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***Trichodina sylhetensis* sp. n. (Ciliophora: Trichodinidae) from the Mud Perch,
Nandus nandus (Hamilton-Buchanan, 1822) (Nandidae) in Sylhet**

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Abstract: In the present article one new species of *Trichodina* Ehrenberg, 1830, named *T. sylhetensis* sp. n., is described from a freshwater fish, *Nandus nandus* (Hamilton-Buchanan, 1822) (Nandidae) in the Tanguar Haor of Sylhet. It is distinguished by having medium body dimensions; slim, rectangularly-angular blade with slightly curved distal margin and blunt tangent point; bluntly rounded, slender central part having no indentation and posterior blade apophysis; broad ray with equal thickness and bluntly rounded tip; and dark-stained centre of the adhesive disc. The general morphology of the silver impregnated adhesive disc of *T. sylhetensis* is probably more closely related to *T. uniforma* and *T. kwando*.

Key words: Trichodind, Ciliophora, Trichodinidae, *Trichodina sylhetensis*, Bangladesh

INTRODUCTION

Representatives of the family Trichodinidae parasitize or are symbionts of a broad spectrum of aquatic invertebrate and vertebrate hosts (Van As and Basson, 1989). Trichodinid infections on fish are common in many zoogeographical regions. Among these, the genus *Trichodina* Ehrenberg, 1830 is the largest of this family. Over 150 species have been described from fishes by Klein's silver impregnation. In Bangladesh, very little attention has been paid to the ciliates of this genus. The existing data on this matter can only be found in Asmat *et al.* (1997, 2003a, b, c) and Bhoyain *et al.* (1999). During the present survey on the species diversity of the trichodinid ciliates from some freshwater fishes of Sylhet division between January and December, 2002, a new species of *Trichodina*, parasitising the gills of *Nandus nandus*, a freshwater fish, was found and is described here.

MATERIALS AND METHODS

The host fishes (6.35-11.4 cm x 6.0-15.0 gm) were collected by fishing nets from the Tanguar Haor in Sunamganj district of Sylhet division between January to December 2002. Gill scrapings were made at the haor side. 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. *Nandus nandus* (Hamilton-Buchanan, 1822) (Nandidae). Locality. Tanguar Haor, Sylhet. Location. Gills. Prevalence. $\frac{45}{60}$ (75.0%); throughout the year, mainly November-February, 2002. Infection. Medium-high.

Description (n=20)

Body: Medium-sized trichodinid, cup-shaped, diameter 31.0-45.8 (36.5 \pm 3.1).
Adhesive disc: Concave, 25.0-38.0 (29.0 \pm 2.9) in diameter.
Denticulate ring: 16.0-25.0 (19.6 \pm 2.1) in diameter.
Centre of adhesive disc: granular with faintly stained central area, 8.0-14 (10.2 \pm 1.6) in diameter.
Border membrane: 3.0-4.5 (3.9 \pm 0.3) wide, finely striated.
Number of denticles: 23-24 (23.8 \pm 0.4).
Number of radial pins per denticle: 5-6 (5.8 \pm 0.4).
Dimensions of denticle: span, 8.3-12.0 (9.2 \pm 0.9); length, 3.0-4.5 (3.7 \pm 0.5).
Dimensions of denticle components: Length of ray 3.2-6.5 (4.3 \pm 0.8), of blade 3.0-4.5 (3.8 \pm 0.5); width of central part 1.5-2 (1.8 \pm 0.2).
Adoral ciliary spiral: 390-395°.

Denticle morphology: The blade is narrow, rectangularly-angular and fills most of space between the y and y+1 axis

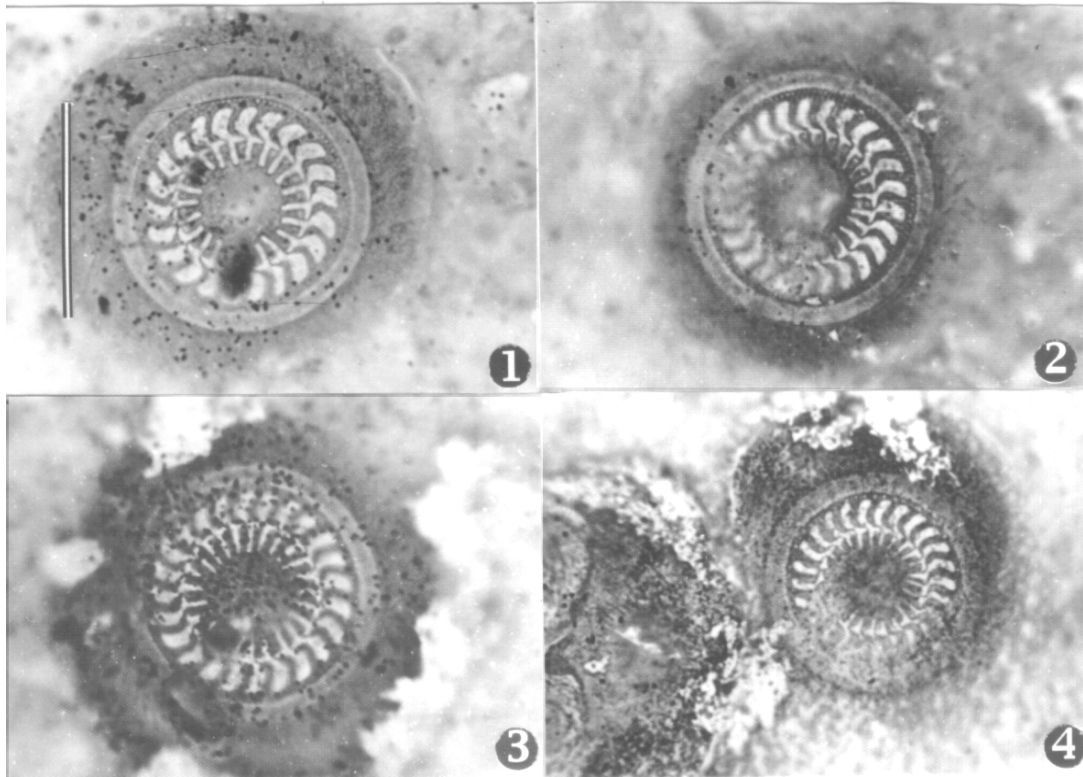


Fig. 1-4: Photomicrographs of silver impregnated adhesive discs of *Trichodina sylhetensis* sp. n. from *Nandus nandus* in the Tanguar Haor of Sylhet. Scale bar-30 μ m

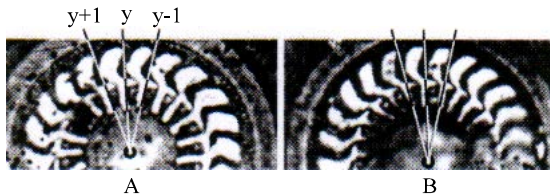


Fig. 5A-B: Denticles of *Trichodina sylhetensis* sp.n. with y-axis

(Fig. 5A-B). The distal margin is slightly curved or angular, lying closely associated with the border membrane. The tangent to the y axis is flat and sometimes forms a small line rather than point and situated slightly below the distal margin. The anterior margin slopes sharply downwards and sometimes bears indentation at the mid-length of the margin. The apex is angular, formed at the middle of the blade, lies apart from the central part of the preceding denticle and sometimes touches the y+1 axis (Fig. 5A). The apical depression is not prominent. The anterior blade apophysis is not visible. The posterior margin forms a shallow, elongated crescent with deepest point at the same level as apex. The blade connection is thick.

The central part is delicate with rounded point which rarely extends slightly more than halfway to the y-1 axis and fitted firmly with the following denticle. The shape of the section above and that of the below x axis is similar. The posterior blade apophysis and indentation in the lower central part is absent. The y axis passes through the middle or nearly tip of the central part.

The tip of the ray rarely extends beyond the y-1 axis. The ray connection is short, broad and almost similar to the blade connection. The ray is slightly shorter than the blade, broad, straight with equal thickness throughout and rounded blunt point. The central groove is not distinct. The ray, although straight, is slightly anteriorly slanted, but remains parallel to the y axis. The y axis passes through the anterior margin of the ray. The ray apophysis is not visible.

Intra specific variability: The specimens from all the examined hosts show very small range of variability in the denticle morphology. In typical denticle, the anterior margin of the blade slopes sharply downwards having no indentation. In some specimens, this margin bears a slight indentation along the mid-length of the blade resulting a notched outline.

The described species may be characterized by having medium body dimensions; slim, rectangular-angular blade with slightly curved distal margin and blunt tangent point; bluntly rounded, slender central part having no indentation and posterior blade apophysis; broad ray with equal thickness and bluntly rounded tip; and dark-stained centre of the adhesive disc (Fig. 1-4). In terms of the general morphology of the silver impregnated adhesive disc the present trichodinid shows some resemblance to *Trichodina uniforma* Van As and Basson, 1989 and *T. kwando* Van As and Basson, 1992.

Trichodina uniforma was described by Van As and Basson (1989) from the skin, fins and gills of *Carassius auratus* from Falls Fish Farm in the Komati River System, Eastern Transvaal of South Africa. At first sight the denticle morphology of the described trichodinid appears similar to *T. uniforma*. In both the species, the blade shape is almost rectangular-angular with apex at the base of the blade and the adhesive disc stains uniformly in silver impregnated specimens. However, the present species can clearly be distinguished from *T. uniforma* using a number of characters. In *T. uniforma*, the blade is broad (*vs* narrow), the distal margin is truncated (*vs* slightly curved); the apex of the anterior margin of the blade extends beyond the y+1 axis (*vs* rarely touches this line) and lies lower than the deepest point of the posterior margin's curve (*vs* the same level as the apex), the apical depression is well developed (*vs* absent); the central part is robust with rounded point, extending halfway past the y-1 axis (*vs* slender central part with pointed end which rarely extends halfway past the y- axis); small indentation on the proximal side of the central part (*vs* absent); the ray is thin, tapering slightly to sharp rounded point (*vs* thick with bluntly rounded tip), the ray is slightly posteriorly curved and directed in the anterior direction, so that the tip extends beyond the y-1 axis (*vs* straight, anteriorly slanted ray and the tip rarely extends beyond the y-1 axis).

Van As and Basson (1992) described *Trichodina kwando* from the skin, fins and gills of host fish, *Brycinus lateralis* and from the gills of *Micralestes acutidens* from the open waters of the Zambesi River System at Katima Mulilo in South Africa. The presently described species was found on the gills of the host fish *Nandus nandus*. The two species are very similar in the general appearance of the blade shape. However, *Trichodina sylhetensis* sp. n. can be distinguished from *T. kwando* in many respects, e.g., In *T. kwando*, the blade is almost straight with broad head, flat distal surface and having no apex (*vs* slightly angular and of uniform thickness with slightly curved or angular distal margin and an angular apex at the base of the blade, close to the central part of the preceding

denticle); the blade fills almost the entire space between the y axis (*vs* the blade although occupy the greater portion of the y axis, but never fills the entire space); the anterior margin is almost parallel to the y+1 axis (*vs* the anterior margin of the blade forms angular line with the y+1 axis); the blade apophysis is prominent in some specimens and the blade connection is thin (*vs* having no blade apophysis, but with thick blade connection); the central part is thicker than the blade connection and extends more than halfway to the y-1 axis (*vs*, the central part is delicate, not thicker than the blade connection and rarely extends halfway to the y-1 axis).

Type Host: *Nandus nandus* (Hamilton-Buchanan, 1822) (Perciformes: Nandidae)
Type Locality: Tanguar Haor at Sunamganj (25.04 N 91.26 E) in Sylhet Division, Bangladesh.
Type Location: Gills
Type Materials: Holotype, slide NN-1 (20. 11. 2002); paratypes, slide NN-2 (20. 11. 2002), NN-3 (06. 03. 2002) and NN-4 (06. 03. 2002) are in the collection of the Department of Zoology, University of Chittagong, Chittagong 4331, Bangladesh.
Etymology: Named after one of the division of Bangladesh, named Sylhet from where this ciliate was collected.

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