



**PHYSICO-CHEMICAL WATER QUALITY ASSESSMENT OF AMBADI DAM,
KANNAD, DIST- AURANGABAD (MH)**

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Abstract

During present investigation, some physico-chemical parameters like water temperature, ph, dissolved oxygen (do), alkalinity, total dissolved solids (tds), biological oxygen demand (bod), chemical oxygen demand (cod), chloride, sulphate, fluoride, phosphorous, nitrates, turbidity and total hardness has been studied season wise during 2020-2021 for water quality assessment of ambadi dam, kannad, dist.-aurangabad (mh) and the results obtained varied season wise. During present study, maximum values of some physico-chemical parameters like tds and turbidity were recorded in monsoon season. In case of cod, bod and total hardness, maximum values were recorded during winter season while maximum values of water temperature, ph, do, alkalinity, nitrates, chlorides, sulphate, fluorides and phosphorus were recorded in summer season. During present investigation, it has been observed that most of the physico-chemical parameters showed their maximum values in the summer season followed by winter and monsoon season.

Keywords- physico-chemical parameters, tds, dissolved oxygen, alkalinity, ph.

Introduction

Water is a basic need of all living organisms on the earth surface and most of the water is stored in the ocean and ice caps. Rain water is deposited in the surface and ground water which fulfills the need of water. The study of fresh water contained within continental boundaries is known as limnology (roberto berton; 2011). Generally, the dams are constructed across the rivers for different purposes such as irrigation, domestic water supply, fish farming, industrial processes etc. The water reservoirs are getting polluted due to increased human population, industrialization, use of fertilizers in agriculture and various man made activities which badly affected the water quality of the reservoirs and depletion of aquatic organisms. Therefore, it is necessary to check the quality of drinking water at regular intervals. Manjare *et al.*,(2010). Various researchers carried out the limnological study of fresh water including kadam *et al.*, (2007), salve and hiware (2008), manjare *et al.*,(2010), mahor (2011), saravankumar and ranjith kumar (2011), khan *et al.*, (2012), mule *et al.*, (2019) etc. The study area selected is ambadi dam of kannad, dist.-aurangabad, maharashtra which is situated on the

shivna river 20.2848^o n, 75.0855^o e. In present investigation, an attempt has been made to study water quality of ambadi dam by using various physico-chemical parameters in different seasons during 2020-21.

Material and methods

Collection of water samples- the water samples from ambadi dam were collected from three different stations in the morning hours between 8 to 10 am in plastic transparent bottles regularly for every season including monsoon, winter and summer seasons. The collected water samples were immediately brought to the laboratory to study various physico-chemical parameters. Some physical parameters like water temperature and ph were recorded on the collection side by using thermometer and ph paper respectively.

Physico-chemical analysis

The water analysis was carried out by using various physico-chemical parameters like water temperature, ph, dissolved oxygen (do), alkalinity, total dissolved solids (tds), biological oxygen demand (bod), chemical oxygen demand (cod), chloride, sulphate, fluoride, phosphorous, nitrates, turbidity and total hardness as per standard procedures (apha; 2005).

Results and discussion

The water quality analysis by using some physico-chemical parameters was carried out monthly during 2020 to 2021 and the results obtained are summarized in table

Water temperature

Water temperature is a very important physical factor which determines the chemical, biochemical and biological characteristics of the water reservoir. During monsoon season the maximum water temperature 33⁰C was recorded in the month of june while minimum temperature 31.4⁰C was observed in the month of september. During present investigation, the maximum temperature 37⁰C was observed in the month of may during summer season while minimum temperature 26⁰C was recorded in the month of january during winter season. Similar study was carried out by manjare *et al.* (2010).

Ph: most of the chemical and biochemical reactions are affected by the ph. During monsoon season maximum ph value 7.6 was observed in the month of july while the minimum ph value 7.2 was recorded in the month of august. During present study, maximum ph value 8.1 was observed in the month of april during summer season while the minimum ph value 7.1 was recorded in the month of october during winter season. It was observed that the ph values observed higher in summer season while lower in winter season. Similar type of study was carried out by kamble *et al.*, (2009).

Dissolved oxygen (do)

During monsoon season maximum do 5.6 mg/l was observed in the month of june while minimum do 4.6 mg/l was recorded in the month of september. During present investigation maximum do 6.6 mg/l was recorded in the month of may during summer season while the minimum do 4.2 mg/l was observed in the month of october. Similar type of study was carried out by kadam *et al.*, (2007).

Alkalinity: during monsoon season the maximum alkalinity recorded was 160 mg/l in the month of june while the minimum alkalinity 140 mg/l was observed in the month of september. During present study, maximum alkalinity 174 mg/l was recorded in the month of may during summer season while minimum alkalinity 135 mg/l was observed in the month of

october during winter season. Similar study was carried out by sinha and biswas (2011).

Total dissolved solids (tds)

During present study maximum tds value 132 mg/l was observed in the month of june during monsoon season while minimum tds value 110 mg/l was recorded in the month of may during summer season.

Biological oxygen demand (bod): maximum bod value was recorded 3.60 mg/l in the month of january during winter season while minimum value was recorded 2.30 mg/l in the month of april during summer season.

Chemical oxygen demand (cod): maximum cod value was recorded 40 mg/l in the month of january during winter season while minimum value 30 mg/l was recorded in the month of july during monsoon season.

Turbidity: maximum turbidity value 260 mg/l was recorded in the month of june during monsoon season while the minimum value observed was 130 mg/l in the month of january during winter season.

Chloride: maximum value 35 mg/l was recorded in the month of may during summer season while minimum value 24 mg/l was observed in the month of november during winter season.

Sulphate: maximum value 180 mg/l was observed in the month of may during summer season while minimum value 130 mg/l was recorded in the month of november during winter season.

Fluoride: maximum value 1.3 mg/l was recorded in the month of may during summer season and minimum value 0.7 mg/l was observed in the month of november during winter season.

Phosphorus: maximum value 1.4 mg/l was observed in the month of may during summer season while minimum value 0.7 mg/l was recorded in the month of june during monsoon season.

Nitrates: maximum value 0.30 mg/l was observed in month of may during summer season while minimum value 0.22 mg/l was recorded in the month of august during monsoon season.

Total hardness: maximum value 130 mg/l was recorded in the month of november during winter season while minimum value 90 Mg/l was observed in the month of may during summer season.

Table-1: seasonal water analysis by using physico-chemical parameters

Parameter	Monsoon				Winter				Summer			
	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Water temp. (⁰ C)	33	32.5	31.5	31.4	31.2	27.5	27	26	25.5	32	34	37
Ph	7.4	7.6	7.2	7.3	7.1	7.5	7.6	7.7	7.6	8.0	8.1	7.9

Do (mg/l)	5.6	4.8	4.9	4.6	4.2	5.1	5.4	5.9	6.0	6.5	6.4	6.6
Alkalinity (mg/l)	160	150	145	140	135	150	140	145	150	172	160	174
Tds (mg/l)	132	120	126	130	124	125	117	114	119	115	112	110
Bod (mg/l)	2.70	2.80	2.85	2.90	2.95	3.0	3.40	3.60	2.75	2.60	2.30	2.40
Cod (mg/l)	31	30	32	33.5	36	38	37	40	34	34.5	35	35.5
Turbidity (mg/l)	260	220	200	210	160	150	140	130	170	175	180	200
Chloride (mg/l)	31.5	31	30	32	25	24	27	26	34	34.7	34.9	35
Sulphate (mg/l)	160	150	145	140	135	130	140	145	160	165	175	180
Fluoride (mg/l)	1.1	1.2	1	1.2	0.9	0.7	1	0.8	1	0.9	1	1.3
Phosphorus (mg/l)	0.7	0.9	1	1.2	1.1	1	1.1	1	0.8	1	1.3	1.4
Nitrates (mg/l)	0.23	0.25	0.22	0.24	0.26	0.27	0.26	0.26	0.28	0.27	0.29	0.30
Total hardness (mg/l)	95	97	96	98	120	130	125	128	91	95	94	90

Conclusion

During present investigation, maximum values of some physico-chemical parameters like total dissolved solids (tds) and turbidity were recorded in monsoon season. In case of chemical oxygen demand (cod), biological oxygen demand (bod) and total hardness, maximum values were recorded during winter season while maximum values of water temperature, ph, dissolved oxygen (do), alkalinity, nitrates, chlorides, sulphate, fluorides and phosphorus were recorded in summer season. During present investigation, it has been observed that most of the physico-chemical parameters showed their maximum values in the summer season followed by winter and monsoon season.

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