



DIVERSITY OF BLUE-GREEN ALGAE OF PADDY FIELD, HASSAN, KARNATAKA

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Abstract

Cyanobacteria (blue green algae) are present abundantly in rice fields and are important in maintaining the rice field fertility through nitrogen fixation. Occurrence of Blue-green algae in local paddy fields of Hassan district has been under taken for the first time in this area. In the present investigation, rich diversity of Blue-green algae was recorded. This study reveals that comparatively lesser number of Blue-green algae were growing in summers in comparison to rainy season. The unicellular forms were abundant during summer while number of filamentous increased during rainy season.

Key words: Blue-green algae, Hassan district, Diversity, Paddy fields.

Introduction

Blue green algae have an important role in the nitrogen fixation, particularly in rice fields. They have one of the main components of the microbiota in rice fields and play an important role in the maintenance of soil fertility, consequently increasing rice production. The rice fields are agronomically managed ecosystem, well known for the rich diversity of cyanobacteria. Rice fields constitute one of the favorable ecologies for the growth and proliferation of cyanobacteria meeting their requirements for light, water and higher temperature. Cyanobacteria in return, provide a large amount of nutrients, such as nitrogen and phosphorus needed for rice cultivation. Most rice fields have a natural population of cyanobacteria which provides a potential source of nitrogen fixation. Species of *Nostoc*, *Anabaena*, *Scytonema*, *Westiellopsis* and several other genera are widespread in Indian rice field soils and are known to contribute significantly to their fertility. These nitrogen fixing organisms have attributed to the natural fertility of tropical rice fields. Rice fields are ideal habitats for blue green algae. Research on cyanobacterial flora from rice fields were also carried out in different parts of India.

Materials and methods

Collection of samples

Soil samples were collected from four local paddy fields of Hassan district of Karnataka, namely, Channarayapattana, Holenarasipura, Arakalagud and Allur. Soil samples were collected at one month interval during morning to noon from the pre-sowing treatment stage of the crop to throughout cropping and cutting season from May 2015 to October 2015. Representative, randomized and composite soil surface samples collected from 8-10 spots of upper 0.5 cm soil crust from study areas. The sites were selected on the basis of different texture of soils and different water resources by which they irrigated, so that diverse and maximum number of Blue-green algal species can be observed in 4 different sites of Hassan.

Isolation and Identification of samples

Soil samples were mixed well, dried, sieved and 100g representative samples from each field were stored in sterilized polythene bags. BG 11 utilized as enrichment medium for isolation of strains. 1 g soil sample was inoculated in 50 mL sterilized BG-11 medium and then flasks were incubated for 30 days at 28 ± 20 C with cool white fluorescent light tubes under a 16/8 h light. The isolation of Blue-green strains was carried out by dilution and pour plate method. And they were identified.

Results and discussion

Blue-green algae identified in four studied local paddy fields of Hassan district.

Name of isolates	Channaray- apattana	Holenar- asipura	Araka- lagud	Allur
<i>Nostoc spp.</i>	+	+	+	+
<i>Anabaena spp.</i>	+	+	+	+
<i>Rivularia spp.</i>	+	+	+	+
<i>Aphanocapsa spp</i>	+	-	+	-
<i>Spirulina spp.</i>	+	+	+	-
<i>Oscillatoria spp.</i>	+	+	+	+
<i>Chroococcus spp.</i>	+	+	+	-
<i>Gloeocapsa spp.</i>	-	-	+	-
<i>Pleurocapsa spp.</i>	+	-	-	+
<i>Calothrix spp.</i>	-	-	-	-
<i>Cylindrospermum spp.</i>	-	-	-	-
<i>Mastigocladus spp.</i>	-	-	-	-
<i>Phormidium spp.</i>	+	+	-	-

* Present (+), Absent (-)

Diversity of Blue-green algae In studied paddy fields, Channarayapattana showed maximum number of species while least number of species recorded from Allur. The unicellular forms are abundant during summer while heterocystous and filamentous forms found exclusively during rainy season. Maximum number of species belongs

to *Nostoc* genera, and order Chroococcales.

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