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AQUATIC BENTHIC MACRO-INVERTEBRATE DIVERSITY OF KUNDA RIVER DISTRICT KHARGONE (M.P.) INDIA

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Abstract

Kunda River has a dense population of benthic communities. The shoreline area of this shallow tropical river is not only an ideal habitat for the benthic community but it also plays an important role in the exchange of food cycles in the river ecosystem. The benthic community serves as major component of secondary production in the river. The benthic organisms are reported as main components of the food chain. It was therefore, thought worth benthic species diversity. The present study is focused on biodiversity of the benthic community of Kunda River, Khargone. The present investigations deals with the population density and species diversity of aquatic benthic macro-invertebrate fauna diversity of this River, studies were conducted during August 2010- July 2011.

***Key Word*:** Aquatic Biodiversity, Kunda River, Species diversity, Population diversity.

Introduction

Biodiversity is variety of life. The concept of biodiversity includes the entire biological hierarchy from molecule to ecosystem, or the entire taxonomic hierarchy from Alleles to Kingdom. The most prevalent usage of the term biodiversity is a synonym for the variety of species, including their genetic diversity. Biodiversity has been defined by the United Nations Convention on Biological Diversity; it includes diversity of ecosystems, species and genus, and the ecological processes that support them. The current textbook definition of "biodiversity" is "variation of life at all levels of biological organization" (Kevin *et al.,* 2004). Benthic macro invertebrates are best indicators for Bio-assessment (Kumar 2003). The abiotic environment of the water body directly affect in the distribution, population density and diversity of the macro benthic community (Zweig and Rabeni 2001; Sharma and Rawat 2009 and Sharma and Choudhary 2011). Benthic fauna are especially of great significance for fisheries that they themselves act as food of bottom feeder fishes (Sharma *et al.,* 2013). The present studies deals with the population density and species diversity of aquatic macro-invertebrate fauna have been discussed.

Materials and Methods

For studying benthic macro-invertebrates of River Kunda at Khargone, four study sites, viz; Dejla-Devada Dam (Station-I), Confluence with Undri river (Station-II), Barrage of Khargone (Station-III), Siptan (Confluence of Kunda and Veda River) (Station-IV) were selected on the banks of river Kunda. Benthic communities along the river were sampled monthly from August 2010 to July 2011 at each of the four stations using D- net and Ekman grab (for deeper sites). The samples were collected by a bottom kick net (500 µm mesh). The samples were taken from an area of nearly 100 m^2 in order to include all possible microhabitats at each station. All the animals collected were immediately fixed in formaldehyde (4%) in the field and then transferred to 70% ethyl alcohol. Collection and identification of Benthic macro-invertebrates with the help of standard books Needham & Needham (1969), Pennak (1989), Tonapi (1980), Welch (1998) The organisms were identified from standard taxonomic keys (e.g. Pennak 1989). A complete list of the taxa taken at each station is available from the senior author.

Results and Discussions

Benthic macro-invertebrates biodiversity recorded in Kunda River during August 2010 to July 2011. A total of forty three (43) species recorded of Benthic macro-invertebrates fauna belonging three (3) phylum- Annelida, Arthropoda and Mollusca; five (5) classes- Oligochaeta, Crustacea, Insecta, Gastropoda and Pelecypoda.

Benthic Macro-Invertebrates

In the present study, 43 species of Benthic macro-invertebrates were identified; 9 species of **Phylum Annelida Class- Oligochaeta**, (*Tubifex- tubifex, Limnodrilus hoffmeisteri, Telmatodrilus multispinosus, Dero dorsalis, Stylaria fossularis, Branchiodrillus hortensis, Tubifex albicola, Dero digitata, Dero cooperi)*; 8 species of **Phylum Arthropods Class- Crustacea** *(Daphnia cercinata, Pina dubia, Cypris, Teterocypris, Cyclopes, Neso Cyclopes, Nauplius, Prawn;* 10 species of **Aquatic insects Family- Baetidae** *(Baetiella sp., Baetis sp., Baetis simplex, Baetis festivus)* **Family- Caenoidae** (*Caehis sp.*) **Family– Ephemeridae** (*Ephemera Nadinac*) **Family- Heptageniidae** *(Epeorus sp., Heptagenia nubile*) **Family- Chironomidae** *(chironomus sp., Chaoborus sp.)* 16 species of **Phylum- Mollusca;** 8 species **Class- Gastropoda** (*Pila globosa, Thiara scabra, Bellamya bengalensis, Thiara lineata, Thiara tuberculata, Vivipara*

*bengalensis, Digiostana pulchella, Gyraulco convexiculus***)** 8 species of **Class- Pelecypoda** (*Lymnaea acuminate, Lymnea auricularia, Lamellidens corricaunus, Lamellidens consobrinus, Lamellidens lamellatus, Pisidium clarkeanum, Corbicula striatella, Melanoides tuberculates*). These benthic macro-invertebrates species can be used to establish biological criteria to classify the river ecosystem as being healthy or polluted. During the present investigation, it was observed that the Kunda River having rich biodiversity of macro-invertebrates communities. The most common benthic macro-invertebrate organisms belong to **Oligochaeta, Crustacea, Insecta, Gastropoda and Pelecypoda** during throughout the study period. Their abundance fluctuation depending upon environmental conditions and physico-chemical parameter of water.

Insect Benthic macro-invertebrate communites belonging to Family **Baetidae, Caenoidae, Ephemeridae , Heptageniidae and Chironomidae**. The insects are having the capabiliry of various adaptive habitates due to their extra ordinary structural organization Vinson (1998), Merrites and cummines (2008) and Tali (2013). The aquatic macro-invertebrates were found to be high population density were undisturbed and rich in aquatic vegetation zone. Most of insect larval forms have been reported to be tolerant too wide range of physico-chemical parameters (Sarkar 2012).The benthic macro-invertebrates population of insect was dominated by diptera and Ephemeroptera. The mollusca fauna of Kishanpura Lake included genera out of which *T. Scabra, P. Clarknum, L.Aluminat, Vivipara bengralensis* dominated the population (Sharma *et al.,* 2007). Sharma (2003) reported 11genera of Mollusca from Sirpur Lake Indore. Similar result also reported to Oomachan and Belsare (1985); Rosenberg and Resh (1993) and Sharma (2009).

This Kunda River is an improvement water resource of Khargone (M.P.). Its supports may aquatic spices of plant and animals. Kunda river facing threat from encroachment, weed invasion, siltation and various type of water pollution. Steps shouted are taking immediately to conserve the biodiversity of this river.

Conclusion

Bio monitoring is good tool for the assessment of water body. It needs no chemicals means ecofriendly, cost effective and moderately accurate. And this study also help in studying aquatic invertebrates i.e., biodiversity of invertebrates.

Recommendation

1. A continuous monitoring of the physico-chemical, biological, and microbiological parameters of this river is needed for in -situ conservation of aquatic biodiversity.
2. A definite impact on the water mass for increase in the development of submerged saprophytes and aquatic weeds which promote eutrophication must be prevented by taking advance precaution in this record.

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