



AN ANALYSIS OF ZOOPLANKTON IN A MAMA LAKE, NEAR WANI TEHSIL, DISTRICT -YAVATMAL (M.S)

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ABSTRACT: Planktons are important components of Aquatic ecosystem. Quantitative and qualitative abundance of plankton in a water body are of great importance in imposing sustainable management policies as they vary from location to location and aquatic systems within the same location. Seasonal changes in the pattern of zooplankton community have been driven by a combination of abiotic and biotic factors. Zooplanktons are heterotrophic planktonic animals floating in water. They serve as good indicators of changes in water quality. Hence the present study was undertaken to assess the zooplankton diversity in a Mama lake situated nearby Wani, District-Yavatmal, (M.S). Results indicate that 40 species belonging to five different groups were recorded during the period of study. Out of these 40 species, two each belonged to Protozoa and Ostracoda, 27 to Rotifera, 5 to Cladocera, 3 to Copepoda and 1 to Anostraca. A percentage composition reveals that rotifera represented 66.03%, cladocerans 12.23%, protozoans 9.56%, copepodans 7.11% and ostracods, 3.51% respectively.

Key words: - Mama Lake, Zooplankton, Protozoans, Rotifers, Copepods, Cladocerans, Ostracods.

INTRODUCTION:

Plankton is the most sensitive floating community which is being the first target of water pollution, thus any undesirable change in aquatic ecosystem affects diversity as well as biomass of this community. Human demands on freshwater ecosystems have risen steeply over the past century leading to large and growing threats to biodiversity around the world (Dudgeon et al., 2006). As a result of this global crisis, documenting losses of biodiversity, diagnosing their causes and finding solutions have become a major part of contemporary freshwater ecology (Strayer and Dudgeon, 2010). Further, the qualitative and quantitative abundance of plankton in a water body are of great importance for imposing sustainable management policies as they vary from location to location and aquatic systems within the same location with similar ecological conditions (Boyd, 1982). In addition, in many lakes and reservoirs zooplankton community have been reported to show changes in abundance of specific taxa during the late

spring through summer especially in the tropics (Sivakamiet al., 2015). Seasonal patterns in zooplankton communities of lakes and reservoirs are recognized as being driven by a combination of abiotic factors (Moore and Folt, 1993; Benndorfet al., 2001), nutrients (Urabe et al., 1997) as well as biotic factors like competition (Gliwicz and Pijanowska, 1989). Hence the present study was undertaken to study the zooplankton community in a Mama lake situated nearby Wani Tehsil, Dist- Yavatmal (M.S.).

MATERIALS AND METHODS:

The aquatic system chosen for the present investigation is a lake situated in Yavatmal District and referred to as Mama Lake. The zooplankton net used in the present study was of 270 mesh sieve (pore diameter 20-30µ). The zooplankton were fixed immediately with 4% formalin for further microscopic analyses. Identification of planktons was done after Clegg (1956), Edmondson (1959), Hutchinson (1967),

Michael (1973), Ward and Whipple (1963), Pennak (1978), APHA (1989) and Sridharan (1989).

RESULT AND DISCUSSION:

Mama Lake harbour diverse taxonomic groups of zooplankton represented in table. As seen from the tables, the zooplankton that occurred in the lake belonged to five different groups Protozoa, Rotifera, Ostracoda, Cladocera and Copepoda. On the whole, a total of 40 species were recorded in the lake during the period of study.

As evident from the table 1, only two species of protozoans were recorded; of these, only one species viz., *Paramecium caudatum* was perennial. The other species (*Diffugia oblongata*) occurred only between December and July recording its highest count in June. *P. caudatum*, on the other hand, recorded the highest count in May. Thus the high counts of protozoans appeared in May and June. Comparing both the species reveals that *P. caudatum* was dominant over *D. oblongata* in terms of number.

Sivakami (1996) recorded maximal protozoan counts from June to September with intermediate peaks between October and November and February to May. In the present study, there was a gradually increasing trend from September to reach the peak in June followed by a decline till August. Similarly, Pathak and Mudgal (2004) and Kiran et al. (2007) were able to record the presence of two species of protozoans while Srivastava (2013) was able to record only one species in a water body of North India.

The various zooplanktons that represented the group Rotifera are presented in table 2. In present study, a total of 27 species belonging to 16 genera were recorded. Of these, the genus *Brachionus* was represented by 7 species, while the genera like *Filinia*, *Keretella*, *Lecane*, *Rotaria* and *Trichocerca* were all represented by two species each and the remaining genera were represented by a single species. Literature reveals that the genus *Brachionus* is the most common rotifer

genera recorded in most of the water bodies of India (Sreenivasan, 1974; Rajalakshmi, 1980; Malarvizhi, 1989; Kastooribai, 1991; Sivakami, 1996; Rajasekhar et al., 2010; Singh et al., 2012; Srivastava, 2013). In the present findings also, *Brachionus* was the most common genera in lake. According to Goldman and Horne (1983) almost all fish feed on tiny rotifers during their early development while Bogdan and Gilbert (1984), reported that rotifers are the dominant members of the zooplankton in most aquatic systems and Sharma (1991) suggested that of the different rotifers identified so far, the rotifers belonging to the genus *Brachionus* are more suitable for feeding fish larvae. Recently, Tidame and Shinde (2012) suggested that rotifers are used as an important aquatic faunal component for biomonitoring.

The various cladoceran species that were recorded in the lake are presented in table 3. As seen from the table, a total of 5 species belonging to 3 genera were recorded. Of these, 2 species each belonged to the genus *Daphnia* and *Monia* and one to the genus *Bosminia*. Among these, only one species, *Daphnia pulex*, was perennial. Among the cladocerans, the most dominant species was *D. pulex* followed by *M. micrura* while the least dominant one was *M. brachiata* in terms of their count.

The group Anostraca (Table 3) was represented by a single species *Streptocephalus dichotomus*. It was not a perennial species. When present, it was recorded between June and October showing the highest count in October.

The copepods that occurred in the lake are presented in table 4. A total of 3 copepods occurred during the period of study of which only one species viz., *Mesocyclops thalassinus* was perennial. The other two species, *Diaptomus castor* and *Heliodiaptomus viduus* occurred only in certain months of the year. *D. castor* occurred only between May and October and *H. viduus* from July to October.

The Zooplanktons of group Ostracoda was represented only by two species (Table 5). None of the species were perennial; while *Heterocypris malcolmsonii* was found to occur between July and December, *Cyprissubglobosa* was found to occur between January and June.

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Table-1: Protozoan population of Mam Lake (i/l) during year 2020-2021.

S.No.	Protozoa	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	<i>Diffflugia oblongata</i>	120	0	0	0	0	20	40	60	170	280	390	380
2	<i>Paramecium caudatum</i>	130	60	60	80	110	220	230	250	360	420	480	340
Total Count		250	60	60	80	110	240	270	310	530	700	870	720

Table-2: Rotifer population of Mam Lake (i/l) during year 2020-2021.

S. No	Rotifera	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	<i>Asplanchnasieboldi</i>	20	60	140	110	210	220	280	440	380	240	120	60
2	<i>Brachionusangularis</i>	0	0	0	0	10	30	150	80	10	0	0	0
3	<i>B. bidentata</i>	10	30	120	170	110	220	330	440	450	330	220	100
4	<i>B. calyciflorus</i>	10	30	90	190	210	260	340	490	400	310	280	140
5	<i>B. caudatus</i>	0	0	0	0	0	0	10	20	80	40	0	0
6	<i>B. diversicornis</i>	40	20	10	0	0	20	70	130	90	40	50	50
7	<i>B. pilicatilis</i>	10	20	80	40	10	20	80	140	90	80	40	10
8	<i>B. rubens</i>	40	90	160	120	150	160	180	230	280	240	180	140
9	<i>Cephalodellagibba</i>	10	30	70	110	70	0	0	0	0	0	0	0
10	<i>Conochilusarboreus</i>	0	0	0	0	10	20	50	160	130	0	0	0
11	<i>Epiphanesseneta</i>	40	160	240	180	0	0	0	0	0	0	10	30
12	<i>Filinialongiseta</i>	40	160	240	140	120	220	310	340	260	170	140	40
13	<i>F. terminalis</i>	0	0	0	0	0	20	60	110	80	40	10	0
14	<i>Kellicottialongispina</i>	10	40	80	70	30	10	0	0	0	0	0	0
15	<i>Keretellacochelearis</i>	10	40	80	40	70	110	120	180	140	50	20	10
16	<i>K. quadrata</i>	0	0	0	30	60	90	160	90	60	20	0	0
17	<i>Lecaneluna</i>	10	40	100	70	110	120	230	160	120	120	60	40
18	<i>L. angulate</i>	0	0	10	20	130	140	200	260	170	70	0	0

19	<i>Notholcaacuminata</i>	0	0	0	0	0	10	60	130	240	130	70	40
20	<i>Philodinaroseola</i>	0	0	10	30	20	0	0	0	0	10	40	20
21	<i>Platyiaspatulus</i>	10	40	120	200	110	190	210	320	260	140	40	30
22	<i>Polyarthra vulgaris</i>	0	0	0	0	0	0	0	0	0	0	0	0
23	<i>Rotariacitrinis</i>	90	120	180	140	110	230	240	320	410	210	160	0
24	<i>Rotariarotatoria</i>	0	0	0	0	0	10	40	70	130	120	90	0
25	<i>Testudinella patina</i>	0	0	0	0	0	0	0	0	0	0	0	0
26	<i>Trichocercacapucina</i>	0	0	0	0	10	40	120	170	80	30	0	0
27	<i>T. longiseta</i>	10	30	140	90	20	80	140	160	140	100	40	20
Total Count		360	910	1870	1750	1570	2220	3380	4440	4000	2490	1570	730

Table-3:Cladoceran and Anostracan population of Mam Lake (i/l) during year 2020-2021.

S. No	Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Cladocera													
1	<i>Bosminalongirostris</i>	0	0	0	0	0	10	30	40	130	220	60	0
2	<i>Daphnia carinata</i>	0	0	0	10	30	40	50	120	160	130	40	0
3	<i>Daphnia pulex</i>	10	20	30	70	110	120	230	350	360	470	240	120
4	<i>Moinabrachiate</i>	10	20	10	0	0	0	0	10	20	80	20	0
5	<i>Moinamicrura</i>	0	0	0	0	10	60	20	130	180	220	140	60
Total Count		50	110	90	190	410	620	1120	1560	2140	2560	1280	350
Anostracan													
1	<i>Streptocephalusdichotomus</i>	20	30	140	210	130	0	0	0	0	0	0	10

Table-4:Copepode population of Mam Lake (i/l) during year 2020-2021.

S. No.	Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	<i>Diatomus castor</i>	40	70	140	120	0	0	0	0	0	0	10	20
2	<i>Heliodiatomusviduus</i>	30	70	180	120	40	20	0	0	0	0	0	0
3	<i>Mesocyclopshyalinus</i>	170	220	230	340	150	90	10	40	60	70	120	140
Total Count		240	360	550	580	190	110	10	40	60	70	130	160

Table-5:Ostracodan population of Mam Lake (i/l) during year 2020-2021.

S.No.	Ostracoda	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	<i>Heterocyprismalcolmsonii</i>	30	40	160	90	30	10	0	0	0	0	0	0
2	<i>Cyprissubglobosa</i>	0	0	0	0	0	0	40	60	170	180	340	300
Total Count		30	40	160	90	0	0	40	60	170	180	340	300