

SPECTRUM OF PROTEROZOIC FLUVIAL REGIMES: INSIGHTS FROM VINDHYAN SUPERGROUP, INDIA

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The Proterozoic Vindhyan Supergroup of central India contains a number of fluvial and fluvio-deltaic sediment bodies occurring throughout the succession, interspersed with shelfal strata, providing the opportunity to visualize the spectrum of fluvial regimes that existed in the pre-vegetational landscape. Four suites of fluvial deposits have been recognized: 1. Pebbly and coarse sandstone, 2. Medium sandstone, 3. Medium sandstone with interbedded mudstone and 4. Medium sandstone with signatures of wave-tide reworking. Tangible aeolian sandsheet deposits occur in the second and third suites. Except the first suite, the other suites form basin-wide, sheet-like bodies. Laterally and vertically superposed channel-belt sediment bodies, 5-20 m thick and tens of kilometers wide that often show undulating, erosional bases characterize the fluvial deposits. The channel-belt sediment bodies show stratifications produced by 1) transverse compound bedforms (foreset macroforms) 2) large-scale simple bedforms and 3) vertical channel-form filling. Macroforms internally show centimeter to meter-scale trough, planar and sigmoidal cross-stratifications that often grade into meter-thick sets of parallel-lamination. Aeolian sandsheets occurring interbedded with the fluvial deposits show stratifications produced by ripples, small longitudinal and transverse dunes. It is inferred that the four suites represent 1) basin marginal, high-gradient fluvial systems, 2) vast, basinwide braidplains of intermediate gradient characterized by abundance sigmoidal cross-stratification and plane-lamination, 3) low-gradient alluvial plains that could trap mud and resulted into multiple braided channel-belts with intervening muddy flood plains and 4) braid-delta. Frequent reworking of fluvial sediments by persistent aeolian dynamism also appears to be a characteristic feature of the Proterozoic alluvial plains.