

# Rotifer diversity of Girda temple ponds from Buldana district, Maharashtra

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## Abstract

Very little work is done on temple tanks in Maharashtra state, particularly in Buldana district. A Girda Temple pond has unique place in mythology as well as a distinct aquatic ecosystem. The present investigation was carried out on zooplanktons during Sept.2014 to Nov 2015. Various types of zooplanktons were noticed among them rotifers were dominant than others. We have observed at about 09 genera of rotifers. The density of *Brachionus* sp. was maximum whereas *Philodina* was least. The variation in density and diversity of rotifers are in line with human disturbances, physico-chemical parameters as well as morphometry of water body.

**Keywords:** Rotifers, diversity, Girda temple ponds

## 1. Introduction

The aquatic ecosystem covers a vast area and the organisms occurring in this area are under the influence of its Physico-chemical parameters. The occurrence and abundance of Zooplankton depend on its productivity which in turn influence by a biotic factors. Zooplankton plays an important role in aquatic ecosystem. They link the primary producer, phytoplankton with higher large tropic level organisms. Zooplankton community responds to a wide variety of disturbances including nutrient loading. It also plays a key role in aquatic food chain. Owing to this they have attracted the attention of a large number of researchers throughout the world. The present study is undertaken to investigate the Zooplanktonic diversity in the Girda Temple pond though different months & seasons during the period of Sept 2014 to Nov 2015.

## 2. Material and Methods

### 2.1 Study Area

**Girda Temple Pond:** It is situated about 25 km away from Buldana city. This pond is stagnant, perennial & filled with rain water only. In summer season water is used for drinking purpose in the temple complex. This pond was constricted in 17th century in back rocks. The pond area measures about 35X38 feet and 20 feet deep this pond is Mythologically block only servants are allowed to visit the pond.

### 2.2 Zooplankton

For the study of Zooplankton, samples were collected on fort night basis for a period of 15 months Sept 2014 to Nov 2015. 50L of water was filtered through plankton net of pore size 42 micron. Filtered plankton sample was preserved in 4% formalin and few drops glycerin was added to it. Plankton sample were identified & counted under the microscope using plankton counting chamber <sup>[1-4]</sup>.

## 2.3 Physico-chemical Parameters

For the Physico- chemical studies water samples were collected in 200 ml plastic bottle, the water temperature were recorded by mercury thermometer on the spot for site under study. For dissolved oxygen, net primary productivity & gross primary productivity sample was fixed on the spot in BOD bottle, brought to laboratory and analyzed by modified wrinkles method [A.P.H.A]. Various parameters like free CO<sub>2</sub>, alkalinity, acidity, hardness, calcium, magnesium, chloride & BOD were estimated according to A.P.H.A. <sup>[3]</sup>. Phosphate and Sulphate were estimated by calorimetric method.

## 3. Result and Discussion

Mean monthly values of Girda Temple Ponds presented in table.

1. PH between 7.2 to 9.2 which is minimum in summer and maximum in monsoon.
2. Temperature is a key factor which controls all the chemical reactions and biological processes in a water body. During the present study water temperature varied between 20 °C to 28 °C with low values during winter high during summer.
3. Hardness varied between 124 mg/l to 229 mg/l which is minimum in winter and maximum in summer.
4. Calcium varied between 37 mg/l to 88mg/l which is minimum in winter and maximum in monsoon.
5. Magnesium varied between 53.0 mg/l to 113.2 mg/l which is minimum in summer and maximum in monsoon.
6. Carbon dioxide varied between 12 to 42 which is minimum in summer and maximum in winter.
7. Acidity varied between 14mg/l to 47 mg/l which is minimum in summer and maximum in winter.
8. Dissolved oxygen varied between 2.2 mg/l to 13.2 mg/l maximum values of dissolved oxygen was observed in the month Aug to Dec (minimum in summer & maximum in monsoon) this may be due to abundance of phytoplanktonic diversity <sup>[5]</sup>.
9. Net primary productivity varied between 0.4 mg/l to 3.3 mg/l which is minimum in summer and maximum in monsoon.
10. Gross primary productivity varied between 0.2 mg/l to 3.0 mg/l which is minimum in summer and maximum in monsoon.
11. Alkalinity varied between 71 mg/l to 359mg/l which is minimum in winter and maximum in summer.
12. Chloride varied between 65mg/l to 204 mg/l which is minimum in summer and maximum in monsoon.
13. Phosphate varied between 0.42 mg/l to 0.8 mg/l which is minimum in winter and maximum in monsoon.
14. Sulphate varied between 16 mg/l to 51mg/l which is minimum in monsoon and maximum in summer <sup>[6]</sup>.

15. B.O.D. varied between 0.2 mg/l to 3.5 mg/l which is minimum in winter and maximum in summer.

**Table: Girda Temple Pond**

S. N.	Months Parameters	Months														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	PH	9.3	8.3	8.1	7.6	7.2	8.1	7.4	7.2	8.0	7.5	8.0	8.1	9.2	8.4	8.4
2	Temp. Oc	25	25	23	23	20	22	24	26	28	27	24	24	25	25	23
3	Hardness Mg/l	139	131	125	137	141	160	198	229	220	204	219	170	139	133	124
4	Calcium Mg/l	38	36	36	38	39	48	42	58	81	63	87	72	37	36	36
5	Magnesium Mg/l	61	57	53	60	61	69	92	103	113	85	80	59	61	58	53
6	Co2 mg/l	13	22	37	33	37	29	35	41	29	24	39	35	12	28	28
7	Acidity mg/l	15	25	42	37	42	32	40	46	25	27	44	40	13	32	31
8	DO mg/l	9.3	11.1	8.7	9.1	7.7	10.2	7.6	5.4	4.2	2.2	4.5	13.2	9.6	10.9	9.0
9	NPP mg/l	3.3	1.2	0.6	0.7	0.9	1.2	1.1	0.7	0.5	0.4	1.6	1.0	3.1	1.0	0.8
10	GPP mg/l	3.0	1.0	1.0	1.3	2.0	2.3	2.0	1.6	1.4	0.2	1.5	0.8	3.0	1.3	1.2
11	Alkalinity mg/l	180	732	140	105	99	94	109	149	262	286	359	246	229	72	168
12	Chloride mg/l	152	118	158	142	129	135	117	95	65	98	204	148	152	130	186
13	Phosphate mg/l	0.41	0.64	0.44	0.44	0.60	0.60	0.80	0.75	0.60	0.59	0.66	0.55	0.42	0.63	0.58
14	Sulphate mg/l	20	26	33	28	21	30	33	39	43	51	36	16	20	22	18
15	BOD mg/l	1.0	1.0	2.4	0.2	0.8	1.4	1.6	2.9	3.1	3.3	3.3	3.5	0.9	1.5	2.9

1-Sep, 2-Oct, 3-Nov, 4-Dec, 5-Jan, 6-Feb, 7-Mar, 8-Apr, 9-May, 10-Jun, 11-Jul, 12-Aug, 13-Sept, 14-Oct, 15-Nov

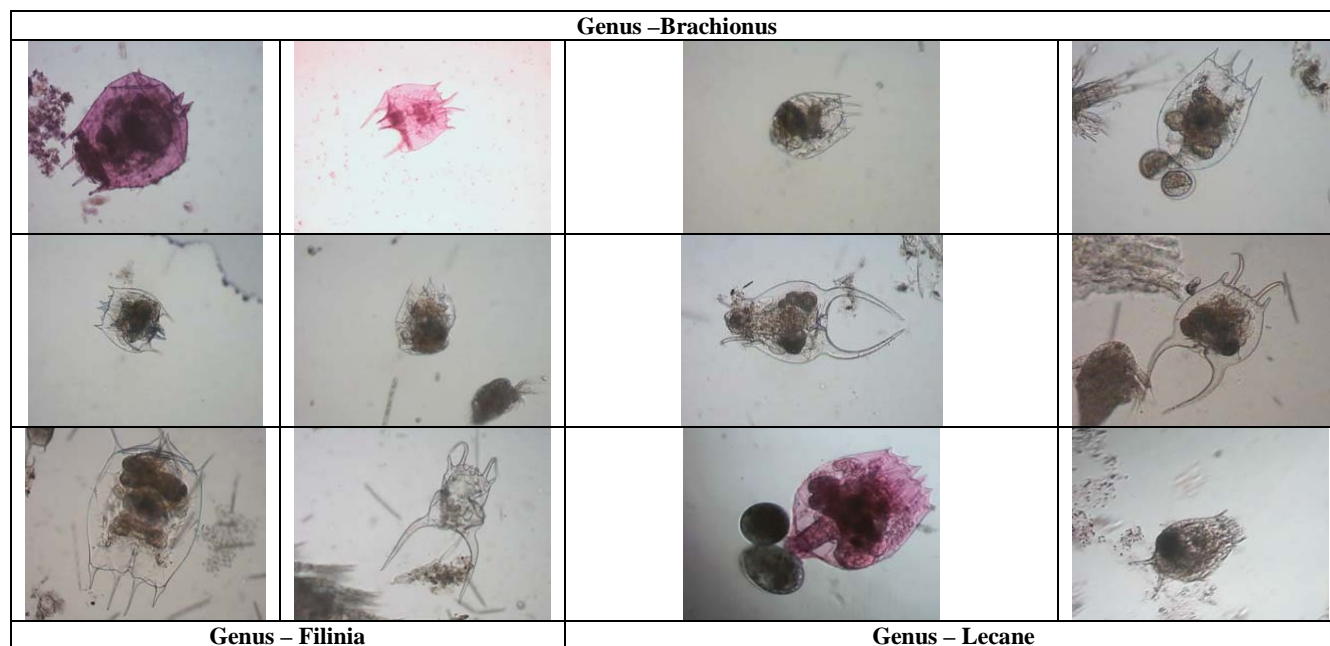
**3.1 Rotifera**

The rotifers play a significant role in aquatic food chain & thereby constitute an important food item to fishes. Rotifers are now being used as an important aquatic faunal component for bio-monitoring. Taxonomic dominance of rotifers was reported in several water bodies. This pattern is common in tropical & subtropical freshwater, whether in lake, ponds, reservoir or streams, [7-8]. In the present study total 09 genera were recorded, among them the most abundant genera were Brachionus, Keratella, Asplanchna. All these genera had earlier been reported from other district of Maharashtra, they are reported for the first time from temple ponds. The maximum diversity of rotifera were observed in the month of April & May because high temperature might have increase the multiplication & metabolic rates of rotifers resulting in

there abundant growth [5]. Genus Brachionus & Keratella were found to be perennial, whereas Keratella found maximum in October and Brachionus was abundant in Jun, July, Aug, Sept. Brachionus was also reported to be dominant form in and around Bikaner [9], and Philodina was minimum observed.

**3.2 List of Rotifera**

Sr. No.	Name of the Genera	Sr. No.	Name of the Genera
1	Brachionus	6	Harringia
2	Filinia	7	Keratella
3	Lecane	8	Testudinella
4	Asplanchna	9	Platytias
5	Monostyla		





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