INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY
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www.vmsindia.org

ZOOPLANKTON DIVERSITY OF DHAM RIVER AT PAWNAR IN WARDHA DISTRICT OF MAHARASHTRA STATE

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Abstract:
Qualitative assessment of zooplankton diversity was carried out in Dham river at Pawnar in Wardha district of Maharashtra state during pre-monsoon, post monsoon and monsoon seasons in the year 2015 in up and down stream in the river. In all the zooplankton diversity of this beautiful river system is represented by Protozoa, Rotifera, Cladocera, Copepoda, Ostracoda and Nematoda groups. Maximum forms are found in post monsoon season in the river basin. In all 27 different zooplankton species are found in the river stretch at Pawnar in our investigation. Maximum zooplankton forms are reported in polluted water down stream of river due to organic pollution. The presence of indicator forms of organic enrichment points out towards organic pollution in the river basin.

Keywords: Zooplankton, Dham River, Biodiversity, Pawnar.

Introduction

The zooplankton represents assemblage of taxonomically unrelated microscopic organisms with common ecological habitat which are drifting in the epilimnion of aquatic environments (Jadhav *et al.,* 2012). They are the indicators of trophic status of a water body and some of them are also acting as bio indicators of organic pollution. Hence through zooplankton studies with respect to their abundance, diversity, density and horizontal and vertical distribution, the trophic status of a water body is known. They act as food chain organisms on which fisheries sustain as a major business, and play a key role in energy energy transfer from primary to higher level in the ecosystems. The most significant feature of zooplankton is its immense diversity over space and time (Sehegal *et a*l, 2013).

In India and abroad studies on riverine zooplankton are undertaken by investigators like Bazmi Shaukat Hussain *et* al (2011); Dutta and Verma (2010); Jindal *et* al (2010); Kobayashi *et* al (1998); Pace *et* al (1992); Sarwade and Kamble (2014); Suresh *et* al (2009) and Venkateswarlu (1969); while studies on reservoir and lakes were done by Thirupataiah *et* al., (2012); Krishnamoorthi and Selvakumar (2012); Jeelani and Sarwar (2005); Sehgal *et al.,* (2013); Thilak (2009); Jadhav *et a*l.,(2012).

As no previous studies were reported on Dham river of ecological importance, it has been investigated by us. In this conext, this study attempted to investigate the structure of zooplankton communities in stretch of river Dham at Pawnar in Wardha district during 3 different seasons from 2 different sampling stations, one upstream near embankment and other downstream after crossing the over bridge, where water is quite stagnated and polluted.

Materials and Methods

Study Area, Zooplankton Sample Collection and Analysis:

The river Dham is a holy river of Vidarbha region of Wardha district. This river has been used for performing holy rituals of forefathers and other festivals of hindus at Pawnar. During Durga Puja and Ganesh festival visarjan of murtis and nirmalya take place in it at Pawnar resulting in contamination of its water by organic enrichment. This is also a tourist spot as Vinoba Hbave Ashram is also on its bank.

Samples were collected in monsoon, premonsoon and post monsoon seasons from the selected 2 sampling stations one upstream and one downstream and collection of zooplankton sample was done by filtering 50L of water through silk bolting cloth net no. 25 (Mesh size 64µ). Samples were preserved by adding 70% alcohol which maintains the fragile structure of animals and also helpful for settling the forms. The identification of zooplankton was done by standard literature (Tonapi, 1980; APHA, 1995; Edmondson, 1963; Battish, 1992).

Results and Discussion

The zooplankton serve as important aquatic organisms which play a vital role in energy transfer in aquatic ecosystems (Altaff, 2004). The major group of zooplankton observed during the present study were protozoa, Rotifera, Cladocera,Copepoda,Ostracoda and Nematoda (Table 1) The protozoans are the smallest of

aquatic organisms in the zooplankton communities. The rotifers are tiny wheel animals considered as natural water purifiers as they perform clean up services in slow moving aquatic environments. In the present study group rotifer was represented by *Ascomorpha*, *Keratella tropica*, *Philodina*, *Brachionus caudatus*, *Brachionus angularis*, *Filinia longiseta*, *Epiphanes sp.*, *Hexarthra sp.*, *Brachionus calyciflorus*, *Lecane luna* and *Cocconeis sp*. Protozoa were represented by Bursaria, *Paramoecium* caudatum, *Stentor*, *Vorticella*, *Prorodon*, *Chilodonella*,*Tetrahymena* sp., Copepoda by *Nauplius*, *Cyclops* and Diaptomus, while cladocera by *Sida*, *Moina*, *Simocephalus* and Bsomina while nematode by *Heterodera* and Ostracoda by *Stenocypris* sp.

Comparatively rotifers were the dominant group with 11 diverse species some of which serve as pollution indicators. Proptozoa are represented by 7 species and similar observations are reported by Sharma in (2009).

Rotifers of genus *Brachionus* and *Keratella* are abundant in the water of Dham river at Pawnar. Their occurrence in eutrophic waters was well documented (Sarwade and Kamble, 2014). The species composition and species diversity of them also points out towards the polluted nature of water. These findings will help in the future studies for biomonitoring of this river ecosystem. Similar observations were reported by Sarawde and Kamble (2014) in Krishna river in Sangli, Maharashtra. Cladocerans are represented by 4 species. Similar observations are made by Dutta and Verma (2010) in river Chenab, 7 species from Tungabhadra river by Suresh *et al*., (2009), whereas Kamble *et al* (2013) documented 4 species of clacoderans from Krishna river ghat at Miraj. Also Green *et al* (2005) reported 5 species of Cladocerans in their study.

Zooplankton communities of Cladocera, Copepoda, Rotifera and Ostracoda are most important in terms of population density, grazing, production of biomass and the nutrient regeneration in all the aquatic ecosystems. Their density and diversity is controlled through availability of food and favorable quality of water. The plankton population is governed by interaction of number of physical, chemical and biological conditions. The water quality and nutrient status of water body play a crucial role in governing the biomass of a plankton in a river or stream or a lake ecosystem.

The presence of indicator forms of organic enrichment points out towards organic pollution in the Dham river downstream as evident by presence of indicator species. In all 27 different zooplankton species are found in the river stretch in up and downstream in our investigation. Maximum forms are reported in polluted and stagnant water downstream near bridge due to organic pollution of man made origin caused by dumping and decomposition of nirmalya and other offerings. Genus *Brachionus* indicates eutrophicated status of a water body (Sladecek, 1983) and hence its presence is considered as biological indicator of eutrophication.

Table 1 Occurrence of Zooplankton in Dham River at Pawnar

Group	Species
PROTOZOA	*Bursaria sps.*
	Paramoecium caudatum
	Stentor sp.
	Vorticella sp.
	Prorodon sp.
	Chilodonella sp.
	Tetrahymena sps.
ROTIFERA	*Ascomorpha sps.* *Keratella tropica*
	Philodina sps.
	Brachionus caudatus
	Brachionus angularis
	Filinia longiseta
	Epiphanes sps.
	Hexarthra sp.
	Brachionus Calyciflorus
	Lecane luna
	Cocconeis sp.
CLADOCERA	*Sida crystallina*
	Moina sp.
	Simocephalus sp.
	Bosmina longirostris
NEMATODA	*Heterodera sp.*
OSTRACODA	*Stenocypris*
COPEPODA	*Cyclops*
	Copepod Nauplius
	Diaptomus
TOTAL RECORDED FORMS	***27***

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