

Geoarchaeology of Lonar Lake, Buldana Districts of Maharashtra, India

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Abstract:

Lonar lake is unique crater, bowl shaped circular depression filled with saline water, in Deccan Trap (basalt) of Central India. It has depth of 130m and a diameter of 1.83 km (rim to rim) which is located in Buldhana district of Maharashtra. The origin of Lonar lake has been a topic of controversy for the last two centuries. So, on the basis of the presence of ancient remains and artifacts, the authors tried to reconstruct the paleoenvironmental conditions of the same and its surrounding areas.

Introduction

Throughout the world the tectonic related effects of mountain building, faulting, earthquakes and volcanism have influenced the prehistoric record. Earth movement, folding, faulting associated with crustal rifting resulted in the creation of lakes used by prehistoric human, as well as in the exposure and discovery of ancient remains and artifacts (Rapp and Hill, 2008). By keeping the same in mind and to reconstruct the paleoecology of the Lonar crater and surrounding areas, excessive explorations were undertaken in this area.

Lonar saline lake has a unique crater-like depression within otherwise flat table-top country of Deccan Traps (Fig. 1). It is located 19° 58' N, 76° 31' E (Survey of India, 1948) in the southern portion of Buldhana district of Maharashtra (Fig.2). The 130m deep Lonar crater measures approximately 1830m in diameter at the top of its encircling rim. The saline lake water (pH >8) and its marshy eco-surroundings host a wonderful collection of flora and fauna of the Lonar wild life sanctuary.

The query of its origin has been a topic of scientific deliberations on for the last two centuries. One school of thought considered it as a sort of a volcanic explosion of central type whereas the other was of the view that the formation was due to the impact of extraterrestrial bodies like comets, asteroids or meteorites on the surface of the Earth and the event is dated back to about 50000 years ago (Fredricksson, et al. 1973).

The crater has a continuous exposure of basaltic flows along its inner slope and is surrounded by a persistent blanket of ejecta breccias with angular bigger rock chunks (fragments) embedded in a finer rock matrix and has a hummocky appearance. The most important of these breccias is the 'suevite' that contains cogenetic glassy fragments. Besides, a pre-crater black, clay-rich soil (palaeosol) below the ejecta blanket is also found at places (Bains and Sabale, 2008). Therefore, due to such controversy, this has attracted geoscientists from all over the world. Many attempts were made in the past to establish the genesis of this crater.