

SOME FRESHWATER PHYTOPLANKTON AS NEW REPORTS AND ONE NEW FORMA FROM BANGLADESH

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Keywords: Phytoplankton; *Chlamydomonas*; *Pyramidomonas*; *Pediastrum*; *Epicystis*; *Chroomonas*.

Abstract

Eight newly recorded taxa of freshwater phytoplankton from Bangladesh have been described in the present paper. Of these, 3 species are from Cryptomonadales, 2 species from each of Volvocales and Euglenales and one species from Chromulinales. In addition one new forma of *Pediastrum duplex* Meyen var. *duplex* fa. *nagdaensis* M.A. Alfasane, M.S. Islam & M. Khondker fa. nov. (Chlorococcales) has also been described in this account.

Introduction

Recently a series of papers have been published where many taxa from different classes have been described and illustrated (Khondker *et al.*, 2007a, b, c; 2008a, b; 2009). During the present study on some recent collections from different parts of the country planktonic algae of different orders have been found to occur which, could not be recorded earlier from the areas selected or any other parts of Bangladesh. So these could be considered as new records for Bangladesh. The recorded species belonged to the genera *Chlamydomonas* and *Pyramidomonas* under Volvocales, two taxa of *Trachelomonas* under Euglenales, *Epicystis* under Chromulinales and the rest three belonged to *Chroomonas*, *Rhodomonas* and *Cryptomonas* under Cryptomonadales. *Pediastrum duplex* var. *duplex* fa. *nagdaensis* M.A. Alfasane, M.S. Islam & M. Khondker fa. nov. under Chlorococcales is described as new to science.

Materials and Methods

Samples for the present paper were collected from 4 different places in Bangladesh. One of them is Buriganga River (near to Sikdar Medical College, Hazaribagh), Dhaka metropolis. In this place, the sampling station (Station 1) is located in the mid-part of the river. The second one is a polluted ditch of village Nagda, Narayanganj. Two other sampling stations are located in two domestic ponds of Pirojpur and Barisal districts (Khondker *et al.* 2006).

Samples were obtained by sieving 100 L of sub-surface water through a plankton net having a mesh aperture of 20 µm. The concentrated plankton sample in the bucket of the plankton net were taken in a screw capped glass vial and fixed with Lugol's solution.

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Organisms were photomicrographed with the help of a Nikon Optiphot, UFX-11A microscope fitted with a Nikon FX-35WA camera, Japan.

Taxonomic enumeration

A total of eight taxa of freshwater phytoplankton have been identified as new reports for Bangladesh and one taxa has been described as new to science. The illustrated taxonomic descriptions of these taxa are given below.

Division: Chlorophyta; Class: Chlorophyceae; Order: Volvocales;

Family: Chlamydomonadaceae; Genus: Chlamydomonas

1. **Chlamydomonas pomiformis** Pascher [*Chlamydonephris pomiformis* (Pascher) H. and O. Ettl] (Fig. 1)

(Huber-Pestalozzi, 1961, 159, 28: 139; Dillard, 1989, 16, 1: 18)

Cells spherical to ellipsoidal, posterior end smoothly rounded, anterior truncated, flat, without papilla. Cells 21 μm in diameter. Flagella 2, equal, 20 μm long.

Buriganga River, Station 1, Collection no. 1-41, 20.05.2005.

Genus: Pyramidomonas

2. **Pyramidomonas quadricauda** Pascher (Fig. 4)

(Huber-Pestalozzi, 1961, 13, 3: 17)

Cells strongly metabolic, inverted, ovoid to pear shaped, anterior end rounded, posterior end provided with 4 tentacle like outgrowth. Cells 25 μm long, 16 μm broad. Flagella 4, 29 μm long.

Buriganga River, Station 1, Collection no. 1-41, 20.05.2005.

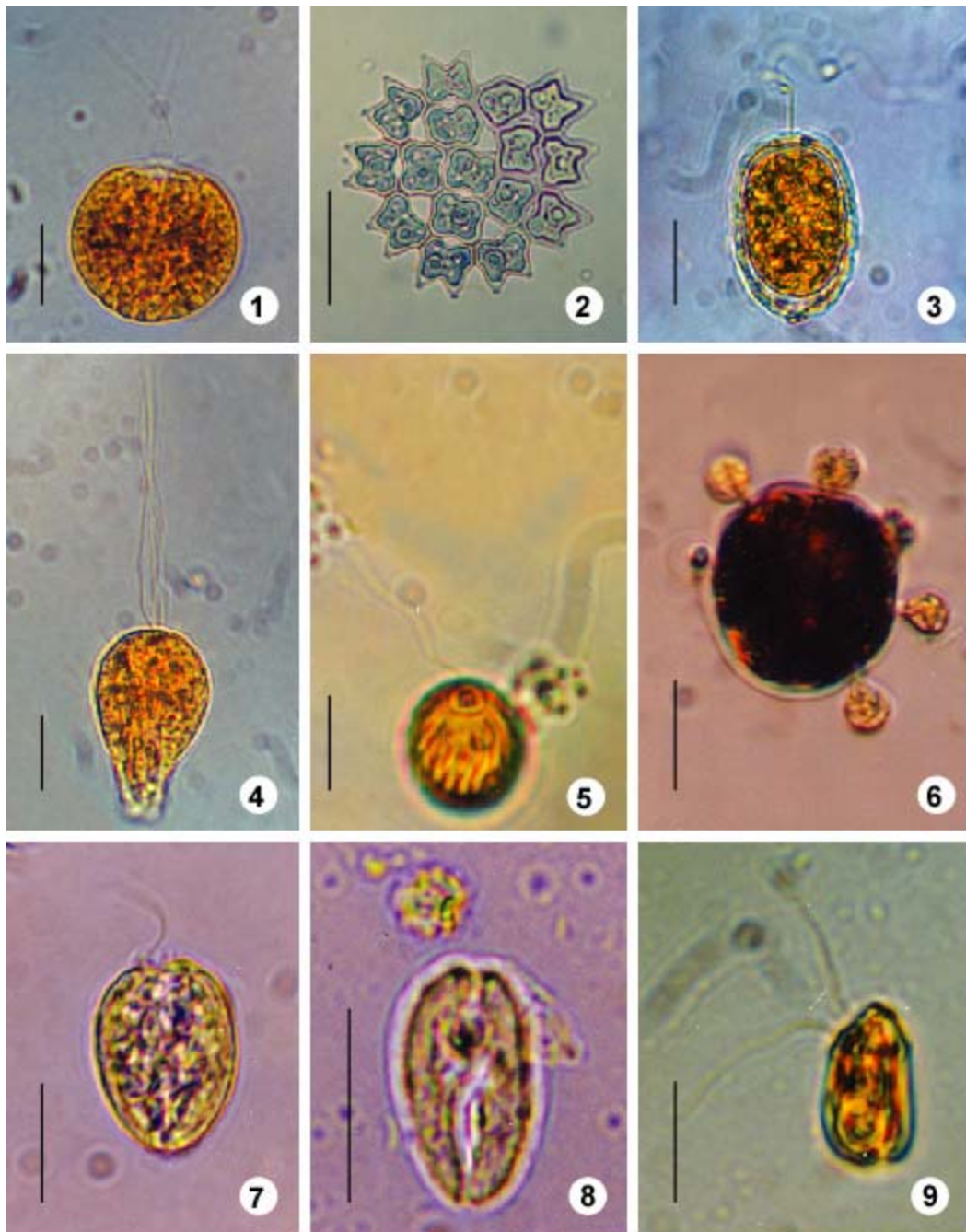
Order: Chlorococcales; Family: Hydrodictyaceae;

Genus: Pediastrum

3. **Pediastrum duplex** Meyen var. **duplex** fa. **nagdaensis** M.A. Alfasane, M.S. Islam & M. Khondker **fa. nov.** (Fig. 2)

Colonia 16 cellularis, 14.73 μm diametro, cellulae in colonia circinatim disposita. Cellulae peripheralis 3.81 μm longum, 3.56 μm latus. Cellulae centralis 2.56 μm longum, 3.07 μm latus. Distantia inter biapicem 2.56 -3.07 μm .

Colony 16-celled, 14.73 μm in diameter. Cells in the colony arranged circinally. Peripheral cells 3.81 μm long, 3.56 μm broad. Central cells 2.56 μm long, 3.07 μm broad. Distance between two tips 2.56-3.07 μm .



Figs. 1. *Chlamydomonas pomiformis* Pascher; 2. *Pediastrum duplex* var. *duplex* fa. *nagdaensis* Alfasane *et al.* fa. nov.; 3. *Trachelomonas zorensis* Lef.; 4. *Pyramidomonas quadricauda* Pascher; 5. *Trachelomonas stockesiana* var. *conradi* (Defl.) H.-P.; 6. *Epicystis peridinearum* Pascher (epiphytic on *Peridinium* cyst); 7. *Chroomonas pochmani* Huber-Pestalozzi; 8. *Rhodomonas ovalis* Nygaard; 9. *Cryptomonas alpina* Chodat. Bars = 10 μ m.

Notes: This new forma differs from the typical by being smaller in colony diameter and length-breadth ratio of central and peripheral cells. In the type, peripheral cell length 1.42 times more than breadth, in the central cells it is nearly double (Huber-Pestalozzi, 1983). In this new forma, length and breadth ratio of both peripheral and central cells are 1.07 and 0.83, respectively.

Holotype: Sample no. 7(2), 17 July 2003, Nagda, Narayanganj district, collected by Mohammed Almujaadade Alfasane, Herbarium of Phycology, Hydrobiology and Limnology Laboratory, Department of Botany, University of Dhaka, Dhaka, Bangladesh.

Type locality: The sample was collected from a polluted ditch located in the village Nagda, Narayanganj, Bangladesh, $Z_{\max} = 1.7$ m, $A = 1600$ m². The ditch receives effluents from the nearby industries.

Ecology: Pelagic plankton, water pH was 7.67.

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

Genus: Trachelomonas

4. **Trachelomonas stockesiana** var. **conradi** (Defl.) Huber-Pestalozzi [*T. rugulosa* bei Conrad, *T. conradi* Skv., *T. rugulosa* var. *conradi* Defl.] (Fig. 5)
(Huber-Pestalozzi, 1955, 265, 58: 410A)

Lorica elliptical, flagellum aperture with a thick ring. Membrane strongly rugose. Cells 14 µm long, 11.4 µm broad. Flagellum 17.8 µm long.

Bakerganj, Station No. 2, Collection no. NHEB0410042, 15.06.2004.

5. **Trachelomonas zorensis** Lef. (Fig. 3)
(Huber-Pestalozzi, 1955, 320, 69: 627b)

Lorica ellipsoidal, posterior end broadly rounded. Flagellum aperture without a collar but with ring like thickening. Cell membrane thick with fine scrobiculations, yellowish brown. Lorica 23 µm long, 14 µm broad. Flagellum about twice the length of the body.

Bakerganj, Station No. 4, Collection no. NHEB0410054, 12.07.2004.

Division: Chrysophyta; Order: Chromulinales;

Family: Chrysosphaeraceae; Genus: Epicystis

6. **Epicystis peridinearum** Pascher (Fig. 6)
(Kristiansen and Preisig, 2001, 120-121, 89).

Unicellular, solitary. Cells spherical, thin walled, epiphytic on *Peridinium* cysts, 5 µm in diameter.

Bakerganj, Station No. 4, Collection no. NHEB0510124, 27.01.2005.

**Division: Cryptophyta; Order: Cryptomonadales;
Family: Cryptomonadaceae; Genus: Chroomonas**

7. **Chroomonas pochmani** Huber-Pestalozzi (Fig. 7)

(Huber-Pestalozzi, 1968, 31, 3: 16a,b)

Unicellular, solitary, free swimming. Cells broadly oval, anterior end broadly rounded, posterior end slightly attenuated. Cells 17 μm long, median diameter 12 μm . Flagella 2, short, almost equal to body length.

Narayanganj, Station No. 5, Collection no. 5, 17.07.2003.

Genus: Cryptomonas

8. **Cryptomonas alpina** Chodat (Fig. 9)

(Huber-Pestalozzi, 1968, 66, 8: 52)

Unicellular, solitary, slipper shaped. Cells elongated, posterior end flatly rounded, anterior one slightly depressed in angle. Flagella 2, 12 μm long. Cells 13 μm long, 8 μm broad.

Mathbaria, Station No. 3, Collection no. NHEM0460053, 21.06.2004.

Genus: Rhodomonas

9. **Rhodomonas ovalis** Nygaard (Fig. 8)

(Huber-Pestalozzi, 1968, 25: 11A, c)

Unicellular, solitary, free swimming. Cells ovoid to elongated oval-cylindric, two times longer than broad. Pyrenoid single, present in anterior part. Cells 15 μm long, 8 μm broad.

Narayanganj, Station No. 5, Collection no. 5, 17.07.2003.

Acknowledgements

The research as an integral part of the major multidisciplinary project entitled 'Epidemiology and Ecology of *Vibrio cholerae* in Bangladesh' was financed by the National Institute of Health (NIH) research grant No. 1R01A13912901 under the collaborative agreement between the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) and Johns Hopkins Bloomberg School of Public Health. The authors gratefully acknowledge the NIH Ecological Surveillance Team at ICDDR,B for kindly supporting this research (i.e. collections of Bakerganj and Mathbaria). Latin diagnosis of the new forma done by Prof. Syed Hadiuzzaman, Department of Botany, University of Dhaka is also gratefully acknowledged.

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(Manuscript received on 23 December 2009; revised on 22 May 2010)