

Palms as a model for rainforest evolution

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Palms provide clues to the diversification of rainforests. Credit: T. Couvreur

(PhysOrg.com) -- The first complete genus-level dated phylogeny of palms reveals insights into the evolution of rainforests.

Understanding how biodiversity is shaped through time is a fundamental question in [biology](#). Even though tropical rainforests represent the most diverse terrestrial biomes, the timing, location and mechanisms of their diversification remain poorly understood. In a recent paper, scientists from the Institut de Recherche pour le Développement (Montpellier), the New York Botanical Garden, and RBG Kew address these issues by constructing the first complete genus-level dated phylogeny of a largely rainforest-restricted plant family, the palms.

Their results indicate that diversification of extant lineages of palms started about 100 million years ago, during the mid-Cretaceous period. Using a range of diversification analyzes, the authors conclude that

palms diversified in a rainforest-like environment at northern latitudes and have conformed to a constant [diversification](#) model (the 'museum' model or Yule process), at least until the Neogene.

These results imply the presence of a rainforest-like biome in the mid-Cretaceous period of Laurasia, considerably earlier than the first reliable fossil evidence for rainforests in the early Tertiary. Controversially, the results also suggest that ancient and steady evolutionary processes dating back to the mid-Cretaceous period can contribute, at least in part, to present day species richness in rainforests, perhaps due to the persistence of refugia during climatically unfavourable periods.

More information: Couvreur, T. L. P., et al. (2011). Origin and global diversification patterns of tropical rain forests: inferences from a complete genus-level phylogeny of palms. *BMC Biology* 9: 44 (open access).

Provided by Royal Botanic Gardens, Kew

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