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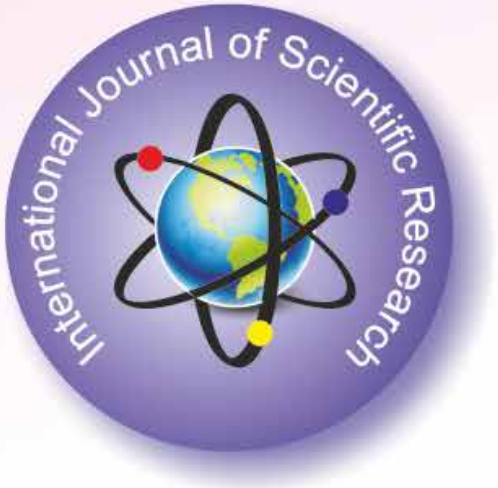

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Research Paper

Protozoan diversity of Kapsi lake kapsi (MS) India

Zoology

KEYWORDS :Kapsi lake , Protozoan diversity, Actinopods ,Flagellates, and Ciliates .

Ade P. P. Assistant Professor Department of zoology, Shri Shivaji college of Arts, Commerce and Science Akola

ABSTRACT

Protozoa play an important role in the stability of water ecosystems, particularly through its involvement in the decay of macrophytes, in the decreasing of the level of water saprobia and serving as a link in the transfer of food and energy in food chains of aquatic ecosystems.Protozoan diversity of Kapsi lake Kapsi investigated under UGC minor research project scheme during May 2005 to May 2006. 57 protozoan species were investigated among them actinopodes (20) species; ciliates (23) species and flagellates (14) species . Prominent among them are Ciliates 40 % followed by actinopods 35% and flagellates 25% observed in the lake water.

Introduction

Importance of protozoa as bioindicators for pollution and environmental biomonitoring has been recognized since long particularly in water purification plants and activated sludge processes (Kelkwitz and Marson, 1908). Actinopod, Flagellate and ciliates protozoa represents a diverse group of organisms with higher metabolic rates and great range in form and function (Fenchel 1987); Hunter and Gary (1990).There are many research which had done water quality survey by using protozoa diversity as indicator. Poowadon (2003) studied diversity of protozoa Nam-Pong-river, Khonkhan provinence during July 2001 to July 2002(12months) He found 2 classes such as class euglenoidea and Lobosea. But the occurrence and distribution of free-living protozoa in different wetlands of India have not so far been analysed and evaluated and hence the present analysis of water sample for protozoan diversity of Kapsi lake Kapsi were made during May 2005 to May-2006. Several investigators recorded the freeliving protozoa from ponds and lakes in India Mahajan and Nair (1965), Mahajan et al. (1981), Das et al. (1993), Mukherjee and Das (2000) and Bindu (2008,in press) reported an appreciable number of species from freshwater and brackishwater wetland ecosystems across India. According to Bindu (2008) estimate 1247 species of free-living protozoa have been recorded from India including the estuarine and marine species. Such type of study were not available on kapsi lake therefore present investigation on protozoan diversity were carried out during May-2005 to May2006 on Kapsi lake Kapsi.

Methodology

Monthly water sample were collected for qualitative analysis of protozoan diversity from eight selected station with the help of plankton net 50um diameter from Kapsi Lake Kapsi during May 2005 to May 2006. For the collection of freshwater protozoa water samples also collected along with some algae, water weeds, bottom ooze and flocculent matter arising out of washing of water weeds and aquatic plants were collected and kept in wide mouthed sampling jars made up of glass. These jars were then brought to the laboratory and kept for few days, keeping their lids open for considerable increase in protozoa population occurring in those samples. The samples were then thoroughly examined under the light microscope from time to time. Lugol's solution was added as killing agent and for detecting peripheral organellae. By using microscopic image capture unit actual image were taken under the microscope. Identification of protozoans were made with help of monograph were described in "Freshwater biology" by Edmondson, (1959).

Results and discussion

In the present study 57 species of Protozoan (20 Actinopodes, 14 flagellates and 23 ciliates) were recorded from Kapsi lake Kapsi (Table1& fig 1to57).Several workers in India investigated freeliving protozoan diversity among them are Wallich (1864) recorded four species of Difflugia from Gangetic Sundarbans of Lower Bengal; Ghosh (1918-b 1929) published a series of papers reporting 29 species of freeliving ciliates and one species of testacid rhizopod from Kolkata and its nearby localities; Mahajan and Nair (1965) published the occurrence of 19 species of freeliving ciliates from Kolkata and its vicinity. Mukherjee and Das (2000) recorded 5 species of ciliates from Renuka wetland which is a Ramsar site in Himachal Pradesh. In the present study 57 species of protozoans belong to 46 genera were investigated from the lake water. Ciliates exhibited 21 genera and 23 species, actinopods 15 genera and 20 species and in flagellate 10 genera and 14 species were recorded. Similar Study has also made by Mahajan et al. (1981) on free-living protozoa in Ramsar site, Bharatpur Bird Sanctuary situated in eastern Rajasthan between27º 07'-27º 12' N latitudes and 77º 29'-77º 33' E longitudes. Protozoan species belonging to 78 genera and 117 species were recorded from Bharatpur wetland ecosystem.

Table:-1 Protozoan diversity of kapsi lake Kapsi

Sr.no	Actinopodes	Sr.no.	Ciliates	Sr.no.	Flagellates
1	Acanthocystis chaetophora	1	Climacostomum virens	1	Chlamydomonas cingulata
2	Amoeba proteus	2	Colpoda cucullus	2	Chlamydomonas sp
3	Antarcell pseudarcella	3	Discomorpha pectinata	3	Chlorella sp
4	Arcella polypore	4	Enchelis simplex	4	Condoneca inclinata
5	Arcella vulgaris	5	Enchelyodon elegans	5	Dinomonas vorax
6	Awerintzewia cyclostomata	6	Epistylis plicatilis	6	Euglena sp1
7	Awerintzewia sp	7	Glaucoma scintillans	7	Euglena sp2
8	Centrophyxis haemisphericus	8	Glaucoma sp	8	Euglena viridis
9	Centropyxis ecornis	9	Gonostomum affine	9	Lepocynclis ovum
10	Difflugia lebes	10	Homalogastra sp	10	Noctilluca sp
11	Euglepha laevis	11	Metacineta mystacine	11	Peridinium palatinum
12	Hylosphenia cuneata	12	Ophisthonecta sp	12	Physomonas sp 1
13	Lecythium hyalinum	13	Orthodon hamatus	13	Physomonas vestita
14	Nebela caudate	14	Paraholosticha herbicola	14	Vampyrella sp
15	Nebela flabellulum	15	Paramecium sp		
16	Paraquadrula irregularis	16	Paravarticella crassucaulis		
17	Pelomyxa palutris	17	Pelodinium remoforme		
18	Pyxidicula operculata	18	Platyophrya vorax		
19	Pyxidicula scutella	19	Polystomella sp		
20	Quadrulella symmetrica	20	Spasmostoma viride		
		21	Tetrahymena pyriformes		
		22	Trachilioides recta		
		23	Vorticella campanula		

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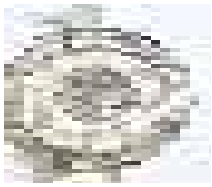
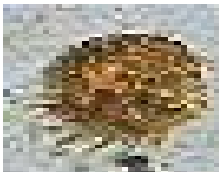
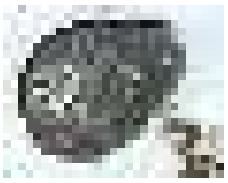
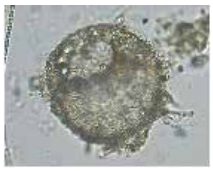
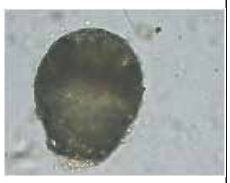
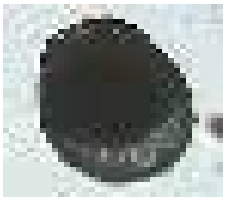
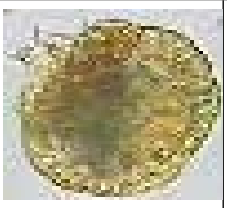
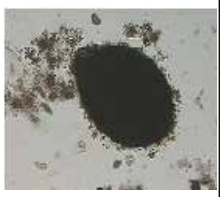
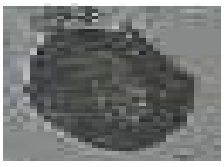
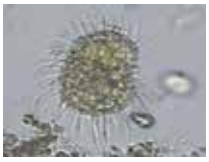
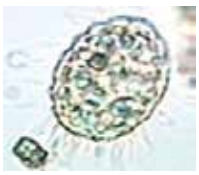
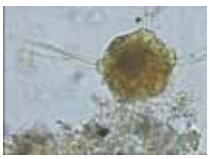
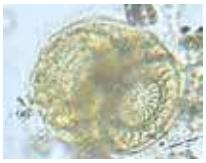
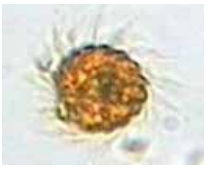
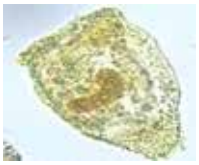
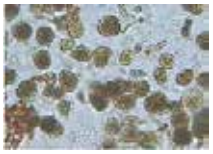
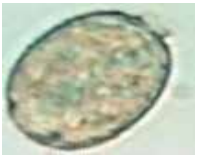
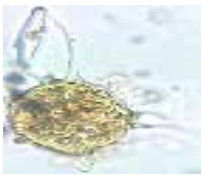
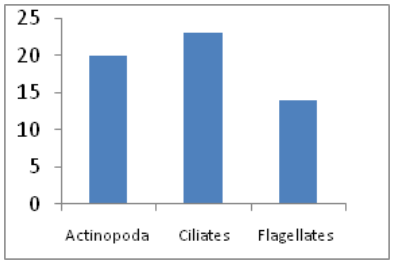
Fig. 1-60 Protzoan of Kapsi lake kapsi dist. Akola

Actinopods				
				
Fig 1.Acanthocystis chaetophora	Fig 2 Amoeba proteus	Fig.3 Antarcell pseudarcella	Fig.4 Arcella polypore	Fig.5 Arcella vulgaris
				
Fig.6Awerintzewia cyclostomata	Fig.7Awerintzewia sp	Fig.8Centrophyxis haemispericus	Fig.9 Centropyxis ecornis	Fig.10Difflugia lebes
				
Fig.11Euglepha laevis	Fig.12Hylosphenia cuneata	Fig.13Lecythium hyalinum	Fig.14Nebela caudate	Fig.15Nebela flabellulum
				
Fig.16Paraquadrula irregularis	Fig.17Pelomyxa palutris	Fig.18Pyxidicula operculata	Fig.19Pyxidicula scutella	Fig.20Quadrulella symmetrica
Ciliates				
	Fig.21Climacostomum virens	Fig.22Colpoda cucullus	Fig.23Discomorpha pectinata	Fig.24Enchelis simplex
				
Fig.25Enchelyodon elegans	Fig.26Epistylis plicatilis	Fig.27Glaucoma scintillans	Fig.28Glaucoma sp	Fig.29Gonostomum affine
				
Fig.30Homalogastra sp	Fig.31Metacineta mystacine	Fig.32Ophisthonecta sp	Fig.33Orthodon hamatus	Fig.34Paraholosticha herbicola

				
Fig.35Paramecium sp	Fig.36Paravarticella crassucaulis	Fig.37Pelodinium remoforme	Fig.38Platyophrya vorax	Fig.39Polystomella sp
				Flagellates
Fig.40 Spasmostoma viride	Fig.41 Tetrahymena pyriformes	Fig.42Trachilioides recta	Fig.43 Vorticella campanula	
				
Fig. 44 Chlamydomonas cingulata	Fig. 45Chlamydomonas sp	Fig.46 Chlorella sp	Fig.47 Condoneca inclinata	Fig. 48Dinomonas vorax
Fig. 49Euglena sp1	Fig.50 Euglena sp2	Fig.51Euglena viridis	Fig. 52 Lepocynclis ovum	Fig. 53 Noctilluca sp
				
Fig. 54 Peridinium palatinum	Fig.55 Physomonas sp1	Fig. 56 Physomonas vestita	Fig.57 Vampyrella sp	



Graph 1 :- Comparative Protozoan diversity of Kapsi Lake Kapsi.

Graph:-2 Percentagewise distribution of Actinopods, Ciliates and flagellates in Kapsi lake Kapsi.

Comparative study of protozoan shows that ciliates shows first order followed by actinopod species and third order were by ciliate species in the lake water during study period (Graph 1and 2).

Conclusion

From the above result and discussion free living protozoa from lake water shows huge diversity. The importance of these organisms as bioindicators for pollution and environmental biomonitoring of waterbodies express that the oligomesotrophic nature of Kapsi lake. It is, urgent need to conserve this water body.Acknowledgements – I express my sincere thanks to UGC for the financial assistance for completion of this project under minor research project scheme (Letter No. F. 47 – 288/2004 Dated 7 Feb – 2005)

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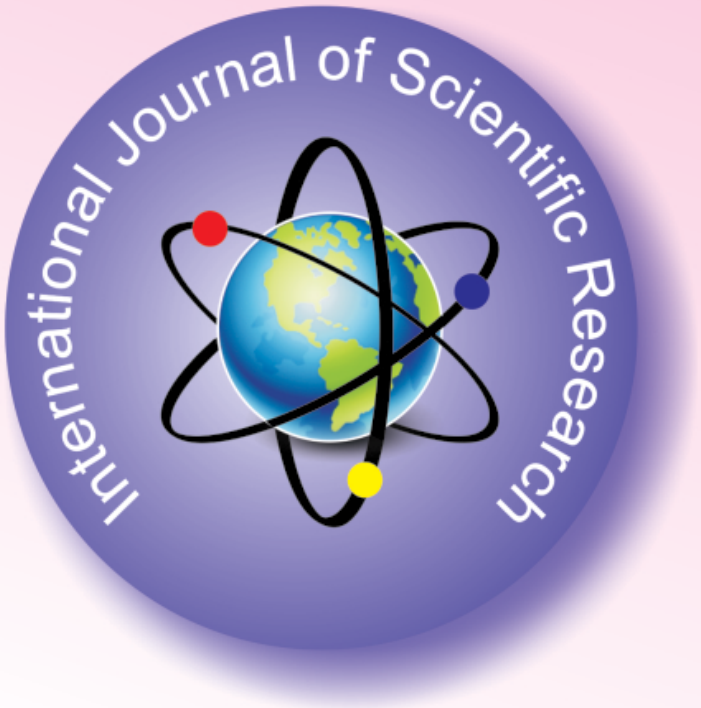

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