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Rotifer diversity of Malhara pond of Bhadrawati, Dist- Chandrapur (M.S.), India.

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ABSTRACT

Rotifers, the group of microscopic soft bodied freshwater invertebrates form an important connecting link between primary producers and consumers of higher orders in an aquatic food web. The present paper describes the biodiversity of Rotifera fauna of Malhara pond, located near the Bhadrawati town of Chandrapur district. Qualitative and quantitative analysis of rotifer community was undertaken on monthly basis from October 2005 to September 2007. A total of 24 rotifer species belonging to 15 genera were identified during the period of Oct. 2005 to Sep. 2006, while a total of 22 rotifer species belonging to 15 genera were identified from Oct. 2006 to Sep 2007. The genus *Brachionus* were recorded as the most diversified genera being represented by seven species. The present study demonstrated that rotifers reaches the peak in density and diversity during summer and decreases during the monsoon season. The seasonal fluctuation of this group is discussed in the light of recent literature.

KEY WORDS

Malhara pond, Rotifer diversity, Seasonal variation.

INTRODUCTION

Rotifers occur almost everywhere in aquatic ecosystems and constitute an important group of zooplankton community in aquatic ecosystems of the world. The abundance of rotifers is more or less governed by the interaction of number of physical, chemical and biological properties of lake waters and is related to the suitable conditions for their survival in the lake. According to Shadick (1983), the population of Rotifera is very useful in indicating water quality particularly in pollution studies and as such, it is regarded as a valuable bioindicator of water quality. This group not only forms an integral part of the aquatic food chain but also acts as an important link between the nonplankton and carnivorous zooplankton (Neves et al., 2003).

The present investigation has been undertaken to study the qualitative and quantitative analysis of rotifer community at the Malhara pond located near Bhadrawati town of Chandrapur district.

MATERIAL AND METHODS

The Malhara pond is situated on the west side, four miles away from the Bhadrawati town and at about 206 m. above the mean sea level and is at 79° 06' 48" E longitude and 20° 06'48" N latitude. Samples for plankton were collected monthly in the morning hours between 8.30 to 10.30 a.m. About 50 Lt. of water sample was filtrated through the plankton net made up of bolting silk number 25 with mesh size 64 lime. The collected samples were allowed to settle down by adding Lugol's iodine. Normally, sedimentation requires 24 hrs. After which supernatant was removed and concentrate was made up to 50 ml depending the number of plankton and preserved in 5% Formalin for further studies.

The quantitative study of rotifers was done by Sedgwick–Rafter cell method, the concentrated sample was shaken and immediately one drop of sample was taken on a clear micro side with the help of a standard dropper, the whole drop was then carefully covered with the cover glass and observed. Identification up to genera and whenever possible up to species level was classified according to keys given by Prescott (1954), Edmonson (1959), Sehgal (1983), Adoni (1985) and APHA (1985) and standard analysis was undertaken as per Zar (2005).

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RESULT AND DISCUSSION

During the year 2005-06, 24 species were recorded among which *Platyias quadricornis* (41 no./lit) is dominant followed by *Polyarthra vulgaris* (36 no./lit), *Monostyla bulla* (29 no./lit), *Brachionus bidentatatus* (20 no./lit), *Brachionus plicatilsi* (17 no./lit), *Rotaria neptunia* (16 no./lit), *Philodina roseota* (15 no./lit), *Trichocera rattus* (9 no./lit), *Brachionus forficula* (9 no./lit), *Philodina* sp. (9 no./lit), *Brachionus falcatus* (8 no./lit), *Brachinus calyciflorus* (8 no./lit), *Horaella brehmi* (8 no./lit), *Brachionus angularis* (7 no./lit), *Testudinella macroneta* (6 no./lit), *Euplotes* sp. (6 no./lit)), *Keratella valga* (6 no./lit), *Asplanehnopus myrmeleo* (5 no./lit), *Cephalodella gibba* (5 no./lit), *Platyias patulus* (5 no./lit), *Brachionus quadridentata*tus (5 no./lit) and *Rotaria citrina* (4 no./lit).

During the year 2006-07, 22 species were recorded among which *Platyias quadricornis* (26 no./lit) is dominant followed by *Polyarthra vulgaris* (22 no./lit), *Monostyla bulla* (19 no./lit), *Brachionus falcatus* (19 no./lit), *Brachionus calyciflorus* (12 no./lit), *Brachionus bidentates* (13 no./lit), *Brachionus pilcatllis* (13 no./lit), *Lecane luna* (12 no./lit), *Rotaria neptunia* (7 no./lit), *Philodina roseota* (11 no./lit), *Brachionus angularis* (9 no./lit),

Trichocerca rattus (8 no./lit), *Brachionus forficula* (8 no./lit), *Euplotes* sp. (7 no./lit), *Filinia longiseta* (7 no./lit), *Testudinella macroneta* (5 no./lit), *Asplanehnopus myrmeleo* (5 no./lit), *Cephalobdella gibbba* (5 no./lit), *Brachionus quadridentatatus* (5 no./lit), *Horaella brehmi* (5 no./lit), *Keratell valga* (5 no./lit) and *Philodina* (4 no./lit).

According to Shadick (1983), Rotifera population is very useful in indicating water quality particularly in pollutioin studies. Rotifers are regarded as valuable bioindicator of water quality. Rotifera forms an integral part of the aquatic food chain. Their role as link between the nonplankton and carnivorous zooplankton is well established. They play a key role in cycling of organic materials.

In the present investigation Rotifera is represented by 24 species (2005-06) and 22 species (2006-07). Isaiarasu et al., (1995) recorded 11 species of Rotifera in a ponds of Sivakashi, Tamilnadu. Kamble and Meshram (2005) reported five species of Rotifera in Khatijapur tank, Achalpur, Amraoti district of Maharashtra. Pawar and Pulle (2005) reported 28 species of Rotifera in Petwadaj dam, Nanded district of Maharashtra. Sahoo et al., (2006) reported 25 species of Rotifera in a fish pond in Thothukudi, Tamilnadu. Jayabhaye and Madalapoure (2006) reported 14 species of Rotifera in Parola dam, Hingoli, Maharashtra. Sharma et al., (2007) reported 28 species of Rotifera in and around Udaipur city, Rajasthan. Chargan et al., (2008) reported seven species of Rotifera in freshwater wetlands in Yeotmal district of Maharashtra.

Among the different species of Rotifera, *Brachionous caliciflorus* was dominant followed by *Cephalodella gibba*, *Rotaria rotatoria, Monostyla bulla, Polyarthra vulgaris, Filinia longiseta, Epistylis plicatilis, Brachionus plicatilis, Euplotes* sp., *Rotaria neptunia* and *Philodina roseota.*

According tho Charjan et al., (2008) occurances of *Brachionus* sp. is a definite indicator of the eutrophic nature of lake. The higher diversity as well as biomass of a *Brachionus* sp.in the zooplankton community clearly indicates that most of the ponds are polluted by the organic pollution mostly contributed by the domestic sewage (Shedick, 1983, Saksena and Bhaskaran, 1983 and Isaiarasu, 1992).

In the present investigation, rotifers were maximum during the summer season and minimum during the monsoon season. Rotifers utilize nutrient more rapidly to build up their population (Sabboor and Altaf, 1995). Kedar (2007) recorded maximum Rotifera during the March and minimum during July. Low value of Rotifers population density and diversity was observed during the monsoon which could be due to dilution of water resulting in less nutrient or could be due to reduction of transparency and dissolved oxygen. (Kedar and Patil, 2002).

In the present investigation, maximum Rotifera during the summer is probably due to high water temperature and abundance of sulphates and phosphates.

Table No. 1: Monthly variation of Rotifera in Malhara Pond During 2005-06

Sr. No.	Components	Winter				Summer				Monsoon				Total
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	*Asplanehnopus myrmeleo*	0	1	1	1	0	0	0	0	1	1	0	0	5
2	*Brachionus angularis*	0	0	0	0	0	0	0	0	1	1	1	4	7
3	*Brachionus bidentata*	5	2	2	1	0	0	0	0	1	2	4	3	20
4	*Brachionus calyciflorus*	1	1	1	1	0	0	0	0	1	1	1	1	8
5	*Brachionus falcatus*	0	0	0	0	4	0	0	0	1	1	1	1	8
6	*Brachionus forficula*	0	1	1	2	0	0	0	0	2	1	2	0	9
7	*Brachionus plicatilis*	5	3	3	1	0	0	0	0	1	1	1	2	17
8	*Brachionus quadridentatus*	0	0	1	1	0	0	0	0	1	1	1	0	5
9	*Cephalodella gibba*	0	0	1	1	0	0	0	0	1	1	1	0	5
10	*Euplotes sp.*	0	1	1	1	0	0	0	0	1	1	1	0	6
11	*Filinia longiseta*	1	0	0	1	6	2	0	0	1	1	1	0	13
12	*Horaella brehmi*	0	1	0	0	0	0	0	0	1	1	1	4	8
13	*Keratella valga*	1	0	0	0	0	0	0	0	1	1	1	2	6
14	*Lecane luna*	1	1	1	1	0	0	0	0	1	3	3	4	15
15	*Monostyla bulla*	1	0	0	0	0	7	7	14	0	0	0	0	29
16	*Philodina sp.*	0	1	1	1	0	0	0	6	0	0	0	0	9
17	*Philodina roseola*	3	4	3	1	0	0	0	0	1	1	2	0	15
18	*Platyias patulus*	0	0	1	1	0	0	0	0	1	1	1	0	5
19	*Platyias quadricornis*	0	0	0	1	11	13	6	7	1	1	1	0	41
20	*Polyarthra vulgaris*	5	3	0	1	0	2	14	6	1	1	1	2	36
21	*Rotaria citrina*	0	0	0	1	0	0	0	0	1	1	1	0	4
22	*Rotaria neptunia*	5	3	3	3	0	0	0	0	0	2	0	0	16
23	*Testudinella macroneta*	0	2	3	1	0	0	0	0	0	0	0	0	6
24	*Trichocerca rattus*	0	1	1	7	0	0	0	0	0	0	0	0	9
	Total	**28**	**25**	**24**	**28**	**21**	**24**	**27**	**33**	**20**	**24**	**25**	**23**	**302**

Table No. 2: Monthly variation of Rotifera in Malhara Pond During 2006-07

Sr. No.	Components	Winter				Summer				Mansoon				Total
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	*Asplanehnopus myrmeleo*	0	1	1	1	1	1	0	0	0	0	0	0	5
2	*Brachionus angularis*	0	0	0	0	1	1	1	6	0	0	0	0	9
3	*Brachionus bidentata*	1	0	0	1	1	1	3	6	0	0	0	0	13
4	*Brachionus calyciflorus*	1	1	6	1	1	1	1	1	0	0	0	0	13
5	*Brachionus falcatus*	0	0	0	0	1	1	1	5	11	0	0	0	19
6	*Brachionus forficula*	1	2	1	1	1	1	1	0	0	0	0	0	8
7	*Brachionus plicatilis*	1	1	5	1	1	1	1	1	0	0	0	0	12
8	*Brachionus quadridentatus*	0	0	1	1	1	1	1	0	0	0	0	0	5
9	*Cephalodella gibba*	0	0	1	1	1	1	1	0	0	0	0	0	5
10	*Euplotes species*	1	1	1	1	1	1	1	0	0	0	0	0	7
11	*Filinia longiseta*	1	1	1	1	1	1	1	0	0	0	0	0	7
12	*Horaella brehmi*	0	1	0	0	1	1	1	1	0	0	0	0	5
13	*Keratella valga*	1	0	0	0	1	1	1	1	0	0	0	0	5
14	*Lecane luna*	1	1	1	1	3	2	2	1	0	0	0	0	12
15	*Monostyla bulla*	1	0	0	0	0	0	0	0	0	8	8	2	19
16	*Philodina sp.*	1	1	1	1	0	0	0	0	0	0	0	0	4
17	*Philodina roseola*	2	2	2	2	1	1	1	0	0	0	0	0	11
18	*Platyias quadricornis*	0	0	0	1	1	1	1	0	3	10	2	7	26
19	*Polyarthra vulgaris*	2	0	0	0	2	2	2	2	0	0	7	5	22
20	*Rotaria neptunia*	1	0	0	1	1	1	1	0	6	0	0	0	11
21	*Testudinella macroneta*	0	3	1	1	0	0	0	0	0	0	0	0	5
22	*Trichocerca rattus*	1	2	1	4	0	0	0	0	0	0	0	0	8
	Total	**16**	**17**	**23**	**20**	**21**	**20**	**21**	**24**	**20**	**18**	**17**	**14**	**231**

Table No. 3: Seasonal variation of Rotifera in Malhara Pond During year 2005-06

Sr. No.	Components	Winter			Summer			Monsoon		
		Mean		S.D.	Mean		S.D.	Mean		S.D.
1	Rotifera	26.250	±	1.785	26.250	±	4.437	23.000	±	1.871
	Total	26.250	±	1.785	26.250	±	4.437	23.000	±	1.871

Table No. 4: Seasonal variation of Rotifera in Malhara Pond During year 2006-07

Sr. No.	Components	Winter			Summer			Monsoon		
		Mean		S.D.	Mean		S.D.	Mean		S.D.
1	Rotifera	19.000	±	2.739	21.500	±	1.500	17.250	±	2.165
	Total	19.000	±	2.739	21.500	±	1.500	17.250	±	2.165

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