

A NEW SPECIES *OXYTRICHA SUSHEELUM* N. SP. (CILIOPHORA: SPORADOTRICHIDA) FROM FRESHWATER IN AURANGABAD.

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ABSTRACT

A new species of free living ciliated protozoa, *Oxytricha susheelum* was recorded from fresh water in Aurangabad, Maharashtra, India. Body shape of *O. susheelum* n.sp. is ellipsoid with broad posterior and narrow anterior end. Two large, ovoid macronuclei and Adoral zone of membranelle running one half of the body length and presence of four to five contractile vacuoles are the distinguishing characters, separating this species from previously described species.

KEY WORDS: Ciliate, Freshwater, *Oxytricha*, Protozoa.

INTRODUCTION

Protozoa are microscopic organisms. A great diversity of forms is known, they are abundant in aquatic environments and are responsible for consumption and control of bacteria and other microorganism (Finlay, 1997). Protozoan communities could be useful in monitoring the levels of organic pollution in fresh waters (Kolkwitz and Marsson, 1909). Protist excretions are an important source of remineralized nutrients, and of colloidal and dissolved trace materials such as iron, in aquatic systems (Sherr *et al.*, 2002). The most common species of genus *Oxytricha* are *O. fallax*, *O. bifaria*, *O. ludibunda*, *O. setigera*, and *O. lanceolata*, which are members of the order Sporadotrichida. All of these species have been found in fresh water only. We report here a previously undescribed species *Oxytricha susheelum* n.sp. of genus *Oxytricha*.

MATERIAL AND METHODS

Water samples were collected in plastic bottles and brought to the laboratory. These samples were then examined under the microscope for further study directly by taking the water drop on a slide which was covered with a cover slip to prevent the drop from drying. Protozoa usually swim rapidly in water and hence are difficult to identify. To immobilize, 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

The genus *Oxytricha* is first time reported by Bory, 1825. It is a member of class *Spirotrichea* (Butschli, 1887). In the ciliates of this class cytostome is deep in some and shallow in others. Body is ciliated in some groups but nearly devoid of cilia in others. This genus belongs to family *Oxytrichidae* and individuals of this family has well developed adoral zone and has cilia or cirri on ventral surface but in some species ventral cirri are reduced while in others, cirri in rows. The organisms of genus *Oxytricha* have right and left marginals. The organisms of genus *Oxytricha* have ellipsoid and flexible body. Ventral surface is flattened and dorsal surface is convex. They have 8 frontals, 5 ventrals, 5 anals and short caudals. Marginals may or may not be continuous along posterior body border. Macronucleus is usually in two parts but rarely single or in four parts. These ciliates are usually found in fresh or salt water.

Description of the species

Present species was collected from fresh water. It is broadly ellipsoid in shape. Anterior end is narrower than the posterior end. Posterior end is broadly rounded. Body measures 63.56 μ to 83.99 μ in length and 31.78 μ to 36.32 μ in width. Adoral zone of membranelle (AZM) extends to one-half the body length. Dorsal surface is convex and ventral surface is flattened. 8 frontals, 5 ventrals, 5 anals and short caudals are present. Marginal cirri are confluent at the posterior end. Two large, ovoid macronuclei and 4-5 small, spherical contractile vacuoles were seen in the posterior half of the body.

Systematic position:

Domain: Eukaryota

Kingdom: Protozoa Goldfuss, 1818, Rown, 1858

Subkingdom: Biciliata

Infrakingdom: Alveolata Cavalier and Smith, 1991

Phylum: Ciliophora Doflein, 1901, Copeland, 1956

Subphylum: Intramacronucleata Lynn, 1996

Class: Spirotrichea Butschli, 1889

Subclass: Stichotrichia Small and Lynn, 1985

Order Sporadotrichida Fauré-Fremiet, 1961
Family: Oxytrichidae Ehrenberg, 1838
Subfamily Oxytrichinae Jankowski
Genus: *Oxytricha* Bory de Saint-Vincent., 1824
Species: *O. susheelum* n.sp.

RESULTS AND DISCUSSION

Body of present species is short ellipsoid and has short caudal cilia and marginal cirri are confluent posteriorly and hence it is a member of genus *Oxytricha*. The results are shown in Table-1. This genus is first reported by Ehrenberg, 1830. Later many other workers; Ehrenberg (1838), Stein (1859), Stokes (1887, 1891), Shibuya (1930), Kudo (1966), Bick (1972) and Shaikh (2006) reported different species of genus *Oxytricha* from fresh water.

Present authors reported this species from fresh water which has broadly ellipsoid body and hence differs from all previously described species of the genus *Oxytricha*. In present species anterior end is narrow and posterior end is broadly rounded and hence found close to *O. fallax* which also has broadly round posterior end region but present species differs from *O. fallax* as it is more elongate than the present species. In *O. bifaria* right side is convex and left side is flattened and has pointed posterior end but in present species both sides are convex and broad posterior end and hence it also separates from *O. bifaria*. It also differs from *O. setigera*, *O. ludibunda* and *O. lanceolata* (Shaikh, 2006), as in these species, both the ends are similarly rounded.

Table 1. Comparison of present species with the previously described species of the genus *Oxytricha*.

| particulars | <i>O. fallax</i> Stein, 1859 | <i>O. bifaria</i> Stokes, 1887 | <i>O. ludibunda</i> Stokes, 1891 | <i>O. setigera</i> Stokes, 1891 | <i>O. lanceolata</i> Shibuya, 1930 Shaikh, 2006 | <i>O. susheelum</i> n.sp. (Present species) |
|----------------------------|--|-----------------------------------|-------------------------------------|--|---|---|
| Body shape | Ellipsoid, posterior end broadly rounded | Ellipsoid, posterior end pointed | Ellipsoid, Both ends rounded | Elongate, ellipsoid, Both ends rounded | Elongate, oval, Both ends rounded | Ellipsoid, broad, posterior end broadly rounded, anterior end narrow. |
| Body dimension | 250µ long | 100µ long | 50µ long | 125µ long | 75-120µ long | 63.56-83.99µ by 31.78-36.32µ |
| Macronuclei | 2, ovoid | 2, ovoid | 2, ovoid | 2, ovoid | 2, oval | 2, large ovoid |
| AZM | 1/3 body length | 1/3 body length | 1/3 body length | 1/3 body length | -- | 1/2 body length |
| Cirri | 8F, 5V, 5A | 8F, 5V, 5A | 8F, 5V, 5A | 5F, 5V, 5A | 5F, 5V, 3A | 8F, 5V, 5A |
| Contractile vacuole | 1, spherical | 1, spherical | absent | 1, spherical | 1, spherical | 4-5, spherical |
| Habitat | Fresh water | Fresh water | Fresh water | Fresh water | Fresh water | Fresh water |

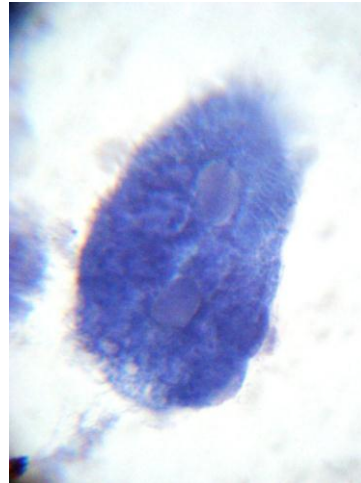
AZM - Adoral zone of membranelle

Cirri: F- Frontals; V-Ventrals; A-Anals

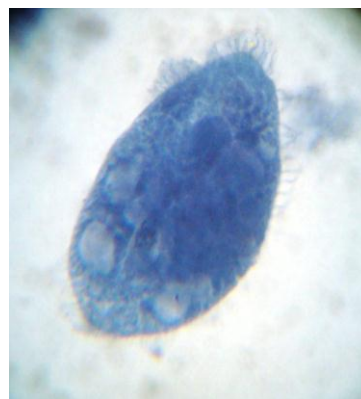
In present species AZM extends up to one-half the body length and separates from all the species of genus *Oxytricha*, in which AZM extends up to one-third the body length.

Present species has 8 frontals, 5 ventrals, 5 anals and short caudals are present and hence similar to *O. fallax*, *O. bifaria*, *O. ludibunda* but differs from *O. setigera* in which there are only 5 frontals present and 5 ventrals are shifted anteriorly. Bick (1972) also reported 8 frontals, 5 ventrals and 5 transversals in *O. fallax*. He also recorded that left marginal cirri meet as a continuous row posteriorly, he referred the anals as transversals.

There are two large ovoid macronuclei observed in present species. Shape of macronuclei in present species is similar to all the species of genus *Oxytricha* but size of these macronuclei in ratio of body size is larger than all species of the genus *Oxytricha* as they all have smaller macronuclei in comparison with present species. Present author observed small to large spherical contractile vacuoles which are 4-5 in number and hence differs from all the species of genus *Oxytricha* in which *O. fallax*, *O. bifaria*, *O. setigera* have one spherical contractile vacuole near the left margin while in *O. ludibunda* there is no contractile vacuole. Bick (1972) reported one contractile vacuole near to the left margin in the vicinity of the posterior end of the buccal area in *O. fallax*. Present species also separates from *O. lanceolata* (Shaikh, 2006), in which she recorded single contractile vacuole near the peristome. After the comparison and discussion of the present species with all the species of genus *Oxytricha* described earlier, it is found to be different from all these species in body dimension, body shape, number and position of contractile vacuoles and size of macronuclei and hence it is considered new to science and designated here as *Oxytricha susheelum* n.sp.



(A)



(B)

Figure 1. *Oxytricha susheelum* n.sp.: Stained with haematoxyline stain

- A-** Showing two large ovoid macronuclei; AZM running one-half the body length.
B- Showing contractile vacuoles in the posterior half of the body.

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