Original Research Paper

Volume - 16 | Issue - 09 | September - 2026 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Botany

DIVERSITY OF PHYTOPLANKTON IN THE FLOODED AREA FROM SHIROL TAHASIL, KOLHAPUR DISTRICT.

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ABSTRACT Occurrences of phytoplankton were recorded at four sites of Shirol Tahasil from Kolhapur District during rainy season in flooded area. Microscopic examination of samples obtained in the CFLD zones of Shirol Taluka revealed the presence of 64 microalgae species from 37 genera. Table shows the group-wise distribution of species included, with Cyanophyceae (24) Chlorophyceae (30), and Bacillariophyceae (10) represented. In this area, chlorophyceae were found in greater abundance than in any other area. While Bacillariophyceae members were relatively limited in number at all sites of completely flooded areas in Shirol Taluka. The number of microalgae was highest in Kanwad circle (32) and lowest at Kurundwad circle (16).

KEYWORDS : Phytoplankton, Kolhapur District, Occurrence

INTRODUCTION

Phytoplankton is a complex group consisting of several taxonomic classes of unicellular and colonial species with great morphological and color variation, generally drifting with movement of water. Color is important for taxonomic classification and depends on the chloroplast pigment composition. The importance of blue green in agriculture has long been recognised (De 1939, Singh 1961, Whitton and Potts 2002, Kaushik and Tyagi 2005). However, its true potential in terms of real-world application requires greater consideration (Whitton and Potts 2002). Because the role of cyanobacteria in agriculture is not the only milestone to be exploited, other characteristics like as pigment composition and UV protection pigments should also be appropriately utilized.

MATERIALS AND METHODS

Study Area

Completely Flooded Region (CFLD) of Arjunwad, Kurundwad, Khidrapur and Kanwad sites from the Shirol Tahasil of Kolhapur districts of Maharashtra were selected for the present study.

Sampling

Water samples from selected sites at Shirol Tahasil Kolhapur district were collected in plastic cans and brought to laboratory for physico-chemical analysis. Sampling for phytoplankton was done using plankton net having mesh size 25 and water samples were preserved by adding 4% formalin. After microscopic observation, photographs of phytoplankton were taken on Nikon L-20 digital camera. The identification of genera and species was carried out referring available literature and records such as, Biswas, K. (1980), Prescott (1982), Sarode and Kamat (1984), Marshal (1986), Cox (1996), Tomas (1997), Botes (2001), Al-Kandari et al., (2009), and websites. For physico-chemical analysis of water samples standard methods described by Trivedi and Goel (1986) were followed.

Table 1. Occurrence of Microalgae in CFLD Regions from Shirol Tahasil

Sr. No.	Name of the species/site	Arjun	Kurnd	Kanwd	Khidra
	Cyanophyceae				
1	Aphanocapsa rivularis (Carm.) Rabenhorst			+	
2	Aphanothece Castagnei (De Breb.) Rabenhorst	+			
3	A. microscopia Nageli		+		
4	Arthrospira jenneri(Kuetz.) Stizenberger			+	
5	Chroococcus limneticusLemmermann			+	
6	C. minor (Kuetz.) Nageli		+		+
7	C. pallidus Naegeli			+	
8	Cylindrospermum minutum G. S. West	+			
9	C. stagnale (Kuetz.)Bornet		+	+	
10	Gleocapsa aeruginosa (Carm.) Kuetzing		+		
11	Gomphosphaeria aponina v. gelatinosa			+	
12	Lyngybya epiphytica Hieronymus			+	
13	L. limnetica Lemmermann		+		
14	Merismopedia tenuissima Lemmermann		+	+	
15	M. flos-que (Wittrock) Kirchne		+		
16	Microchaete Goeppertiana Kirchner		+		+
17	M. robusta Setchell& Gardner	+			
18	Nostoc commune Vaucher			+	
19	N. microscopicum Carmichael			+	
20	Phormidium molle Gomont	+			
21	Rivularia minutula (Kuetz.)Bornet			+	
22	Spirulina princeps (West & West) G. S. West			+	
23	S. subsalsa Oersted			+	
24	Schizothrix fuscescens Kuetzing		+	+	
	Chlorophyceae				
25	Ankistrodesmus spiralis (Turner) Lemmermann	+			
26	A. fusiformis Corda	+			
27	Asterococcus limneticus G. M. Smith			+	
28	Botryococus braunii Kuetzing		+	+	
29	Bulbochaete mirabilis Wittrock ex Hirn				+
30	Closterium acutum (Lyngb) Breb. v. variable Brebisson			+	
31	C. parvulumNag.	+	+	+	+
32	Coelastrum microporum Naegeli	+	+		
33	C. proboscidium Bohlin	+		+	
34	C. sphaericum Naegeli	+			
35	Cosmarium blitii Wille			+	
36	C. corda West et W. West		+		+
37	C. margaritiferum Meneghini	+		+	
38	C. vexatum W. West	+	+		+
39	Kirchneriella lunaris (Krich.) Moebius	+	+		+
40	K. obese (W.West) Schmidle	+		+	
41	Oocystis ellipticaW. West		+		
42	O. Eremospheria G. M. Smith	+		+	
43	O. parva West & West	+		+	
44	Ooedogonium angustissimum West &West	+		+	

45	O. vaucheri (Le Clerk) A. Braun	+		+	
46	Scenedesmus bijugatus Lagerheim		+		
47	S. quadricauda (Turp.) de Brebisson	+			
48	Spirogyra dubia Kutz				+
49	S. condensate Kutz.				+
50	S. turfosa F. Grey	+		+	
51	Spirogyra wabashensis Tiffny		+		
52	Tetraedron trigonum Hansgirg	+			
53	T. regulare v. incus f. major Braun				+
54	Volvox aereus Ehrenberg	+		+	
	Bacillariophyceae				
55	Diploneis subovalis f. robusta Cleve	+		+	
56	Gomphonema lanceolatum C. Agardh		+		+
57	Hantzschia amphioxys (Ehren.) Grunow	+			+
58	H. amphioxys v. robusta (Ehren.) W. Smith	+		+	
59	Navicula cuspidatav. brevirostrate Kutz.		+		
60	N. cuspidatav. Ambigua f.diminuta Kutz.	+			+
61	Nidium iridis v. tumidula W. Smith	+		+	
62	Nitzschia obtuse v. scalpeliformis W. Smith		+		+
63	N. vermicularis (Kutzing) Hantzch			+	+
64	Synedra ulna (Nitzsch) Ehrenberg	+			+
	Total	28	21	32	16

*Arjun-Arjunwad; Kurnd-Kurundwad; Khidra-Khidrapur; Kanw-Kanwad CFLD- Completely Flooded Region

RESULTS AND DISCUSSION

Datta and Keshari (2014) discovered approximately 22 blue green alga in crop soil in the West Bengal region. They reported taxa such as *Nostoc commune, Aulosira, Phormidium, and Scytonemain* crop fields such as rice and sugarcane, and it may be used in numerous parts of agriculture and soil improvement. Wagh and Jadhav (2019) investigated the cyanobacterial diversity of cultivated soil, sugarcane, and onion farms in Maharashtra's Ahmednagar area. They discovered a total of 29 species under 12 genera, with the sugarcane field having the highest number of species observed. *Aphanothece, Oscillatoria, Phormidium, Microcoleus, and Plectonema* were observed to be prominent during the study period.

In the present study also a total more than 64 species were recorded in different groups. Cyanophyceae and chlorophyceae members are dominated than other groups in the partially flooded sugarcane region and overall sites the nitrogen fixing blue green algal species were recorded noticeable. Cyanophyceae members i.e. *Aphanocapsa, Aphanothece, Chroococcus, Nostoc, Scytonema, Spirullina* and *Oscillatoria* significantly found in completely and partially flooded regions. Species of Bacillariophyceae viz. *Nitzschia, Hantzschia, Navicula* and *Gyrosigma;* from Chlorophyceae *Closterium, Spirogyra* and *Mougeotia;* and from cyanophyceae *Chroococcus, Oscillatoria* and *Microcystis* were common to most of the sites during study time.

When site wise analysis calculated the the Kanwad site found highest (32) number of species followed at arjunwad site having 28 species recorded during study period. There no much variation observed when site wise analysis calculated. Because the area were completely flooded throughout the taluka at the river site.

REFERENCES

1. Singh R. N. (1961): Role of blue-green algae in nitrogen economy of Indian agriculture. – Indian Council of Agricultural Research, New Delhi :175pp.
2. Datta S. and Kheshari J. P. (2014). Soil and Sub Aerial Blue Green algae (Cyanoprokaryotes) of Burdwan,West Bengal, India , *International Journal of Plant Research*. Vol. 27 (2): 112-126.
3. De P. K. (1939). The role of the blue-green algae in nitrogen fixation in the rice fields. Proc Roy Soc London Ser B 127: 121-139.
4. Kaushik B. D. and Tyagi R. (2005). Cyanobacteria in Agriculture. In (ed) Keshri J P and Kargupta A N. Glimpses of Indian Phycology. Dehradun: 91-108.
5. Wagh S. G. and Jadhav M. J. (2010). Diversity of cyanobacteria in the cultivated fields of Ahmednagar districts (M.S.) India. *Bioscience Discovery*, 10(3): 122-125.
6. Whitton BA (1992) Diversity, ecology, and taxonomy of the cyanobacteria. In: Mann NH and Carr NG (eds) Photosynthetic Prokaryotes, pp 1-51. Plenum, New York.
7. Whitton B. A. and Potts M. The Ecology of Cyanobacteria: Their Diversity in Time and Space. DOI 10.1007/978-94-007-3855-3_1, © Springer Science+Business Media B.V. 2012.
8. Trivedy R. K. and Goel P. K. (1986). "Chemical and Biological methods for water pollution studies" Environmental Publication, karad. 211p.
9. Prescott G.W. 1970. Algae of the western great lakes area. W M. C. Brown Company Publishers. 977 pp.
10. Desikachary T. V. (1959). Cyanophyta. New Delhi: Indian Council of Agricultural Research. 686pp.
11. Marshal, H. G. 1986. Identification Manual For Phytoplankton Of The United States Atlantic Coast. Environmental monitoring and support laboratory. U. S. Environmental Protection Agency. 132p.
12. Al-Kandari, M., Al-Yamani, F. Y. and Al-Rifaie, K. 2009. Marine Phytoplankton Atlas of Kuwait's Water. Pub. Kuwait Institute for scientific Research. Kuwait. 350p.
13. Botes, L. 2003. Phytoplankton Identification Catalogue-Saldanha Bay, South Africa, GloBallast Monograph series No. 7. IMO London. 77p.
14. Tomas, C. R. 1997. Identifying Marine Phytoplankton. Acad. Press. San Diego, 858p.