



Sundaland's subsidence requires revisiting its biogeography

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It is widely accepted that sea level changes intermittently inundated the Sunda Shelf throughout the Pleistocene, separating Java, Sumatra and Borneo from the Malay Peninsula and from each other. On this basis, the dynamics of the biodiversity hotspot of Sundaland is consistently regarded as solely contingent on glacial sea level oscillations, with interglacial highstands creating intermittent dispersal barriers between disjunct landmasses. However, recent findings on the geomorphology of the currently submerged Sunda shelf suggest that it subsided during the Pleistocene and that, over the Late Pliocene and Quaternary, it was never submerged prior to Marine Isotope Stage 11 (MIS 11, 400 ka). This would have enabled the dispersal of terrestrial organisms regardless of sea level variations until 400 ka and hampered movements thereafter, at least during interglacial periods. Existing phylogeographic data for terrestrial organisms conform to this scenario: available divergence time estimates reveal an 8- to 9-fold increase in the rate of vicariance between landmasses of Sundaland after 400 ka, corresponding to the onset of episodic flooding of the Sunda shelf. These results highlight how reconsidering the paleogeographic setting of Sundaland challenges understanding the mechanisms generating Southeast Asian biodiversity.