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A Wetland's Macrozoobenthos: A Qualitative and Quantative Analysis

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Abstract
In the current study, 38 genera from the phylums of mollusks, arthropods, and annelids were identified. As indicated in the table, mollusks provide approximately 43.63% of the total benthic population during the current study, followed by arthropods with a good diversity contribution of approximately 28.90% and annelids with a contribution of just 29.39%. 1861 nos/m2 was the estimated total benthic population. Molluscans (15 genera and 812nos/m2) made the largest contribution, followed by arthropods (12 genera and 547nos/m2) and annelids (11 genera and 538nos/m2).
Key Words: *Macrozoobenthos, Qualitative, Wetland*

I. INTRODUCTION

Since wetlands are regarded as one of the most abundant sources of biological diversity, they play a significant role in watersheds and offer numerous beneficial services to the environment and society. Wetlands are the world's most productive environments with remarkable biological variety, according to the Ramsar Convention Burea (2006). According to Kumar et al. (2015), wetlands are frequently referred to as the "kidneys of the landscape." Wetlands cover between 4 and 6 percent of the earth's surface. The majority of wetlands have succumbed to a higher degree of biologically active nutrient deposition as a result of urbanization and human pressure.

The bottom of the water body is home to benthic creatures. It is commonly known that benthic communities play a functional role in the trophic dynamics of aquatic ecosystems. An indicator of the ecosystem can be found in the distribution and composition of benthic species across time. More attention has been paid globally in recent years to a deeper comprehension of the benthic ecosystem.

Many fishes and aquatic birds eat macrozoobenthic creatures. Documenting benthic diversity is crucial because benthic organisms are also employed as powerful pollution indicators. Numerous ecologists in India have studied the benthic diversity of lentic waterbodies (Gupta, 1976; Dutta et al., 1887; Shrivastava, 1997; Pani and Misra, 2000; Kumar, 2001; Sisodia, 2001; Pani and Misra, 2005; Srinivasan and Hamlatha, 2006; Bhat and Pandit, 2009; Vyas and Bhat, 2010). However, no such data are available in freshwater bodies in the North Tarai region of Uttar Pradesh in 2010. In light of this, an effort has been undertaken to record the macrozoobenthic variety of Semara Taal, as well as its composition and the ways in which it varies with depth.

Study area:. The water in the Taal reaches a maximum depth of 15 feet during the monsoon season and a minimum of 5 feet during the summer. The drainage water from the Banganga River is the source of the Taal's water supply. There are many different kinds of vegetation in the Taal. Agriculture and pisciculture are two uses for Taal water. Eichornia crassipes is a major pest along the Taal's edge, and organic decomposition causes the Taal to silt. Six stations, designated S1, S2, S3, S4, S5, and S6, were chosen from around the lake body based on habitat, nutrient type, and supply. While Sites S4, S5, and S6 are situated in the deepest section of Taal, Sites S1, S2, and S3 are situated in the inshore region.

II. MATERIALS AND METHODS

Using a Peterson Grabe mud sampler, sediment samples were taken from the bottom of each station in the morning. The samples were then sieved through a 0.5 mm sieve (Ankar and Elmgreen, 1976). The material that remained on the sieve was collected, and benthic organisms were removed using forceps and a brush. These were then placed in a narrow-mouthed plastic bottle with 70% alcohol and 4% formalin as a preservative, depending on the kind of organisms to be preserved. Mollusks and other shelled organisms were kept in 4% formalin, whereas soft-bodied species were preserved in 70% alcohol (Borror et al., 1976). Using the provided key and the manuals Neetham and Needham (1962), Borror et al. (1976), and Pennak (1989), all of the macroflora in the bottle were identified under a light microscope. The number of individuals of a species per sample and the population of organisms were counted and expressed as number/m2. .

III. RESULTS AND DISCUSSION

It has been found that under normal circumstances, the spread of macro benthos fauna is reliant on the distribution and availability of preferred food items. Indeed, their abundance may account for their ability to take advantage of regions with the best food supply (Zahoor et al., 2010). The table shows the benthic diversity of each site. During the 12-month study period, biweekly sampling was used to estimate the water body's benthic population to be 1897 nos/m2. During the study period, 38 genera were discovered in the current analysis. Eleven of the 38 species were annelids, twelve were arthropods, and fifteen were mollusks. One of the macrobenthos, *Tubifex* sp.,*Aumbriculus* sp., *Lumbriculus* sp. and *Nais* sp. of annelid; *Chironomus* sp, *Spaniotoma* sp. and *Cyclops* sp. of arthropods where as *Bellamya* sp*, Vivipara* sp*, Pila* sp, and *Pissidium* sp. of molluscans were most dominant forms being present in all the six stations of Semara Tal. Vyas and Bhat (2010) and Shrivastava (1997) reported 1782 nos/m^2 and 845nos/m^2 in tropical water body and Ravishankar reservoir, respectively.

Table: Macrozoobenthos diversity of Semara Taal

Phylum /Genera	Number of Macrozoobenthos (number/m^2)					
	S_1	S_2	S_3	S_4	S_5	S_5
Annelida						
***Tubifex* sp.**	**42**	**30**	**20**	**5**	**8**	**9**
***Aumbriculus* sp.**	**19**	**23**	**15**	**16**	**5**	**4**
***Lumbriculus* sp.**	**24**	**6**	**9**	**10**	**11**	**12**
***Poecilobdella* sp.**	**6**	**-**	**7**	**11**	**9**	**-**
***Glassiphonia* sp.**	**9**	**8**	**9**	**-**	**-**	**-**
***Batracobdella* sp.**	**10**	**6**	**2**	**2**	**-**	**-**
***Branchiura* sp.**	**6**	**8**	**2**	**-**	**4**	**3**
***Limnodrillus* sp.**	**12**	**14**	**8**	**2**	**-**	**-**
***Nais* sp.**	**25**	**15**	**17**	**3**	**7**	**3**
***Hemiclepsis* sp.**	**5**	**6**	**-**	**-**	**-**	**-**
***Glassiphonia* sp**	**14**	**9**	**9**	**7**	**6**	**7**
Diversity / Density	**11/172**	**10/125**	**9/97**	**8/56**	**7/50**	**6/38**
Arthropoda						
***Chironomus* sp.**	**42**	**37**	**37**	**12**	**11**	**16**
***Spaniotoma* sp.**	**18**	**18**	**20**	**11**	**3**	**11**
***Polycetropus* sp.**	**6**	**8**	**16**	**2**	**-**	**-**
***Philopotamus* sp.**	**8**	**15**	**15**	**-**	**-**	**-**
***Tinodes* sp.**	**6**	**11**	**11**	**-**	**2**	**-**
***Hydroptila* sp.**	**7**	**-**	**-**	**-**	**-**	**-**
***Psphenus* sp.**	**33**	**10**	**35**	**-**	**-**	**-**
***Caenidae* sp.**	**-**	**-**	**-**	**6**	**9**	**-**
***Gammarus* sp.**	**-**	**12**	**-**	**-**	**-**	**-**
***Cyclops* sp.**	**12**	**11**	**19**	**6**	**9**	**6**
***Atydae* sp.**	**8**	**-**	**14**	**-**	**-**	**9**
Daphnia	**5**	**-**				
Diversity / Density	**10/145**	**8/122**	**8/167**	**5/37**	**5/34**	**4/42**
Mollusca						
***Lymnaea* sp.**	**12**	**-**	**10**	**7**	**-**	**-**
***Bellamya* sp.**	**32**	**20**	**25**	**10**	**15**	**14**
***Vivipara* sp.**	**9**	**11**	**10**	**3**	**5**	**7**
***Gyraulus* sp.**	**8**	**14**	**-**	**-**	**-**	**-**
***Thiara* sp.**	**29**	**24**	**27**	**-**	**-**	**-**
***Pila* sp.**	**24**	**29**	**38**	**14**	**12**	**18**
***Unio* sp.**	**11**	**14**	**12**	**-**	**12**	**7**
Planorbis sp.	**2**	**31**	**14**	**-**	**-**	**-**
***Gibbia* sp.**	**7**	**14**	**9**	**13**	**-**	**-**
***Corbicula* sp.**	**12**	**14**	**11**	**7**	**9**	**4**
***Lymnaea* sp.**	**11**	**15**	**15**	**-**	**5**	**2**
***Perreysia* sp.**	**4**	**12**	**9**	**6**	**7**	**-**
***Pissidium* sp.**	**11**	**15**	**14**	**13**	**3**	**3**
***Melanoides* sp.**	**3**	**13**	**7**	**-**	**-**	**-**
***Planorbis* sp.**	**-**	**11**	**-**	**-**	**3**	**-**
Diversity / Density	**14/175**	**14/237**	**13/201**	**8/68**	**9/76**	**7/55**
Total	**35/492**	**32/448**	**30/465**	**21/161**	**21/160**	**17/135**

Mollusks contribute around 45% of the overall benthic population in the current study, as indicated in the table. Arthropods also contribute approximately 30%, while annelids make up just 25% of the total population. The current study found that, as a result of the macrophytes' maximal breakdown, the diversity and density of macrobenthos peaked in the spring and summer.

Because of the low depth, transparency rises, allowing sunlight to reach the bottom layer and speeding up the decomposition process, which in turn enhances benthic diversity. The current study's results concurred with those of Pani and Misra (2005), Srinivasan and Hamlatha (2006), Vyas and Bhat (201), and Efitre et al. (2001). Because shallow inshore waterbodies are rich in macrophytes and solid organic wastes, it can be inferred that these areas are conducive to the growth of benthic creatures.

Therefore, macrozoobenthos have a variety of roles that are crucial to sustaining ecosystem processes including food web energy flow. These benthic organisms concurrently maintain energy flow while offering vital ecosystem services including sediment aeration and nitrogen cycling. Distinct functional groups that maintain ecological integrity are made up of various species. This study demonstrates that shallow zones are conducive to the growth of benthic species. Therefore, from a diversity point of view, the current body of water is a cradle for benthic organisms, particularly in shallower areas where macrophytes are abundant. The bottom of the body showed mud, sand, rocks, macrophytes, and solid organic wastes, to which benthic organisms attach and act as on organic debris.

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