

# Inventory & population diversity of fresh water crabs of Kanwar lake, Begusarai, Bihar, India

### Mousumi Dey\*

Department of Zoology, B.N Mandal University, Madhepura, Bihar, India

Received : 02<sup>nd</sup> May, 2017; Revised : 25<sup>th</sup> June, 2017

**Abstract:** A first hand preliminary inventory of fresh water crabs found in the Kanwar lake of Begusarai has been prepared on the basis of random sampling through aquatic net (having big mesh size). The population count of each crab species in each & every net sweep has also been done in order to prepare the species level population diversity. The article deals with statistical approach of crab species abundance & richness computed through the fundamental sampling data of the lake. The available food resources useful for the crabs and present in the lake have also been investigated. This exercise provides information about the ecological wellbeing of the lake with respect to the crab's population & their available food resources.

Keywords : Inventory & population diversity, fresh water crabs, species abundance & richness, food resource, ecology of Kanwar lake, Begusarai

### **INTRODUCTION**

Freshwater crabs are considered as one of the diverse group belonging to the phylum Arthropoda & infraorder Brachyura, with very short projecting "tail"(abdomen) which is entirely hidden under the thorax. Crabs come under the order decapoda and class crustacean & shows great variation in size among all arthropods. Globally, 1394 species of freshwater crabs in five different families have been seen.<sup>1</sup> These crabs are referred as primary freshwater crabs, which lack a larval stage and complete life cycle independent of marine environment.<sup>2</sup> Freshwater crabs are one of the most diverse groups among brachyurans with a distribution limited to most of the tropical and subtropical waters. They occupy almost all freshwater bodies, including streams, rivers, ponds, swamps, and

\*Corresponding author :

Phone : 7903035949

E-mail : m5284banty@gmail.com

rice fields besides semi-terrestrial or terrestrial habitats like tree holes, leaf axils, and leaf litters. They are also considered as a good source of food to different communities of the people as well as play an important role in the food chain of aquatic ecosystem.

The present study was conducted to prepare an inventory of different crab species along with their population diversity present in the Kanwar lake of Begusarai, Bihar. The habit & habitat along with the food choise of the crabs present in the lake have also been observed in order to make a holistic ecological study which is considered as one of the Asia's largest freshwater lake also known as oxbow lake. It is approximately six times the size of the Bharatpur Sanctuary. Kanwar jheel, as it is locally called, is located 22 km north-west of Begusarai town and is extended over an area of 7,400-hectare. It is a residual oxbow lake, formed due to meandering of Gandak River, a tributary of Ganga, in the geological past.<sup>3</sup>

# Biospectra : Vol. 12(2), September, 2017

An International Biannual Refereed Journal of Life Sciences

the state, hosting 106 species of resident birds and providing a nesting ground for 59 species of migratory birds. In addition, the wetland supports a large number of flora and fauna round the year. Economically too, the lake is significant because it yields about two tones of fish everyday and is the single biggest source of irrigation in the area. The wetland is used simultaneously for rice cultivation, fishing, and many other uses. Agriculture is the most important use of the wetland and the basic source of income in the area.

### **MATERIAL & METHODS**

Collection of the sample & its statistical analysis

Samples were collected from the different points of the Kanwar Lake in Begusarai during the morning hour from 10 am to 12 pm. The crabs were sampled statistically from sixty randomly selected sites of above mentioned water body. Sampling was made twice in a week. About 388 specimens were chosen for the statistical study. Crabs were collected by using aquatic net. Each of the collected specimen were kept in a plastic container & brought in the laboratory where these crabs were preserved in 5-10% formalin & identified using secondary data.<sup>4-6</sup> Thus the statistical analysis of crabs population during various seasons has been given in table no 1-4 & in fig 1 along with its data representing its relativity in graph 2-5.

Table 1: Seasonality in the crab population of Kanwar lake<br/>during rains 2016.

Si. No.	Name	n	Relative abundance %(n/N* 100)	pi(n/N)	log pi	pi*log pi	Н
1	Sartoriana spinigera	82	21.2	0.212	-0.673	-0.1426	
2	Barytelphusa guerini	16	4.1	0.041	-1.387	-0.0568	
3	Barytelphusa lugubris	22	5.6	0.056	-1.251	-0.0700	1
4	Inglethelphusa fronto	48	12.4	0.124	-0.906	-0.1123	0.0007
5	Paratelphusa masoniona	65	16.8	0.168	-0.774	-0.1300	0.8927
6	Paratelphusa spinigera	43	11.1	0.111	-0.954	-0.1058	
7	Potamon lugubre	62	16	0.160	-0.795	-0.1272	1
8	Barytelphusa cunicularis	28	7.2	0.072	-1.142	-0.0822	
9	Vanni travancorica	20	5.1	0.051	-1.292	-0.0658	

 
 Table 2: Seasonality in the crab population of Kanwar lake during winter 2016

Si. No.	Name	n	Relative abundance% (n/N* 100)	pi(n/N)	log pi	pi*log pi	Ħ
1	Sartoriana spinigera	65	23.7	0.237	-0.625	-0.1481	
2	Barytelphusa guerini	10	3.6	0.036	-1.443	-0.0519	1
3	Barytelphusa lugubris	16	5.8	0.058	-1.236	-0.0716	1
4	Inglethelphusa fronto	30	10.9	0.109	-0.962	-0.1048	0.8301
5	Paratelphusa masoniona	40	14.5	0.145	-0.838	-0.1215	1
6	Paratelphusa spinigera	32	11.6	0.116	-0.935	-0.1084	1
7	Potamon lugubre	55	20	0.200	-0.698	-0.1396	1
8	Barytelphusa cunicularis	15	5	0.054	-1.267	-0.0684	
9	Vanni travancorica	11	4	0.040	-1.397	-0.0158	1

 Table 3: Seasonality in the crab population of Kanwar lake during autumn 2016

Si. No.	Name	n	Relative abundance %(n/N* 100)	pi(n/N)	log pi	pi*log pi	H
1	Sartoriana spinigera	60	26.9	0.269	-0.570	-0.1533	
2	Barytelphusa guerini	8	3.5	0.035	-1.455	-0.0509	1
3	Barytelphusa lugubris	11	4.9	0.049	-1.309	-0.0641	1
4	Inglethelphusa fronto	23	10.3	0.103	-0.987	-0.1016	
5	Paratelphusa masoniona	32	14.3	0.143	-0.844	-0.1206	0.8428
6	Paratelphusa spinigera	25	11.2	0.112	-0.950	-0.1064	1
7	Potamon lugubre	48	21.5	0.215	-0.667	-0.1434	
8	Barytelphusa cunicularis	9	4	0.040	-1.397	-0.0558	1
9	Vanni travancorica	7	3.1	0.031	-1.508	-0.0467	

Table 4: Seasonality in the crab population of Kanwar lake during summer 2016

Si. No.	Name	n	Relative abundance %(n/N* 100)	pi(n/N)	log pi	pi*log pi	Ħ
1	Sartoriana spinigera	30	34.8	0.348	-0.458	-0.1593	
2	Barytelphusa guerini	2	2.3	0.023	-1.638	-0.0376	
3	Barytelphusa lugubris	4	4.6	0.046	-1.337	-0.0615	
4	Inglethelphusa fronto	1	1.1	0.011	-1.958	-0.0215	0.7561
5	Paratelphusa masoniona	14	16.2	0.162	-0.790	-0.1279	
6	Paratelphusa spinigera	12	13.9	0.139	-0.856	-0.1189	
7	Potamon lugubre	18	20.9	0.209	-0.679	-0.1419	
8	Barytelphusa cunicularis	3	3.4	0.034	-1.468	-0.0499	
9	Vanni travancorica	2	2.3	0.023	-1.638	-0.0376	



Fig 1: Pie chart showing seasonal variation in cumulative diversity (&) of fresh water crabs of Kanwar lake, Begusarai(2016)

#### Graph 1: Relative abundance of freshwater crabs in Kanwar lake of Begusarai during rains





Graph 2: Relative abundance of freshwater crabs in Kanwar lake of Begusarai during winter

Graph 3: Relative abundance of freshwater crabs in Kanwar lake of Begusarai during autumn







### **RESULT & DISCUSSION**

On the basis of present investigation nine species of fresh water crab have been recorded in the aquatic habitats of Kanwar Lake, Begusarai. These species includes Sartoriana spinigera, Barytelphusa guerini, Barytelphusa lugubris, Inglethelphusa fronto, Paratelphusa masoniona, Paratelphusa spinigera, Potamon lugubre, Barvtelphusa cunicularis & Vanni travancorica. These species were at its highest peak during the rainy season, however during summer they were rare in number (Table no. 1-4). While the findings on relative abundance of these species shows that Sartoriana spinigera were relatively among the most abundant species found in all the four seasons as mentioned above (Graph no. 1-4) in those habitat which were usually meant for human and aquaculture feed. Rural people used them as fried food and as the medicine of Asthma diseases. Nowadays, also used in poultry feed and as a fertilizer. While Barytelphusa guerini were among least species present which may be due to unbalanced aquatic habitat for the survival of these species of crabs. However Paratelphusa masoniona, Potamon lugubre were among those species which were moderately distributed among this habitat. Thus the above findings as given above reflects that freshwater habitat of Kanwar Lake in Begusarai is ecologically fit for the aquatic dwelling organisms and also acts as rich food resources for the survival of these species.

# ACKNOWLEDGEMENT

The author is very thankful for the help and cooperation rendered by the Department of Zoology & her guide Dr. Pankaj Kumar, Associate Prof., P.G Dept. of Zoology, T.P College Madhepura in completion of this present investigation.

# REFERENCES

- Cumberlidge N. 1999. The Freshwater Crabs of West Africa: Family Potamonautidae. Institut de Recherche pourle Development, Collection Faune et Flore Tropicales no. 36, Paris, 1-382.
- Yeo DCJ, Ng PKL, Cambridge N, Magalhaes C, Daniels SR and Campos MR. 2008. Global diversity of crabs (Crustacea:Decapoda:Brachyura) in freshwaters. *Hydrobiologia*. 595: 275-289.

# Biospectra : Vol. 12(2), September, 2017

An International Biannual Refereed Journal of Life Sciences

- 3. Kanwar lake: birds' paradise lost https:// www.downtoearth.org.in/news/kanwar-lake-birdsparadise-lost-44693
- 4. Shafi, M. and Quddus, M. M. A. 1982. Fisheries Resources in Bangladesh. (Bangladesher Matshaya Sampad, in Bengali), Bangla Academy, Dhaka, pp 369-396
- Chowdhury, S.H. and Hafizuddin, A.K.M. 1991. Crab Fauna of Bangladesh. Part-I. Some marine crabs from the Bay of Bengal. *Chittagong University Studies*. *Part-II, Science* 2(15): 65-77
- 6. Siddiqui M.Z. H. and Zafor, M. 2002. Crabs in the Chakaria Sundarban are of Bangladesh. *The Journal* of NOAMI. 19 (2): 61-75.

\*\*\*