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PJBS

ISSN 1028-8880

**Pakistan
Journal of Biological Sciences**

ANSI*net*

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***Trichodina gulshae* sp. n. (Ciliophora : Trichodinidae) from the Gangetic
Mystus, *Mystus cavasius* (Hamilton-Buchanan, 1822) (Bagridae) in Chittagong**

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Abstract: A new species of *Trichodina* is described from the gills of an estuarine fish, *Mystus cavasius* (Hamilton-Buchanan, 1822) at Sadarghat area of the Karnaphuli River in Chittagong between January-December, 2001. The described trichodinid species is characterized by having a large body; robust and sickle-shaped blade with blunt tangent point, conical apex and notch at the anterior margin; robust and wide-triangular central part; strongly developed straight, but anteriorly slanted ray having parallel borders and distinct central groove; and lightly stained dark central area. Approximately 14.9% of the host fishes (10 out of 67) were infected with this ciliate on their gills during March-June, 2001. The variation is recorded and discussed. The species is probably more closely related to *Trichodina matsu*.

Key words: Trichodinid, Ciliophora, Trichodinidae, *Trichodina gulshae*, Bangladesh

INTRODUCTION

Members of the family Trichodinidae are best known as ectoparasites of fish with most of the species reported from freshwater environments (Basson and Van As, 1994). The genus *Trichodina* Ehrenberg, 1830 is the largest of this family. Over 150 species have been described from fish by Klein's silver impregnation. Despite this, very little attention has been paid to the ciliates of the genus *Trichodina* from Bangladeshi fishes and is infrequently studied. The existing data on this matter can only be found in Asmat *et al.* (1997, 2003a, b, c) and Bhoyuain *et al.* (1999). During the present survey on the species diversity of the trichodinid ciliates from some freshwater and estuarine fishes of Chittagong between January and December, 2001, a new species of *Trichodina*, parasitising the gills of *Mystus cavasius*, a predominantly estuarine fish, was found and is described here. This is the second report of any new species of *Trichodina* from Bangladesh.

MATERIALS AND METHODS

The host fishes were collected by fishing nets from the Karnaphuli River in the Sadarghat area of Chittagong District between January to December 2001. Gill scrapings were made at the riverside. Air-dried gill scrapings were transported to the laboratory. The slides with trichodinid ciliates were impregnated with Klein's dry silver impregnation technique (Klein, 1958). Examinations of prepared slides were made under research microscope at x100 magnification. Measurements were done following the recommendations of Lom (1958), Wellborn (1967),

Arthur and Lom (1984) and Van As and Basson (1989, 1992). For comprehensive morphological details of the ciliates numerous photomicrographs were made. The level of infestation was presented as low (1-5 ciliate slide⁻¹), medium (6-10 ciliate slide⁻¹) and high (more than 10 ciliates slide⁻¹). Measurements are given in μm . The results and photographs were compared to results from other studies.

RESULTS AND DISCUSSION

Host. *Mystus cavasius* (Hamilton-Buchanan, 1822). (Siluriformes: Bagridae). Locality. Karnaphuli River at Sadarghat area in Chittagong. Location. Gills. Prevalence. $\frac{10}{67}$ (14.9%); March-June, 2001. Infestation. Low to medium.

Description (n = 20)

Body: Large-sized trichodinid, cup-shaped, diameter 50.0-85.5 (65.5 \pm 8.5)
Border membrane: 3.1-7.6 (6.4 \pm 1.0) wide, finely striated.
Adhesive disc: Concave, 43.9-71.4 (56.6 \pm 7.3) in diameter.
Centre of adhesive disc: granular with lightly stained central area, 10.2-23.5 (18.8 \pm 3.9) in diameter.
Denticulate ring: 28.6-45.9 (35.5 \pm 4.1) in diameter.
Number of denticles: 21-28 (24.6 \pm 1.5).
Number of radial pins per denticle: 7-13 (9.8 \pm 1.9).
Dimensions of denticle: span, 13.8-19.9 (16.9 \pm 1.7); length, 6.1-11.2 (9.0 \pm 1.2).
Dimensions of denticle components: Length of ray 5.1-7.6 (6.3 \pm 0.8), of blade 5.1-8.2 (6.8 \pm 0.9); width of central part 3.1-5.1 (3.8 \pm 0.7).
Adoral ciliary spiral: about 400°.

Denticle morphology: The blade of denticle is broad and sickle-shaped, occupying the entire space between y-axes (Fig. 5A-B) and with moderate to narrow interblade space. The distal margin of blade, lying away from the border membrane, is rounded with sharp curve to the anterior margin (Fig. 1-4). The distal margin is higher than the tangent point. The tangent point is blunt. The anterior margin sharply curves down, extending to and slightly beyond the y+1 axis. The apex is angular with distinct apical depression that never impregnates. The anterior blade apophysis is strongly developed, as a result, the lower border of apex appears to be notched. The posterior margin curves to form a deep and elongated semilunar curve with deepest point at the same level as apex. The blade connection is strong, but in most cases, little thinner than the ray connection. The posterior blade apophysis is sometimes distinctly visible.

The central part of denticle is robust, wide triangular, tapering towards bluntly rounded point and fitting tightly into the corresponding denticle, extending to slightly more than halfway towards the y-1 axis. The shape of section above and below the x-axis is similar. The indentation in lower central part is sometimes prominent.

The ray connection is short, strong and broad. The ray is strongly developed with prominent central groove,

parallel borders, ending in rounded tip and slightly shorter than the blade. The orientation of ray is variable.

Typically, the ray is straight and slightly slanted in anterior direction, so that the tip of ray extends to the y+1 axis.

Intraspecific variability: Typically, the central part is robust wide triangular, but in some individuals become rectangularly triangular, fits firmly with each other, forming a rounded, continuous cylinder. These variations could be found in the same sub-populations of this ciliate.

Type Host: *Mystus cavasius* (Hamilton-Buchanan, 1822) [Siluriformes: Bagridae].

Type Locality: Karnaphuli River (22°18'N 91°53'E) at Sadarghat area in Chittagong, Bangladesh.

Type Location: Gills.

Type Materials: Holotype, slide MC 1 (14. 4. 2001); paratypes, slide MC 2 (14. 4. 2001) and MC 3 (5. 5. 2001) are in the collection of the Department of Zoology, University of Chittagong, Chittagong 4331, Bangladesh.

Etymology: Named after the local common name of *Mystus cavasius* as Gulsha.

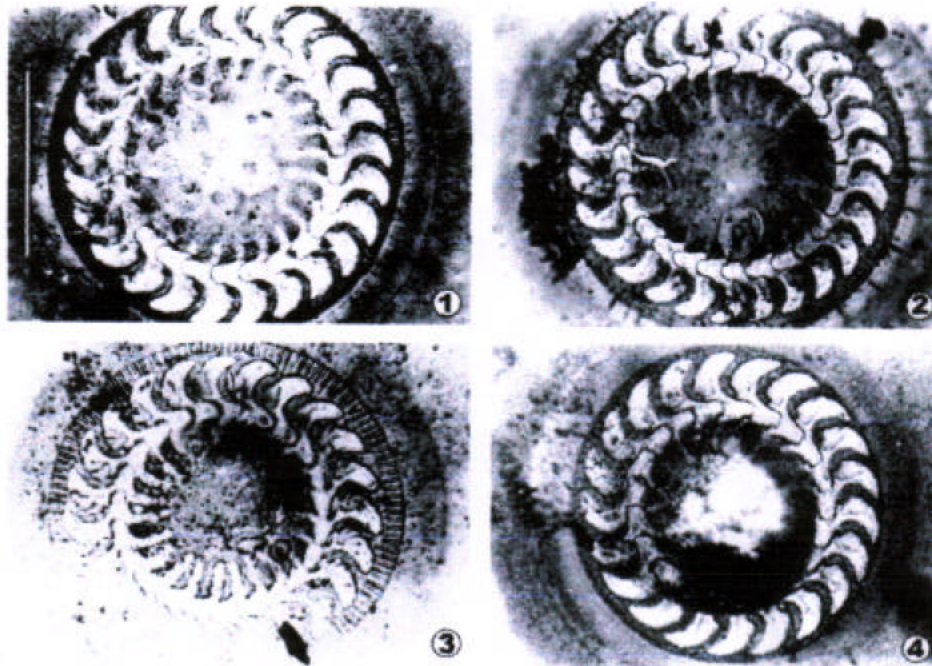


Fig. 1-4: Photomicrographs of silver impregnated adhesive discs of *Trichodina gulshae* sp. n. from *Mystus cavasius* in the Karnaphulli River. Scale bar-30 μ M

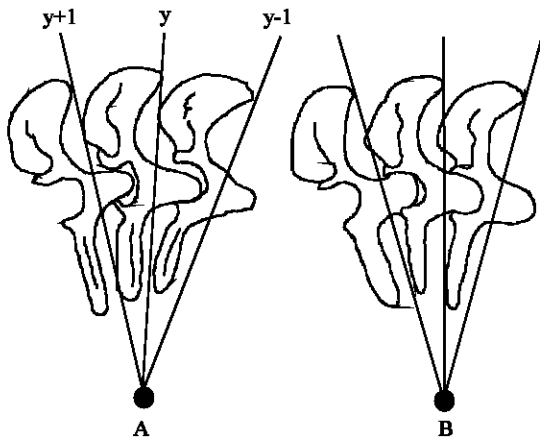


Fig. 5A-B: Diagrammatic drawings of the denticles of *Trichodina gulshae* sp. n.

The described trichodinid species is unique among the mobiline ciliates in having a large body; robust and sickle-shaped blade with blunt tangent point, conical apex and notch at the anterior margin; robust and wide-triangular central part; strongly developed straight, but anteriorly slanted ray having parallel borders and distinct central groove; and lightly stained dark central area. At first sight the silver impregnated adhesive disc of the present species resembles to some extent *Trichodina matsu* Basson and Van As (1994).

Basson and Van As (1994) described *T. matsu* from the gills of *Crossostoma lacustre* and from the gills, fins and skin of *Leiocassis adiposalis* from the confluence of Nankang and Peikang River in Taiwan.

T. matsu showed some similarity with the described species. However, it can clearly be distinguished from *T. matsu* in many aspects. For example, in *T. matsu*, the distal margin of blade in some specimens flat and truncated, parallel to border membrane (vs distal margin is difficult to distinguish, almost always rounded); the anterior blade apophysis is not prominent (vs prominent, so base of anterior margin appears to be notched); the posterior margin forms triangular curve with deepest point at lower than apex (vs forms deep semilunar curve with deepest point at same level as apex); the blade connection is thin (vs thick); the posterior blade apophysis is not visible (vs visible, sometimes distinct); the central part is well-developed, but delicate, tapers to sharp point (vs robust, rectangularly-triangular, tapers to rounded point); the section of the central part above the x-axis sloping sharply downwards, while section below almost parallel to x axis (vs upper and lower sections similar in

shape); the ray is thin, directed slightly in posterior direction (vs thick, slanted in anterior direction); the centre of the adhesive disc is dark-stained (vs light-stained); and the body size is medium (vs large size).

ACKNOWLEDGMENTS

The work was carried out in the Department of Zoology, University of Chittagong. The authors are grateful to Dr. Nurul Anwar, Professor of Microbiology, University of Chittagong for helping in photomicrography.

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