

CERAMAH TEKNIK TECHNICAL TALK

Signature of mass mortality of fauna and high temperature pressure event preserved in Late Cretaceous bone bed of Fatehgarh Formation of Barmer Basin, India

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Abstract: Bone bed of Fatehgarh Formation (FGF) is an important entity of the petroliferous Barmer Basin, western Rajasthan, India as it preserved signatures to endorse various global events such as Late Cretaceous phosphogenesis, K/T boundary, mass extinction of fauna, and unusual impact event. The 12 meter thick phosphorite facies of FGF display almost all spectrums of phosphorite types and representing global Late Cretaceous phosphogenic event in N-W India. Among these types, the 15cm thick bone bed (event bed) is a principle phosphorite facies of FGF. It is characterized by their significant biogenic and unusual magnetic framework elements. The biogenic framework elements include vertebrae, dental plates, teeth, spines and scales of microvertebrates along with teeth, bones, bone fragments, cranium, vertebrae, phosphatic dungs of crocodile, dinosaur and turtles. Maastrichian age is suggested from the close faunistic association of biota of the bone bed which represent near shore marine. The five cms thin, discontinuous layer in the topmost part of the bone bed represent the K/T boundary which is characterized by the presence of ejecta material including magnetic spherules, fine magnetic dusts and microbracciaded matrix. The petrographic and geochemical analysis of these high temperature pressure objects indicate impact event that brought significant biological changes perhaps Mass extinction of the Fatehgarh biota. To recognize impact structure, at first instance, geomorphologically, the potential candidate in western India, seems to be Siwana Ring Complex (SRC) which is situated about 130kms from Barmer city.

The SRC is composed of rings of granites nestling around Siwana and covers an area of 290 km². To recognize, it as impact crater, following evidences are significant: Mathur *et al.* (2009) and Tripathi *et al.* (2010) reported the presence of coesite and stishovite minerals from the magnetic particles recovered from the SRC. Additionally, the deformational field features such as shatter cones, impact melt and lithic breccias, pseudotachylite, impact melt sheets and microscopic features such as diaplectic glasses; planar deformation features (PDFs) in minerals, diagnostic textures and microstructures of the impact melt. These evidences are diagnostic target rock deformation features derived due to an impact at SRC (Mathur 2016, under communication).