

# POPULATION DYNAMICS AND SEASONAL VARIATION OF ROTIFERS IN CHANDLOI RIVER, KOTA RAJASTHAN

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**ABSTRACT:** The study presented a population dynamics and seasonal variation of fresh water rotifers recorded from River Chandloi, District Kota Rajasthan, India. It listed 16 genera and 31 species of fresh water rotifers found in the river in different seasons. This study was conducted for one year that is July 2018 to June 2019. This type of study related to population dynamics and seasonal variation of rotifers from the River Chandloi is prepared for the first time. The study also discussed dominance and abundance of the species.

**KEYWORDS:-** Population dynamics, Abundance, Dominance, Chandloi River.

## **INTRODUCTION:-**

Zooplanktons are microscopic free floating heterogenous animals which play a vital role in aquatic ecosystem. They are divided into wide range of taxonomic group viz. Protozoa, Rotifera, Cladocera, Copepoda, Ostracoda and Crustacia.

Rotifera are called Rotatoria or wheel animalcules. It is the group of small usually microscopic, pseudocoelomate animals having a length of 0.4 to 2.5 m.m. (Kumar, Kiran 2015). A rotifer has a transparent, cylindrical body, lined by a thin cuticle. In majority of rotifers cuticle form a lorica. The body is divided into head, trunk, neck and foot. Rotifers have been variously regarded either as a class of phylum Aschelminthes or as a separate minor phylum. They are omnipresent in nature and occurring in almost all types of fresh water habitats from large permanent lakes to small temporary puddles and feed on algae and bacteria. Being prey for plankton feeders. Rotifers play a crucial role in many fresh water ecosystems. They are permanently and obligatory connected to aquatic habitats in all active stages, only their resting stages are draught resistant. (Hardrik, 2007).

Rotifer distribution and diversity is influenced primarily by deteriorating quality of water in primary production, temperature, abundance of predators and competitors, potential food resources and various physical, chemical, geographical, biological and ecological parameters. All these factors play an individual role in the formation of rotifer assemblages and their seasonal occurrence but the ultimate effect is produced due to interplay and interaction of all these factors.

There has been lack of studies regarding the population of rotifers from Chandloi River, Kota. Keeping this in view, the aim of the present study was to collect, identify and to determine monthly variations of density of rotifers.

## **MATERIAL AND METHODS:-**

Chandloi River is a left bank tributary of Chambal River. It originates near Aalania village and meets the River Chambal near Mawasa village. The river flows nearly 90 Km before entering Chambal River. The studies were continued for a period of one year from January 18 to December 18. Zooplankton samples were collected during early morning on monthly basis from four different locations.

100 litres of water sampled from different areas and depths of the river was filtered through plankton net made up of bolting silk (No: 10; mesh size 150 micro meter) and the plankton biomasses were transferred to the specimens bottles (pre filed with 5% formaline) and subjected to microscopic analysis. The zooplankton was segregated group wise like rotifer, cladocera, copepod, ostracoda, etc. They were separated under a binocular stereo zoom dissection microscope using a fine needle and brush. Quantitative analysis was done by putting 1 ml. of the preserved sample on a Sedgwick-Rafter counter cell and studying it under an inverted microscope. The identification of rotifers was made by using standard keys of Michael and Sharma (1998),

Sharma and Sharma (2008), Altaff (2004) were utilized and results were expressed as organisms per liter (O/L).



Fig. 1- Study Site Chandloi River at Kota Rajasthan

**RESULTS:-**

A total 16 genera of rotifers were recorded from Chandloi River. Among 16 genera *Brachionus* was dominant with 7 species followed by 5 species of *Filinia*, 3 species of *Lepadella*, 3 species of *Rotaria*, 2 species of *Trichocera*. Remaining genera followed single species. Monthly number variation from July 2018 to June 2019 recorded of rotifers population in table-1.

The total number of species recorded was 31. The occurrence of the season wise rotifers was dominant in following increasing order table-2.

**DISSCUSSION:-**

The number of Rotifers increased in summer which may be due to the higher population of bacteria and organic

matter of dead and decaying vegetation (Majagi and Vijay Kumar, 2009). When primary production is found to be low, small species dominate the consumption of available resources and may exclude the bigger species (De Mott and Kerfoot, 1982). Segers (2003) studying the dominance of rotifer population which was due to its preference for warm waters. Kudari et al. (2006) studying rotifer taxonomic richness is common in tropical fresh waters. Bharati et al. (2014) reported that the abundance of rotifer species such as *Brachionus* indicates nutrient rich water body which may undergo the state of eutrophication. Kumar and Kiran (2015) studied that rotifer fauna of Jannapura tank of Bhadravathi taluk can be linked with favourable conditions and availability of abundant food. Dirican et al. (2009) studied permanent dominance of rotifer species such as *Brachionus* and *Keratella* are indicative of eutrophic condition and their abundance was due to the presence of high levels of organic matter. Sharma et al. (2010) studied presence of rotifer in the water indicates the water quality deterioration and onset of eutrophication at alarming rate.

Present study indicates population dynamics and distribution of rotifers maximum number were found in during summer, followed by winter and minimum during monsoon. In summer season the absence of inflow of the water brings stability to the water body and availability of food is more. Normally monsoon is associated with lower densities due to its dilution effect and decreased photosynthesis by primary production.

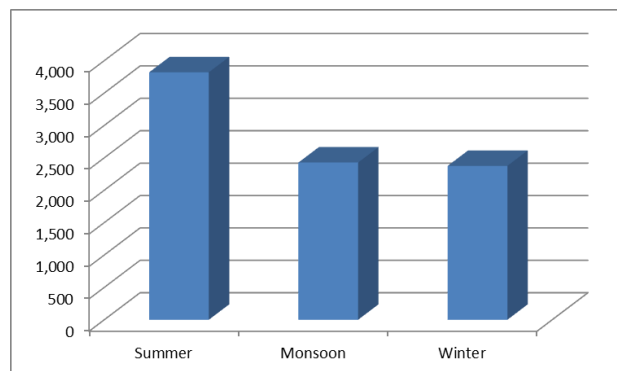
High diversity of rotifer indicates the presence of high amount of suspended material in the water body which may lead to the eutrofication of the water body. Thus, from the present investigation it is obvious that steps should be taken immediately for the preservation of river.

**Table-1: Monthly variation of Rotifers (no/lit.) at four stations of Chandloi River, kota, Rajasthan**

Station/Months	S1	S2	S3	S4
January	150	124	130	135
February	185	160	125	130
March	170	153	132	140
April	240	245	160	165
May	370	340	270	250
June	357	333	258	236
July	279	250	220	201
August	155	102	129	108
September	120	151	100	116
October	109	128	120	87
November	180	150	142	124
December	195	179	169	14
Total	2690	2435	2055	1939

**Table 2: Seasonal variation of rotifer in Chandloi River, Kota, Rajasthan**

S. No.	Seasons	Rotifers
1.	Summer	3,819
2.	Monsoon	2,426
3.	Winter	2,375
Summer > Winter > Rainy		



**Fig-2: Season wise graph of Rotifers in Chandloi River, Kota, Rajasthan**

**REFERENCES:-**

- Altaff, K. (2004): A manual of zooplankton, (p.p.1-155). New Delhi, India. University Grants Commission.
- Battish, S. K. (1992): Freshwater zooplankton of India oxford and IBH publishing Co., New Delhi.
- De Mott, W. R. and Kerfoot, W. C. (1982): Competition among cladocerans: nature of the

interaction between Bosmina and daphnia. Ecology; 63: 1949-1966.

- Dirican, S., Haldun, M. and Suleyman, C. (2009): Some physico chemical characteristics and rotifers of Camligoze Dam lake, Susehri, Sivas, Turkey. Journal of animal and veterinary advances; 8(4): 715-719.
- Handrik, S. (2007): Hydrbiologia; 595: 245-256.
- Kumar, K. Harish, Kiran B.R. (2015): population dynamic of rotifers in Jannapura tank, Karnataka International Journal of fisheries and aquatic studies; 3(1): 165-168.
- Majagi, G. and Vijay Kumar K. (2009): Ecology and abundance in Karanja reservoir. Environ. Monit. Asses.; 152: 137-144.
- Michael, R. G. and Sharma, B. K. (1998): Indian cladocera (curstacea: branchiopoda: cladocera). Fauna of India and adjacent countries series- Zoological Survey of India, Calcutta.
- Segers, H. (2003): A biogeographical analysis of rotifers of the genus Trichocera Lamarck, 1801 with notes on taxonomy, Hydrobiologia, 500: 103-114.
- Sharma, B. K. and Sharma, S. (2008): Zooplankton diversity in flood plain lakes of Assam. Records of Zoological Survey of India. Occasional paper no. 290: 1-307.
- Sharma, A., Ranga, M.M. and Sharma, P.C. (2010): Water quality status of Historical Gundolav Lake at Kishangarh as a primary data for sustainable management. South Asian Journal of Tourism and Haritage; 3(2). .