Abundance of Non-Heterocystous Blue Green Algae of Rice Field of Mangaldoi Sub Division, Darrang District Assam

Matiur Rahman¹, Ranee Das² and G C Sarma³

¹Ph.D. Research Scholar, Department of Botany, University of Science and Technology, Meghalaya, Techno City, 9th Mile, Kling Road, Baridua, Ri-Bhoi Meghalaya-793101

²Professor, Department of Botany, University of Science and Technology, Meghalaya, Techno City, 9th Mile, Kling Road, Baridua, Ri-Bhoi Meghalaya-793101

³Professor Department of Botany Gauwahati University Assam India

ABSTRACT

In these studies total 40 numbers of non-heterocystous blue green algal species were identified from Feb 2017 to Jan. 2019 in Mangaldoi sub division, Darrang District Assam, belonged to the genus Microcystis, Chroococcus, Aphanocapsa, Oscillatoria, Phormidium. Out of which the Genus Gloeocapsa shows highest number of species, and Genus Aphanothaceae shows lowest number of species

KEY WORDS: ABUNDANCE, BLUE GREEN ALGAE, NON HETEROCYSTOUS, RICE FIELD, GENUS GLOEOCAPSA, GENUS APHANOTHACEAE.

INTRODUCTION

Blue green algae, constitute a fascinating group of prokaryotic photosynthetic organisms, some of them fix atmospheric nitrogen by which they can increase fertility in the tropical rice field. Many workers have studied the cyanobacterial flora of rice fields of our country. (Rai and Bergman, 2002; Jaiswal et al., 2008; Karthikeyan et al., 2009, Anamika Singh, Hema Joshi 2018), cyanobacteria have enormous potential in serving humanity in many ways. Their diazotrophic nature, wide distribution pattern and capability to enter into N₂-fixing symbiosis make them attractive research interest.

Cyanobacteria have a long history of usage in agriculture as biofertilizer (Whitton, 2000). They improve the texture of soil and increase the biochemical quality of the soil which forms a rapidly multiplying cover of microscopic plants. They have highly colonization with almost all types of soils. (Bold and Wanne, 1978) These strains are having special concern in microbiology as they are widely used as biofertilizer.

MATERIAL AND METHODS

Water samples were collected from seven different location of Mangaldoi sub-division of Darrang District, Assam. To perform the proposed taxonomical study in a precise manner, the Mangaldoi Sub-division is specified into seven selected sites. During the field survey, specimens are being collected in wide mouthed bottles, test tubes, polythene bags, plankton net. Scalpel, blade, forceps are being used to collect blue green algae from running water. Sampling bottle is filled up with specimen along with water collected from the area to its one third capacities, the remaining parts is for aeration. Species of

ARTICLE INFORMATION

Received 28th Oct 2020 Accepted after revision 12th Dec 2020
Print ISSN: 0974-6455 Online ISSN: 2321-4007 CODEN: BBRCBA

Thomson Reuters ISI Web of Science Clarivate Analytics USA and Crossref Indexed Journal

NAAS Journal Score 2020 (4.31)
A Society of Science and Nature Publication,
Bhopal India 2020. All rights reserved.
Online Contents Available at: <http://www.bbrc.in/>
Doi: <http://dx.doi.org/10.21786/bbrc/13.15/5>

different levels of water is being collected by using pipes & tubes. Few samples will be collected from the same area in each case. Most of the methods and techniques are used on the basis of “Standard Operating Procedures for the Collection and Analysis of Aquatic Algae” June 2016 (Version 2.0) Published by North Carolina department of Environmental Quality. 2016.

Identification: Identification of collected species was carried out by consulting keys given by, Fritch (1935) Smith (1950), Desikachary, (1959) Randhawa, (1959), and some published literature, monographs of algal taxonomy also studied. However Desikachary's (1959) classification is followed in arranging the genera and species.

Name of the species

1. *Microcystis robusta* (Clark) Nygaard
2. *Microcystis bengalensis* Banerji
3. *Microcystis elongata* Geitler
4. *Microcystis lamelliformis* Holsinger
5. *Microcystis aeruginosa* Kutzing
6. *Microcystis flos-aquae* (Witt) Kirchner
7. *Microcystis elabens* (Breb) Kutzing
8. *Chroococcus giganteus* West
9. *Chroococcus macrococcus* (Kutzing) Rabenhorst
10. *Chroococcus turgidus* (Kutzing) Naegeli
11. *Chroococcus tenax* (Kirchner) Hieronymus
12. *Chroococcus minutus* (Kutzing) Naegeli
13. *Chroococcus cohaerens* (Breb) Naegeli
14. *Gloeocapsa decorticans* (Agardh) Richter
15. *Gloeocapsa montana* Kutzing
16. *Gloeocapsa gelatinosa* Kutzing
17. *Gloeocapsa polydermatica* Kutzing
18. *Gloeocapsa calcarea* Tilden
19. *Gloeocapsa punctata* Naegeli
20. *Gloeocapsa atrata* (Turp) Kutzing
21. *Gloeocapsa nigrescens* Naegeli
22. *Gloeocapsa stegophila* var. *crassa* Rao
23. *Gloeocapsa coracina* Kutzing
24. *Gloeocapsa magma* (Breb) Kutzing
25. *Gloeocapsa pleurocapsoides* Novacek
26. *Aphanocapsa pulchra* (Kutzing) Rabenhorst
27. *Aphanocapsa koordersi*: Strom
28. *Aphanocapsa banarensis* Bharadwaja
29. *Aphanocapsa bifurmis* A Braun
30. *Aphanocapsa grevillei* (Hase) Rabenhorst
31. *Aphanocapsa crassa* Ghose,
32. *Aphanocapsa stagnina* (Spring)
33. *Oscillatoria vizagapatensis* Rao
34. *Oscillatoria sancta* (Kutzing) Gomont
35. *Oscillatoria perornata* Skuja
36. *Oscillatoria ornata* Kutzing ex Gomont
37. *Oscillatoria subbrevis* Schmidle
38. *Oscillatoria curviceps* Frey
39. *Phormidium microtolum* Skuja
40. *Phormidium stagnina* Rao

RESULTS AND DISCUSSION

The identified non-heterocystous blue green algae are structurally different in shape, size and structure. The identified blue green algal species of rice field are 40 in numbers. Genus *Gloeocapsa* having 30% including 12 species (*Gloeocapsa decorticans* (Agardh) Richter, *G. montana* Kutzing, *G. gelatinosa* Kutzing, *G. polydermatica* Kutzing, *G. calcarea* Tilden, *G. punctata* Naegeli, *G. atrata* (Turp.) Kutzing, *G. nigrescens* Naegeli, *G. stegophila* v. *crassa* Rao, *G. coracina* Kutzing, *G. magma* (Breb.) Kutzing, *G. pleurocapsoides* Novacek.) Followed by genus having species *Microcystis* 17.5% *Chroococcus* 13% *Aphanocapsa* 13% *Oscillatoria* 13% *Phormidium* 5% *Aphanocapsaceae* 2.5%.

CONCLUSION

Algal species add readily available nutrition to crop plants in agricultural lands and ensure better crop nutrient management. They improve the texture of soil and increase the biochemical quality of the soil which forms a rapidly multiplying cover of microscopic plants. They have highly colonization with almost all types of soils. (Bold and Wanne, 1978). The study shown Genus *Gloeocapsa* 12/40 x 100 = 30 % in rice field of Mangaldai sub division. In another study “Taxonomic Enumeration of blue green algae of tea garden area of Mangaldai sub division Darrang District Assam”. Blue green algae are sensitive to environmental change and nutrient fluctuation has been suggested by Frempong (1981), Tilman et al. (1982), Sudhakar et al. (1991).

REFERENCES:

- APHA (2005): Standard Methods for the Examination of Water and Waste Water. American Public Health Association, Washington, D. C.
- Baruah, P. P. Kakati B. Ahmed I (2009): Some fresh water algae of oil Refinery Effluent Drains of Assam India. Our Nature 7:139-134.
- Bharadwaja, Y. (1933): Contribution to our knowledge of the Myxophyceae of India (Vol. 47).
- Deka, M. and Bordoloi, R.P.M. (1991): Studies on the blue green algae from the rice fields of Assam. Phytos, 30: 173-180.
- Deka, Sheemanta Jyoti (2013): Taxonomic Studies of Blue Green Algae of Goalpara District, Assam. A Ph.D Thesis, Gauhati University, Guwahati, Assam.
- Desikachary, T.V. (1959): Cyanophyta, Indian Council of Agricultural Research Publication, New Delhi, India. Press. London, pp. 791.
- Hazarika D., Duarah I Barukia J (2012): An Ecological assessment of algal growth with particular reference to blue-green algae from upper Brahmaputra valley of Assam. Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231-6345. Vol. 2 (3) July-September, pp. 29-35
- Moirangthem Thajammbi (2020): Isolation and Characterization of Two Cyanobacterial Strains *Calothrix* Sp. and *Microchaete* Sp. from Rice Fields of Karimganj District, Assam, North East India. Current World