



# HYDROLOGICAL ANALYSIS OF GROUND WATER QUALITY AND DISTRIBUTION OF PHYTOPLANKTON'S CHARACTERISTICS OF RAMSHILA POND AT GAYA DISTRICT.

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## Abstract

The Present paper deals with certain hydrological parameters and distribution of phytoplankton's characteristics of Ramshila pond at Gaya District in different times intervals. A total of 36 species of Phytoplankton's were identified during research period. Among the identified phytoplankton species Cyanophyceae formed the dominant group, followed by Euglenophyceae Bacillariophyceae and Chlorophyceae. The hydrological parameters such as, pH, temperature, calcium, phosphate, alkalinity, total hardness, dissolved oxygen, biochemical oxygen demand, Fluoride, iron and sulphate, were estimated in the samples to evaluate their quality. Phytoplankton species Cyanophyceae formed the dominant group, followed by Euglenophyceae, Chlorophyceae, Bacillariophyceae and concentration of BOD, DO, Total hardness, Calcium, sulphate, alkalinity, phosphate, iron and chloride are within permissible limits and Iron, phosphate are negligible in comparison to permissible limits. The proper treatment necessary before the use for drinking purposes and irrigation purposes.

Key words : Hydrological Parameters, Phytoplankton's, Pond, Water quality,

## Introduction

Although considerable investigations have been made by the researchers but a little information is known about the systematic hydrological studies in ramshila pond at Gaya. It is important to note that no qualitative, quantitative or ecological study on hydrology was made so far from Ramshila pond Gaya. Ramshila has received various types of sewage i.e., domestic sewage, cattle waste etc. Hence an attempt into the hydrological investigation in relation to the different physicochemical characteristics of water taken up in the present investigation. Information about Ramshila pond. These freshwater communities are

extremely sensitive to environmental variations. Phytoplanktons are the microscopic free floating algal communities of water bodies and productivity of an aquatic system is directly related to diversity of phytoplankton. The phytoplanktonic study is a very useful tool for the assessment of water quality and productivity of any type of water body and also contributes to understanding of lentic water bodies. Phytoplankton includes several thousands of microalgae belonged to Bacillariophyta (diatoms), Cyanophyta (blue green algae), Chlorophyta (green algae), Euglenophyta (pigmented flagellate or phytoflagellated) etc. They respond quickly to environmental changes and are used to assess the ecological status of water body. In the present study an attempt has been made to assess the limnological studies of phytoplankton and their distribution and fluctuations in the hydrological variables in the pond.

## Materials and Methods

In Ramshila pond water Samples were collected in plastic bottles for physico-chemical and biological analysis. Water temperature, pH, dissolved oxygen and free CO were determined on the 2 sampling spots and other parameters were analyzed in the laboratory. It is small, open, shallow, round shaped, fresh water pond. All collections were made between 7.30 am to 9.30 am during the study period. Phytoplankton samples were collected by filtering pond water through plankton net with 25  $\mu\text{m}$  mesh size. The filtrate was immediately preserved in 4% formaldehyde. The phytoplankton samples were observed thoroughly under microscope and have been identified with the help of standard literature (Fritsch, 1935; Desikachary, 1959; Round 1971; Prescott, 1978 and Anand, 1998) and Physico-chemical parameters were analyzed in accordance with APHA et al. (2012), Sarmah & Goswami (2012), Mishra & Singh (2018) and Choudhary (2019)

## Results

Our result revealed that concentration of alkalinity, phosphate, iron, DO, BOD, Total hardness, Calcium, sulphate, and chloride are within permissible limits and Iron, phosphate are negligible in comparison to permissible limits. In Ramshila pond 36 species of phytoplankton members were identified in four classes of algae viz. Bacillariophyceae, Chlorophyceae, Cyanophyceae and Euglenophyceae. Among these Cyanophyceae includes 17 species followed by Chlorophyceae 13 species, Bacillariophyceae 4 species and Euglenophyceae 2 species were Recorded.

Table 1: Different phytoplankton species in Ramshila pond.

S.n	Phytoplanktons (algae)	No of species
1	Euglenophyceae	1
2	Bacillariophyceae	4
3	Chlorophyceae	13
4	Cynophyceae	17

Table 2: : Showing different parameters of Ground water quality of Ramshila pond.

S n	Parameters	Sampling and Analysis			
		March	July	November	February
1	Alkalinity (mg/l)	230	230	240	230
2	PH	7.6	6.5	6.5	7.6
3	Temperature(°C)	28	31	26	27
4	Nitrate (mg/l)	15	15	10	15
5	Nitrite (mg/l)	2.0	3.0	3.0	2.0
6	Phosphate (mg/l)	0.0	0.0	0.0	0.0
7	Iron (mg/l)	0.3	0.3	0.3	0.3
8	Chloride (mg/l)	300	220	300	300
9	Total Hardness (mg/l)	340	350	200	500
10	DO(mg/l)	3.1	3.2	4.2	2.1
9	BOD(mg/l)	2.0	2.1	2.6	2.4
11	Floride	0.0	0.0	0.0	0.0

### Conclusion

In ramshila pond ;

1. Phytoplankton species Cyanophyceae formed the dominant group, followed by Euglenophyceae ,Chlorophyceae and Bacillariophyceae .
2. Concentration of DO, BOD, Total hardness, Calcium, sulphate, alkalinity, phosphate, iron and chloride are within permissible limits and Iron, phosphate are negligible in comparison to permissible limits .
3. The Proper treatment necessary before the use for drinking and irrigation purposes.

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