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NEW RECORDS OF PHYTOPLANKTON FOR BANGLADESH. 6. *LEPOCINCLIS* PERTY, *STROMBOMONAS* DEFL., *ASTASIA* DUJARDIN, *MENOIDIUM* PERTY

MONIRUZZAMAN KHONDKER[1], RAUF AHMED BHUIYAN, JENAT YEASMIN, MUNIRUL ALAM[2], R. BRADLEY SACK[3], ANWAR HUQ[4] AND RITA R. COLWELL[3,4,5]

Department of Botany, University of Dhaka, Dhaka 1000, Bangladesh

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Abstract

The paper deals with a systematic account of 17 euglenoid phytoplakton. Of these, seven taxa belong to *Lepocinclis* and seven to *Strombomonas*. The other three taxa are *Astasia cylindrica* Pringsheim, *A. pygmaea* Skuja and *Menoidium tremulum* Skv. The taxa are reported from some pond ecosystems located in Pirojpur and Barisal districts of Bangladesh.

Introduction

The euglenoid genera *Lepocinclis* and *Strombomonas* are represented worldwide by 40 and 42 species, respectively; whereas, *Astasia* and *Menoidium* have 32 and 16 species, respectively (Huber-Pestalozzi 1955). In Bangladesh, Islam and Alfasane (2003) have reported 10 taxa of *Lepocinclis* and 6 taxa of *Strombomonas*. The genus *Astasia* has been represented by two taxa in Bangladesh (Islam and Aziz 1979). The occurrence of the genus *Menoidium* is new for Bangladesh.

A total of 17 taxa of euglenoid phytoplankton have been worked out in the present investigation and found to be new reports for Bangladesh. The taxa were found to occur in the plankton samples collected from different pond ecosystems of Mathbaria of Pirojpur district and Bakerganj of Barisal district. New reports of phytoplankton for Bangladesh from the same locality have also been published elsewhere (Khondker *et al*. 2006, 2007a, b, c, d, 2008).

Materials and Methods

Samples studied were collected via a plankton net (20 µm mesh) and sedimentation technique using Lugol's iodine. The collection was made from 1-8 and 1-6 permanent stations of Bakerganj (Barisal district) and Mathbaria (Pirojpur district), respectively, in between 2004 and 2006. Details of the sampling procedure and descriptions of the sites have been published in Khondker *et al*. (2006).

[1]Corresponding author. E-mail: khondker56@yahoo.com [2]International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, Bangladesh. [3]Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA. [4]Centre of Marine Biotechnology, University of Maryland Biotechnology Institute, Baltimore, Maryland, USA. [5]University of Maryland Institute for Advanced Computer Studies, College Park, Maryland, USA.

Taxonomic enumeration

The present paper deals with 17 taxa of the family Euglenaceae which were identified from the pelagic plankton communities of different ponds of Mathbaria and Bakerganj. An illustrated account of these species together with each of their taxonomic features have been elaborated here. The species are alphabetized under the genera.

Division: Euglenophyta; Class: Euglenophyceae; Order: Euglenales
Family: Euglenaceae

1. **Lepocinclis cylindrica** Conrad var. **minor** Chu (**Pl. 1, Fig. 3**)
(Yamagishi and Kanetsuna 1990, 42, 1:13-14)

Cells solitary, cylindrical to ovoid. Anterior end rounded, posterior end bears a nipple like cauda. Periplast soft. Cells 13-18 µm long, 6-9 µm broad. Flagellum 15 µm long.

Note: Cell dimension as quoted in Yamagishi and Kanetsuna (1990) fits very well with the present material. However, the spiral striation of periplast and 2 rings of paramylon body could not be recognized in the present material while taking photomicrographs. These are also not visible in the photomicrographs as presented in Yamagishi and Kanetsuna (1990). The taxon has been tentatively put under *L. cylindrica* var. *minor*.

Bakerganj, Station No. 2, 15.06.2004, Station No. 1, 01.11.2004.

2. **Lepocinclis ovum** (Ehrenb.) Lemm. var. **bütschlii** Conr. [Syn.: *L. bütschlii* Lemm.]
(Huber-Pestalozzi 1955, 150, 29: 149a) (**Pl. 1, Fig. 4**)

Cells broadly ovoid or ellipsoidal with deeply coloured membrane. Anterior end broadly rounded, posterior end with a short, blunt, caudus. Body surface covered with spirally coiled striations. Cells 30 µm long, 19 µm broad. Chloroplasts discoid, many. Paramylon two on each side, elongated ring like or roundish, big.

Mathbaria, Station No. 4, 27.09.2004.

3. **Lepocinclis ovum** (Ehrenb.) Lemm. var. **dimidio-minor** Defl. (**Pl. 1, Figs 5a, b**)
(Huber-Pestalozzi 1955, 151, 30: 151-152)

Cells regularly elliptical to ovoid, anterior rounded, posterior a short, blunt, straight, caudus. Cells smaller than the type, 17-18 µm long, 11-12 µm broad. Flagellum opening exactly apical, flagellum more than body length, 26 µm long.

Bakerganj, Station No. 2, 15.06.2004, Station No. 4, 16.08.2004.

4. **Lepocinclis ovum** (Ehrenb.) Lemm. var. **major** (Huber-Pestal.) Conr. [Syn.: *L. bütschlii* Lemm. var. *major* Huber-Pestal.] (**Pl. 1, Fig. 6**)

(Huber-Pestalozzi 1955, 152, 30: 155)

Cells broadly ovoid, apical end papillate, posterior end with a moderately long, clear, pointed caudal process. Cells 37 µm long, 25 µm broad. Flagellum not seen.

Bakerganj, Station No. 1, 06.09.2004.

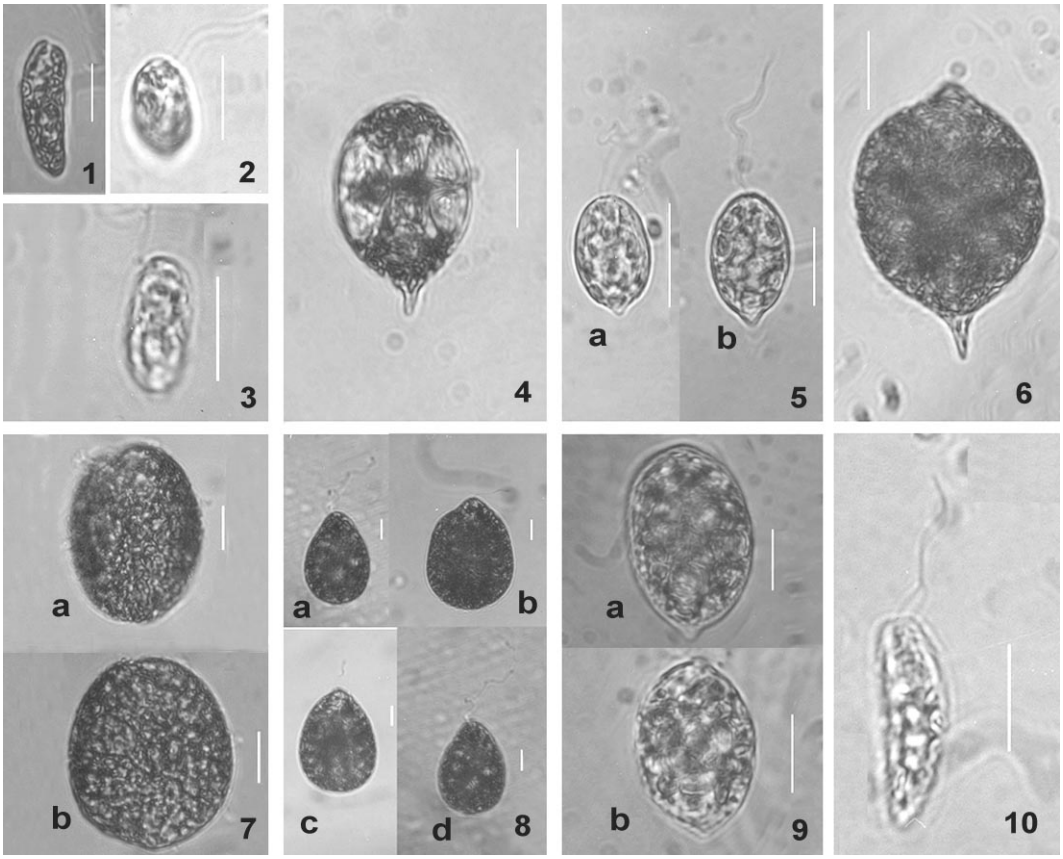

Plate 1

Figs 1-10. 1. *Astasia cylindrica*, 2. *A. pygmaea*, 3. *Lepocinclis cylindrica* var. *minor*, 4. *L. ovum* var. *bütschlii*, 5a, b. *L. ovum* var. *dimidio-minor*, 6. *L. ovum* var. *major*, 7a, b. *L. texta*, 8a-d. *L. salina*, 9a, b. *L. teres* fa. *parvula*, 10. *Menoidium tremulum.* (Bars = 10 µm)

5. **Lepocinclis salina** Fritsch [Syn.: *L. texta* var. *minor* Roll., *L. texta* var. *minor* Hub.-Pest., "*L. texta*" auct.] (**Pl. 1, Figs 8a-d**)

(Huber-Pestalozzi 1955, 157, 32: 173; Ling and Tyler 2000, 79, 37: 11)

Cells ellipsoid to ovoid, anterior end comparatively narrowed than posterior. Mouth meaningfully ex-central. Posterior end broadly rounded, no caudus. Periplast spirally

striated. Chloroplasts discoid, many. Flagellum 10.6-40.0 µm long. Paramylon round, grains, never ring like. Cells 31-38 µm long, 23-31 µm broad.

Bakerganj, Station No. 3, 06.09.2004; Mathbaria, Station No. 3, 16.08.2004, Station No. 4, 30.08.2004.

6. **Lepocinclis teres** (Schmitz) Francé fa. **parvula** Conr. (**Pl. 1, Figs 9a, b**)

(Huber-Pestalozzi 1955, 153, 31: 161)

Cells ovoid or pear-shaped, anterior end broadly rounded, posterior end gradually drawn to a conical shape. Periplast finely striated. Flagellum longer than body length. Paramylon discoid or ring like. Cells 25-36 µm long, 17-23 µm broad. The caudus is not so long drawn as the type.

Bakerganj, Station No. 4, 12.07.2004.

7. **Lepocinclis texta** (Duj.) Lemm. emend. Conrad [Syn.: *Crumenula texta* Duj., *E. texta* (Duj.) Hübner, *Lepocinclis obtusa* Francè, *L. texta* var. *minor* Woronichin.]

(Huber-Pestalozzi 1955, 142, 27: 127) (**Pl. 1, Figs 7a, b**)

Cells elliptic to ovoid, posterior end broadly rounded, anterior end with a central groove. Periplast striated. Chloroplast discoid, round or angled. Paramylon never in rings rather roundish bodies, elliptical to ovoid, present in very high numbers. Cells 51 µm long, 38-46 µm broad.

Note: The size and shape of the present specimen fits well with the type, but the cell content was so densely packed that neither the internal structure nor the striations were visible. Regarding this, Huber-Pestalozzi (1955) stated that the cells and cysts of the species are so densely packed with paramylon bodies that without pretreatment of the cells with KOH it is hardly possible to study the fine structures.

Mathbaria, Station No. 1, 13.09.2004.

8. **Strombomonas fluviatilis** (Lemm.) Defl. [Syn.: *Trachelomonas fluviatilis* Lemm.]

(Huber-Pestalozzi 1955, 378, 78: 815; Dillard 2000, 72, 13: 5). (**Pl. 2, Figs 1a, b**)

Lorica elongate ellipsoid to broadly fusiform, colourless to pale yellow brownish. Anterior end with a short neck but wide mouth, posterior gradually tapered to a pointed end. Lorica 28-30 µm long, 10-12 µm broad, wall roughened. Flagellum 13 µm long, mouth 8 µm broad. Protoplast 15-22 µm long, 8-10 µm broad.

Mathbaria, Station No. 1, 16.08.2004, Station No. 2, 19.07.2004, Station No. 3, 21.06.2004.

Note: Islam and Irfanullah (2005) reported *St. fluviatilis* as a variety of the type species.

9. **Strombomonas girardiana** (Playf.) Defl. [Syn.: *Trachelomonas girardiana* Playf., *T. urceolata* Stokes var. *girardiana* Playf.] (**Pl. 2, Figs 2a, b**)

(Huber-Pestalozzi 1955, 375, 78: 805; Dillard 2000, 72, 13: 2; Ling and Tyler 2000, 83, 38: 3-4)

Lorica subhexagonal, yellow to dark brown. Lateral margin with median groove and humps. Anterior end narrowed to a long neck, 6 µm long, 8-10 µm broad. Posterior end pointed to a long caudus, 15 µm long. Lorica 47 µm long, 24 µm broad, wall rough with large warts.

Mathbaria, Station No. 2, 19.07.2004.

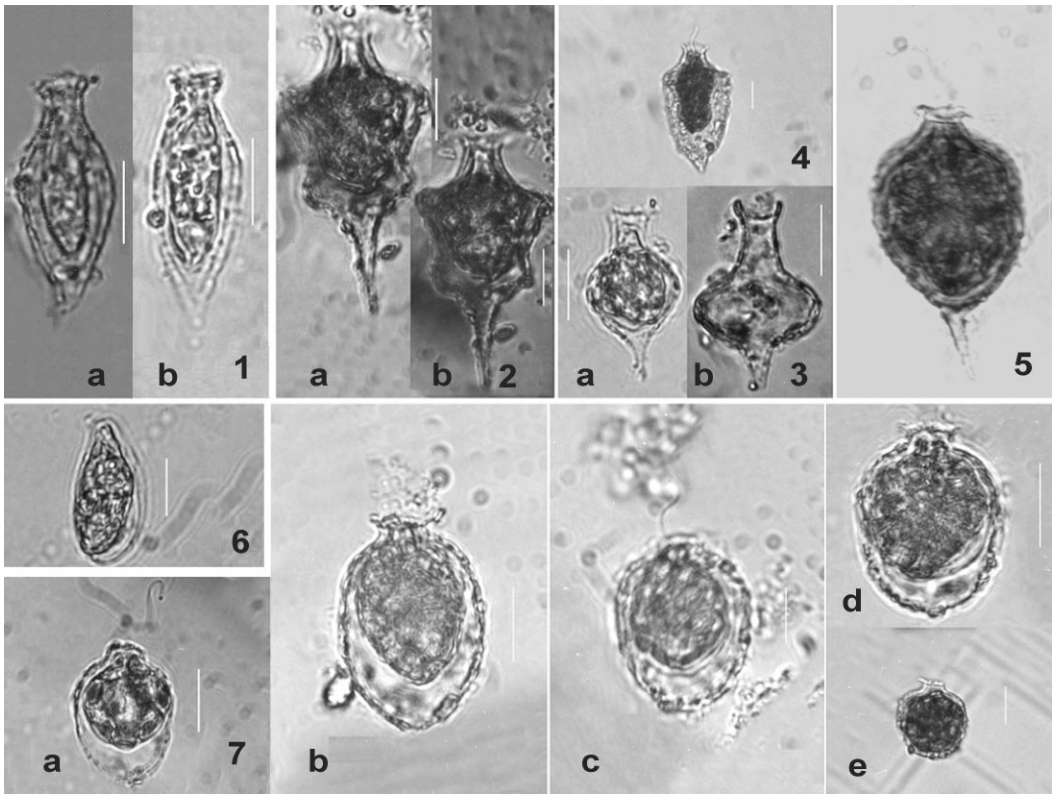

Plate 2

Figs 1-7. 1a, b. *Strombomonas fluviatilis*, 2a, b. *S. girardiana*, 3a, b. *S. rotunda*, 4. *S. triquetra*, 5. *S. napiformis* var. *brevicollis*, 6. *S. tuberosa*, 7a-e. *S. verrucosa* var. *borystheniensis*. (Bars = 10 µm)

10. **Strombomonas napiformis** (Playf.) Defl. var. **brevicollis** (Playf.) Defl. [Syn.: *Trachelomonas napiformis* Playf. var. *brevicollis* Playf.] **(Pl. 2, Fig. 5)**

(Huber-Pestalozzi 1955, 376, 78: 810; Ling and Tyler 2000, 83, 38: 2).

Lorica dark brown, obovate, narrowed posteriorly into a caudus. Neck short, 3 µm high, with slightly flared aperture, 8 µm broad. Caudus 12 µm long with sharp end. Lorica 40 µm long, 24 µm broad, wall roughened, warty.

Mathbaria, Station No. 3, 25.10.2004.

11. **Strombomonas rotunda** Chadef. [Syn.: *Trachelomonas gibberosa* var. *rotunda* Playf.] (**Pl. 2, Figs 3a, b**)

(Huber-Pestalozzi 1955, 380, 79: 821)

Lorica clear, top-shaped. Anterior end with a medium to long neck, which is 6-10 µm long, 5 µm broad. Middle portion of the lorica bulged out or hump-like. Posterior end with a pointed caudus, 6-8 µm long. Lorica 25-28 µm long, 15-20 µm broad, wall roughened, warty. Protoplast 10-12 µm in diameter.

Mathbaria, Station No. 2, 19.07.2004, Station No. 3, 25.10.2004.

12. **Strombomonas triquetra** (Playf.) Defl. [Syn.: *Trachelomonas triquetra* Playf.]

(Yamagishi and Kanetsuna 1991, 138, 4: 13) (**Pl. 2, Fig. 4**)

Upper part of the lorica rectangular, lower part triangular. Anterior end bears a short neck, about 10 µm long, 10 µm broad. Posterior end gradually narrowed to a short caudus. Lorica 48.3 µm long, 25.4 µm broad, wall rough, warted. Flagellum short, about 10 µm long, terminally inserted. Lorica not completely filled by protoplast. Protoplast c 30 µm long, 15 µm broad.

Note: Triangular shape of the specimen under optical section could not be confirmed in the present material. Therefore, it has been tentatively put under *S. triquetra*.

Mathbaria, Station No. 4, 04.07.2005.

13. **Strombomonas tuberosa** (Skv.) Defl. [Syn.: *Trachelomonas tuberosa* Skv.]

(Huber-Pestalozzi 1955, 367, 77: 784) (**Pl. 2, Fig. 6**)

Lorica elongated ovoid. Anterior end gradually narrowed to a truncate end, posterior end oval-shaped, wall smooth. Lorica 22 µm long, 10 µm broad. Protoplast 20 µm long, 8 µm broad, posterior end 3 µm broad.

Bakerganj, Station No. 2, 06.09.2004.

14. **Strombomonas verrucosa** (v. Daday) Defl. var. **borystheniensis** (Roll) Defl. [Syn.: *Trachelomonas borystheniensis* Roll] (**Pl. 2, Figs 7 a-e**)

(Huber-Pestalozzi 1955, 371, 77: 793; Ling and Tyler 2000, 84, 37: 14)

Lorica oval with a short, wide neck, wall thick, dark brown, bears wart like outgrowths. Posterior end slightly tapered. Lorica 23-32 µm long, 19-23 µm broad. Protoplast may fill the lorica or remain aside posteriorly from the lorica, 22 µm long, 20 µm broad. Chloroplasts many, discoid, with big diplopyrenoids. Flagellum 35 µm long, protrudes through a wide, flared, mouth. Opening of the mouth c 8 µm.

Mathbaria, Station No. 1, 03.05.2004, Station No. 2, 25.10.2004 and 12.02.2005, Station No. 4, 16.08.2004.

15. **Astasia cylindrica** Pringsheim (**Pl. 1, Fig. 1**)

(Huber-Pestalozzi 1955, 430, 87: 890)

Cells free swimming, cylindrical, anterior end slightly narrowed, posterior end rounded. Cells 28 µm long, 6 µm broad. Paramylon round or short rods, many.

Mathbaria, Station No. 2, 31.07.2004, Station No. 5, 28.02.2005.

16. **Astasia pygmaea** Skuja (**Pl. 1, Fig. 2**)

(Huber-Pestalozzi 1955, 439, 89: 910)

Cells ovoid to pear-shaped, less metabolic, anterior end narrowly rounded, posterior end suddenly narrowed, obtuse. Cells 9 µm long, 6 µm broad. Flagellum about the body length, 10 µm long.

Mathbaria, Station No. 1, 16.08.2004.

17. **Menoidium tremulum** Skv. (**Pl. 1, Fig. 10**)

(Huber-Pestalozzi 1955, 448, 91: 926)

Cells relatively small, slightly bent, cylindrical. Periplast soft, smooth. Cells 18 µm long, 6 µm broad. Flagellum about body length, here it is 11 µm long.

Mathbaria, Station No. 6, 22.06.2004.

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