

# Impact related deformation within and around the proposed Kaveri Crater, southern India.

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## ABSTRACT

Occurrence of an extraterrestrial impact crater, named as Kaveri crater, has been proposed from the southern Indian peninsula. This crater, with a diameter of about 120 km, could be the fourth largest on the surface of the Earth. Initial findings regarding this crater have already been published (Subrahmanya and Prakash Narasimha, 2017). In the present work, we provide additional primary and supporting evidences. Shatter cones are observed within the crater, while the radial and concentric fractures are present outside the crater rim. Besides, Planar Deformation Features are found to be present in quartz and plagioclase. Indirect evidences point its formation around Neoproterozoic – Cambrian boundary.

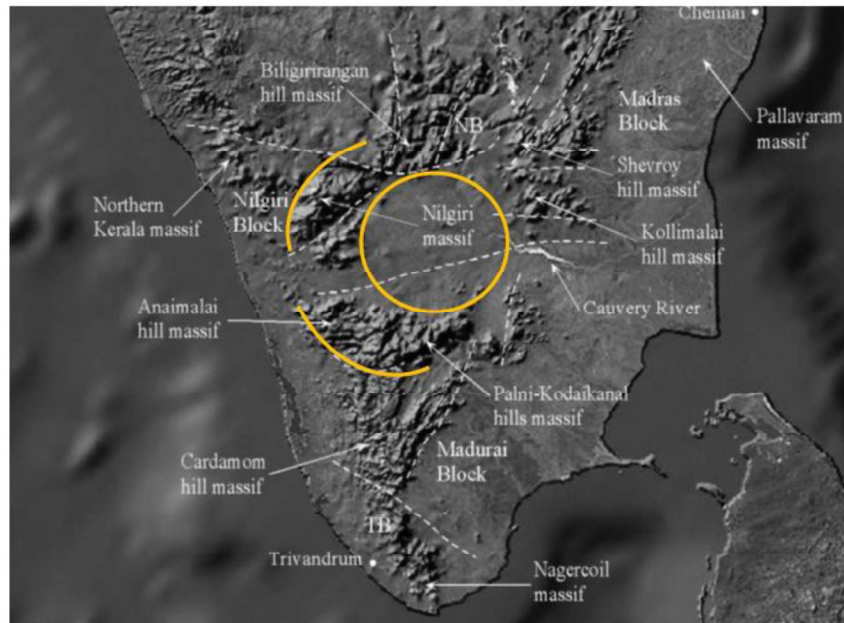
**Key words:** Kaveri crater (South India), Impact structure, Deformation, Shatter cone, Planar Deformation Features.

## INTRODUCTION

Southern Indian terrain predominantly consists of Precambrian schists, gneisses and granulites. Within this terrain, there is a circular depression, bound by a mountainous terrain. All the hill ranges around this structure, have a steep slope facing the depression and a gentle slope in the other direction. Subrahmanya (2007) suggested that this physiographic anomaly to the east of the Palghat Gap, could have been resulted due to an extraterrestrial impact. Subsequent field and laboratory investigations too provide supporting evidences (Subrahmanya and Prakash Narasimha, 2017). The present paper provides additional significant structural evidences in the support of impact origin of this crater.

## STRUCTURE

South of Anaimalai–Palani–Kodaikanal hill range, there is a major break in the gradient. This is a part of the Karur–Kambam–Painavu–Trichur shear zone (KKPTSZ). Northwest of Nilgiris, there is a similar break. These two regions indicated by arcs in Figure 1, are listric faults and apparent rim of the proposed crater. Reddy et al. (2003) who have made detailed geophysical investigations of the region, have expressed the view that the Nilgiris and Kodaikanal granulite massifs, have undergone uplift during the Phanerozoic period. Apparent rim and listric faults are not prominent to the north, northeast and east of the crater, because the radial fractures dominate in this region.



**Figure 1.** Shaded relief map of the proposed Kaveri crater (yellow circle). Yellow arcs south of Anaimalai Hill Massif and north-west of Nilgiri massif, represent apparent rim and listric fault. Dashed lines indicate fractures/faults/shear zones which radiate from the crater (Modified from Rajesh and Santosh, 2004).