

Diversity of zooplanktons and phytoplankton of freshwater of Mun dam of Buldhana district (M.S.), India

PP Rathod, VR Kakde, AC Thakur

Department of Zoology, Jijamata Mahavidyalaya, Buldhana, Maharashtra, India

Abstract

The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life. Investigative study is related with analysis and diversity of zooplankton and phytoplankton of Mun dam of Buldhana District (M.S.) for duration of one year from January 2015 to December 2015. Investigated study of planktons were divide into zooplanktons and phytoplankton's from these zooplankton were belong to 22 species of 16 genera of different groups like as Rotifers (12 species of 6 genera), Cladocera (5 species of 5 genera), Copepoda (2 species of 2 genera) and Ostracoda (3 species of 3 genera). During investigation period Rotifers are higher in population density and dominant. Phytoplankton were belong to 35 species of 25 genera of different groups like as Chlorophyceae (12 species of 11 genera), Euglenophyceae (3 species of 2 genera), Bacillariophyceae (5 species of 5 genera) and Cyanophyceae (15 species of 7 genera). During investigation period Chlorophyceae are higher in population density and dominant from different of spots of Mun dam.

Key Words: Chlorophyceae, Mun dam, Zooplankton, Bacillariophyceae, Phytoplankton

1. Introduction

Water is the nature's most wonderful, abundant and most useful chemical compound created by nature with biological, chemical, physical properties, as well as diversity of zooplanktons and phytoplankton's and unique characteristics. It is essential for all living things for the survival on this earth planet. Out of total water available on earth's surface only 0.3% to 0.5% issuable therefore, its judicious use is imperative. It is the most abundant and elixir of life and essential chemical, but this vast natural resource has been

depleted and turned into scarce commodity with increased usage catering to the needs of ever-expanding population.

There is almost a global shortage of water and the world's most important and front rank problem is to supply and maintain cheap and clean drinking water today to everyone.

The problems relates to water borne diseases attract the attention to the urgency for investigating causes and suggest remedies to prepare future plan of action for maintenance of potable waters and related development issues. The present investigation involves collection, observation and identification of zooplankton and phytoplankton found in water of Mun dam of Buldhana district located in Maharashtra, India.

2. Materials and Methods

Study area: The Mun dam is situated about 65Km east of Buldhana city at a latitude of 20°-27'-40''. The Mun dam lies on 76°-30'-48'' Longitude. The dam is surrounded by hills from three sides. There water spread in area of 13936 hectares. Total irrigated area under Mun dam is about 314 Sq. Km. Average depth of the reservoir 22 meter. The reservoir is rain fed during monsoon periods. Mun dam is located in Buldhana district of Maharashtra. The dam is located on river Mun, a tributary of Purna River in Tapi basin. The dam comprises of rolled filled earthen dam 1.466 km in length including spillway of 72 meter. The maximum height of the dam is 30.20 meter from the deepest foundation. The spillway is provided with 5 radial gates of 12x8 meter size to pass maximum possible flood discharge of 3623.78 cumec. The main canal is on the left bank and is 22.53 km length with head discharge capacity of 7.8327 cumec. The dam is irrigating an area of 7804 hectare (CCA) with annual irrigation of 9287 hectare. Total 32 villages of Buldhana and Akola district is get benefitted.

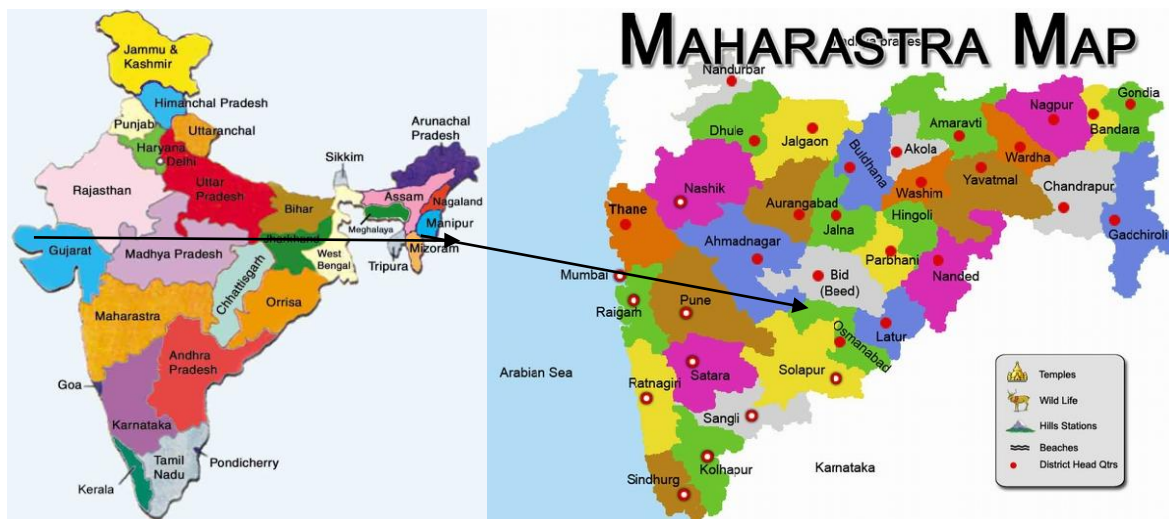




Fig 1: Map showing the location of Mun Dam Dist. Buldana

Sample Collection and Analysis: Monthly collections of water samples were collected from sampling site for one complete year from January 2015 to December 2015. Samples are collected from sampling sites on months first week at 7.00 a.m. to 10.00 a.m. Plankton net of bolting silk no. 25 was used for sampling purpose. Samples were taken at mid-stream 0.5 to 1 m below the surface of water. Plankton samples were collected, fixed and preserved in 5% formalin. Samples were observed under light microscope at 40 – 100X resolution power and identified up to genus and species level with the help of books and keys ^[1,2].

3. Result and Discussion

Zooplankton

In present investigation zooplankton were belong to 22 species of 16 genera of different groups like as Rotifers (12

species of 6 genera), Cladocera (5 species of 5 genera), Copepoda (2 species of 2 genera) and Ostracoda (3 species of 3 genera). During investigation period Rotifers are higher in population density and dominant. Over that Copepods are showing less population in the study period. Kumar et al ^[3] reported similar findings from Yamuna River at Kalpi. Registered Zooplankton were belong to 22 species of 16 genera of different groups like as Protozoa (3 species of 3 genera), Rotifera (12 species of 6 genera), Cladocera (5species of 5 genera) and Copepoda (2 species of 2 genera). Sontakke et al ^[4] reported the zooplankton diversity has a total 25 species of zooplankton were recorded in which rotifers were more abundant with 11 species followed by copepods and cladocerans 6 species each and 2 species of Ostracods.

Table 1: Monthly population density of Zooplankton from Mun Dam of Buldhana District, (M.S.) India.

Sr. No.	Month	Rotifera (Org./l)	Cladocera (Org./l)	Copepoda (Org./l)	Ostracoda (Org./l)
1	Jan. 2015	27	31	10	08
2	Feb. 2015	33	42	17	11
3	Mar. 2015	45	65	29	17
4	Apr. 2015	59	85	45	21
5	May 2015	98	81	66	27
6	Jun. 2015	111	69	33	32
7	Jul. 2015	27	10	25	05
8	Aug. 2015	09	06	07	04
9	Sep. 2015	28	09	08	07
10	Oct. 2015	56	18	13	13
11	Nov. 2015	36	32	29	18
12	Dec. 2015	31	26	43	10
Total =		560	474	325	173

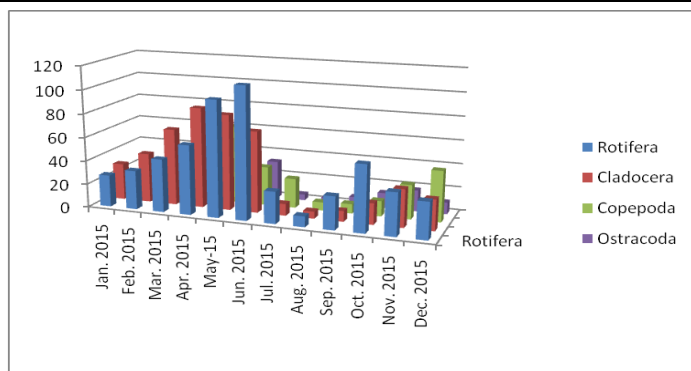


Figure 2: Monthly population density of Zooplankton from Mun Dam of Buldhana District, (M.S.) India.

Phytoplankton

In present investigation phytoplankton were belong to 35 species of 25 genera of different groups like as Chlorophyceae (12 species of 11 genera), Euglenophyceae (3 species of 2 genera), Bacillariophyceae (5 species of 5

genera) and Cyanophyceae (15 species of 7 genera). During investigation period Chlorophyceae are higher in population density and dominant. Over that Euglenophyceae are showing less population in the study period. Similar results was found to Kumar *et al* [3] reported phytoplankton diversity, chlorophyceae (12 species of 11 genera), Euglenophyceae (3 species of 2 genera), Bacillariophyceae (5 species of 5 genera), and Cyanophyceae (15 species of 7 genera) from Yamuna River at Kalpi. S. U. Kadam *et al* [5]. reported findings on phytoplankton diversity of reservoirs in Parbhani District, Maharashtra, India they find 37 species of Chlorophyceae, 47 species of Cyanophyceae, 34 species of Bacillariophyceae, 07 species of Euglenophyceae, and 04 species of Dinophyceae. Bamane *et al* [6] studied on phytoplankton diversity of Upvan-lake, Thane, Maharashtra, India reported in his investigation phytoplankton species of Chlorophyta are 13 species, Bacillariophyta 05 species, and Cyanophyta are 02 species.

Table No. 2- Monthly population density of Phytoplankton from Mun Dam of Buldhana District, (M.S.) India

Sr. No.	Month	Chlorophyceae (Org./l)	Euglenophyceae (Org./l)	Bacillariophyceae (Org./l)	Cyanophyceae (Org./l)
1	Jan. 2015	67	08	51	38
2	Feb. 2015	85	14	53	60
3	Mar. 2015	129	18	66	81
4	Apr. 2015	145	27	70	93
5	May 2015	177	33	83	113
6	Jun. 2015	203	41	28	109
7	Jul. 2015	41	08	14	31
8	Aug. 2015	11	06	08	12
9	Sep. 2015	32	09	12	22
10	Oct. 2015	85	19	45	67
11	Nov. 2015	101	29	65	69
12	Dec. 2015	78	16	57	46
Total =		1154	228	552	741

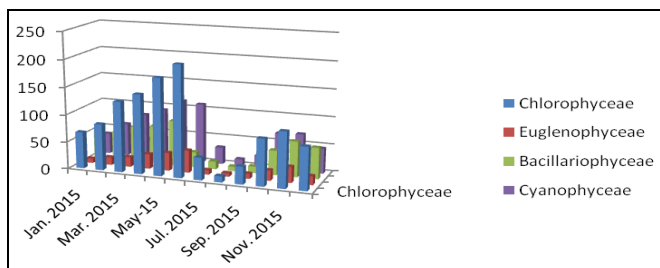


Figure 3: Monthly population density of phytoplankton from Mun Dam of Buldhana District, (M.S.) India

4. Conclusion

The present investigation has been focused on plankton’s diversity including zooplankton and phytoplankton of Mun dam water with specific environmental associations. Our results will help for assessing the potable nature of dam water. This investigation also focuses on reducing the water pollution due to human activity and helps in improve social and cultural importance of dam and its scenario.

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6. References

1. Patterson DJ. Free-living Freshwater Protozoa, Manson Publishing Ltd 73 Corringham Road, London NW1 7DL. 1998.
2. Adoni AD. Work book on limnology. Pratibha Publications, Sagar (MP) 1985.
3. Kumar M, Khare PK. Diversity of Plankton and their Seasonal Variation of Density in the Yamuna River at Kalpi, District Jalaun (U.P.) India. Journal of Global Biosciences. 2015; 4(7):2720-2729.
4. Sontakke G, Mokashe S. Diversity of zooplankton in Dekhu Reservoir from Aurangabad, Maharashtra.,

- Journal of applied and Natural Science. 2014; 6(1):131-133.
5. Kadam SU, Kadam SS, Babar M. Phytoplankton diversity of reservoirs in Parbhani District, Maharashtra, India, Int. J Curr Microbiol App Sci. 2014; 3(8):459-466.
 6. Bamane S, Ghondhalekar S, More K. Study of phytoplankton diversity and physico-chemical parameters of Upvan-lake, Thane, Maharashtra, India., National Conference on Biodiversity: Status and Challenges in Conservation. 2013, 1-6.