

RRST-Zoology

Observation of *Hypotrichidium tetranucleatum* sp.nov. (Ciliophora: Strichotrichida) from Aurangabad, M.S., India

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Article Info	Abstract
Article History <i>Received</i> : 27-01-2011 <i>Revised</i> : 20-03-2011 <i>Accepted</i> : 20-03-2011	A new species <i>Hypotrichidium tetranucleatum</i> sp.nov. is observed belonging to the genus <i>Hypotrichidium</i> from the fresh water body in Aurangabad, Maharashtra, India. This is the free living form of ciliate protozoa found in water. The new species is characterized by elongate body shape with Adoral zone of membranelle running one-third the body length, four macronuclei, four micronuclei and one contractile vacuole located at the posterior left of the body.
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Introduction

Protozoa are single celled eukaryotic organisms found in aquatic and terrestrial environments. Protozoa are most abundant organism on the earth [12]. They occur in trophic or encysted states in virtually any kind of habitat which is temporarily wet [10]. They are found everywhere, as long as there is water or moisture. They can be found in stagnant water, ponds, river, lakes, oceans and damp soil. In aquatic ecosystem, protozoa are important components of food chain [13]. They are consumed by the larger organisms and are good source of protein minerals for aquatic organisms [2]. Protozoa are grazers of bacteria increasing mineralization and making nutrients more available to other organism [12]. Some species of protozoa are used as preliminary indicators identifying character and quality of water resources [3]. *Hypotrichidium tetranucleatum* sp.nov. first time reported from the Aurangabad region.

Materials and Methods

The water samples were collected from various water bodies. Care should be taken that water must be collected along with submerged plants, decaying leaves or any other detritus material. Most of the samples were collected in morning time as the temperature affects the abundance of protozoa and they found more abundant at low temperature.

These samples were brought to laboratory and examined under the microscope for the further study and observation. Water samples were observed directly by taking a water drop on a slide and it was covered with coverslip so that water cannot be dry.

Protozoa are usually swim rapidly in water and hence unable to identify. To immobilize those, 10% methyl cellulose was added to the water drop on slide. This slows the

movement of organism without immediate death or bursting. Smears are fixed in Schaudinn's fixative and stained with haematoxyline stain.

DESCRIPTION OF THE GENUS HYPOTRICHIDUM:

This genus *Hypotrichidium* belongs to class Spirotrichea, order Strichotrichida. In individuals of this class, body cilia are usually sparse, buccal ciliature is conspicuous with adoral zone typically composed of many membranelles, winding clockwise to cytostome. This genus is a member of family Spirofilidae, in these individuals ventral cirri are inconspicuous and in quite numerous and/or helically spiraled rows. Adoral zone of membranelles is not highly prominent.

The members of this genus have elongate and flattened body. Strong cilia or cirri are restricted to the ventral surface. It has rounded anterior end and pointed posterior end.

The peristome is large with well developed adoral zone. Peristome extends one-half the body length. Two ventral rows and marginal rows of cirri are present which are spirally arranged. AZM extends one-half the body length with a large undulating membrane.

Two macronuclei and two micronuclei are present. Contractile vacuole is present at the anterior left region of the body. It is commonly found in fresh water [6].

The genus *Hypotrichidium* has only one species *H. conicum* (Ilowaisky, 1921).

Description of the species (Fig 1):

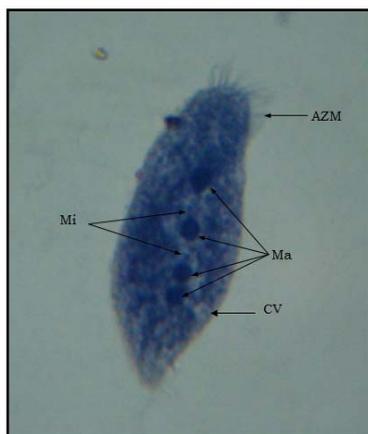


Fig1: *Hypotrichidium tetranucleatum* sp.nov. showing four spherical macronuclei (Ma), micronuclei (Mi), AZM (Adoral zone of membranelle) and contractile vacuole (CV).

Body of this organism is elongate and measured 78µ to 105µ in length and 32µ to 44µ in width. Anterior end is broadly rounded while posterior end is narrow and pointed.

Peristome is large and has an undulating membrane. AZM is well developed and extends one-third the body length. There are two rows of ventral cirri and two rows of marginal cirri which are spirally arranged.

There are four macronuclei present in a longitudinal row which are spherical to ovoid in shape. Four spherical micronuclei are observed, each is present near the macronucleus.

Present author collected this species from fresh water.

Results and Discussion

This genus *Hypotrichidium* is first reported by Ilowaisky, 1921. According to Kudo (1946), this genus belongs to order – Hypotrichida and the members of this order are as a rule, flattened and strong cilia or cirri are restricted to the ventral surface. The peristome is very large with well developed adoral zone. This order includes a family – Oxytrichidae. The members of this family have well developed adoral zone, cirri

on ventral surface. In some individuals ventrals are reduced while in other cirri are present in rows with right and left marginals. This family has the genus – *Hypotrichidium* and genus – *Kerona*. Body shape of the present species matches with these two genus.

Genus *Kerona* has only one species *Kerona polyporum* in which peristome is without undulating membrane and there are six oblique rows of cirri are present but in present species peristome has undulating membrane and two ventral and two marginal cirri are present and hence it separates from genus *Kerona*.

Present species has undulating membrane and two rows of ventral cirri and two rows of marginal cirri and hence close to genus *Hypotrichidium* which also possesses undulating membrane and two rows of ventral and two rows of marginal cirri. Present author therefore compared this species with the species of genus *Hypotrichidium* which has only one species, *H. conicum*.

The broadly rounded anterior end and pointed posterior end of the body matches to *H. conicum* which also has broad anterior end and pointed at the posterior end, but the present species was found more elongate than the *H. conicum*, which is somewhat broader than the present species.

In *H. conicum*, two ovoid macronuclei are located just below the AZM and are arranged obliquely, running parallel to the left margin. Present author observed four spherical macronuclei which are centrally placed in a longitudinal row and hence present species differs from *H. conicum*.

In the present species there are four, spherical micronuclei are seen, each of them located close to each macronucleus. *H. conicum* has two micronuclei and hence present species distinguishes from previous species.

H. conicum bears a contractile vacuole located at the anterior left region below the AZM but in present case the contractile vacuole found to be located at the posterior-left part between the posterior most macronucleus and the left margin. This position of the contractile vacuole separates the present species from *H. conicum*.

The AZM in present species extends up to one-third the body length and hence distinguishes from *H. conicum* in which AZM extends to one-half the body length.

The body dimensions of the present species also observed smaller than that of previously described species (Table 1).

Table 1: Comparison of the present species with the species of genus *Hypotrichidium*.

Particulars	<i>H. conicum</i> Ilowaisky, 1921	Present species <i>Hypotrichidium tetranucleatum</i> sp.nov.
Body shape	Broad, reniform, Anterior end-broadly rounded, posterior end- pointed	Elongate, reniform, Anterior end-broadly rounded, posterior end- pointed
Body dimensions	90µ-150µ long	78µ-105µ by 32µ-44µ
AZM	½ the body length	1/3 the body length
Macronuclei	2, ovoid	4, spherical
Micronuclei	2	4, spherical
Contractile vacuole	1, anterior left	1, posterior left
Habitat	Fresh water	Fresh water

AZM- Adoral zone of membranelle

Conclusion

After the comparison and discussion of the present species with the previous species, it is found that the elongate body, number and location of macronuclei and micronuclei, position of the contractile vacuole, length of AZM and body dimensions separates this species from the *H. conicum* and hence it is considered new to science and designated here as *Hypotrichidium tetranucleatum* sp.nov.

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