

THREE NEW GASTROTRICHS FROM ORISSA COAST, INDIA

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ABSTRACT

This paper describes three new species of marine interstitial macrodasyid gastrotricha collected from the intertidal sands on Orissa coast (Bay of Bengal). They are, *Cephalodasys caudatus* n. sp., *Turbanella indica* n. sp., and *Tetranchyroderma littoralis* n. sp.

INTRODUCTION

Our knowledge of the marine interstitial Gastrotricha inhabiting the intertidal sands on Orissa coast is restricted to the earlier work by Rao (1969). During a short subsequent survey of the interstitial meiofauna carried out by the present author on Orissa coast in winter 1977, more species of the Gastrotricha were encountered in the sand collections. The present paper describes three of these gastrotrichs discovered new to science.

SYSTEMATIC ACCOUNT

Order : MACRODASYIDA

Family : LEPIDODASYIDAE Remane, 1927

Genus : *Cephalodasys* Remane, 1926

Cephalodasys caudatus n. sp. (Fig. 1)

DESCRIPTION

Adult specimens reach a length of 700–800 μm and a maximum width of 80–90 μm depending on the state of contraction. Body transparent, elongated and dorsoventrally flattened. Head distinct, about 80 μm long and delineated from trunk by means of ventrolateral grooves. Short sensory hairs 5–8 μm in length occur on the margin of head. Body slightly tapers posteriorly and ends in a medial process clearly demarcated from trunk region by means of ventrolateral grooves; it is about

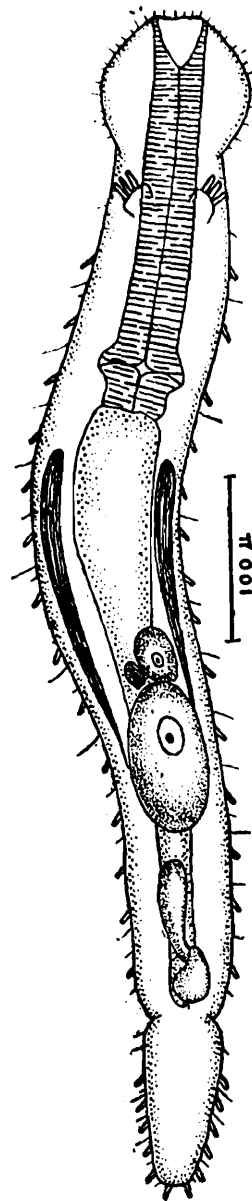


Fig. 1. *Cephalodasys caudatus* n. sp. Adult, dorsal view, showing anterior adhesive tubes on ventral surface.

100 μm long and 45 μm in maximum width. Cuticle thin, finely granular and without dorsal epidermal glands, papillae, scales, spines, etc. Body bears numerous lateral sensory hairs 10—20 μm long. Ventral ciliation is entire, but more dense on the ventrolateral region.

Three pairs of anterior adhesive tubes about 12 μm in length occur just behind neck constriction and borne on extensible feet.

Twelve to 15 pairs of lateral adhesive tubes about 12 μm in length present; they are nearly even spaced and located along the second posterior half of pharyngeal and the intestinal regions. Dorsal adhesive tubes absent. Five to six pairs of posterior adhesive tubes about 12 μm in length occur distributed along the lateral and posterior borders of the posterior end; half of these tubes arranged on either side of midline, but merge indistinguishably around the tail lobe.

Mouth is 25—30 μm wide, terminal, slightly inclined to ventral surface and surrounded by a corona of short sensory hairs about 5 μm in length. Buccal cavity small and nearly conical. Pharynx is about 220 μm long and occupies about 1/3 of the total gut length. Conspicuous pharyngeal pores occur close to the posterior end of pharynx. Intestine is about 440 μm long, granular and divisible into a broad anterior region and a narrower posterior region. Anus subterminal and located on the ventral surface at the beginning of the tail lobe.

Reproductive system follows the usual pattern. Testes paired and located laterally along the anterior part of intestine. Vasa deferentia converge behind the posterior egg cells and the male pore located medioventrally close and anterior to anus. Penis absent. Ovary unpaired and dorsal, with 2—3 egg

cells located about halfway of the intestinal region. An elongated seminal receptacle about 70 μm long present behind the ovary. A pear-shaped copulatory bursa about 35 μm long occurs close to anus.

Holotype: Specimen 720 μm long, with gonads, collected by the author on 21 January, 1977. Deposited with the Zoological Survey of India, Calcutta. Regd. No. P 3029/1.

Type locality: Coarse and medium sand, 10 cm below surface between low and half-tide levels of intertidal zone, Puri Beach (Lat. 19°48'06" N and Long. 85°51'14" E), Orissa, India.

Remarks: Hitherto, seven species are known assigned to the genus *Cephalodasys* Remane (see Hummon, 1974 a). These are, *C. maximus* Remane (1926), *C. turbanelloides* (Boaden, 1960), *C. cambriensis* (Boaden, 1963a), *C. palavensis* Fize (1963), *C. littoralis* Renaud—Debyser (1964), *C. minicerus* Hummon (1974b) and *C. pacificus* Schmidt (1974). Of these species, *C. caudatus* n. sp. approaches *C. turbanelloides* in general organization of body. But, the new species clearly differs from the latter and all the other species of the genus in the shape of tail lobe, number and disposition of adhesive tubes and the structure of genital apparatus.

Diagnostic features: Body up to 800 μm long, 90 μm wide, transparent and dorsoventrally flattened. Head distinct. Hind end ends in a median process. Anterior paired feet on ventral surface with 3 adhesive tubes each. Lateral adhesive tubes 12—15 pairs. Tail lobe with 10—12 posterior adhesive tubes. Mouth terminal. Cuticle thin and granular; dorsal armament absent. Ventral ciliation more dense on ventrolateral region. Pharynx/total gut length about 1/3. Conspi-

cuous pharyngeal pores at posterior end of pharynx. Testes paired. Unpaired dorsal ovary. Elongated seminal receptacle and pear-shaped copulatory bursa present.

Family : TURBANELLIDAE Remane, 1925

Genus : *Turbanella* Schultze, 1853

Turbanella indica n. sp. (Fig. 2)

DESCRIPTION

Adult specimens reach a length of 320—360 μm and a maximum width of 50—55 μm . Body is transparent, elongated, strap-shaped, widest in middle region and slightly tapers towards the posterior end. Head distinct, short and somewhat triangular in outline with lateral protuberances. It measures about 35 μm in length and 55 μm in width between the posterolateral corners. Posterior end bilobed as usual and separated with deep cleft; each lobe reaches about 30 μm in length. A median anal cone is absent between the two caudal lobes. Cuticle thin and without dorsal armament as spines, scales etc. Numerous small epidermal glands about 2 μm in size present, the lateral ones being more numerous than the dorsal ones. Head bears numerous marginal cilia 4—5 μm in length; they occur in a longer bunch attaining about 15—20 μm at the tip of lateral protuberances. Lateral sensory hairs 8—10 μm in length occur along the trunk region and are free from ventrolateral adhesive tubes. Ventral ciliation is somewhat sparse and arranged in two longitudinal bands.

Anterior adhesive tubes occur on two typical extensible ventrolateral feet; each foot bears 3—4 tubes reaching about 6 μm in length. Eight to 10 pairs of ventrolateral adhesive tubes 6—8 μm in length occur in a single longitudinal row and are nearly even

spaced along the trunk. The tubes start behind the ventral feet nearly halfway along the pharyngeal region; they lack sensory hairs at their tips seen in some other species of the genus. Dorsal adhesive tubes not seen. There are 5 posterior adhesive tubes on the inner edge of each tail lobe; the tubes progressively increase in length towards the outermost tube and measure about 6—12 μm

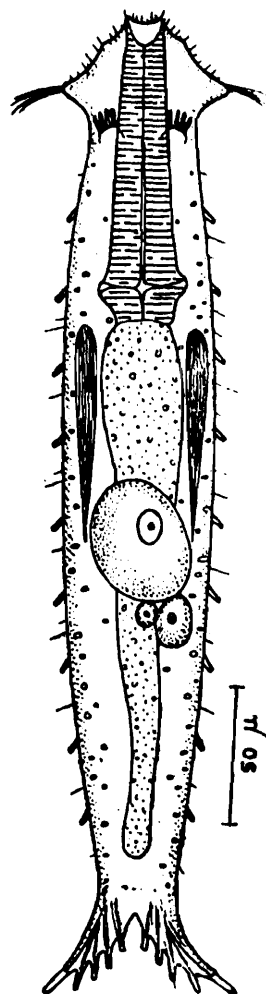


Fig. 2. *Turbanella indica* n. sp. Adult, dorsal view, showing anterior adhesive tubes on ventral surface.

in length. No adhesive tubes occur on the outer edge of the caudal lobes.

Mouth is terminal, 12 μm wide and encircled by a corona of short sensory setae 3 μm in length. Buccal cavity small and cup-shaped. Pharynx is about 100 μm long and occupies

about a third of the total gut length. Pharyngeal pores conspicuous at the posterior end of pharynx. Intestine is granular and vacuolated; it is about 200 μm long and divisible into a broad anterior region and a narrower posterior region. Anus subterminal and opens on the ventral surface in front of the caudal lobes about 20 μm from the posterior border.

Genital system follows the usual pattern. Paired testes extend lateral to the anterior part of intestine. Male pore not seen. Eggs occur about the middle part of intestine and attain about 45 μm in maximum diameter. Protonephridia not seen.

Holotype : Specimen 350 μm long, with gonads, collected by the author on 31 January, 1977. Deposited with the Zoological Survey of India, Calcutta. Regd. No. P. 3030/1.

Type locality : Medium sand, 20 cm below surface, half-tide level, intertidal zone, Gopalpur Beach (Lat. 19°15'28" N and Long. 84°55'14" E), Orissa, India.

Remarks : Of the 18 species of *Turbanella* Schultze hitherto known (see Schmidt, 1974), *T. indica* n. sp. approaches the group of species as *T. bocqueti* Kaplan (1958) and *T. veneziana* Schrom (1972) in the reduction of adhesive tubes. However, the new species clearly differs from both the species in other details. It differs from *T. bocqueti* in the shape of head and tail lobes and the structure and number of adhesive tubes. *T. indica* differs from *T. veneziana* in the shape of body, possession of lateral cephalic protuberances, absence of a median anal cone and the number of adhesive tubes.

Diagnostic features : Shape of body typical of the genus. Body up to 360 μm long and

55 μm wide. Head distinct with lateral protuberances. Posterior end bilobed and deeply cleft. Median anal cone absent. Anterior adhesive tubes 3—4 pairs, ventrolateral adhesive tubes 8—10 pairs and posterior adhesive tubes 5 pairs. Dorsal adhesive tubes absent. Dorsolateral epidermal glands small and numerous. Ventral ciliation in two longitudinal bands. Pharynx occupies 1/3 of total gut length. Conspicuous pharyngeal pores at posterior end of pharynx.

Family : THAUMASTODERMATIDAE Remane, 1926

Genus : *Tetranchyoderma* Remane, 1926

Tetranchyoderma littoralis n. sp. (Fig. 3)

DESCRIPTION

The specimens attain a total length of 320–360 μm and a maximum width of 70–85 μm , depending on the state of contraction. Body elongated, contractile, dorsoventrally flattened and slightly tapers towards both the ends. Head distinct. Both the head and tail are bluntly rounded. Head without pestle organs and tentacles, but bears dorsally two flagelliform hairs about 40 μm in length on its anterolateral corners. Body has a complete dorsal covering of 4-pronged cuticular hooks or tetrancres. The hooks have prongs of equal size and measure about 3 μm in the anterior region and 5–8 μm in middle and posterior regions. There are about 60 transverse rows of tetrancres, each row consisting 15–20 hooks. As in other species, cuticular hooks are absent or sparse in the narrow strip of anterior region on head. Two rows of small and numerous dorsolateral epidermal glands present; they are about 15–18 pairs on each side, attaining about 3–5 μm in diameter. Dorsal glands absent. Ventral surface has a complete and uniform covering of cilia,

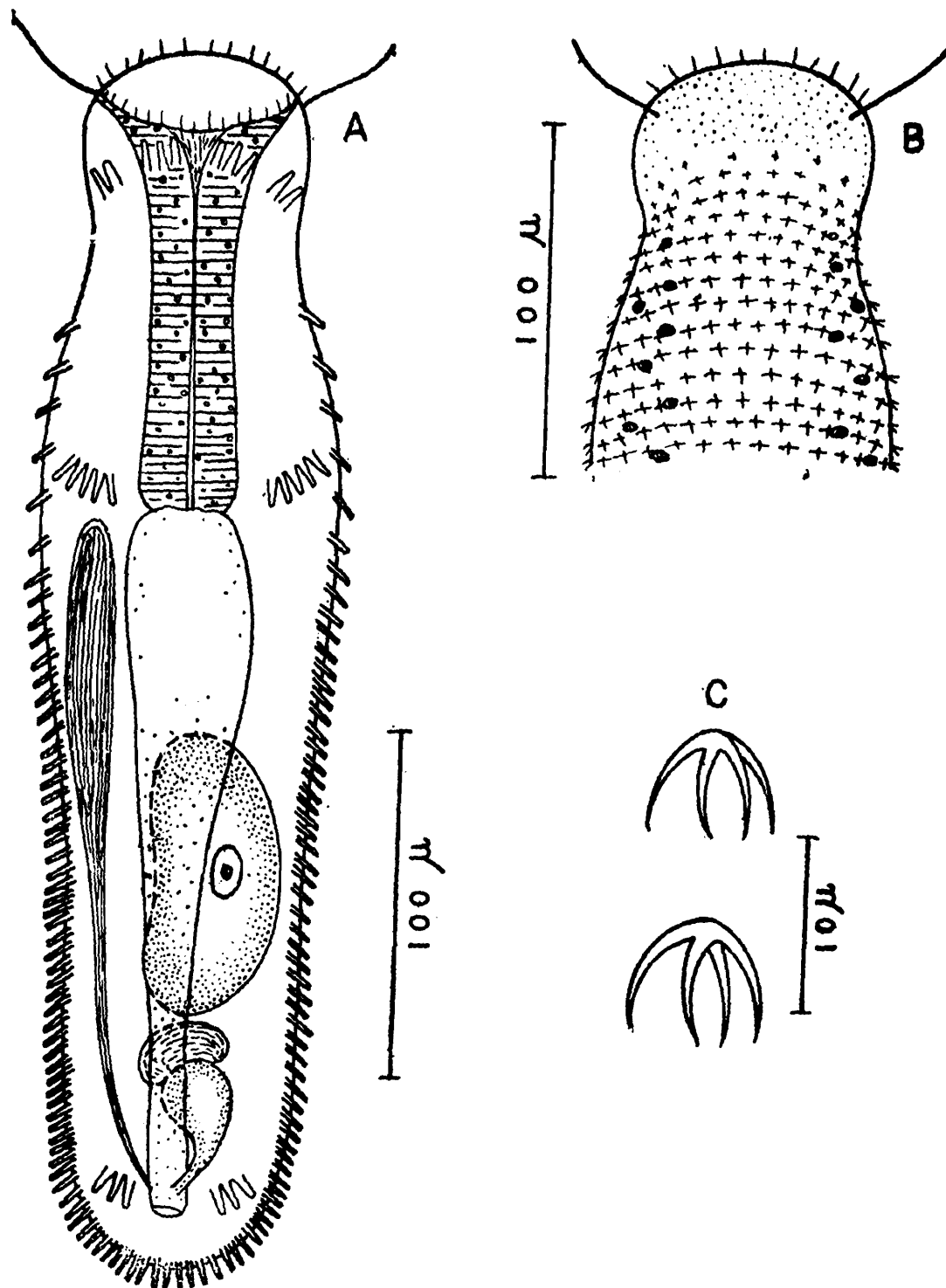


Fig. 3. *Tetranchyoderma littoralis* n. sp. A. adult, ventral view ; B. anterior region, dorsal view ; C. Two cuticular hooks or tetrancres.

Short sensory hairs 5—12 μm in length occur along the anterior margin of head and lateral sides of body.

Anterior adhesive organ consists of 5 tubes

on either side, arranged in an arc on the ventral surface just behind mouth. They occur in two groups, three being ventral and two ventrolateral in position. The tubes

attain 6—8 μm in length. Fifty to 60 pairs of ventrolateral and posterior adhesive tubes 5—8 μm in length occur in a single row. The tubes start at the level about halfway of the pharynx; they are somewhat sparse anteriorly and more numerous towards the posterior end. The ventrolateral and posterior adhesive tubes merge around the posterior border and are indistinguishable. Lateral and dorsal adhesive tubes, cirri and posterior pedicles seen in some other species of the genus are absent. In addition to the anterior, ventrolateral and posterior adhesive tubes, two pairs of ventral feet resembling those reported for *T. coeliopodium* Boaden (1963 b) and *T. thysanogaster* Boaden (1965), are present. The more anterior feet are located at the level lateral to the posterior end of pharynx, while the posterior ones occur lateral to anus. The anterior foot bears 5 adhesive tubes about 8 μm in length, while the posterior one has 3 tubes 6—8 μm in length. The tubes are directly borne on ventral body surface.

Mouth is about 50 μm wide, quite extensible, terminal, inclined to ventral surface and encircled by a corona of sensory setae about 3 μm in length. Pharynx, intestine and gonads follow the usual pattern. Pharynx is about 110 μm long and occupies nearly 1/3 of the total gut length. Pharyngeal pores inconspicuous at the posterior end of pharynx. The unpaired right testis extends up to the level of the posterior end of pharynx. One dorsal ovum about 80 \times 35 μm in size situated nearly halfway along intestinal region, observed. A reniform seminal receptacle 28 \times 12 μm in size and a pitcher-shaped granular copulatory bursa with stalk reaching about 45 μm in length, present. Both the genital pores open on the ventral surface close and adjacent to anus. Protonephridia not seen.

Holotype : Specimen 330 μm long, with gonads, collected by the author on 21 January, 1977. Deposited with the Zoological Survey of India, Calcutta. Regd. No. P 3031/1.

Type locality : Medium sand, 10 cm below surface between low and half-tide levels of the intertidal zone, Puri Beach (Lat. 19°48' 60" N and Long. 85°51'14" E), Orissa, India.

Remarks : Hitherto, the genus *Tetranchyroderma* Remane included 24 species. Of these species, *T. littoralis* n. sp. appears closely related to *T. apus* Remane (1927) in the shape and structure of body, particularly the disposition of adhesive tubes and the absence of posterior pedicles. But, the new species clearly differs from the latter in the absence of head tentacles, presence of tetrancres and the number of adhesive tubes. *T. littoralis* is distinguished from all other known species of its genus by the presence of two pairs of additional ventral feet, each with 5 and 3 adhesive tubes, respectively.

Diagnostic features : Body up to 360 μm long and 85 μm wide, with both the ends rounded. Cuticular armament of tetrancres present. Fifteen to 18 pairs of small dorsolateral epidermal glands present. Head tentacles and pestle organs absent. Five pairs of anterior adhesive tubes present. Fifty to 60 pairs of ventrolateral and posterior adhesive tubes merge indistinguishably at posterior end. Dorsal and lateral adhesive tubes and posterior pedicles absent. Two pairs of additional ventral feet with 5 and 3 adhesive tubes present. Pharynx about 110 μm long. Reniform seminal receptacle and pear-shaped copulatory bursa present.

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