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## Premansoon season physicochemical parameters of Lonar lake water

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### Abstract

Lonar Lake, also known as the Lonar crater, is a monument to the National Geo-Heritage Monument, a salt, soda reservoir, located in the Lonar region of Buldana in Maharashtra. An attempt has been made to test the physicochemical properties of water in Lonar Lake. A total of 4 water samples were analyzed in 2008 for pre-term physiological properties of Lonar lake water and revealed that the water was alkaline (pH 10.5) and characterized by high salts (9060mg/L), chloride (4125.69 mg/L), Salinity (7599.81 mg/L), Alkalinity (3503 mg/L), Total hardness (494 mg / L), Calcium hardness (142.8 mg/L), Magnesium hardness (351.2 mg/L), Sulphate (21.75 mg)./L, Phosphate (0.42 mg/L) and Nitrate (4.2 mg/L), and Dissolve Oxygen (4.7 mg/L). As Lonar Lake is different from the rest of the world in terms of quality of water and salt water. So this earth's heritage should be preserved for its alkalinity and salt.

**Keywords:** Lonar Lake, basalt rock, Meteoritic effect, alkalinity, salt

### 1. Introduction

Lonar Lake, also known as the Lonar crater, is a monument to the National Geo-Heritage Monument, a salt, soda reservoir, located in the Lonar region of Buldana in Maharashtra. Lonar Lake was created by a meteorite collision during the Pleistocene Epoch. It is one of the four known sites, hyper-velocity, impact craters on basaltic rock anywhere on Earth. The other three basaltic impact structures are located in southern Brazil's Lonar Lake with an apparent width of 1.2 km (3,900 ft) and 137 meters (449 ft) below the edge of the mountain. The meteor range is 1.8 km (5,900 ft) wide. The lake water is very salty <sup>[1]</sup>. The Lonar crater is the world's third-largest saltwater lake with a depth of 1800 m and 170 m depth. It comes after Lake 10,000m in China with a width of 10,000m and New Cubec in Canada with a width of 3500 m <sup>[2, 3]</sup> The lake was first introduced in 1823 by CJE Alexander in 1896, and American Geologist G. Gilbert conducted studies to prove that Lonar was created as a result of meteorological strikes <sup>[4]</sup>.

Water is directly related to humans. Visitors use the water of 'Dhar' (natural water flow in the lake) and 'Sitanahani' to bathe and draining from hotels, stairs directly from the pool, which degrade water quality. Another source of garbage is dumped by visitors and the remains of pesticides from plantations after the rains <sup>[5]</sup>. A literature review revealed that salt was 40.78, 31.52, 30.87 in 1910, 1958 and 1960 respectively. Lake salt has now been reduced to 7.9% <sup>[6]</sup>.

The purpose of the current study was to analyze the Premansoon parameters of the Physico-chemical period of the Lonar lake water. Lonar Lake is closed to the outside and is unique due to its salinity, alkalinity and diversity. Because of its diversity, the lake has raised many scientific standards among researchers and continues to attract many. Water is a very important abiotic component of a fish pond and while learning about biodiversity in any ecosystem in the pond, knowledge of the physicochemical quality of the lake water is important. The boundaries of the Premansoon season Physico-chemical watershed in the lake are not taught in detail. It was therefore thought to study studies on the physicochemical parameters of water in Lonar Lake.

### 2. Experimental section

Four samples of water were collected from an eight-sample Lonar crater (Fig. 1) in 1L bottles and transported to a laboratory.

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Sampling was done monthly in the morning of 2008. The parameters selected for analysis were water temperature, pH, soluble solid, total alkalinity, total hardness, calcium hardness, magnesium hardness, chloride, dissolved oxygen, sulphate, nitrate, phosphate. The pH, temperature, DO, salt and TDS were determined at the site of the water analysis and other parameters were analyzed in the laboratory by standard methods [7].

### 3. Results and discussion

In this study a total of 4 water samples during the pre-rainy season from Lonar Lake. These 4 water samples were analyzed for the pre-rain quality of the Lonar Lake watershed. Number of physicochemical parameters such as pH, temperature, soluble solids, alkalinity, dissolved oxygen, chloride, salt, total hardness, calcium hardness, magnesium hardness, sulphate, phosphate and nitrate.

In a recent study the data showed that there was a significant variation in quality in relation to their physicochemical properties. Lonar Lake physical analysis was studied during the Premonsoon period (2008). It is also evident from the current study that the color of the lake water is also green and dark green due to the dense algal boom with outstanding spirulina. The smell of the lake water is somewhat irritating. Muley and Babar [8] noticed the stench of the lake's water. The pH of the water in Lake is 10.5 and the temperature is 27 °C. The total dissolved solids were 8.6 mg/L and the alkalinity was 3503 mg/L. The dissolved oxygen content was 4.7 mg/L, chloride 4125.69 mg/L and 7599.81mg/L salt were recorded. The total hardness is 494 mg/L; calcium hardness 142.8 mg/L and magnesium hardness 351.2 mg/L. Sulphate was recorded as 21.75 mg/L, phosphate was 0.42 mg/L and nitrate was 4.2 mg/L during the present study. (Table 1).

Lonar Lake remains alkaline and has a very high pH in the pre-monsoon (Table 1). Thakker and Ranade saw pH 9.5 to 10.0 and Dabhade *et al.* recorded it from 10 to 10.5. Temperature plays an important role in the chemical and biological properties of a body of water. The Lake has its own localized temperature system and maintains a high humidity. High water temperatures can also increase the amount of inorganic salts that can be filtered by the Lake's high salinity. Dabhade *et al.* (2006) recorded that the temperature of the pools ranged from 18 °C to 32 °C, the minimum temperature recorded was 18 °C to 20 °C in

November to February, and the temperature gradually rose to 30 °C to 31 °C in March. to June and from July to October from 25 °C to 28 °C. Thakker and Ranade [9] (2002) recorded a temperature of 35 °C.



**Fig 1:** General view of Lonar Lake and sites of water sample collections for analysis

Total dissolved solids of the lake 8600 mg/L in the pre-monsoon (Table 1). The high rate of fixed stiffness during the rainy season is due to the rising ground. This was also indicative of the degree of flexibility. This variation occurs due to the suspended substance and algal bloom in the lake water. The amount of soluble hardness, suspended material used and algal bloom are the main factors indicating the transparency of the lake water. Thakker and Ranade recorded the strongest dose was 15500mg/L while Dabhade *et al.* [5] looked at ranges from 9950mg/L to 1200 mg/L. In the present study, the total alkalinity was 3503 mg/L (Figure 2). -3600 mg/L. Blanford [10] believed that the evaporation of water when there was no discharge was what caused the water in the lake to be the same. The high content of chloride 4126mg/L was recorded in the pre-rainy season (Figure 2). Thakker and Ranade, (2002) recorded chloride as 3000 mg/L while Dabhade *et al.* [5] (2006) showed distances ranging from 1440mg/L to 3958mg/L. L which is the highest rate in the premonsoon season (Figure 2). Thakker and Ranade [9] wrote that the salt water of the lake was 5508mg/L.

**Table 1:** Premonsoon Season Physicochemical Parameters of Lonar Lake Water in 2008

pH	Temperature	Total dissolved solids (mg/L)	Alkalinity (g/L)	Chloride (g/L)	Salinity (mg/L)	Dissolved oxygen(g/L)	Total Hardness (mg/L)	Calcium Hardness (mg/L)	Magnesium Hardness (mg/L)	Sulphate (mg/L)	Phosphate (mg/L)	Nitrate (mg/L)
10.5	27	8.6	3503	4125.69	7599.81	4.7	494	142.8	351.2	21.75	0.42	4.2

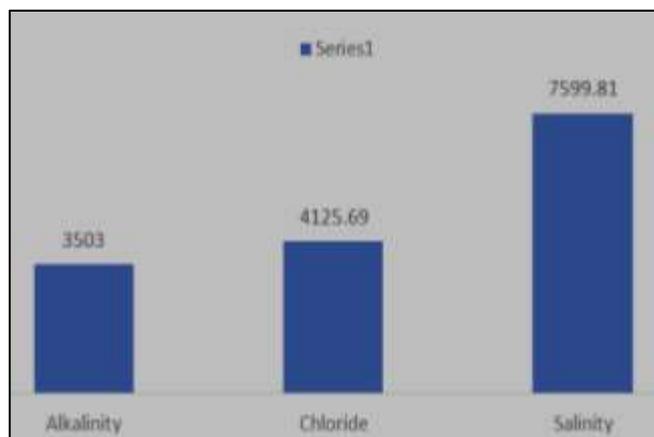


Fig 2: Season physicochemical parameters of Lonar lake water

Soluble oxygen is an important parameter for survival of aquatic life. A large concentration of dissolved oxygen was observed at 0.0047mg/L during the pre-rainy season. The slightly soluble oxygen in the lake is an indication of the presence of organisms leading to a High Biological Oxygen Demand. The "algal bloom" is sufficient to describe the existence of the planktonic community of Lonar Lake. Not only is it suspended in the water columns but it also forms a ridge on the surface of the lake water which does not allow the oxygen of the atmosphere to dissolve in the lake water. Any oxygen produced by phytoplankton through respiration can be utilized by zooplanktons and other macroinvertebrates. Dabhade *et al.*,<sup>[5]</sup> (2006) observed melted oxygen ranging from 1.1 mg/L to 4.87 mg/L.

The hardness of the water is caused by metallic ions dissolved in water including calcium and magnesium ions. The total hardness of the lake water was recorded before heavy rainfall (9494 mg/L). Dabhade *et al.*,<sup>[5]</sup> recorded that the total hardness was slightly variable again at 494 mg/L while Taiwade<sup>[11]</sup> recorded 101 ppm. Calcium is an important component of natural plants, which play a vital role in the body's transformation and growth. Calcium hardness was found to be 136 mg/L in the pre-rainy season due to evaporation of the lake water in the summer. Normally these ions are harmless but at high concentrations it increases the overall solidity of the water. The magnesium concentration of lake water is found to be 358mg/L in the pre-monsoon. Taiwade recorded calcium as low as 20.3 ppm while magnesium as high as 80.7 ppm.

Lonar Lake water sulphate was found to be 22 mg/L in the pre-monsoon. There was a slight variation of sulfate. Dabhade *et al.* found that sulfur variations of lake water have been observed in the range of 0.2 mg/L to 1.90 mg/L. The water phosphate of the pool was found to be 0.42 mg/L in the premonsoon. This depletion of phosphate occurs due to phosphate being easily absorbed by phytoplankton. Thakker and Ranade recorded phosphate as 0.2 mg/L while Surakashi<sup>[12]</sup> was recorded as 22 mg/L. Lake water nitrate was found to be 4.2 mg/L in the premonsoon. 4.2 mg/L nitrate was recorded in the pre-rainy season (Table 1).

Lonar volcano is under threat from uncontrolled flow of sewage that has increased the lake's water levels, reducing the salinity of such changes and being environmentally friendly.

#### 4. References

1. Tambekar DH, Pawar AL, Dudhane MN. Nat. Env. Poll. Tech 2010;9(2):17-221.

2. Grieve RAF, Robertson PB. *Icarus* 1979;38:212.
3. Fredriksson K, Dube A, Milton DJ, Balasundaram MS. *Sci* 1973;180:862864.
4. Mehrotra SC, Bhalerao AS. Biodiversity of Lonar Crater. Anamaya Publishers, New Delhi, India 2005, 17-30.
5. Dabhade DS, Malu RA, Patil PS, Wanjari HV, *J Aqua Biol* 2006;21(3):14-19.
6. Joshi AA, Kanekar P, Kelkar AS, Shouche YS, Wani A A, Borgave SB *et al.*, *Microb Ecol DOI*, 2007, 10. 1007/s0024.007.9264-8.
7. APHA, Standard Methods for the Examination of Water and Wastewater (20<sup>th</sup> Ed.), Washington DC, 1998.
8. Muley RB, Babar MD. Quality of Reservoir-1 at WALMI Aurangabad 1998, 28-33.
9. Thakker CD, Ranade DR. *Curr Sci* 2002;82:455-458.
10. Blandford WT. *Rec Geol Surv Ind* 1870, 60-65.
11. Taiwade VS. *Bull Astr Soc Ind* 1994;23:105-111.
12. Surakashi VP, Vani AA, Souche YS, Ranade DR. *Microbial Ecology* 2007;54:697-704.