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The human-made forest: evaluating the impact of historical human activity on the present-day floristic composition of rainforest in western Central Africa

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The Central African rainforest block harbours a significant tree diversity with a high degree of endemism and yet remains insufficiently studied to date. Growing evidence suggests that historical human activity has left a heavy imprint on tree community composition, that can blur natural diversity patterns. Indeed, many forest stands we observe today represent the final successional stage of secondary regrowth that initiated when formerly widespread agricultural fields were abruptly left fallow due to forced colonial resettlement policies (*regroupement*) in the early 20th century. However, patterns of rainforest tree community composition and inferences about underlying environmental determinants have for a long time been interpreted while disregarding historical human activity. Here, we use Gabon as a study case to show that forest typologies that unproportionally account large canopy trees and abundant species unveil biased compositional patterns that echo past anthropogenic disturbances instead of natural forest types. We emphasize the importance to integrate understory trees and rare species if we are to identify natural compositional patterns and do so by using a spatially explicit modelling approach. We subsequently explore temporal changes in composition, diversity, functional trait composition and stand structure in post-fallow secondary succession in north-eastern Gabon. We construct space-for-time chronosequences by combining ecological, historical and anthropological data in an innovative approach that aims at cross validating the age of different forest stands.

Key words: Central Africa; rainforest; floristic composition; historical human activity; secondary succession

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