



Study on Diversity of Rotifer from water Bodies around Aurangabad region

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Abstract

Rotifers are microscopic secondary producers which play a vital role in trophodynamics of aquatic ecosystem. To understand the fauna the rotifera present study was undertaken to investigate the rotifer diversity and density in order to assess the species composition and population density of these groups. The study was carried out for one year. During the investigation 12 species of rotifers belonging to Branchionidae, Euchlaidae, Philonidae, Asplanchnidae, Keretella were recorded. *Branchionus calyciflorus* showed a maximum density.

Keywords: Rotifer, shannon-weiner, diversity, abundance.

Introduction

Rotifers are microscopic fauna characteristically prevalent in freshwaters. Rotifers fauna plays significant role in the food chain and biological productions of water such as aqua pollution indicators. Amongst zooplanktons rotifers plays an important food item of omnivorous and carnivorous fishes¹. The reproductive rate of rotifers are related to temperature. Due to the Seasonal fluctuation reproductions rate of rotifera some times declines and also due to the imbalance predatory action results to mortality.

Material and Methods

Rotifera sample were collected, mainly from three water bodies i.e. Kholi 20.3.30°N 74 4 95°E, Sarangi 19.92°N 74.73°E and Narangi is located at 19.47°N 72.8°E which is on similar nature of water body and even located on similar geographic location. The rotifera sample was collected using 40µm an interval of 15days every month for a period of one year from Feb2010-Jan11 between 7 to 8 am. The collected samples were kept in plastic bottles containing 4% formaldehyde solution. The following taxonomy was done by using Edmondson², Pennak³, Koste⁴, Batish⁵ and Dhanapathi⁶.

Diversity indices analysis: The qualitative and quantitative analysis of zooplankton organisms was carried out. Species Shannon-Wiener index [$H = - \sum_{i=1}^n P_i \log P_i$]

Shannon-Weiner index $H = - \sum_{i=1}^n P_i \log P_i$: Where, H = Shannon – Weiner index, $P_i = n_i / N$, $\sum =$ Sum, $n_i =$ Number of individuals of each species in the sample,

N = Total number of individuals of all species in the sample.

Relative Abundance: Percent total - $T_i/T * 100 = (A)$

Where: Number of Individuals' per. Species = (T_i), Total no. of species = T, Dominance Rank. = (A)

Results and Discussion

During this study 12 species of rotifers species were identified table-1. Of which 12 species belongs to 5 different families of Monogonata were recorded. In the quantitative evaluation the *Branchionus calyciflorus* (83.25%) was highest in relative abundance followed by *Asplanchna brightwelli* (36.5%) where as *Euchlanis dialata* (7.2%) showed minimum abundance which was followed by *Monostylla bulla* (6.83%) (table-3). The Shannon –Weiner Diversity indices of the rotifers were observed and two samples from each water bodies and its mean value is represented where the highest 0.94 in the month of May and lowest 0.091 in the month of June. Species diversity (H) for rotifers in summer showed H=2.9, monsoon was H= 1.9 and in winter it showed H= 1.4. Where as the value for Dec. appears as "0" as only one species (*Lepadella ovalis*) was recorded.

During this study 12 species of rotifers belonging to 6 genera were identified (table 1). The genera *Branchionus* was represented by 6 species Viz. *Branchionus calyciflorus*, *Branchionus falcatus*, *Branchionus rubens*, *Branchionus diversicornis*, *Branchionus forficula* and *Branchionus caudatus*. A similar finding was noticed by Pejaler⁷ and Fernando⁸. The composition of rotifers population showed higher population diversity in the month of May, while lower in the month of June. This was noticed by Saboor, A and K Altaff⁹. This may be due to the decreased water level by evaporation which led higher population of bacteria and dead and decayed organisms. *Branchionus calyciflorus* was the dominant group of rotifera. As the interpretation of rotifer population dynamics assumes that the species co-occur and interact in space and time. A similar finding was also noticed by Goel, P. K. and Chavan, V. R.¹⁰ Dadhich, N., and Saxena, M.M.¹¹, Somani Vaishali, Quadros Goldin and Pejaver Madhuri.K¹². However, the Shannon – Weaver index for rotifers have shown highest density in the month of May and lowest in June. In summer, species diversity for rotifers H was 2.9, in monsoon was 1.9 and in winter it

showed 1.4. The species diversity *H* of rotifers was highest in summer and was lower in monsoon and winter. Similar finding was noticed by Stiling¹³.

Conclusion

The species richness of rotifers was highest month of May and lowest in June. *Brachionus* species together were dominant genera in terms of abundance and periodicity.

Acknowledgement

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Table-1
Diversity of rotifers of Freshwater bodies of Aurangabad region

Order and family	Species
Order Monogonata	
Family : <i>Brachionidae</i>	<i>Brachionus calyciflorus</i> (Pallas,1776)
	<i>Brachionus falcatus</i> (Wierzejski,1891)
	<i>Brachionus caudatus</i> (Barrios and Daday,1894)
	<i>Brachionus diversicornis</i> (Daday, 1883)
	<i>Brachionus forficula</i> (Wierzejski, 1891)
	<i>Brachionus rubens</i> (Ehrenberg,1838)
	<i>Keretella tropica</i> (Apstein,1907)
Family : <i>Euchlanidae</i>	<i>Euchlanis dialata</i> (Voronkov,1912)
Family : <i>Lecanidae</i>	<i>Lecane luna</i> (Muller,1776)
	<i>Monostylla bulla</i> (Gosse,1851)
Family : <i>Asplanchnidae</i>	<i>Asplanchna sp.</i> (Gosse,1850)
Family : <i>Filiniidae</i>	<i>Filinia longiesta</i> (Ehrenberg,1834)

Table-2
Shannon Weiner

Index	Shannon H' Log Base 10.
Feb	0.38531
Mar	0.66974
Apr	0.90411
May	0.9445
Jun	0.09132
Jul	0.55055
Aug	0.40055
Sep	0.86346
Oct	0.72269
Nov	0.51602
Dec	0
Jan	0.21585

Table-3
Relative abundance of Rotifers of Freshwater bodies of Aurangabad region

Species	Number of Individuals per Species (Ti)	Percent Total Ti/T*100	A
<i>Brachionus forficula</i>	18.58	18.583/311.61*100	5.90%
<i>Brachionus caudatus</i>	20	20/311.61*100	6.41%
<i>Brachionus diversicornis</i>	20.41	20.41/311.61*100	6.55%
<i>Brachionus rubens</i>	22.83	22.83/311.61*100	7.32%
<i>Brachionus calyciflorus</i>	83.25	83.25/311.61*100	26.70%
<i>Brachionus falcatus</i>	29.75	29.75/311.61*100	9.54%
<i>keretella tropica</i>	35.3	35.3/311.6*100	11.32%
<i>Euchlanis dialata</i>	7.2	7.2/311.6*100	2.31%
<i>Lecane luna</i>	14.25	14.25/311.6*100	4.57%
<i>Monostylla bulla</i>	6.83	6.83/311.61*100	2.19%
<i>Asplanchna brightwelli</i>	36.5	36.5/311.61*100	11.71%
<i>Filina longiesta</i>	16.6	16.6/311.6*100	5.32%
Total	311.5	-	99.84%

Table-4
Rotifers Diversity (H) Seasonal Values

Seasons	Rotifers
Summer	2.90366
Monsoon	1.90588
Winter	1.45456

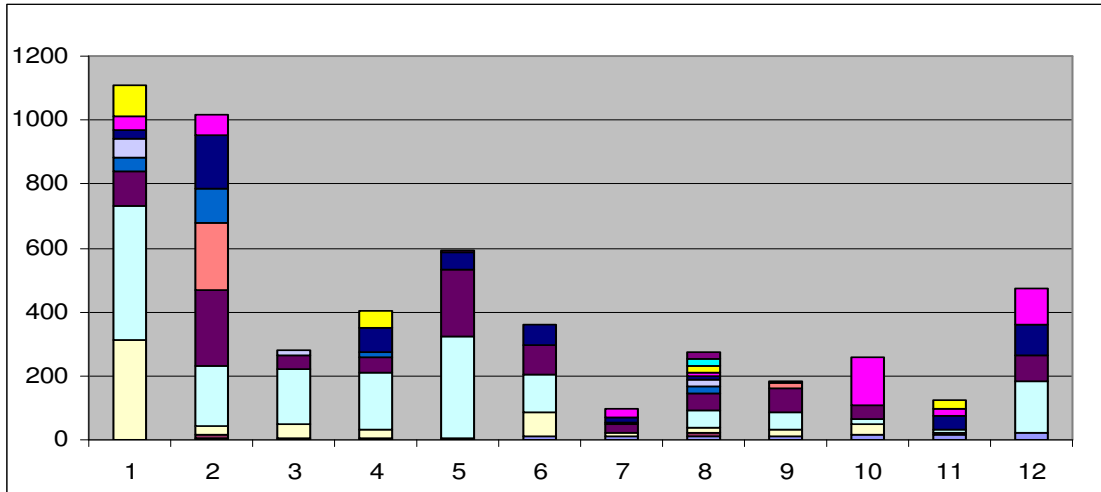


Figure-1
 Density of individual species stacked for the period of Feb- 2010- Jan 2011

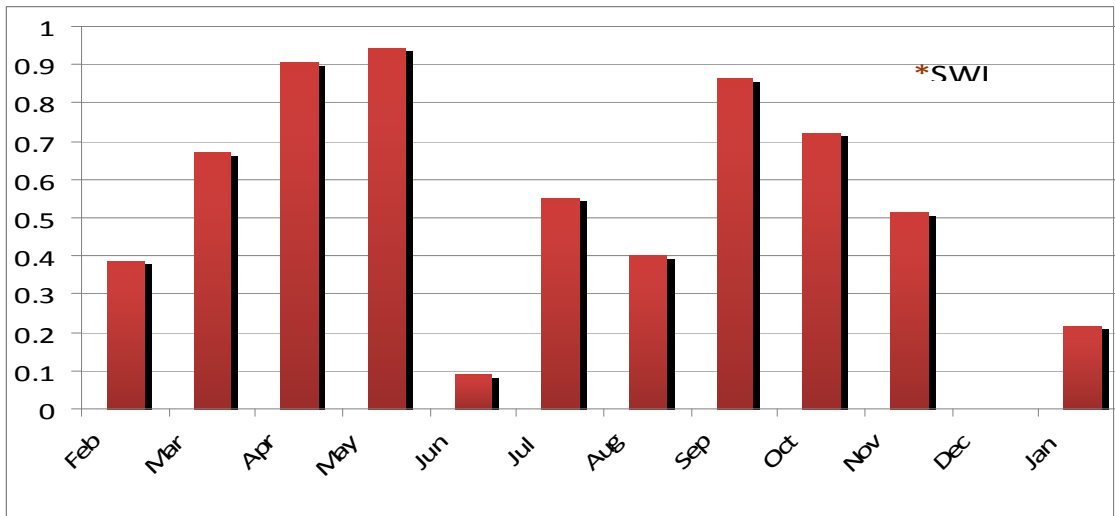


Figure-2
 Shannon – Weiner diversity (SWI) diversity of rotifers

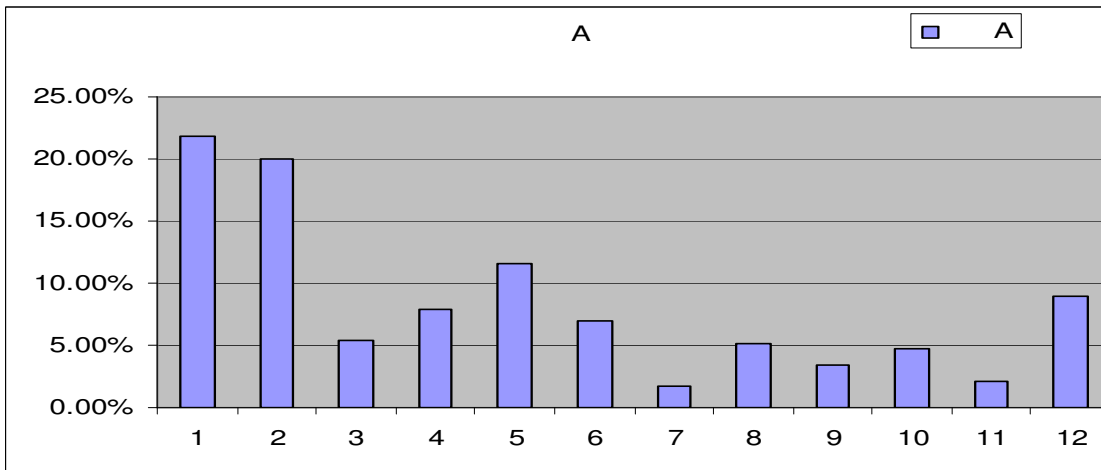


Figure-3
 Composition and relative abundance (%) of Rotifera, during the periods of Feb 2010- Jan 2011

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