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ASSESSMENT OF WATER QUALITY OF DEVKHAL *chour* OF SAMASTIPUR (BIHAR)

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In the present investigation phytoplanktonic spectrum of Devkhal chour was studied for one year and pollution indices of water were made on the basis of 20 significant representative genera as suggested by Palmer (1969). Altogether 58 algal taxa belonging to class Cyanophyceae, Chlorophyceae and Bacillariophyceae were identified in *chour* water which appeared in varying numbers in different months of the year. On the basis of scores of pollution index obtained the *chour* water may be supposed to be organically polluted.

INTRODUCTION

Water quality assessment is not possible simply by analysis of physicochemical characteristics of water. Biomonitoring is an important and reliable method for assessing the quality of water (Cairns, 1970; Warren, 1971; Krishnamurthy *et al.*, 1978; Bilgrami and Siddiqui, 1983; Bilgrami *et al.,* 1985). Phytoplankotons have been used as indicators of water pollution (Palmer 1969; Singh *et al.,* 1970; Miller and Maloney, 1971). In the present investigation, water quality of Devkhal *Chour* of Samastipur (Bihar) was assessed through the indicator algae and species diversity index.

MATERIALS & METHODS

Water samples were collected from one point of the *chour* for one year. *Chour* water was analysed for phytoplankton community structure. The algal taxa were identified with the standard literature (Desikachary, 1959; Prescott, 1978; Fritsch, 1935). Species diversity index was determined using the formula of Shannon and Weaver (1963). Water pollution was assessed on the basis of indicator algae as prosposed by Palmer (1969).

RESULTS AND DISCUSSION

Altogether 58 algal taxa were detected in the chour water during the course of investigation of which 15 were of Cyanophyceae, 26 of Chlorophyceae and 17 of Bacillariophyceae. All the taxa were not recorded in a month but they appeared in varying numbers in different months of the year. The maximum number of algal taxa was observed in the month of June (34 taxa) and minimum in the month of April (21 taxa). Amongst the algal taxa *Microcystis aertuginosa*, *Oscillaotaria limosa*, *O. tenius*, *Ankistrodesmus falcatus*, *A. spiralis*, *Chlorella vulgaris*, *Chlorella pyrenoidosa*, *Scenedesmus quadricauda*, *S. obliqus*, *Pediastrum boryanam*, *Cyclatella meneghiniana*, *Gomphonema panvulum*, *Nitzschia palea*, *and Navicula sp.* were found in good numbers and existed in *chour* water for longer durations. These algae were also rated as pollution tolerant by Palmer (1969). The pollution indices of *chour* water were made on the basis of 20 significant representative genera as suggested by Palmer (1969) and presented in Table-1. On the basis of scores obtained which ranged from 21-25, the *chour* water may be supposed to be organically polluted.

The species divrsity is the ratio between number of species and importance value (number, biomass, productivity and so on) of individuals (Verma and Munchi, 1987). In the present study, species diversity index of phytoplantons was computed and presented in Table-2. The species diversity value was found ranging from 0.642 (November) to 1.805 (February) with annual mean value as 1.247 +0.11 bits/individual. Based on data from a variety of clean water and polluted streams, Withm and Dorris (1966) proposed a relationship between species diversity (H) and the pollution status of sampling stations as follows :

H Species Diversity
>3 Clean water
1-3 Moderately polluted
>1 Heavily polluted

From the species diversity value, it is quite clear that *chour* water falls under moderately polluted to heavily polluted category during different months of the year.

From the above discussion it seems quite clear that *chour* water is eutrophic in nature.

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TABLE-1 : Monthwise variations in the scores of pollution index based on twenty significant pollution tolerant genera.

Pollutant tolerant genus	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July
Ankistrodesmum	2	–	–	2	2	2	2	–	–	–	–	–
Chlamydomonas	–	–	–	–	–	–	–	–	–	–	–	–
Chlorella	3	3	3	3	3	3	3	3	3	3	3	3
Closterium	–	–	–	–	1	1	1	–	–	1	1	–
Cyclotella	–	1	1	1	1	1	–	1	1	1	–	–
Euglena	–	–	–	–	–	–	–	–	–	–	–	–
Ghomphonema	1	–	–	–	1	1	1	1	1	1	1	1
Lepotenclis	–	–	–	–	–	–	–	–	–	–	–	–
Melosira	1	1	1	1	1	1	1	1	1	1	1	1
Micratenium	–	–	–	–	–	–	–	–	–	–	–	–
Navicula	3	3	3	3	–	3	–	3	3	3	3	3
Nitzschia	3	–	3	3	3	3	3	3	3	3	3	3
Oscillatoria	5	5	5	5	5	–	5	5	5	5	5	5
Pandorina	–	–	–	–	–	–	–	–	–	–	–	–
Phacus	–	–	–	–	–	–	–	–	–	–	–	–
Phormidium	1	1	–	–	–	1	1	–	–	1	1	–
Scenedesmus	4	4	4	4	4	4	4	4	4	4	4	4
Stigeoclonium	–	–	–	–	–	–	–	–	–	–	–	–
Synedra	2	2	2	2	2	2	2	2	2	2	2	2
Total Scores	**25**	**23**	**22**	**24**	**23**	**23**	**23**	**23**	**21**	**25**	**27**	**22**

TABLE-2 : Monthwise variations in species diversity (H. bits/individual) of Devkhal Chour

Months	Species Diversity
Aug.	0.950
Sep.	1.506
Oct.	0.708
Nov.	0.642
Dec.	1.278
Jan.	1.420
Feb.	1.805
Mar.	1.677
Apr.	1.475
May	0.791
June	1.342
July	1.378
Mean	**1.247**
S.E. (±)	**0.1109**