

On *Anthyllis onobrychioides* Cav. and the genus *Dorycnopsis* Boiss. (Leguminosae-Loteae)

by

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Abstract

Anthyllis onobrychioides and *Anthyllis gerardi* are two closely related species included by De Candolle in an individual section, *Anthyllis* sect. *Dorycnioides*, the second being the type of the monotypic genus *Dorycnopsis* Boiss. A morphological study of both species shows that the characters on which the genus *Dorycnopsis* is based are not consistent, and *Dorycnopsis* is here included in *Anthyllis* L. *Anthyllis* sect. *Dorycnioides* DC. is lectotypified with *A. onobrychioides* Cav.

Kew words: *Anthyllis*, *Anthyllis* sect. *Dorycnioides*, *Dorycnopsis*.

Resumen

Después de analizar el gran parecido entre *Anthyllis onobrychioides* y *Anthyllis gerardi* se concluye que ambas especies están muy próximamente emparentadas y que el género *Dorycnopsis* Boiss. se debe incluir en *Anthyllis* L., con el que no presenta realmente diferencias significativas. Se tipifica *Anthyllis* sect. *Dorycnioides* DC., designando lectotipo a *A. onobrychioides* Cav.

Palabras clave: *Anthyllis*, *Anthyllis* sect. *Dorycnioides*, *Dorycnopsis*.

Introduction

Anthyllis gerardi L. [= *Dorycnopsis gerardi* (L.) Boiss.] and *A. onobrychioides* Cav. are two Spanish plants so similar that it is difficult to distinguish them at first glance. Despite their similarity, they are two separate species, that have at times been considered members of two different genera, *Anthyllis* L. and *Dorycnopsis* Boiss. Although the genus *Dorycnopsis* [type, *D. gerardi* (L.) Boiss.] is usually considered to be monotypic, Tikhomirov & Sokoloff (1997) also included in it an Ethiopian species, *Vermifruux abyssinica* (A. Rich.) Gillett, but it seems more closely related to *Coronilla* than to *Anthyllis* (cf. Allan & al., 2003). Many authors have included *A. gerardi*, and consequently *Dorycnopsis*, in *Anthyllis* (e.g., De Candolle, 1825; Taubert, 1894; Cullen, 1976; Akulova, according to Tikhomirov & Sokoloff, 1997; Bolòs & Vigo, 1984). Others, however, have accepted it as a separate genus (Willkomm, 1871; Hutchinson, 1964; Lassen, 1989; Tikhomirov & Sokoloff, 1997; Benedi, 1998). Lassen (1989) considered *Dorycnopsis* to be part of the “*Coronilla* group” in the *Loteae*, and thus

more closely related to *Coronilla*, *Hippocrepis* and *Securigera*, which implies a distant relationship with *Anthyllis*.

Anthyllis gerardi and *A. onobrychioides* are so similar that even Boissier, the author of the genus *Dorycnopsis*, considered them inseparable: “Je crois avec M. Moris et d’après la description et la figure de Cavanilles que son *A. onobrychioides* ne diffère pas de la *Gerardi*, et qu’il lui attribue des fleurs jaunes par erreur et parce qu’il la décrit probablement sur des échantillons desséchés.” [From Cavanilles’ description and drawing I think, as Moris does, that his *A. onobrychioides* is identical to *D. gerardi*, and also that his report of yellow flowers is a mistake, likely because his description was based on dry specimens] (Boissier, 1839). Previously, De Candolle (1825) had included both species in a new section, *Anthyllis* sect. *Dorycnioides*, a name indicating the superficial resemblance of both species to the genus *Dorycnium* Mill. Such similarity with *Dorycnium* is most likely due to morphologic convergence; a superficial study of *Anthyllis gerardi* and *A. onobrychioides* flowers shows that they have no relation with *Dorycnium*.

Discussion

The genus *Dorycnopsis* is characterized by having diadelphous stamens, and filaments of the same length not expanded at the tip (Boissier, 1839). Conversely, *Anthyllis* has monadelphous stamens, and filaments widened at the tip (Benedí, 1998). Despite the previous differences, neither the androecium of *A. gerardi* is clearly diadelphous –“Androceo submonadelfo o subdiadelfo” [Androecium submonadelphous or subdiadelphous] (Díaz Lifante, 2000)–, nor completely monadelphous in *A. onobrychioides* –“Estambre vexilar parcialmente adnato al tubo de los estambres” [Vexillar stamen partially attached to the staminal tube] (Benedí, 2000); and the staminal filaments of *A. gerardi* are occasionally expanded at the apex (cf. Díaz Lifante, Fig. 1c), although to a lesser degree than in *A. onobrychioides* or other *Anthyllis* species.

A further difference has been occasionally invoked: the chromosome number in *A. onobrychioides* is $2n = 14$, whereas for *Dorycnopsis* $x = 6$ has been reported as the basic chromosome number (Benedí, 1998), with $2n = 12$. However, the basic chromosome number $x = 6$ occurs also in other *Anthyllis* taxa (e.g. *A. vulneraria* group) and *Hymenocarpus* (cf. Benedí, 1998), which supports the idea that it has evolved independently several times in this group of *Loteae*; and there are two discordant counts for *D. gerardi*, $2n = 12$ (Fernandes & Santos, 1971; Vioque & Pastor, 1991), and $2n = 16$ (Tschechow & Kartaschowa, 1932).

Unlike the previous characters, there are two morphologic characters that separate both species: flowers are pink-yellowish in *D. gerardi*, but yellow in *A. onobrychioides*, and the inflorescence of *A. gerardi* lacks the small foliaceous bract present in *A. onobrychioides*. The lack of this bract –a very characteristic feature in most *Anthyllis* species– is the best character to distinguish *A. gerardi*, but it is not enough to separate it at the generic level: other *Anthyllis*, e.g. *A. cytisoides* or *A. terniflora*, differ more strongly from *A. onobrychioides* in their inflorescence structure.

Tikhomirov & Sokoloff (1997) modified the generic concept of *Dorycnopsis* to include an East African species previously considered to be the only member of *Vermifruax*, *V. abyssinica* (A. Rich.) Gillett. This species, like *D. gerardi*, lacks the inflorescence bract, and has a similar fruit anatomy. However, *V. abyssinica* has spiral fruits with two seeds and its chromosome number is $2n = 14$. As noted above, a recent phylogenetic analysis place *V. abyssinica* closer to *Coronilla* than to *Anthyllis* (Allan & al., 2003).

Conclusion

Morphologically, *A. gerardi* is closely related to *A. onobrychioides*. Atrophy and loss of the inflorescence bract and reduction of the chromosome number point to *A. gerardi*'s origin from an ancestor similar to *A. onobrychioides*. This was already noted by Willkomm (1877, 3: 334): “*A. onobrychioides* Cav.... Planta habitu *Dorycnopside* *Gerardi* simillima transitum ab *Anthyllide* ad *Dorycnopsim* facit” [species very similar to *Dorycnopsis gerardi* in habit, and connecting *Anthyllis* to *Dorycnopsis*]. Consequently *Dorycnopsis* is here synonymized with *Anthyllis*.

Typification of *Anthyllis* sect. *Dorycnioides* DC.

***Anthyllis* sect. *Dorycnioides* DC.**, Prodr. 2: 168-169. 1825
 = *Dorycnopsis* Boiss., Voy. Bot. Espagne 2: 163. 1839
 = *Anthyllis* sect. *Dorycnopsis* (Boiss.) Taubert in Engl. & Prantl, Nat. Pflanz. 3(3): 255. 1894

Lectotype, here designated: *Anthyllis onobrychioides* Cav.

As previously stated, De Candolle included only *A. gerardi* and *A. onobrychioides* in this section, which has priority over sect. *Oreanthyllis* Griseb., created in 1843. Willkomm's (1871) transfer of *A. gerardi* to *Dorycnopsis* implicitly typified sect. *Dorycnioides* by exclusion, but the current ICBN (St. Louis code, art. 7.11) requires explicit selection of the lectotype. An alternative classification, proposed by Taubert (1894), further split sect. *Dorycnioides* DC. to create sect. *Dorycnopsis* (Boiss.) Taubert, with *A. gerardi* as its only member. Both species are morphologically too close and we do not follow this taxonomic arrangement.

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