

# Limnological Study of Lentic Ecosystems in Bodhgaya Block in Gaya District Bihar

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**ABSTRACT:** - Study of freshwater ecosystems is very necessary because day by day rainfall is not sufficient. Water is getting tremendous importance in life more than it was before due to repeated draught like situations. In the present study Limnology of the four selected water bodies in Bodhgaya Block in Gaya District Bihar state. The physiochemical parameters like acidity, alkalinity, dissolved Oxygen, TDS, pH and hardness of the water from the selected spots were estimated in rainy season and winter season. Seasonal variation and variation in different parameters at different spots were observed. During rainy season the acidity was found in the range of 12.5 to 29.16 mg/L. Alkalinity was in the range of 73.33 mg/L. pH was in the range of 6.3 to 8.2. Hardness was in the range of 13.66 to 120.83. TDS was in the range of 40 to 360. Temperature was in the range of 210 c to 290 C. In winter season the acidity was found in the range of 13.33 to 94.6 mg/L. The alkalinity was in the range of 61.66 to 113.3 mg/L. pH was in the range of 8.1 to 8.36. Dissolved oxygen was found in the range of 2.95 to 8.19 mg/L. Hardness was in the range of 45 to 132.8. TDS was in the range of 160 to 490. Temperature was in the range of 22 to 24 0C. Various zooplanktons like rotifers, Protozoans like Amoeba and Paramecium along with guppy fish, frogs, crabs and fresh water snails, hydra were also observed. Some Aquatic algae Chara, Spirogyra and Hydrilla were also observed.

**KEYWORDS:** - Freshwater ecosystem, Limnology, Seasonal variation

## I. INTRODUCTION

Freshwater bodies are very important in the nature. They provide habitat to the living

aquatic organisms and also drinking water to other organisms in the vicinity. Bodhgaya Block in Gaya District Bihar is a rain fed area having less rainfall. Therefore in the present study this topic was selected. Limnology is a very useful tool to study the entire ecosystem. Review of literature reveals that much work has not been done in this area on such topic. In the present study One water bodies Maya Sarovar (Bodhgaya Pond ) selected. It is necessary to study the physicochemical parameters to know the water quality which support the life in that aquatic ecosystem. Physicochemical parameters of Gulabsagar water body in Jodhpur was studied by Chouhan and Vyas (2017). Nayaka (2018), has carried out assessment of physicochemical parameters of Gundalamma Lake in Tumkur in Karnataka. Nama and Dhanraj (2018), have assessed the water quality of Palasani pond in Joghpur by studying physicochemical parameters. Rajesh Kumar has studied hydrobiology in Bodhgaya Block in Gaya District Bihar state. the physicochemical parameters in Maya Sarovar (Bodhgaya Pond ) Lake in Gaya district.

## II. MATERIALS AND METHODS

Survey was done to select the lentic ecosystems. Temperature was recorded with the help of thermometer. pH and TDS were recorded with the help of Hanna digital pH and TDS meter respectively. Dissolved oxygen was estimated by Winkler's method. Acidity, Alkalinity and hardness were estimated by the method given by Maithei. Flora and fauna were observed and recorded.

## III. RESULTS AND DISCUSSION

The results are shown in

Table .1.

Assessment of various parameters of water bodies during rainy Season	On Four Parametres			
rainy season				
Acidity (mg/L) :-	29.16	25.83	20.83	12.5
Alkalinity (mg/L) :-	5	73.33	63.33	21.66
pH :-	8.2	6.3	6.7	5.7

Dissolved O2 Content (mg/L) :-	5.77	6.57	3.08	5.77
Hardness (mg/L) :-	37	58.33	120.83	13.66
TDS :-	140	360	40	340
Temperature (°C):-	29	29	21	20

During rainy season the acidity was found in the range of 12.5 to 29.16 mg/L. It was maximum . Alkalinity was in the range of 73.33 mg/L. pH was in the range of 6.3 to 8.2. It was maximum and minimum . Dissolved oxygen was in the range of 3.08 to 6.57 mg/L.. Hardness was in the range of 13.66 to 120.83. It was maximum and minimum . TDS was in the range of 40 to 360. It was maximum and minimum . Temperature was in the range of 210 c to 290C. It was maximum and minimum . Variation in physicochemical parameters of water from various water bodies during rainy season In winter season the acidity was found in the range of 13.33 to 94.6 mg/L. The

maximum acidity was observed and minimum . The alkalinity was in the range of 61.66 to 113.3 mg/L. It was maximum and minimum . pH was in the range of 8.1 to 8.36. It was maximum and minimum . Dissolved oxygen was found in the range of 2.95 to 8.19 mg/L. It was maximum and minimum . Hardness was in the range of 45 to 132.8. It was maximum and minimum . TDS was in the range of 160 to 490. It was maximum and minimum . Temperature was in the range of 22 to 240C. It was maximum and minimum .

**Table. 2.** Assessment of various parameters of water bodies during winter season .

Variation in physicochemical parameters of water from various water bodies during winter season Winter Season All Three Parametres

Acidity (mg/L) :-	94.167	55.20	13.33
Alkalinity (mg/L) :-	61.66	113.3	113.3
pH :-	8.1	8.2	8.367
Dissolved O2 Content (mg/L):-	6.6	7.114	2.95
Hardness (mg/L):-	45.83	63	132.8
TDS :-	160	390	136.7
Temperature (°C):-	24	22	21.33

The result showed that there is variation in the physicochemical parameters at different spots. His may be due to difference in topography and the nearby soil. Seasonal variation was also observed regarding some parameters at some spots. . Various zooplanktons like rotifers, Protozoans like Amoeba and Paramoecium along with guppy fish, frogs, crabs and fresh water snails, Hydra were also observed. Some Aquatic algae Chara, Spirogyra and Hydrilla were also observed. From the limnological study of Balai et al 2016, it is evident that such limnological studies are useful to know the suitability of such lakes for aquaculture and fisheries. Tasleem Begum 2016 after studying physicochemical

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