STUDY ON ZOOPLANKTON DIVERSITY OF FRESH WATER LAKE OF KONDESHWAR NEAR AMRAVATI, MAHARASHTRA

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Abstract:The aquatic ecosystem is very important ecosystem in the world which occupies maximum area where the animals residing in it are always under the trace due to continuous changes in the aquatic environment resulting into change in its physio-chemical parameters. The zooplankton- the important ecological indicator of fresh water bodies serve as a major component of aquatic food chain. They also helps to maintain proper equilibrium between biotic and abiotic components of the aquatic ecosystem. The present investigation deals with the study of zooplankton diversity of Kondeshwar Lake, near Amravati .The work was carried out for one year i.e December 2011 to November 2012. The zooplankton diversity of lake water was represented by 5 different groups i.e protozoa, rotifera, cladocera, copepoda and ostracoda. zooplankton species were recorded from the kondeshwar lake. The maximum species of rotifers was noted indicates the polluted nature of lake due to the anthropogenic activities.

Key words: Zooplankton , Kondeshwar Lake, Diversity.

INTRODUCTION

The aquatic ecosystem is very important ecosystem in the world which covers maximum area where the animals residing in it are always under the trace due to rapid changes in the aquatic environment resulting into change in its physio-chemical parameters, Lampert & Sommer (1997).The zooplankton are small, microscopic animals that lives in water column of almost all water bodies and acts as primary and secondary links in the food chain of all aquatic ecosystem. These zooplankton are very important components of fauna of freshwater bodies. The occurrence and richness of zooplankton depends on its productivity which in turn is influenced by abiotic factors and the level of nutrients. The freshwater zooplankton form an important group as most of them feed upon and incorporate the primary producers into their bodies and make themselves available to higher organisms in food chain Michael(1973);Santos-Wisniewski *et al.* (2006)). With the global loss of many species everyday as a result of pollution and habitat Moreover, zooplankton communities are sensitive to human activities and that is why their study may be useful to know of long-term changes in lake ecosystems, as these communities are highly sensitive to environment fluctuations Ferrara, Vagaggini, & Margaritora, (2002); Preston & Rusak,(2010). it has been reported by several studies that zooplankton can serve as an indicator of changes in trophic dynamics and the ecological state of lakes related to changes in nutrient loading and climate ,Caroni & Irvine(2010). Hence, current study was undertaken to investigate the impact of human disturbance in zooplankton diversity in the kondeshwar lake at Amravati, Maharashtra. The study area of the present study is shown by using satellite image and indicated as Fig 1.

Fig.1: Satellite image of Kondeshwar Lake

MATERIALS AND METHODS

The present study was carried out on Kondeshwar lake which is located in the middle of dense forest surrounded by hills, shrubs, mix heighted trees and agricultural land. It is situated near an ancient elephant temple known as Kondeshwar temple, dedicated to Lord Shiva. The water samples were collected for a period of 1 year from December 2011 to November 2012 at three different sites in order to assess the fauna prevailing in this water body The surface water samples were taken from the study site once in a month between 8.30 am to 10.30 am in wide mouth plastic bottles. The spot parameters like pH, Humidity, Water temperature, Air temperature was recorded at sampling spot by using Thermometer and Pocket digital pH meter and other physicochemical parameters like TDS, Dissolved oxygen, etc were estimated as per standard methods

prescribed by APHA(1998), Kodarkar (1992). To study the zooplankton diversity from each sampling spot 50 Litre water was filtered through plankton net made of silk bolting cloth. Filtered water sample was preserved in 4% formalin and by adding a few drops of glycerine. The sample was qualitatively analyzed using Sedgewick Rafter Cell Method APHA, (1998), The identification of zooplankton was performed in laboratory using standard manuals and textbooks Idris(1983), Adoni (1985)Sharma and Michael (1987), Chandrashekhar and Kodarkar (1995), Shiel (1995) and Altaff (2004)

RESULTS AND DISCUSSION

Zooplankton are considered as one of the most important food source to the aquatic organisms particularly to planktivorous fish . Most of the fishes during their larval mode of life were dependent zooplankton. Monthly variation of zooplankton species were presented in Table.1. The population of zooplankton fauna of lake water represent by Protozoa, Rotifera, Copepods, Cladocera and Ostracods. In the present study the population of zooplankton exhibit mix variations in their populations reached at maximum level during the months of summer and winter and minimum during the rainy season. Similar findings were recorded by Adoni (1985).

The density of protozoa was observed maximum during the month of April to June and minimum in the month of August to November it might be due to the rain water which dilutes the water of lake and maximum density is due to decay of organic matter. Some important species of protozons found in lake water are Urocentrum, Coleps, Sarcodina and Vorticella, Rotifers occur in almost all kinds of fresh water bodies and have attracted global attention as an indicator of water quality. Rotifers were the most rich species group in kondeshwar lake followed by cladocerans and copepods The population of rotifers was found minimum during rainy session i.e June and July and maximum during the months of mid November to mid January period. This present study is in agreement with other studies of Sinha(1992), Barrabin (2000); Saler (2004) that rotifers are the most dominant group in freshwater ecosystems. Asplanchna, Brachionus durgae, B. angularis, B. bidentata, B. falcatus, F. longiseta and Keratella vulga were some species recorded in lake water. In the present study the high density numbers of rotifers is due to the eutrophic water of lake . similar findings were stated by Cajander (1983) The occurrence of Brachionus is a good indicators of eutrophic condition of lake. Other than the rotifers , the group of zooplanktons like cladocerans and copepods accounted 24 % and 5 % of total density.The Cladocera, an order of small crustaceans commonly called water fleas plays an important role in in food chain and energy transformation. Most of the cladoceran species feed on microscopic algae and the fine particulate matter in the detritus thus influencing cycling of matter and energy in benthos, Jayabhaye and Madlapure, (2006).In the present study the population of cladocera found in almost all the sampling points. However their density to be maximum in the month of December to March and minimum during the monsoon session. Similar findings were reported by Rao and Durve (1992). According to Edmondson(1992) temperature and easily availability of food is one of the reason in increase and decrease of cladocera density.Other group of zooplankton, copepods accounted their density very low in the present study and it might be due to the temperature fluctuation of lake water and larger in size compare to other zooplanktons , specially rotifers. Planktivorous fish is probably a major factor for the decreasing density of copepods in the study sites. Ostracods are bivalve and have shape like small seeds and found in all type of water bodies and act as a good source of food for other aquatic organisms. Maximum density was recorded in March to May and and minimum in July August.

Table.1: Month-wise population density (No/Lit) of different Zooplankton Groups

Zooplankton Component	Months-wise population												Total
	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
Protozoa	115	120	128	132	136	143	123	104	92	69	84	101	1347
Rotifera	348	329	292	235	206	115	93	72	96	106	198	256	2346
Cladocera	142	156	146	114	72	54	60	75	80	96	112	134	1241
Copepoda	86	95	108	124	120	106	93	86	99	102	95	78	1192
Ostracoda	12	24	45	62	66	48	32	26	38	42	36	34	465
Total Zooplankton	703	724	719	667	600	466	401	363	405	415	525	603	6591

CONCLUSION

The present investigation of kondeshwar lake water showed diverse population of zooplankton indicates that the temperature and anthropogenic activities near by the lake might have influence on zooplankton production

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