

Short communication

Rehabilitation of the South American genus *Ochetophila* Poepp. ex Endl. (Rhamnaceae: Colletieae)

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Abstract Recent molecular and morphological analyses show that *Discaria* is polyphyletic and consists of two separate clades, *Discaria* sens. str. and a clade of two species from Chile and Argentina: *D. trinervis* and *D. nana*. The genus *Ochetophila* is here reinstated to accommodate these two species. A revised synonymy is presented, and a new combination is provided for *O. nana*.

Keywords Rhamnaceae; Colletieae; *Discaria*; *Ochetophila*; *O. trinervis*; *O. nana*; South America; Argentina; Chile; nomenclature

INTRODUCTION

The tribe Colletieae Reissek ex Endl. is one of the smaller tribes of the family Rhamnaceae, comprising 6 genera and a total of 20 species (*Adolphia* Meisn. 1, *Colletia* Comm. ex A. Juss. 5, *Discaria* Hook. 8, *Kentrothamnus* Suss. & Overkott 1, *Retanilla* (DC.) Brongn. 4, and *Trevoa* Miers ex Hook. 1 (Medan & Schirarend 2004)). The maximum species diversity of the tribe is found south of 30°S. Most of the distributions are loosely associated with the Andes in South America, but the tribe also includes a genus of apparent Gondwanic distribution, *Discaria*, with members found in South America, Australia, and New Zealand (Medan 1985; Arroyo et al. 1995).

In a recent paper (Aagesen et al. 2005) we examined the phylogenetic relationships within the Colletieae by combining data from a previous morphological analysis (Aagesen 1999) with data from the *trnL*_{UAA} intron and *trnL*-F spacer. The resulting tree (Fig. 1) generally agreed with the current taxonomic treatment of this tribe, which consists of six genera, three of which are monotypic (see above). However, in agreement with morphology (Aagesen 1999), the monophyly of *Discaria* was not supported and the results strongly suggested the necessity for segregating two species, *D. nana* and *D. trinervis*, under a different taxon of generic rank.

Discaria nana and *D. trinervis* have been perceived as a distinct subunit of Colletieae. Miers (1860) first realised that both species should be grouped under a genus of their own, different from *Discaria*, using for this purpose an available taxon, *Ochetophila*. The genus *Ochetophila* had been erected by Endlicher (1836–1840) on the basis of an unpublished diagnosis by E. F. Poeppig to accommodate three entities. One of these (*Sageretia trinervis*) had been published earlier (Hooker & Arnott 1833) and is the basis of the present *Discaria trinervis*; the other two manuscript names of Poeppig (*Ceanothus riparius* and *C. divergens*, based on two plants collected by Poeppig in Chile) remained undescribed and are thus *nomina nuda*. Gemoll (1902) examined Poeppig's original collections at M and concluded that these two entities were identical to *Discaria trinervis*. Miers (1860)

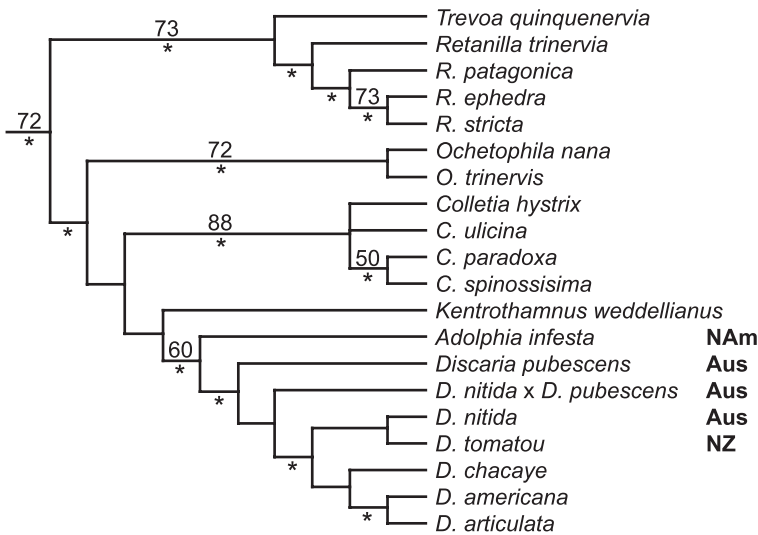


Fig. 1 Phylogeny of Colletieae using morphological and molecular data (*trnL-F* region, cpDNA) from Aagesen et al. (2005). Numbers above branches refer to jackknife values. Branches indicated with an asterisk also received high support during the sensitivity analysis, i.e., in more than 6 of the 8 different cost-sets used; for details see Aagesen et al. (2005). The geographical distribution has been added for taxa not occurring in South America: Aus, Australia; NAm, North America; NZ, New Zealand. *Ochetophila nana* and *O. trinervis* were previously classified in *Discaria*.

amended Endlicher's generic description and added two species (*Ochetophila prostrata* and *O. parvifolia*), both of which are synonymous with the present *Discaria nana*. Escalante (1945) split *D. trinervis* from *Discaria* and established the monotypic genus *Chacaya* on the basis of a characteristic concave receptacle in that species. Although he was aware of the earlier name *Ochetophila*, he did not adopt this, since Poeppig's concept of the genus was different from his. However, by doing this Escalante created a superfluous name.

Miers (1860) distinguished his *Ochetophila* from *Discaria* partly because of slightly different stipule morphology, a distinction not confirmed by later inspection (Suessenguth 1953). However, Suessenguth (1953) followed Miers' concept and treated *Discaria trinervis* and *D. nana* under his section *Ochetophila* of *Discaria*, which he distinguished from the other two sections by the combination of leafiness and presence of petals. More recent studies revealed additional morphological character states shared by both species and not present in other *Discaria* species. These potential synapomorphies are: leaf margin always entire, striated cuticle in leaf underside, spines with basal nodes, and petals not reduced as in other *Discaria* species (Medan & Aagesen 1995; Aagesen 1999). When morphological and molecular data are combined, *Discaria nana* and *D. trinervis* emerge as a monophyletic group, which is the sister clade to the remaining species of the *Adolphia-Colletia-Discaria-Kentrothamnus* clade (Aagesen et al. 2005).

Since the present status of *Discaria trinervis* and *Discaria nana* as part of the genus *Discaria* does not reflect the current state of knowledge of Colletieae, in this contribution we formally reinstate the genus *Ochetophila* to accommodate these two species. *Ochetophila* was hitherto treated as a synonym of *Discaria* (Tortosa 1983; Medan & Schirarend 2004). A detailed discussion of morphological characters and synapomorphies for all genera of Colletieae is provided in Aagesen et al. (2005) and Aagesen (1999).

TAXONOMY

Ochetophila Poepp. ex Endl., *Gen. pl.*, 1099 (1840); emend. Miers, *Ann. Mag. Nat. Hist. ser. 3*, 5, 377 (1860). \equiv *Chacaya* Escalante, *Bol. Soc. Argent. Bot.* 1, 44 (1943), *nom. superfl. & illeg.* \equiv *Discaria* sect. *Ochetophila* (Poepp. ex Endl.) Suess., *Mitt. Bot. Staatssamml. München* 8, 355 (1953); name first published in Engl. & Prantl, *Nat. Pflanzenfam. (ed. 2)* 20d, 159 (1953).

TYPE SPECIES: *Ochetophila trinervis* (Gillies ex Hook. & Arn.) Poepp. ex Miers.

DESCRIPTION: Prostrate to erect, leafy, often spiny shrubs or trees up to 8 m tall, with actinorhizal root nodules. Leaves decussate, each subtending 2 serial buds. Leaf margin entire, spines with a node close to spine base. Flowers perfect, 4–5(–6)-merous, in 1–3-flowered cymes; hypanthium campanulate

to urceolate, glabrous, deciduous; sepals valvate, deltoid, adaxially carinated, at anthesis somewhat reflexed; petals cucullate; stamens opposite to petals, filaments erect, cylindrical, anthers 4-sporangiate, introrse; disc ring-like, more or less lobed, encircling the ovary at bottom of hypanthium; ovary semi-inferior, 3-locular, locules 1-ovulated, style subcylindrical, stigma with three lateral receptive areas. Fruit an explosive capsule.

Key to species (adapted from Medan (1986) and Tortosa (1983))

- I* Leaves with three nerves. Stomata on abaxial leaf side. Erect shrubs and trees *O. trinervis*
 Leaves not three-nerved. Stomata on both leaf sides. Prostrate, carpet-forming shrubs.....
*O. nana*

Included species and synonymy

For *Discaria trinervis* there is a validly published combination under the genus *Ochetophila*. This is not the case for *Discaria nana*, for which a new combination is provided below. Nomenclature, synonymy, and typifications follow Gemoll (1902) and Tortosa (1983). For detailed descriptions, illustrations, typifications, and geographical distribution see Tortosa (1983, 1995, 1999).

Ochetophila trinervis (Gillies ex Hook. & Arn.) Poepp. ex Miers, *Ann. Mag. Nat. Hist.*, ser. 3, 5, 378 (1860). ≡ *Sageretia trinervis* Gillies ex Hook. & Arn., *Bot. Misc.* 3, 172 (1833). ≡ *Ochetophila hookeriana* Reissek ex Clos in Gay, *Fl. chil.* 2, 39 (1847), *nom. superfl. & illeg.* ≡ *Discaria trinervis* (Gillies ex Hook. & Arn.) Reiche, *Fl. Chil.* 2, 14 (1897). ≡ *Chacaya trinervis* (Gillies ex Hook. & Arn.) Escalante, *Bol. Soc. Argent. Bot.* 1, 46 (1946), *nom. superfl.* Type: “Valleys in the Andes of Mendoza and near La Guardia in those of Chili, Dr. Gillies. Cordillera of Chili, Cuming 242” (K).

= *Rhamnus linearis* Clos in Gay, *Fl. chil.* 2, 19 (1847). Type: “Se cría al pie de las cordilleras de las provincias del Sud” (P).

= *Colletia doniana* Clos in Gay, *Fl. chil.* 2, 36 (1847). ≡ *Discaria doniana* (Clos) Benth. & Hook. ex Weberb. in Engl. & Prantl, *Nat. Pflanzenfam.* 3(5), 423 (1896). Type: “Se halla en los valles de las cordilleras de Santiago, Colchagua, Concepción etc.”, Gay (SI, P).

= *Ceanothus divergens* Poepp. ex Endl., *Gen. pl.*, 1099 (1840), *nom. nud.* ≡ *Sageretia divergens* (Poepp. ex Endl.) Steud., *Nomencl. bot. (ed. 2)* 2, 491 (1841), *nom. inval.* ≡ *Ochetophila divergens*

(Poepp. ex Endl.) Steud., *Nomencl. bot. (ed. 2)* 2, 491 (1841), *nom. inval. pro syn.* Synonymised with *Discaria trinervis* by Gemoll (1902, p. 407) after examining Poeppig’s collections. Type: “Poepp. Coll. pl. Chil. III 68; Cr. in Chil. austr. campis ad Antuco Lect. Decbr.” (M).

= *Ceanothus riparius* Poepp. ex Endl., *Gen. pl.*, 1099 (1840), *nom. nud.* ≡ *Sageretia riparia* (Poepp. ex Endl.) Steud., *Nomencl. bot. (ed. 2)* 2, 491 (1841), *nom. inval.* ≡ *Ochetophila riparia* (Poep. ex Endl.) Steud., *Nomencl. bot. (ed. 2)* 2, 491 (1841), *nom. inval. pro syn.* (synonymy *fide* Gemoll 1902, p. 407, see above). Type: “Poepp. Coll. pl. Chil. II 29 (132); Lect. ad Rio Colorado Flor. Decbr.” (M).

= *Colletia inermis* Clos ex Miers, *Ann. Mag. Nat. Hist.*, ser. 3, 5, 378 (1870), *nom. inval. pro syn.* (cf. Tortosa 1983).

Ochetophila nana (Clos) J.Kellerm., Medan & Aagesen, comb. nov. ≡ *Colletia nana* Clos in Gay, *Fl. Chil.* 2, 37 (1847). ≡ *Ochetophila prostrata* Miers, *Ann. Mag. Nat. Hist. ser. 3, 5, 379* (1860), *nom. superfl. & illeg.* ≡ *Discaria nana* (Clos) Benth. & Hook. ex Weberb. in Engl. & Prantl, *Nat. Pflanzenfam.* 3(5), 423 (1896). ≡ *Discaria prostrata* (Miers) Reiche, *Anales Univ. Chile* 96, 50 (1898), *nom. illeg.* ≡ *Discaria prostrata* (Miers) Reiche var. *nana* (Clos) Suess., *nom. illeg.*, *Mitt. Bot. Staatssamml. München* 8, 355 (1953); name first published in Engl. & Prantl, *Nat. Pflanzenfam. (ed. 2)* 20d, 160 (1953). Type: “Se cría en las cordilleras de las provincias de Aconcagua y Coquimbo”, Gay (SI, P).

= *Ochetophila parvifolia* Miers, *Ann. Mag. Nat. Hist. ser. 3, 5, 379* (1860). Type: “Cordillera, in praealtis, Bridges (herb. Hook.)” (K, BM).

= *Colletia stipellacea* Philippi, *Linnaea* 33, 36 (1865). Type: “In Andibus depart. Illapel crescit”, 1860–61, *Volckmann* (SGO).

= *Discaria nana* (Clos) Benth. & Hook. ex Weberb. var. *inermis* Kuntze, *Revis. gen. pl.* 3(2), 38 (1898). Type: “Argentina, Paso Cruz”, *Kuntze* (NY).

= *Discaria nana* (Clos) Benth. & Hook. ex Weberb. var. *spinosa* Kuntze, *Revis. gen. pl.* 3(2), 39 (1898). Type: “Argentina, Paso Cruz”, *Kuntze* (NY).

= *Discaria nana* (Clos) Benth. & Hook. ex Weberb. var. *prostrata* Hicken, *Darwiniana* 1, 59 (1923). Type: “Mallín del Valle, XII, 1912”, *Gerth* 62 (SI?).

= *Discaria prostrata* (Miers) Reiche var. *inermis* Chodat & Wilczek, *Bull. Herb. Boissier sér.* 2, 2, 529 (1902), *nom. nud.* (cf. Hicken 1923). Type: “Cordillera de Maule (Germain 1855); Philippi sans Station (in herb. Boiss.)” (P?, G?).

Key to the genera of Colletieae

The formal addition of *Ochetophila* to the tribe Colletieae makes a comprehensive key for all genera desirable. The following key is based on Medan & Schirarend (2004), modified to incorporate the reinstated genus *Ochetophila*.

- 1 Inflorescences with a terminal flower; floral tube pubescent inside; fruit indehiscent or slowly splitting into indehiscent endocarps; arils remaining enclosed in the endocarps..... 2
 Inflorescences without terminal flowers; hypanthium glabrous inside; fruit an explosive capsule; aril detached from endocarpid and seed at dehiscence 3
- 2 Anthers 4-locular; stigma exerted; fruit a papery rostrate nut..... *Trevoa*
 Anthers 2-locular; stigma not exerted; fruit a barely fleshy drupe, indehiscent or slowly splitting into indehiscent endocarps *Retanilla*
- 3 Floral tube caducous at fruit maturity; rim of fruit pedastal sinusoid; margin of aril deeply lobed
 *Kentrothamnus*
 Rim of fruit pedastal smooth, or floral tube persistent at fruit maturity; margin of aril more or less smooth 4
- 4 Filaments distally geniculate; nectary inconspicuous, adpressed to lower floral tube; floral tube persistent in fruit..... *Adolphia*
 Filaments curved distally; nectary forming a conspicuous disc; floral tube not persistent in fruit 5
- 5 Bases of opposite leaves not united; stomata paracytic; disc forming a revolute laminar projection of the floral tube located above ovary level..... *Colletia*
 Bases of opposite leaves united forming a line; stomata anomocytic; disc ring-like, encircling the ovary at bottom of floral tube 6
- 6 Petals strongly cucullate; leaf margin always entire; spines with a proximal node *Ochetophila*
 Petals not or slightly cucullate, or absent; leaf margin entire or toothed; spines with a distal node.....
 *Discaria*

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