Introduction

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Blue green algae are also known as Cyanophytes, Cyanobacteria, Myxophyceae, or Chloroxybacteria. These are the photosynthetic prokaryotes representing a wide distribution in habitat and range in morphology as compared to eubacteria. The blue green algae have a long history on earth. The oldest cyanobacterial fossils are 3.5 billion years old remains from the Apex Basalts, a geological deposit in Western Australia. Representatives of most of the blue green algae have been recorded from fossil record of latter part of the Precambrian. This area has been known as the age of blue green algae/cyanobacteria.

They were the dominant forms on earth for more than 1.5 billion years at that time. They were probably the chief primary producers of the organic matter and the first organisms to release the elemental oxygen into the primitive atmosphere (until then the atmosphere was free from oxygen).

Recent evidence suggests that blue green algae evolved from two anoxygenic photosynthetic groups, the **Firmicutes** and the **Chlorobi.** Their photosystems I and II thought to have descended from photosystems of each of these two groups. These organisms first produced chlorophyll a and a variety of carotenoids, and phycobilliproteins. Thus blue green algae are most probably responsible for the major evolutionary transformation leading to the subsequent rise of higher plants. The origin of oxygenic photosynthesis in eukaryotic algae has been explained by serial endosymbiosis theory that explains the occurrence of oxygenic photosynthesis in eukaryotes by retention of photosynthesizing prokaryotic endosymbiont blue green algae.

Blue green algae occur frequently in fresh water bodies as phytoplankton. However they are found in most diverse habitats like the upper part of intertidal zone and also the spray zones of lakes. They also occur as epilithic forms. There are instances where blue green algae live as endoliths. Some blue green algae live as symbionts even with other plants. Species like *Mastigocladus laminosus* and *Phormidium laminosum* are capable for living in hot spring at the temperature above 50° C.

Blue green algae are unusual among microorganisms in having specific insoluble reserves of element nitrogen and these provide important advantage in the

competition with other microbial group for available nutrients and in case of phototrophs for energy. In a predominantly nitrogen limited ecosystem this is their advantage. Blue green algae posses two insoluble reserves of nitrogen, cyanophycin and phycocyanin. The cyanophycin is polymer of aspartate and arginine and phycocyanin is protein component of the light harvesting apparatus. The production of extra cellular substances and cyanotoxins by blue green algae illustrates the diverse nature of their interaction with other organisms.

The research on blue green algae is very important as there are many academic and practical reasons-

i) They are of considerable importance in natural environment as natural producer as primary producer of organic matter and as initial colonizer of land. They not only fix atmospheric carbon but have an equal role in biological nitrogen fixation.

ii) They provide a relatively simple and model system for the study of fundamental cellular processes. They are the simplest organisms known to have circadian clock genes.

iii) There is growing appreciation of the role blue green algae play in Man's economy. This is particularly in solving food and energy problem. Apart from exploiting various naturally occurring blue green algal species for human benefits, some blue green algal species are subjected genetic manipulations. There are attempts to develop ammonium depressible herbicide resistant blue green algal mutants to be used in agriculture as Photobio-N fertilizer.

Now a days there is much debate on inclusion of blue green algae under the algae as well as bacteria. This is mostly because of their prokaryotic and photosynthetic nature. If the similarities between cyanobacteria and chloroplast with regard to their principle mode of metabolism and their contribution to the natural nutritional cycles are considered, then the inclusion of these organisms as a division of algae is justified. However, there is certain structural and functional differentiation in their thylakoid membrane organization and accessory light harvesting complexes between cyanobacteria and higher plants. Considering this and the ultrastructural similarities with eubacterial cells they are called cyanobacteria. Traditionally this group of photosynthetic prokaryotes has been classified as a group of algae under the

aegis of the botanical code. Phycologists have developed a system of classification for these organisms based on their morphological development, ecological characters and mode of prorogation as determined not on pure culture but with natural samples

Considering the above discussion and the significance of these organisms in the national interest present attempt has been made to investigate these organisms from the local ecosystems. A critical survey of literature showed that meager information is available with us on the taxonomy as well as systematics of blue green algae from the local area. In order to update the knowledge of blue green algae locally occurring within the area this problem was taken up.