

A Preliminary Survey of Algal Biodiversity of Tawarja Dam, Latur, Maharashtra

Yadav S. G.¹ and Pratiksha Mamadge²

Department of Botany, Shivaji Mahavidyalaya, Renapur, Latur, M.S., India¹

Research Scholar, Dept. of Botany, Research Center, Shivaji Mahavidyalaya, Udgir, Latur, India²

Abstract: While working on algal biodiversity of Tawarja dam (from January 2023 to December 2023) away 20 kms from Latur, the researcher came across a total of 233 taxa under 57 genera, of which 128 taxa under 32 genera were belonged to Chlorophyceae, 80 taxa under 22 genera were belonged to Cyanophyceae and 25 taxa under 3 genera were belonged to Euglenophyceae. Seasonal variation studies reveals that Chlorophyceae were found dominant in monsoon season, Cyanophyceae were found in winter season and the members of Euglenophyceae were found dominantly in the summer seasons

Keywords: Algal Biodiversity, Tawarja Dam, Seasonal variation

I. INTRODUCTION

Tawarja dam is 21 kms away from the Latur Headquarter. Tawarja river drainage basin is one of the sub basins of river Manjra. The dam was constructed on river Tawarja in 1982 near Utti (Khurd) and Utti (Budruk). It is medium size dam having catchment area of about 250.52 km². Height of the dam about its lowest foundation is 14.3m (47 ft) while length is 2222m (7290ft). The volume content is 361m³ and gross storage capacity is 20520.00 km². Tawarja dam catchment extends between 180 14'00"N to 180 24'00"N latitude and 760 15'0"E to 760 27'00"E longitude. Biodiversity of algae from different aquatic habitats were extensively studied in India. In the present century great advances have been made in the investigations of fresh water algae, marine algae, soil algae and particular attentions has been paid to their taxonomy, ecology and applied aspects. But very few reports have paid attentions on diversity of algae in Marathwada region of Maharashtra, Kamat (1974), Ashtekar (1980), Nandan (1993), Andhale (2008), Talekar (2009) and Yadav (2010) although the climatic conditions of Marathwada regions are most suitable to grow algae luxuriantly and in diverse form, therefore to fulfill this lacuna present work was carried out.

II. MATERIALS AND METHODS

FIELD WORK

Tawarja dam is 20 kms away from the Latur Headquarter. Tawarja river drainage basin is one of the sub basin of river Manjra. The algal samples were collected from January 2023 to December 2023. The algal collections were made regularly from various selected sites of dam area. Acid washed collection bottles were used for the collection of algal samples. Floating, planktonic, submerged, attached epiphytic and soil algal samples were collected separately in collection bottles. Plankton nets were used to collect the planktonic algae. Field note book was maintained in which the color of the algae, habit, habitat and dates of collection were noted, the pH of the water of the collection spots was recorded by studying at least three samples of water from three different places of the collection spots.

LABORATORY WORK

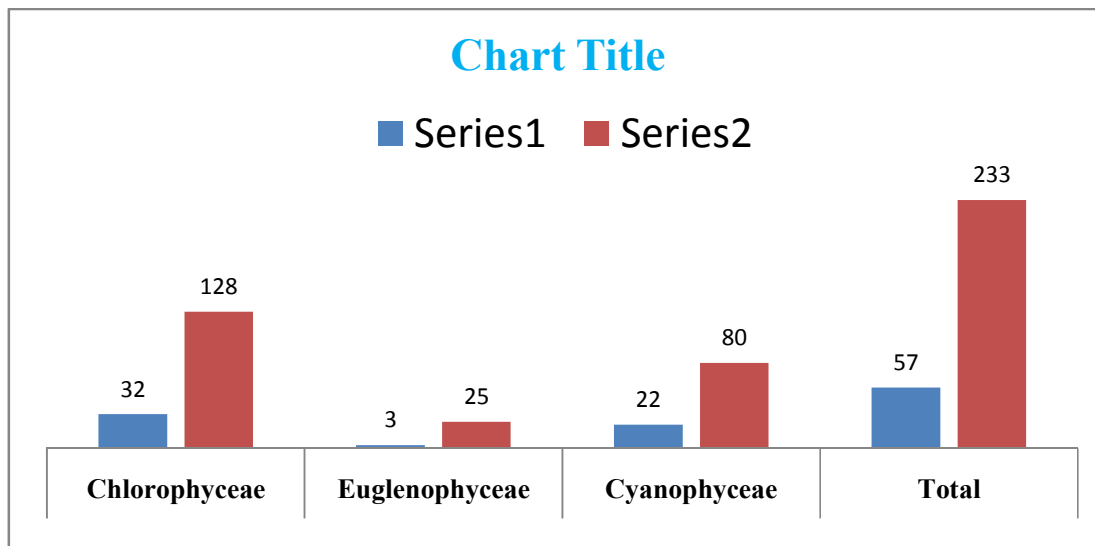
On return to the laboratory from field, the collections were carefully observed under the microscope and important points were noted. All collections were preserved in 4% commercial formalin added with 5% glycerine. Generally 5 to 10 random temporary mounts were made from each collection for microscopic observations. Camera Lucida diagrams of these algae have been drawn by mirror type of camera Lucida for the proper and accurate measurements. Microphotograph were also taken and presented in taxonomic description of algae. Identification of algal taxa was performed by referring to the standard literature on algae. The systems of classification followed here is substantially that of Smith (1951, 1955), Prescott (1951), Philipose (1967), Geitler (1932) and Desikachary (1959), Randhawa (1959),

Scott and Prescott (1961), Gonzalves (1981), Desikachary (1959). Taxonomic accounts of all identified algal taxa were made for the three groups of algae viz. Chlorophyceae, Euglenophyceae and Cyanophyceae.

III. RESULTS AND DISCUSSION:

Table 1: Total occurrence of Algal taxa from selected sites of Tawarja dam:

SR.NO.	Class	Genera	Species
1.	Chlorophyceae	32	128
2.	Euglenophyceae	03	25
3.	Cyanophyceae	22	80
	Total	57	233



A total of 233 species under 57 genera were recorded at the streams, of which 128 species under 32 genera belonged to Chlorophyceae. Among the Chlorophyceae the various genera with maximum number of species were *Cosmarium*, *Scenedesmus*, *Tetraedron*, *Pediastrum*, *Spirogyra*, *Mougeotia*, *Zygnema*, *Closterium* and *Ankistrodesmus*, the various genera with single species were *Protococcus*, *Dictyosphaerium*, *Dactylococcus*, *Selenastrum*, *Kirchneriella*, *Chlorococcum*, *Conocossus* and *Desmidium*. 25 species under 3 genera belonged to Euglenophyceae, of which *Trachelomonas*, *Phacus* and *Euglena* were found dominant genera with maximum number of species. Cyanophyceae members were represented by 80 species under 22 genera. Among Cyanophyceae *Oscillatoria*, *Phormidium*, *Lyngbya*, *Chroococcus*, *Merismopedia*, *Aphanocapsa*, were found with maximum number of species. *Microcystis*, *Gloeothece*, *Synechococcus*, *Dactylococcopsis*, *Johannesbaptistia*, *Hydrococcus*, *Arthrospira*, *Spirulina*, *Schizothrix*, *Symploca*, *Hydrocoleum*, *Homoeothrix* were the genera found with single species. (Table 1).

REFERENCES

- [1]. Allen, W.E. (1920). A quantitative and statistical study of the plankton of the Son Joaquin river and tributaries in and near Stockton, California in 1913. *Publi* 2001.22: 1-297.
- [2]. Anand, V.K. (1975). A check list of planktonic algae from Mansar lake, Jammu. *Phykos* 14(1 & 2): 77-79.
- [3]. Andhale S.B. (2008). Studies on the flora of Jayakwadi Bird Sanctuary. Ph.D. Thesis, Dr. Babasaheb Ambedkar Marathwada University Aurangabad.
- [4]. Ashtekar, P.V. (1980). Studies on fresh water algae of Aurangabad district. Ph.D. thesis, Marathwada University, Aurangabad.
- [5]. Barhate, V.P. and J.L. Tarar (1981). The algal flora of Tapiriver, Bhusawal Maharashtra, *Phykos*, 20: 75-78.

- [6]. Claus, G. and Reimer, C.W. (1961). A Quantitative and Qualitative study of the phytoplankton of the Danube River at Vienna. *Revista De Biologia***2(3-4)**: 261-275.
- [7]. Collins, F.S. (1928). Green algae of North America. G.E. Strechert and Co. New York
- [8]. Dakshini, K. M. and Gupta, S. K. (1979). Preliminary observations on the limnology of three freshwater lakes around Delhi state, Indian. *Proc. Indian Nat. Sci. Acad.***45(6)**: 564-570.
- [9]. Das, S.K., Samad, L.K, Ramanujam. P. and Adikari, S.P. (2009). Freshwater algae of Meghalaya. *J. Indian Bot. Soc.* Vol. **88 (142)**: 102-188.
- [10]. Dawning, R.C. (1970). Shoreline algae of western lake Erie. *The Ohio Journal of science***70 (5)**: 257-276.
- [11]. Desikachary T.V. (1959) Cyanophyceae. *I.C.A.R. Monographs on Algae* New Delhi. **Pp.** 680
- [12]. Dike, N.I. (1998). Seasonal changes in phytoplankton composition and diversity in the Epe lagoon, Nigeria. *ActaHydrobiologia***40 (2)**:83-92
- [13]. Dixit, S.C. (1937). The Chlorophyceae of the Bombay Presidency, India-I. *Ibid.***5(1)**: 16-25.
- [14]. EswariY.(2002). Hydrobiological studies of Red hills reservoir, North Chennai, Tamil Nadu. *J. Aqua. Biol.***17 (1)**: 13-16.
- [15]. Fatma,T.(1985). Epiphytic algal flora of fresh water ponds of Lucknow, Chaetophorales. *Phykos.***24**: 173-174.
- [16]. Forest, H.S. (1954). Handbook of Algae. The University of Tennessee Press, Knoxville
- [17]. Fritsch, F. E. (1903). Observations of phytoplanktons of the river Tames, *Ann. Bot.***17**:631-647.
- [18]. Gonzalves, E. A. (1981). Oedogonials. ICAR Monograph. New Delhi. Pp.: 1-757.
- [19]. Gonzalves, E.A. and Jain, S.C. (1970). Some Oedogoniaceae from Thana district. *Ibid.***9**: 9-22.
- [20]. Hamid, M.F., Abd. M.M., Fouly H.M. and Bodawy, T.E.M. (1999) Development of the fresh water phytoplankton in a fish pond ecosystem. Egyptin *J. of Bot.***37(2)**:109-127.
- [21]. Hegde G.R. and Bharati, S.G. (1983). Freshwater algae of Bijapur district, Karnataka state, India. *Phykos.***22**: 167-170.
- [22]. Hegde, G. R. (1988b). Freshwater algae of Karnataka state-certain new records from Dharwad. *Indian Bot. Rpt.***7(1 and 2)**: 51-53.
- [23]. Hilliard, D.K. (1959). Notes on the Phytoplankton of Karluklake, Kodiak, Island, Alaska. *The Canadian Field Naturalist.***73 (3)**: 135-143.
- [24]. Hisano, M. and Minoru H. (1950). Some new or noteworthy desmids from Japan, II. *ActaPhytotax.Geobot.***14 (2)**: 34-38.
- [25]. Iqbal, Habib. (1993). Some desmids of Jaipur, Rajasthan. *Res. Bull. Of the Punjab Univ. Sci.***43(1-4)**: 61-64.
- [26]. Islam, Nurul and Khatun, M. (1966). Preliminary studies on the phytoplanktons of polluted waters. *Sci. Res., Eat regional Lab., Pakistan.***3 (2)**: 94-109.
- [27]. Iyengar, M. O. P. and Desikachary, (1981). Volvocales ICAR Monograph, New Delhi. 1-532.
- [28]. JadhavMilind, TalekarSanthosh and Chavan Ashok M. (2007). A preliminary investigation on algal flora of lonar lake. *Proc. Nat. Symp. Recent trends in algal biotechnology and biodiversity*, Ed. S.S. Patil, Dhanaji Nana Mahavidyalaya, Fiazpur. 66-67.
- [29]. Johnson Mary Esther Cynthia (2006). Algal Flora of Banjara and Nadimi Lakes. *J. Indian Bot. Soc.***85**: 103-106.
- [30]. Jose, L. and Patel, R.J. (1992). A systematic account of Chlorococcales new to Kerala. *Phykos.***31 (1 & 2)**: 95-102.
- [31]. Kamat, N.D. (1962a). Chlorophyceae of Ahmedabad, India. *Ibid.***20(2)**: 248-279.
- [32]. Kamat, N.D. (1974). Algae of Marathwada, Maharashtra. *Phykos***13**: 22-32.
- [33]. Kamat, N.D. and Frietas, J.F. (1976). A Check list of Eulgenophyceae and Chlorophyceae of Nagpur, Maharashtra. *Phykos.***15**: 121-125
- [34]. Kumawat D.A. and Jawale A.K. (2004b). An Ecological study of chlorococcales in the Inland Fishery. *J. Phytol. Res.***17 (1)**: 43-46.
- [35]. More, Y.S. and Nandan, S.N. (2003). Hydrobiological study of algae of Panzara Dam (Maharashtra). *Eco.Env. And. Cons.***9 (3)**: 367-369.

- [36]. Nandan, S.N. and Patel, P.J. (1985a). Eutrophication in Vishwamitri river flowing through, Baroda city. *Geobios***12**:60-62.
- [37]. Olluwande, P. A. Sridhar, M. K. C., Bammeke, A. O. and A. O. Okubadejo (1983). Pollution levels in some Nigerian rivers. *Wat. Res.***17(9)**: 957-963.
- [38]. Phillipose.M.T.(1967).Chlorococcales.*JCAR*. Monograph, NewDelhi. P. 365.
- [39]. Pingle, S.D. (1981). Studies on algae of impoundments and streams in Maharashtra, Ph.D. thesis, Poona University.
- [40]. Randhawa M.S. (1959). Zygnemataceae*JCAR* New Delhi. Pp. 478
- [41]. Smith, G. M. (1950).The fresh water algae of the United states. McGraw Hill Book Co., New York. P: 719.
- [42]. Sophia, M. G. (1999). Desmids of phytohelmic environments.*Rev. Brasileira de Biol.***59(1)**: 141-150.
- [43]. TalekarSantosh and JadhavMilind (2009). Biodiversity of desmids in Manjarariver in Maharashtra. *The Ecotech***1(2)**: 104-105.
- [44]. Tiffany, L.H. and Britton, M.E. (1951). The Zygnemataceae.Ohia
- [45]. Vijayvergia, R. P. (2007). Composition and periodicity of Cyanophyceae in eutrophic lakeUdaisagar, Udaipur (Rajasthan). *Proc. DAE, BRNS Nat. Sym. On Limnol.*(**NSL-2007**): 326-328.
- [46]. Waghodkekar V.H. and Jawale, A.K. (2001) Addition to Euglenoids of Maharashtra. *Bri'sjast.***3(I and II)**: 13-16.
- [47]. Yadav, S.G. (2010). Studies on Taxonomy of algae of Beed District. Ph.D. thesis, Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.
- [48]. Zhang, Y., Tian, Y. and Shang, X. (1995). Studies on phytoplankton in Lake Baiyangdian. *ActaHydrobiologiaSinica***19(4)**: 317-326.