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ZOOPLANKTON DIVERSITY IN A GODAVARI RIVER NEAR NANDED CITY

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ABSTRACT Zooplanktons are worldwide distributed organism and they are found to inhabit all freshwater tropical and subtropical wetlands.The present investigation deals with the study of monthly changes of diversity and density of Zooplanktons in Godavari river near Nanded city.The work was carried out for the period bof one year from June 2017 to May 2018.The population status of Zooplanktons In Godavari river near Nanded city consisted of 40 genera, categorised into three major groups, viz, Rotifera> Cladocera> Copepoda. The Zooplanktons sample consisted of 53%Rotifera, 25%Cladocera and 22%Copepoda respectively. Rotifera were the major group of Zooplanktons recorded with respect to diversity and population density status.

KEYWORDS : Diversity, Godavari river, Nanded city, Population density, Zooplanktons.

INTRODUCTION

Zooplanktons are the main sources of natural food for fish which is directly related to their survival and growth and are base of food chains and food webs in all aquatic ecosystem (Miah et.al., 2013).Zooplankton are a diverse group of heterotrophic organisms that consume phytoplankton, regenerate nutrients via their metabolism, and transfer energy to higher trophic levels (Steinberg and Robert, 2009). They play important role in in recycling of energy and nutrients in aquatic ecosystem. They are the essential food item of omnivorous and planktivorous fishes and the most essential for fish larvae culture (Alam et.al., 1987). Zooplankton differs from site to site within the same location with similar ecological conditions and as such both qualitative and quantitative studies of zooplankton in a waterbody are of major importance in managing successful aquaculture operation (Boyd, 1982). Zooplankton is a good indicator of changes in water quality because it is drastically affected by environmental conditions and responds quickly to changes in physical and chemical conditions of environment. Zooplankton communities respond to a different variety of disturbances including nutrient loading, acidification, sediment input etc. It is a well-suited tool for understanding water pollution status (Contreras et al., 2009). There is lot of work on Zooplanktons from different areas of India but scarcity in work from Marathwada.Therefore this study is essential.

MATERIAL AND METHODS

STUDY AREA:

Nanded is located on the banks of Godavari river in central west India. It is closer (approximately 275 kilometres (171 mi)) to Hyderabad[4] in the state of Telangana than it is to the capital of Maharashtra state, Mumbai. Nanded district borders Latur district and Parbhani district to the west and Yavatmal district to the north. The district is bounded by the Nizamabad, Medak and Adilabad districts of Telangana state to the east.Nanded has two parts: Old Nanded 20.62 square kilometres (7.96 sq mi) occupies the north bank of the Godavari river; New Nanded, to the south of the river, 31.14 square kilometres (12.02 sq mi) encompasses Waghala and six other villages.

ZOOPLANKTON SAMPLING:

The study was conducted for a period of one year from June 2017 to May 2018. Zooplankton were sampled weekly from the site following standard methods of Battish (1992). Then the sample were filtered and placed in Tarson (100 ml) container, subsequently fixed in Lugol's solution and stored in cool and dark place. For studying the diversity of Zooplankton, sample were taken in a Sedgwick-Rafter counting chamber and observed under a light microscope under required magnification (X 10 intially , followed X 40) and the specimens were identified following standard literature of Battish (1992); Edmondson (1959); Michael and Sharma (1998)**;** Sharma (1998); Sharma and Sharma (2008).

RESULTS AND DISCUSSION

During the present study, 40 genera of Zooplankton were recorded from the wetland belonging to the three groups viz, Rotifera, Cladocera and Copepoda. Among the recorded genera, 14 belongs to Cladocera, 4 belongs to Copepoda and 22 genera belongs to Rotifera group (Table 1). Similar observation was made by many researchers throughout the country Kar and Kar (2013) reported 26 species of Zooplankton from an oxbow lake of Cachar, Assam; Tyor et al. (2014) studied Zooplankton diversity in a shallow lake of Gurgaon, Haryana revealing Rotifera with highest diversity followed by Cladocera and then Copepoda showing least diversity; Pawar (2014) reported 66 species of Zooplankton in some freshwater bodies around Satara district of Maharashtra, India.

The abundance status of Zooplankton group recorded from Godavari river near Nanded city. The present study revealed that the freshwater body that was investigated comprised of Cladocera (14 genera), Copepoda (4 genera) and Rotifera (22 genera) where Rotifera constituted the most dominating group contributing 53% to the total Zooplankton followed by Cladocera contributing 25% and Copepoda contributing 22% to the total Zooplankton. Different species of Zooplankton showed their abundance according to the favourable environmental conditions.

The population density status of the Zooplankton recorded from Godavari river near Nanded city depicted in Fig 2. During the study period, among Cladocera, *Diaphanosoma* sp., *Sida* sp., *Chydorus* sp., *Ceriodaphnia* sp., *Bosmina* sp., *Alona* sp. and *Moina* sp. were recorded throughout the year; among Copepoda, *Mesocyclops* sp., *Neodiaptomus* sp. were recorded throughout the year and among Rotifera, *Brachionus* sp., *Plationus* sp., *Lecane* sp., *Keratella* sp., *Anuraeopsis* sp., *Asplanchna* sp., *Ascomorpha* sp., *Testudinella* sp., *Trichocerca* sp. and *Scaridium* sp. wre recorded throughout the year. Present investigation shows high value of species richness reflecting the suitability of the area for the dominant species (Arora and Mehra 2003). In the present study, the study site was characterized by a greater diversity of Zooplankton taxa during winter season.

During the present study, Rotifera group was reported to be dominant among all other Zooplankton groups. In tropical freshwater wetlands, dominance of rotifera group is a common characteristic, similar was reported from the studies of Mwebaza-Nadwula, 2005. The present investigation shows that the population density of Rotifera group

reported from the study site vary in different seasons. Its density was reported to be highest in the month of December (Fig 2). Rotifera density was followed by that of Cladocera and then that of Copepoda as similar as it was reported by Tyor *et al.* (2014) during their study of Zooplankton diversity in a shallow lake of Gurgaon, Haryana where Rotifera was followed by Cladocera and then Copepoda showing least diversity and dominance with only 4 genera constituting 20% of the total Zooplankton population.

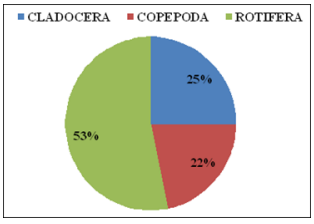

Fig 1: Abundance of Zooplankton of Godavari River Near Nanded city

Table 1: Abundance of Zooplankton species of Godavi River Near Nanded City

GODAVARI RIVER, NEAR NANDED CITY ZOOPLANKTON	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
CLADOCERA												
Diaphanosoma sp.	+	+	+	+	+	+	+	+	+	+	+	+
Scapholeberis sp.	+	-	-	+	+	+	+	+	+	+	+	+
Sida sp.	+	+	+	+	+	+	+	+	+	+	+	+
Simocephalus sp.	+	-	-	+	-	-	-	-	+	-	-	+
Macrothrix sp.	-	+	-	-	+	-	-	+	+	+	+	+
Chydorus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Ceriodaphnia sp.	+	+	+	+	+	+	+	+	+	+	+	+
Bosmina sp.	+	+	+	+	+	+	+	+	+	+	+	+
Bosminopsis sp.	-	-	-	+	-	-	-	-	+	-	+	-
Alona sp.	+	+	+	+	+	+	+	+	+	+	+	+
Alonella sp.	+	-	-	-	+	-	-	-	+	-	-	-
Daphnia sp.	-	-	-	+	-	-	-	-	-	-	+	-
Moinodaphnia sp.	-	-	-	+	-	-	-	-	+	-	-	-
Moina sp.	+	+	+	+	+	+	+	+	+	+	+	+
COPEPODA												
Mesocyclops sp.	+	+	+	+	+	+	+	+	+	+	+	+
Thermocyclops sp.	+	+	+	+	+	+	-	+	-	+	+	+
Neodiaptomus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Heliodiaptomus sp.	+	+	+	-	+	+	-	+	+	+	+	+
ROTIFERA												
Brachionus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Polyarthra sp.	-	+	-	+	-	-	-	-	+	-	-	+
Plationus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Lecane sp.	+	+	+	+	+	+	+	+	+	+	+	+
Lepadella sp.	+	-	-	-	+	-	-	-	-	+	-	-
Keratella sp.	+	+	+	+	+	+	+	+	+	+	+	+
Anuraeopsis sp.	+	+	+	+	+	+	+	+	+	+	+	+
Asplanchna sp.	+	+	+	+	+	+	+	+	+	+	+	+
Ascomorpha sp.	+	+	+	+	+	+	+	+	+	+	+	+
Testudinella sp.	+	+	+	+	+	+	+	+	+	+	+	+
Trichocerca sp.	+	+	+	+	+	+	+	+	+	+	+	+
Cephalodella sp.	+	-	+	+	-	-	+	-	+	+	+	+
Macrochaetus sp.	-	-	+	-	-	-	-	+	-	-	-	+
Mytilina sp.	-	-	-	-	-	-	-	-	-	+	-	-
Horaella sp.	-	-	-	-	+	-	-	-	-	+	-	+
Filinia sp.	+	+	+	+	+	+	+	-	+	-	+	+
Colurella sp.	-	+	+	-	-	-	-	-	+	-	+	+
Conochilus sp.	-	-	-	-	+	-	-	-	-	+	-	+
Rotaria sp.	-	+	-	-	-	-	-	+	-	-	+	+
Scaridium sp.	+	+	+	+	+	+	+	+	+	+	+	+
Pompholyx sp.	-	+	-	-	+	-	-	-	-	+	+	+
Platyias sp.	-	-	-	-	-	-	-	-	-	-	-	-

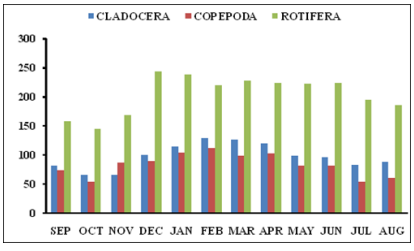

Fig 2: Population density status of Zooplankton of Godavari River Nanded city

CONCLUSION

The present study on Godavari river exhibits rich and diversified Zooplankton which is dominated by Rotifera throughout the study period which shows that the wetland is very much suitable for aquaculture as Zooplankton mostly rotifer are known to be the best food for the fish larvae for aquaculture. This study is a beneficial contribution to reveal the diversity of Zooplankton in tropical floodplains in general which on the other hand is useful in maintaining aquaculture in natural floodplain in particular. Thus, keeping in view the importance of the study, steps should be taken for the conservation and maintenance of the freshwater wetland.

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