

Linkage between the Himalaya-Tibetan plateau and Asian Monsoon: Overview and new findings

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Our recent study revealed that the metamorphic nappe in the Himalaya stopped its southward advancement at 11 to 10 Ma and the frontal range of the Himalaya started its rapid uplift at 1 Ma. In addition, our data suggest that the Himalaya has reached present elevation at least before 11 Ma. Several lines of evidence on the paleo-altitude of the Tibetan plateau commonly indicate that the Tibetan plateau has also reached present elevation by ~14Ma: timing of onset of N-S trending normal faults caused by E-W extension, estimate of paleo-altitude by means of middle Miocene fossil plants and $\delta^{18}O$ of carbonate in the graben-fill. Strong upwelling during 10 to 8 Ma, which has hitherto been considered to be evidence of beginning of Indian summer monsoon, is reported not only from Indian Ocean but also from Pacific Ocean and Atlantic Ocean. It might be linked to global cooling caused by expansion of Antarctica ice-sheet at 10 to 8Ma. We must re-examine the linkage between evolution and uplift of Himalaya-Tibetan plateau and development of monsoon climate, taking new discovery that the middle crust of Tibet is partially melted into consideration.