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Studies on Blue Green Algae of Jait Sagar Lake, Bundi (Rajasthan)

Abstract

Blue-green algae are often referred to as Cyanobacteria and may be single-celled or colonial and filamentous. These are found in almost every conceivable habitat, from oceans to fresh water to bare rock to soil. A total number of 24 species belonging to 12 genera of Blue-green algae were identified. Some of common Blue-green algal genera belonging to Cyanophyceae of Jait Sagar lake were *Microcystis*, *Oscillatoria*, *Anabaena*, *Microcoleus*, *Microchaete*, *Gloeocapsa* etc.

Keywords: Cyanobacteria, Filamentous, Trichome, Granulated, Jait Sagar lake.

Introduction

Bundi district is the part of 'Haroti region in South Eastern Rajasthan and has a number of water tanks, ponds and lakes such as Jait Sagar, Phool Sagar, Naval Sagar etc. Since long the Jait Sagar Lake has not only been a tourist resort with unparalleled scenic beauty but has also been the source of drinking water supply of the township of Bundi. Blue-green algae, technically known as cyanobacteria, are natural inhabitants of many inland waters, estuaries and the sea. In fresh waters, they are found in suspension and attached to rocks and other surfaces at the bottom of shallow water bodies and along the edges of lakes and rivers. It includes single-celled, colonies and chains (filaments) forms. Single-celled species form clumps, and the filaments of other species come together into bundles or balls. These forms can appear like greenish flocs, flakes of green sawdust, or like brownish pinheads in the water.

Materials and Methods

Algal samples were collected from different sites of Jait Sagar Lake, Bundi (Rajasthan) India which is situated 25°27'31.4" latitude and 75° 39'17" longitude. Algae were collected by phytoplanktonic net. Samples collected were fixed and stored in marked plastic bottles. After collection, phytoplanktons were centrifuged and the supernatant liquid was siphoned off, the sedimented portion and other major algal forms being preserved in 4% formaldehyde. The systematic identification of algae was done with the help of the standard works (Fritsch, 1935 and Desikachary, 1959).

Result and Discussion

The systematic enumerations of Blue-green algal species observed from studied lake are as follow:

Spirulina Major Kutz ex. Gomont

Trichome 1.58 μ broad, regularly spirally coiled, blue-green, spirals 2.63 μ broad and 3.26 μ distant. Habitat- Trichome free floating in stagnant water.

Microcystis Scripta (Richter) Lemm.

Colony clathrate but elongated, cells closely arranged, with gas vacuoles, cell more or less spherical, 4-5.26 μ in diameter and sheath indistinct. Planktonic in stagnant water.

Microcystis Aeruginosa Kutz.

Young colonies rounded, solid and old becoming clathrate with distinct hyaline mucilage, cells spherical, 5.26-7.89 μ broad and with gas vacuoles. Planktonic in stagnant water.

Aphanocapsa Koordersi Strom

Colony dull green, spherical, 2.5mm in diameter, cells irregularly arranged, spherical 2.63 μ in diameter.

Aphanocapsa Roeseana de Barry

Colony irregular and embedded with mucilage. Cells spherical to sub-spherical, light green to yellowish and cells 5.26 μ broad and 7.89 μ long.



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Habitat- colonies attached on stones in lotic water.

Oscillatoria Martini Frey

Thallus blue-green, trichome single amidst other algae, spirally coiled attenuated, capitate, end straight and rounded, cell to cell not constricted, cells broader than length, not granulated at the cross wall, cells 4.09 μ broad and 2.73 μ long.

Habitat- Free floating and moist edges of the lake.

Oscillatoria Limosa Ag. Ex Gomont

Thallus blue-green, free floating in stagnant water, trichome straight, not attenuated, not capitate, end cell slightly thickened and, broad and 2.63-3.65 μ in length.

Oscillatoria Obscura Bruhl et Biswas

Trichome free but not form thallus, unconstructed, straight, not attenuated, ends bent, calyptra absent, cross wall granulated, cells vacuolated, cells 3.65-5.26 μ broad and 2.63 μ long.

Oscillatoria Mougeotii Kutz

Trichome straight but tip curved, not attenuated, cells vacuolated, septa non granulated, calyptra absent, trichome constricted at the cross wall. Cells 5-5.26 μ broad.

Oscillatoria Chlaybea (Mertens) Gonont

Thallus dark blue-green, trichome straight, tip bent, septa non granulated, calyptra absent, not attenuated, cells 6.84 μ long and 10.52 μ broad.

Oscillatoria Chlorina Kutz ex Gomont

Thallus yellowish green, trichome bent at tip, not so constricted at the cross wall, calyptra absent, cells 2.63-3.94 μ long and 5.26 μ broad.

Oscillatoria Princeps Vaucher ex Gomont

Thallus light green to brownish, trichome more or less straight, cap slightly present, rounded, calyptra present, end cell thick walled, non-constructed, septa granulated, cells 21.04 μ broad and 3.4 μ long.

Oscillatoria Proboscidea Gomont

Thallus blue-green, trichome capitate, not granulated at the cross wall, cells vacuolated, more or less straight, cells 2.92 μ long and 15.78 μ broad.

Oscillatoria Jasorvensis Vouk

Thallus yellowish green, trichome not attenuated, not capitate, curved at the ends, straight, cells 2.63 μ broad and 2.5 μ long.

Anabaena Fullebornii Schmidle

Thallus mucilaginous, blue-greenish in color, filament straight, heterocyst cylindrical with rounded ends, akinetes, ellipsoidal and one side of the heterocyst. Cells 10-10.52 μ broad and 7.89-9.21 μ long.

Anabaena Variabilis Kutzing ex. Born et Flah.

Thallus gelatinous, dark-green, flexuous, broad, trichome 3.63-4.25 μ broad and 6.36 μ long, not so constricted at the cross walls, cells barrel-shaped, heterocyst barrel shaped, 8.33 μ long and 8.04-10.52 μ broad. Spores in series, cylindrical and yellowish brown.

Anabaena Variabilis var. ***Kashiensis*** (Bharadwaja) Fritsch

Thallus dense, dark-green, trichome 3.62 μ broad, irregularly curved, constricted at the joints,

ends attenuated, end cells with rounded apex, cells cylindrical, 5.25 μ broad and 10.52 μ long. Heterocyst intercalary, barrel-shaped, 5.83 μ broad and 10.52 μ long.

Aulosira Aenignatica Frey

Thallus floating, dull blue-green, gelatinous, filaments suberect, 7.89 μ broad, sheath colourless, trichome 5.26 μ broad, slightly constricted of the cross wall, apical cell conical shaped heterocyst as broader as long and barrel shaped.

Microcoleus Acutissimus Gardner

More than one filaments in a single sheath, filament more or less straight, 466 μ long and 31.35 μ broad with 20 trichomes, sheath colourless, gelatinous, trichome parallel, not constricted at the cross wall, ends long pointed, cells 5.26 μ long and 2.63 μ broad.

Phormidium Stagnina Rao, C. B.

Thallus dark blue-green, one filament with a sheath, end cell rounded, thick walled, non-attenuated. Trichome olive blue-green to brown, filaments attached by base, not constricted, 15.78 μ broad, sheath open, straight, calyptra present, cross wall granulated, trichome 10.52 μ broad and cells very small with 2.63 μ long.

Habitat- Thallus attached to lower surface of leaves of Nelumbo.

Microchaete Calothrichoides Hansgirg

Thallus greenish, filament in tuft, curved, narrower up to end, sheath distinct, close and 7.89 to 10.52 μ broad, trichome lamellated and homogenous, light greenish, with base and apex. Apex without apical hair, cell to cell constriction present and with heterocysts and spores. Heterocysts basal, oval and 7.89 μ in diameter. Spore ellipsoidal, 7.89 μ broad and 10.52 μ in length.

Habitat- Thallus attached to lower surface of the submerged leaves of Nelumbo.

Chroococcus Tenax (Kirchn.) Hieron

Colony with 2 cells, blue-green, sheath colourless, without laminated, colony 13.15 μ broad and 18.41 μ long without sheath, with sheath 18.41 μ broad and 23.67 μ long.

Gloeocapsa Decorticans (A. Br.) Richter

Cells spherical, blue-green, 4 cells in a colony, single cell with 9.21 X 10.52 μ , without sheath 6.58 X 7.89 μ , in four celled stage with sheath 23.67 X 31.56 μ , without sheath 18.41 X 2.63 μ , sheath colourless, thick and distinctly lamellated.

Merismopedia Punctata Meyen

Colony small, with 8 cells, cells with mucilage, ovoid, 2.63 to 3.945 μ broad, without gas vacuoles. Plankton in stagnant water.

The total 4 genera and 10 species of Cyanophyceae were recorded as dominant alga throughout the study period. The most dominant algae i.e. *Oscillatoria* consisting 6 species and *Microcystis* with 2 species were occurred during summer to autumn and winter season, respectively. *Microchaete calothrichoid* and *Chroococcus tenax* were dominant during autumn season. Cyanobacteria flourished in all seasons. Some form blooms such as *Oscillatoria* and

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Microcystis which spread in huge quantity in Summer and Autumn, respectively. Similar trends has been observed by many worker i.e., Jemi and Balasingh (2011), Kavitha and Balasingh, (2007) and Hujare (2008).

Conclusion

Present investigation shows that Jait Sagar Lake contains a variety of Blue-green species representing class Cyanophyceae. Some of the most dominant species were observed during the period of this investigation.

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