Available online at www.elixirpublishers.com (Elixir International Journal)

Bio Sciences

Elixir Bio Sci. 97 (2016) 42258-42259

ISSN: 2229-712X

Percentage Prevalence of Rotifers from Upper Dudhana Dam of Jalna District, (M.S.)

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ARTICLE INFO

Article history:

Received: 11 July 2016;

Received in revised form:

10 August 2016;

Accepted: 20 August 2016;

Keywords

Fresh water,

Rotifers,

Percentage prevalence.

ABSTRACT

A study on rotifers was conducted to count percentage prevalence from Upper Dudhana dam of Jalna district, Maharashtra, India. Rotifera is major group from zooplankton having divers planktonic forms and they shows variation in occurrence amongst them. Samples were collected fortnightly interval for a period of one year from February 2014 to January 2015 and percentage prevalence was counted. Result indicated that the highest percentage prevalence was showed by *Brachionus caudatus* (87.5%) whereas lowest by *Keratella vulga* (20.83%) during the period of sampling. The authors concluded that *Brachionus caudatus* was persistently present in all the seasons of sampling period. The above study gives information of the status of rotifers and providing new insights into its ecology.

Introduction

The study of fresh water fauna especially zooplankton, even if of a particular area, is extensive and complicated due to environmental, physical, chemical and geographic variations involving ecological, extrinsic and intrinsic factors (Majagi and Vijaykumar, 2009). The seasonal changes in zooplankton species are clearly related to the aquatic environment. Being the smallest in category of metazoan and body organized into organ system, Rotifers are multicellular animals with body cavities being lined up by mesoderm (Pennak, 1953). Possessing transparent body, showing complex movements in varied life types and being ecologically important as indicator and purifier agents (since they feed on suspended organic particles), free swimming rotifers are amongst the most fascinating creatures ever to encounter in aquatic environment (Ricci and Balsamo, 2000; Wallace, 1977).

Ecological barriers have stronger influence on their distribution than geographical isolation (Pejler, 1995). Rotifers are found in aquatic and semi-aquatic environments, but are characteristically common in freshwaters. Most of the studies were carried out in freshwater habitats and the ecology of rotifer species from many of the habitats in India is well documented, but the study on percentage prevalence of rotifer is very less.

Therefore the present study focused on this theme so as to know the seasonal availability of rotifer species from 'Upper Dudhana Dam' and any fresh water aquatic habitat of rotifers as well.

Study Site

Upper Dudhana dam is situated near village Somthana of Badnapur tahsil in district Jalna, Maharashtra, India on the river Dudhana. The dam is located at 19°55' 11.8" N to 75° 41' 39.9" E. This is an earthen dam and has a height of about 18m and 2.46 km in length, wherein the width is approximately 2 km.

Materials and Methods

The study was conducted from month of February 2014 to January 2015 during three seasons of sampling year. Zooplankton samples were collected fortnightly by filtering 100 lit. of water through 40µ mesh size nylon plankton net and preserved in 4% formalin for further analysis. The eosin was used for staining the zooplankton samples. The rotifers were identified according to the standard keys of Altaff (2004), Dhanapathi (2000), Edmondson (1959) and Pennak (1953) as well as image based identification provided by various websites (http://rotifers.acnatsci.org/science),http://cfb.unh.edu,www.glerl.noaa.gov/seagrant/GLWL/zooplnkton/rotifers).

The percentage prevalence counted by using formula as,

$$\%P = \frac{n}{N} \times 100$$

Where, P = Prevalence of species

n = No. of sample containing species

N = Total no. of samples collected

Result and Discussion

The results showed that the annual percentage prevalence of twelve fresh water rotifer species which is depicted in (Table.1). The annual % prevalence was *B.calyciflorus* (83.33%), *B.falcatus* (45.83%), *B.bidenta* (62.5%), *B.caudatus* (87.5%), *B.angularis* (33.3%), *K.tropica* (79.16%), *K.vulga* (20.83%), *K.tecta* (37.5%), *A.brightwelli* (41.66%), *A.priodonta* (41.66%), *F.longiseta* (33.33%) and *Hexarthra species* (37.5%) during the study period (Fig.2). The annual percentage prevalence of the rotifer was highest by *Brachionus caudatus* (100%) and lowest by *Keratella vulga* (20.83%). The annual percentage prevalence of the rotifer was highest by *Brachionus caudatus* (100%) and lowest by *Keratella vulga* (20.83%) during the study period.

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Table 1. Showing percentage prevalence of rotifers from Upper Dudhana Dam during Feb.2014 to Jan.2015.

Sr.No.	Name of the species	Percentage prevalence (%P)			Total % prevalence
		Summer	Rainy	Winter	
1.	*Brachionus calyciflorus*	87.5	75	87.5	83.33
2.	*Brachionus falcatus*	62.5	50	25	45.83
3.	*Brachionus bidenta*	87.5	50	50	62.5
4.	*Brachionus caudatus*	87.5	75	100	87.5
5.	*Brachionus angularis*	50	12.5	37.5	33.33
6.	*Keratella tropica*	87.5	62.5	87.5	79.16
7.	*Keratella vulga*	25	25	12.5	20.83
8.	*Keratella tecta*	25	37.5	50	37.5
9.	*Asplanchna brightwelli*	25	12.5	87.5	41.66
10.	*Asplanchna priodonta*	0	37.5	87.5	41.66
11.	*Filinia longiseta*	50	37.5	12.5	33.33
12.	*Hexarthra species*	0	37.5	75	37.5

*No.of zooplankton sample collected during sampling period= 24

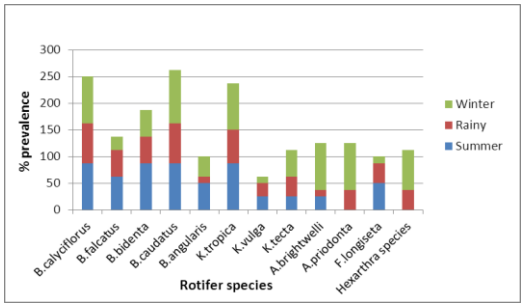

Fig 1. Showing seasonal % prevalence of rotifers during sampling period

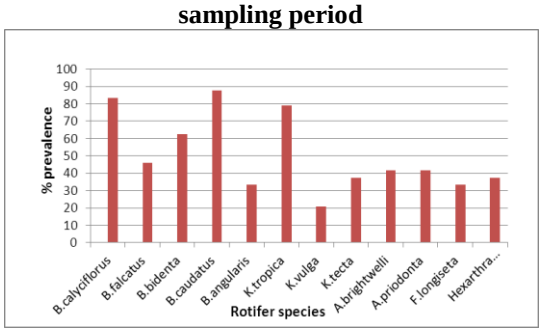

Fig 2. Showing annual % prevalence of rotifers during sampling period

In summer season percentage prevalence of rotifers was highest by *B.calyciflorus*, *B.bidenta*, *B.caudatus* and *K.tropica*, *i.e.*87.5% whereas lowest by *K.vulga*, *K.tecta* and *A.brightwelli*, *i.e.*25%. At the same time *A.priodonta* and *Hexarthra species* were absent in summer. The present study showed that absence of two species out of twelve in summer season whereas whole species present in rainy and winter season. Wilhm and Dorris (1968) opined that the increase in diversity is an indication of the healthier environmental condition and low diversity suggested fewer species dominance in summer probably due to sewage environmental stress or increasing organic pollution. Present study showed peak values of *B.caudatus* 100% in summer and 87.5% in winter seasons. This result is supported by Pathmalal and Piyasiri (1999) by showing peak abundance of *B.caudatus* in May and October. The rotifers showed percentage prevalence in rainy season highest by *B.calyciflorus* (75%) and lowest by *B.angularis* and *A.brightwelli* (12.5%). Similarly highest percentage prevalence by *B.caudatus* (100%) and lowest by *K.vulga* and *F.longiseta* (12.5%) in winter season during the period of sampling.

Altogether the annual percentage prevalence of the rotifer was highest by *Brachionus caudatus* (100%) and lowest by *Keratella vulga* (20.83%). The order of percentage prevalence of *Brachionus caudatus* was as, rainy < summer < winter. Similarly the order of percentage prevalence of *Keratella vulga* was as, winter < summer = rainy. The difference in seasonal availability of any species might be the nutrition and biotic interactions (Pawar and Pulle, 2005).

Conclusion

The fluctuation in percentage prevalence of rotifers occurs in rainy season as there is a less population due to the increase in quantum of water. The population raises a bit higher level during winter season because of favorable environmental conditions like presence of excess of food in the form of bacteria and suspended detritus. In summer availability of food is more due to decomposition of organic matter and the density of rotifers might be high due to this and also due to less predation.

Acknowledgement

Authors are grateful to the Head, Department of Zoology, Dr.Babasaheb Ambedkar Marathwada University, Aurangabad for providing all necessary laboratory facilities for conducting this research work.

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