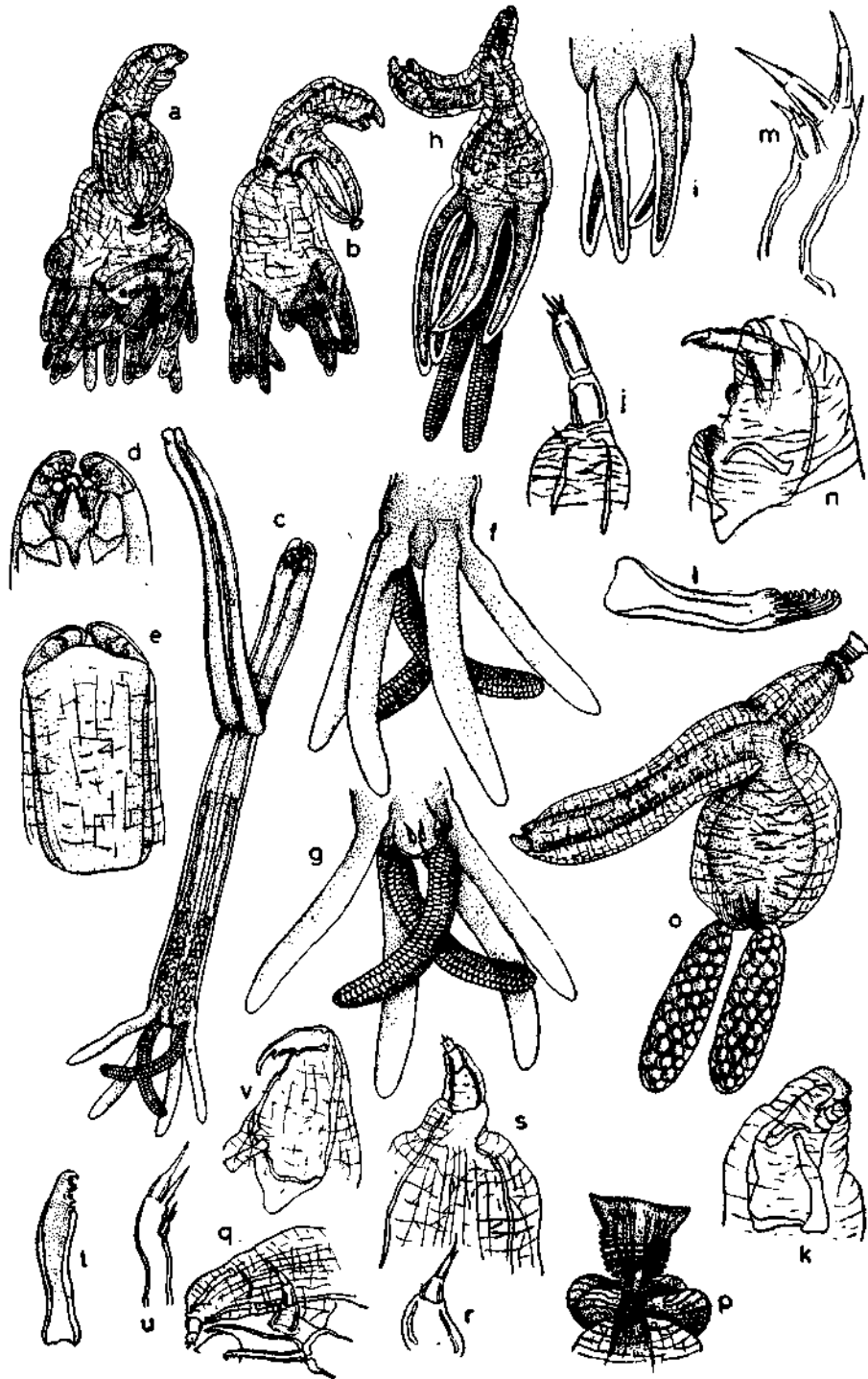
Like *T. gymnobrachiata* the present species is also a parasite of *Epinephelus*. It unfortunately lacks egg sacs though is apparently fully mature. There is the remote possibility that these two species may turn out to be synonymous.

***Brachiella cybii* sp. nov. (Fig. 1 c-g)**

Material: A single female, with egg sacs, attached inside the nasal cavity of *Acanthocybium solandri* examined at Trivandrum. This specimen will be deposited in the Indian Museum, Calcutta, as the holotype. Length 20.0mm.

Female: Body long and very slender, nearly of the same width throughout. Body cuticle without wrinkles unlike as in most lernaeopodids. Cephalothorax slightly more than half the length of the trunk, with parallel sides, somewhat dorso-ventrally flattened. Carapace large and distinct, antero-medially conically produced. Trunk very slightly broader than cephalothorax and very gradually widening backwards, postero-medially produced into a bilobed genital process or abdomen demarcated by two lateral incisions. Genital lobe carries a pair of spermatophores and egg sacs, eggs closely packed and polygonal. The fleshy part of the trunk showing clear indications of partitions, first segment shorter than second and the latter as long as third. Postero-lateral parts of trunk prolonged into two pairs of processes which appear laminate rather than cylindrical, members of the dorsal pair longer than those of the ventral and placed closer to each other. Ventral processes slightly shorter and as long as the egg sacs.

Appendages could not be studied in detail as we had only one specimen, probably the largest *Brachiella* hitherto recorded. Antennules rather swollen and four-jointed. Antennae curving towards the median line, endopods small, attached at right angles to the exopods. Distal segment of maxilliped irregularly curved, apically blunt and apparently without distinct unguis or any armature. Maxillae very long, as long as or slightly longer than trunk, much longer than cephalothorax, slender and fully free, apically slightly expanded, bulla partially broken.



Please see facing page for explanation.

Remarks: *B. cybii* shows the closest resemblance to *B. magna* Kabata (1968) and probably may be identical. But judging from the figure published by Kabata (1968) *B. cybii* has longer maxillae and shorter egg sacs. Moreover in *B. cybii* the dorsal trunk processes appear to be longer than the ventral, just the opposite in *B. magna*. Both are parasites of closely related fishes and the appendages also show close similarity. It is unfortunate that the appendages could not be studied.

Commenting on the appendages of *B. magna*, Kabata observed that *B. magna* differs from typical members of the genus in the structure of the antennae, maxillule and maxilliped. This is indeed true of *B. cybii* also. But it should be pointed out that the appendages of *B. thynni* Cuvier are also of the same pattern. More over these three species show indistinct segmentation of the trunk and appear to form a natural group deserving separation from the other members of the genus. If such a separation is effected *B. elegans* Richiardi (1880), *B. seriola* Yamaguti and Yamasu (1960) and *B. gracilis* Wilson (1908) should also be re-examined in this context. Their available descriptions are rather inadequate.

***Brachiella malabarica* sp. nov. (Fig. 2 h - n)**

Material: Three females from the gill arches of *Lutianus* sp. examined at Trivandrum. The holotype, female will be deposited in the Indian Museum, Calcutta and the paratype, female, will be in the Department of Aquatic Biology and Fisheries, University of Kerala, Trivandrum. Length 4.9 mm.

Female: Cephalothorax comparatively short, fairly well curved and bent dorsalwards and remaining almost at right angles to the trunk, cephalic portion directed forwards and with distinct carapace. Trunk pyriform, anteriorly only slightly broader than cephalothorax and steadily widening backwards, posterior part subglobular and distally drawn out into two pairs of processes as usual in the genus, the processes comparatively stout and gradually narrowing distalwards, dorsal ones contiguous at their base, slightly longer than the ventral, latter placed farther apart. No genital or abdominal process. Egg sacs very long and slender, perfectly cylindrical, reaching far beyond trunk processes, eggs closely packed and polygonal.

Antennule three-jointed, basal segment highly swollen, with sharp inner distal seta, distal segment with four setiform spines. Antenna only slightly inclined inwards, covered by the chitinous envelope, exopod with distal part spinulose, endopod three-jointed, third segment with two spines and a patch of spinules. Mandible fairly strong and stout, with seven primary teeth and two secondary teeth alternating with the second and

Fig. 1. *Thysanote nudibrachiata* n. sp.: a. female, ventral view; b. same, dorsal view; c-g. *Brachiella cybii* n. sp.: c. female, ventral view; d. cephalon, ventral view; e. same, dorsal view; f. hind end of trunk, dorsal view; and g. same, ventral view; h-n *Brachiella malabarica* n. sp.: h. female, lateral view; i. hind end of trunk, dorsal view; j. antennule; k. antenna; l. mandible; m. maxillule; and n. maxilliped. o-v. *Clavella ovata* Yamaguti: o. female, lateral view; p. bulla, lateral view; q. antennule, antenna and mandible; r. antennule; s. antenna; t. mandible; u. maxillule; and v. maxilliped.

third primary teeth. Maxillule with stout stem, terminating in two stout distal processes and a small spine-like outer third process, inner process clearly stouter than the median, palp with two processes. Maxillae completely fused, remaining almost in line with trunk. Maxilliped covered by the chitinous envelope, basal segment with two spherical spiny projections and a sharp spine midway between two, distal segment rather slender, its lower distal part serrate and ending in a spine under-riding the strong curved unguis.

Remarks: This species closely resembles *B. lutiani* (Pillai) (= *B. indica* Pillai, 1968 preoccupied) a parasite of *Lutianus* sp. But *B. malabarica* can be distinguished by the shorter cephalothorax, the absence of a third pair of small trunk processes, the different mandibular formula and the presence of three distal processes on the maxillule.

***Clavella ovata* Yamaguti (Fig. 2 o-v)**

Clavella ovata Yamaguti, 1939, p.554, pl.47, figs. 128-132.

Material: Several females, but no males, from the gill arches of *Nemipterus japonicus* examined at Trivandrum.

Female: Cephalothorax long and stout, clearly longer than trunk and generally bent over the latter, cephalic portion narrowing forwards, without carapace. Trunk slightly swollen, nearly globular, with two submedian dorsal rounded prominences giving attachment to egg sacs. No genital or abdominal process. Whole body enclosed in a very loose chitinous covering. Egg sacs short but stout, as long as trunk, eggs rounded, loosely packed. Length 2.0 mm.

Antennule very small and slender, three-jointed, quite unlike that of other species. Basal segment rather swollen, others strongly narrowing, distal segment with two unequal spines. Antenna uniramous, with chitinous covering carrying an outer patch of spinules, distal segment with five short teeth. Mandible very small, with four widely spaced primary teeth, first two alternating with subsidiary teeth. Maxillule very slender, with two comparatively long distal processes, outer stouter than inner, palp very small, with two spines. Maxillae moderately long, completely fused, remaining in a straight line with cephalothorax, bulla wine glass-shaped, basally flanked by two bilobed wings, bulla proper with transverse projecting rings or ridges producing a serrate appearance on the lateral borders. Basal segment of maxilliped rather illdeveloped and feebly armed, distal segment comparatively stout, with median ventral blunt process and lower distal row of spines ending in a large spine or tooth, unguis slender and fairly well curved.

Remarks: This species was originally described by Yamaguti from the same host collected in the Japanese waters. But our specimens show some marked difference from Yamaguti's material. The bulla shows prominent rings which Yamaguti apparently failed to observe. Yamaguti has

illustrated a peculiar type of antennule. As can be seen from the accompanying illustration the antennule though unusually small is three-jointed, ending in two spines. The large spines illustrated by Yamaguti on the antennae were not observed. The antenna is a four-jointed uniramous appendage as usual in the genus. In our specimens the maxillule ends in a pair of processes, the third process shown by Yamaguti is absent. The armature of the maxilliped also shows some difference.

Kabata and Gussev (1966) observed that species of *Clavella* inhabit the northern hemisphere and are comparatively rare in lower latitudes. To date only one species, *C. uncinata* (Müller) (Kirtisinghe, 1964) has been recorded from Indian waters. The present record is therefore interesting as it is from a locality close to the equator though in the northern hemisphere. Kirtisinghe has not given details and hence one cannot be sure of the correctness of his identification.

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