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Observation on some LimnologicalFeatures and Density of plankton in MukundpurTalabDistt. Satna (M.P.) and with special Reference to Macroinvertebrate

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ABSTRACT
In this investigation the annual density of phytoplankton in this Talab was recorded and found to be 2167.16 org/l and 2219.02 org/l during both study year (Jan. to Dec. 2004 and Jan. 2005 to Dec 2005) and annual density of zooplankton 1510.56 org/l and 1282.1 org/l During both study year and annual density of macroinvertebrate 59.86 org/m2and 66.46 org/m2 both study year and Twelve species aremacroinvertebrate have been observed in both study year. The water Quality have key role in this Talab showing in Eutrophic in Nature after critical examination of water quality.

INTRODUCTION

A large number of lentic water resources of our country are not onlyindispensable but also significant to have their social and economic factor like air soil and to maintain ecological processes of the bio system. It cover about 73% of earth surface and provide of most extensive medium for aquatic life. It constitutes about 70 to 90% chemical factor water also act as major controlling factor for the organism water contain several minerals and gases needed for the building of protoplasm the multi purpose demand of water is brought about by the two interdependent and parallel line forces i.e. industrialisation and urbanization which is one hand usually reflect the development and progress and other hand possess strong concern about the fate of fresh water habitats.

2. Material and Method

2.1 The Description of the Study Area

The investigation area of MukundpurTalab in originated in Mukundpur Village of Anarpattan Tehsil District Satna (M.P.). This Talab is also known as RoopsagarTalab. It located 15km way from Rewa city on BelaGovindgrah Road and its spread about 160 hec. area.

2.2 Research Methodology

In this investigation five sampling site have been decided. The sampling site A, B, C, D and E in which four sampling site located on the bank of Talab and fifth locate in the Middle of Talab. Every time sampling was done 8.00 AM on to 12.00 Noon all research work done between (Jan. 2004 to Dec. 2004 and Jan. 2005 to Dec. 2005) covering all the three prevailing season. Monthly sampling done in the second week of each month and all work done during tenure of Research work in Research Center Govt. Model Science College Rewa (M.P.).

2.3 Biological Analysis

Plankton were collected along with water sample far qualitative studies, samples were collected by net -- bolting silk No. 14(120...) and 25 (64 ..).

2.4 Phytoplankton

Phytoplankton sample were collected in 500 ml narrow mouthed gloss bottles and preserved in 5% formalin and also in 10 ml Lugol's iodine solution and counting was performed by using Hydrobios microscope.

2.5 Zooplankton

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Zooplankton were quantitatively estimated by filtering 100 litres of water from the surface through 40 HD silk bolting cloth. The sample preserved in 5 percent buffered formaline and were thoroughly mixed by rotating bottle and using method by Rafter cells Method and calculated of following formula

$$\text{Orgainsm/ml} \frac{C \times 1000\,mm^3}{L \times D \times W \times S}$$

Where C = Number of organism

L, D, W = Length Depth and Width

S = Number of site

2.6 Macroinvertebrate

Macroinvertebratecounted by with help of a Peterson grab having an area of 0.08m^{2}and biting depth of 10cm and organism Identifiedupto species level segregated and counted.

3. Community Analysis

Species diversity of Plankton and Macroinvertebrate ofMukundpurTalab was determined by shanmons weaver (1949) index (H) which is as follow :

$$H = \sum_{i=1}^{s} pi \log pi$$

Where pi = Importance probability for each species (ni/N) species richness (d) was determined by the Index given by odum (1983) :

$$d = \frac{S-1}{\text{Log } N}$$

Where S = Number of species

N = Number of individuals

According to Uherekand GouveiaOliveira and CallistoSuleemanand Abdullahiand sandin and hering the analytical procedure were identification of Plankton and Macroinvertebrate form each site to family level.

Table-1

Total seasonal density (org/l of Phytoplankton) observed at five site of MukundpurTalab during 2004-05

Years	Season	Site A	Site B	Site C	Site D	Site E	Average
	Winter	285	292	304	306	253	2886
2004	Summer	1629.0	1650.5	1673.5	1647.3	1447.0	1609.46
	Rainy	1991.3	2032.2	2082.9	2121.0	1800.6	2005.6
2005	Winter	3005.8	3052.2	3147.5	3159.7	2901.6	3053.36
	Summer	1664.5	1691.4	1732.0	1717.6	1603.1	1681.72
	Rainy	1889.7	1939.6	1987.0	1960.1	1833.5	1921.98

Graph

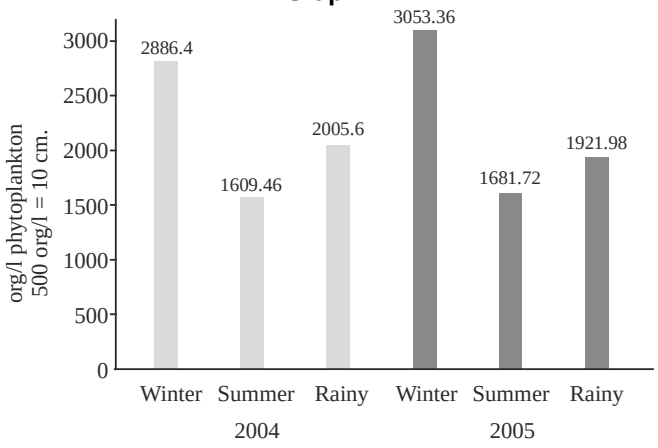

Table 2

Mean annual density (org/l) of different taxonomic group of phytoplankton of MukundpurTalab and percentage contribution observed during 2004-05

S.No.	Taxonomic groups	Mean annual density (org/l)			
		2004	%	2005	%
01	Chlorophyceae	389.25	17.96	417.45	18.81
02	Cynophyceae	759.75	35.06	760.11	34.25
03	Euglenophyceae	50.67	2.34	54.08	2.44
04	Bacillariophyceae	967.49	44.64	987.38	44.50
	Total	2167.16	100	2219.02	100.00

Graph

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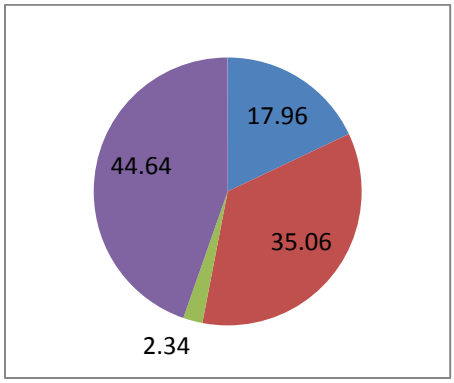
2004



2005

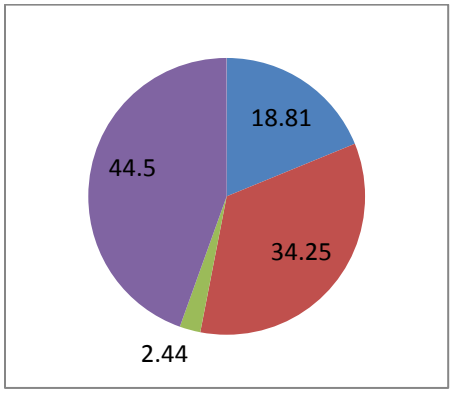


Table 3

Total seasonal density (org/l) of zooplankton observed at five site of MukundpurTalab during 2004-05

Years	Season	Site A	Site B	Site C	Site D	Site E	Average
2004	Winter	1185.0	1152.1	1088.0	1171.9	1305.4	1180.48
	Summer	1398.7	1369.6	1314.2	1390.4	1534.1	1401.4
	Rainy	1040.5	1018.9	973.1	1044.4	1172.1	1049.8
2005	Winter	1242.3	1215.4	1195.3	1222.1	1344.0	1243.82
	Summer	1391.4	1398.6	1398.9	1419.2	1533.0	1428.22
	Rainy	1165.4	1151.9	1133.2	1152.4	1268.6	1174.3

Graph

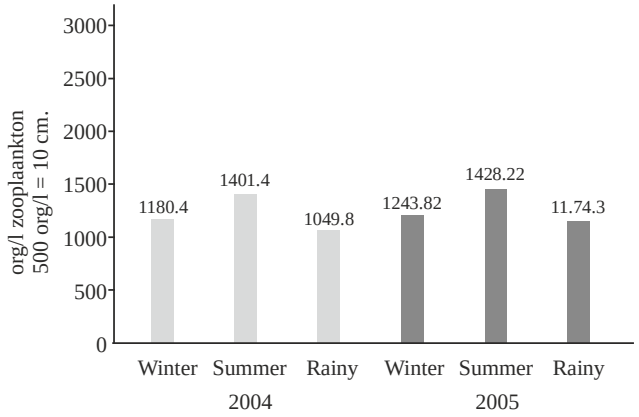


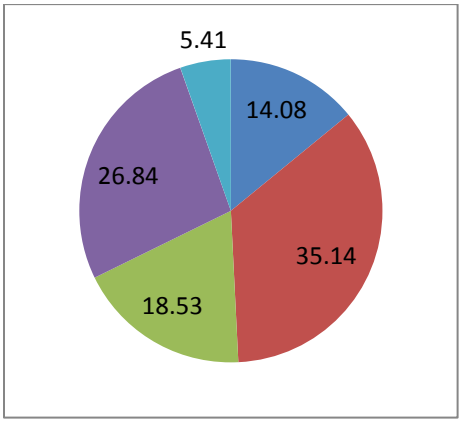
Table 4

Mean annual density (org/l) of different taxonomic group of zooplankton of Mukunpurtalab and percentage contribution observed during 2004-2005

S.No.	Taxonomic group	Mean annual density (org/l)			
		2004	%	2005	%
01	Protozoa	170.43	14.08	179.24	13.98
02	Rotifera	425.41	35.14	448.04	34.95
03	Cladocera	224.35	18.53	243.71	19.01
04	Copepoda	324.91	26.84	339.05	26.44
05	Ostracoda	65.46	5.41	72.07	5.62
	Total	1510.56	100.00	1282.11	100.00

Graph

2004



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2005

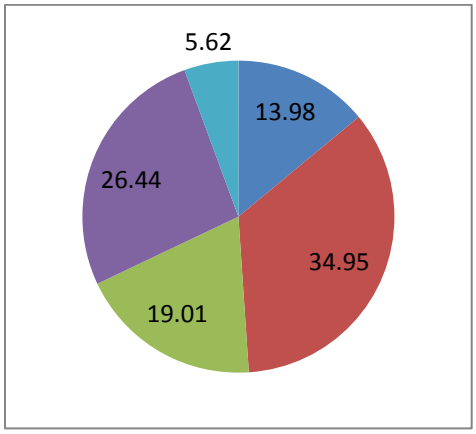

Table 5

Total seasonal density (org/m^2) of macro invertebrate observed at five site of MukundpurTalabduring 2004-2005

Years	Season	Site A	Site B	Site C	Site D	Site E	Average
2004	Winter	21	24	49	78	60	46.4
	Summer	28	33	58	87	62	53.6
	Rainy	44	51	91	121	91	79.6
2005	Winter	31	29	61	83	64	53.6
	Summer	39	36	67	91	71	60.8
	Rainy	54	51	94	128	97	84.8

Table 6

Mean annul density (org/m^2) and percentage contribution of different taxonomic group of macroinvertbrate of MukundpurTalabobserved during 2004-2005.

S.No.	Taxonomic group	Mean annual density (org/m^2)			
		2004	%	2005	%
01	Oligochaeta	6.33	10.57	7.33	11.03
02	Insecta	35.4	59.14	38.0	57.18
03	Mollusea	18.13	30.29	21.13	31.79
	Total	59.86	100.00	66.46	100.00

Result and Discussion

In this investigation Ph of water in this Talabwas observed the range of 7.1 to 7.9 throughout both investigation period and the value of conductivity fluctuate between 0.112 to 0.267/4 mhos/cm at different site during both study year and the biochemical oxygen demand (BOD) varied between 1.7 to 3.8 mg/l during 2004 and 1.6 to 4.1 ml during 2005 in both study year and chemical oxygen demand (COD) value ranged between 27.0 to 69.0 mg/l and 26.0 to 68.0 mg/l during 2004 and 2005 in both study year.

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Fig. 1 Limnodrillussp

Fig. 2Tubifextubifex

Fig. 3Hyginusfulginosus

Fig. 4Chironomussp

Fig. 5Chlroperlasp

Fig. 6 Micronectapoweri

Fig. 7Gamphus sp.

Fig. 8Limnaacuminata

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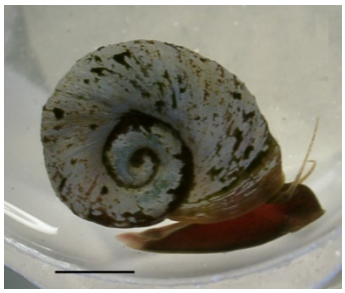

Fig. 9Indoplanorbissp.

Fig. 10ViviparusBengalensis

Fig. 11Lamellidemsmarginalis

Fig. 12Uniopictorum

The annual density of phytoplankton of MukundpurTalabwas recorded and found to be 2167.16 org/l and 2219.02 org/l during. both study year. and annual density of zooplankton 1510.56 org/l and 1282.11 (org/l) both study year and annual density ofmacroinvertebrate 59.86 org/m^2 and 66.86 and 66.46 org/m^2 both study year.

In the MukundpurTalab have been observed twleve species of macroinvertebrate in both study year. In which two are OligochaetaieLimnodrillussp. Tubifex. tubifexand five species are observed i.e. HyginusfulginosusChironomusspChlroperlaspMcronectapoweri and Gamphusspand five speieces are observed in mollusca i.e.LimnaacuminataIndoplanorbisspViviparusbengalensisLamellidensmarginalis and Uniopictorum in this research work hence the analysis of water quality several macro invertebrate found in this Talabin which Talabshowing Eutrophic in nature.

Conclusion and Recommendation

Due to pollution load like COD (chemical oxygen Demand) Water of this fond gave foul smell and show distnict green colour appearance it suggested that water of this pond are Eutrophic in Nature therefore this study recommends that are relevant authorities shuold regularly moniter and control of the source of pollutants and Talabshuld be protected and monitored regularly.

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