

ORIGINAL ARTICLE

Hydrobiological study of Lonar Crater

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ABSTRACT

The Lonar Crater is situated in Buldhana District of Maharashtra State India. It is a circular depression formed due to impact of a huge meteorite with high velocity. It contains a shallow saline lake occupying most of its floor. Part of its floor being flooded by fresh water carried through constant flow of water of unknown origin. Physico-Chemical Parameters of Lonar Crater lake were studied monthly at four sampling stations, two each of fresh & saline water in the year 2012. Salinity & high alkalinity are dominating parameters observed. The physico-chemical parameters of saline & fresh water Hydrobiological study include - temperature, PH, dissolved O₂, dissolved CO₂, alkalinity, chlorides, salinity, detection of sodium, potassium & Iron. The result of the analysis of saline water is compared with the findings of the earlier workers & shown in the tabular form. The unique findings of the Lonar crater lake includes constant PH range between 9.5 to 10.00, total absence of free CO₂, and high contents of chlorides and salinity throughout the year. During the study period slight variations were recorded in the values of temperature, O₂, carbonate & bicarbonate alkalinity.

Key words: Lonar crater, hydrobiological, pH, Salinity.

1. INTRODUCTION

In Buldhana District of Maharashtra State (India) about 125 kms. from Parbhani District there is a Lonar crater naturally formed due to impact of a Meteorite. The Topography is 19° 58' North and 76° 31' East. It contains a highly saline water lake. The Lonar crater is an excellent example of meteoritic impact crater naturally formed with biographical wonders. It is present about 01 km to the South West of Lonar town and ranks third among the five largest craters in the world. Amongst them the Arizona crater U.S.A. and Lonar crater India stand out as craters which have been proved beyond doubt to have been caused by the impact of meteorites (India Today 14th Aug. 1979). The studies have shown that this crater was formed about 50-52 thousand years ago.

The crater contains a saline lake. It is a circular depression surrounding from all sides by a steeply rising escarpment to an even high of 150 meters above lake level. The circumference of the lake is 06 kms on the top & along its inner rim 3.5 kms, with a shallow saline lake occupying most of its floor. Years together the crater filled with natural waters giving rise to a lake ecosystem. The lake also contains fresh water ecosystem due to the constant flow of fresh water through unknown origin. The lake is closed one without any outlet and unique due to it's high salinity, alkalinity and biodiversity. Due to it's uniqueness the lake has evoked much scientific value among researchers. Water is the most vital abiotic component of any aquatic ecosystem. During the study of any lake ecosystem knowledge of physico-chemical parameters of water becomes important.

2. MATERIAL & METHODS:

In the water analysis of Lonar crater lake analysis of saline & fresh water ecosystem was done for a year. Physico-chemical parameters studied includes- color, odour, temperature, taste, PH dissolved O₂, dissolved CO₂, alkalinity, chlorides, salinity, Sodium, potassium, iron. Physico-chemical parameters were studied monthly at four sampling station, two each of fresh and saline water

in the year 2012. Standard analytical methods were utilized to examine water sample. The collecting bottles were filled with samples from desired depth to study a number of parameters. With the help of an electronic portable PH meter reading were taken & the temperature was noted down with the help thermometer. For the detection of chemical parameters titrimetric methods & spectrophotometric methods were used.

3. RESULT AND DISCUSSION

In recent years there is considerable increase in water level due to percolation which is responsible for changing the quality of water affecting the biodiversity within the lake. However between 1970 to 1985 the lake water dries every year in summer and in rainy season accommodation of water takes place. The dried salts from the lake was sold in the market as papad khar. The lake receives fresh water from three springs of which the largest. " Dhar ", Sita nahani and Ram Gaya smaller in size. According to Badve *et al.* [1] the water has considerably been increasing since 1991. Present investigation also supports the same fact about increasing the water level of Lonar crater lake. Since from 2000 to 2004 the water level has increased up to near about 06 feet in height.

Table 1: showing comparative chart of water analysis of Lonar lake (saline water)

Sr. No.	Components	1910 Christi	1958 Jhingran and Rao.	1960 Tata Research Institute	1993 Badve	2000 Kshirsagar	2012 Drshpande
1	Temperature	-	-	-	-	77.16	29.50
2	PH	-	09.0 to 9.7	-	-	10.5	10.25
3	Dissolved Oxygen	-	-	-	-	02.45	02.15
4	Dissolved Carbon Dioxide	-	-	-	-	FREE CO ₂ ABSENT	FREE CO ₂ ABSENT
5	Carbonate Alkalinity	15.03	22.26	07.52	-	37.19	35.50
6	Bicarbonate alkalinity	02.61	02.06	11.65	24.34	68.23	60.25
7	Chlorides	40.78	31.52	30.87	19.17	28.42	30.42
8	Salinity	-	-	-	-	51.42	53.42
9	Sodium	39.69	41.74	15.15	27.76	59.77	57.50
10	Potassium	00.11	01.58	02.05	-	08.50	09.50
11	Iron	-	-	-	-	00.34	00.41
12	So ₄	01.41	00.33	00.67	01.25	-	-
13	Ca	00.01	00.01	00.18	00.78	-	-
14	Mg.	Trance	00.01	00.14	00.78	-	-
15	SiO ₂	00.41	00.61	01.46	-	-	-
16	B	Trace	Trace	00.13	00.96	-	-

In the present investigation the colour of the lake water is pale green to dark green with yellowish shedding which is because of dense algal population, with predominating spirulina algae possessing medicinal value [2]. The odour of the lake is an offensive one mostly in summer season. Muley and Shaikh [3] have also studied odour & other parameters of the lake. According to him the odour of saline lake water is an offensive one. PH values of fresh water ranges between. 6.5 to 8.5 and that of saline water remains in a constant range of 9.5 to 10.0 throughout year. Jhingran & Rao [4] have also studied the PH Values of the lake. According to him the PH of spring water is 7.5 and that of lake water ranges between 9.3 to 9.7 Along with PH, other physico- chemical parameter values given by Jhingran & Rao [4], La Touche and Christi [5], Badve [1], Pedge and Ahirrao [6],[7], Kshirsagar and Deshpande [8], Kadam and Bhusare [9] Pawar [10] and of lake water when compared with the present values shows fluctuations like pH of spring water is less and that of crater lake is more. The results of the analysis of lonar crater lake compared with earlier workers is shown in the tabular form (Table 1) The peculiarities of the findings of the physico-chemical parameters of saline water includes constant PH, total absence of dissolved free CO₂, high contents of chlorides, salinity & carbonate & bicarbonate alkalinity throughout the year which directly effects on the biodiversity of the crater lake.

In the present investigation no alarming changes observed in other physico-chemical parameters, values. The month wise physico-chemical parameter values of fresh water when compared with crater lake water, they do not show any peculiarity. The findings of fresh and saline water have no correlation with each other, which tells us about the uniqueness of Lonar crater lake ecosystems.

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