

Researchers trace evolution of Kaziranga to the last great Home of the one-horned rhino

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From the mud below the wetlands of Assam's Kaziranga National Park (KNP), has emerged a story of how residence of the one horned Rhino has evolved through climate change, vegetation shifts, exotic species invasion, and herbivore activity.

Rapid urbanization, industrialization, and deforestation, together with natural hazards such as floods, droughts, earthquakes, and landslides, are driving global ecological degradation and accelerating biodiversity loss. Northeast India, part of the Indo-Burma biodiversity hotspot, hosts numerous endangered species facing extinction risk. Late Quaternary megafaunal extinctions remain a major global concern, with their causes still debated; today, nearly 60% of large herbivores are threatened worldwide, and Southeast Asia has the highest number of at-risk species. Kaziranga National Park, a UNESCO World Heritage Site, is a stronghold of megaherbivores, notably the Indian one-horned rhinoceros.

Scientists from Birbal Sahni institution of Palaeosciences (BSIP), an autonomous institute of the Department of Science and Technology (DST), used pollens from mud below wetlands in KNP to trace the first long-term palaeoecological records in relation to the palaeoherbivory from KNP.

The researchers extracted a sediment core just over a metre long from the Sohola swamp inside Kaziranga National Park. Layer by layer, this mud acts like a natural archive, preserving microscopic traces of the past. Among these traces are pollen grains from plants and fungal spores that thrive on animal dung.

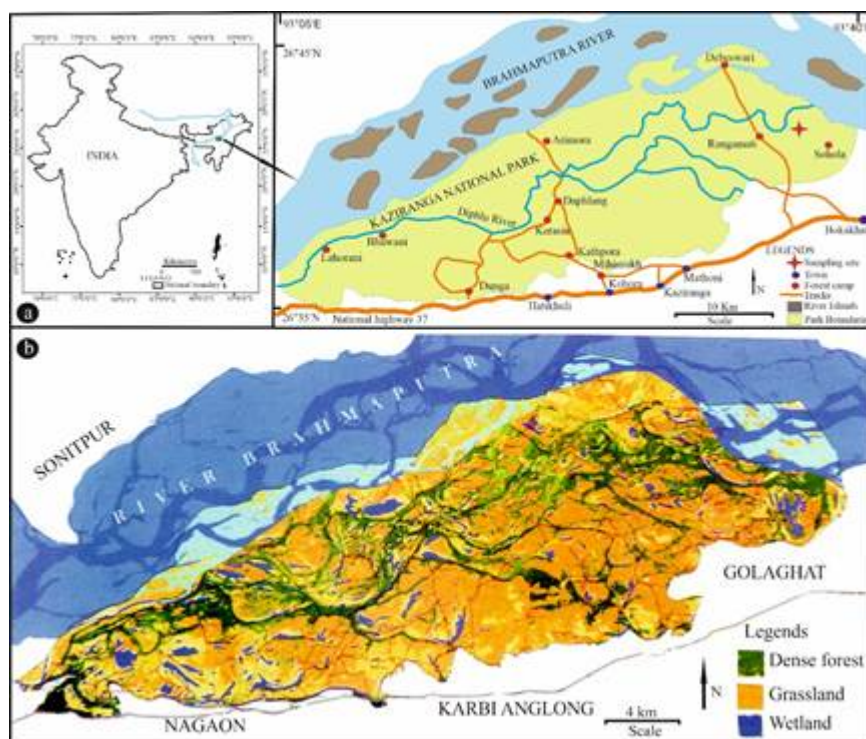


Fig 1: a. Location map of the sampling site, b. Vegetation coverage map of the Kaziranga National Park (after Das et al., 2014).

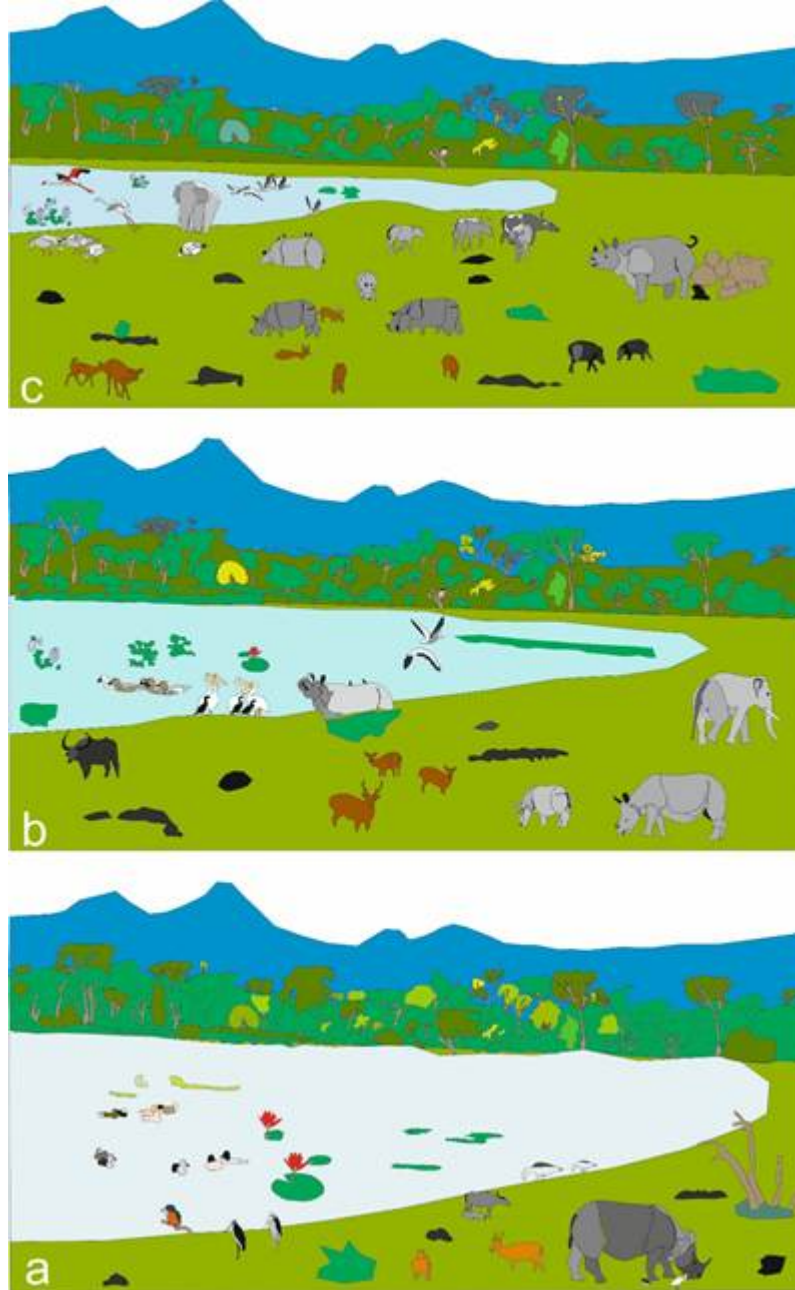


Fig 2: *A model (schematic view) of palaeovegetation and palaeoherbivory activities in the KNP, a. Dense forest with wider and swamp condition with low wildlife activities, b. Relatively less dense and less deep water with increased wildlife activities, c. Comparatively more less dense forest and less deep swamp with more increased wildlife activities within KNP.*

The study (published in journal, 'Catena' (Elsevier)) highlights that Kaziranga's present landscape differs markedly from its past and documents the regional extinction of megaherbivores, including the Indian rhinoceros, from northwestern India due to climatic amelioration during late Holocene, especially during the Little Ice Age and increasing human activities. In contrast, northeastern India remained relatively climatically stable, facilitating eastward migration and eventual concentration of rhinoceroses in Kaziranga.

The study which examined the reasons behind the decline and present confinement of megaherbivores, especially the Indian one-horned rhinoceros, to Kaziranga National Park shows through fossil evidence that the species was once widely distributed across the Indian subcontinent, but this distribution greatly reduced since the Holocene. Over the last ~3300 years, northeastern India remained relatively climatically stable with lower human pressure, while habitat loss, climate deterioration, and overhunting in northwestern regions forced rhinoceroses to migrate eastward and eventually concentrate in Kaziranga.

The study demonstrates how long-term vegetation and climate changes shaped wildlife survival, migration, and extinction, providing long-term ecological knowledge that can help guide better conservation and wildlife management under present and future climate change.

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