

Exploiting the Genomic Record of Living Biota to Reconstruct the Landscape Evolution of South Central Africa

Initiative: Außergewöhnliches

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In this "off the beaten track" interdisciplinary research project, we are conducting a proof of concept study to refine and expand an entirely novel, geobiotic approach to reconstruct landscape evolution with unprecedented accuracy. It integrates dated events in fish and landform evolution across a tectonically dynamic study area (northern Zambia-Katanga 300 000 km²), where the Upper Congo, Zambezi and Kafue rivers evolved from an ancestral SW flowing drainage rearranged by capture events over the past 20Ma. Whole genome RAD sequencing will determine phylogenetic relationships of four major groups of fishes with high accuracy. These include several cichlid genera (Family Cichlidae) related to those of Africa's Great Lakes, shellfish (Family Kneriidae, two genera), characins (tiger fishes, Hydrocynus) and toothed carps (genus Nothobranchius). Key landforms will be dated with high precision rock dating methods (surface exposure and radiometric approaches) which will then calibrate fish phylogenies. This consistent methodology will allow us to date evolutionary events for biota across unrelated rivers and landscapes, thereby elucidating details of paleoecological events and landform evolution with far greater precision than conventional coarse-scaled methods of landscape dating across the African continent.

Projektbeteiligte

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Open Access-Publikationen

Genomic fingerprints of palaeogeographic history: The tempo and mode of rift tectonics across tropical Africa has shaped the diversification of the killifish genus *Nothobranchius* (Teleostei: Cyprinodontiformes).

East African cichlid lineages (Teleostei: Cichlidae) might be older than their ancient host lakes: new divergence estimates for the east African cichlid radiation