RESEARCH REVIEW JOURNALS
Volume-05
Issue-09
September-2020

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com[Peer Reviewed Journal]
DOI: https://doi.org/10.31305/rrijm.2020.v05.i09.024

Ecology of Distribrtion and Abundance of Macro Invertebrate Community of Ganga River Hajipur, Bihar

[1]Poonam Kumari and [2]Dr. Ravindra Kumar Singh

[1]Research Scholar, Department of Zoology, Jai Prakash University, Chapra (India)
[2]Associate Professor, Department of Zoology, Jai Prakash University, Chapra (India)

ARTICLE DETAILS

Article History
Published Online: 15 September 2020

Keywords
Benthic community, oligochaeta, polychaeta etc.

ABSTRACT

As for as the present study is concerned, environmental factors are responsible for this distribution and abundance of benthic macro invertebrates, for example substrate type, Food quality and abundance, light, temperature, water movement and chemistry. Generally, the detailed characterization of the composition, abundance and distribution in nature of the substrate-mud, sand, stone and fringing submerged or emerged vegetation. The oligochaetes of Ganga river was thick populated. At station I the oligochaetes were totally absent in monsoon period which my probably be due to the fast current of the river water Tubifex was the most dominant oligochaetes present during the monsoon period. In the first annual cycle the maximum population was recorded in May 2018(605 (indv/m^2) in several months Oligochaetes were the most dominant group of total benthic population at station II. The highest number was observed in February 2018 (23656indu/m^2) . and April 2019 (5691 indv/m^2) While the lowest in October 2017 (215 indv/m^2) and July 2019 (86 indv/m^2), during the two annual cycle and it was completely absent in monsoon season.

1. Introduction

Benthic macro invertebrates of aquatic environment are among the commonest and most widespread of fresh water faunas. The benthic organism often occur in enormous numbers and form an essential component of food web vital to the existence of higher from such as fish. Benthic invertebrates occupy virtually in all tropic level in aquatic ecosystem and are especially important in the processing of organic matter and the recycling of nutrients. Generally these benthic fauna are microphageous in their feeding habits, using either phytoplankton, bacteria or organic mud constituents as their food. In their turn, they were widely eaten by varieties of aquatic carnivores and are an important food item for fish. Thus they transformer organic matter produced at Primary level to the top consumer available in the form of predators.

Thus the study of macro invertebrates is the important justification for the study of functionally rather than economically defined groups in an aquatic system Pandey and Singh (2012) described the aquatic macro invertebrates to be large enough to seen by naked eye's and they pass at least part of their life in water transport system and any available substrate including sediments, bottoms, submerge debris, pipes, vascular aquatic plants and algal body which provide suitable habitat to these organism. During the present investigation the taxonomy study was made of primary important and generally includes as benthic macro invertebrates are polychaetes, oligachaeta ,hirudinea, insect, Crustaceans , and gastropod.

Historically very brief account of lotic benthic faana have been described Hynes((1970) Wheatehead 1930, Needham 1934, Pennak vangerpen 1947, Singh & Pandey(2012).

2. Materials and Methods

Fortnightly sample of bottom macro fauna were collected with the help of Ekman's dredge. One set of five samples were taken on each station to avoid sampling error. The benthic organism were identified following Pennak(1978) Ward and Whipple (1963) Needham and Needham(1978)

All organisms were counted and were captured by using the formula:

$$ni\frac{(a.1000)c}{1}$$

where: ni = Number of macro benthic organisms.
a = The mean number of benthic fauna per counting cell.
c = Volume.

3. Result & Discussion

The benthic fauna collected during present investigation presented in Table I & II.

The Composition of benthic fauna include polychaeta Oligochaeta, insect, Crustaceans, hirudinea etc.

At station I the benthic macro invertebrates showed somewhat increasing trend from October 2017 Own wards and reached to the maximum number during February 2018, then it gradually decreased in the subsequent months. In the first annual cycle and the minimum density was recorded in October 2017. In the second year, It gradually increased from November 2018 own wards attained their peak number in June 2019 and lowest October 2018.

At Station II, the abundance of benthic invertebrates pattern. In the first annual cycle this maximum population was observed in February 2018 and the minimum in September 2018. Whereas, in the second year, the highest was recorded in April 2019 and lowest in September 2019. In the present investigation certain grows Viz, Polychaeta, Oligochaeta and

Hirundinea, were completely absent during the monsoon season.

Oligochaeta:- The oligochaetes of Ganga river was thick populated. At station I the oligochaetes were totally absent in monsoon period which my probably be due to the fast current of the river water Tubifex was the most domino oligochaetes present accept during the monsoon period. In the first annual cycle the maximum population was recorded in May 2018(605 (indv/m^2) in several months Oligochaetes were the most dominant group of total benthic population at station II. The highest number was observed in February 2018 (23656indu/m^2) . and April 2019 (5691 indv/m^2) While the lowest in October 2017 (215 indv/m^2) and July 2019 (86 indv/m^2), during the two annual cycle and it was completely absent in monsoon season. The peak population was recorded during February 2018 (18483 indv/m^2) and least in October 2017 (172 indv/m^2) in the first annual cycle. In the second year the peak was recorded in April 2019 (5605 indv/m^2) and minimum during July 2019 (85 indv/m^2).

As fas as **the Hirundinea** is concered only a single species was found at Station I.

At Station I, the large number of Polycheate population was recorded in June 2018 and was lowest in March 2018 during the first annual cycle. In the second year the maximum population was observed in December 2018 and minimum in several months. At station II its maximum number was recorded in April 2018 and March 2019 Where as minimum number was recorded in November 2017 February 2018.

The population of **insects** varied seasonally. At station I, the highest population was recorded in March 2018 and 2019, whereas the largest in September 2018 and October 2018 during the respective annual cycles. At station II the largest insects' population was encountered in April 2018 and lowest in August 2018. In the first annual cycle. In the second year the maximum number was collected in February 2018. During the first year the maximum abundance was noticed in summer season, whereas in the second year. It was during winter season.

Crustaceans was found in small number at station I during the winter and early summer season. The maximum density was observed during January 2018 and February 2019 and the minimum is in several months.

Pelecypods was much more diversified in Ganga river. At station I, the total pelecypod number was maximum in February 2018 and January 2019, while the minimum in many months during respective cycles. However, polypods at Station II did not depicted any seasonality and equally distributed throughout the study period accept in May 2019 when their population increased suddenly.

Gastropods constituted the major share of molluscan fauna in both the stations. Gastropod population showed a greater diversity at station I in comparision to Station II.

As for as the present study is concerned environmental factors are responsible for this distribution and abundance of benthic macro invertebrates for example substrate type, Food quality and abundance, light, temperature, water movement and chemistry Generally, the detailed characterization of the composition, abundance and distribution in nature of the substrate-mud, sand, store and fringing submerged or emerged vegetation. Several workers have showed that seasonal abundance of food may strongly influence the life cycle of benthic species of the lotic community (Ross, 1963; Cummins, 1997; Seasonal foraging strategies may also exist in predatory species (Townsend ,1979) current plays an important role, it may be responsible for the distribution of substrate, which in turn influence the composition and abundance of the benthic fauna.

Table:-1 (a) Seasonal abundance of macro invertebrates a lotic station I

	Total Annelida	Total Polychaeta	Total Insects	Pelecypoda	Gastropoda
Oct	-	41	41	215	105
Nov	63	127	192	287	169
Dec	64	323	257	106	904
Jan	128	214	127	150	112
Feb	193	64	300	132	244
Mar	63	20	604	301	1082
Apr	85	64	323	151	994
May	627	215	192	388	1276
Jun	688	605	135	193	1231
Jul	20	42	-	20	927
Aug	-	-	42	-	430
Sep	-	-	20	21	560
Oct	-	20	20	20	172
Nov	40	128	84	207	130
Dec	83	414	321	604	185
Jan	108	214	429	518	1056
Feb	106	84	236	820	1902
Mar	128	41	453	302	2183

Apr	101	64	106	583	2336
May	432	63	63	820	2247
Jun	676	301	128	1120	2851
Jul	85	20	62	84	906
Aug	-	-	42	20	668
Sep	-	-	-	41	214

(b) Seasonal abundance of macroinvertebrates a lotic station II

	Oligochaeta	**Polychaeta**	**Pelecypoda**	**Insects**	**Gastropoda**
Oct	215	-	63	63	365
Nov	993	20	64	474	322
Dec	9371	86	43	843	128
Jan	6971	43	-	452	196
Feb	2356	21	-	12	85
Mar	3521	172	-	53	218
Apr	1731	256	42	1470	107
May	735	150	64	165	215
Jun	7660	42	20	1563	85
Jul	258	-	42	259	689
Aug	-	-	42	107	288
Sep	-	-	20	20	127
Oct	245	-	20	64	885
Nov	1534	-	42	20	280
Dec	3634	43	43	408	149
Jan	1946	64	21	452	388
Feb	860	172	-	648	256
Mar	4665	216	42	776	237
Apr	5691	107	42	541	288
May	1942	85	188	63	474
Jun	480	20	64	128	300
Jul	8400	-	92	25	733
Aug	-	-	20	85	840
Sep	-	-	-	20	582

References

[1]. Ali.A. and M.S mulladistibution and day time dutt of chironomeds in a southern California river mosquito News, 36:122-126.
[2]. APHA 1985 American public health association standard methods to the examination of water and waste water (16th.ed) APHA, Newyork 1268 PP.
[3]. Armitage K.B(1958 Ecology of riffle insects on the firehole river, Wyoming Ecology, 39:571-580.
[4]. Bartun B.A (1977) short team effect of highway construction on the liminology of a small streams in southern Ontario freshwater Bio 7:99-108.
[5]. Bilgrami K.S (1984) Ecology of the river hanges-imapct of human activities and comervation of aquatic biota. In 2nd annual workshop on the projects; New Delhi; March 23.25 pp 16-17.
[6]. Davis J.R 1982 New records of aquatic oligochaetes from texas with observation on their ecological charectiatics Hydrobiologia 96:15-17.
[7]. Dutta S.P.S and Y.R Malhotra 1986 seasonal variations in the macrobenthic fauna of Gadigarh stream Jammu. Indian J. Eco. 13(1):138-145.
[8]. Hynes H.B.N 1960 The biology of polluted waters. Liverpool university press, 202PP.
[9]. Needam, J.G and P.R. Needham 1978. A guide of the study of freshwater biology. Holden day inc.sanfransco, 108 PP.
[10]. Pennak, RW (1978) freshwater invertebrates of the united stalis. John wiley and sons, New York, 803 PP.

