Timing of Earliest India-Asia Contact: Evidence of Terrestrial Vertebrates from Cambay Shale, Gujarat, Western Peninsular India

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India's physical and biotic links following its break-up from the Gondwana supercontinent continue to be debated in the context of geodynamic plate tectonic models (Ali and Aitchison, 2008). One of the most interesting, though controversial, issues concerns the timing of the collision between India and Asia, for which estimates ranging from approximately 65 to 35 Ma have been proposed. The collision was characterized by major faunal changes that include the origin and radiation of new mammalian communities in the Indian subcontinent, documented in recent years from the Eocene sedimentary sequences of Kutch and Surat (Gujarat) and the Subathu Formation of NW Himalaya in Himachal Pradesh and Jammu & Kashmir. A major recent find is the early Eocene (ca. 54-55 Ma) terrestrial vertebrate fauna which was discovered in a lignite mine at Vastan, District Surat (Gujarat state), western India (Bajpai et al. and others, 2008 a,b; Prasad and Bajpai, 2008). These Vastan mammals constitute the oldest record of the Cenozoic terrestrial mammal fauna of South Asia, and the described taxa include primitive members of several placental land mammal orders including artiodactyls, perissodactyls and primates (APP taxa). Elsewhere, in the holarctic (northern) continents, these mammalian taxa make their first appearance slightly earlier (ca. 55.5 Ma), during the intense warming interval that coincided at the Paleocene-Eocene boundary.

The presence of early Eocene holarctic mammals in India, especially those of medium-to-large size date the earliest Cenozoic faunal exchanges between India and Eurasia, providing independent evidence that subareal contact was established between these landmasses by at least 54 Ma, in response to the initiation of India-Asia collision. The Vastan data also raises the possibility of an Indian origin and subsequent migration to northern continents for some of the modern groups.

References

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