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Seasonal Variation of Rotifers population in Tajbaj Pokhara and Rani Pokhar Hajipur, Vaishali, Bihar

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ABSTRACT:
Rotifers, a diverse group of zooplankton, are important mediators between autotrophic and heterotrophic organisms. It creates important connections in the food chain. Rotifers are widely distributed in Rani Pokhar and Tajbaj Pokhara. In ponds 1 and 2, 13 and 11 species of rotifers were identified, respectively. June 2023 and May 2023 saw the first (154 U/L) and second (123 U/L) peaks, respectively. B. caudatus was the main rotifer species, with 21 U/L and 23 U/L observed in May 2023 and May 2024. Second in importance was Keratella tropica. During the examination of complete inequality, a total of 13 and 11 species were gathered in the first and second ponds. The Data collected co-related to study the situation of Tajbaj Pokhara and Rani Pokhar in the light of available literature.

Keywords:
Zooplanktons, Autotrophic, Rotifers, Collected.

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INTRODUCTION

Rotifers are tiny aquatic invertebrates that live in freshwater environments. While some live in communities, others are parasites, others live freely, and some live alone. Rotifers are important to the zooplankton population in the world's aquatic ecosystems because they feed a variety of other creatures. In fresh water, rotifers are accustomed. They serve as a mediator between higher trophic level microorganisms. Due to their sensitivity to changes in the water environment, rotifers are utilized as good indicators of the level of pollution and the eutrophication state of aquatic ecosystems (Boltovskoy and Mazzoni, 1998). According to Sharma and Tiwari (2011), zooplankton has been employed as a bioindicator of eutrophication. They eat microorganisms like ciliates, algae, and bacteria. Rotifers are crucial to the trophic structure of freshwater ecosystems because some species are detritivores (Radwan 1973). The current study set out to investigate the seasonal variations in the rotiferation of two Vishali [Bihar] ponds.

MATERIAL AND METHODS

For a year, from May 2023 to May 2024, water from two distinct ponds in the Vaishali District was gathered monthly for a qualitative and quantitative analysis of rotifers. 50 liters of water were filtered from each sampling location using a plankton net of bolting silk (mesh size 64 µm). 4% formalin was used to preserve the filtered water sample. For both qualitative and quantitative estimation, the concentrated sample was examined using a binocular microscope. Here, 10 ml of the sample was added, and it was shaken well. Then, using the compound

microscope's reduced power, 1 milliliter of the sample was removed and put on a Sedgwick rafter plankton counting chamber.
The total estimation of zooplankton was made by the following formula N = (a.1000) C /L Where, N= No. of Plankton /Litre of water.
A = Average no. of plankton in 1ml sub sample L = Volume of original water sample in 1 litter
C = ml of plankton concentrate
The present contribution of the in dividable species in respect to the class and group was calculated separately.

RESULTS AND DISCUSSION

Rotifers were the most diversified group aquatic habitat zooplankton habitually found in both the Pond. The total of 13 species of rotifers were reported at pond 1.The total abundance of rotifers shows two peaks, the first peak (154u/L) was observed in June 2024 and the second peak (123u/L) in May 2023 in the period of study. During the investigation the primarily & secondary maxima (115u/L & 104u/L) was recorded in June 2023 and july 2023 at Pond 2 within total number of 11 species. The lowest number at Pond 1 (84u/L & 92u/L) observed in July 2023 and September 2023 individually whereas at Pond 2 lowest number was recorded (67u/L & 69u/L) in the month of August 2023 and January 2024 individually. Among the rotifer *Brachionus caudatus* was the dominant species. *Keratella tropica* was the second most dominant species, its maximum density (21u/L and 18u/L) were recorded in May 2023 and July 2023 individually at Pond 1 and 2. Whereas the minimum density 4u/ L in October 2023 and April 2024 at Pond 1 whereas 5u/L in April 2024 at Pond 2.At pond 2(DM residence Ghat), a total number of 11 species of rotifers were reported during the present study. The other species of rotifers were thinly populated and scarcely present throughout the study.

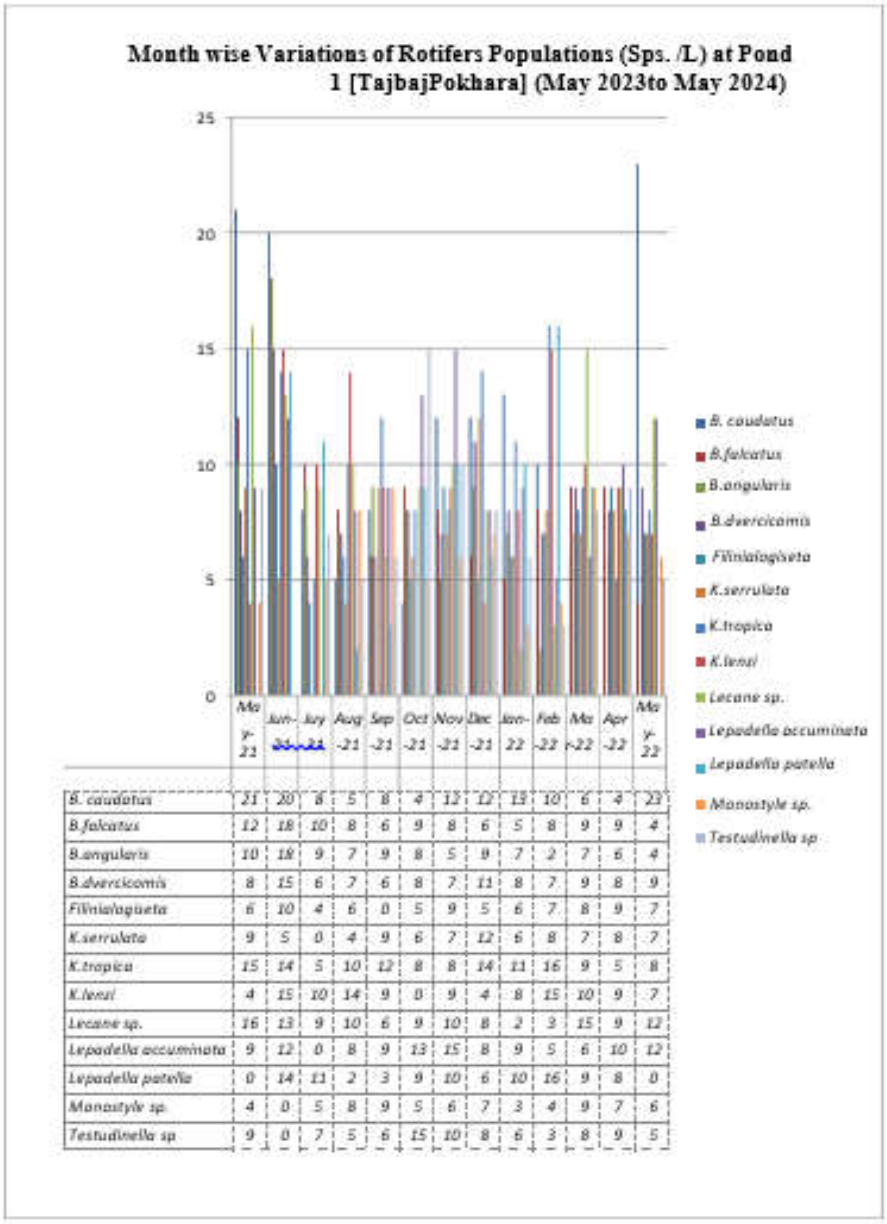
Zooplankton are an important link in the food web of the freshwater ecosystem, acting as a bridge between autotrophic organisms and other heterotrophic organisms. Because zooplankton is highly influenced by environmental conditions and reacts rapidly to changes in environmental quality, it is a good indicator of changes in water quality. In Pond I and seven in station II is regarded as pollution indicator species. According to Sharma (1986) *B. angularis, B. calyciflorus* and *B.rubens* accompanied with BGA and large number of *cladocerans* indicates highly polluted state of water. The present study differs from observation of Sharma.

The seasonal variation of rotifers, Nasar (1997) and Patra and Dutta (2004) reported that variation is controlled by abiotic and biotic factor. Such observation was also reported by Shivakami et al. (2011).Which helped the present study.

Table 1: Month wise Variations of Rotifers Population (Sps./L) at Pond 1(from May 2023 May 2024)

	Rotifers/Months	May 21	Jun 21	Juy 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22
1	*B. caudatus*	21	20	8	5	8	4	12	12	13	10	6	4	23
2	*B.falcatus*	12	18	10	8	6	9	8	6	5	8	9	9	4
3	*B.angularis*	10	18	9	7	9	8	5	9	7	2	7	6	4
4	*B.dvercicomis*	8	15	6	7	6	8	7	11	8	7	9	8	9
5	*Filinialogiseta*	6	10	4	6	0	5	9	5	6	7	8	9	7
6	*K.serrulata*	9	5	0	4	9	6	7	12	6	8	7	8	7
7	*K.tropica*	15	14	5	10	12	8	8	14	11	16	9	5	8
8	*K.lenzi*	4	15	10	14	9	0	9	4	8	15	10	9	7
9	*Lecane sp.*	16	13	9	10	6	9	10	8	2	3	15	9	12
10	*Lepadella*	9	12	0	8	9	13	15	8	9	5	6	10	12

	accuminata													
11	*Lepadella patella*	0	14	11	2	3	9	10	6	10	16	9	8	0
12	*Monostyle sp.*	4	0	5	8	9	5	6	7	3	4	9	7	6
13	*Testudinella sp*	9	0	7	5	6	15	10	8	6	3	8	9	5
	TOTAL	123	154	84	94	92	99	116	110	94	104	112	101	104

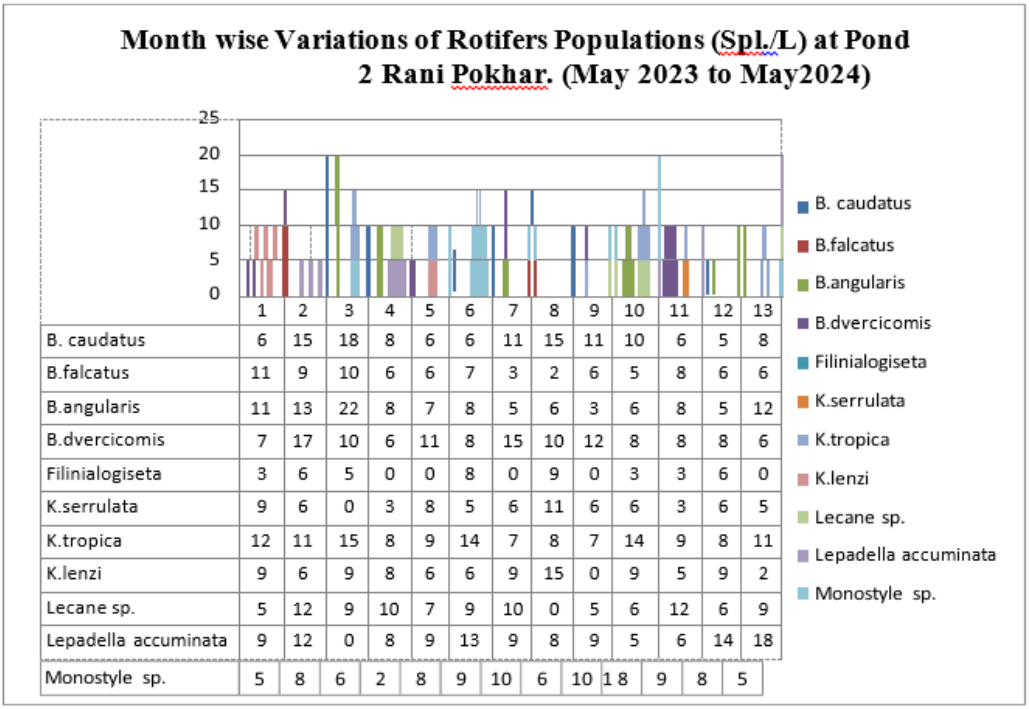


	May-21	Jun-21	July-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22
B. caudatus	21	20	8	5	8	4	12	12	13	10	6	4	23
B.falcatus	12	18	10	8	6	9	8	6	5	8	9	9	4
B.angularis	10	18	9	7	9	8	5	9	7	2	7	6	4
B.dvercicornis	8	15	6	7	6	8	7	11	8	7	9	8	9
Filinialogiseta	6	10	4	6	0	5	9	5	6	7	8	9	7
K.serrulata	9	5	0	4	9	6	7	12	6	8	7	8	7
K.tropica	15	14	5	10	12	8	8	14	11	16	9	5	8
K.lenzi	4	15	10	14	9	0	9	4	8	15	10	9	7
Lecane sp.	16	13	9	10	6	9	10	8	2	3	15	9	12
Lepadella accuminata	9	12	0	8	9	13	15	8	9	5	6	10	12
Lepadella patella	0	14	11	2	3	9	10	6	10	16	9	8	0
Monostyle sp.	4	0	5	8	9	5	6	7	3	4	9	7	6
Testudinella sp	9	0	7	5	6	15	10	8	6	3	8	9	5

Figure 1: Month wise Variations of Rotifers Populations (Sps./L) at Pond 1 [TajbajPokhara] (May 2023to May 2024)

Table 2: Month wise Variations of Rotifers Population (Sps./L) at Pond 2[Rani Pokhar](from May 2023 May 2024)

	Rotifers/Months	May 21	Jun 21	Juy 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22
1	*B. caudatus*	6	15	18	8	6	6	11	15	11	10	6	5	8
2	*B.falcatus*	11	9	10	6	6	7	3	2	6	5	8	6	6
3	*B.angularis*	11	13	22	8	7	8	5	6	3	6	8	5	12
4	*B.dvercicomis*	7	17	10	6	11	8	15	10	12	8	8	8	6
5	*Filinialogiseta*	3	6	5	0	0	8	0	9	0	3	3	6	0
6	*K.serrulata*	9	6	0	3	8	5	6	11	6	6	3	6	5
7	*K.tropica*	12	11	10	8	9	10	7	8	7	12	9	8	11
8	*K.lenzi*	9	6	9	8	6	6	9	15	0	9	5	9	2
9	*Lecane sp.*	5	12	9	10	7	9	10	0	5	6	12	6	9
10	*Lepadella accuminata*	9	12	0	8	9	13	9	8	9	5	6	14	18
11	*Monostyle sp.*	5	8	6	2	8	9	10	6	10	18	9	8	5
	TOTAL	87	115	104	67	77	93	85	90	69	90	77	81	82



	1	2	3	4	5	6	7	8	9	10	11	12	13
B. caudatus	6	15	18	8	6	6	11	15	11	10	6	5	8
B.falcatus	11	9	10	6	6	7	3	2	6	5	8	6	6
B.angularis	11	13	22	8	7	8	5	6	3	6	8	5	12
B.dvercicomis	7	17	10	6	11	8	15	10	12	8	8	8	6
Filinialogiseta	3	6	5	0	0	8	0	9	0	3	3	6	0
K.serrulata	9	6	0	3	8	5	6	11	6	6	3	6	5
K.tropica	12	11	15	8	9	14	7	8	7	14	9	8	11
K.lenzi	9	6	9	8	6	6	9	15	0	9	5	9	2
Lecane sp.	5	12	9	10	7	9	10	0	5	6	12	6	9
Lepadella accuminata	9	12	0	8	9	13	9	8	9	5	6	14	18
Monostyle sp.	5	8	6	2	8	9	10	6	10	18	9	8	5

Figure 2: Month wise Variations of Rotifers Population (Sps./L) at Pond 2[Rani Pokhar](from May 2023 May 2024)

CONCLUSION

According to the current study of Tajbaj Pokhara and Rani Pokhara, physio-chemical and environmental changes are important factors in affecting the diversity and density of Rotifers.

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