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ANALYSIS OF WATER QUALITY USING PHYSICO-CHEMICAL PARAMETERS OF KODAR DAM IN MAHASAMUND DISTRICT, CHHATTISGARH

Manish Upadhyay

Department of Chemistry, C.V. Raman University, Kota, Bilaspur, Chattisgarh, India.

Article Info	ABSTRACT
Received 28/10/2013	An investigation was undertaken to Determine the Water quality of KODAR dam located
Revised 19/11/2013	at mahasamund Dist. by analyzing Physico chemical parameters .For this water samples
Accepted 22/11/2013	were collected from Dam for 12 months (January to December) and were analyzed for
	various Physical (Temp., Transparency, TDS, pH and Turbidity) and chemical (DO,
Key words: Maximum,	Free Co ₂ , Hardness, Chloride, Phosphate and Nitrate) Parameters and the variation in
Temperature, Ground	different seasons has been observed. From this study we came to know that Water
water.	Temperature Ranges From 22.5°c to 26°C.The Maximum (26°C) Temperature was
	recorded in the Month of March (summer) and minimum (22.5°C) in the month of
	December (winter). Transparency of Water Fluctuates from 6.0 cm to 92.0 cm.

INTRODUCTION

Water covers 70.9% of the Earth's surface, and is vital for all known forms of life. On Earth, 96.5% of the planet's water is found in oceans, 1.7% in groundwater, 1.7% in glaciers and the ice caps of Antarctica and Greenland, a small fraction in other large water bodies, and 0.001% in the air as vapor, clouds (formed of solid and liquid water particles suspended in air), and precipitation. Only 2.5% of the Earth's water is fresh water and 98.8% of that water is in ice and groundwater [1, 2]. Less than 0.3% of all freshwater is in rivers, lakes, and the atmosphere, and an even smaller amount of the Earth's freshwater (0.003%) is contained within biological bodies and manufactured products [3, 4]. Water on Earth moves continually through the hydrological cycle of evaporation and transpiration (evapotranspiration), condensation, precipitation, and runoff, usually reaching the sea. Evaporation and transpiration contribute to the precipitation over land [5, 6]. Safe drinking water is essential to humans and other life forms. Access to safe drinking water has improved over the last decades in almost every part of the world, but

Corresponding Author

Dr. Manish Upadhyay
Email:- man_bsp@rediffmail.com
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approximately one billion people still lack access to safe water and over 2.5 billion lack accesses to adequate sanitation [7]. There is a clear correlation between access to safe water and GDP per capita. However, some observers have estimated that by 2025 more than half of the world population will be facing water-based vulnerability [8,9]. A recent report (November 2009) suggests that by 2030, in some developing regions of the world, water demand will exceed supply by 50%. Water plays an important role in the world economy, as it functions as a solvent for a wide variety of chemical substances and facilitates industrial cooling and transportation. Approximately 70% of the fresh water used by humans goes to agriculture [10, 11]. So An investigation was undertaken to Determine the Water quality of KODAR dam located at mahasamund Dist. by analyzing Physico chemical parameters [12,13].

Sample collection and analysis

For this water samples were collected from Dam for 12 months (January to December) and were analyzed for various Physical (Temp., Transparency, TDS, pH and Turbidity) and chemical (D O, Free Co2, Hardness, Chloride, Phosphate and Nitrate) Parameters and the variation in different seasons has been observed.



Study of the Physical parameter (Temp., Transparency, TDS, pH, Turbidity) of collected water samples were determined using physical equipments like Thermometer, pH meter, conductivity meter, water analyzer kit.

Analysis of Chemical parameter (D O, Free CO_2 , Hardness, Chloride, Phosphate, Nitrate) of collected water samples were determined by different chemical means.

That is, D.O. by Winkler titration method, Free

 Table 1. Physical parameters

 CO_2 by titrimetric method, Hardness by Titrimetric method, Chloride by Argentometric method, Phosphate by spectrophotometric method, Nitrate by Ion selective Electrode method.

RESULTS AND DISCUSSION

Analysis results of Physical and chemical parameters of Kodar dam water in various moths from Jan to Dec are mentioned in the below table:

Month	Temperature 0C	Transparency cm	Turbidity NTU	TDS gm/lit	pН
Jan	23	14	11	0.39	8.0
Feb	24	12	10	0.27	8.7
Mar	26	9.0	12	0.3	8.8
Apr	23	7.5	9	0.1	8.0
May	25	6.0	7	0.6	8.0
Jun	23.5	10	13	2.0	8.4
Jul	24	55	1.0	1.13	8.1
Aug	24.5	61	3	0.2	8.3
Sep	25.5	52	4	0.4	7.7
Oct	25.5	92.0	0.4	0.4	7.5
Nov	25	80	1.8	1.8	7.4
Dec	22.5	65	2	0.4	8.2

 Table 2. Chemical parameters

Month	D.0	Free CO ₂	Hardness	Chloride	Alkalinity
Jan	8.0	4.4	80.0	42.0	120.0
Feb	9.05		80.00	30.0	123.0
Mar	8.5	4.0	102	44.0	180
Apr	8.0	5.4	170	45.0	150
May	9.5	3.4	142	57	200
Jun	10.0	8.6	160	41.0	170
Jul	10.04	9.8	75	44.0	155
Aug	9.79	6.0	90	47.57	190
Sep	9.05	20	104	38.34	190
Oct	8.82	13.2	70	42.6	170
Nov	6.40	15.0	110	44.55	150
Dec	9.21	12.6	88	48.61	140

The present study of the water temperature ranges from 22.5° c to 26° C. The Maximum (26° C) Temperature was recorded in the Month of March (summer) and minimum (22.5° C) in the month of December (winter). It showed that Higher Temperature in summer and relatively lowers in winter. Transparency of Water Fluctuates from 6.0 cm to 92.0 cm. The Maximum (92.0cm) was recorded in the month of October (winter) and minimum (6.0cm) in the month of May during summer. The turbidity of water fluctuates from 0.4 NTU to 12.41 NTU. The maximum values (12.14 NTU) was recorded in the month of February (summer) It might be due to human activities, decrease in the water level and presence of suspended particulate matter, and minimum value (0.4NTU) in the month of October. The total dissolved solids fluctuate from 0.1g/l to

month of June. It is due to heavy rainfall and minimum value (0.1g/l) in the month of April. The pH was alkaline values ranges from 7.3 to 8.8. The maximum pH value (8.8) was recorded in the month of May (summer) and minimum (7.3) in the month of September. The values of DO fluctuate from 6.40 mg/l to 8.5 mg/l. The maximum values (8.5 mg/l) was recorded in the month of May (summer) and minimum values (6.40 mg/l) in the month of November (winter). The value of free Co2 ranges from 0.0 mg/l to 12.6 mg/l. The maximum value (12.6 mg/l) was recorded in the month of December (winter) and minimum value (0.0mg/l) in the month of March.

2.2g/l. the maximum value (2.2g/l) was recorded in the

The value of hardness fluctuates from 70 mg/l to 179mg/l. The maximum value (179 mg/l) was recorded in

the month of April (summer) and minimum value (70 mg/l) in the month of October.

The values of chlorides range from 31.06 mg/l to 57.61 mg/l. The maximum value (57.61 mg/l) was recorded in the month of May (summer) and minimum value (31.06 mg/l) in the month of February. Total alkalinity ranges from 121.25 mg/l to 200mg/l. the maximum value (200 mg/l) was recorded in the month of May (summer) and minimum value (121.25 mg/l) in the

month of January (winter). The value of phosphate fluctuates from 0.12mg/l to 12.38 mg/l. the maximum value (12.38mg/l) was recorded in the month of August (monsoon) and minimum value in the month of October (winter). The values of nitrate ranges from 4.40mg/l to 37.5 mg/l. the maximum value (37.5mg/l) was observed in the month of July (monsoon) and minimum (4.40mg/l) in the month of November (winter).

REFERENCES

- 1. Pandey AK, Siddiqi SZ and Rama Rao. (1993). Physico-chemical and biological characteristics of Husain sagar, an industrially polluted lake, Hyderabad. Proc. *Acad. Environ. Biol*, 2(2), 161-167.
- 2. Trivedy RK and Goel PK. (1986). Chemical and biological methods for water pollution studies, Environmental Publication, Karad, Maharashtra.
- 3. Kodarkar MS. (1992). Methodology for water analysis, physico-chemical, Association of Aquatic Biologists Hyderbad. *Pub. Met*, 2, 50.
- 4. APHA. (1985). Standard Methods for Examination of Water and Wastewater, 20th Edition, American Public Health Association, Washington D. C.
- 5. Jayabhaye UM, Pentewar MS and Hiware CJ. (2006). A Study on Physico-Chemical Parameters of a Minor Reservoir, Sawana, Hingoli District, Maharashtra.
- 6. Salve VB and Hiware CJ. (2008). Study on water quality of Wanparakalpa reservoir Nagpur, Near Parli Vaijnath, District Beed. Marathwada region. *J. Aqua. Biol*, 21(2), 113-117.
- 7. Khan MAG and Choudhary SH. (1994). Physical and chemical limnology of lake Kaptai, Bangladesh. *Trop. Eco*, 35(1), 35-51.
- 8. Kadam MS, Pampatwar DV and Mali RP. (2007). Seasonal variations in different physico-chemical characteristicsin Masoli reservoir of Parbhani district, Maharashtra. J. Aqua. Biol, 22(1), 110-112.
- 9. Kamble SM, Kamble AH and Narke SY. (2009). Study of physico-chemical parameters of Ruti dam, Tq. Ashti, dist.Beed, Maharashtra. *J. Aqua. Biol*, 24(2), 86-89.
- 10. Masood Ahmed and Krishnamurthy R. (1990). Hydrobiological studies of Wohar reservoir Aurangabad (Maharashtrastate) India. J. Environ. Biol, 11(3), 335-343.
- 11. Anderson EA. (1973). National Weather Service River Forecast System, NOAA Technical Memorandum NWS HYDRO-17, U.S. Department of Commerce, Silver Spring, MD.
- 12. ASCE. (1993). Task Committee on Definition of Criteria for Evaluation of Watershed Models, Criteria for evaluation of watershed models. *Journal of Irrigation and Drainage Engineering*, 429-442.
- 13. Barringer TH, Reiser RG, Price CV. (1994). Potential effects of development on flow characteristics of two New Jersey streams. *Water resources bulletin*, 30(2), 283-295.

