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DISTRIBUTION PATTERN OF TAXA OF FAMILY NOSTOCACEAE NOSTOCALES, CYANOPROKARYOTE IN RICE-FIELDS OF KAILASHAHAR AND ITS ADJOINING AREAS

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ABSTRACT : Present communication deals with biodiversity and distribution pattern of blue-green algal genera of family Nostocaceae, Nostocales, Cyanoprokaryotes in rice-fields of Kailashahar and its adjoining area of Unakoti District of Tripura. Total 36 rice fields of three localities *viz.* Kailashahar, Kumarghat and Shrirampur of Unakoti District of Tripura, India were explored for the occurrence and distribution pattern of Nostocacean members in rice-fields. Present study revealed the occurrence of 41 strains of 05 genera from three sites of Unakoti district of Tripura. These genera include *Anabaena* (13), *Aulosira* (04), *Cylindrospermum* (04), *Nostoc* (18) and *Wollea* (02). Out of total 41 strains of 05 genera, 21 strains of 05 genera *viz. Anabaena* (10), *Aulosira* (04) *Cylindrospermum* (03), *Nostoc* (02) and *Wollea* (02) were found growing in low land rice-fields and 20 strains of 03 genera *viz. Anabaena* (03), *Cylindrospermum* (01), *Nostoc* (16) were found growing on moist soils of rice-fields. On the basis of observations it is concluded that the rice fields of Tripura harbour more than 50% strains of total known Indian Nostocacean members of Cyanoprokaryotes..

Key words : *Biodiversity, Blue-green algae, Diazotrophic, Nostocaceae, rice-fields.*

INTRODUCTION

The blue-green algae (Cyanobacteria) constitute the largest group of photosynthetic prokaryotes, these are widespread and ubiquitous in occurrence. They are able to grow almost in all type of habitats *i.e.* fresh water bodies, marine, moist soil, rocks, walls, tree bark and some other specialized habitats including thermal springs, rice fields etc. they also exhibits a wide range of morphological diversity, they are unicellular, colonial, multicellular, non-heterocystous filamentous, heterocystous filamentous, pseudobranched and true branched heterocystous forms. This group of organisms is worldwide in distribution particularly in the moist tropics, free or in symbiotic association, they are also abundant in extreme environments such as arid deserts, hot springs and in parts of Antarctica, where they out compete with other sensitive eukaryotic photosynthetic organisms. Rice fields are considered as one of the most suitable environmental condition to flourish the cyanobacteria and the fertility of rice field soils is due to luxuriant growth of heterocystous blue-green algae (De,1939). Tiwari *et al.* (2007) have revealed the occurrence of total 1530 taxa from all types of Indian habitats and 725 taxa from Indian rice fields. The main aim of the present study was to explore the diversity of Nostocacean members of blue-green algae and to know their distribution pattern in rice-fields of Kailashahar and its adjoining area of Unakoti district of Tripura, India.

MATERIAL AND METHODS

In the present study, total 36 rice-fields, 12 rice-fields from each sites *viz.* Kailashahar, Kumarghat and Shrirampur of Unakoti district of Tripura were surveyed for the occurrence and distribution of pattern of blue-green algal diversity in ricefields during June-July,2012. Total 360 samples (10 samples from each rice field) were collected from different rice-fields of three selected sites. All the collected samples were grown in nitrogenous and nitrogen deficient BG-11 medium (Stanier *et al.*, 1971). After 5-7 days, blue-green algal growth was observed with the help of research microscope (Radical RXLr-5) attached with digital camera (JENOPTIC-ProgRes CTS) and image analysis software. Blue-green algal strains were identified upto the genus level with the help available literatures (Geitler,1932 and Desikachary,1959).

RESULTS AND DISCUSSION

Microscopic observations of samples indicated the occurrence of total 41 strains of 05 genera of family Nostocaceae, Nostocales, Cyanoprokaryote from all three selected sites of Unakoti district of Tripura. These genera include *Anabaena* (13), *Aulosira* (04), *Cylindrospermum* (04), *Nostoc* (18) and *Wollea* (02). Out of total 41 strains of 05 genera, 21 strains of 05 genera *Anabaena* (10), *Aulosira* (04) *Cylindrospermum* (03), *Nostoc* (02) and *Wollea* (02) were observed from the enrichment cultures raised from the material collected from low land rice-fields and 20 strains of 03 genera *Anabaena* (03), *Cylindrospermum* (01), *Nostoc* (16) were observed from the enrichment cultures raised from the material collected from the moist soils of rice-fields. Detailed observations of occurrence and distribution patterns are given in Tables. 1&2. Detailed results of contribution and their

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share (%) in the total population of Nostocacean members of blue-green algae are given in pie (Fig.1). As for as distribution pattern of members of Nostocaceae is concerned, out of total 05 genera, 04 genera *Anabaena, Aulosira, Cylindrospermum* and *Nostoc* were found growing in rice field soils of all the three selected sites of Unakoti district of Tripura and one genus *Wollea* was found in rice fields of two sites *viz.* Kumarghat and Shrirampur. Analysis of data has also revealed that the contribution of genus *Nostoc* was maximum (44%) and the contribution of *Wollea* was minimum (5%) in the diversity of the blue-green algae of family Nostocaceae of order Nostocales, Cyanoprokaryotes.

Survey of literature revealed that except North Eastern region of India, almost all part of the country have been surveyed extensively for the occurrence of these agriculturally important microorganisms, but North Eastern states of our country have been mostly ignored by the Indian workers during their survey work; this may be due to poor connectivity of these states from the rest part of our country. Our study revealed the occurrence of total 05 genera of the family Nostocaceae, Nostocales, Cyanoprokaryote, which are about 50% of total known Indian genera, this may be due to fewer attempts for the collection of samples or ignorance of minute growth samples the state Tripura, India.

Desikachary (1959) described total 85 genera, 541 species, 102 varieties and 31 forma from India, out of total 85 genera, 08 genera belong to the family Nostocaceae, they include *Anabaena, Anabaenopsis, Aphanizomenon, Aulosira, Cylindrospermum, Nodularia, Nostoc* and *Wollea*. Tiwari *et al.* (2007) reported total 97 genera and 1530 taxa (1084 species and 446 varieties and forma) from India.

Table. 1 Showing occurrence of nostocacean members in 4 district of Tripura.

Cyanobacteria	Kailashahar	Kumarghat	Shrirampur
Anabaena	+	+	+
Aulosira	+	+	+
Cylindrospermum	+	+	+
Nostoc	+	+	+
Wollea	-	+	+

+ = Present, - = Absent.

Table. 2 Showing different habitats of nostocacean members in 4 district of Tripura.

Cyanobacteria	Kailashahar	Kumarghat	Shrirampur
Anabaena	A/B	A	A
Aulosira	A/B	A/B	A/B
Cylindrospermum	B	A/B	B
Nostoc	A/B	A/B	A/B
Wollea	NF	A	A

A = Aquatic, B = Moist soil, NF = Not found.

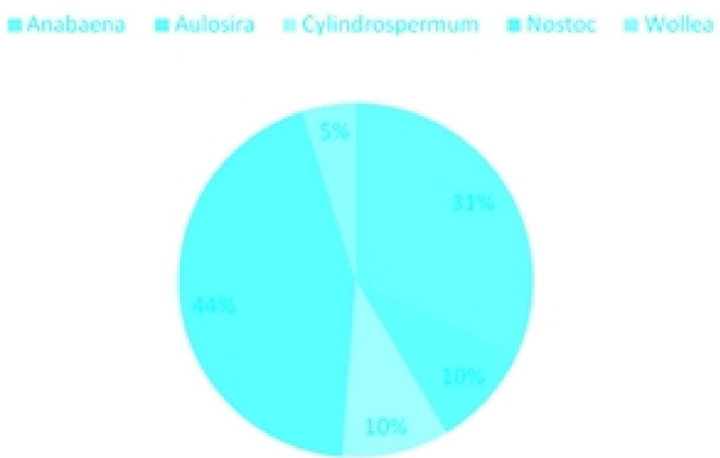

Fig. 1 Showing distribution pattern and share (%) of individual genera in total diversity of nostocacean members in rice fields of Tripura.

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