Climate- Himalayan Tectonic Interactions in the Context of the Asian Monsoon

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Upliftment of Tibetan-Himalaya, mostly since ~50 Ma, is hypothesized to have intensified the Asian monsoon system. This in turn has a powerful effect in controlling weathering and erosion and thus the exhumation of deep-buried rocks in the Himalaya and other Cenozoic mountains across Asia. Erosion of these mountains has constructed the largest sediment bodies on Earth and buried large volumes of organic carbon, which may, along with the weathering of silicate minerals under the influence of monsoon rains, be a powerful control on atmospheric CO2, itself a major control on climate. The potential for large feedbacks between tectonic, climatic and weathering and depositional processes is enormous, with possible influence over global climate. However, the timing and patterns Tibetan-Himalayan surface uplift are still poorly understood and controversial. Recently, an international team of researchers have discovered that the Indian continental crust was subducted to a minimum depth of 200 km under the Asian plate (*Pandey et al., Geology, in press*)1. This discovery would have significant implications on rate of upliftment of Tibetan-Himalaya system. In light of this discovery, revised rate of upliftment of the Tibetan-Himalaya system, during different time windows have been computed (*Pandey et al., Nature, under review)2*. This study shows that the rate of uplift of the Tibetan-Himalaya system during 50 to 40 Ma was similar to the plate motion rate of the Indian tectonic plate (*Pandey et al., Nature, under review*). However, since 40 Ma the rate of upliftment of the Tibetan-Himalaya system is decreasing in a phased manner. We have proposed a model that the rate of upliftment of the Tibetan-Himalayan system is controlled by the rate of motion of the Indian plate in corresponding time windows (*Pandey et al., Nature, under review*). Further studies are required to relate the variations in monsoonal intensity with the newly deciphered rate of upliftment of Tibetan-Himalaya.

1. Pandey, Anju, Leech, Mary., Milton, Andy, Singh, P., Verma, P.K. 2010, Evidence of former majoritic garnet in Himalayan eclogite points to 200 km deep subduction of the Indian continental crust. ***Geology, 2010, (in press).***

2. Pandey, Anju, Leech, Mary, Milton, Andy., Rate of upliftment of the Tibetan-Himalayan system related to the rate of subduction of the Indian tectonic plate? ***Nature, (under review).***

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