



Savannah vegetation largely distributed on the north equatorial Sundaland during the Last Glacial Maximum

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The Sunda Shelf was mostly exposed during the Last Glacial Maximum (LGM) sea level lowstands. The vegetation on it is important for quantifying the change of global terrestrial carbon storage, however its vegetation distribution is ambiguous. Savannah is inferred from biogeographical evidences to occupy the exposed shelf while rainforest contracted into a 'refugia' condition; but model simulations and sediment records imply that no broad savannah existed, rather, the rainforest was maintained and even expanded during the LGM. Well dated vegetation record on the northern Sundaland is still scarce, here we use the leaf wax n-alkane distribution from a marine sediment core (MD05-2894, 7°2.25'N, 111°33.11'E, water depth 1982 m) closing to the Sundaland paleo river mouths to reconstruct the vegetation changes over the past 22,000 years. The Average Chain Length (ACL) and the n-alkane C₃₁/(C₂₉+C₃₁) index are highest during the LGM and Heinrich stadial 1 (HS1), then decrease gradually through deglaciation and early Holocene to their minimum at around 2 ka. We show that even though prominent fluvial input may carry substantial riparian signal, and overestimate the rainforest vegetation distribution, Savannah still expanded significantly during the LGM compared to modern and the Holocene. Rainforest distribution was limited on exposed shelf possibly except for northern Borneo. Thus we hypothesize that savannah vegetation dominated the northern Sundaland during the LGM.