

RESEARCH ARTICLE

## Protozoan Fauna of Freshwater Habitats in South Dum Dum Municipality, North 24 Parganas, West Bengal

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### Abstract

Wetlands of South Dum Dum Municipality were focused to reveal the status of the planktonic protozoan fauna in detail. A total of 37 different sites were selected and plankton samples from these sites were collected. About 16 sp. of protozoa were identified from few localities from the present investigation. Eight species of rhizopoda belonged to 4 genera, 4 family (Pelomyxidae, Arcellidae, Centropyxidae and Diffugiidae) and 2 order (Pelobintida and Arcellinida), Four species of flagellate belongs to 2 genera, 1 family (Euglenidae) and 1 order (Euglenida), 4 species of ciliate belongs to 4 genera, 4 family (Colepidae, Vorticellidae, Euplotidae and Paramaeciidae), 2 order (Prorodontida and Peritrichida) and 2 suborder (Sporadotrichinia and Peniculina). Among 37 localities, protozoans were observed only in L2, L3, L8, L9, L12, L13, L15, L17, L18, L19, L21, L24, L26, L32, L33, L34 and L36 localities. Protozoan diversity and their abundance were noticed higher in L12, L18, L21, L26, L33 and L34 localities. *Euglena viridis*, *E. acus*, *E. oxyuris* and *Phacus acuminata*, *Pelomyxa palustris*, *Vorticella companula* were found to be higher in abundance and distribution.

**Keywords:** South Dum Dum municipality, planktonic protozoan, *Euglena viridis*, abundance, distribution.

### Introduction

Protozoa are highly abundant in all aquatic habitats and greatly involved in food chain (Finlay, 1997). They act as bioindicators in freshwaters due to their environment sensitivity, rapid turnover rate, to detect organic pollution in freshwater and heavy metal pollutants (Foissner 1987, 1999; kolkwitz and Marsson, 1909; Patterson, 1996). Earlier works on free living protozoa from India were initiated by Naidu (1966), Mahajan (1971), Nair *et al.* (1971) and Mishra *et al.* (1977). Several works by Das (1993, 1995, 2000, 2003, 2004), Bindu (2008, 2010) and Bindu and Das (2010) were explored from India. Freshwater protozoan fauna from few places like Barasat, Barrackpore and Naihati were only explored from North 24 Parganas district of West Bengal. About 50 species of protozoa including 9 flagellates, 23 rhizopods and 18 ciliates were reported and the collections were from pond ooze sample, soil and moss collections (Das *et al.*, 1993). The present study on the wetlands of South Dum Dum Municipality reveals the status of the planktonic protozoan fauna in detail. The exploration on free living protozoa from South Dum Dum Municipality of North 24 Parganas district would be the first hand information in West Bengal from the present investigation.

### Materials and methods

**Experimental design:** South Dum Dum municipality is located in North 24 Parganas district of West Bengal. The study area consists of a total of 37 different sites (ponds, tanks and lakes) from Bangur, Lake town,

Dumdum Park, Amarpalli, Telipukur, Nager Bazar, Patipukur and Dum Dum were selected and the plankton samples were collected during Dec 2012. The plankton samples were collected by using the plankton net of 50 m mesh size and preserved in 4% formaldehyde. The collected samples of respective localities are assigned as L1-Harihar Nagar 1, Shyam Nagar, L2- Harihar Nagar Pond No. 2, Shyamnagar, L3-Harihar Nagar Pond No. 3, Shyamnagar, L4- Nilachal complex tank, RAK road, L5-Swami Vivekananda road Pond, Jessore road, L6- Baghabathi Nagar Tank No. 1, L7-Baghabathinagar Tank No. 2, L8-Bapuji Nagar Tank No. 1, L9-Bapuji Nagar No. 2, L10-Bapuji Nagar Tank No. 3, L11-Bapuji Nagar Tank No. 4, L12-Bapuji Nagar Tank No. 5, L13- Clive house Pond, Nager Bazaar, L14-MotiJheel Avenue Pond, L15-Moti Jheel avenue Pond No. 2, L16-Motijheel old quarter pond, L17-Telipukur Lake, L18-Amarpalli Block-B Pond, L19-Devendra Nagar Tank, Jessore Road, L20- Rangpara Pond, Nayapatti Road, L21-Kachhari badi Tank, Shyam Nagar, L22-Mallibagan Pond, Shyamnagar road, L23-Dum Dum park Tank No. 1, L24-Dum Dum park Tank No. 2, L25- Dum Dum Park, Tank No. 3, L26-Dum Dum park Tank No. 4, L27-Dum Dum Park Tank No. 5, L28-Bangur Block B Tank, L29-Bangur Block C Tank, L30- Lake Town lake, L31-Vidyapara Tank, Lake Town, L32- Hazrapara pond Lake Town, L33-Digirpara Pond, Patipukur, L34-Kothpol Pond Patipukur, L35-Seth colony Pond Dum Dum, L36-Tanawar Colony Tank No. 2, Dum Dum, L37-Japur Tank No. 4, Dum Dum (Table 1).

Table 1. Distribution of Protozoa in wetlands of South Dum Dum Municipality, North 24 Parganas District.

| Sl. No. | Species recorded from the investigation                   | Occurrence in localities of South Dum Dum Municipality |
|---------|---|--|
|         | Order Euglenida   |  |
|         | Family Euglenidae   |  |
| 1.      | <i>Euglena viridis</i> Ehrenberg, 1830                    | L12, L18, L36  |
| 2.      | <i>Euglena acus</i> Ehrenberg, 1830                       | L17, L19, L8, L18                                      |
| 3.      | <i>Euglena oxyuris</i> Schmadra 1846                      | L18, L19, L36  |
| 4.      | <i>Phacus acuminata</i> Stokes, 1885                      | L2, L9, L15, L18                                       |
|         | Order Pelobiontida  |  |
|         | Family Pelomyxidae  |  |
| 5.      | <i>Pelomyxa palustris</i> Greef, 1874                     | L24, L26, L34  |
|         | Order Arcellinida   |  |
|         | Family Arcellidae   |  |
| 6.      | <i>Arcella discoides</i> Ehrenberg, 1871                  | L21, L26   |
| 7.      | <i>Arcella gibbosa</i> Penard, 1890                       | L33  |
|         | Family Centropyxidae                                      |  |
| 8.      | <i>Centropyxis aculeata</i> (Ehrenberg, 1832) Stein, 1859 | L21  |
|         | <i>Centropyxis spinosa</i> Cash, 1905                     |  |
|         | Family Diffugiidae  |  |
|         | <i>Diffugia acuminata</i> Ehrenberg, 1838                 | L18, L26   |
| 10.     | <i>Diffugia corona</i> Wallich, 1864                      | L12  |
| 11.     | <i>Diffugia oblonga</i> Ehrenberg, 1832                   | L18, L26   |
| 12.     | Order Prorodontida  | L32  |
|         | Family Colepidae  |  |
|         | <i>Coleps hirtus</i> (Muller, 1786) Nitzsch, 1827         |  |
| 13.     | Sub Class Peritrichia                                     | L21  |
|         | Order Peritrichida  |  |
|         | Family Vorticellidae                                      |  |
|         | <i>Vorticella companula</i> Ehrenberg, 1831               |  |
| 14.     | Sub order Sporadotrichinia                                | L3, L13, L26   |
|         | Family Euplotidae   |  |
|         | <i>Euplotes</i> sp.                                       |  |
| 15.     | Suborder Peniculina                                       | L33, L34   |
|         | Family Paramaeciidae                                      |  |
|         | <i>Paramaecium caudatum</i> Ehrenberg, 1833               |  |
| 16.     |   | L18  |

From zooplankton samples, protozoan fauna alone were analyzed for the detailed taxonomical studies. The species were identified following Deflandre (1959), Das *et al.* (1993) and Chattopadhyay and Das (2003).

## Results and discussion

A total of 16 species of protozoa were recorded from the present investigation (Table 1). About 8 species of rhizopoda belong to 4 genera, 4 family (Pelomyxidae, Arcellidae, Centropyxidae and Diffugiidae) and 2 order (Pelobiontida and Arcellinida). Four species of flagellate belongs to 2 genera, 1 family (Euglenidae) and 1 order (Euglenida), 4 species of ciliate belongs to 4 genera, 4 family (Colepidae, Vorticellidae, Euplotidae and Paramaeciidae), 2 order (Prorodontida and Peritrichida) and 2 suborder (Sporadotrichinia and Peniculina). Bakare and Nalawade (2012) reported 9 species of Heliozoa from the freshwater bodies of Maharashtra. Kamble (2012) reported 10 species from Pawailake, Maharashtra. Saikh *et al.* (2012) also reported 10 species of protozoa from Salim Ali Lake, Aurangabad and stated that the factor which influence the distribution of protozoa and population by physico-chemical parameters and the food present in the water and degree of adaptability of protozoa to various environmental changes.

In the present study, Among 37 localities, protozoans were observed only in L2, L3, L8, L9, L12, L13, L15, L17, L18, L19, L21, L24, L26, L32, L33, L34 and L36. Protozoan diversity and their abundance were noticed higher in L12, L18, L21, L26, L33 and L34 localities. *Euglena viridis*, *E. acus*, *E. oxyuris* and *Phacus acuminata*, *Pelomyxa palustris*, *Vorticella companula* were found to be higher in abundance and distribution (Table 1). The distribution and abundance of microbial communities is governed by various ecological factors (Vidhyapradhan and Saikh, 2011). Protozoa plays a significant role in the functioning of aquatic ecosystem. They consume bacteria and thus, reduce their number in environments rich in organic matter. They also feed voraciously on phytoplankton (Prat and Cairns, 1985; Finlay *et al.*, 1987) and in thus, are eaten by many species of metazoans (Beck *et al.*, 1977; Porter *et al.*, 1979). The recorded data from the investigation were explored from the localities for first time.

## Conclusion

Monitoring in regular intervals in wetlands are essential since they are the important media for biological resources like zooplankton, micro and macro crustaceans, fishes, birds and mammals. Further studies have to be conducted on seasonal influences which

would reveal the clear picture on protozoan community, distribution and abundance pattern.

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