



Qinghai-Tibetan Plateau uplift and growth shape vegetation and biodiversity in Asian monsoon area

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The Qinghai Tibetan Plateau (QTP) uplift and growth during the Cenozoic dramatically altered the Asian monsoon system thus fundamentally changed the ecosystem and biodiversity in East Asia, yet the QTP uplift history and its effect on vegetation and biodiversity are a matter of debate. We conducted sensitivity experiments using HadCM3 climate model with 18 different QTP uplift conditions based on Late Oligocene (21.8–23.3 Ma) topography. We investigated the mechanisms underlying influence of the QTP uplift on vegetation and biodiversity in East Asia. We show that the QTP uplift and growth was crucial for the evolution of vegetation and biodiversity by reconfiguring monsoon patterns and intensifying both summer and winter precipitations. The winter precipitation may play an important role in regulation vegetation and plant species in this area. The northeast Tibet is much more important than southeast part of the QTP in controlling the climate and vegetation, suggesting that the QTP uplift and growth from southwest to northeast, confirming previous geological researches.