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A dubious resurrection of *Ochetophila* POEPP. ex ENDL. (Rhamnaceae)

Summary

The split off of *Discaria nana* and *D. trinervis* from the genus *Discaria*, recently made by KELLERMAN et al. (2005), is not accepted. The occurrence of specimens with morphological intermediacy between both species and *D. chacaya*, show that those species, that had been segregated into the genus *Ochetophila*, are closely related to the last species. Moreover, the entire margin of leaves and the petals well developed, considered synapomorphies of *Ochetophila*, are present in other species of *Discaria*.

ENDLICHER erected the genus *Ochetophila* (Rhamnaceae) in 1840, attributing its authority to POEPPIG, for the accommodation of *Sageretia trinervis* GILLIES ex HOOK. & ARN., a South American species, actually known as *Discaria trinervis* (HOOK. & ARN.) REICHE. Later, MIERS (1860) emended the description of the genus *Ochetophila* and included in it two Chilean species, *O. parvifolia* MIERS and *O. prostrata* MIERS; the last a superfluous name for *Colletia nana* CLOS, and both known at present as *Discaria nana* (CLOS) WEBERB. Likewise MIERS established the combination *Ochetophila trinervis* (HOOK. & ARN.) POEPP. ex MIERS for *Sageretia trinervis*.

HOOKER f. (1862), WEBERBAUER (1896), REICHE (1898), and SUESSENGUTH (1953) agreed in including *Ochetophila* as synonym of *Discaria*, a genus described by HOOKER in 1829. Notwithstanding, SUESSENGUTH (1953) established the section *Ochetophila* (MIERS) SUESS. for *Discaria prostrata* (MIERS) REICHE (= *D. nana*) and *D. trinervis*.

Zusammenfassung

Eine zweifelhafte Wiederbelebung von *Ochetophila* POEPP. ex ENDL. (Rhamnaceae)

Die Abtrennung von *Discaria nana* und *D. trinervis* von der Gattung *Discaria* durch KELLERMANN et al. (2005) wird nicht akzeptiert. Das Auftreten von Arten mit morphologischen Mittelwerten zwischen diesen beiden Arten und *D. chacaya*, die in die Gattung *Ochetophila* gestellt werden, zeigt, dass diese Arten eng mit letzterer verwandt sind. Mehr noch, der vollständige Rand der Blätter und die gut entwickelten Petale deuten an, dass solche Arten, betrachtet als Synapomorphe der Gattung *Ochetophila*, durchaus auch bei anderen *Discaria*-Arten vorhanden sind.

Discaria has a Gondwana distribution, with species in South America, Australia and New Zealand. The floral disc form, with a free elevated edge, was traditionally taken into account in distinguishing *Discaria* from its related genera grouped in the tribe Colletieae. The floral disc is inconspicuous or absent in *Retanilla* (DC.) BRONGN. and *Trevoa* MIERS ex HOOK., both South American genera. In *Adolphia* MEISN., of North America, and in *Kentrothamnus* SUESS. & OVERKOTT, of South America, it is concave, adhered to the base of the floral tube, and in *Colletia* COMM. ex JUSS., also a South American genus, it has a conspicuous free elevated and involute edge. The fruit of *Discaria* – a capsule with explosive dehiscence – is similar to those present in *Adolphia*, *Colletia* and *Kentrothamnus*.

In a taxonomic revision of the genus *Discaria* (TORTOSA 1983b), I recognized eight species: *D. americana* GILLIES & HOOK., *D. articulata* (PHIL.) MIERS, *D. chacaya* (G.DON) TORTOSA, *D. nana* and *D. trinervis*,

all of austral South America, *D. pubescens* (BRONGN.) DRUCE and *D. nitida* TORTOSA of Australia and *D. touamtou* ROUL of New Zealand. The occurrence of specimens with intermediate and combined characters between *D. chacaye* and *D. nana*, and also between *D. chacaye* and *D. trinervis* (TORTOSA 1983a), led me to formulate the hypothesis of hybridization. Moreover, the offspring of one individual with the phenotype of *D. trinervis*, resulted with the combined leaf characters of *D. chacaye* and *D. trinervis* (TORTOSA 1983a).

Discaria chacaye is a polymorphous species, characterized by its lack of petals and hairy ovary. All the remainder species of the genus have glabrous ovaries, and in all the South American species the corolla is present. The leaves are reticulately nerved, with crenate or serrate margins, and the spines present a distal node. Both *D. nana* and *D. trinervis* have hooded petals, leaves with entire margins, and spines with a basal node. The leaves are uninnerved in *D. nana* and three-nerved in *D. trinervis*.

Putative hybrids *Discaria chacaye* × *D. nana* have leaves both with entire and serrated margins, spines with medial node, petals elliptic, reduced or wanting, and ovary hairy or glabrous. Those *D. chacaye* × *D. trinervis* have leaves both three-nerved and reticulately nerved, with entire or serrated margins, spines with medial node, petals mostly hooded, sometimes reduced or lacking, and ovary hairy or glabrous.

For these apparent feasibility of hybridization I decided to overlook the section *Ochetophila* proposed by SUESSENGUTH (TORTOSA 1983b).

A posterior anatomical inquiry carried on by MEDAN (1986) on the species of *Discaria* and the putative hybrid materials, strengthened this hypothesis of hybridization. He found that *D. nana* was the unique species of *Discaria* with leaves with subisolateral structure and stomata on both epidermis, all the remainder species present dorsiventral structure and stomata only on the abaxial leaf surface. Likewise he noted that *D. nana* and *D. trinervis* differ from the other species in the striate cuticle. The leaves of the putative hybrids *D. chacaye* × *D. nana* showed dorsiventral structure and stomata on both epidermis – a novelty in *Dis-*

caria –; in those *D. chacaye* × *D. trinervis* he found smooth or reticulate cuticle in different leaves of the same voucher.

In a cladistic study on the tribe Colletieae, based on morphological characters, AAGESEN (1999) found that *Discaria nana* and *D. trinervis* form a monophyletic group, and the monophyly of the genus *Discaria* could not be confirmed. In a later analysis in which molecular and morphological data were combined (AAGESEN et al. 2005), the clade *D. nana* – *D. trinervis* resulted the sister group of the clade *Adolphia-Colletia-Kentrothamnus* – and the remainder species of *Discaria*, which led the authors to recommend reestablishing the genus *Ochetophila* for *D. nana* and *D. trinervis*. Accordingly, KELLERMAN et al. (2005) rehabilitated this genus, pointing out that the leaf margins always entire, the node of spines basally located, the cuticle striate, and the petals not reduced, constitute its synapomorphies.

The existence of individuals with intermediate characters *Discaria chacaye* – *D. nana* and *D. chacaye* – *D. trinervis*, the petals not reduced of *D. pubescens* (TORTOSA 1983b, Fig. 7A) and the leaves with normally entire margins in *D. nitida* and *D. touamtou*, were overlooked or had not been properly considered by AAGESEN et al. (2005) and KELLERMAN et al. (2005). It is worth noting that the same characters considered synapomorphies for *Ochetophila*, exhibit intermediate or combined states in the putative hybrids above mentioned (TORTOSA 1983a; MEDAN 1986).

Natural hybridization between very closely related species as well as of more distant relatives may be common (MCDADE 1995). In fact, putative hybrids between *Discaria articulata* and *D. chacaye*, sister species in the phylogenetic results of AAGESEN et al. (2005), are very frequent (TORTOSA 1983a). Notwithstanding, hybridization between species of different genera, separated by several cladistic events, are unexpected. Likewise, introgression between *D. chacaye* and relative species may explain the polymorphism that exhibit the former (TORTOSA 1983a).

Before making taxonomic changes, all the evidence must be taken into account, and an unbalanced emphasis based on molecular data at the expense of the rest of the characters must be avoided (CRISCI 2006). Therefore, I consider

proper not to modify the current status of the genus *Discaria*, reincluding *Ochetophila* as a synonym. As KELLERMAN et al. (2005) established the new combination *Ochetophila nana* (CLOS) J.KELLERM., MEDAN & AAGESEN, New Zealand J. Bot. 43: 867. 2005, it is therefore necessary to include this name in the synonymy of *Discaria nana* (CLOS) WEBERB., in ENGLER & PRANTL. Nat. Pflanzenfam. 3(5): 423. 1896.

Acknowledgements

I wish to thank to Liliana Katinas and to Jorge Crisci for reviewing the manuscript and for their useful comments.

References

- AAGESEN, L. 1995 (1999): Phylogeny of the tribe Colletieae, Rhamnaceae. – Bot. J. Linnean Soc. **131**: 1–43.
- AAGESEN, L.; MEDAN, D.; KELLERMANN, J. & HILGER, H. H. 2005: Phylogeny of the tribe Colletieae (Rhamnaceae) – a sensitivity analysis of the plastid region *trnL-trnF* combined with morphology. – Pl. Syst. Evol. **250**: 197–214.
- CRISCI, J. V. 2006: One-dimensional systematist: perils in a time of steady progress. – Syst. Bot. **31**(1): 217–221.
- ENDLICHER, S. L. 1840: Rhamneae: 1094–1104. – In: S. L. ENDLICHER, Genera plantarum secundum ordines naturales disposita. – Wien.
- HOOKE, J. D. 1862: Rhamneae: 371–386. – In: G. BENTHAM & J. D. HOOKE (eds.), Genera Plantarum 1. – London.
- HOOKE, W. J. 1829: On the species of the genus *Colletia*, of the natural order Rhamneae, discovered by Dr. Gillies in South America. – Bot. Miscell. **1**: 150–159.
- KELLERMANN, J.; MEDAN, D.; AAGESEN, L. & HILGER, H. H. 2005: Rehabilitation of the South American genus *Ochetophila* POEPP. ex ENDL. (Rhamnaceae: Colletieae). – New Zealand J. Bot. **43**: 865–869.
- MCDADE, L. A. 1995: Species concepts and problems in practice: Insight from Botanical Monographs. – Syst. Bot. **20**(4): 606–622.
- MEDAN, D. 1986: Anatomía y arquitectura foliares de *Discaria* (Rhamnaceae). – Kurtziana **18**: 133–151.
- MIERS, J. 1860: On the tribe Colletieae, with some observations on the structure of the seed in the family of the Rhamnaceae. – Ann. Mag. Nat. Hist. ser. 2, **5**: 76–96, 200–216, 267–273, 370–381, 482–492; **6**: 5–14.
- REICHE, C. 1898: Rhamnaceae. Estudios críticos sobre la flora de Chile. – Anales Univ. Chile **97**: 41–58.
- SUESSENGUTH, K. 1953: Rhamnaceae: 7–173. – In: A. ENGLER & K. PRANTL (eds.), Die natürlichen Pflanzenfamilien, 2. Aufl., 20d. – Berlin.
- TORTOSA, R. D. 1983a: Una especie polimorfa de *Discaria*: *D. chacaye* (G. DON) comb. nov. (Rhamnaceae) y sus híbridos presuntivos. – Parodiana **2**(1): 79–89.
- TORTOSA, R. D. 1983b: El género *Discaria* (Rhamnaceae). – Bol. Soc. Argentina Bot. **22**: 301–335.
- WEBERBAUER, A. 1896: Rhamnaceae: 393–427. – In: A. ENGLER & K. PRANTL (eds.), Die natürlichen Pflanzenfamilien 3(5). – Leipzig.

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Manuscript received: April 10th, 2008.