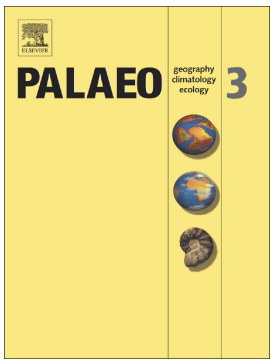

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Postrift deltaic sedimentation in western Kachchh Basin: Insights from ichnology and sedimentology

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ABSTRACT:

The postrift stage in the pericratonic Kachchh Rift Basin of western India is represented by a thick sequence of a diachronous megadelta system. The deposition of this deltaic sequence was initiated during the mid-Kimmeridgian and ended in the Albian. The sedimentation was interrupted by two transgressive events demarcating three subcycles within the megadelta system. The present study addresses the older mid-Kimmeridgian to Tithonian "Jhuran Delta." An attempt is made here to delineate the nature of the Jhuran Delta using the ichnological and sedimentological parameters. The Jhuran Delta, which consists of 14 lithofacies, is grouped into seven lithofacies associations corresponding to the prodelta, subaqueous gravity flow, delta front, distributary channel, distributary mouth bar, and shoreface depositional environments along with a transgressive unit overlapping the lower delta of the megadelta system. Three distinct stages of deltaic evolution are delineated along with the fourth stage of transgression and delta destruction. The prodelta environment of Stage I is characterized by moderate ichnodiversity represented by nine recurring ichnotaxa, suggesting alternating brackish and fully saline water conditions, which indicate river-dominated deltaic sedimentation. Stage II shows a marked increase in the influence of river (fresh water) water, as indicated by a submarine mass failure that includes debris flow, chaotic and contorted structures, sediment gravity-failure and water-escape structures and suggesting a higher rate of sedimentation. Ichnologically, this phase indicates low ichnodiversity with sporadic occurrences of *Ophiomorpha* and *Palaeophycus*. Stage III indicates the mixed dominance of river and wave processes. Sediments deposited in the delta front environment show moderate ichnodiversity with nine ichnotaxa. The distributary mouth bar environment comprises 6 recurring ichnotaxa including the ichnoassemblages of both river and marine wave environments. Integrated ichnological data suggest deposition in a mixed environment. The Jhuran Delta stage ended with