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A TAXONOMIC ACCOUNT ON THE PHYTOPLANKTON OF A POND RECEIVING TEXTILE INDUSTRIAL EFFLUENTS. II. EUGLENOPHYCEAE AND BACILLARIOPHYCEAE

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Abstract

A total of 97 phytoplanktonic algal taxa belonging to 17 genera under two classes (Euglenophyceae and Bacillariophyceae) have been recorded from a pond receiving effluents from two textile industries at Demra, Dhaka district. Five diatom species, namely *Navicula cryptocephala* Kütz., *N. decussis* Oestrup, *N. rhynchocephala* Kütz., *N. viridula* Kütz. and *Nitzschia intermedia* Hantzsch are new records for Bangladesh.

Introduction

For the assessment of water quality phytoplankton are important biological indicators and sometimes they are better than physical and chemical variables (Round, 1985). Previously, information about the physico-chemical aspects (Begum and Hossain, 1993), and impact of major and minor elements on the plankton community (Begum *et al.*, 1996) of a pond receiving textile industrial effluents have been made for the first time from Bangladesh. Recently, Begum (2008) has described the phytoplanktonic algal taxa belonging to six classes, namely Cyanophyceae, Chlorophyceae, Xanthophyceae, Chrysophyceae, Cryptophyceae and Dinophyceae from the same pond at Demra, Dhaka district. The present paper is a continuation and last part of the previous one, based on the same collections, and it includes 97 taxa under Euglenophyceae and Bacillariophyceae.

Materials and Methods

The samples were collected from a pond receiving textile industrial effluents in different seasons of 1990 and 1991. Description of sample collections, their preservation and examination, details of physical and chemical conditions of water at four stations or sampling points have been published by Begum (2008). Literature consulted for the identification of all the phytoplankton are: Islam and Khatun (1966), Islam and Haroon (1975), Islam and Aziz (1977, 1979), Islam and Chowdhury (1979), Islam and Hossain (1979), Germain (1981), Islam and Moniruzzaman (1981), Aziz and Islam (1986), Islam and Mannan (1986), Khondker *et al*. (1990), Islam *et al*. (1991), Aziz and Ara (2000), Nahar (2001), Aziz and Tanbir (2003), Islam and Alfasane (2004), and Islam and Irfanullah (2005). In the present study classification proposed by Bold and Wynne (1985) is followed.

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Taxonomic enumeration

A total of 97 taxa belonging to 17 genera under two classes are presented in this paper, most of them have been reported previously from different aquatic bodies, mostly polluted water (see references in the Materials and Methods). However, five diatom taxa are newly recorded for Bangladesh as indicated after their brief descriptions.

Class: Euglenophyceae

Order: Euglenales; Family: Euglenaceae

1. **Euglena acus** (Müller) Ehr., Abhandl. königl. Akad. der Wiss. zu Berlin 1: 1-88, pl. 6 (1830). [Syn.: *Vibrio acus* Müller (1786), *Euglena acus* var. *rigida* Hübner (1886), *E. acus* var. *minor* Hansgirg (1892)]. Cells 76-250 µm long, 5.7-14.3 µm broad. Stations: 1-4; abundant.
2. **Euglena australica** var. **claviformis** Playfair, Proc. Linn. Soc. N. S. W. 48: 223 (1923). Cells 20 µm long, 14 µm broad. Stations: 1-3; common.
3. **Euglena chlamydophora** Mainx, Arch. f. Protistenk. 60: 342, pl. 1, fig. 8 (1928). Cells 54 µm long, 17 µm broad. Stations: 1-4; common.
4. **Euglena clavata** Skuja, Symb. Bot. Upsal. 9(3): 189, pl. 22, figs 2-5 (1948). Cells 99 µm long, 16 µm broad. Stations: 2, 4; rare.
5. **Euglena deses** Ehr., Abhandl. d. Akad. d. Wiss. Berlin 1833: 248 (1834). [Syn.*: Enchelys deses* Müller (1786), *Euglena satelles* Braslavska-Spectorova (1937)]. Cells 99 µm long, 11 µm broad. Station: 2; rare.
6. **Euglena exilis** Gojdics, The Genus *Euglena*: 148, pl. 28, fig. 4 (1953). Cells 48 µm long, 11.4 µm broad. Stations: 1-3; few.
7. **Euglena flava** Dangeard, Le Botaniste 8: 180, pl. 5, figs. 53 (1902). Cells 16-44 µm long, 6.4-14.3 µm broad. Station: 3; rare.
8. **Euglena geniculata** Dujardin, Infusiones: 362 (1841). Cells 99 µm long, 15.6 µm broad. Stations: 1-4; common.
9. **Euglena granulata** (Klebs) Fr. Schmitz Jahrb. Wiss. Bot. 15: 16 (1884). [Syn.: *E. velata* var. *granulata* Klebs (1883)]. Cells 37-64 µm long, 23-29 µm broad. Stations: 1, 2, 4; few.
10. **Euglena güntheri** Gojdics, Univ. Wisconsin Press, Madison, p.161, fig.1, pl. 33 (1953). [Syn.: *Enchelys terricola* Günther (1928)]. Cells 54-97 µm long, 11.4-14.5 µm broad. Stations: 1, 2, 4; common.
11. **Euglena pisciformis** Klebs, Unters. bot. Inst. Tüb. 1(2): 302 (1883). [Syn.: *E. agilis* H. J. Carter (1856)]. Cells 24-82 µm long, 7-11 µm broad. Stations: 1-4; abundant.

12. **Euglena polymorpha** Dangeard, Le Botaniste 8: 175 (1902). [Syn.: *E. granulata* var. *polymorpha* Popova (1966)]. Cells 73 µm long, 6.6-23.8 µm broad. Stations: 1, 2; common.
13. **Euglena proxima** Dangeard, Le Botaniste 8: 154 (1902). Cells 54 µm long, 14.2 µm broad. Station: 3; rare.
14. **Euglena sanguinea** Ehr., Physik. Abh. kgl. Akad. Wiss. 1: 1-18, pl. 6. 1830 (1831). [Syn.: *Cercaria viridis* Müller (1790), *Euglena viridis* var. *sanguinea* Playfair (1921)]. Cells 60-102 µm long, 31 µm broad. Stations: 1-4; abundant.
15. **Euglena sociabilis** (Schimtz) Dangeard, La Botaniste 8: 182 (1902). Cells 70 µm long, 7 µm broad. Stations: 1-4; abundant.
16. **Euglena spirogyra** Ehr., Abh. K. Akad. Wiss. Berlin, Phys. Kl. 1830: 83, pl. 6: 6 (1830). [Syn.: *E. spirogyra* var. *fusiformis* Deflandre (1924)]. Cells 70-74 µm long, 3-14 µm broad. Stations: 1-4; common.
17. **Euglena subehrenbergii** Skuja, Symb. Bot. Upsal. 9(3): 192 (1948). Cells 92 µm long, 11.5 µm broad. Station: 1; rare.
18. **Euglena tripteris** (Dujardin) Klebs, Unters. Bot. Inst. Tüb. 1: 306 (1883). [Syn.: *E. torta* Stokes (1885), *E. tripteris* subsp. *crassa* Swirenko (1915)]. Cells 65-97 µm long, 11-17 µm broad. Station: 2; very rare.
19. **Euglena variabilis** Klebs, Unters. Bot. Inst. Tüb. 1: 300 (1883). Cells 77 µm long, 14-29 µm broad. Stations: 1, 2; abundant.
20. **Phacus caudatus** Hübn., Euglenac.-F1. Stralsund: 5, fig. 5 (1886). Cells 18-30 µm long, 8.5-18.2 µm broad. Stations: 1-3; rare.
21. **Phacus curvicauda** Swirenko, Arch. f. Hydrobiol. v. Planktonk. 10: 333 pl. II, figs 13, 16 (1915). [Syn.: *Phacus brevicauda* (Klebs) Lemm. bei Fritsch (1918), *P. brevicauda* fa. *minor* Defl. (1928)]. Cells 30-80 µm long, 24-47 µm broad. Stations: 1-4; abundant.
22. **Phacus longicauda** (Ehr.) Duj., Infusoires: 337 (1841). Cells 40 µm long, 33 µm broad. Stations: 1, 2, 4; few.
23. **Phacus swirenkoi** Skvortzov, Ber. d. Dtsch. Bot. Ges. 46 (105-125) (1928). Cells 38-70 µm long, 23-60 µm broad. Stations: 1, 3, 4; few.
24. **Trachelomonas abrupta** fa. **angustata** Defl., Monogr. Du genre *Trachelomonas* - Nemurous (1926). Lorica 25-26 µm long, 14-18 µm broad. Stations: 1, 2; few.
25. **Trachelomonas allorgei** var. **madaripurense** Islam, Int. rev. der Gesamt. Hydrobiol. 66(1): 109-125 (1981). Lorica 71 µm long, 18 µm broad. Station: 1; rare.
26. **Trachelomonas armata** (Ehr.) Stein, Org. Infusionsthiere III(1): pl. 22, figs 37, 38 (1878). Lorica 12-14 µm long, 21-30 µm broad. Station: 1; rare.

27. **Trachelomonas armata** var. **steinii** Lemm., Abh. Naturw. ver. Bremen 18: 165 (1905). Lorica 43-50 µm long, 31-39 µm broad. Stations: 2, 3; rare.
28. **Trachelomonas caffra** Rino, Revista de Ciências Biológicas [Universidade de Lourenco Marques], Série A, 5: 158, pl. 8, figs 6-9 (1972). Lorica with spines 32-33 µm long, 36 µm broad; without spines 22-24 µm long, 22-23 µm broad. Station: 2; rare.
29. **Trachelomonas dybowskii** Drez., Odbitka z Rosprawi Widom. z Muz. im Dzieduszychich. 7/8 (1921). [Syn.: *T. oblonga* Lemm. bei Conrad und Van Meel (1952)]. Lorica 16-19 µm long, 9-17 µm broad. Station: 3; rare.
30. **Trachelomonas hispida** (Perty) Stein, Org. Infusionsthiere III(1): 22, figs 20-34 (1878). Lorica 21-36 µm long, 15-25 µm broad. Stations: 1-4; common.
31. **Trachelomonas hispida** var. **coronata** Lemm., Eugl. in Die Süssw. Deutsch. Öst. und der Schweiz, G. Fischer, Jena 2: 150 (1913). Lorica 38 µm long, 22-25 µm broad. Stations: 2-4; few.
32. **Trachelomonas hispida** var. **punctata** Lemm., Abh. Naturw. ver. Bremen 18: 165 (1905). Lorica 25-29 µm long, 17-26 µm broad. Stations: 1-4; common.
33. **Trachelomonas intermedia** Dang., La Botaniste: 8 (97-360) (1901). Lorica 20-25 µm long, 18-21 µm broad. Station: 1; rare.
34. **Trachelomonas mucosa** var. **brevicollis** Skv., Ber. d. Dtsch. Bot. Ges. 43: 306-341 (1925). Lorica 18 µm long, 14.5 µm broad. Station: 1; rare.
35. **Trachelomonas oblonga** Lemm., Abh. Naturw. ver. Bremen 16: 344 (1899). Lorica 11-16 µm long, 7.5-12.4 µm broad. Stations: 1-4; common.
36. **Trachelomonas oblonga** var. **attenuata** Playfair, Proc. Linn. Soc: N. S. W., Sydney 40: 1-41 (1915). [Syn.: *T. minuscula* Drez. (1925)]. Lorica 16.4 µm long, 12.3 µm broad. Station: 2; rare.
37. **Trachelomonas oblonga** var. **truncata** Lemm., Beih. Bot. Zbl. 76: 150-156 (1898). Lorica 10-11 µm long, 7.5 µm broad. Station: 2; rare.
38. **Trachelomonas oblonga** Lemm. fa. **ovata** Defl., Monogr. Du genre *Trachelomonas* –Nemurous (1926). Lorica 17.7 µm long, 13.6 µm broad. Station: 1; rare.
39. **Trachelomonas planctonica** Swir., Arch. Hydrobiol. Planktonk. 9: 633 (1914). Lorica 26-29 µm long, 21 µm broad. Station: 2; rare.
40. **Trachelomonas playfairii** Defl., Bull. Soc. Bot. France 71: 1125 (1924). [Syn.: *T. flexicollis* Drez. (1925), non *T. flexicollis* Drez. (1922)]. Lorica 23-25 µm long, 16-18 µm broad. Stations: 1-4; few.
41. **Trachelomonas pulcherrima** Playfair, Proc. Linn. Soc.: N. S. W., Sydney 40: 13 (1915). [Syn.: *T. oblonga* var. *pulcherrima* (Playfair) Popova (1955)]. Lorica 20.0-21.5 µm long, 10.0-11.5 µm broad. Station: 2; rare.

42. **Trachelomonas pulcherrima** var. **latior** Playfair, Proc. Linn. Soc.: N. S. W., Sydney 40: 1-41 (1915). Lorica 20 µm long, 11 µm broad. Station: 2; vary rare.
43. **Trachelomonas pulcherrima** var. **ovalis** Playfair, Proc. Linn. Soc.: N. S. W., Sydney 40: 14 (1915). [Syn.: *T. oblonga* var. *ovalis* Popova (1955)]. Lorica 19.6 µm long, 10.0-11.4 µm broad. Station: 2; rare.
44. **Trachelomonas pusilla** Playfair, Proc. Linn. Soc.: N. S. W., Sydney 40: 12 (1915). Lorica 12.4-14.3 µm long, 10.7-12.4 broad. Stations: 1-3; common.
45. **Trachelomonas robusta** Swir. *emend* Defl., Arch. Hydrobiol. 9: 636 (1914). Lorica 28.0-28.6 µm long, 21.5-22.0 µm broad. Station: 2; rare.
46. **Trachelomonas rotunda** Swir., Arch. Hydrobiol. 9: 636 (1914). [Syn.: *T. gibbelaris* var. *rotunda* Skv. (1925)]. Lorica 12.0-22.5 µm long, 14-25 µm broad. Stations: 1-4; abundant.
47. **Trachelomonas superba** Swir., Arch. Hydrobiol. 9: 642 (1914). [Syn.: *T. horrida* var. *superba* (Swirenk.) Skv. (1917)]. Lorica 31-41 µm long, 25-35 µm broad. Stations: 2, 4; few.
48. **Trachelomonas volvocina** Ehr., Phys. Abh. Berl. Akad. Wiss: 145-336 (1833). Lorica 7.0-21.5 µm in diameter. Stations: 1-4; abundant.
49. **Trachelomonas volzii** Lemm., Arch. Hydrobiol. 1: 409-427 (1906). Lorica 31-32 µm long, 16.5-18.0 µm broad. Stations: 1, 2, 4; few.
50. **Trachelomonas volzii** Lemm. var. **acidophila** Bourr., Bull. Inst. Franç. Afr. Noire, ser. A, 23: 310, 354, pl. 5, fig. 13, pl. 6, fig. 2. (1961). Lorica 36-37 µm long, 14-16 µm broad. Station: 1; rare.

Class: Bacillariophyceae

Order: Centrales; Family: Melosiraceae

51. **Melosira granulata** (Ehr.) Ralfs, Pritchard, Hist. Inf. ed. 4: 820 (1861). [Syn.: *M. moniliformis* Ag. (1824)]. Frustules 11.5-15.5 µm long, 8.0 µm broad; half-cells 3.6 µm long. Stations: 1-4; abundant.
52. **Melosira varians** C. Ag., Flora 10(40): 628 (1827). [Syn.: *Lysigonium varians* (C. Agardh) De Tone (1892)]. Frustules 20-22 µm long, 9.5 µm broad, spine 7.3 µm long. Stations: 1-3; few.

Family: Coscinodiscaceae

53. **Coscinodiscus lacustris** Grun., K. Svenska Vet.-Akad. Handl., ser. 4, 17(2): 114 (1880). Frustules 33-34 µm in diameter in valve view. Stations: 1-3; few.

Order: Pennales; Family: Fragilariaceae

54. **Fragilaria capucina** Desm., Pl. Crypt. France ed. 1, 10: 453 (1825). [Syn.: *F. capucina* var. *lanceolata* Grunow (1881)]. Frustules 44 µm long, 4.5 µm broad. Stations: 2-4; common.
55. **Fragilaria virescens** Ralfs, Ann. Mag. Nat. Hist. 12: 110 (1843). Frustules 42-79 µm long, 5-8 µm broad, striae 9-12 in 10 µm. Stations: 1-4; common.
56. **Synedra acus** Kütz., Kieselschal. Bacill: 68, pl. 15, fig. 7 (1844). Frustules 149 µm long, 73 µm broad (at the middle), 3.6 µm broad (at the tip), striae 14-16 in 10 µm. Stations: 1-4; abundant.
57. **Synedra tabulata** (Ag.) Kütz., Bacillarien p. 68 (1844). [Syn.: *Diatoma tabulatum* Ag. (1832)]. Frustules 33-94 µm long, 4.0-5.5 µm broad, striae 12 in 10 µm. Stations: 1-4; abundant.
58. **Synedra ulna** (Nitzch) Ehr., Abh. K. Akad. Wiss. Berlin 1831, Phys. Kl. 87 (1932). [Syn: *Bacillaria ulna* Nitzsch.]. Frustules 320-350 µm long, 6.6 µm broad in the median region; tip 9.5 µm broad. Stations: 1-4; abundant.
59. **Synedra ulna** var. **oxyrhynchus** (Kütz.) Ó Meara, Proc. Ray. Trish Acad., ser. 2 (science): 306 (1875). Frustules 120-126 µm long, 14 µm broad, 10 or 11 striae in 10 µm. Stations: 1-4; common.

Family: Eunotiaceae

60. **Eunotia alpina** (Näg.) Hust., A. Schmidt's Atlas: pl. 291, figs 7, 8 (1913). [Syn.: *Synedra alpina* Nägeli (1849)]. Frustules 57-100 µm long, 2.5-3.5 µm broad in the median region. Stations: 2-4; common.
61. **Eunotia lunaris** (Ehr.) Grun., Month. Micr. J. 18: 170 (1877). Frustules 112 µm long, 73 µm broad (at the middle), 15 striae in 10 µm. Stations: 1-4; abundant.
62. **Eunotia monodon** Ehr., Ath. K. Akad. Wiss. Berlin Physik. Kl. 1841: 414 (1843). [Syn.: *E. undoso* var. *monodon* Ehr. (1870), *E. major* (W. Smith) Rabenhorst (1864)]. Frustules 54 µm long, 7-26 µm broad (at the middle), 9-12 striae in 10 µm. Stations: 1, 2, 4; few.
63. **Eunotia pectinalis** var. **minor** (Kütz.) Rab., Bot. Jahrb. 45: 117 (1910). Frustules 43.5 µm long, 3.6 µm broad (at the middle), 14 or 15 striae in 10 µm. Stations: 2, 4; very rare.
64. **Eunotia sudetica** (O. Müller) Forsch, Ber. Biol. Stat. Plön 6: 59 (1898). Frustules 33 µm long, 15 µm broad, 9 or 10 striae in 10 µm. Stations: 2-4; common.

Family: Naviculaceae

65. **Gyrosigma acuminata** (Kütz.) Rab., Süssw.-Diat.: 47 (1853). [Syn.: *Frustulia acuminata* Kütz. (1832)]. Frustules 139-165 µm long, 23-25 µm broad. Stations: 1-4; abundant.
66. **Gyrosigma attenuatum** (Kütz.) Rab., Süssw.-Diat.: 47 (1853). [Syn.: *Frustulia attenuate* Kütz. (1833)]. Frustules 208-250 µm long, 25 µm broad. Stations: 1-4; abundant.
67. **Gyrosigma distortum** (W. Smith) Cleve var. **parkeri** (M.B. Harrisson) Cleve, K. Svenska Vet.-Akad. Handl., ser. 4, 26(2): 116 (1894). Frustules 110-120 µm long, 16-17 µm broad. Stations: 1-4, few.
68. **Navicula cryptocephala** Kütz., Bacillarien: 95 (1844). Frustules 25-35 µm long, 5-7 µm broad, 16 or 17 striae in 10 µm. Stations: 2-4; few. It is a new record for Bangladesh.
69. **Navicula cuspidata** Kütz., Bacillarien: 94 (1844). [Syn.: *Frustulia cuspidata* Kütz. (1833), *N. fulva* Ehr. (1838)]. Frustules 47-166 µm long, 16-32 µm broad, 11-18 striae in 10 µm. Stations: 1-4; common.
70. **Navicula decussis** Oestrup, DanSek Diat.: 77, pl. II, fig. 50 (1910). Frustules 16-25 µm long, 6-7 µm broad. Stations: 1-4; abundant. It is a new record for Bangladesh.
71. **Navicula exigua** (Dujardin) Nouv., Man. Obs. Micr. Atlas.: 44 (1842). Frustules 25-28 µm long, 7.8 µm broad. Stations: 1-4; abundant.
72. **Navicula gastrum** (Ehr.) Kütz., Bacillarien: 94 (1844). [Syn.: *Pinnularia gastrum* Ehr. (1843)]. Frustules 26-49 µm long, 7-10 µm broad. Stations: 2-4; few.
73. **Navicula menisculus** Schum., Schr. K. Phys.-Ökon. Ges. königs berg 8: 56 (1867). [Syn.: *Navicula peregrima* var. *menisculus* A. Mayer (1911)]. Frustules 28 µm long, 6-7 µm broad. Stations: 1-4; abundant.
74. **Navicula rhynchocephala** Kütz., Bacillarien: 145 (1844). Frustules 50-65 µm long, 12-15 µm broad, 10 striae in 10 µm. Stations: 1, 3, 4; few. It is a new record for Bangladesh.
75. **Navicula viridula** Kütz., Bacillarien: 91 (1844). Frustules 60-80 µm long, 13-15 µm broad, 6-9 striae in 10 µm. Stations: 1-4; few. It is a new record for Bangladesh.
76. **Pinnularia acrosphaeria** Bréb. var. **laevis** Cleve, K. Svenska Vet.-Akad. Handl., ser. 4, 27(3): 86 (1895). Frustules 83 µm long, 12.7 µm broad, 12-14 striae in 10 µm. Stations: 1-4; abundant.
77. **Pinnularia gibba** var. **mesogongyla** (Ehr.) Hust., Pascher, Sussw.-fl. 10, 2. Aufl.: 327 (1930). [Syn.: *P. mesogongyla* Ehr. (1843)]. Frustules 44 µm long, 10 µm broad, 14 or 15 striae in 10 µm. Stations: 2, 3; few.

78. **Pinnularia gibba** var. **parva** (Ehr.) Grun., An. Mus. Argent. Cienc. Nat. 37: 395 (1933). [Syn.: *Navicula stauroptera* var. *parva* Grunow (1860)]. Frustules 33-42 µm long, 8.3-9.0 µm broad, 9-12 striae in 10 µm. Stations: 2-4; few.
79. **Pinnularia tabellaria** Ehr., Abh. K. Akad.. Wiss. Berlin, Physik. K1. 1841: 422 (1843). Frustules 102 µm long, 16 µm broad (at the middle) and 11 µm broad (at the tip), 15 striae in 10 µm. Stations: 3, 4; few.
80. **Pleurosigma balticum** var. **simile** (Ehr.) Grun., Ann. Mag Nat. Hist. ser. 2, 9: 8 (1852). Frustules 87 µm long, 15 µm broad, 19 or 20 striae in 10 µm. Stations: 1, 3; common.
81. **Stauroneis anceps** fa. **gracilis** (Ehr.) [Hustedt] Pascher, Süssw.-Fl. 10, 2, Aufl.: 256 (1930). Frustules 90-100 µm long, 9-21 µm broad, 20 or 25 striae in 10 µm. Stations: 2-4; common.

Family: Cymbellaceae

82. **Cymbella affinis** Kütz., Bacillarien: 80 (1844). [Syn.: *Cocconema fusidium* Ehr. (1838), *Cymbella cymbiformis* C. Agardh (1830)]. Frustules 83 µm long, 18 µm (at the middle), 11 µm broad (at the tip). 13-15 striae in 10 µm. Station: 4; very rare.
83. **Cymbella hustedtii** Krasske, Bot. Arch. 3: 204, fig. 11 (1923). Frustules 36 µm long, 11 µm broad (at the middle), 7 µm broad (at the tip), 13-15 striae in 10 µm. Station: 3; rare.
84. **Cymbella parva** (W. Smith) Kirchner, Alg. Schles.: 188 (1878). [Syn.: *Cocconema parvum* W. Smith (1853)]. Frustules 80 µm long, 18 µm broad (at the middle), 11 µm broad (at the tip), 10-12 striae in 10 µm. Stations: 1, 3; very rare.
85. **Cymbella stuxbergii** (Cl.) Cleve, K. Sverska Vet.-Acad. Handl., ser. 4, 26(2): 174 (1894). [Syn.*: Cocconema stuxbergii* Cleve (1880)]. Frustules 50-69 µm long, 18-22 µm broad, 9-10 striae in 10 µm. Stations: 2-4; common.
86. **Cymbella tumida** (Bréb. *ex* Kütz.) Van Heurek, Syn. Diat. Belg. Expl., pl. 2, fig. 10 (1880). [Syn.: *Cocconema tumidum* Bréb. *ex* Kütz. (1849)]. Frustules 40-78 µm long, 12-20 µm broad, 10-15 striae in 10 µm. Stations: 2-4; common.
87. **Cymbella turgida** Gregory, Quart. J. Micr. Sc. 4: 5 (1858). [Syn.: *Cymbella eleginenia* Krammer (1981)]. Frustules 56 µm long, 15 µm broad, 8 or 9 striae in 10 µm. Station: 3; few.
88. **Cymbella turgidula** Grun., A. Schmidt, Atlas: pl. a, figs 23-29 (1875). Frustules 38-39 µm long, 12-14 µm broad, 9 or 10 striae in 10 µm. Stations: 1-4; few.
89. **Gomphonema augur** Ehr., Ber. K. Akad. Wiss. Berlin 1840: 211 (1840). [Syn.: *G. ehrenbergii* Farrutherum (1864)]. Frustules 20-22 µm long, 7 µm broad. Stations: 2-3; few.

90. **Gomphonema lanceolatum** var. **turris** (Ehr.) Hust., Arch. Hydrobiol. suppl. 14: 166 (1935). [Syn.: *G. turris* Ehr. (1842)]. Frustules 54-73 µm long, 12-15 µm broad, 9-12 striae in 10 µm. Stations: 1-4; abundant.
91. **Gomphonema longiceps** var. **subclavata** (Ehr.) Grun., in Hustedt Pascher, Süssw-Fl. 10. 2. Aufl.: 375 (1930). [Syn.: *G. montanum* var. *subclavatum* Grun. (1880)]. Frustules 62 µm long, 11 µm broad. Station: 3; few.
92. **Gomphonema olivaceum** (Hornemann) Kütz., Bacillarien: 85 (1844). Frustules 45-48 µm long, 8.5-9.0 µm broad, 8-10 stirae in 10 µm. Stations: 1, 2, 4; few.

Family: Epithemiaceae

93. **Rhopalodia gibba** (Ehr.) Ö Müller, Bot. Jahrb. 22: 65 (1895). [Syn.: *Epithemia gibba* (Ehr.) Kütz. (1844), *Navicula gibba* Ehr. (1832)]. Frustules 80-109 µm long, 18.2-21.8 µm broad (at the middle), 11.0-14.5 µm broad (at the tip) having sometimes median constrictions. Stations: 2-4; common.

Family: Bacillariaceae

94. **Nitzschia acicularis** (Kütz.) W. Smith, Syn. Brit. Diat. I: 43 (1853). [Syn.: *Synedra acicularis* Kutz. (1844)]. Frustules 35-100 µm long, 3-5 µm broad, striae 16-20 in 10 µm. Stations: 2-4; few.
95. **Nitzschia hantzschiana** Rabh. in Grunow, Verh. K. Zool.-Bot. Ges. Wien 12: 576 (1862). Frustules 87 µm long, 10 µm broad, 10 canals in 10 µm. Stations: 1-4; common.
96. **Nitzschia intermedia** Hantzsch, Grunow K. Svenska Vet.-Akad. Handl., Ser. 4, 17(2): 95 (1880). Frustules 40-130 µm long, 4-6 µm broad, 9-12 striae in 10 µm. Stations: 1, 3; few. It is a new record for Bangladesh.
97. **Nitzschia longissima** (Bréb.) Grunow, Verh. k. Zool.-Bot. Ges. Wien 12: 581 (1862). [Syn.: *Ceratoneis longissima* Bréb. (1849), *Nitzschia birostrata* W. Smith (1853)]. Frustules 33 µm long, 4 µm broad. Stations: 2, 4; few.

Discussion

The studied pond is a unique habitat because of the fact that the limnological parameters showed wide range. Here carbon dioxide was occasionally undetectable at Stations 1 and 3, biocarbonate alkalinity was also undetectable at different times in all the stations and anoxia was observed in all the stations (Begum, 2008). Among the different phytoplankton groups, highest richness was represented by Euglenophyceae (50 taxa), Chlorophyceae (48 taxa) (Begum, 2008), and Bacillariophyceae (47 taxa) followed by Cyanophyceae (17 taxa) (Begum, 2008). Chrysophyceae, Xanthophyceae, Cryptophyceae

and Dinophyceae were each represented by single species. Similar observation was made earlier by Islam *et al.* (1991) in organically polluted pond. Dominance of Euglenophyceae in the studied pond is supported by the observations made by Islam *et al*. (1991) and Begum and Hossain (1993). Record of euglenoid bloom under oxygen deficient condition is in agreement with observations made by previous workers (Hickmen and Penn, 1977; Begum and Hossain, 1993). The comparatively lower representation of Cyanophyceae among the major groups is in agreement with observations made by Islam *et al*. (1991) and Begum and Hossain (1993).

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