

Algal Diversity of Balthan Dam, Akole Tehsil, Ahilyanagar, Maharashtra

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ABSTRACT:

Balthan Dam is located at Balthan village of Akole tehsil in western part of Ahilyanagar district in Maharashtra. It builds across the river Mula near the village Balthan. During the present study algal diversity of Balthan dam has been carried out for duration of one year (June 2024-May 2025). Three sampling sites were selected for collection of water and algal samples. In early monsoon season the water was quite muddy later on it become clear. Many planktonic, benthic and epiphytic algal members were observed during investigation from all sampling stations. The algae were identified with the use of standard monograph. The systematic account of observed algal taxa arranged in four groups i.e. Cyanophyceae, Chlorophyceae, Charophyceae and Bacillariophyceae.

In general, good flora of algae observed in Balthan dam during investigation period.

Keywords: Diversity, Balthan Dam, Algal diversity

INTRODUCTION:

Ahilyanagar district is located between 19° 6' 3.7908" N and 74° 44' 26.4372" E. It comes under semi-arid subtropical zone of Maharashtra. It occupies an area about 6666 Sq. miles. Ahilyanagar district is situated in upper Godavari basin. It is located south to Nashik district, south-west by Aurangabad, west to Beed and Osmanabad, northwest to Solapur, south by Pune, and to the east by Thane district, Pradhan and Singh (1999).

Akole taluka lies in hilly area having semi-evergreen forest. Western parts of the tahsil have good vegetation. However, in valleys some pockets show semi-evergreen forest. At other places vegetation is deciduous. Main dams in Akole tahsil are Wilson, Pinpalgaon khand, Ambit, Balthan, Nilwande, Ghatghar, Deothan and Sangavi.

Balthan dam : It is constructed on Mula river nearby Balthan village. Dam construction is RCC type. The height of dam is 31.50 meters (105 feet) while length is 150 meters (500 feet). Water storage capacity of this dam is 202 MCFT. Water of dam is used for irrigation purposes. Constructions of this project completed in 2008. Balthan dam is constructed on Mula river. This area is located in upper part of Mula dam having heavy rainfall, around 4000 mm/year. This dam has small storage capacity and it overflows very early in rainy season.

MATERIALS AND METHODS:

Three sampling stations of Balthan dam were selected for the collection of algal samples during

study period are as S1, S2 and S3.

The water samples were collected monthly from the selected stations over a period of one year, June 2024 to May 2025. The monthly collection of the samples were in between 9 am. to 12 pm. throughout the investigation. The samples were collected with plankton net 25 meshes bolting silk of diameter of pore 60 micrometers (Trivedi and Goel, 1986). The samples were studied qualitatively. The collected algal samples were observed on spot; these are brought to laboratory and preserved in 4% formaldehyde or Lugols iodine solution. Phytoplankton were observed in fresh living condition as well as after boiling in nitric acid (Sinha 1997). They were microphotographed. The systematic accounts of the algal taxa were made for four classes as follows.

- 1) Class- Cyanophyceae
- 2) Class- Chlorophyceae
- 3) Class- Charophyceae
- 4) Class- Bacillariophyceae

The collected algal samples were identified with use of standard monographs Desikacharya (1959), Randhawa (1959), Pal et.al (1962), Ramanathan (1964), Bourrelly (1972), Philipose (1967), Anand (1998), Tarar and Bodhe (1998a,1998b), Srinivasan (1969), Rajan (2000) Pal and Santra (1990).

RESULTS AND DISCUSSION:

Total number of algal taxa observed during study period given in table-1. Chlorophyceae members observed maximum at all the study sites. 54 species of Chlorophyceae were recorded. It was followed by Bacillariophyceae which was represented by 23 species. Cyanophyceae were represented by 14 species. Whereas Charophyceae was represented by only 01 species.

Maximum number of algae was observed from December to March and to some extent in May. During rainy season benthic and filamentous algae were seen. The seasonal percentage of algae was found more in winter. Seasonal occurrence of Cyanophyta algae recorded in monsoon whereas Bacillariophyceae in summer. Blooms of *Microcystis*, *Oscillatoria* observed in summer. Diatoms recorded throughout the year but minimum in summer.

The algal species recorded at three sampling stations is shown in Table no- 1

Cyanophyceae - In the present study Cyanophyceae (Blue green algae) were comprised to 14 species belonging to 7 genera, 4 families and 3 orders as Chroococcales, Oscillatoriales and Nostocales. The class was represented by most of the species of genus *Microcystis*, *Chroococcus*, *Spirulina*, *Nostoc* & *Scytonema*

Chlorophyceae - Green algae were dominant throughout investigation period. Most of species of *Volvox*, *Ulothrix*, *Stigeoclonium*, *Pithophora*, *Oedogonium*, *Characium*, *Pediastrum*, *Coelastrum*, *Cosmarium* & *Staurastrum* were observed during study period. There are about 54 species belongs to 25 genera of 14 families and 7 orders like Volvocales, Ulotricales, Chaetophorales, Cladophorales, Oedogoniales, Chlorococcales and Zygnimetales.

Charophyceae-It was represented by only one species of genus *Chara*.

Bacillariophyceae - Bacillariophyceae was represented by 23 species, 13 genera, 6 families and 5 orders as Centrales, Cymbellales, Pennales, Thalassiophysales & Rhopalodiales. Most of the genera of class Bacillariophyceae like *Melosira*, *Cyclotella*, *Cymbella*, *Gomphonema*, *Navicula*,

Pinnularia, Amphora, Epithemia & Fragilaria were recorded during investigation.

CONCLUSION:

Following points have emerged out from the present investigation. In the present study 92 algal taxa belonging to 46 genera, representing 25 families and 16 orders were recorded from three study sites of Balthan dam. Maximum number of algae was observed from December to April and some extent in May, from which Chlorophyceae were found dominant, during the period of investigation.

REFERENCES:

1. Anand N. (1998). *Indian Fresh water microalgae*. Published by Bishen Singh Mahendra Pal Singh, Dehradun PP-1-94
2. Balakrishnan M.S. and Chaugule B.B. 2002, Checklist of algae, Biodiversity of the Western Ghat of Maharashtra, Edited by Jagtap A.P. & Singh N.P. Published by Bishen Singh and Mahendra pal Singh, Dehradun, PP.38-40 + 113-122.
3. Bourrelly, P. (1972). *Les algues deau douce. Initiation a, la systematic*. Tome I. Paris E. D. N. Boubee, PP 1to 475
4. Deshmukh B. S. and Pingle S. D. 2006, studied on the hydro-biological studies of Pravara River, Maharashtra, *Indian hydrobiology*.7: 97-100
5. Desikachary T.V. (1959). *Cyanophyta* ICAR, New Delhi.1-686.
6. Pal B.P. Kundu B.C Sundarlingam, V.S. and G.J. Venkatraman. (1962). *Charophyta*, Indian Council of Agricultural Research, New Delhi. Gonzalves,
7. E.A. 1981. *Oedogonials*, Indian Council of Agricultural Research. New Delhi. PP 1-557.
8. Pal. V. C. and Santra S.C. (1990). *Algae of Midnapore, West Bengal. II Bacillariophyceae*. *Phykos*, **29(1&2)**: 73-81
9. Philipose M.T. (1967). *Chlorococcales*. Indian Council of Agricultural Research, New Delhi. PP. 323
10. Pingle S. D. and Deshmukh B. S. (2005). *Some fresh water algae from Amphitheatre of Wilson dam* *Indian Hydrobiology* 7:97-100.
11. Pingle S. D. (2007). *Chlorophycean and Cyanophycean algae of Pune and Ahilyanagar district (M.S.)*, *Proc. Nat. Symp. "Recent trends in Algal Biotechnology and Biodiversity."* D. N. Mahavidyalaya, Faizpur, pp. 8-18.
12. Rajan S.S. (2000). *Practical Manual of Algae*. Anmol Publications Pvt. Ltd: New Delhi. PP.1-207
13. Randhawa M.S. (1959). *Zygnemetaceae*, Indian Council of Agricultural Research, New Delhi, pp.1-478
14. Ramanathan K.R. (1964). *Ulotricales*, Indian Council of Agricultural Research, New Delhi, pp. I-ix, -1-188
15. Sinha M. (1997). *Limnological studies on a natural water body around Jaintpur, Muzaaffarpur*. Ph.D. Thesis, B.R.A. Bihar University.
16. Tarar J.L. and Bodkhe Seema (1998a). *Studies on Chlorococcales of Napery*. *Phykos* **37(1 & 2)**:107-114

17. Tarar J.L. and Bodkhe Seema (1998b). Studies on Diatoms Flora of polluted water bodies of Nagpure. *Phykos* 37 (1 & 2): 77-86.
18. Trivedy R.K. and Goel P.K. (1986). Chemical and Biological Methods for Water Pollution Studies. Environmental Publications, Karad (India) pp.1-211.
19. Wagh B. D. (2010) Phyco-diversity and water quality assessment of some water reservoirs from Ahilyanagar district (MS) Ph.D. Thesis SPPU, Pune
20. Wale L. L (2021) Hydrobiological studies of waterbodies in Ahilyanagar district (MS) Ph.D. Thesis SPPU, Pune.

Table No. 1: Enlisted Algae from study sites

| Sr. No. | Name of the Algae | C1 | C2 | C3 |
|---------|---------------------------------|----|----|----|
| | Class- Cyanophyceae | | | |
| | Order- Chroococales | | | |
| | Family- chroococaceae | | | |
| 1. | <i>Microcystis aeruginosa</i> | + | - | + |
| 2. | <i>Chroococcus disperses</i> | + | - | + |
| 3. | <i>Chroococcus minor</i> | - | + | - |
| | Order- Oscillatoriales | | | |
| | Family- Oscillatoriaceae | | | |
| 4. | <i>Spirulina gigantean</i> | - | + | - |
| 5. | <i>Spirulina laxissima</i> | - | - | + |
| 6. | <i>Spirulina major</i> | + | - | - |
| 7. | <i>Oscillatoria sancta</i> | - | + | - |
| 8. | <i>Lyngbya major</i> | + | + | - |
| | Order- Nostocales | | | |
| | Family- Nostocaceae | | | |
| 9. | <i>Nostoc humifusum</i> | - | - | + |
| 10. | <i>Nostoc punctiforme</i> | - | + | - |
| 11. | <i>Nostoc rivulae</i> | + | - | + |
| | Family- Scytonenaceae | | | |
| 12. | <i>Scytonema chiasmum</i> | + | - | - |
| 13. | <i>Scytonema leptobasis</i> | - | + | - |
| 14. | <i>Scytonema schimiditii</i> | + | - | + |
| | Class- Chlorophyceae | | | |
| | Order- Volvocales | | | |
| | Family- Chlamydomonaceae | | | |
| 1. | <i>Chlamydomonas globosa</i> | + | + | + |
| | Family- Volvocaceae | | | |
| 2. | <i>Volvox aureus</i> Ehrenberg | + | + | - |
| 3. | <i>Volvox globator</i> | + | - | + |
| 4. | <i>Pandorina morum</i> | + | + | - |

| Sr. No. | Name of the Algae | C1 | C2 | C3 |
|---------|--|----|----|----|
| | Order- Ulotricales Family- Ulotricaceae | | | |
| 5. | <i>Ulothrix fimbriata</i> | + | - | + |
| 6. | <i>Ulothrix zonata</i> | + | + | - |
| | Order- Chaetophorales Family- Chaetophoraceae | | | |
| 7. | <i>Stigeoclonium nanum</i> | + | + | - |
| 8. | <i>Stigeoclonium polymorphum</i> | + | + | - |
| | Order- Cladophorales Family Cladophoraceae | | | |
| 9. | <i>Cladophora insignis</i> | + | - | + |
| 10. | <i>Pithophora mooreana</i> | + | + | - |
| 11. | <i>Pithophora varia</i> | + | - | + |
| | Order- Oedogoniales Family- Oedogoniaceae | | | |
| 12. | <i>Oedogonium curtum</i> | + | - | + |
| 13. | <i>Oedogonium epiphyticum</i> | + | + | - |
| 14. | <i>Oedogonium laticulum</i> Tiff | - | + | + |
| | Order- Chlorococcales Family- Chlorococaceae | | | |
| 15. | <i>Chlorococcum humicola</i> | - | + | - |
| | Family- Characeae | | | |
| 16. | <i>Characium gracilipes</i> | + | + | - |
| 17. | <i>Characium nasutum</i> | - | - | + |
| 18. | <i>Characium rostratum</i> | - | + | - |
| | Family- Hydrodictiaceae | | | |
| 19. | <i>Pediastrum boryanum</i> | + | - | + |
| 20. | <i>Pediastrum duplex</i> var. clathratum | - | + | - |
| 21. | <i>Pediastrum integrum</i> | - | - | + |
| 22. | <i>Pediastrum integrum</i> . Var. perphoratum | + | - | + |
| 23. | <i>Pediastrum simplex</i> | - | + | - |
| 24. | <i>Pediastrum tetras</i> | + | + | - |
| 25. | <i>Hydroctyon reticulatum</i> | - | + | + |
| 26. | <i>Sorastrum americanum</i> | + | + | - |
| | Family- Coelastraceae | | | |
| 27. | <i>Coelastrum cambricum</i> var. intermedium | + | - | + |
| 28. | <i>Coelastrum microporum</i> | + | - | + |
| | Family- Oocystaceae | | | |
| 29. | <i>Chlorella ellipsoidea</i> | + | - | + |
| 30. | <i>Oocystis lacustris</i> | - | + | - |

| Sr. No. | Name of the Algae | C1 | C2 | C3 |
|---------|--|----|----|----|
| 31. | <i>Oocystis parva</i> | + | - | + |
| 32. | <i>Oocystis submarina</i> | + | - | + |
| | Family- Selanastraceae | | | |
| 33. | <i>Selenastrum westii</i> | + | - | + |
| 34. | <i>Ankistrodesmus falcatus</i> var. <i>mirabilis</i> | - | + | - |
| 35. | <i>Ankistrodesmus spairalis</i> | - | - | + |
| 36. | <i>Tetraedron caudatum</i> | - | - | + |
| 37. | <i>Tetraedron gracile</i> | - | + | - |
| 38. | <i>Tetraedron planctonicum</i> | - | - | + |
| 39. | <i>Tetraedron pusillum</i> | + | + | - |
| | Order- Zygnemetales | | | |
| | Family- Zygnemetaceae | | | |
| 40. | <i>Zygnem aoveidanum</i> | - | - | + |
| 41. | <i>Spirogyra Africana</i> | + | - | + |
| 42. | <i>Spirogyra borgena</i> | + | - | + |
| 43. | <i>Spirogyra irregularies</i> | + | + | - |
| 44. | <i>Spirogyra jogensis</i> var. <i>minor</i> | - | + | + |
| 45. | <i>Spirogyra notabilis</i> | + | - | + |
| | Family- Desmidiaceae | | | |
| 46. | <i>Closterium ehrenbergii</i> var. <i>malinvernianum</i> | + | - | + |
| 47. | <i>Closterium intermedium</i> | + | + | + |
| 48. | <i>Euastrum irregulare</i> var. <i>gwalioresi</i> | - | + | + |
| 49. | <i>Cosmarium portianum</i> var. <i>nephroideum</i> | + | - | + |
| 50. | <i>Cosmarium awadhense</i> | + | + | - |
| 51. | <i>Cosmarium biretum</i> | + | - | + |
| 52. | <i>Cosmarium botrytis</i> | - | + | - |
| 53. | <i>Staurastrum leptocladum</i> var. <i>cornutum</i> | + | - | + |
| 54. | <i>Staurastrum pterosporum</i> | + | + | + |
| | Class- Charophyceae | | | |
| | Order- Charales | | | |
| | Family- Characeae | | | |
| 1. | <i>Chara canescens</i> | + | - | + |
| | Class- Bacillariophyceae | | | |
| | Order-Centrales | | | |
| | Family- Coscinodiscaceae | | | |
| 1. | <i>Melosira juergensii</i> | + | + | + |
| 2. | <i>Melosira sulcata</i> | - | + | - |
| 3. | <i>Cyclotella antiquav.minor</i> | + | - | + |
| 4. | <i>Cyclotella glomerata</i> | - | - | + |
| | Order- Cymbellales | | | |

| Sr. No. | Name of the Algae | C1 | C2 | C3 |
|---------|---|----|----|----|
| | Family-Cymbellaceae | | | |
| 5. | <i>Cymbella affinies</i> | + | + | - |
| 6. | <i>Cymbella affinis</i> | + | + | + |
| 7. | <i>Cymbella bharatensis</i> | + | - | + |
| 8. | <i>Gomphonema lingulatum</i> | + | - | + |
| 9. | <i>Gomphonema parvulum</i> (Kuetz.) Grun. | + | + | - |
| 10. | <i>Gomphonema sphaerophorum</i> | - | - | + |
| | Order Pennales | | | |
| | Family Naviculaceae | | | |
| 11. | <i>Navicula cari</i> Ehr. | - | + | + |
| 12. | <i>Navicula cuspidata</i> var. <i>ambigua</i> Kuetz. | - | + | + |
| 13. | <i>Navicula rhynchocephala</i> Kuetz | - | + | - |
| 14. | <i>Pinnularia dolosa</i> | + | + | + |
| 15. | <i>Pinnularia mesolepta</i> var. <i>stauroneiformis</i> | + | + | - |
| 16. | <i>Pinnularia platycephala</i> | + | + | + |
| 17. | <i>Pinnularia subcapitata</i> var. <i>laponica</i> | + | + | + |
| | Order- Thalassiophysales | | | |
| | Family-Catenulaceae | | | |
| 18. | <i>Amphora ostresria</i> | - | + | - |
| 19. | <i>Amphora ovalis</i> Kuetz | + | - | + |
| | Order-Rhopalodiales | | | |
| | Family- Rhopalodiaceae | | | |
| 20. | <i>Epithemia sorex</i> | + | + | - |
| 21. | <i>Epithemia zebra</i> | + | + | + |
| | Family- Fragilariaceae | | | |
| 22. | <i>Fragilaria capucina</i> Dems. var. <i>arctica</i> | - | + | - |
| 23. | <i>Fragilaria leptostauron</i> var. <i>woerthensis</i> | + | - | + |



Figure 1. Balthan Dam