Phytotaxa 158 (2): 111–132
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

http://dx.doi.org/10.11646/phytotaxa.158.2.1

A phylogenetic analysis of the *Cryptocarya* group (Lauraceae), and relationships of *Dahlgrenodendron*, *Sinopora*, *Triadodaphne*, and *Yasunia*

JENS G. ROHWER[1], PEDRO LUIS RODRIGUES DE MORAES[2], BARBARA RUDOLPH[3] & HENK VAN DER WERFF[4]

[1]*Universität Hamburg, Biozentrum Klein Flottbek und Botanischer Garten, Ohnhorststr. 18, 22609 Hamburg, Germany; email: Jens.Rohwer@uni-hamburg.de*
[2]*Universidade Estadual Paulista "Júlio de Mesquita Filho", Instituto de Biociências, Departamento de Botânica, Av. 24 A 1515, Bela Vista, Rio Claro, São Paulo, CEP 13506-900, Caixa Postal 199, Brazil*
[3]*Universität Hamburg, Biozentrum Klein Flottbek und Botanischer Garten, Ohnhorststr. 18, 22609 Hamburg, Germany*
[4]*Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, USA*

Abstract

A phylogenetic analysis based on nuclear ITS and plastid *trnK* intron sequences confirms that *Dahlgrenodendron*, *Sinopora*, *Triadodaphne*, and *Yasunia* are members of the *Cryptocarya* group, as expected from morphology. *Dahlgrenodendron* from South Africa is sister to *Aspidostemon* from Madagascar. *Triadodaphne inaequitepala* is nested within *Endiandra* (both from Australasia), and *Yasunia* from South America is nested among South American *Beilschmiedia* species. *Sinopora* is a member of the *Beilschmiedia* clade, but its precise position is still uncertain. Among large genera of the group, *Cryptocarya* is clearly monophyletic, and *Endiandra* appears to be as well, if *T. inaequitepala* is included. *Beilschmiedia* is paraphyletic with respect to (at least) *Potameia* and *Yasunia*. Most well-supported clades within genera are geographically homogeneous, except a clade including the Chilean *Cryptocarya alba* and two New Caledonian species. Both *Beilschmiedia* and *Cryptocarya* have reached the Americas more than once. Four-locular anthers are plesiomorphic in the *Cryptocarya* group; two-locular anthers have arisen by fusion of the two pollen sacs of a theca. In the plesiomorphic fruit type, the ovary is completely enclosed in receptacular tissue; a superior fruit, seated free on its pedicel, is a synapomorphy of the *Beilschmiedia* clade.

Key words: Biogeography, evolution, floral morphology

Introduction

Lauraceae are among the larger families of Magnoliidae and one of the most common families in moist tropical and subtropical forests of the Americas, Asia, and Australia (Gentry 1988). As discussed in more detail by Rohwer (1993) and van der Werff & Richter (1996), morphology-based systems of the family have been divergent, depending on the relative importance attributed to characters by different authors. Molecular studies, in contrast, have been largely congruent and thus have led to a widespread agreement about the major phylogenetic divisions (Rohwer 2000; Chanderbali *et. al.* 2001; Rohwer & Rudolph 2005). In these studies, the *Cryptocarya* group, which had first been recognized based on wood and bark anatomy by Richter (1981), turned out to be sister to the rest of the family except *Hypodaphnis* Stapf (1909). The group has been shown to include at least the genera *Beilschmiedia* Nees (1831: 61, 69), *Cryptocarya* Brown (1810: 402), *Endiandra* Brown (1810: 402), *Aspidostemon* Rohwer & Richter (1987: 71), *Potameia* Du Petit-Thouars (1806: 5), *Eusideroxylon* Teijsmann & Binnendijk (1863: 292), and *Potoxylon* Kostermans (1978: 143). *Beilschmiedia* and *Cryptocarya* are species-rich genera, widespread in tropical and subtropical regions of all continents, though estimates of 250 and 350 spp., respectively, by Rohwer (1993) may be too high. *Endiandra* (ca. 100 spp.) is distributed from the Malesian region through eastern Australia to the western Pacific islands. *Potameia* (ca. 25 spp.) has most of its species in Madagascar but has also been reported from India to Southeast Asia, where delimitation from *Syndiclis* Hooker (1886a: pl. 1515)

Accepted by Mark Chase: 30 Nov. 2013; published: 3 Feb. 2014

Germany (voucher in MJG), A.T. Gwee from Singapore (voucher in SING), and Marianne Lauerer from Bayreuth, Germany (voucher in UBT). DNA extracts have been provided by the Royal Botanic Gardens, Kew, DNA Bank (http://apps.kew.org/dnabank/homepage.html, vouchers at K), by Cliff Morden from the Hawaiian Plant DNA library (vouchers in BISH and PTBG), and by Zoe Davids from Kirstenbosch, South Africa (voucher in SANBI). The curators of the herbaria AAU and L are gratefully acknowledged for allowing the first author (many years ago) to remove fragments from herbarium specimens, from some of which we were now able to extract DNA. This work would not have been possible without these collections or without the herbaria of our institutions (HBG, HRCB, and MO). Elisa Suganuma and Élvia Rodrigues de Souza kindly provided (partial) ITS and/or *matK* sequences of several taxa (*Beilschmiedia costaricensis*, *Cryptocarya* aff. *aschersoniana*, *C. citriformis*, *C. gracilis*, *C. mandioccana*, *C. moschata*, *C. oubatchensis*), which we could use to complement our data. We also thank our lab technicians Andrea Jounais and Anna Maria Vogt not only for their skillful work in the lab, but also for supervising our student assistants Christina Baro, Torsten Hoche, Anja zur Loye and Randi Weege.

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