International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Impact Factor (2012): 3.358

Seasonal Fluctuation of Zooplankton Biodiversity in Panvel Lakes (Vishrale, Krishnale and Dewale Lake) at Dist. - Raigad (Maharashtra) India

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Abstract: ***The present study is carried out during the period of February 2010 to January 2011 to investigate the seasonal diversity of zooplankton in Panvel Lakes (Vishrale, Krishnale and Dewale Lake) by analyzing monthly variations. In each of the three lakes, 14 generas of zooplanktons were found belonging to different groups, 02 generas from Protozoa, 04 generas from Rotifera, 03 generas from Cladocera, 03 generas from Copepoda and 02 generas from Ostracoda.***

Keywords: Biodiversity, zooplankton, Seasonal variation, Panvel Lakes.

1. Introduction

Zooplanktons are indicator of productivity in a water body. The abundance and growth of zooplankton varies with seasons and water properties. Zooplankton abundance has great importance in fish farming (Bhuiyanet. Al., 2008). The knowledge about the biodiversity of lakes along with its present conservation status will help in the wise-use of these lakes, enabling in their sustainable utilization, for the benefit of humankind by maintenance of its natural properties. Hence, the present study will help us to understand the zooplankton biodiversity of lakes.

2. Material and Method

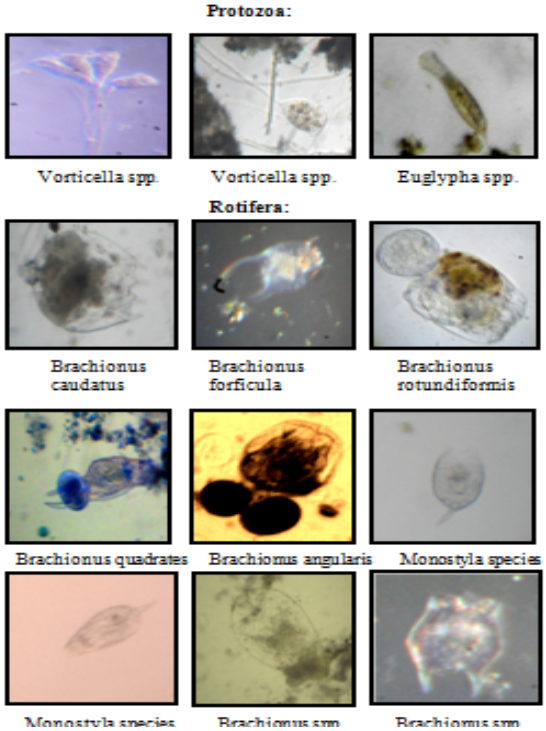
The sampling on monthly basis was done for a period of one year, from the three lakes (Vishrale, Krishnale and Dewale). About 50 liters of water sample was filtered and concentrated to 50 ml. Then the samples were preserved in 4 % formalin and little amount of glycerine was added to maintain flexibility of organisms. These samples were used for qualitative and quantitative study.

3. Result and Discussion

Zooplankton studied in lakes, qualitatively and quantitatively belongs to five (Fig. 1) major groups which are as follows:

Protozoa : Euglypha spp. and Vorticella spp.
Rotifera : Brachionus spp., (Brachionus caudatus, Brachionusforficula, Brachionusrotundiformis, Brachionusquadrates, Brachionus angularis), Keratellaspp., Fillinia spp. and Gastropus species.

Cladocera : Daphnia spp., Bosmina spp. and Moina spp.
Copepoda : Mesocyclops spp., Cypridopsis spp. and Nauplius spp.
Ostracoda : Cypris spp. and Cyprinotus spp.
In each of the three lakes, 14 generas of zooplanktons were recorded belonging to different groups, 02 generas from Protozoa, 04 generas from Rotifera, 03 generas from Cladocera, 03 generas from Copepoda and 02 generas from Ostracoda.



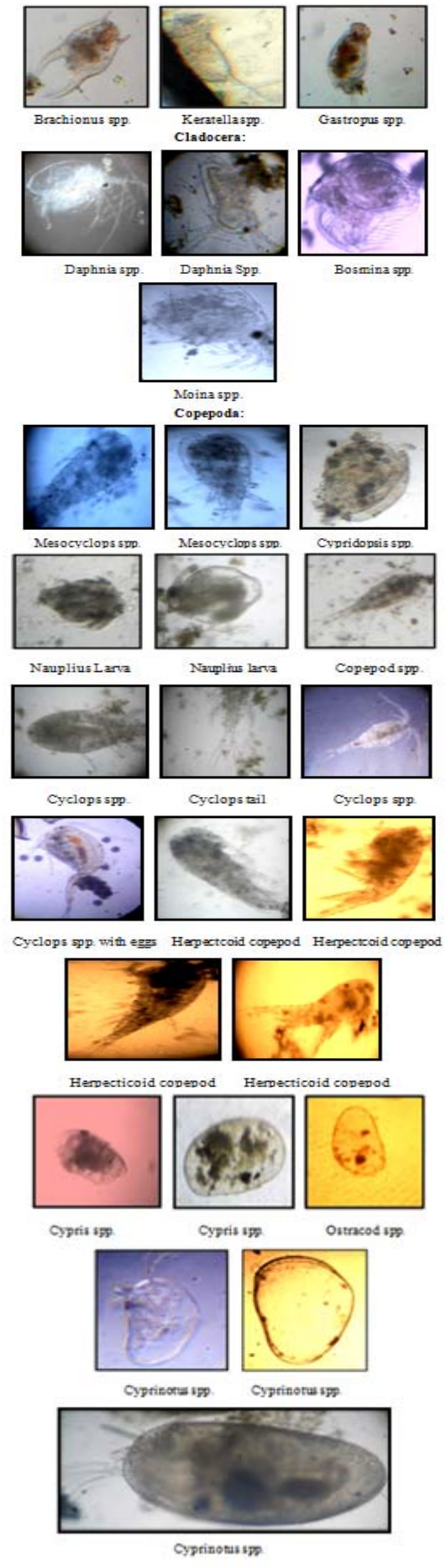


Figure 1: Zooplankton found in the lakes.

Seasonal fluctuation of total zooplankton in all the three lakes was recorded in (Table No. 1 & 2and Fig 2 and 3 a, b & c)

In Vishrale lake

Pre – monsoon: Season value is 1472± 83.71 n/L with variations in zooplankton group during the season were recorded asRotifer (398 ± 45.64) 37% >Copepoda (388 ± 66.94) 26% >Cladocera (294 ± 37) 20% >Ostracoda (214 ± 21.62) 15% >Protozoa (178 ± 7.72) 12%

Monsoon: Seasonal value is 1218 ±63 n/L with variations in zooplankton group during the season were recorded as Rotifer (402 ± 37.39) 33% >Copepoda (334 ± 48.80) 27% >Cladocera (178 ±30.34) 15% >Ostracoda (176 ± 10.58) 14% >Protozoa (128 ± 24.22) 11%

Post –monsoon: Seasonal value 1703 ± 141.98 n/L with variations in zooplankton group during the season were recorded asRotifer (588 ± 44.97) 34% >Copepoda (505 ± 26.68) 30% >Ostracoda (234 ± 24.07) 14% >Cladocera (208 ±12.43) 12% > Protozoa (168 ± 36.14) 10%

In Krishnale

Pre – monsoon: Seasonal value is 628 ± 22.31 n/L with variations in zooplankton group during the season were recorded asCopepoda (196 ± 17.70) 31% >Cladocera (136 ± 8.48) 22% > Rotifer (128 ± 11.51) 20% >Ostracoda (98 ± 5.50) 16% >Protozoa (70 ± 5.25) 11%

Monsoon: Seasonal value 460± 27.65 n/L with variations in zooplankton group during the season recorded as Copepoda (165 ± 6.39) 36% > Rotifer (125 ± 6.44) 27% >Cladocera (72 ± 1.41) 16% > Protozoa (58 ± 5.74) 12% >Ostracoda (40 ± 14.14) 9%

Post –monsoon: Seasonal value is 645 ± 17.23 n/L with variations in zooplankton group during the season were recorded asCopepoda (215 ± 15.62) 33% > Rotifer (146 ± 11.73) 23% >Cladocera (120 ± 15.25) 19% >Ostracoda (96 ± 8.48) 15% > Protozoa (68 ± 13.90) 10%

In Dewale lake

Pre – monsoon: Seasonal value is 607 ±57.74 n/L with variations in total zooplankton group during the season recorded asRotifer (177± 46.22) 29% = Copepoda (177 ± 7.45) 29% >Cladocera (134 ± 17.33) 22% >Ostracoda (62 ± 3.41) 10% > Protozoa (58 ± 1.91) 10%

Monsoon: Seasonal value were 619 ± 4.11 n/L with variations in zooplankton group during the season recorded asRotifer (202 ± 14.20) 33% >Copepoda (164 ± 15.64) 26% >Cladocera (143 ± 12.57) 23% >Protozoa (62 ± 13.98) 10% >Ostracoda (48 ± 2.82) 8%

Post –monsoon: Seasonal value were 857 ± 22.06 n/L with variations in zooplankton group during the season were recorded as;Rotifer (220 ± 17.45) 26% >Copepoda (218 ±10.66) 25% > Protozoa (148 ± 11.60) 17% >Cladocera (138 ± 9.21) 16% >Ostracoda (133 ± 9.53) 16%

In all the three lakes, maximum zooplankton is recorded during post – monsoon season.

Table 1: Seasonal Variation of Zooplankton in the three lakes during 2010-2011

Lakes	Pre-Monsoon	Monsoon	Post-Monsoon
Vishrale Lake	1472 ± 83.71	1218 ± 63	1703 ± 141.98
Krishnale Lake	628 ± 22.31	460 ± 27.65	645 ± 17.23
Dewale Lake	607 ± 57.74	619 ± 4.11	857 ± 22.06

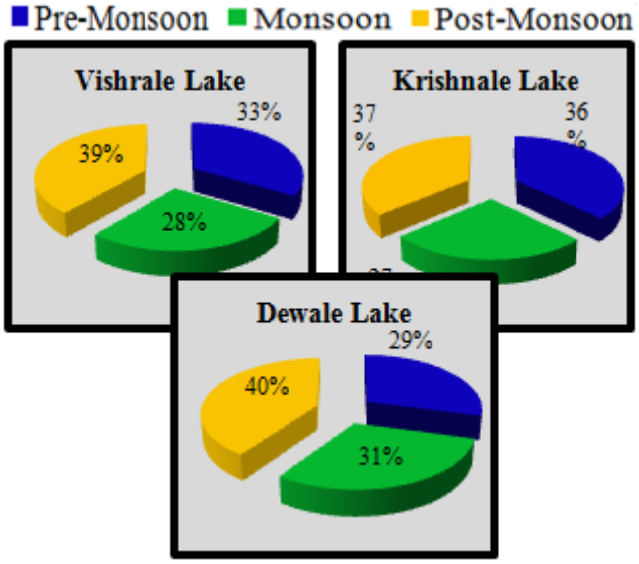
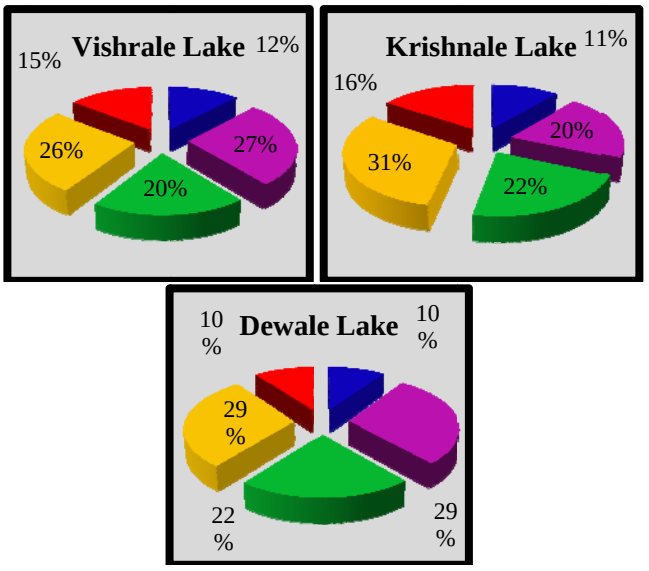


Figure 2: Seasonal Variation of Zooplankton in the three lakes during 2010-2011

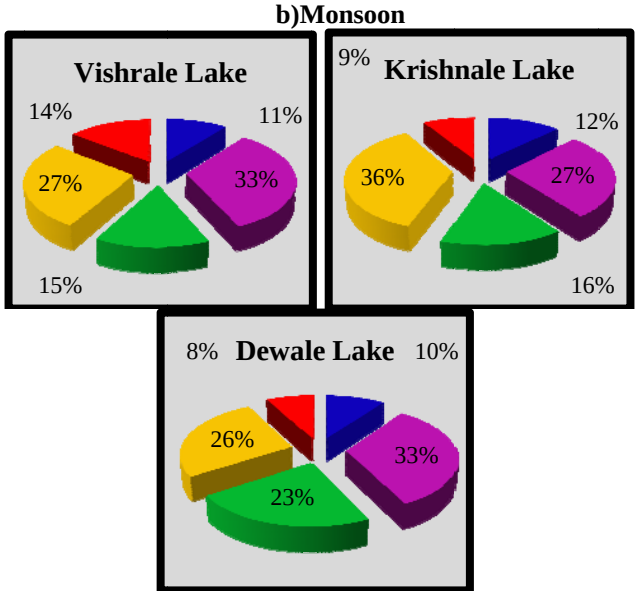
Table 2: Seasonal variation of zooplankton groups in three lakes during 2010-2011

Seasons	Zooplankton	Vishrale Lake	Krishnale Lake	Dewale Lake
Pre-Monsoon	Protozoa	178±7.72	70±5.25	58±1.91
	Rotifera	398±45.64	128±11.51	177±46.22
	Cladocera	294±37	136±8.48	134±17.33
	Copepoda	388±66.94	196±17.70	177±7.45
	Ostracoda	214±21.62	98±5.50	62±3.41
Monsoon	Protozoa	128±24.22	58±5.74	62±13.98
	Rotifera	402±37.39	125±6.44	202±14.20
	Cladocera	178±30.34	72±1.41	143±12.57
	Copepoda	334±48.80	165±6.39	164±15.64
	Ostracoda	176±10.58	40±14.14	48±2.82
Post – Monsoon	Protozoa	168±36.14	68±13.90	148±11.60
	Rotifera	588±44.97	146±11.73	220±17.45
	Cladocera	208±12.43	120±15.25	138±9.53
	Copepoda	505±26.68	215±15.62	218±10.66
	Ostracoda	234±24.07	96±8.48	133±9.21

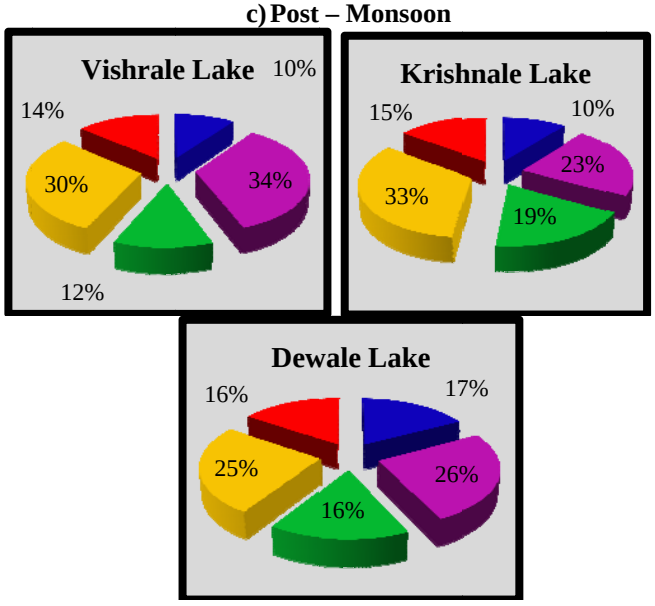
a) Pre – Monsoon



b) Monsoon



c) Post – Monsoon



4. Discussion

Abundance of zooplankton varies from season to season and such variations are mostly related to abiotic factors according

to limnological features and the trophic state (Jeppesenet al., 2002). Therefore, composition and diversity of zooplankton provide information on the characteristics and quality of the water body (Adeyemi et al., 2009; Okayiet al., 2001). Kedar et al., 2008; Dhanapati, 2000 reported that rotifers are chiefly freshwater forms and abundance of these organisms in water body can be related to favourable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus which is suitable conditions for their survival. The presence of Brachionus spp., Keratella spp., Bosmina spp., Mesocyclops spp. and Daphnia spp. in all the three lakes indicate the higher trophic status of these lakes as these species are indicator of eutrophication (Kumar et al., 2011;Sharma, 1983; Chaurasia and Adoni, 1985; Agarkaret al., 1994; Wanganeo and Wanganeo, 2006; Kumar et al., 2010). Presence of eutrophication indicators, indicates that these lakes have to be protected from waste disposal so, that they are saved from disappearance in future.

5. Conclusion

Thus, we can conclude that zooplanktons are abundant during post – monsoon. Lakes has to be maintained in good condition by cleaning them regularly as well as creating awareness among the citizens through street play, banners, posters etc.

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