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BENTHIC MACROINVERTEBRATE COMMUNITIES AND ITS DIVERSITY IN TAMASI LAKE, TEHSIL- BHADRAVATI, DISTRICT-CHANDRAPUR (M.S.)

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ABSTRACT

Benthic macroinvertebrates are a bioindicator for evaluating overall health of aquatic ecosystem and the quality of water. Change in environmental factors reflected in the structure of benthic macroinvertebrate community. Study was carried out during May 2022 to April 2023 at Tamsi Lake Tahsil- Bhadravati District – Chandrapur. In present investigation total of 23 macroinvertebrates species were recorded and identified, belonging to 11Order from all the study sites. Benthic population size and distribution were showing spatial effect. Climatic effect has shown a considerable difference in the number of benthic communities. In comparison to the dry season, more individuals were seen during the wet season. The Hemiptera family species of macroinvertebrates showed their maximum appearance, followed by Diptera, Coleoptera and Gastropoda. Less number of animals representing the order Ephemeroptera, Tubificida and Glossiphoniiformes were identified. When compared the presence of bioindicator species at the majority of sampling sites, the Benthic community of Tamasi Lake shows tolerant species. This indicates the existence of pollution and hence is likely to undergo environmental stress.

INTRODUCTION

Benthic macro invertebrate community is one of the essential elements of a lake ecosystem, which serves as a connecting link between the apex trophic levels in aquatic food webs and the primary producers of detrital deposits. Ecological conditions like habitat, heterogeneity and water quality are reflected in the structure of benthic community in an aquatic ecosystem. the benthosmacro invertebrates broadly reflect environmental conditions among the biological community,Benthic macro invertebrates occupy an intermediary role in this lake zone between vertebrate predators and primary producers on one side and microbial decomposers on the other.Barnett (2005), Kazanci and Girgin (1998).

The alterationsin the composition and arrangement of benthic macroinvertebrate assemblages may serve as a relevant indicator for significant changes throughout a specific ecosystem. Since planktonic creatures do not accurately reflect the ecological status of a lake environment, lake assessment based on benthic macro invertebrate provides a basic information. As a result, a system of evaluation based on benthic macro invertebrate could effectively reveal numerous stressors. Therefore, the goal of the research was to identify the variety of benthic macro invertebrate communities in the littoral zone of Tamasilake, in order to assess the lake's ecological state given that the area has undergone significant anthropogenic modification. Similar study was noted by, Harman (1974), Halse *et al. (*2002), Haidekker and Hering (2008) and Jiang (2008).

MATERIALS AND METHODS

Study Area

Tamasi lake is a perennial lake, situated in Bhadravati,district Chandrapur, Cultural command area of lake was 24.90 hectares. Lake water is used for domestic purpose and irrigation.

Sampling protocol:

During benthic macroinvertebrates sampling collection of species from different four sites by handpicking methods and Tray type sampler methods. Collected species are preserved in 4% formalinand identified as per Edmondson (1959), Tonapi (1980),Pennak (1989) and Rosenberg and Resh (1993).

RESULT AND DISCUSSION

Results and observation represented in Table.1.1 and Fig.1.1,1.2 and 1.3. In present investigation total of 23 macro invertebrates species were recorded and identified belonging to 11 Order from all the study sites were represented in table No. 1.1.The Hemiptera family species of macro invertebrates showed their maximum appearance, followed by Diptera, Coleoptera and Gastropoda. Less number of animals representing the order Ephemeroptera, Tubificida and Glossiphoniiformes were identified. Similar findings noted by,Bhandarkar and Bhandarkar (2013) and Gorai *et al.*, (2005)identified4 major groups of macro

invertebrates belongs Gastropoda (03species), Insects larvae (01 species), Oligochaetae (08 species) and Nematode (01 species). Chavan and Lonkar (2012) stated that macro invertebrates like Lymnaea spp., Planarian spp., made their appearance only alter the monsoon at all the sampling station. Lymnaea spp. was recorded from all the sampling stations.Seasonal variations had an impact on the benthic macroinvertebrate structure and diversity similar study was recorded by, Narasimha and Benarjee (2017). In wet season, the number of Benthic Macroinvertebrates were high than in summer season. The Diptera shows the highest contribution, followed by Coleoptera and Trichoptera. Insecta, Hirudinae and Oligochaeta shows comparatively less specimen. During summer Season Ephemeroptera shows high number than in rainy period. Ramakrishna (2014) stated that Hirudinea and Oligochaeta have a high tolerant values for pollution and are considered as pollution tolerant taxa similar findings noted by, Walmiki *et al.*,(2016) and Bhute and Harney (2017).

Benthic fauna abundance is largely dependent on the physical and chemical characteristics of the substrate. Numerous benthic forms are detritivores, and they are essential to the organic matter's mineral recycling process.

Most of the invertebrates were noted in post monsson. The water quality deteriorates due to anthropogenic activities of humans. Presence of Dipteran larvae and Molluscs ex. Lymnae columell, Lymnae luteola, Alasmidonta viridis shows that lake. Brinkhrust and Cook (1974) noted that the abundance of tubeficids are bioindicators of pollution studies.The study summaries as of benthic macroinvertebrates is crucial for assessing the water quality of the study area based on the dynamics of macroinvertebrates assemblages. It is clear that organic contamination exists. This shows that Tamasi Lake has experienced persistent environmental stress. This obviously calls for collaborative, interdisciplinary efforts to manage watersheds and make prudent use of aquatic resources.

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Conflict of Interest:

Author has no conflict of interest.

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Table. 1.1

Diversity of benthic macroinvertebrates of Tamasi lake

S.N.	*Phylum*	*Class*	*Order*	*Family*	*Genera*
1	Platyhelminthes	Turbellaria	Tricladida	Dugesiidae	*Dugesia*
2	Annelida	Oligochaeta	Tubificida	Tubificidae	*Tubifex*
		Hirudenia	Glossiphoniiformes	Glossiphoniidae	*Glossiphonia*
3	Mollusca	Gastropoda	Basommatofora	Lymnacidae	*Lymnaea*
4	Arthropoda	Arachnoidea	Arachnida	Teragnathidae	Teragnatha
		Crustacea	Amphipoda	Hyalellidae	*Hyalella*
		Insecta	Ephemeroptera	Baetidade	*Baetis*
				Leptophlebiidae	*Leptophlebia*
			Coleoptera	Hydrophilidae	*Hydrophillus*
				Eulicadidae	*Eulicas.*
				Dystiscidae	*Methles.*
				Elmidae	*Dubiraphia*
			Diptera	Ceratopogonidae	*Bezzia*
				Simulidae	*Simulium*
				Tipulidae	*Hexatom*
				Syrphidae	*Eristalis*
				Tabanidae	*Tabanus*
				Chironomidae	*Chironomus*
			Plecoptera	Perlidae	*Neoperla*
				Chloroperlidae	*Chloroperla*
			Trichoptera	Hydropsychidae	*Leptonema*
				Polycentropodidae	*Polycentropus*
				Stenopsychidae	*Stenopysche*

Fig.1.1 Satellite view of Tamsi lake, Tahsil Bhadravati, Distrct- Chandrapur

Fig.1. 2 Overall view of Tamsi lake, Tahsil Bhadravati, District- Chandrapur

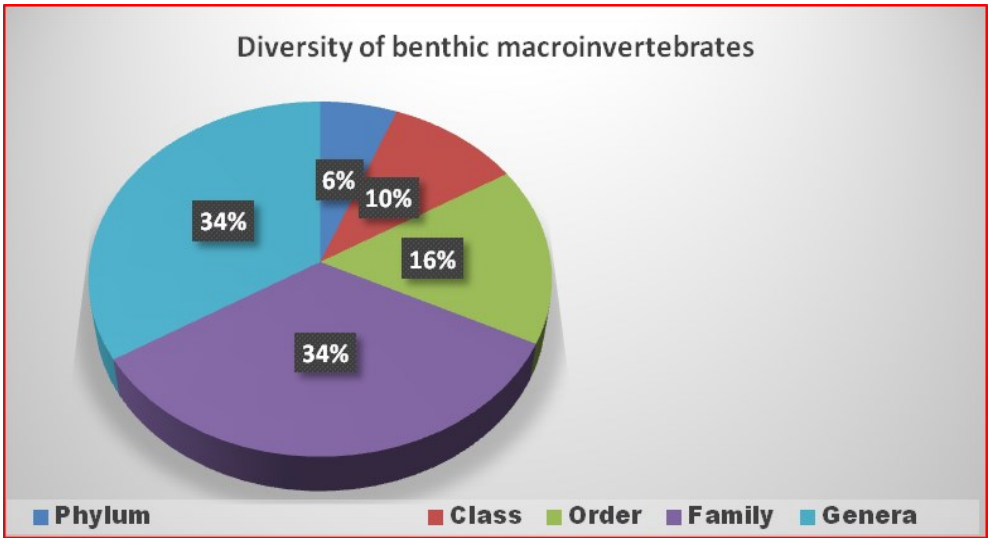

Fig. 1.1 Diversity of benthic macroinvertebrates of Tamasi lake