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Full Length Research Paper

Composition and Abundance of Benthic Community of Bilawali Talab Indore Madhya Pradesh India

Shailendra Sharma* and Shitika Barkale

P.G. Department of Zoology, Adarsh Institute of Management & Science Damnod (M.P.) India.

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Corresponding Author
Shailendra Sharma
P.G. Department of Zoology, Adarsh Institute of Management & Science Damnod (M.P.) India.

Abstract
The present study involved sampling, pre-identification and identification of macro-invertebrates during 2014-15 and computing the % occurrence of families of various taxonomic groups. Macro-invertebrates were identified up to family level and bio assessment at various locations has been done. 35 species of Benthic macro-invertebrates were identified 12 species of Annelides, 12 species of Molluscans and 11 species of Arthropods have been found in different depth composition inhabiting the BilawaliTalab. The present study deals with the composition and functioning of benthic community. Biological samples were collected from the selected sampling stations in the BilawaliTalab. A hand net was used in collecting the sample and sieving them for isolation. The bigger animal species picked up by hand, whereas the smaller forms were isolated by sugar floatation method and studied them under low power (x50) microscope. They were preserved by narcotizing them by Methanol and Chloral hydrate and late 70% Alcohol. The benthic organisms were identified with the help of APHA (2005), Willium & Doris (1966), Pennak (1989), Tonapi (1980), Needham & Needham (1969), etc.

Key Words: *Seasonal diversity, Macro invertebrates, Bio-assessment, Population density, Littoral region*

Introduction

Benthic macro-invertebrates are best indicators for Bio-assessment. Macro-invertebrates are organisms without backbones, which are visible to the eye without the aid of a microscope. Aquatic macro-invertebrates live on, under and around rocks and sediment on the bottoms of lakes, rivers and streams. As a result of their habitat choice, macro-invertebrates are often regarded as "benthos" which refers collectively to organisms which live on, in or near the bottom. The macro-invertebrates are the most valuable indicators of environmental quality in aquatic ecosystem because of stable mode of life, their convenient size and distinct characters which offers an easy sorting and identification of these organisms (Krishnamoorthi, 1966).The study of aquatic Macro-invertebrates provides a method to determine the water quality of a stream based on collection and identification of stream-bottom (benthic) macro-invertebrates. This study has been done to find out the diversity of benthic macro-invertebrates and their relationship with different parameters of water because the physical, chemical and biological parameters are support the water body assessment. Very little work has been done on the benthic faunas in Indian water Kumar & Singh (1997), Oomachandra & Balsare (1985), Sharma et. al. (2006), Lento et al. (2008), Pandey S. (2007), Sharma et al. (2007), Adeogun & Fafioye (2011), Sharma et al. (2011). Studies on Benthic community in Malwa region are rare except that of Varshney Govindan & Desai (1981), Roaet. al. (1989), Sunny &Diwan (1991), Sharma (2003).

Material and Method

Study area

Indore is the largest city of Madhya Pradesh in Central India. It is situated between 22°20" N latitude and 75°25" E to 75°15" E longitude. Bilawali talab is situated in the southwest direction of Indore at Khandwa road. It is situated 6 km. away from Indore in Madhya Pradesh. The catchment area of talab is 117 ha. This talab was completely made in 1914 by Maharaja TukojiRaoHolkar under the supervision of Sri Gaddes. After its completion, the talab was connected to pipliyapala talab by means of a canal near the Limbodi village. It is based on the plan of the contemporary resident Shri Bhojket in 1905. The talab used to provide water to the textile industries in the past. Now-a-days the talab caters to the need of a particular area for its various uses like drinking, fish culture etc.

Sampling method

The present study was conducted for the period of one year from September 2014 to August 2015. Biological samples were collected from the selected sampling stations in the Bilawali Talab. A hand net was used in collecting the sample and sieving them for isolation. The bigger animal species picked up by hand, where as the smaller forms were isolated by sugar floatation method and studied them

under low power (x50) microscope. They were preserved by narcotizing them by Methanol and Chloral hydrate and late 70% Alcohol. The benthic organisms were identified with the help of APHA (2005), Willium& Doris (1966), Pennak (1989), Tonapi (1980), Needham & Needham (1969), etc.

Results

Table 1: Average quantitative percentage composition of Macro-invertebrates of Bilawali talab (Year 2014-15). Four stations (Per Cm² of Sediment)

S. No.	Months	Annelida	Arthropoda	Mollusca
1.	September	53	37	10
2.	October	51.5	38.6	9.9
3.	November	50.8	39.2	10
4.	December	40.2	46.1	13.7
5.	January	36.1	41.7	22.2
6.	February	33.6	39.2	27.2
7.	March	44.1	32.2	23.7
8.	April	45.1	21.4	33.5
9.	May	70.8	10.7	18.5
10.	June	80	11.7	8.3
11.	July	75.9	9.8	14.3
12.	August	68.8	19.1	12.1
13.	**REMARK**	**I**	**II**	**III**

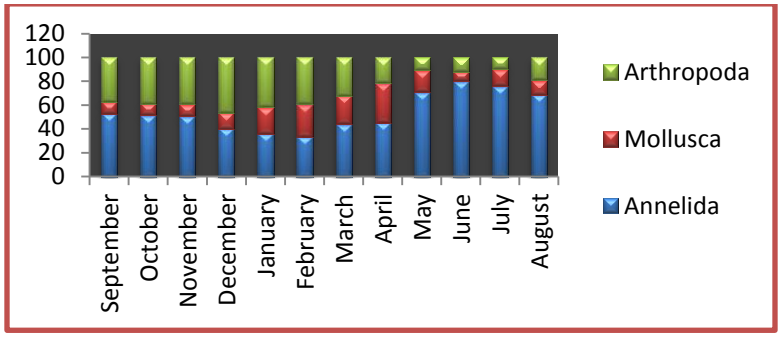

Fig. 1. Average quantitative percentage composition of Macro-invertebrates of Bilawali talab (Year 2014-15). Four stations (Per Cm² of Sediment)

Annelida

During the study period (2014-15) Tubifextubifex, Chaetogaster species, Nais simplex, Aeolosomabengalensis, Derolimnosa, Branchiurasowerbyi, Stylariafossularis, Helobdella species, Glossiphonia species were recorded. Tubifextubifex, Branchiurasowerbyi, Stylariafossularis species were recorded as regular and abundant at 0.2m. – 1.5 m. depth.Nais simplex was irregular at the depth from 0.2m. – 1.5m. Chaetogaster species were recorded irregular at 0.2m. – 1m. depth but at 1.5m. it is recorded as single species. Aeolosomabengalensis was not recorded at 1.5m. depth and irregular from 0.2m. – 1m. depth. Derolimnosa was irregular at 0.2m. & 0.5 M. depth but at 1m.& 1.5 m. depth it was found as regular and abundant. Helobdella species, Glossiphonia species were recorded irregular at 0.2m. &0.5m.depth but they not recorded at depth of 1m. & 1.5m.

Mollusca

During the study period (2014-15) Planorbis species, Limnaeaauricularia, Limnaeaacumainata, Limnaea species, Vivipara bengalenis, Viviperaoxytropsis, Bellamyabengalensis, Lamellidensmarginalis, Lamellidensconsobrinus were recorded. Planorbis species was recorded as regular and abundant from 0.2m. – 1m. depth but it was record as single species at the depth of 1.5m. Limnaea species

was found irregular from 0.2m. – 1.5m. Limnaeaauricularia&Limnaeaacumainata were regular and abundant from 0.2m -0.5m., at 1m. depth they were recorded as single recorded species but at 1.5 mThey were not recorded. Vivipara bengalenis&Viviperaoxytropsis were regular and abundant from 0.2m. – 1m. depth but at 1.5m they were irregular & less abundant. Bellamyabengalensis was recorded as regular at the depth of 0.2m., 1m. & 1.5 m but at 0.5m. it was irregular & less abundant. Lamellidens marginalis & Lamellidens consobrinus were irregular and less abundant from 0.2m. – 0.5m.but not recorded from 1m. – 1.5m.

Arthropoda

During the study period (2014-15) Chironomusphumosus, Strictochironomous species, Baetis simplex, Corixa species, Berosus species, Hydaticus species, Apus (Tadpole shrimp), Daphnia (Water fly) were recorded. From which Chirono musphumosus & Strictochironomous species were recorded as regular & abundant from 0.2m. – 1.5m. Apus (Tadpole shrimp) & Daphnia (Water fly) were found irregular and less abundant from the depth of 0.2m. – 1.5m. Berosus species was irregular from 0.2m. – 1.5m. Baetis simplex was found as irregular and less abundant from 0.2m. – 1m. but at 1.5m. it was not present. Corixa species was recorded as irregular at 0.2m. & 0.5m. but regaluar & abundant at 1m. of depth and absent at 1.5m. Hydaticus species was irregular and less abundant from 0.2m – 0.5m. and absent at 1m. – 1.5m. depth.

Discussion

Presence and absence of dominant species and the degree of community assemblages reflect pollution levels making macro-invertebrates good bio-indicators. During the present study, A remarkable variety and abundance of macro-invertebrates with the Phylum Annelida (Oligochaeta), Arthropoda (Insecta and Crustacea) and then Phylum mollusca (Gastropoda and Pelecypoda) were recorded in BilawaliTalab. Tubifextubifex, Branchiurasowerbyi&Stylariafossularis (Class-Oligochaeta) and Chironomousphumosus&strictochironomous (Class- Insecta) were recorded as regular and abundant species from shallow to deeper depth zone (0.2m – 1.5 m) as well as Nais simplex (Class – Oligochaeta), Limnea species (Class – Gastropoda) and Baetis species (class – Insecta) were recorded as Irregular species in all the depth zones during the study period. As per the study period, collections of benthic macro-invertebrates were decreasing in number from shoreline to depth because of less penetration of light and less availability of nutrients. On the basis of our study we can say that the distributions of benthic macro-invertebrates according to depth are very important for the trophic status of pond.

Conclusion

We studied average quantitative percentage composition of Macro-invertebrates. 35 species of benthic macro-invertebrates were identified 12 species of Annelides, 12 species of Molluscans and 11 species of Arthropods have been found in different depth composition inhabiting the Bilawali Talab. Among them we observed the percentage of annelids was higher than molluscans & arthropods and the percentage of molluscans found low than arthropods.

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