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Taxonomic novelties in Neotropical Chrysobalanaceae: towards a monophyletic *Couepia*

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Abstract

Recent molecular phylogenetic studies in Chrysobalanaceae as well as new analyses presented in this study cast doubt on the monophyly of the three largest genera in the family, *Couepia*, *Hirtella* and *Licania*. *Couepia*, a Neotropical genus, had species appearing in four separate clades, the majority of species sequenced, however, form a highly supported clade, referred to here as core *Couepia* (including the type species). These results lend support to a revised taxonomy of the genus, and to resolve *Couepia* as monophyletic the following taxonomic changes are here proposed: *Couepia recurva* should be transferred to *Hirtella*, *C. platycalyx* transferred to *Licania*, *C. longipendula* and *C. dolichopoda* transferred to *Acioa*, and a new genus, *Gaulettia*, is proposed to accommodate species of the *Gaulettia* clade and allies.

Key words: *Acioa*, *Hirtella*, *Licania*, phylogenetics, *rbcL*, *matK*, *ndhF*, ITS, *Xdh*

Introduction

Couepia Aublet (1775: 519) is the third largest genus of the pantropical family Chrysobalanaceae, with all 71 species endemic to the Neotropics (Prance & Sothers 2003b); its distribution is from Mexico to Paraguay, with the greatest number of species found in the Guianas and the Brazilian Amazon region. The genus occurs mainly in wet lowland tropical primary rainforests, although it is also present in a variety of habitats such as flooded forests, cerrado, savanna, campina and wallaba forest and at higher elevations up to 1000 m, with the exception of *C. recurva* Spruce ex Prance (1972a: 272), *C. platycalyx* Cuatrecasas (1950: 66) and *C. steyermarkii* Maguire (1952: 252), which may occur at elevations of 2000 m and higher.

Couepia is characterised by a hollow, usually cylindrical receptacle, free stamens inserted in a complete circle, in a semi-circle or unilaterally around the mouth of the receptacle, a tendency towards numerous stamens, varying from ca. (10–)15 to 300 (but most species range from 30–40), a unilocular ovary positioned at the mouth of the receptacle and fruit with a hard, granular endocarp and a single seed.

Couepia was based on the type *C. guianensis* Aublet (1775: 519). At the same time Aublet also described four other Neotropical genera of Chrysobalanaceae: *Licania* Aublet (1775: 119), *Acioa* Aublet (1775: 698), *Parinari* Aublet (1775: 514) and *Moquilea* Aublet (1775: 521; currently considered a synonym of *Licania*). He distinguished *Couepia* from these by the numerous free stamens, their arrangement around the receptacle, and the position of the ovary at the mouth of the receptacle. *Acioa* was defined by the fused and unilateral stamens, a reduced number of stamens and ovary at the mouth of the receptacle. *Licania* (and *Moquilea*) was described with having a variable number of free stamens, from few to numerous and the ovary positioned at the base of the receptacle, which clearly distinguishes it from *Couepia*. *Hirtella* Linnaeus (1753: 34) was easily separated from *Couepia* by its fewer stamens situated unilaterally on the receptacle.

Although *Couepia* has been considered a well-defined genus, several relationships remain unclear. Phylogenetic studies (Bardon *et al.* 2013, Yakandawala *et al.* 2010 and Sothers unpublished results) have cast doubts on the monophyly of some genera in Chrysobalanaceae, including *Couepia*, *Licania* and *Hirtella*, the three largest genera in the family. The molecular results presented here corroborate previous ideas regarding the peculiar species of *Couepia*, namely *C.*

Illustration:—Prance & Sothers (2003b: 50).

Distribution and habitat:—Costa Rica, Venezuela, Colombia and Ecuador. Occurs in higher altitude Andean and Central American forests, from 1000 m to 2700 m, but has been recorded from 250 m.

Conservation status:—*Licania platycalyx* occurs over an extensive geographic range encompassing four countries, however, it is restricted to higher altitudes and therefore is here assessed as near threatened, NT (IUCN 2001). This species was assessed as EN for Colombia alone (Calderón *et al.* 2002).

Selected specimens examined:—COSTA RICA. Limón: Cantón de Talamanca, Bratsi, Alto Lari, Kivut, 15 March 1992, *Aguilar & Schmidt 1133* (INB!, K!, MO!). Heredia: Cantón de Sarapiqui, Rara Avis, 15 km SW of Horquetas, 2 October 1989, *Vargas 175* (CR!, K!, MO!). VENEZUELA. Lara: Distr. Jiménez, camino entre San Carlos y el camino a Sanare, 15 km S of Sanare, 9 August 1970, *Steyermark et al. 103618* (M!, NY!, S!, VEN!). COLOMBIA. Antióquia**:** Mun. de El Retiro, 4 km WNW of Cabecera of Quebrada La Agudelo, 12 April 1980, *Bernal & Galeano 142* (HUA). Mun. de Yarumal: 1–5 km on road to San Fermin de Briceño, 4–5 June 1989, *Luteyn & Escobar 13275* (NY!). Valle: Res. Nat. El Refugio Torremdinos, Mun. de Dagua, December 1988, *Calderón-Sáenz 143C* (K!). ECUADOR. Esmeraldas: Quinindé, Bilsa Biological Station, Reserva Ecológica Mache-Chindul, 11 March 1998, *Clark et al. 4639* (K!, MO!, QCNE).

Notes:—*Licania* [as *Couepia*] *platycalyx* was described by Cuatrecasas (1950), who noted that the species was "an extraordinary member of this genus and of the Chrysobalanoideae", and placed it in *Couepia* "on account of the strongly lateral insertion of the ovary and the numerous stamens". Prance (1972a) saw only the type and one other specimen so was reluctant to make a change, although uncertain about its affinity to *Couepia*, since the fruits and the position of the ovary differ from all other *Couepia*.

Licania platycalyx shares a similar receptacle and leaf morphology with *Licania*, but differs in the position the ovary, which is laterally inserted on the wall of the receptacle rather than at the base, as in most other *Licania*. *Licania licaniiflora* (Sagot 1883: 308) Blake (1917: 66), also has a laterally inserted ovary, but differs significantly from *L. platycalyx* in other characters.

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