



PHYSICO-CHEMICAL COMPOSITION OF LOWER DUDHNA DAM, WAKDI MUD, DISTRICT PARBHANI (MS), INDIA.

Satish D. Magar¹, Rajesh S. Gaikwad²

ABSTRACT

A laboratory analysis was performed to determine the chemical properties of sample collected from Lower Dudhna Dam, Wakdi, Dist. Parbhani (M.S.) India, Several analytical techniques were used to determine the chemical compositions of mud sample. Important parameters were studied. The mud samples were quite rich in Sodium salt, available Phosphorus and Potash. The most abundant trace element in the samples followed by Mn.2.00 and Fe.4.50. There were significant differences in the elemental contents of mud samples collected from Lower Dudhna Dam.

KEYWORDS: Lower Dudhna Dam, Mud, Chemical, Composition

INTRODUCTION

Mud is a semi-colloidal substance formed by the mixture of inorganic, organic and water under the influence of various physical and chemical factors through geological and biological processes. The chemical composition of mud is complex, rich in Ca²⁺, Zn²⁺, Mg²⁺, Na⁺ and other mineral elements, also contains organic matter such as humic acid, fulvic acid and acetic acid. Xiaojing Tian et al (2022). Dead Sea mud salt solution rich in magnesium, has many therapeutic uses. It was proved that bathing in this salt solution improves functions of skin barriers and reduces dry skin inflammation (Proksch 2005). Mud is widely applied in cosmetic fields. In modern times, it has become fashionable to use mud bath for beauty and health care. The Dead Sea in Israel, for example, is rich in mineral silt, which has been exploited by local beauty salons and medical institutions, making it popular in the world for beauty and health (Poprygina et al., 2020). Mud has rich minerals, large specific surface area, high adsorption performance and so on, which can adjust the skin microbial flora to expand the proportion of beneficial bacteria (Calderan et al., 2020). Therefore, the property of mud and its application in cosmetic and medical fields are summarized and provide ideas for further research in mud.

Mud is a unique gift from nature to human beings in this age of various resources shortage. In the future, mud may be used in a wider range of applications, including more applications in skin care products, more accurate prevention/treatment of human diseases and better understanding of the natural world. Xiaojing Tian (2022). With the development of modern science and technology, an important research direction

of mud in the future may be transformed from investigating the function of mud to explore its action mechanisms.

MATERIALS AND METHODS

Lower Dudhna Dam is a water reservoir located on Dudhna River in Selu taluka of Parbhani District of Maharashtra State. It is situated between 18.45 to 19.10 North Latitude, 76.13 to 77.00 East Latitude and 357 m above sea level. The water from this dam is mainly used for the drinking and irrigation purpose in Parbhani and Jalna district of Maharashtra. Its storage capacity 242,200 million liters. Jagtap (2023).

Physico-chemical properties were analysed from Rashtriya Chemicals and Fertilizers Limited, Approved by Government of India, Soil Analysis Lab, Nanded District. Nanded-431602. (M.S) India. Card.No-N162023004414, Date 22/03/2023.

a. Analyses of chemical properties:

The analysis involves the estimation of pH, electrical conductivity (EC), Organic Carbon, Sodium salt, available Phosphorus and Potash of the Lower Dudhna Dam mud. were carried out in the present study.

b. Determination of mineral elements:

The elements were extracted from Lower Dudhna Dam mud by the wet digest method. The digested sample was analyzed for the elemental composition using Atomic Absorption Spectrophotometer, Zn, Cu, Mn, and Fe were determined and the concentrations of the elements were presented in mg/l.

^{1,2}Swami Vivekanand Senior College, Mantha, Dist. Jalna

HOW TO CITE THIS ARTICLE:

Satish D. Magar, Rajesh S. Gaikwad (2024). Physico-Chemical Composition of Lower Dudhna Dam, Wakdi Mud, District Parbhani (Ms), India, International Educational Journal of Science and Engineering (IEJSE), Vol: 7, Issue: 9, 23-24

RESULTS AND DISCUSSION

In order to understand the Physico-chemical composition of Lower Dudhana Dam mud and results are given in table 1. It is clear from result summarized in table 1 that the mud samples were quite rich in P (36.05), K (605) Fe (4.50), Mn (2.00) was the most abundant trace element in the samples followed by Zn (0.60), Electric Conductivity 0.32, OC (0.27), Cu (0.20). There were significant differences in the elemental contents of mud sample collected from Lower Dudhana Dam mud Wakdi.

Sr. No	Lower Dudhana Dam mud	
	Sr.No-N162023004414	
	Properties	Observations(mg/l)
1	pH	7.4
2	EC(dSm-1)	0.32
3	OC (%)	0.27
4	P(%)	36.05
5	K (%)	605
6	Zn(ppm)	0.60
7	Cu(ppm)	0.20
8	Mn (ppm)	2.00
9	Fe (ppm)	4.50

Table 1: Physico-chemical composition of Lower Dudhana Dam mud.

Several workers have performed such type of experiments on mud, Khlaifat et al., 2010 .studied the physical and chemical properties of 24 different Dead Sea mud samples collected from three different locations on the eastern seaside of the Dead Sea. Their results showed that the mud samples were rich in some elements viz.Barium, Vanadium, Strontium, lead, cadmium and zinc. The most abundant element was strontium followed by barium, vanadium and lead, with the concentration ranges of 410–810, 155–380 , 209–264 , 108–114 part per million (ppm).The physical and chemical properties of 24 different Dead Sea mud samples collected from three different locations on the eastern seaside of the Dead Sea. Their results showed that the mud samples were rich in some elements viz.Barium, Vanadium, Strontium, lead, cadmium and zinc (Abdel-Fattah and Pingitore 2009). Similarly, (Khlaifat et al., 2010).The physical parameters of the mud shows that the moisture, redox potential, and heat capacity of all the muds studied are within the normative values, indicating optimal sulfate-reducing properties (especially for Solyonoye, Alzhansor, Sorkol, Kisloe mud), heat retention properties, and consistency. The content of heavy metals is below the background concentrations (Akhmedenov, 2020; Akhmedenov & Khalelova, 2021).

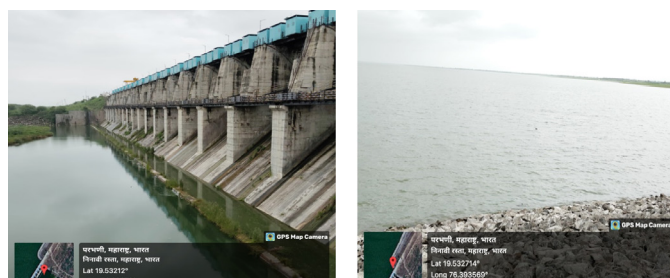


Figure 1: Lower Dudhana Dam,Wakdi

CONCLUSION

This paper has examined the physico-chemi characteristics of samples collected from Characterization of Lower Dudhana Dam mud showed quite rich in chemicals and minerals.

ACKNOWLEDGEMENTS

Author is grateful to the Principal, Swami Vivekanand Senior College, Mantha-431504. Dist. Jalna (M.S.) India and for providing necessary facilities.

REFERENCE

1. Abdel-Fattah A and Pingitore N E(2009) Environmental Geochemistry and Health 31 (4) 487-492.
2. Akhmedenov, K. M. (2020). Tourist and recreational potential of the salt lakes of Western Kazakhstan. *Geo Journal of Tourism and Geosites*, 30(2),782–787. <https://doi.org/10.30892/gtg.302spl01-505>
3. Akhmedenov, K. M., & Khalelova, R. A. (2021). Salt lakes of the West Kazakhstan region as objects of medical tourism.
4. Calderan, A., Carraro, A., Honisch, C., Lalli, A., Ruzza, P., & Tateo, F. (2020). Euganean therapeutic mud (NE Italy): Chlorophyll a variations over two years and relationships with mineralogy and geochemistry. *Applied Clay Science*, 185,105361. <https://doi.org/10.1016/j.clay.2019.105361>
5. Jagtap ,J.T (2023). Hydrobiological Study of Lower Dudhna Dam,Wakdi, Dist. Parbhani (M.S.) IndiaInternational Journal of Scientific Development and Research Volume 8 Issue 7. 998-400.
6. Khlaifat A, Al-Khashman O, and Qutob H(2010) Materials Characterization 61 564-568. Kudish AI, Abels D and Harari M (2003) International Journal of Dermatology 42 (5) 359-365.
7. Poprygina, T., Klokova, V., & Ponomareva, N. (2020). Experimental (laboratory) research of dead sea salts (Israel). *Applied Information Aspects of Medicine (prikladnye Informacionnye Aspekty Mediciny)*, 23(2), 122–126.
8. Proksch E, Nissen H P, Bremgartner M and Urquhart C (2005) International Journal of Dermatology 44 (2) 151-157.
9. Xiaojing Tian · Yafei Zhang · Haichao Li · Yuzhen Jiao · Qiuli Wang · Yumeng Zhang Ning Ma · Wenhong Wang. (2022) Property of mud and its application in cosmetic and medical
10. felds: a review Environ Geochem Health, <https://doi.org/10.1007/s10653-022-01228-6>.