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Occurrence of an Outlier of Lower Gondwana sandstone in the Bela- Mangruda area, Adilabad district, Telangana State, India

Barman.D.¹, Ananda Murthy. S.²

¹ Geological Survey of India, Hyderabad, India, 500068, email: digantab40@gmail.com.

² Geological Survey of India, Hyderabad, India, 500068, email: s.murthy.gsi@gov.in

The northwest-southeast trending Pranhita-Godavari basin, where Gondwana sediments were deposited is an important tectonic feature in the Peninsular India. The north western flank of this basin is occupied by unmetamorphosed Proterozoic succession of limestone and shale designated as the Penganga Group. An Outlier of Barakar Sandstone was reported for the first time in the south of Mangruda village, Adilabad district. It is surrounded by the Proterozoic limestone-shale assemblage of the Penganga Group. In the northern peripheral part of the outlier, Talchir litho-units exhibiting a typical glacial depositional environment are recorded. The occurrence of Barakar Sandstone outlier amidst the Proterozoic rocks gives clues to the tectonic evolution of the area. At the contact of Barakar and Talchir formations occurs a peculiar structure known as sand pseudo-pillow, which has been recorded for the first time in the Pranhita-Godavari basin. The Barakar Sandstone is in faulted contact with the Mangruda Limestone on the eastern, southern, northern and north western flank and with the Bela Shale on the western flank. Evidences of faulting like the presence of small scale micro-faults, micro- step faults and silicification along fracture planes were noticed. It is evident that, the younger Gondwana sandstone is surrounded by the older Penganga Group forming the outlier. Tectonic activity during post deposition leads to the formation of horst and graben structure. Later widespread erosion activity removes the younger formation of the horst block leaving the older formation exposed surrounding the down thrown younger formation of the graben forming an outlier. From the field evidences it is presume that both the Penganga and Gondwana sedimentation was, in fault controlled troughs of a successor type basin. The faulting continued penecontemporaneously with the deposition. It was only during the early stages of the Gondwana deposition that the sedimentation overlapped the main trough and is now preserved as outliers beyond the main trough.

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