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Zoobenthos Diversity in Tedhi Nadi at Godwaghat of District Gonda,Uttar Pradesh, India

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Abstract

The present investigation deals with the study of monthly fluctuation of Zoobenthos diversity in Tedhi Nadi at Godawaghat of district Gonda, Uttar Pradesh India. The work was carried out for a period of one year from January 2020 to December 2020. A total of 18 genera and 15 families were found in Tedhi Nadi at Godwaghat. Among these six genera belong to annelids, four genera belong to arthropods and eight genera belong to molluscs. Zoobenthos showed distinct quantitative variations. Number of Zoobenthos increased in the summer month (May) while decreased in the spring month (February). Different group of Zoobenthos exhibited their distinct peaks in different months of the year. In Tedhi Nadi at Godwaghat, Molluscs genera have to be dominant among Zoobenthos genera. Accordingly this water body is most suitable for pisciculture. Generally Anopheles larvae, Culex larvae, Chironomus larvae and Eristalis larvae present in water body, which indicate the polluted nature of water body of Tedhi Nadi at Godwaghat. Thus keeping in view the importance of study steps, should be taken for conservation and maintenance of Tedhi Nadi. It is the necessarily step which have to be followed for the safety of water body of Tedhi Nadi.

Keywords: Tedhi Nadi, Godwaghat, Zoobenthos diversity, Conservation and Gonda.

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Introduction

Benthos is the bottom layer organisms occupied in all types of ecosystems, both in saline as well as fresh water. The terms benthos is used as an expensive term for the entire bottom community and the benthic boundary layer relate to the immediate physical environment of the benthos (McCave, 1976), Benthos word is coined by a German Zoologist Ernst Hackel in 1891.In Greek the meaning of benthos is depth of the freshwater reservoir, the organisms live in the benthic region concerning the sediment. On the basis of type of organisms they are classified in to Zoobenthos and Phytobenthos, example all the benthic animals are known as Zoobenthos while benthic plants known as Phytobenthos such as micro-algae. In all the benthos community or even closely related species may receive their food resources differently (Covich et.al., 1999). There are numerous food web relationship in which one species interrelates positively or negatively with others or in which the addition or defeat of only species alter food web dynamic. Benthos converts organic detritus from sedimentary storage in to dissolved nutrients that can be mixed in to overlying waters, which is used by rooted plants, macrophytes and algae, to improve primary productivity. Some benthos is omnivorous and feed on macrophytes, algae and Zooplankton. Many benthos are consumed by fishes. Through their mixing of sediments and consideration of diverse resources, benthos can directly and indirectly influence microbial production and release of greenhouse gases, toxic gases and nitrogen (Covich et. al., 1999). It is a Endo-benthos, these organisms are living inside the sediment, they ingest sediment's fine particulate matter example- Oligochaetes, Endobenthic organisms are sedentary. They consist of diverse species that show different tolerances to pressure. They are representative of different Zoological groups including annelids, Molluscs and Crustaceans that contribute greatly to aquatic ecosystems. Among annelids, oligochaetes are mainly presented in freshwater, whereas polychaetes are mainly marine organisms. Among Insects Chironomus larvae used in eco-toxicological freshwater studies (Amiard-Triquet and Berthest, 2015).

The studies of Zoobenthos diversity in our country were undertaken by investigators like Eggleton (1931), Jha (1968), Mishra (1968), Jakher (1980), Gupta and Pant (1983), Garg et.al. (2009), Kabir et.al. (2010), Kabir et.al. (2011) and Arnab et.al. (2013).

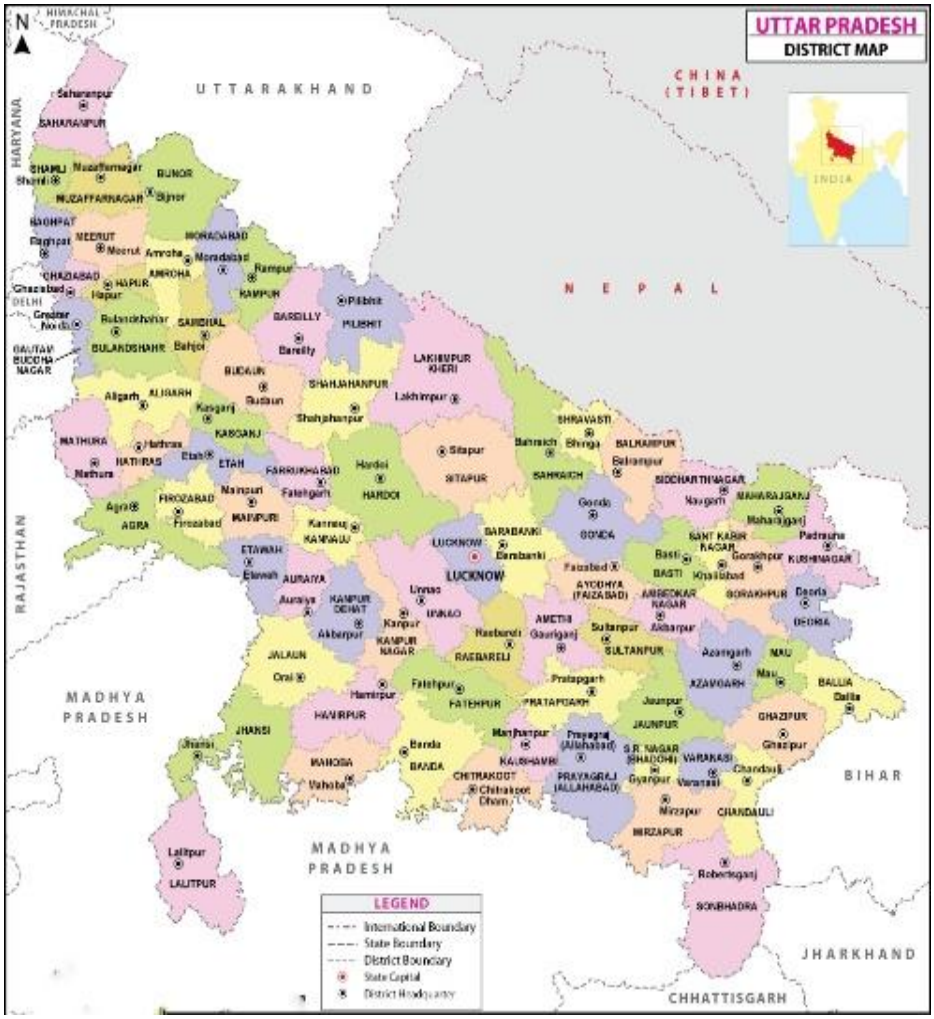
Materials and Methods

Location of study area: Tedhi Nadi at Godwaghat is one of the important sites of the district Gonda. It is situated 8 km from the district head quarter. The district Gonda lies between 26°47'and 27°20' north latitude and 81°30', 82°46' east longitude (Map-1,2 & 3).Tedhi Nadi originated from Chittaura Jheel and Join river Ghaghara. Flows in the range about 269 km from Chittaura Jheel to river Ghaghara (Fig.1).

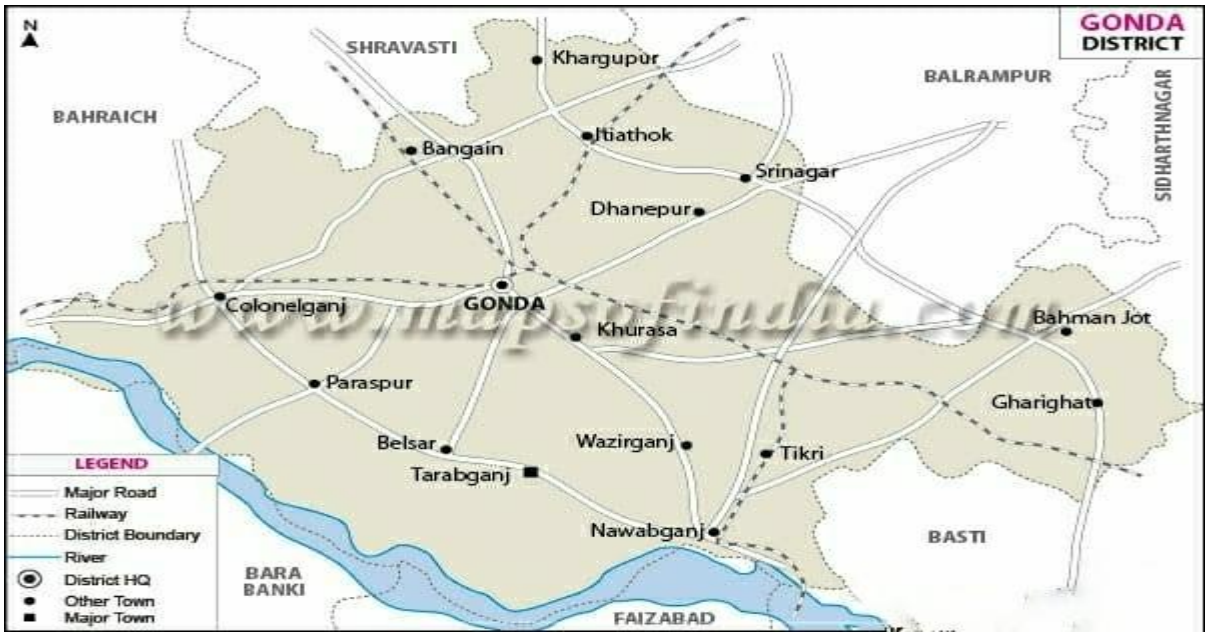
Sampling, identification and preservation:

Zoobenthos samples in Tedhi Nadi at Godwaghat were collected during third week of each month between 8.00AM to 11.30 AM. They were taken from three sampling sites fixed up littoral, pelagic and polluted regions were transported to the laboratory of P.G. Department of Zoology, M.L.K.P.G. College, Balrampur, Uttar Pradesh. Zoobenthos were sampled with mushroom shaped bottom sampler which collected a sample of about 10cm×10cm. The entire collections were brought to the laboratory for further investigation as per the method applied by Singh et.al. (1998). A sample of 200 ml was taken out and passed through guarded sieves and washed with plenty of water. The organisms collected in sieve were transferred to a bottle filled with water. The Zoobenthos were first identified in living condition and then preserved in 5% formaldehyde solution. For the identification of Zoobenthos using Standard taxonomic literatures (Ward and Whipple, 1959), Zoobenthos fauna and diversity worked out according to Mishra (1968).

Map-1: Location of the study area in India



Map-2: Location of the study area in Uttar Pradesh



Map-3: Location of the study area in district Gonda

Fig.-1: Tedhi Nadi at Godwaghat of district Gonda, Uttar Pradesh

Results and Discussion

During present investigation, total 18 genera and 15 families of Zoobenthos belonging to three major phylum viz. Annelida, Arthropoda and Mollusca have been reported from three different sites in Tedhi Nadi at Godwaghat of district Gonda for a period of about one year January 2020 to December 2020. Monthly fluctuations of Zoobenthos is documented in Table-2.The maximum Zoobenthos genera is recorded at pelagic region followed by littoral and polluted region respectively. In Tedhi Nadi at Godwaghat among Annelids contain-Placopdelloides, Ozobranchus, Poecilobdella, Hirudinaria, Barbronia and Salifa genera were recorded from all site. Among Arthropods contain-Anopheles larvae, Culex larvae, Chironomus larvae and Eristalis larvae genera were recorded from all sites. Among Molluscs contain-Limnaea, Planorbis, Physa, Amnicola, Bythinia, Campeloma and Goniobasis recorded from all sites. Zoobenthos showed distinct quantitative variations. Number of Zoobenthos increased in the summer month (May) and decrease in the spring month (February) is documented in (Table 1 & 2). Generally Anopheles larvae, Culex larvae, Chironomus larvae and Eristalis larvae present in water body, which indicate the polluted nature of water body of Tedhi Nadi.

During the study period, the presence of Zoobenthos was maximum in the summer months (May) and minimum in the spring month (February). This is not conformity to the finding of Eggleton (1931) and Devey (1945), who observed the maximum Zoobenthos in the month of April and minimum in the month of September in an American lake, while Srivastava (1956) and Tripathi (2015) observed maximum in the month of May and minimum in the month of February from a lake of Lucknow, Uttar Pradesh and Seetadwar lake of district Shravasti,Uttar Pradesh, India. Michael (1969) concluded the peak period in the month of January and April but Mandal and Moitra (1975), Jana and Manna (1975), Bose and Lakra (1994) found maximum peak during summer months which is quite in conformity to the findings of this investigation. The differences in composition of abiotic factors of water, soil and variation in productivity of water bodies. Some workers such as Qadri and Yousuf (1980), Bhati andRana(1987), Singh (2000),Latha andThanga (2010) correlatedbottom community with the fish productivity and accordingly this water body is most suitable for pisciculture.

Table-1: Zoobenthos Community in Tedhi Nadi at Godwaghat of district Gonda (U.P), India (Data of January 2020 to December 2020)

S.No.	Zoobenthos Genera	Family	Phylum
1	Placobdelloides	Glossiphoniidae	Annelida
2	Ozobranchus	Ozobranchidae	Annelida
3	Poecilobdella	Hirudinidae	Annelida
4	Hirudinaria	Hirudinidae	Annelida
5	Barbronia	Salifidae	Annelida
6	Salifa	Salifidae	Annelida
7	Anopheles larvae	Culicidae	Arthropoda
8	Culex larvae	Culicidae	Arthropoda
9	Chironomus larvae	Chironomidae	Arthropoda
10	Eristalis larvae	Syrphidae	Arthropoda
11	Limnaea	Lymnaeidae	Mollusca
12	Planorbis	Planorbidae	Mollusca
13	Physa	Physidae	Mollusca
14	Amnicola	Amnicolidae	Mollusca
15	Anodonta	Unionidae	Mollusca
16	Bythinia	Bithyniidae	Mollusca
17	Campeloma	Viviparidae	Mollusca
18	Goniobasis	Melanidae	Mollusca

Table-1: Monthly variations of Zoobenthos in Tedhi Nadi at Godwaghat of district Gonda (U.P.), India (Data of January 2020 to December 2020)

	Zoobenthos	Months											
S.No	Genera	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Annelids												
1	Placobdelloides	+	-	++	+++	++++	+++	++	++	+++	++	++	++
2	Ozobranchus	+	+	++	++	+++	++	++	+++	+++	++	++	+
3	Poecilobdella	-	-	++	+++	++++	+++	++	+++	+++	++	+++	+
4	Hirudinaria	+	-	++	+++	++++	+++	+++	+++	+++	++	+++	++
5	Barbronia	+	-	++	++	+++	++	+++	++	+++	++	++	+
6	Salifa	-	+	++	++	+++	+++	+++	++	+++	+++	++	+
	Arthropods												
7	Anopheles larvae	+	+	++	+++	++++	+++	++	++	+++	+++	+++	+
8	Culex larvae	+	+	++	+++	++++	+++	++	++	+++	+++	++	++
9	Chironomus larvae	+	+	++	++	++++	+++	++	++	+++	+++	+++	++
10	Eristalis larvae	-	-	++	+++	++++	+++	++	++	+++	++++	++	+++
	Molluscs												
11	Limnaea	-	+	++	++	++++	++	++	++	+++	++	+	+
12	Planorbis	-	-	++	++	+++	+++	++	+++	++++	++	++	+
13	Physa	+	-	++	++	+++	+++	++++	+++	+++	++	++	
14	Amnicola	+	+	++	++	+++	++	+++	++	++	++	++	++
15	Anodonta	+	-	++	+++	++++	+++	++++	+++	+++	++	++	++
16	Bythinia	+	+	++	+++	++++	+++	++++	+++	+++	++	+	+
17	Campeloma	+	+	++	+++	++++	+++	++++	+++	++++	+++	+++	++
18	Goniobasis	+	+	++	+++	++++	+++	++++	+++	++++	++	++	++

Note: ++++=Abundant (51-60%), +++=Common (26-50%), ++=Frequent (11-25%), += Rare, - = Absent

Conclusion

The present contribution is the result of the extensive and intensive studies on Zoobenthos fauna carried out during January 2020 to December 2020 which deals with the diversity and abundance of commonly occurring Zoobenthos fauna in large number and accordingly this water body is most suitable for pisciculture.

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