

Preliminary Investigation of Zooplankton from Mankara lake, Aamgaon Mahal dist. Gadchiroli (M.S), India.

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Abstract:

This study presents a preliminary investigation of the zooplankton community in Mankara lake, Aamgaon Mahal District, Gadchiroli. We examined the diversity, abundance, and ecological significance of zooplankton across three selected stations (ML-1, ML-2, and ML-3) during different seasons. A total 13 zooplankton species were identified, belonging to rotifers, cladocerans, and copepods. The abundance of zooplankton varied seasonally and spatially, with [station/season] showing the highest density. Our findings provide insights into the zooplankton community in Mankara lake and highlight the importance of understanding the ecological dynamics of freshwater ecosystems. This study contributes to the conservation and management efforts of Mankara lake and similar freshwater resources.

Keywords: Zooplankton, Mankara lake, diversity, abundance, ecological significance.

Introduction

Freshwater environments, such as rivers and lakes, are essential to the world's ecosystem because they provide vital ecosystem services and support a diverse array of aquatic life (Dudgeon *et al.*, 2006). In these ecosystems, zooplankton, a class of minute creatures, are crucial because they serve as a source of food for fish and other aquatic species (Lampert and Sommer, 2007). Furthermore, changes in the composition and abundance of zooplankton communities can mirror wider environmental changes (Gannon and Stemberger, 1978), making them valuable indicators of water quality and ecosystem health.

Location of Mankara lake near Aamgaon Mahal Gadchiroli district, an important freshwater source that sustains aquatic life and biodiversity. Although the zooplankton population in this lake is significant, there is little data on it. Managing and conserving the Mankara lake environment depends on understanding the diversity, abundance, and ecological importance of zooplankton.

Previous studies have revealed that zooplankton populations might differ greatly between lakes and other aquatic ecosystems, reflecting variations in water quality, trophic status, and other environmental variables (Havens *et al.*, 2009). For instance, a study on the zooplankton community in a eutrophic lake discovered that it was mostly made up of rotifers and cladocerans, while a study on an oligotrophic lake found that copepods were the dominant species (Gulati *et al.*, 1992).

The purpose of this research is to analyze the zooplankton community in Mankara lake, giving information on its diversity, density, and ecological relevance throughout three chosen locations. The results of this research will help us learn more about the zooplankton population of this lake and guide our conservation and management initiatives.

Materials and Methods

Sampling Stations: Three stations were selected for sampling namely L1, L2 and L3. Zooplankton samples were collected from each station using a plankton net (mesh size: 64 μ m) during different seasons. After centrifugation take 1ml. sample in a “Sedgwick rafter counting cell” with Sedgwick Rafter plankton method (Adoni et. al., 1985). Samples were preserved in 4% formaldehyde and examined under a microscope for identification and enumeration of zooplankton species. Zooplankton species were identified using standard taxonomic keys (Dhanapathi 2000, and Altaf 2004).

Observations and Results

Table no. 1: Showing seasonal data of zooplankton at station L1 from Manakara lake.

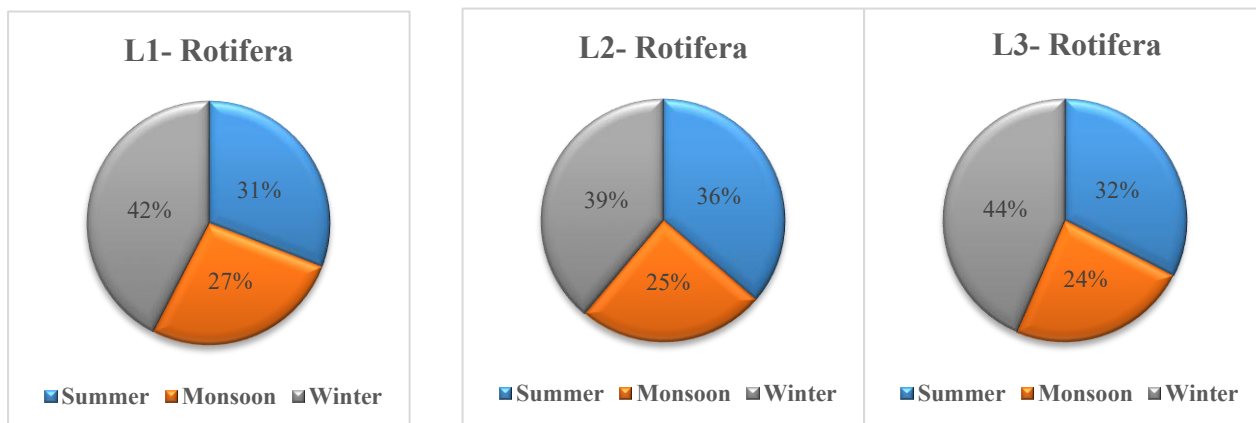
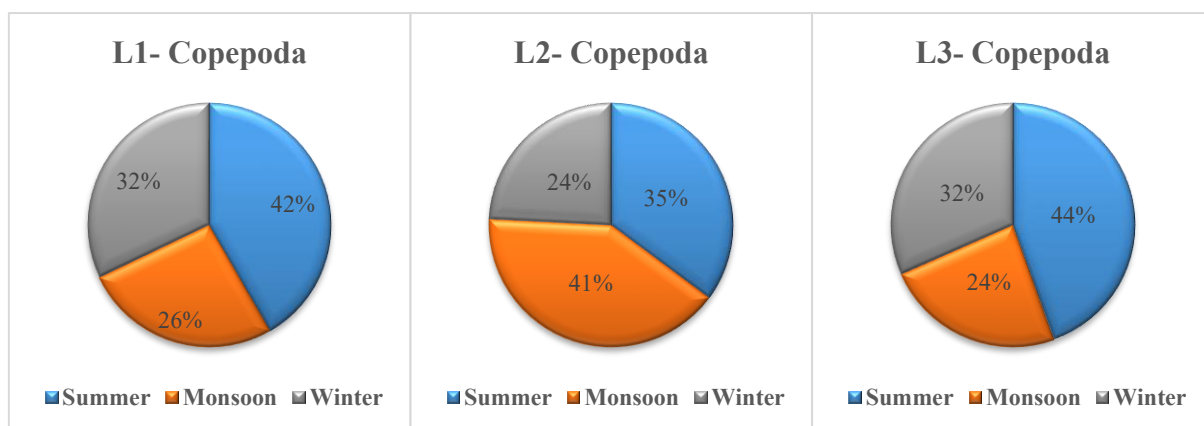
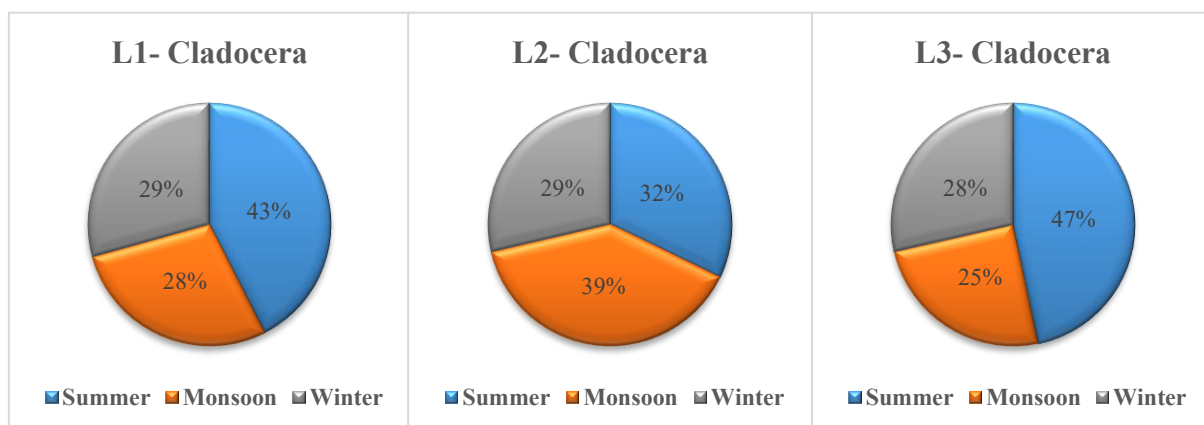
Seasons → Zooplankton ↓	Summer		Monsoon		Winter		Annual Average	
	MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE
Rotifera	46.7 5	3.276	40.5	1.936	64.25	4.25	50.5	6.156
Copepoda	25	1.472	15.75	1.931	19.25	0.479	20	2.335
Cladocera	18.5	1.109	12.25	1.109	12.75	0.629	14.5	1.737

Table no. 2: Showing seasonal data of zooplankton at station L2 from Manakara lake.

Seasons → Zooplankton ↓	Summer		Monsoon		Winter		Annual Average	
	MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE
Rotifera	49.2 5	6.21	33.75	2.097	52.75	3.637	45.25	5.056
Copepoda	19.2 5	0.75	22.25	3.172	13.25	1.225	18.25	2.291
Cladocera	11.5	0.5	14	1.472	10.25	0.25	11.92	0.955

Table no. 1: Showing seasonal data of zooplankton at station L3 from Manakara lake.

Seasons → Zooplankton ↓	Summer		Monsoon		Winter		Annual Average	
	MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE
Rotifera	34	2.55	25	1.581	45.5	4.735	34.83	5.138
Copepoda	17.2 5	1.181	9.25	2.323	12.25	0.629	12.92	2.021
Cladocera	12.2 5	1.19	6.5	1.19	7.5	0.645	8.75	1.536

Figure no. 1: Pie showing seasonal data of rotifer of station L1, L2 and L3 from Manakara lake.**Figure no. 2:** Pie showing seasonal data of copepoda of station L1, L2 and L3 from Manakara lake.**Figure no. 3:** Pie showing seasonal data of cladocera of station L1, L2 and L3 from Manakara lake.

Data on seasonal variations show that zooplankton are primarily found in three groups where rotifers predominate over cladocera and copepoda. During the winter months, rotifers are most prevalent, whereas copepods and cladocerans are more common during the summer and several

monsoon months. Analogous findings reported by Ingale *et al.*, (2016) and Ingale *et al.*, (2018) from Bhiwapur lake India.

Conclusion

This preliminary investigation provides valuable insights into the zooplankton community in Mankara lake, highlighting the importance of spatial and seasonal variations in zooplankton diversity and abundance. The current state of zooplankton diversity indicates that the Mankara lake has a good food supply for zooplankton and is suitable for fish farming in the future. The study underscores the need for further research to understand the dynamics of zooplankton populations and their role in maintaining ecological balance. The findings of this study can inform conservation and management efforts for Mankara lake and similar freshwater ecosystems.

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