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Department of Geography, Shri Madhavrao Patil Mahavidhyalaya, Murum, Dist. Dharashiv

Address for correspondence:
Dr. Khadke V. V.
Department of Geography, Shri Madhavrao Patil Mahavidhyalaya, Murum, Dist. Dharashiv

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Geo-chemical studies of Benitura Reservoirs, Murum, District Dharashiv

Dr. Khadke V.V.

Abstract

Ground water is one of the predominant sources of drinking and other related requirements. It has the most exploited natural system due to over increasing demand of man for food, cloths, industrialization, enormous growth of population and agriculture. The drinking water quality was analyzed in all season. The water quality parameters such as Electrical conductivity, T.D.S, Hardness, Calcium, Mg, sodium, alkalinity, Chloride and Sulphate were analyzed. The water sample collected from 3 stations in Benitura Dam. One result was compared with water quality standards of WHO, ICMR indicated that it is not suitable for drinking. So, the water needs treatment before human consumption.

Keywords: Water quality, Physiochemical parameter, Water pollution,

Introduction:

Any reservoirs are one of the most important water resources used for irrigation, water supply and flood control purposes. On the other hand, reservoirs also provide a habitat for invertebrates, fishes and aquatic birds. Ground Water is the major source of drinking water in both urban and rural Maharashtra and also an important source of water for the agricultural and the industrial sectors. Water utilization Projections for the year 2011 put the groundwater usage at about 50 per cent. Being an important and integral part of the hydrological cycle, its availability depends on the rainfall and recharge Conditions

Study area:

Murum is situated in south eastern part of Dharashiv district. This study area is the famous commercial and educational center. Benitura Dam (Medium Project) is situated at Murum area. It is constructed by Government of Maharashtra in 2000. Height of Dam is 13.35 mts., Length of canal in kms. 44. Total water storage capacity in M.C.M. 12.84, Irrigation potential in hect. 2612 and Project Exp. In Rs. Lakh 202.60. This Dam may be used for drinking, Agriculture, washing of cloths, fish culture etc. The Dam consists of various aquatic animals and weeds are present in bodies. More than 60 % of the drinking water supply to this area from Benitura reservoirs. An important aspect of urbanization is the increase in demand and creation of potential with the possibility of population of potable water. The water quality was analyzed in the distribution system in entire study area.

Material and Methods:

The present study, three sampling stations namely A, B and C were selected from the Benitura Reservoirs. The water samples were collected once in a month from January 2024 to December 2024 at selecting three stations all parameters were analyzed in the laboratory according to the methods suggested by APHA (1985) and Trivedi & Goyal (1986).

Result and Discussion:

The data for various Physio-chemical parameters of Benitura Reservoirs after monthly observation station A, B, and C during the period of from January 2022 to December 2022 were presented in the Table1.

Total Solid: In this investigation total solids were found to be in the range of 280 to 420mg/L. The maximum total solid were found in the month of September in each sites and minimum in the month of January to all in the station.

Table-1. Monthly variation in Physio-chemical parameter

Parameter	Chloride			Calcium		
Station	A	B	C	A	B	C
January 25	355	365	372	58	58	60
April	324	335	348	75	105	80
July	398	405	419	46	48	47
Oct.25	412	456	498	62	55	54
Parameter	D O			BOD		
Station	A	B	C	A	B	C
January 25	9.34	9.22	9.29	7	7.3	7.3
April	9.25	9.26	9.25	9.5	10	10.5
July	9.27	9.29	9.25	5	5.5	6
Oct.25	9.31	9.25	9.25	3.5	3.6	3.6
Parameter	Total Hardness			TDS		
Station	A	B	C	A	B	C
January 25	160	166	162	245	270	310
April	185	187	190	265	215	200
July	168	166	167	365	370	415
Oct.25	142	146	144	412	440	465

Source: Compiled by researcher

Chloride: Chloride is a natural substance present in all potable water as well as sewage effluents as metallic salt. High chloride ion concentration indicates organic pollution in the water. The chloride concentration in most of the water samples were higher than highest desirable level 200 mg/L by ICMR. Invested chloride values range from 324 to 456 mg/L from three samples of Benitura Dam.

Calcium: Similarly calcium are found between 46 to 105 Mg/. Highest concentration of these cations recorded at station B in the month of April 2025.

Total Hardness: Total hardness is an important parameter of water quality. Calcium and Magnesium are the principle cations responsible for hardness in present study values of Total hardness varied in between 142 to 187 Mg/L in 2025. These results exceed the limit set by WHO (150 Mg/L) Thus the water is very hard water and not suitable for drinking and domestic purposes.

TDS: The TDS of water can also be taken as an index of Salinity. Generally high TDS indicates a high salinity water. The quality of drinking water in the study area has been deteriorating indicated by the presence of high concentration of hardness, TDS Ca, and Mg, in Benitura Dam. Hence there is an urgent need to take steps for protection of this valuable source. High concentration of TDS observed in month of May in sample A, B, and C location. The amount of TDS ranged between 245 to 465 mg/l observed from Benitura Dam during the study period of January 2025 to October 2025

Dissolved Oxygen (DO): DO is one of the most important parameters in assessing water quality and understanding the physical and biological processes prevailing in the water. DO is an aquatic ecosystem brings out various biochemical changes and it influenced on metabolic activities on organism. The DO of collected water samples is about 9.22 to 9.31 mg/L.

Biochemical Oxygen Demand (BOD): BOD is the measure of degradable organic matter present in water can be defined as the amount of Oxygen required by the microorganism in stabilizing the biological degradable organic matter under aerobic condition. BOD values varied were maximum during summer and minimum during winter (3.5 to 10.5 mg/L)

Conclusion:

The result revealed that there were significant monthly variation in some Physio-chemical parameters and most of the parameters are within permissible limit when compared with WHO.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

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