



SEASONAL DIVERSITY OF BENTHIC-MACROINVERTEBRATES IN JUNONA LAKE, DIST. CHANDRAPUR (M.S.), INDIA

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Abstract:

Benthic organisms are regarded as the most suitable indicators of water pollution. The distribution, density and biomass of benthic organisms depends on physico-chemical characteristic of water, nature of sediment and the biological complexes such as availability of food, predation etc. In an organically enriched water body, the suspended organic matter settles as sediment on the bottom and is decomposed. Benthic variables are particularly useful in measuring the water quality. In the present piece of work, an attempt has been made to investigate the seasonal variations of benthic macroinvertebrates in Junona lake of Chandrapur district. The present study was carried out for a period of one year i.e. from Feb. 2007 to Jan 2008 monthly; total 17 species from four major groups were observed viz. Annelida, Nematoda, Arthropoda and Mollusca. The benthic macroinvertebrates population was higher during winter season followed by monsoon and summer.

Keywords:

Junona lake, Seasonal variation, benthic macroinvertebrates

Introduction:

Benthic organisms are regarded as the most suitable indicators of water pollution. The distribution, density and biomass of benthic organisms depends on physicochemical characteristic of water, nature of sediment and the biological complexes such as availability of food, predation etc. In an organically enriched water body, the suspended organic matter settles as sediment on the bottom and is decomposed. Benthic animals are extremely diverse, and are represented by nearly all phyla from protozoans through large macro invertebrates and vertebrates. The study of aquatic ecosystem without the study of its benthos is incomplete. Many of the benthic forms are





detritivores and are the primary consumers. Thus, benthos in general, plays a key role in the trophic status of an ecosystem and recycling of the organic matter. Many several investigators such as Berg (1938), Mason et al. (1971) and Bahura (2001). The benthos, an integral part of the food web and production of water body, is biocoenoses of the solid, liquid interface which has become an important aspect of the limnology. The relative abundance of benthic macroinvertebrates has been related to the pollution sources, and their values have been judged as indicators of eutrophication level and water quality. The study was carried out in Junona lake, which is 7 km away from Chandrapur city. The present work was carried out for one year i.e. from February 2007 to January 2008. The benthic macroinvertebrates collected seasonally over a period of one year at four sampling stations.

Material and Method:

During the period of investigation benthic samples were collected with the help of a tray type sampler. Samples transferred into the laboratory in polythene bag and water benthic organisms floats on the surface and are pick-up with the help of dropper and preserved in 4% formalin and identified as per Edmondson (1959), Tonapi (1980) and Pennak (1989).

Result and Discussion:

Benthic populations have various characteristics, which are important in monitoring an aquatic ecosystem. The most basic of these are population size, dispersion, distribution, density, and seasonal variation. Population size is widely employed in monitoring an aquatic ecosystem. The study of aquatic ecosystem without the study of its Benthos is incomplete. Many Benthic forms are detritivores and play a key role in the mineral recycling of organic matter, and many benthic insect larvae and Oligochaetes are the major food sources for small and big bottom feeders (Anita, 2002). Aquatic invertebrate serve as a primary food source for many fishes. They are the preferred indicator of long





term water quality due to their limited mobility. In the present investigation, total 17 species from four major groups were observed viz. Annelida, Nematoda, Arthropoda and Mollusca, In Annelids 2 species were recorded, Nematode by 2 species, Arthropods by 4 species and Mollusca by 9 species. Similarly, Anitha et al., (2004) reported the macro-zoobenthic fauna from Mir Alam Lake, Hyderabad, belonged to the three major groups. Annelida, represented by three species belonging to Tubificidae, Naididae and Lumbricidae, 4 species of Arthropoda belonging to Chironomidae and Noto-nectidae and 10 species of Mollusca belonging to Viviparidae, Thiaridae Planorbidae, Bithyniidae and Lymnaeidae. In Annelida, *Pristine aquiseta* and *Tubifex tubifex* recorded from all the sites however, *Tubifex tubifex* showed its appearance in all the seasons at site S2 and S4, and *Pristine aquiseta* showed its appearance at site S3, Generally Oligochaetes increase with eutrophication of water body. This is in conformity with observation of Cole and Underhill (1965). Nematodes are universally distributed and extensive taxonomical studies are carried out on them, however, very little is known about their ecological role in sediment. Nematodes constitute the best-studied group of aquatic organisms, which can be used as biological indicators of pollution. Nematodes are infrequently observed in at all the sites and only two species namely *Rhabdolimus minor* and *Diphigaster ficator* were recorded, Telkhade et al., (2008) earlier recorded these two species from Masala Lake of the same District. Nematodes are invertebrates that inhabits virtually in all environment from and desert to the lakes and rivers and play a very important role in sedimentary reducing of organic matter. In Arthropoda no species showed its dominance throughout the seasons. However, *Chironomus* larva showed its dominance in all the seasons at site S2 and S4. *Chironomus* larvae are an important group of benthos. They were important constituent of bottom fauna in the reservoir and comprised 75 to 80 % of the food for bottom feeding fishes (Akhrov, 1974). Gastropods are principle constituents of aquatic invertebrate community, particularly in lentic ecosystem. In present investigation Gastropods species showed their





dominance on all the sites, in Gastropods *Lymnea aquinata* showed its dominance in all the seasons at site S2. However *Thiara tuberculata* showed its dominance at site S1. *Pila globosa* showed its dominance at site S3. There is no clear dominance of other species of Gastropods at the site specific sites. Tudoranea (1972) regarded alkaline nature of water and high concentration of calcium as contributory factors towards the dominance of Mollusca in the water bodies studied by him. *Lymnaea* sp. was recorded from all the sampling stations. When the calcium content showed an increase, as the calcium is essential component for shell formation in Mollusca. Water hardness favours the growth Mollusca and Zooplankton (Arce and Boyd, 1975). Similar study also made by Harman (1974) has also pointed out that Mollusca are bioindicator of water pollution. In the present investigation at all the sampling stations winter population was highest and was followed by monsoon and summer, Sharma et al., (2007) observed that benthic density high during winter season followed by summer and monsoon at site Jhar Jhani pond. In Deppura pond, the Benthic density high during winter season followed by summer and monsoon, and the high density was observed in monsoon followed by winter and summer at site Tamlao pond of southern Rajasthan.

Conclusion:

As evident in the present study it seems that seasonal abundance of benthos is strongly influence by composition of sediments in terms of proportion of silts, mud and clay (Gupta, 1976). It is suggested that proper measures are necessary to avoid contamination as rare indicator species are existed at site S2. Benthic Organisms with narrow level of tolerance are sensitive to even small change in their environment and such species are useful indicator species because changes in their distribution and abundance can be an indication of environmental perturbation such as chemical pollution.





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