Seismicity along the Moradabad Basement Fault in the Central Ganga Plain: A Geological and Geophysical approach

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The basement of Indo-Gangetic plain is characterized by various fault bounded ridges and troughs. These Basement faults have great influence on the Ganga Plain tectonics. In response to the stress generated along the Himalaya these basement faults propagate surface ward and affect the sediment cover. This results in the form of Earthquakes along these basement faults. The present study shows several field evidences of surface deformation caused by the Moradabad basement fault. Soft sediment deformation structures (seismites) and surface faults are found at four different locations on the trace of the Moradabad basement fault in the upper Ganga Plain. Ground Penetrating Radar (GPR) survey across the fault also provides evidence of shallow subsurface deformations. The epicenters of historical earthquakes are concentrated along the Moradabad basement fault. The deformations can be attributed to possible pre-historic earthquake events associated with Moradabad basement fault as other impulsive stresses like slope instability, flood surges and rapid sediment deposition are absent. Close association of these secondary faults and deformation structures with the Moradabad basement fault indicate their origin is due to the stress release along this fault generated by Himalayan tectonics.

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