From Desert to Monsoon: Irreversible Climatic Transition at ~36 Ma in Southeastern Tibetan Plateau

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Although there is increasing evidence for wet, monsoonal conditions in Southeast Asia during the late Eocene it has not been clear when this environment became established. Newly radiometrically dated Eocene sedimentary rocks from the Jianchuan Basin located in the southeast flank of Tibetan Plateau now provide a section whose facies and climatic proxies constrain this evolution. Semi-arid conditions dominated Paleocene to mid Eocene period, culminating with development of desert dunes in late Eocene, which constitutes part of the wide arid zone in East Asia closely associated with the northern Westerly Jet without the blocking of high Tibetan Plateau. From 36 Ma onwards, the basin began to accumulate swamp sediments with coals, together with synchronous braided river deposits, indicating significant increase in precipitation. This remarkable and irreversible transition from dry to wet conditions precedes the E/O boundary at 34 Ma, thus excluding general global cooling as a prime driver. We suggests that uplift of Tibetan Plateau might have reached a threshold level by that time which divided/weakened the Westerly Jet and thus gave way to monsoon rains to intrude into this downwind locality.

Keywords: desert, onset of Asian monsoon, Tibetan Plateau, late Eocene

