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# Evolution of Philodendron (Araceae) species in Neotropical biomes

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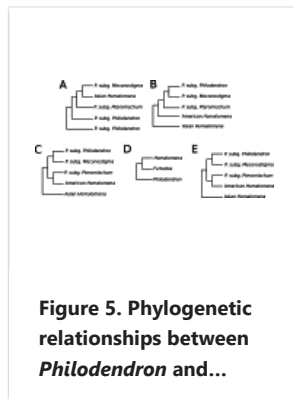
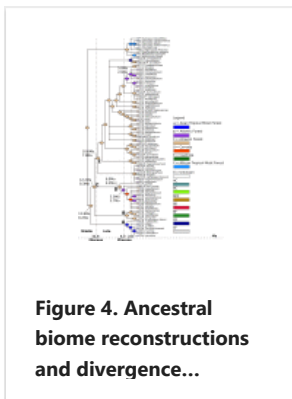
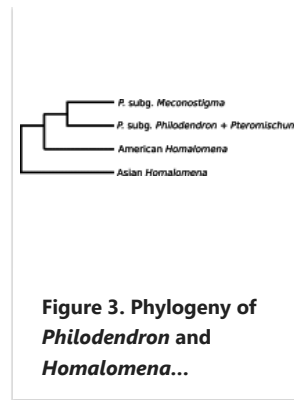
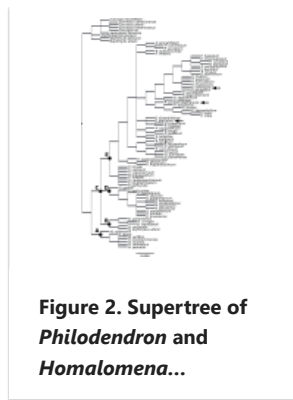
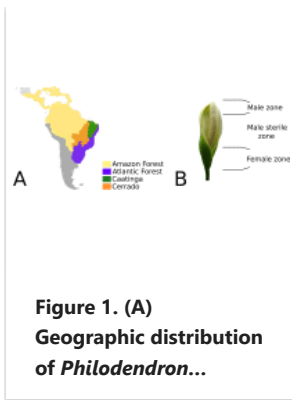
## Abstract

Philodendron is the second most diverse genus of the Araceae, a tropical monocot family with significant morphological diversity along its wide geographic distribution in the Neotropics. Although evolutionary studies of Philodendron were conducted in recent years, the phylogenetic relationship among its species remains unclear. Additionally, analyses conducted to date suggested the inclusion of all American representatives of a closely-related genus, Homalomena, within the Philodendron clade. A thorough evaluation of the phylogeny and timescale of these lineages is thus necessary to elucidate the tempo and mode of evolution of this large Neotropical genus and to unveil the biogeographic history of Philodendron evolution along the Amazonian and Atlantic rainforests as well as open dry forests of South America. To this end, we have estimated the molecular phylogeny for 68 Philodendron species, which consists of the largest sampling assembled to date aiming the study of the evolutionary affinities. We have also performed ancestral reconstruction of species distribution along biomes. Finally, we contrasted these results with the inferred timescale of Philodendron and Homalomena lineage diversification. Our estimates indicate that American Homalomena is the sister clade to Philodendron. The early diversification of Philodendron took place in the Amazon forest from Early to Middle Miocene, followed by colonization of the Atlantic forest and the savanna-like landscapes, respectively. Based on the age of the last common ancestor of Philodendron, the species of this genus diversified by rapid radiations, leading to its wide extant distribution in the Neotropical region.

**Keywords:** Amazon; Andes; Biogeography; Dispersal; South America; Supertree.

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