

## Variety and Abundance of Benthic Macro-Invertebrate Biodiversity of Littoral Zone of Mansarovar Talab of Jeerapura, Dhar (M.P.)

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### ABSTRACT

Macro benthic invertebrates are an important and integral part of any aquatic ecosystem as they form the basis of the trophic level and any negative effects caused by pollution in the community structure can in turn affect trophic relationships. These can include those that feed on them directly or indirectly such as fish and bird populations, respectively. In addition, aquatic invertebrates have the ability to clean rivers as they utilize the organic and detritus matter. According to Carlisle *et al.*, 2007 macro-invertebrate populations in streams and rivers can assist in the assessment of the overall health of the stream. During the present Survey of at Mansarovar talab 32 species of Macro invertebrates were recorded which belong to represented 11(eleven) species of oligochaeta, 2(two) species of Hirudinea (Leeches), 8 (eight) species of Gastropoda, 3 (three) species of pelecypoda (Bivalvia), 4 (four) species of insect 2 (two) species of ostracoda and 2 (two) species of Branchiopoda. The Present study was carried out at Mansarovar Talab of Jeerapura, Dhar (M.P.) during a Jun 2014-July 2015.

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### Introduction

Benthic macro-invertebrates are ecologically important organisms in food webs and are integral in establishing trophic structure of an aquatic ecosystem. They also mix the sediments allowing exchange of oxygen, nutrients and pollutants between the water column and the bottom. Because of their inability to escape exposure to changing conditions (relative to more motile aquatic fauna), benthic macro-invertebrates are often used to assess the condition of an aquatic system since they integrate numerous environmental factors over time spans exceeding those of typical water quality monitoring. There is difficulty in studying benthic macroinvertebrate diversity due to their heterogenous distribution in littoral water in relation to their requirements for feeding, growth and reproduction (Sharma 2003). They cope up with these changes with their adaptive mechanisms, return or die. Another major problem encounters in effective analysis of these organisms is the difficulty of sampling them quantitatively because of substrate heterogeneity which leads to a patchy and nonrandom distribution. Furthermore taxonomy of many groups is confusing and in some cases incomplete. In spite of these difficulties the present investigation has generated quantitative evaluation of populations of oligochaetes, mollusks and arthropods.

### Methods & Methods

#### Description of study Area

Mansarovar Talab is situated in the Jeerapura, on Dhar-Mandav road 23km away from Dhar in Madhya Pradesh. The talab is very old and made by parrams. The talab are basically used for irrigation, fish culture, drinking etc. It is situated between latitude 22.598°N and longitude is 75.304°E.

### Biological analysis

After survey of Mansarovar Talab for the benthic biodiversity and nature bottom, there four sampling stations are selected for the study in shore line of lake. Monthly sampling were made from Jun 2014 to July 2015, a rod net was used in collecting samples and sieving them for isolation. The bigger animal species picked by hand where the smaller forms were isolated by sugar isolation method and studied them under low power (X 50) 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 (2002), William & Feltmate (1992), Pennak (1989), Tonapi (1980), Needham & Needham (1969), etc.

### Result and Discussion

In the present study, Benthic macro-invertebrates this talab qualitatively diversified and rich all together 32 species of bottom fauna were collected and identified during 2014-2015 (Table 02). They represented 11(eleven) species of oligochaeta, 2(two) species of Hirudinea (Leeches), 8 (eight) species of Gastropoda, 3 (three) species of pelecypoda (Bivalvia), 4 (four) species of insect 2 (two) species of ostracoda and 2 (two) species of Branchiopoda. The densities of oligochaeta and insect together formed the main bulk consisting about 67% of the total benthos collected during present study for two years. The percentage abundance of oligochaetes were maximum in June and July while minimum in during winter. A distinct variation in oligochaetes density was noticed during presently study as the maximum in June and July and the minimum during winter. However, **Mandal & Moitra (1975) and Chatterjee, 1994** reported its peak in

November and **Cowell & Vodopich (1981)** found uniformity in the abundance of oligochaetes throughout the year. Among oligochaetes, strong dominance of Tubifex was recorded forming the bulk population as also observed by **Barnhuyan & Khan (1992)** and **Jaiswal & Singh (1994)**.

Insects, gastropods and Ostracoda showed their highest abundance during colder months and lowest during monsoon. However, variations in other groups were registered but in haphazard fashion. This was in agreement with findings of **Mandal & Moitra (1975)**, **Oomachan, and Belsare. (1985)**, **Reddy, & Rao, (1989)**, **Bass (1986)**, **Sharma et.al ,( 2007)**, **Ahmed, & Singh, (1989)**. and **Jaiswal & Singh (1994)**.

Due to greater number of different microhabitats in littoral region of Mansarovar talab, they are abundant in hot as well as cold climates **Sunny & Diwan (1991)**. Their abundance at station III of the talab is due to organic matter of domestic sewage effluent and run-off water from agricultural fields. During cold season the diversity of oligochaete populations and their abundance, even though shore line fishes , which feed on them, are abundant probably indicate interacting mechanism permitting coexistence in the habitat **Sharma,(2003)**. The population of these worms is regulated by selective breeding and adaptive regulatory mechanism.

**Table 01. Monthly Variation of Diversity Macro invertebrates reported in Mansarovar 2014-15**

Sl.N.	Macro-invertebrates (Bottom fauna)	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	Total	Remarks
1	Oligochaeta	67	59.4	50.1	43	45.1	42.5	32	30.3	31	41.5	49.8	61.4	554553.1	I
2	Hirudinea (Leeches)	4.2	3.3	2	2.3	2.2	2	4.3	3.1	3	3.8	3.5	4	37.7	VI
3	Gastropoda	6.5	7.9	5.1	7.3	8.8	12.9	15	17.2	26.7	28.5	19.2	8.2	163	III
4	Pelecypoda (Bivalvia)	4.9	6.9	4.3	3.6	2.8	3.1	4.2	9.7	7.3	5.3	4.8	5.9	62.8	IV
5	Insecta	11	14.2	28.5	34	30.9	33.9	36	30.9	24.8	15.6	16.2	13.5	288289.5	II
6	Ostracoda	2.2	3.9	6.5	5.2	3	2.5	4.5	4.8	3.5	2.4	2.2	2	42.7	V
7	Shrimps	2.8	2.5	2	1.9	1.7	2	3	2.8	2.2	1.9	2.5	3	28.3	VII
8	Miscellaneous	1.8	1.9	1.5	2.8	5.5	1.1	1.5	1.2	1.5	1	1.8	2	23.6	VIII

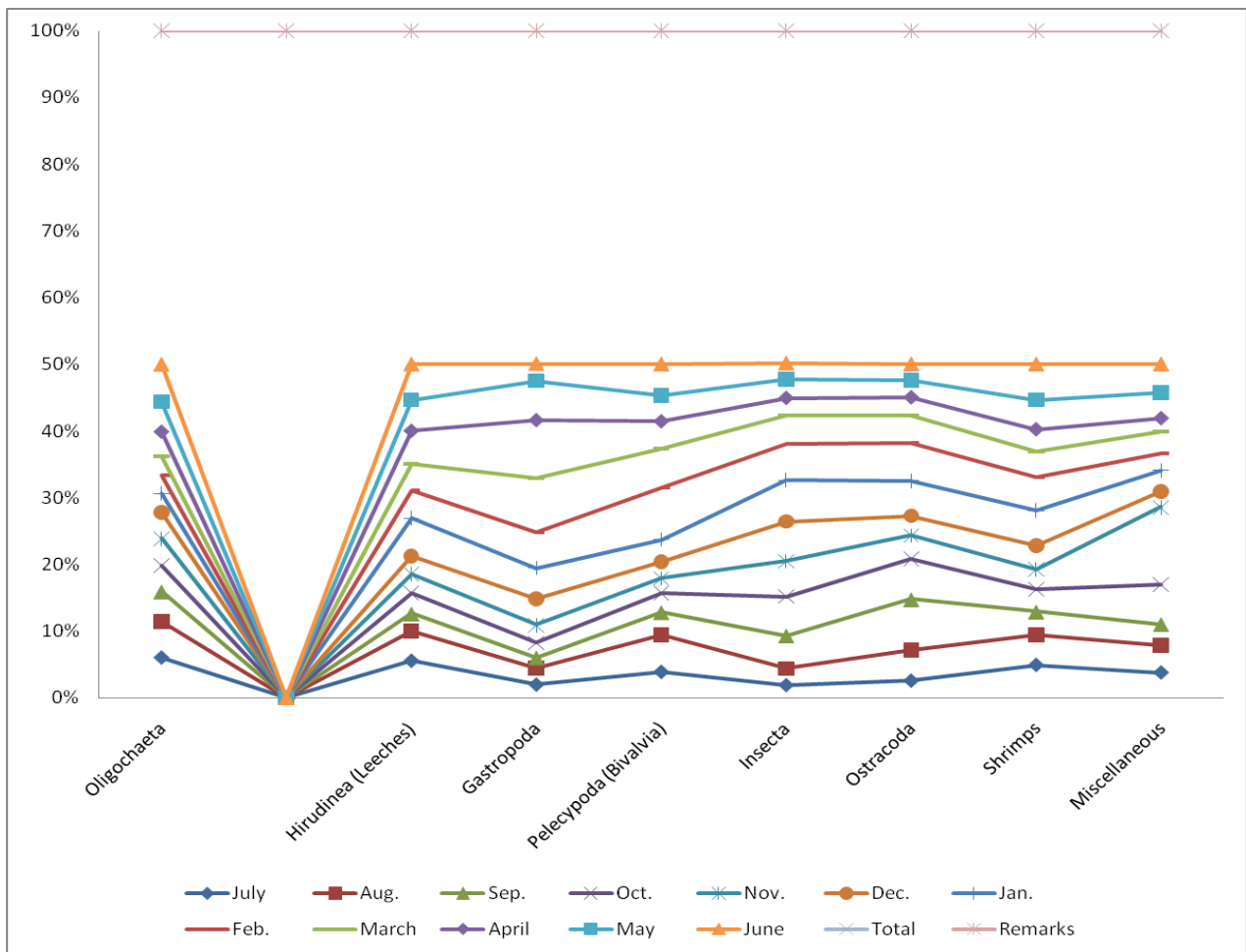


Table 02. List of Benthic Macro-invertebrates species reported in Mansarovar Talab from Jun 2014 –July 2015.

Phylum	Class	Species
Annelida	Oligocheata	1. <i>Tubifex tubifex</i> 2. <i>Limnodrilus hoffmeisteri</i> 3. <i>Telmatodrilus multispinosus</i> 4. <i>Dero dorsalis</i> 5. <i>Dero digitata</i> 6. <i>Stylaria fossularis</i> 7. <i>Branchiodrilus hortensis</i> 8. <i>Tubifex albicola</i> 9. <i>Dero limosa</i> 10. <i>Nais simplex</i> 11. <i>Srachiendrilus semperi</i>
	Hirudinea	12. <i>Helobdella species</i> 13. <i>Glossiphonia species</i>
Mollusca	Gastropoda	14. <i>Thiara scabra</i> 15. <i>Bellamya bengalensis</i> 16. <i>Thiara lineate</i> 17. <i>Vivipara bengalensis</i> 18. <i>Digiostana pulchella</i> 19. <i>Melanoides tuberculatus</i> 20. <i>Pila globosa</i> 21. <i>Planorbis species</i>
	Pelecypoda(Bivalvia)	22. <i>Lymnaea acuminata</i> 23. <i>Pisidium clarkeanum</i> 24. <i>Corbicula striatella</i>
Arthropoda	Insecta	25. <i>Chironomus phumosus</i> 26. <i>Strictochironomous species</i> 27. <i>Baetis simplex</i> 28. <i>Berosus species</i>
	Crustacea	<b>Ostracoda</b> 29. <i>Apus(Tadpole shrimp)</i> 30. <i>Daphnia cercinata</i> <b>Branchiopoda</b> <b>(Shrimp)</b> 31. <i>Stenocypris sp.</i> 32. <i>Herpectocypris sp.</i>

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