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PRELIMINARY SURVEY ON FRESH WATER ALGAE OF UPPER MANAIR DAM, RAJANNA SIRICILLA DISTRICT, TELANGANA.

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Abstract: Phytoplankton plays an important role as a bio indicator of water quality. Its abundance is also considered a primary source of feed for these aquatic organisms. The present paper reports algal flora of Upper Manair Dam in Rajanna Siricilla district, Telangana. The lake water is used for agriculture and aquaculture. The algal identification work was carried out during January to December 2020. The collected water samples were preserved in 4% formaldehyde and were observed under binocular microscope for identification. In the present study four algal groups were identified. Chlorophyceae, Cyanophyceae, Bacillariophyceae, and Euglenophyceae.

Keywords: Phytoplankton, Algal Diversity, Upper Manair Dam

I. INTRODUCTION

Water maintains an ecological balance between various groups of living organisms and their environment (Kumar *et al.*, 2009). Limnology is the study of the functional relationship and productivity of freshwater communities. Algae constitute a major part of the chain of the aquatic life. Algae show distinct distribution and diversity and major food producer of all aquatic environments (Priya Gopinath, T. 2014). Whatever alters the algal growth and composition also affects all other organisms (Palmer, 1980). Fresh

water algae have great importance due to their role in the natural environment and serve as the base of food chain in the aquatic ecosystem. Fresh water algae of India have been studied by several workers (Desikachary 1959, Krishnamurthy 2000). Therefore the nature and health of the aquatic communities is an expression of the quality of water (Tiwari, 2005).

II. MATERIALS AND METHODS

Study Area: The Upper Manair Dam is a dam on the Manair River at Narmal Village, Gambhiraopet mandal, Rajanna Sircilla district, Telangana by Nizam. Situated at narmala village, rajanna sircilla district. Foundation stone laid in 1943 by Nizam of Hyderabad state. Back water present mainly in lachapet, srigadha village srigadha and kollamaddi villages. Upper Manair Dam is a major irrigation project across the Manair River, at Narmal Village, Rajanna Sircilla district.It has a capacity to irrigate 2,00,000 acres. Latitude, longitude coordinates 18.1613° N, 78.3240° E. It has surface area 15.3 km. Once the dam reaches full capacity, water is released into the Lower Manair Dam. The Left Bank Canal 22 km to irrigate 9,500 acres. The Right Bank Canal 64 km to irrigate 90,500 acres, the Kaleshwaram project feeds the Upper-Manair Reservoir with the Godavari water and stabilizes the ayacut via existing projects.

Fig 1. Location and overview of Upper Manair Dam in Telangana

Sample collection and Preservation

Algal samples were collected from surface and bottom of the lake in sterilized bottles by using algal samples and preserved in 4% of formaldehyde for further identification and transfer to Dept of Botany, University college of Science, Osmania University, Hyderabad.

Fig 2. Algal Sample collection from Upper Manair Dam

Laboratory analysis

The chemical analyses were carried out by following the methods of APHA (2017) and Anand N (1998).The main objective of this work is to study the distribution and diversity of phytoplankton in Upper Manair Dam. For analysis of phytoplankton water samples were collected monthly wise January to December 2020 from three stations (Station- I, II, and III,) of selected lake. **Identification of Algae**

The algal samples were further identified with the standard literature and other related research books like Fritsch (1935), Prescott (1951), Desikachary, Venkatramann (1951), Smith (1950), Philipose (1967) and Anand (1988).

III. RESULTS AND DISCUSSIONS

The present study has shown different algal members belongs to different community classes in that Chlorophyceae is first rank in all classes and second to Cyanophyceae, third community class is Bacillariophyceae and few community species are present in Euglenophyceae as fourth rank in the distribution of algae in Upper Manair Dam, Similar observations found in (Raju Potharaju 2022).

Phytoplanktons are often considered powerful biological indicators of freshwater ecosystems (Bellinger and Singee, 2011). Diversity of phytoplankton species found in the Upper Manair Dam given in the **Table-1.** Chlorophyceae was most significant group of phytoplankton (**Fig.3**, Microphotographs) from the total phytoplankton, distributed 44 forms of population. The group was mostly represented by *Characium sp., Chlorella vulgaris., Chlorococcum sp., Cosmarium sp., Hydrodictyon sp., Oocystis crassa West., Pediastrum angulosum., Scenedesmus sp., Spyrogyra longata., Stigeoclonium sp and Zygnema pectinatum etc.,* Cyanophyceae group was mostly represented by *Anabaena anamala F.E.Fritch, Anacystis sp., Chrococcus sp., Lyngbya majuscule, Oscillatoria acuta Breuhl* and *Spyrulina gigantean.* This group distributed 31 forms of phytoplankton. Bacillariophyceae group distributed 19 forms of total phytoplankton distribution. Mostly they are *Amphora sp., Cymbella aspera, Navicula radiosa, Navicula rhynocephala, Pinnularia borealis Ehrenberg., Synedra ulna.* Etc,. Seven species of Euglenophyceae viz., *Euglena pascheri., E.polymorpha,. E.sanguinea., Phacus orbicularis* were identified in medchal lake.

Seeneyya (1971) reported that temperature above 25^0 C was good for the growth of Euglenophyceae. Water temperature influences aquatic weeds, algal blooms (Zafar, 1968), and its affects the growth of diatoms (Pearsall, 1946).The four classes of algae percentage wise contribution of phytoplankton groups are shown in table 1. Some of the Bacillariophycean algal members are good indicators of water pollution (Prasad and Singh, 1996).

Table 1: Occurrence of common and dominant species of Phytoplankton of Upper Manair Dam

Chlorophyceae (44 forms) 28 genera	**S-1**	**S-2**	**S-3**
1. *Ankistrodesmus falcatus*	+	+	+
2. *Bulbochaete* sp	+	+	-
3. *Chara vulgaris*	+	+	+
4. *Chlorella vulgaris*	+	+	+
5. *Closterium ehrenbergii*	-	+	+
6. *Cl. Tumidum*	+	-	+
7. *Cl. Porrectum*	+	-	+
8. *Cladophora glomarata*	+	+	+
9. *Cl. Crispate*	+	+	-
10. *Cosmarium botrytis*	+	+	+
11. *C. auriculatum*	+	-	-
12. *C. granatum*	+	-	+
13. *C. leave*	-	+	-
14. *C. phaseolus*	-	+	+
15. *C. javanicum*	-	+	-
16. *Euastrum verrucosum*	+	+	+
17. *Hydrodictyon reticulatum*	-	+	+
18. *Microspora* sp.	+	-	+
19. *Mougeotia* sp	+	+	+
20. *Nitella* sp.	-	+	+
21. *Oedogonium borisianum*	+	+	+

22. *O. grande*	+	-	+
23. *Oocystis gigas*	+	+	+
24. *Pandorina* sp.	-	+	-
25. *Pediastrum duplex*	+	+	+
26. *P. ovatum*	-	+	-
27. *Pithophora varia*	+	-	+
28. *Protococcus* sp.	+	-	+
29. *Rhizoclonium hieroglyphicum*	+	+	+
30. *Scenedesmus denticulatus*	+	+	+
31. *S. quadricauda*	+	-	+
32. *S. dimorphus*	+	+	+
33. *S. obliquus*	+	+	+
34. *Sirogonium phacosporum*	-	+	+
35. *Spirogyra acanthospora*	+	+	+
36. *S. discoidea*	+	-	+
37. *S. formosa*	+	+	+
38. *Stigeoclonium* sp.	+	+	+
39. *Staurastrum pinnatum*	+	-	+
40. *Tetraedron gracile*	-	+	+
41. *T. quadratum*	+	+	+
42. *Ulothrix* sp.	+	+	+
43. *Zygnema czurde*	+	+	+
44. *Zygnemopsis* sp.	+	+	+
Cyanophyceae (31 forms) 21 genera	**S-1**	**S-2**	**S-3**
1. *Anabaena iyengarii*	+	+	+
2. *A. variabilis*	-	+	+
3. *A. vagincola*	-	+	-

4. *Anabaenopsis* sp.	+	-	-
5. *Aphanocapsa montana*	-	+	+
6. *A. litorales*	+	+	+
7. *Aphanothece pallid*	-	+	+
8. *Aphanozomenon* sp.	-	+	+
9. *Arthrospira* sp.	+	+	+
10. *Chroococcus minutes*	+	-	+
11. *Calothrix membranacea*	-	+	+
12. *Gloeocapsa atrata*	+	+	+
13. *Gloeotrichia natans*	+	+	+
14. *Gloeotrichia pisam*	-	+	+
15. *Hydrococcus* sp.	+	-	+
16. *Merismopedia glauca*	-	+	+
17. *Microcystis aeruginosa*	+	+	+
18. *M. flos-aquae*	-	+	+
19. *Nostoc linchia*	-	+	+
20. *N. sphaerium*	+	+	+
21. *Oscillatoria Formosa*	+	+	+
22. *O. tenuis*	+	+	+
23. *O. limosa*	-	-	+
Bacillariophyceae (19 forms) 16 genera	**S-1**	**S-2**	**S-3**
1. *Actinastrum* sp.	+	+	+
2. *Amphipleura pellucida*	-	+	-
3. *Amphora* sp.	+	+	+
4. *Bacillaria paradosa*	+	-	+
5. *Cocconeis* sp.	+	-	+
6. *Cymbella sturbergii*	-	+	+
7. *C. hustedii*	-	+	+

8. *Diatoma* sp.	+	+	+
9. *Dioploneis* sp.	-	+	+
10. *Fragilaria* sp.	-	+	+
11. *Fragilaria crotononensis*	-	+	+
12. *Frustulia* sp.	-	+	+
13. *Gomphonema* sp.	+	+	+
14. *Navicula exigna*	+	+	+
15. *N. cryptocephala*	-	+	+
16. *Nitzchia* sp.	+	+	+
17. *Pinnularia* sp.	+	+	+
18. *Synedra* sp.	-	+	+
19. *Tabellaria* sp.	+	+	+
Euglenophyceae (7 forms) 3 genera	**S-1**	**S-2**	**S-3**
1. *Euglena acus*	-	+	+
2. *E. viridis*	-	+	+
3. *E. polymorpha*	+	+	+
4. *Phacus* sp.	+	-	+
5. *P. ranula*	-	+	+
6. *Trachelomonas* sp.	-	+	+
7. *T. curta*	+	+	+

Figure 3 showing some algal micrographs of Different groups

Plate-1 Chlorophyceae

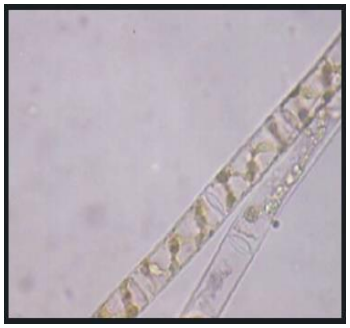
		
Eudorina indica	***Pediastrum tetras***	***Spirogyra longata***

Plate-2 Cyanophyceae

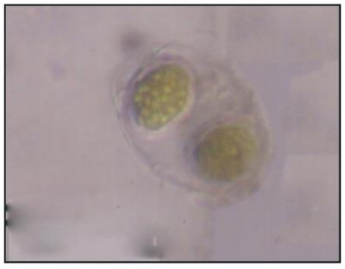
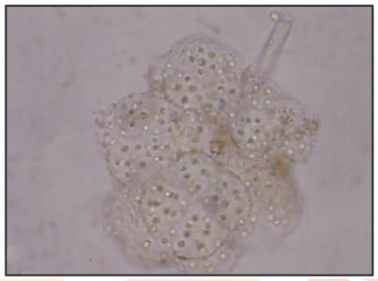
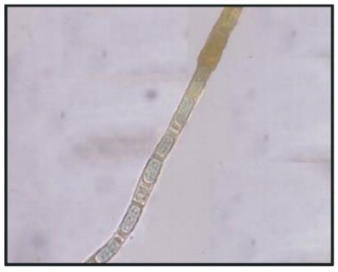
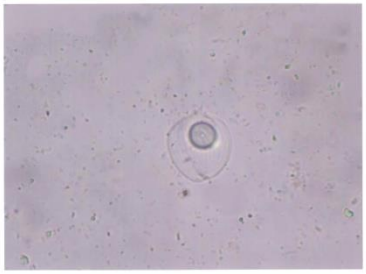
		
Chroococcus minor	***Microcystis auruginosa***	***Anabaena***

Plate-3 Bacillariophyceae & Euglenophyceae

		
Navicula radiosa	***N.rhynocephala***	***Phacus orbicularis***

From Chlorophyceae *Eudorina indica*, *Pediastrum tetras*, *Spirogyra longata* in Cyanophyceae *Chroococcus minor*, *Microcystis auruginosa*, *Anabaena*, from Bacillariophyceae *Navicula radiosa*, *N.rhynocephala and* from Euglenophyceae *phacus.*

IV.CONCLUSION

The study shown that the Upper manair dam lake had a diversified group of phytoplankton dominated by Chlorophyceae members followed by Cyanaophyceae, Bacillariophyceae followed by Euglenophyceae. Phytoplankton plays an important role as biological indicators of aquatic ecosystems.

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