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RESEARCH ARTICLE **LIFE SCIENCE**

EUGLENOID ALGAE FORM SHRIMP CULTURE PONDS IN KHULNA, BANGLADESH

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Abstract: Nineteen speies belonging to four genera namely, *Euglena*, *phacus*, *Astasia* and *Trachelomonas* have been studied and illustrated form shrimp culture ponds based on one year investigation.

Key words: Euglenoid algae, *Euglena*, *Phacus*, *Trachelomons*, *Astasia* and shrimp culture ponds

Introduction

Englenaids found in a wide range of habitats, but they mostly occurs in stagnant waters from temporary road side, ditches, drains, small reservoirs or larger, permanent bodies of water, such as ponds, lakes and reservoirs. They are particularly abundant in organically rich habitats. Euglenoids are bright reddish-brown to deep-brown in color while others may be hyaline, yellow and orange. Islam and Khatun (1966), Islam and Aziz (1979), Islam and Khondokar (1981) and Islam *et al.* (1991) have been studied the Euglenoids of Bangladesh. Much more information is needed to asses the total Euglenoids member of Bangladesh.

Materials and Methods

The two Ponds selected for the study were located in Khulna district at 24°35'N and 24°70' N and 89°10'E and 89°35'E. Pond -1 was more or less rectangular with a surface area of 5.2 acre. It was a fresh water shrimp Pond which is situated at Terokhada thana. Pond-1 was connected with the Atarabay river by a canal. Main source of water was rainfall though sometime water was supplied from canal. Pond-2 was more or less square in shape with a surface area of 2.69 acre. It was a seasonally saline water shrimp pond. It is in Botiaghata thana and connected with the Satuari river.

Phytoplankton samples were collected from November 2006 to October 2007 at monthly intervals. The plankton was collected by plankton net of no. 20 silk bolting cloth, water 75 liters was passed through the plankton net with the help of a plastic pan of 5 litre capacity. The water was passed down the net and the plankton was colleted in a glass test tube fixed firmly at the lower end of the plankton net (Welch 1948). After collection, plankton materials were transferred to glass bottles and preserved in Transeaus solution (Transeau, 1951).The enumeration of the euglenoids were

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carried out with the help of a Sedgwick Rafter counting cell and by drop method (Welch, 1948). The euglenoids abundance was expressed as units per liter (units l^{-1}). The figures of euglenoid members were drown with the help of camera lucida.

Results

Taxonomic Enumerations

***Euglena acus* Ehr. (Pl. 1, Fig. 2)**

(Islam *et al.* 1991, P1. 1, Fig. 5)

Cells flat or little cylindrical rigid and elongated gradually narrower at the posterior edn, 100.04 μm long and 9.84 μm broad.

***E. agilis* Carter (P1. 1, Fig. 14)**

(Gojdics, 1953, 35, P1. 1, Fig. 5c)

47.85μm long and 15.1μm diam. When fully entended. it is nearly cylindrical with the anterior end bluntly rounded, and the posterior end coming to a short, rather blunt point.

***E. cyclopicola* Gicklhorl (P1. 1, Fig. 10)**

(Gojdics, 1953, 90, P1. 8, fig. 1b)

29.7μ long and 14.85 μ diam attached, ovoid to globose, free swiming.

***E. detonii* Vanoye (Pl. 1, Fig. 20)**

(Gojdics, 1953, 97, P1. 10, Fig. 6)

Very elongated fusiform ending in a hyaline point. Pellicle: smooth. lenth 47.85μ and breath 15-18μ.

***E. exilis* Gojdics, (P1. 1, Fig. 13)**

(Islam *et al.* 1991, P1. 1, Fig. 14)

Fusiform to spindle shaped pelicle highly flexible metabolic movement present; 45.92 μ long and 12.3μ broad.

***E. gaumei* Allorge and Lefevre (P1. 1, Fig. 17)**

(Gojdics, 1953, 104, P1. 12, Fig. 2b)

Nearly cylindrical. With a some what tuncated anterior end, and with a pointed tail piece. lenth 56.86μ and breath 11.55μ.

***E. korshikovii* (P1. 1, Fig. 3)**

(Gojdics, 1953, 123, P1. 19, Fig. 2a)

30.3μ long and 13.2μ wide obovate with the posterior end narrowed and produced into a short spine; shihtly flattend and spirally furrowed.

***E. proxima* Dang. (P1. 1, Fig. 8)**

(Islam *et al.* 1991, P1. 2, Fig. 18)

Cylindrical, anterior end rounded, small posterior tail present; highly metabolic 55.11μ long and 16.4μ broad.

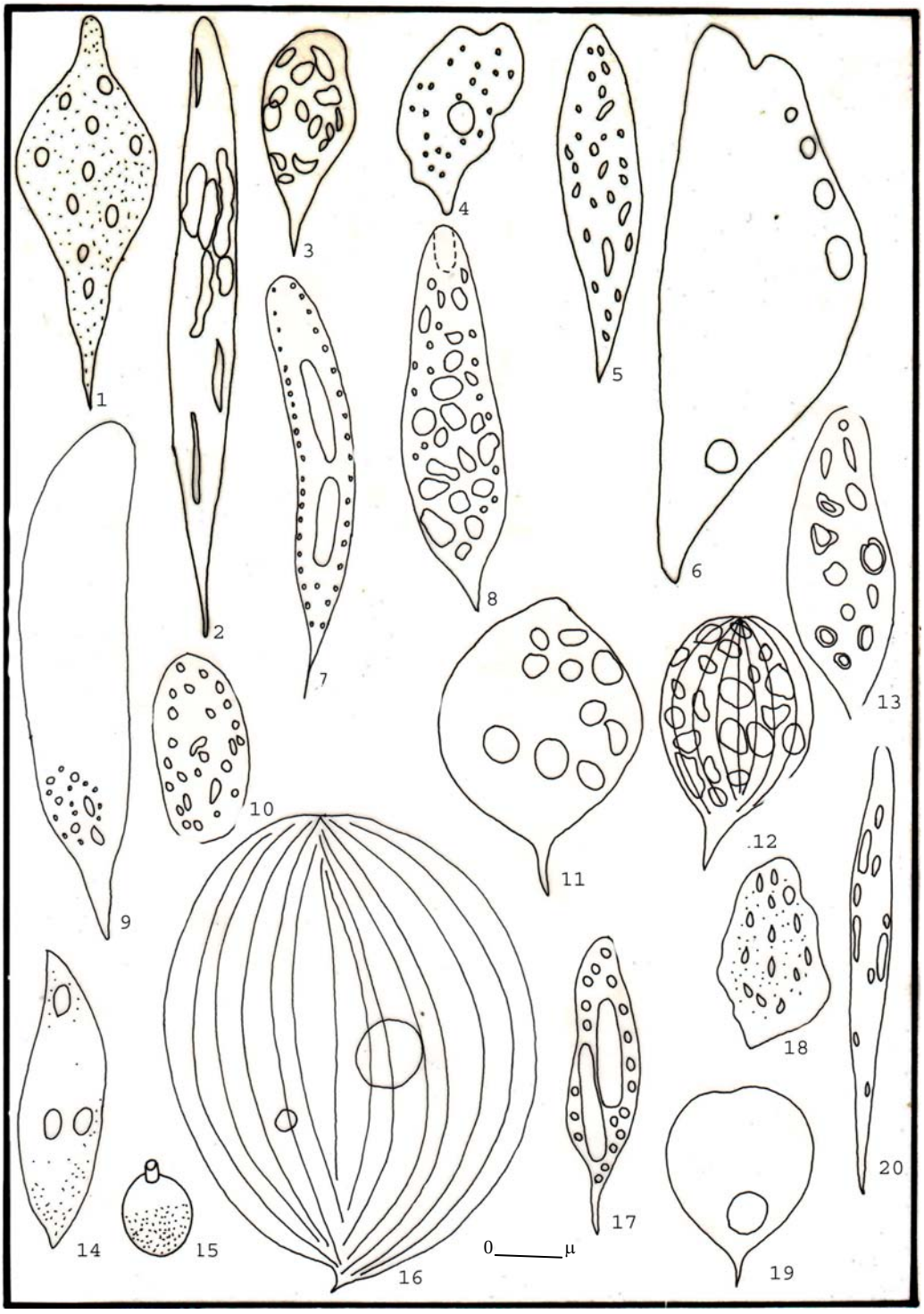

Plate 01

***E. rostrifera* Johnson. (P1. 1, Fig. 1)**

(Gojdics, 1953, 136, P1. 24, Fig. 1)

Usually bulged near the middle, narrowed anteriorly to form a snout, tapered posteriorly to a colourless point. vegelative cell 97.35µ long, and 31.35µ broad.

***E. sanguinea* Ehrenberg. (P1. 1, Fig. 6)**

(Gojdics, 1953, 154, P1. 31, Fig. 3)

127.95µ long and 46.2µ diam. Broadly spindle shaped, rounded anteriorly, gradually tapering to a point posteriorly.

***E. spathirhyncha* Skuja. (P1. 1, Fig. 5)**

(Gojdics, 1953, 106, P1. 13, Fig. 1)

Fusiform to long rhombic some what flattened, particularly in the anterior end, but the middle is some whtat expandeed, angular, and becomes triangular in cross section in the back. Long 51. 2µ and 12. 27µ broad.

***E. spirogyra* Ehr (P1. 1, Fig. 7)**

(Islam and Khatun, 1966, P1. 2, Fig. 26)

Vegtative cell 72.16µ long and 8.95µ broad.

***E. stellata* Mainx (Pl. 1, Figs. 4 & 18)**

(Gojdics, 1953, 71, Pl. 4, Fig. 2b)

29-30.36µ long and 13.2-16.5µ diam. Spindle shaped to oviod, rounded interiorly, ending in a point posterior.

***Phacus acuminatus* Stokes (P1. 1, Fig. 12)**

(Yamagishi and Hirano 1973, P1. 5, Fig. 10)

Cell 36.08µ long and 21.68µ broad.

***P. curvicauda* Swir (P1. 1, Fig. 11)**

(Islam *et al*. 1991. P1. 2, Fig. 37)

Rigid, flat, oval shaped, dark green, chromatophores discoid, three larger paramylons; 37.72µ long and 29.52µ broad.

***P. orbicularis* Huebner (P1. 1, Fig. 19)**

(Islam and Khatun, 1966, 101, P1. 2, Fig. 33)

Cells broadly ovoid, cell 55-60µ diam. at the mid region, 65-75µ long with the tail, tail 10-14µ long.

***P. swirenkoi* (P1. 1, Fig. 16)**

(Islam and Khatun, 1966, P1. 2, Fig. 29)

Vegetative cell 67µ long, 56µ broad.

***Trachelomonas oblonga* (P1. 1, Fig. 15)**

(Islam and Khondker, 1981, 116, P1. 8, Figs. 30-32)

lorica short oblong, light brown in colour smooth walled, flagellum apeature, 15.20μ long and 8.12μ diam.

***Astasia longa* pringsh (P1. 1, Fig. 9)**

(Islam and Aziz 1979, P1. 2, Fig. 27, 28 & 31)

Cells elongate cylindrical and twisted, posterior part abruptly narrowed forming short blunt tail piece; cells 108.24μ long and 24.6μ diam.

Pond 1

The monthly abundance of Euglenoids was found to vary from 928 to 10213 units l^{-1}. Highest abundance was recorded in month of November and the lowest in July. The seasonal mean value of Euglenophyta was 3714 units l^{-1} in summer, 4336 units l^{-1} in Monsoon, 4642/1 in Post monsoon and 3713 units l^{-1} in winter. 9.37% of the total phytoplankton population constitute by Euglenoids (Table 1)

Pond 2

Euglenoids abundance was found to very from 1857 to 9285 units l^{-1}. The highest abundance was in May and the lowest abundance in September. The seasonal mean value of Euglenophyta was 6190 units l^{-1} in summer, 6460 units l^{-1} in Monsoon, 4643 units l^{-1} in Post monsoon and 4642 units l^{-1} in winter. The Euglenoids constitute 26.59% of the total phytoplankton population (Table 2)

Table 1. Seasonal distribution and abundance of Euglenoids in pond-1

Name of the Genus	% of the Genus	Month of occurrence
Euglena	6.45	November to March May, June, September & October.
Phacus	1.04	December, February, March & June.
Trachelomonas	0.62	November, January & June.
Astasia	1.26	November, June, August & September.

***** Pond-1 was dried up in April.

Table 2. Seasonal distribution and abundance of Euglenoids in pond-2

Name of the Genus	% of the Genus	Month of occurrence
Euglena	19.94	Whole study period.
Phacus	3.79	June to August.
Trachelomonas	2.38	February, June, October.
Astasia	0.48	August.

- Pond-2 was dried up from November to January.

Discussion

Euglenoids were present in all the yerar round in both the Ponds. Monthly abundance of Euglenoids was 928-10213 units l^{-1} in Pond-1, with highest abundance in November and the lowest in July. In Pond-2 the abundance of Euglenoids varied from 1857 units l^{-1} in September to 9285 units l^{-1} in May. Euglenoids constituted 9.37% in Pond -1 and 26.59% in Pond-2. The Pond-2 was seasonally saline. It showed that a high pH is related to the formation of phytoplankton bloom (Jana, 1973 & Pavoni, 1963) and dense growth of Euglenoids were associated with hypertrophic conditions, distinguished by high loading rates of nitrogen and phosphorus. Similar observation was made in the present study. Euglenoids population showed peak in November and June in Pond-1 and February to May in Pond-2. Yamagishi and Hirano (1973), George (1966), Rao (1953) and Zafar (1964) observed that Euglenoid population was abundant when the organic content was high. From February to May when the salinity was comparatively high the Euglenoid population

was dominant in Pond-2. *Euglena* was present all the year round in Pond-2 with high organic content Pond. Munawar *et al*. (1982) suggested that Euglenoids prefer higher concentration of free carbon dioxide for their growth. This view is favored by the present investigation. During late Summer (34mg/l and 29mg/l) and Post monsoon (30mg/l and 9mg/l) content of free carbon dioxide was high in both the Ponds with higher abundance of Euglenoids. From July to October Euglenoids population show gradually low production in Pond-1 this might be due to lack of nutrients.

Conclusion

Euglenoids are over emphasized for its bilateral character of plant and animal. As well as its character is very significance on evolutionary treads. It is possible to get rough idea of the condition of the water by noting the predominant euglenoids species and it has glorious impact on pisciculture. Bangladesh is the land of rivers, ponds, *beels*, *haors*, ditches with rich prospect of euglenoids diversity. To accesses the euglenoids diversity we have to carry out many research works on them. The present study was such an attempt to know the taxonomy, abundance and periodicity of them.

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