

Algal Biodiversity and Application of Boyd's Index for accessing pollution in a pond of Saharsa District

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ABSTRACT

In the present study, Boyd's index for Algal biodiversity was applied on the Phytoplanktons of Shankar Pokhar of Saharsa local. The number of Phytoplanktons belonging to the class Desmidiaceae was lowest in all months while the no. of Phytoplanktons from Chlorophyceae were highest. Total no. of genera were lowest in the month of November and highest in the month of January. The water was clean in the month of January, February and December while moderately polluted from March to November.

Key Words - Phytoplankton, Boyd's Index, Shankar Pokhar

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INTRODUCTION

In North Bihar, particularly in Koshi division ponds are the major source of Water in village area as well as near Temples. Ponds are generally, used for bathing, washing clothes, irrigation and several other purposes. Ponds of Temple area are mostly used for bathing and offering flowers and other worship materials. In the present study, Shankar Pokhar of Saharsa local was selected for the study. This pond is situated near a temple of God Shankar. Devotees from different area worship God Shankar at this temple after bathing in this pond. Flowers and other waste materials of this temple are regularly added in the pond which causes water pollution. To access the order or pollution in this pond, the diversity index of Boyd was applied in the no. of genera of Phytoplankton collected from this pond.

MATERIAL & METHOD

Phytoplanktons were collected from this pond at regular intervals in each month from January 2021 to December 2021. Samples were identified and total no. of Phytoplanktons were counted using Lackey's drop method (1938) and modified Suxena.

The value of biodiversity index was calculated by the formula:

$$H = \frac{s - 1}{\ln N}$$

s is the number of genera of Phytoplankton.

N is the total no. of Phytoplankton and

ln is the Natural logarithm

The value of Boyd's Index for clean and less polluted water is >4 and 3-2 for moderately polluted water and <1 for heavily polluted water.

RESULT

The number of Phytoplanktons belonging to the class Desmidiaceae was lowest in all months while the no. of Phytoplanktons from Chlorophyceae were highest. Total no. of genera were lowest in the month of November and highest in the month of January. The diversity index of Boyd was ranged in between 1.236 and 3.662. The water was clean in the month of January, February and December while moderately polluted from March to November. The result is mentioned in table 1 & 2.

Table 1- Total no. of Phytoplanktons in Shankar Pokhar

S. No.	Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	Cyanophyceae	14200	9300	9800	9700	8000	6000	2000	100	100	200	800	9500
2	Chlorophyceae	22100	14200	12900	12500	9900	10500	11000	11500	12000	11500	10200	11200
3	Bacillariophyceae	1100	400	400	300	400	500	300	200	100	100	Nil	Nil
4	Desmidiaceae	6500	4100	4800	4500	1500	2200	1200	1100	600	500	100	1500
5	Total no. of Genera	18	17	16	14	12	10	9	9	8	7	6	15
6	Total no. of Phytoplankton	43900	28000	27900	27000	19800	19200	14500	12900	12800	12300	11100	22200

Table 2- Diversity index and order of pollution of Shankar Pokhar

S. No.	Month	No. of Genera	No. of Phytoplanktons	In N	Diversity Index	Order of Pollution
1	Jan	18	43900	4.642	3.662	Clean
2	Feb	17	28000	4.447	3.597	Clean
3	Mar	16	27900	4.445	3.374	Moderately polluted
4	Apr	14	27000	4.431	2.933	Moderately polluted
5	May	12	19800	4.296	2.560	Moderately polluted
6	June	10	19200	4.283	2.101	Moderately polluted
7	July	9	14500	4.161	1.922	Moderately polluted
8	Aug	9	12900	4.110	1.946	Moderately polluted
9	Sept	8	12800	4.107	1.704	Moderately polluted
10	Oct	7	12300	4.089	1.467	Moderately polluted
11	Nov	6	11100	4.045	1.236	Moderately polluted
12	Dec	15	22200	4.346	3.221	Clean

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