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# Algal diversity with special reference to cyanobacteria of Shershah Suri Pond, G.T. Road, Kanpur, U.P.

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**Abstract :** Water is a major component for the living being, there can be no life without water. Pure water is an animating fluid; polluted water is a real curse for living being. The physico - chemical characteristic of aquatic system of Shershah Suri pond, G.T. Road, Kanpur were found to be different season of year 2012. The aquatic system have shown existences of 34 algal forms and out of them 12 belong to Cyanobacteria, 4 to Euglenophyceae, 7 to Bacillariophyceae and 11 to Chlorophyceae. The present paper deals with the members of cyanobacteria e.g. *Microcystis, Chroococuss, Aphanocapsa, Coelosphaerium, Merismopedia, Arthrospira, Spirulina, Oscillatoria, Phormidium, Nostoc, Anabaena* and *Euglena.*

**Key words: Cyanobacteria, Algal Diversity, Shershah Suri Pond.**

## INTRODUCTION

Fresh water is a natural source of fundamental importance to all living beings on earth. Without water, life is not possible. The property of water is unique in many respects. They seems to be especially designed for the living organism, no other liquid can replace it. Natural water is rich in bacteria, algae, protozoa, worms and other organisms. Pollution is affecting the quality of land, water and air. It is steadily increasing both in urban and rural area of Kanpur. The Shershah Suri pond is situated at adjacent most important national highways NH-2(main Delhi-Howrah Grand Trunk Road) having approximately 26.34' N latitude and 80.35'E longitude and altitude of 110 m. from sea level.

The algal flora of aquatic ecosystems often shows a distinct periodicity and succession of algae. Among algal forms belonging to various classes some of them grow throughout the year, other during a large span of time or short lived only recorded sporadically, algae exhibit preferences for periodicity and succession in different seasons. Patrick (1949) and Palmer (1959, 1969) used algae as indicators of pollution. Cholonky (1968) gave a detailed account of dominant diatom species being used as indicators of water quality. System for biological assessment of water pollution was proposed by Patrick (1950, 1951) and modified by Wurtz (1955).

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## MATERIALS AND METHODS

Standard methods for the examination of pond water (APHA 2005) were followed for the analytical techniques. A regular monthly sampling of pond water with simultaneous collection of algae was conducted. Spots were selected for collecting samples. Sampling was carried out from four corners of the pond. Sample of algae from each fixed spot were made once in a month from January to December 2012. All the samples were brought to the laboratory and preserved at room temperature till the analysis was completed. The samples were collected in a standard manner.

For planktons, bottle of about 125 cc capacity was

filled with water obtained by towing a silk net form the spots on surface and at a depth of 6-8 inches. Another bottle was filled with tips of another portion; aquatic algal flora was taken from the surface of water. The collection was being made with a little disturbance as possible. After the bottle has been left undisturbed overnight the same had settled and the clear water above was decanted off. 20 cc of material and water were left and was preserved in 4% formalin. Floating filamentous algae and algae were also attached to the rocks and pebbles collected by scraping and studied. The details of sampling procedure were same as described in Indian Standard methods of sampling and test of water.

The collected samples were analysed for different variables by the standard methods. From the preserved sample, algal material were mounted on slides and examined in detail and identified with standard literature.

## RESULTS AND DISCUSSION

The biography of Shershah Suri pond, Kanpur includes basically bacteria, fungi, algae, fishes with other aquatic animals and plants. While each one of them forms integral part of energetic pond ecosystem. They control and coordinate their water quality, contribution of algae in self purification, disease spread and for supporting fish and animal life. Such a vast qualitative variance in algal profile is amazing. Detailed examination shows that algae exhibit a high degree of qualitative and quantitative variance through out stretch of Shershah Suri Pond. A Total number of 34 algal forms were recorded and out of them 12 belong to cyanobacteria, 4 to euglenophyceae, 7 to bacillariophyceae and 11 to chlorophyceae.

Annual average values of important chemical parameters are given in Table no. 1. The occurrence and periodicity of algal samples studied are given in Table no. 2. The algal flora of the shows a distinct periodicity and succession of algae numerically maximum algal species were recorded in month of January, February, and December 2012 and minimum number of species were recorded in August. There are certain algae occur in all the season. In cyanobacteria *Aphanocapsa*, *Anabaena, Chroococuss, Coelospharium, Euglena, Microcystis, Merismopedia, Oscillatoria, Nostoc and Spirulina* were recorded.

Certain algae are used as indicators of pollution in this aquatic system, some pollution indicator algae e.g. *Oscillatoria, Microcystis* belongs to cyanobacteria were recorded. There is evidence of pollution indicator algae from certain other localities (Patrick1965, Kant 1979, Gupta 1991, Tripathi 1991, Mohan et al. 2002).

Diversity of algae could be of greatest benefit in making the water clean from inorganic pollutants which get bound up in them along with oxygenation of water and other attributes of microbe profile. The present investigation appears prove with facts of both academic and applied significance.

**Table 1. Physico-chemical characteristics of Shershah Suri pond-water, kanpur, U.P.**

| Parameters | Year - 2012 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| Temp.(°C) | 17 | 20 | 26 | 30 | 33 | 32 | 33 | 32 | 30 | 25 | 20 | 12 |
| pH | 7.8 | 8.2 | 8.1 | 7.8 | 8.2 | 7.3 | 7.9 | 8.18 | 8.26 | 8.12 | 7.8 | 7.2 |
| DO(mg/l) | 7.3 | 7.1 | 7.2 | 7.5 | 6.4 | 5.9 | 6.1 | 8.5 | 7.1 | 7.9 | 4.1 | 4.8 |
| BOD(mg/l) | 4.9 | 5.7 | 6.5 | 5.9 | 12.5 | 8.7 | 13.5 | 5.8 | 4.7 | 4.9 | 7.5 | 5.2 |

**Table 2: Distribution Pattern of Cyanobacteria in Shershah Suri pond-water, Kanpur, U.P.**

| | | Year - 2012 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S.N. | Algae | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| 1. | *Anabaena* | + | + | + | + | - | - | - | - | - | + | + | + |
| 2. | *Chroococuss* | - | + | + | + | + | - | - | - | + | + | - | - |
| 3. | *Coelosphaerium* | + | + | - | + | - | - | - | + | + | + | + | + |
| 4. | *Aphanocapsa* | - | - | - | - | - | - | - | - | + | + | + | + |
| 5. | *Arthrospira* | + | + | + | - | - | - | - | + | + | + | + | + |
| 6. | *Euglena* | + | + | + | + | + | - | - | - | - | + | + | + |
| 7. | *Merismopedia* | + | + | + | - | - | - | - | - | - | + | + | + |
| 8. | *Microcystis* | + | + | + | - | - | - | - | - | - | + | + | + |
| 9. | *Spirulina* | - | - | - | - | - | - | + | - | - | + | + | + |
| 10. | *Phormidium* | + | + | + | - | - | - | - | + | + | + | + | + |
| 11. | *Nostoc* | + | + | + | + | + | - | - | - | + | + | + | + |
| 12. | *Oscillatoria* | - | - | - | - | - | - | - | - | + | + | - | - |

(+) = Present as abundant algae, ( - ) = Not present as abundant algae.

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