

Short Note

Occurrence of protozoans & their limnological relationships in some ponds of Mathbaria, Bangladesh

Pronob Kumar Mozumder^{1*}, Marjia Akhter Banu¹, M. Njamul Naser¹, Md. Shahadat Ali¹, Munirul Alam², R. Bradley Sack³, Rita R. Colwell⁴ & Anwar Huq⁵

¹Department of Zoology, University of Dhaka, Bangladesh ; ²Enteric & Food Microbiology Laboratory, ICDDR, B. Dhaka ; ³Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA ; ⁴Center for Bioinformatics & Computational Biology, University of Maryland, College Park, USA ; ⁵Maryland Pathogen Research Institute, University of Maryland, USA.

*Corresponding author E-mail: pronob22du@yahoo.com

Sample collection and identification of protozoans

Water samples were collected fortnightly between October 2004 to May 2005 from four water bodies of Mathbaria of Pirojpur district in Bangladesh. For zooplankton sample collection, 100 liters of water were filtered successively through 20 µm mesh nylon nets (Millipore corp., Bedford, MA), and 50 ml of the concentrates were collected initially as a crude measure of zooplankton. From 50 ml concentrates, 10 ml was used for analysis and the samples were immediately preserved in 5% buffered formaldehyde solution. The bottle containing the zooplankton was gently swirled (clock wise) for equal suspension of zooplankton in the sampled water. By using a clean large mouth 10 ml pipette, 1µl of suspended material was placed in counting cell slot. The counting cell was then covered with a glass slide and examined under a compound binocular microscope at a magnification of 40 X to 100 X. The Protozoan samples were observed under a compound microscope (Axioskop 40, Japan). For protozoans analysis, heliber bacteria single round cell (Cat no. Z 30000 LOT 11756) was used. The specimens were identified up to genera level. Quantitative analysis was followed by the total count method of Welch (1948). Identification was made following Ward & Whipple (1959), Tonapi

(1960), Mellanby (1975), Bhouyain & Asmat (1992), & Ali & Chakrabarty (1992).

Protozoans composition

In this study 3 genera of the protozoans were identified from four ponds of Mathbaria. From the accumulated data in the total study period abundance of protozoans per sampling (per week) varied from 15 individuals/l in March'2005 to 196 individuals/l in October'2004 with an average of 93 individuals/l. (Table 1).

Variations in the percentage composition of average protozoans during the study period were, 1.91% in Kachisira pond, 55.5% in South Mithakhali pond, 10.53% in Mathbaria Bazar pond and 32.06% in BRAC pond (Table 2).

Variations in total protozoans during the study period were 114 ind./l in Kachisira pond, 3305 ind./l in South Mithakhali pond, 627 ind./l in Mathbaria Bazar pond and 1909 ind./l in BRAC pond (Fig.1, Table 2).

From this study of four ponds in Mathbaria *Holophrya* sp. was 0.96%, *Glaucoma* sp. 74.16%, *Nassula* sp. 12.44% and unidentified protozoans were 12.44% of total protozoans in total study period (Table 2, Fig.2).

Table 1. Pond wise variations in the abundance (Individual/l) of protozoan fauna in Mathbaria during the period of October 2004 to May 2005.

Ponds	Months																Average
	Oct.		Nov.		Dec.		Jun.		Feb.		Mar.		Apr.		May.		
	Weeks		Weeks		Weeks		Weeks		Weeks		Weeks		Weeks		Weeks		
	1 st	3 rd	1 st	3 rd	1 st	3 rd	1 st	3 rd	1 st	3 rd	1 st	3 rd	1 st	3 rd	1 st	3 rd	
Kachisira pond	0	57	0	0	0	0	0	0	0	0	57	0	0	0	0	7	
South Mithakhali pond	0	741	342	285	114	114	228	342	342	455	285	0	57	0	0	207	
Mathbaria Bazar pond	0	0	0	114	0	0	242	57	57	0	0	0	57	0	0	33	
BRAC pond	0	0	0	0	57	114	228	57	114	0	57	57	285	542	0	123	
Average	0	196	86	100	43	57	175	114	129	114	100	15	85	150	0	93	

Table 2. Percentage composition of different protozoans in four ponds during the study period in Mathbaria.

Ponds	<i>Holophrya</i> sp.		<i>Glaucoma</i> sp.		<i>Nassula</i> sp.		Unidentified protozoans		Total protozoans	
	Individual/l	%	Individual/l	%	Individual/l	%	Individual/l	%	Individual/l	%
	Kachisira pond	57	50	0	0	0	0	57	50	114
South Mithakhali pond	0	0	2735	82.75	0	0	570	17.25	3305	55.50
Mathbaria Bazar pond	0	0	57	9.09	456	72.93	114	18.18	627	10.53
BRAC pond	0	0	1624	85.07	285	14.93	0	0	1909	32.06
Total	57	0.96	4416	74.16	741	12.44	741	12.44	5955	100
Average	14		1,104		185		185		1,489	

Relationship among the different physico-chemical variables and protozoans in the ponds.

The coefficient of correlation between physico-chemical parameters and protozoans of four ponds during the study period were calculated (Table 3). The relationships are summarized below:

Water temperature showed direct positive relationship with air temperature ($r=0.941$). Water temperature showed positive relationship with pH ($r=0.676$) and DO ($r=0.348$). pH showed positive relationship with DO ($r=0.351$).

Protozoans showed positive relationship with dissolved oxygen (DO) ($r=0.227$) while inversely related with water temperature ($r=-0.276$) and pH ($r=-0.397$).

Table 3. Co-efficient of correlations (r) between physico-chemical variables and protozoans composition of four ponds in Mathbaria during the study period.

Sl. No.	Parameters	Co-efficient of correlations 'r'
1.	Air temperature and water temperature	0.941
2.	Water temperature and pH	0.676
3.	Water temperature and DO	0.348
4.	pH and DO	0.351
5.	Water temperature and protozoans	-0.276
6.	pH and protozoans	-0.397
7.	DO and protozoans	0.227

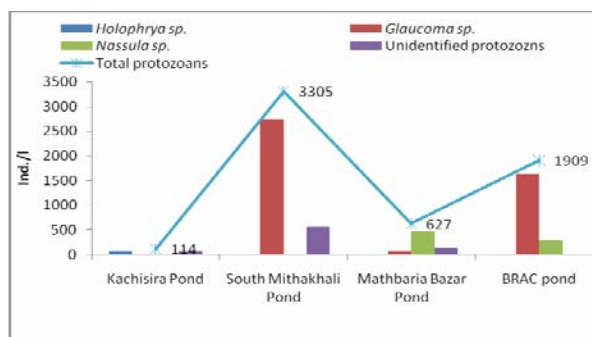


Fig. 1. Occurrence of different protozoan fauna in four ponds during the study period.

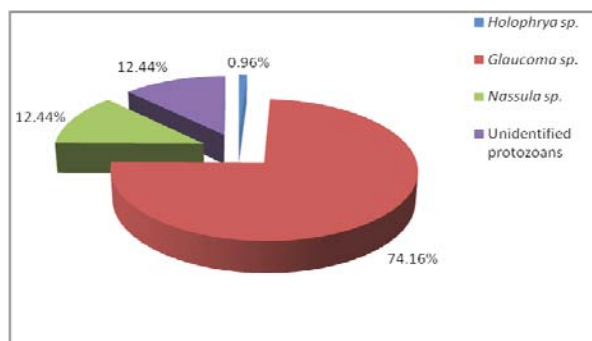


Fig. 2. Showing the average percentage occurrences of different groups of protozoan fauna of four ponds in Mathbaria, during the study period.

Conclusion

It is evident from the study that the protozoans showed variation in the selected aquatic environments. The variation depends on the different physico-chemical variables that exist in the pond ecosystem. However, considering the nature of the ponds, as no fertilizer or nutrients added in the systems, natural productivity of the studied ponds were very high.

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