

Discovery of Shocked Quartz in a Possible Ejecta Deposit of 0.79 Ma Impact at Huai Om Section, NE Thailand

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Impacts of extraterrestrial body can cause catastrophic effects on the environment of the Earth. Strewn field of Australasian tektite is the largest (covering SE Asia ~ Antarctic) and youngest (0.79Ma) among the four known tektite strewn fields, and relevance to the large flood deposits in NE Thailand and the last occurrence of hominid in the Sangiran area, Java have been suggested (Haines et al., 2004, Hyodo et al., 2011).

Although it has been estimated that the location of the impact crater is in eastern part of Indochina peninsula, the crater has never been found and the nature of the impact event is not well understood (e.g. Glass and Koeberl, 2006). Since the thickness of an ejecta layer should decrease with distance from the crater, the distribution of the ejecta layer is important for more precise estimation of the crater location. Although the ejecta layer of the impact event has been identified as microtektite layer in marine sediment core, it has never been identified on land.

The purpose of this study is to identify the ejecta layer in Indochina peninsula. A field survey was conducted in NE Thailand. Fiske et al. (1996) described Huai Om section, Ubon Rathcathani Province and reported layered (Muong Nong type) tektites from the near surface deposit (ca. 2 m below the ground surface). In this study, we described the stratigraphy and lithology at Huai Om section. The whitish gray silt deposit unconformably overlaying cretaceous sandstone includes angular pebbles of red sandstone. We observed quartz grains from the silt matrix under a polarizing microscope and found quartz grains with lamellae. The orientations of lamellae in quartz were measured using a universal stage and we confirmed that they coincide with that of PDFs (Planar Deformation Features) observed in shocked quartz. This is the first report of shocked quartz relevant to this impact event from on-land exposure in Indochina peninsula. We conclude that the deposit at Huai Om section is the ejecta layer of 0.79Ma impact event.