

The wood anatomical structure between two dated marks reveals periodicity of secondary growth of rainforest species

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Abstract: In the tropics, specifically in equatorial dense rainforests, xylogenesis is influenced by minimal climatic seasonality, and many tropical trees do not exhibit clear growth rings. This makes it challenging to conduct retrospective analyses and predict future tree performance. This research examines the presence, distinctness, and periodicity of growth rings in dominant tree species in two semi-deciduous rainforests that differ in precipitation patterns. We investigated eighteen tree species common to both forests. Using the cambial marking technique, we verified the presence and periodicity of growth-ring boundaries in the wood produced between marking and collection through microscopic and macroscopic observation. The study found that all eighteen species can form visible growth rings at both sites. However, the periodicity of ring formation varied significantly within and between species, and within sites. Trees from the site with a well-defined dry season were more likely to form periodic growth rings compared to those from the site with less pronounced rainfall seasonality. The distinctness of the formed rings, however, did not depend on the site. Periodic growth-ring formation was more likely in fast-growing trees.

KEYWORDS

cambial marking, growth-ring distinctness, periodicity of growth-ring formation, secondary growth, tropical forests