

Periodic Research

Abundance of Benthic Invertebrate in Freshwater Angoori Barrage, District Datia (M.P.)

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Abstract

The main aim of the present study was to investigate the zoobenthos diversity of Angoori Barrage Datia, M.P. during January 2020 to December 2020. Various species of benthic animals were found in this reservoir. Total 28 genera, 20 family, 15 order, 9 class and 4 phyla were recorded in study area. Phylum Arthropoda was dominant phylum with 5087 organism (49.6%) followed phylum Mollusca with total 2753 organism (26.85%) while the phylum Annelida and phylum Rotifera were presented with 1636 organism (15.9%) and 774 organism (7.5%).

Key Words: Zoobenthos, Arthropoda, Mollusca, Annelida, Rotifera.

Introduction

Zoobenthos fauna are organisms that live on or inside the deposit at the bottom of a water body. Odum (1971), Barnes et. all. (1988), Idowu E.O. et. all. (2005) large benthic animals are collectively referred to as macro- zoobenthos or macro- invertebrates. These animals of size 200-500 μm . Rosenburg and Resh (1993) inhabit the bottom substrate of fresh water, estuarine and marine ecosystem (APHA 1998).

Zoobenthos are sensitive to watershed condition and exhibit sufficient stability in assemblage structure over time to make them useful as long-term monitor of stream health and indicator of water quality (Gauffin and Tarwell 1952). Hynes (1961) reported that the density of benthos in a water body is a useful index of water quality, though; density may fluctuate widely with changes in seasons and space. Benthic macro invertebrates are best indicators for bio-assessment (Kumar 2003). The abiotic environment of the water body directly affects in the distribution population density and diversity of the macro benthic community, Zweig and Rabeni (2001), Sharma and Choudhary (2011). Benthic fauna is especially of great significance for fisheries that they themselves act as food of bottom feeder fishes (Sharma et. all. 2013). The present studies deal with species diversity and population density of zoobenthos fauna have been discussed.

Materials and Methods

Angoori Barrage is man mad reservoir located in the district Datia of Madhya Pradesh. This reservoir made across the river Angoori the tributary of river Pahuj, this reservoir is constructed with the help of JBIC. The catchment area of reservoir is 162 sq. km. it is used for different purpose like drinking, irrigation, and fisheries. Geographically the reservoir is located between $78^{\circ} 28'$ longitude and $25^{\circ} 38'$ latitudes. The benthic specimens were collected on last Saturday in every month from January 2020 to December 2020 using an Ekman grip with dimension of $15.2 \times 15.2 \times 15.2$ cm. collected samples were preserved in 4% formalin (for specimen with exoskeleton) and soft bodies organism were preserved in 70% ethanol (Borror et. all. 1976). Organisms were sorted and enumerated under major taxa and preserved in small vials by using small brush or forceps, Binocular and dissecting microscope with digital camera was used to identified and capture the image of benthos. The identification of benthos was done up to genus level with the help of standard works of Wetzel and Likens (2000), and Ward (1992).



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Result and Discussion

The zoobenthos diversity was recorded in Angoori reservoir 28 species belonging to 20 family, 15 order, 9 class and 4 phyla were recorded. The dominated phylum was Arthropoda 5087 organism with 14 species, 11 family, 8 order and 4 class; followed by phylum Mollusca 2753 organism with 7 species, 6 family, 4 order and 2 class were recorded and phylum Annelida 1636 organism with 4 species, 2 family, 2 order, 2 class was present while the phylum Rotifera was still with 774 organism with 3 species, 1 family, 1 order and 1 class. composition of zoobenthos and its relative abundance are recorded in table-1 and monthly percent composition of zoobenthos is given in table- 2

Total 28 taxa were recorded from the study area Angoori reservoir a shown in the table -1 of these phylum Arthropoda contributed the largest share constituting 49.62% with 14 genera of the total zooplankton. Among the phylum Arthropoda Culex sp was the dominant species with 10.3% to the total Arthropods Cyclops sp was the second dominant species 9.3% followed by sigara sp with 8.2% and other comes after that. Phylum Arthropoda followed by the phylum Mollusca 26.85% and phylum Annelida 15.96% while the phylum Rotifera was represented with 7.55% total contribution of zoobenthos was shown in table-3

Total 7 genera were recorded in phylum Mollusca, Thiara sp was the dominant species it contributed 18.9% of total Molluscan fauna followed by Lymnaea sp. 17.7% and minor representation was of the Corbicula sp 9.7 with total phylum Mollusca . phylum Annelida was the third dominant phylum among this phylum Tubifix albicola 31.9% was the dominant species of the total Annelidan zoobenthos collected from study area are followed by Tubifix tubifix 24.5% with total 4 genera was present in this phylum while in the phylum Rotifera was recorded with 3 genera in study area Notholca 35.6% Beachionus sp. (34.2%) and Keratella sp. Present with 30.1% Notholca sp. was dominant spices in the phylum Rotifera.

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Table 1 Qualitative and Quantitative Abundance of Zoobenthos (No/m²) in Angoori reservoir

Phylum	Class	Order	Family	Genus /Species	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Arthropoda	Branchiopoda	Diplostraca	Daphnidae	Daphnia sp.	25	28	35	40	38	35	28	30	32	35	30	29
		Cladocera	Bosminidae	Bosmina sp.	30	25	28	19	20	25	35	40	36	30	29	25
	Ostracoda	Podocopida	Cyprididae	Cypris sp.	40	35	20	18	25	20	22	35	33	29	38	35
	Hexanauplia	Cyclopoida	Cyprididae	Cyclops sp.	30	36	45	52	40	50	35	38	40	35	38	36
	Insecta	Lepidoptera	Nymphalidae	Nauplius sp.	15	18	25	28	32	35	22	20	24	19	22	20
		Diptera	Chironomidae	Chironomus sp.	20	22	30	38	29	35	25	20	22	15	25	22
				Tanypus sp.	31	29	25	28	20	22	35	32	30	32	38	35
				Pentaneura sp.	40	35	39	30	35	28	34	30	28	30	35	44
			Coretopogonidae	Culicodes sp.	30	28	20	17	22	20	26	31	38	38	33	28
			Culicidae	Culex sp.	45	40	42	58	46	40	38	45	50	48	36	39

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		Hemiptera	Hebridae	Hebrus sp.	22	30	25	33	38	35	30	29	40	28	32	30
			Belostomatidae	Belostoma sp.	18	25	20	28	35	25	30	38	30	25	28	20
			Corixidae	Sigara sp.	35	30	31	40	38	42	30	25	30	40	47	33
		Ephemeroptera	Caenidae	Caenis sp.	12	18	20	15	17	11	19	22	25	20	16	19
				TOTAL	393	399	405	444	435	423	409	435	458	424	447	415
Mollusca	Gastropoda	Neotaenioglossa	Thiaridae	Thiara sp.	50	45	51	40	30	35	50	55	42	41	43	39
				Melanoides sp.	38	30	42	48	36	40	38	42	35	28	20	30
		Basommatophora	Lymnaeidae	Lymnaea sp.	42	50	40	42	38	35	40	45	38	35	40	45
			Planorbidae	Gyrulus sp.	31	35	20	25	20	21	15	20	25	32	30	35
			Physidae	Physa sp.	20	30	25	31	30	32	35	40	30	29	25	22
		Architaenioglossa	Viviparidae	Bellamyia sp.	32	35	30	25	30	35	31	28	30	38	40	35
	Bivalvia	Veneroida	Corbiculidae	Corbicula sp.	15	18	10	20	22	28	30	28	25	30	20	22

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				TOTAL	228	243	218	231	206	226	239	258	225	233	218	228
Annelida	Oligochaeta	Heplotaxida	Tubificidae	Tubifex-tubifex	36	30	21	24	22	30	35	40	35	42	40	46
				Tubifex albicola	38	40	35	30	36	40	48	50	45	55	51	55
	Clitellata	Haplotaxida	Naididae	Stylaria sp.	25	35	20	25	30	35	35	29	38	41	40	40
				Dero digitata	40	30	15	25	28	30	28	25	35	30	22	21
				TOTAL	139	135	91	94	116	135	146	144	153	168	153	162
Rotifera	Monogononta	Ploima	Brachionidae	Beachionus sp.	21	24	30	12	19	13	21	19	22	29	31	24
				Keratella sp.	19	25	15	17	14	19	20	18	20	19	25	22
				Notholca sp.	25	21	26	21	19	22	18	15	24	30	23	32
				TOTAL	65	70	71	50	52	54	59	52	66	78	79	78
				GRAND TOTAL	825	847	785	819	809	838	853	889	902	903	897	883

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Table 2 Monthly percent composition of different phylum of zoobenthos in Angoori reservoir

Phylum	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Arthropoda	47.6	47.1	51.6	54.2	53.7	50.4	47.9	48.9	50.7	46.9	49.8	47
Mollusca	27.6	28.6	27.7	28.2	25.4	26.9	28	29	24.9	25.8	24.3	25.8
Annelida	16.8	15.9	11.6	11.4	14.3	16.1	17.1	16.2	16.9	18.6	17.1	18.3
Rotifera	7.8	8.2	9	6.1	6.4	6.4	6.9	5.8	7.3	8.6	8.8	8.8

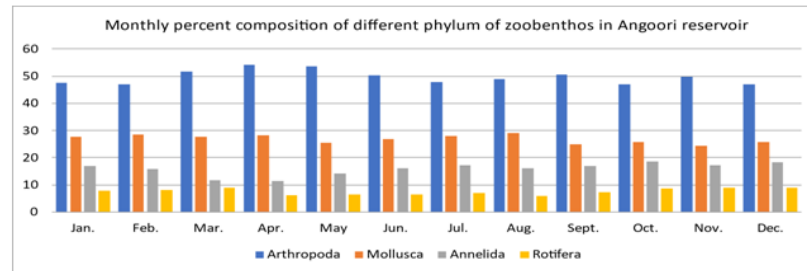
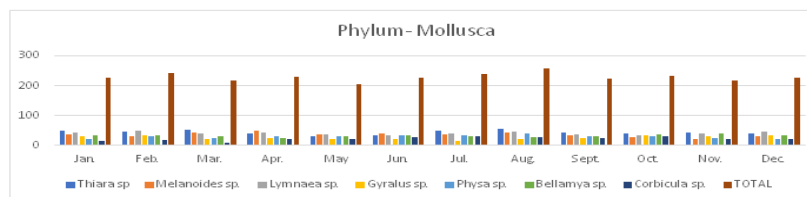
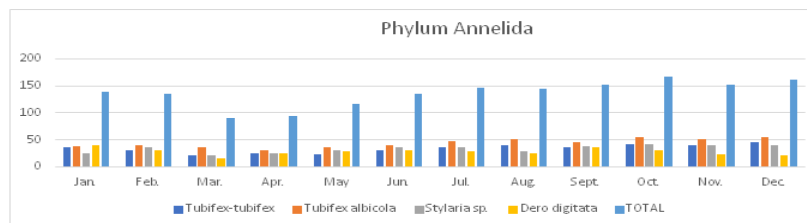
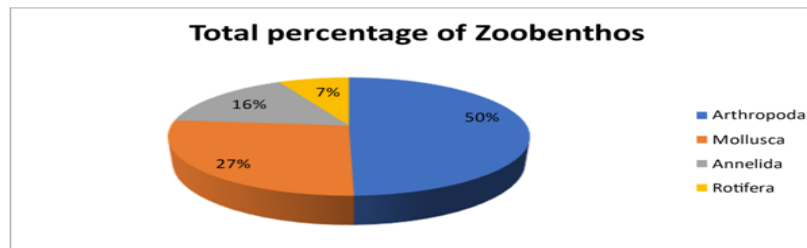
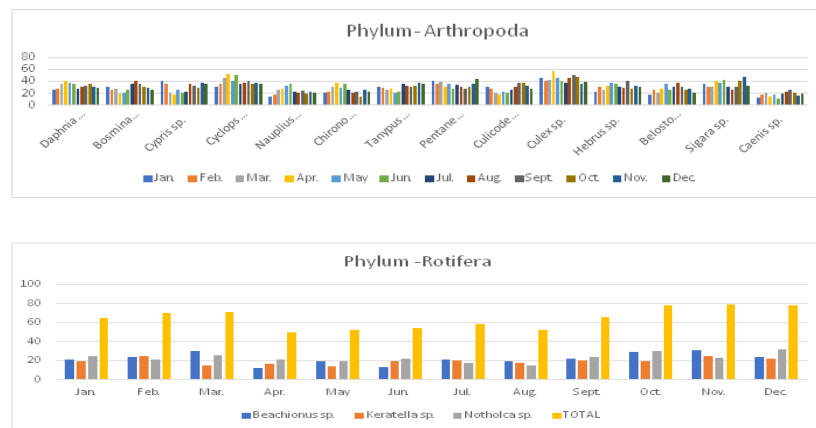


Table 3 Total Number and percentage of different phylum zoobenthos in Angoori reservoir

Phylum	Total Number of zoobenthos	Percentage
Arthropoda	5087	49.62
Mollusca	2753	26.85
Annelida	1636	15.96
Rotifera	774	7.55
Total	10250	100





Objective of the Study

The purpose of this research work is to study the nature and types of benthic animals living under water and prepare their database.

Conclusion

The conclusion of the research study of abundance of benthic invertebrate in freshwater angoori barrage district data. Total 28 genera, 20 family, 15 order, 9 class and 4 phyla were recorded in study area. Phylum Arthropod was dominant phylum with 5087 organism (49.6%) followed phylum Mollusca with total 2753 organism (26.85%)

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