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Provenance Variability during Damuda Sedimentation in the Talchir Gondwana Basin, India – A Statistical Assessment

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ABSTRACT

The Talchir Gondwana basin houses the Talchir Formation at the base, succeeded by the Damuda Group and the Kamthi Formation in upward progression. The present study is an attempt to determine the provenance of the Damuda Group and its variability in terms of location, climate and tectonism through time from the composition of sandstone grains and detritus of the constituent Karharbari, Barakar and Barren Measures formations. The Damuda sandstones are composed of variable amounts of monocrystalline undulatory, nonundulatory and polycrystalline quartz grains, potash and plagioclase feldspars as well as metamorphic and sedimentary rock fragments in addition to heavy accessories. Palaeocurrent studies suggest that the Eastern Ghats Supergroup lying to the south of the basin served as the source area of the Damuda sediments. Plots of sandstone composition in tectonic setting discrimination diagrams suggest derivation of the detritus from craton interior, continental block and recycled orogen provinces. Statistical analyses indicate significant differences in the detrital modes of the sandstones of the Karharbari, Barakar and Barren Measures formations, which may be attributed to temporal and spatial variation of the provenance coupled with climate change in commensurate with Damuda sedimentation.

KEYWORDS

Provenance, Damuda Group, Talchir Gondwana Basin, Statistics

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