



Geological indicators of a suspected seismic source from Peninsular India

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An increase in seismicity in Peninsular India during the last few decades has initiated various studies for identifying seismogenic structures and their behaviour. Even though few earthquakes occurred at well defined structures many of them occurred at unexpected locations where no previous seismicity reported. However, studies subsequent to the 1993 Latur earthquake as well as the studies at different parts of peninsular India, have led to the identification of pre-existing faults that have activated in the past. Studies elsewhere in the cratonic hinterland also show that the damaging earthquakes occur on pre-existing faults with a recurrence period of tens of thousands of year

Studies subsequent to 1989 Wadakkancheri earthquake ($M=4.3$) identified Desamangalam fault which are capable of generating earthquakes. However, it is noted that a number of later events are occurring much south of the Desamangalam fault. We identified a set of NW-SE trending lineaments which are influencing the drainage pattern of the area. A network of paleochannels is also observed in the remote sensing analysis and field studies in this area. Regionally these lineaments meeting one of the major lineaments in central Kerala called Periyar lineament, in the south. Charnockite rocks constitutes the major rock type of the region. These rocks at places developed strong foliation similar to the lineament direction. Detailed field studies identified oblique movement (reverse and strike slip component) along NW-SE trending faults which are dipping south-west. The studies also find NNE-SSW trending vertical faults showing strike-slip movement. The damage zones of each of these faults bears different mineral precipitations and gouge injections of episodic nature. The presence of loose gouge may indicate the faulting is a much later development in the brittle regime. The sense of movement of the observed faults may indicate that the various river/drainage abandonment observed in the area are due to the movement of these faults. The correlation of the ongoing earthquake activity with these faults and their sense of movement akin to the present stress condition of Peninsular India and its episodic nature as well as its influence on the drainage network of the area may indicate that these faults may be adjusting to the present tectonic regime and are capable of producing moderate events.

Key words Peninsular India, stress regime, lineaments, brittle deformation