

RESEARCH ARTICLE

Assessment of phytoplankton of Karadkhed Dam, District Nanded, Maharashtra, India

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ABSTRACT

The present study was conducted to the An assessment of Phytoplankton of Karadkhed dam of Deglur Taluka in Nanded district, Maharashtra, India during the year June 2016 to May 2017. Presently 17085 Phytoplankton genera representing various group. 22 species of Chlorophyceae, 05 species of Euglenophyceae, 12 species of Bacillariophyceae, 11 species of cyanophyceae. Among phytoplankton particularly Chlorophyceae was the dominant group throughout the study. The highest count of 1058 species was record in the month of May.

Key word:- Karadkhed dam, Phytoplankton, Chlorophyceae, Bacillariophyceae, Euglenophyceae.

INTRODUCTION

Plytoplanktons are microscopic single celled aquatic plants forming the prime component in the food chain of an aquatic ecosystem. Phytoplankton dynamics have been studied extensively in lentic fresh water, yet comparatively little research has focused on lotic water [1,2]. The investigations in the river planktons are scanty due to practical difficulties in the survey and sampling of flowing water. Phytoplankton constitutes the very basic of nutritional cycle of an aquatic ecosystem [2]. Phytoplankton functions as the primary producers in the aquatic biotopes. Hence, the quality and quantity of phytoplankton population bear much influence on the production potential of an aquatic ecosystem [3, 4]. Phytoplanktons are those organisms which float aimlessly or swim feebly to maintain constant position against water current. If the phytoplankton shows any changes due to natural and human activities it directly affect on aquatic ford chain [4]. Phytoplanktons are eaten by Zooplankton, aquatic insects, fish and other organisms. Phytoplankton has some important groups like diatoms, Cynobacteria, Dinoflagellates and Coccolithophores for the

production of fish culture phytoplankton can be produced by artificial condition is itself farm of aquaculture [5-12]. The co-construction of assessments of the state of the world biodiversity and the benefits it provides to human phytoplankton are at the base of aquatic food webs and of global importance for ecosystem functioning and services. The present plankton study is useful tool for the assessment of biotic potential and contributes to over all estimation of basic nature and general economic potential of water body. Several workers Kamble *et al.* [1], Ramesha and Sophia [2], Shinde *et al.* [3], Sharma and Bhardwas [4], Gupta [5,6], Pawar [7-13], Pulle [14], Narsimba and Jaya [15], Dwivedi and Pandey [16], Kumawat and Jawale [17], Mazher and Dawood [18], More and Nandan [19], Sirsat *et al.* [20].

The present investigation have been undertaken to study an assessment of phytoplankton of Karadkhed dam. Qualitative and quantities analysis of phytoplankton assessment were carried out. The height of the dam above lowest foundation is 19 m. (62 ft.) while the length is 1,454 m. (4,770 ft.). The volume content is 498 km³ (119 cu. mi) and gross storage capacity is 12,000,00 km³ (2,878,95 cu. mi). It is situated near Karadkhed which is 12 km. away from sub-district headquarter Deglur and 93 km. away from district headquarter Nanded, Maharashtra, India.

METHODOLOGY

The water samples for phytoplankton analysis were collected from the dam for a period of 12 months starting from June 2016 to May 2017 from four stations (A, B, C & D). The sample was collected with the help of plankton net. The sample was taken in 500 ml. bottle and preserved in 4% formalin. The samples were collected monthly in the morning between 6:00 A.M. to 9:00 A.M. The quantitative and qualitative analysis was carried out by taking 20 ml of concentrate obtained by siphoning the supernatant liquid. Identification of phytoplankton in different class of different genera was carried out under research microscope. Phytoplanktons were counted by drop count method and the results were converted to organisms per ml of water. The identification was done up to generic level as described by Fritsch. [21], Desikachary [22] and APHA [23].

RESULTS

The total number of phytoplankton and monthly average phytoplankton number per ml are given Table. The prominent group of phytoplankton identified during present study was chlorophyceae, cyanophyceae, Bacillariophyceae and Euglenophyceae. The list of phytoplanktons observed is given below.

Chlorophyceae

Micrasterias species, oedogonium patulum, pediatrum duplex, pediatrum duplex, pediatrum simplex, scenedesmus armatus, scenedesmus carinatus, spirogyra, Ankistrodesmus falcatus, chlamydomonas conferta, chlorella conglanerata, chlorella ulgoris, cladophora, closteridium limmeticum, cosmarium contractum, Helimeda species, Hydrodictyon, Ulothrix Zonta, Zygnema species, Pleurococcus sp., Stigeochaete sp., Pithophora.

Cyanophyceae

Merismopedia punctata, microcystis aeruginosa, Notoc, Phormidium mucoid, Oscillatoria chlorine, Oscillatoria limosa, Anabaena constricta, Anacystis species, Aphanotheca nidulans, Gloeocapsa sp., microcystis.

Bacillariophyceae

Fragillaria capurina, Navicula gracills, N. radiosa, N. Viridula, Nitzschia subtilis, Synedra affinis, Bacillaria paradoxa, Diatom sp., Diatom vuloare, Synedra ulna, cyclotella sp., Rhopalodia sp.

Euglenophyceae :-

Euglena stellata, Euglena viridis, Euglena pisciformis, Euglena acus, Euglena anabaena var. minima. The monthly variations in the density of different group of phytoplankton is shown in the table.

The present observation is similar to those observation made by other workers. Somani and Pejaver [24], Bhagat and Meshram [25], Khapekar and Deshpande [26], Patil *et al.* [27], Shankarsan and Jameson [28]), Ugale *et al.* [30].

Table:- Assessment of Phytoplankton (count/ml.) Of Karadkhed Dam During the Year June 2016 to May 2017.

| Phytoplankton Group | Station | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | Total |
|---------------------|---------|-------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Chlorophyceae | A | 85 | 68 | 41 | 31 | 74 | 119 | 122 | 172 | 199 | 207 | 218 | 274 | 1610 |
| | B | 105 | 74 | 45 | 34 | 81 | 124 | 148 | 164 | 205 | 220 | 225 | 268 | 1694 |
| | C | 98 | 82 | 48 | 39 | 78 | 115 | 136 | 183 | 182 | 211 | 228 | 245 | 1645 |
| | D | 102 | 87 | 55 | 42 | 83 | 110 | 140 | 178 | 209 | 123 | 235 | 271 | 1635 |
| Total | | 390 | 311 | 189 | 146 | 316 | 468 | 546 | 697 | 795 | 761 | 906 | 1058 | 6584 |
| Euglenophyceae | A | 32 | 21 | 17 | 18 | 27 | 21 | 10 | 13 | 85 | 64 | 87 | 101 | 496 |
| | B | 38 | 29 | 20 | 32 | 36 | 32 | 14 | 18 | 68 | 69 | 81 | 103 | 540 |
| | C | 41 | 33 | 24 | 28 | 32 | 36 | 28 | 24 | 71 | 81 | 91 | 106 | 595 |
| | D | 35 | 36 | 28 | 33 | 43 | 41 | 31 | 32 | 78 | 84 | 94 | 110 | 645 |
| Total | | 146 | 119 | 89 | 111 | 138 | 130 | 83 | 87 | 302 | 298 | 353 | 420 | 2276 |
| Bacillariophyceae | A | 75 | 65 | 32 | 70 | 55 | 103 | 162 | 128 | 221 | 165 | 163 | 217 | 1556 |
| | B | 63 | 61 | 35 | 31 | 51 | 101 | 167 | 217 | 218 | 168 | 169 | 212 | 1493 |
| | C | 68 | 63 | 37 | 35 | 58 | 107 | 171 | 213 | 231 | 170 | 172 | 223 | 1548 |
| | D | 71 | 66 | 43 | 41 | 61 | 111 | 74 | 23 | 237 | 173 | 166 | 227 | 1593 |
| Total | | 277 | 255 | 147 | 177 | 225 | 422 | 674 | 881 | 907 | 676 | 670 | 879 | 6190 |
| Cyanophyceae | A | 51 | 28 | 21 | 18 | 24 | 61 | 31 | 16 | 13 | 22 | 72 | 118 | 475 |
| | B | 54 | 31 | 24 | 21 | 25 | 68 | 34 | 15 | 17 | 24 | 69 | 113 | 795 |
| | C | 57 | 34 | 27 | 23 | 27 | 63 | 37 | 18 | 19 | 27 | 74 | 109 | 515 |
| | D | 59 | 36 | 29 | 25 | 30 | 65 | 39 | 21 | 23 | 29 | 79 | 115 | 550 |
| Total | | 221 | 129 | 101 | 87 | 106 | 257 | 141 | 70 | 72 | 102 | 294 | 455 | 2035 |
| Grand Total | | 1034 | 814 | 526 | 521 | 785 | 1277 | 1444 | 1735 | 2076 | 1837 | 2223 | 2812 | 17085 |

REFERENCES

- Kamble S, Bhagwan HK and Patil BY. The study of Phytoplankton in River Manjara near Kallam, Tal. Kallam, Dist. Osmanabad (M.S.) India. *Trends in Life sciences An International Peer Reviewed Journal*. 2013; Vol.2 (1) : 21-24 P.
- Ramesha MM and Sophia S. Species composition and diversity of plankton in the River Seeta at Seetanadi the Western Ghats, India. *Advanced Bio Tech.*, 2013; Vol.12 (08) : 20-27 P.
- Shinde SE, Pathan TS and Sonawane DL. Seasonal Variations and biodiversity of phytoplankton in Harsool-Savangi dam, Aurangabad, India. *Journal of Environmental Biology*, 2012; 33 : 643-647 P.
- Sharma MK and Bhardwaj S. An assessment of seasonal Variation in phytoplankton community of Mahi River (India). *Journal of Gene Conserve*, 2011; No.40, 154-164 P.
- Gupta P. Algae of India. Vol.I-A check list of cyanoproeryota (cyanophyceae). Published by Botanical Survey of India, 2012; 160 P.
- Gupta P. Algae of India. Vol.I-A check list of cyanoproeryota (cyanophyceae). Published by Botanical Survey of India, 2012; 428 P.
- Pawar SK. Population kinetics and seasonal fluctuation of phytoplankton of Vishnupuri dam, Nanded district, (M.S) India. *Int. Res. Journal of Science & Engineering*, 2017; 5 (3): 231-234.
- Pawar SK. Population kinetics and seasonal fluctuation of zooplankton of Vishnupuri dam, Nanded district, (M.S) India. *Int. Res. Journal of Science & Engineering*, 2017; 5 (3): 227-230.
- Pawar SK. The study on fish diversity in the Vishnupuri dam, Nanded (M.S.) India, *Int. J. of Life Sciences*, 2017; Volume 5(1): 137-139.
- Pawar SK. Physico-chemical analysis of water in Vishnupuri dam, Nanded (M.S.) India,, *Int. J. of Life Sciences*, 2017; Volume 5(4): 754-757.
- Pawar SK. Water quality assessment of Vishnupuri dam, in Nanded District, Maharashtra, India, *Int. J. of Life Sciences*, 2017; Volume 5(4): 758-761.
- Pawar SK. Determination of physico-chemical parameters of Vishnupuri Dan, Nanded District, Maharashtra, India. *Int. Res. Journal of Science & Engineering*, 2018, 6 (1): 26-30.
- Pawar SK. Fish diversity in relation to fish economics of Isapur dam, from Pusad, Yavatmal District (Maharashtra), India, *Int. J. of Life Sciences*, 2017; Volume 5(1): 133-136.
- Pulle JS. Biomonitoring of Isapur Dam water. Ph.D. Thesis, Swami Ramanand Teerth Marathwada University, Nanded, 2000.
- Narsimba Rao P and Jaya Raju PB. Limnological investigations and diversity of plankton in sewage fedfish culture pond at Nambur near Guntur A.P. India *J. Aqua. Biol.* 2001; 16 (1 and 2) : 11-14.
- Dwivedi BK and Pandey GC. Physico-chemical factors and algal diversity of two ponds (Jinja Kund and Magubara Pond), Faizabad, India, *Poll. Res.* 2002; 21 (3) : 361-370.
- Kumawat DA and Jawale AK. Phytoplankters of a fish pond at Anjale, Maharashtra, Eco-Emv. And Cons. 2003; 9 (3) : 411-415.
- Mazher Sultana and Dawood. Water Pollution Studies in the double lake (Frretaleria) with relation to phytoplankton. *J. Aqua. Bio.* 2004; Vol. 19 (1) : 15-18.
- More YS and Nandan SN. Hydrobiological Study of algae of Panzara dam (Maharashtra). 2003.
- Sirsat DB, Ambore NE and Pulle JS. Study of Phytoplankton of fresh water pond at Dharmapuri in Beed District (Maharashtra), *J. Aqua. Biol.* 2004; Vol. 19 (2) : 7-10.
- Fritch FE. The structure and Reproduction of the Algae Vol.I Published by Cambridge University Press London, 1935.
- Desikachary TV. Cyanophyta. Indian Council of Agriculture Research, New Delhi, 1959.
- APHA. Standard methods for the examination of water and waste water, AWWA, WPCE, New York, 21st edition, 2005.
- Somani VU and Pejaver MK. Dynamics of Chlorophyceae in Phytoplankton of lake masunda, Thane (M.S.), *J. Aqua. Biol.*, 2003; 18 (2) : 21-25.
- Bhagat VB and Meshram CB. Zooplankton dynamic of Ambadi Dam, near Akot, Dist. Akola, Maharashtra, *J. Aqua. Biol.* 2007; Vol. 22 (1) : 19-20.
- Khapekar RR and Deshpande SV. Phytoplankton Composition and Assessment of Pollution Status of Naik lake, Nagpur (M.S.), *J. Aqua. Biol.* 2007; Vol. 22 (2) : 21-26.
- Patil GP, Kedar GT and Yeole SM. Zooplankton biodiversity study of two water bodies in Washim District, Maharashtra. *J. Aqua. Biol.* 2008; Vol. 23 (1) : 13-17.
- Sankarsan Sahoo and James Danies Jameson. Zooplankton Diversity in Cattle Waste fed fishpond. *J. Aqua. Biol.* 2006; Vol. 21 (2) : 45-50.
- Sheeba S and Ramanujan N. Qualitative and Quantitative Study of Zooplankton in I thikkara river, Kerala, *Poll Res.* 2005; 24 (1) : 119-122.
- Ugale BJ, Hiware CJ, Jadhav BV and Pathan DM. Zooplankton diversity in Jagatunga samudra reservoir, Kandhara, Nanded District (M.S.), *J. Aqua. Biol.* 2005; Vol. 20 (2) : 49-52.