
Abstract

Phylogenetic relationships among 122 species of Lauraceae representing 44 of the 55 currently recognized genera is inferred from sequence variation in the chloroplast and nuclear genomes. The trnL-trnF, trnT-trnL, psbA-trnH and rpl16 regions of cpDNA, and the 5' end of 26S rDNA resolved major lineages, while the ITS/5.8S region of rDNA resolved a large terminal clade. The phylogenetic estimate is used to assess morphology-based views of relationships and, with a temporal dimension added, to reconstruct the biogeographic history of the family. Results suggest Lauraceae radiate when trans-Tethyan migration was relatively easy, and basal lineages are established on either Gondwanan or Laurasian terrains by the Late Cretaceous. Most genera with Gondwanan histories place in Cryptocaryeae (sensu van der Werff & Richter, 1996), but a small group of South American genera, Chlorocardium-Mezilaurus clade, represent a separate Gondwanan lineage. Caryodaphnopsis and Neocinnamomum may be the only extant representatives of the ancient Lauraceae flora documented in Mid- to Late Cretaceous Laurasian strata (e.g., Drinnan et al., 1990). Remaining genera place in a terminal Perseeae-Laureae clade that radiated in Early Eocene Laurasia. Therein, non-cupulate genera associate as Persea group, and cupuliferous genera sort to Laureae of most classifications or Cinnamomeae sensu Kostermans (1957). Laureae are Laurasian relicts in Asia. Persea group and Cinnamomum group (of Cinnamomeae), show tropical amphi-Pacific disjunctions here credited to disruption of Boreotropical ranges by Eocene-Oligocene climatic cooling. Ocotea complex accommodates remaining Cinnamomeae and shows a trans-Atlantic disjunction possibly derived from a Madrean-Tethyan ancestral distribution. These finding support hypotheses of Laurasian ancestry for most of the neotropical representation of Lauraceae, and our Early Miocene estimate for arrival of Ocotea complex in South America is closer to the Pliocene date suggested Rohwer and Kubitzki (1993), than the Late Cretaceous-Early Tertiary age favored by Taylor (1988).

Keywords: Biogeography, Boreotropical, Gondwana, Lauraceae, Laurasia, Madrean-Tethyan, molecular clock, phylogeny.