

A NEW TAXONOMIC ARRANGEMENT IN *LINARIA* SECT. *SUPINAE* (ANTIRRHINEAE)

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RESUMEN: Como resultado de un estudio macromorfológico y de los caracteres seminales de *Linaria benitoi* Fern. Casas, endemismo de los alrededores del Cabo de Gata (SE Península Ibérica) y de los táxones del grupo de *L. oblongifolia*, se discuten la variabilidad y las relaciones morfológicas de este conjunto de plantas. Así, se propone la siguiente nueva combinación: *Linaria oblongifolia* subsp. *benitoi* (Fern. Casas) L. Sáez, M.B. Crespo, Juan & M. Bernal, comb. & stat. nov. **Palabras clave:** *Linaria*, Antirrhineae, plantas vasculares, variación infraespecífica, Península Ibérica.

SUMMARY: As a result of a study of macromorphological and seed features of *Linaria benitoi* Fern. Casas, endemic to Cabo de Gata (SE Iberian Peninsula) and taxa included in the *L. oblongifolia* group, the variability and morphological relationships are discussed. The following new combination is proposed: *Linaria oblongifolia* subsp. *benitoi* (Fern. Casas) L. Sáez, M.B. Crespo, Juan & M. Bernal, comb. & stat. nov. **Key words:** *Linaria*, Antirrhineae, infraspecific variation, taxonomy, Iberian Peninsula.

INTRODUCTION

Linaria Mill. with nearly 150 species, is the largest genus of the Tribe *Antirrhineae* (SUTTON, 1988). It is distributed throughout Europe, Northern Africa and Asia, the centre of diversity lying in the Iberian Peninsula (VALDÉS, 1970; SUTTON, 1988). The complexity of this genus, in particular of *L.* sect. *Supinae* (Benth.) Wettst. subsect. *Supinae* in the Iberian Peninsula, is stressed by the available different systematic arrangements concerning its taxa. SUTTON (1988) re-

cognized in subsect. *Supinae* 44 taxa at specific or subspecific level, of which 35 grow in the Iberian Peninsula and the Balearic Islands, being 31 of them endemic to these territories. Most of those taxa are relatively narrow endemics of mountain areas (SUTTON, 1988).

The group of *Linaria oblongifolia* comprises annual herbs with decumbent to suberect stems, linear-oblong to elliptical leaves and yellow flowers. Taxa in that aggregate show very close similarities in both vegetative and floral morphology, and reliable diagnostic characters

are based on seed-coat sculpturing, features of leaves (mainly width and shape) and pedicels (fruiting pedicels length). Plants included in this group are distributed through southern and eastern Iberian Peninsula, and are usually recognized as subspecies (SUTTON, 1988) due to remarkable morphological similarities.

Populations from the surroundings of Cabo de Gata (Almería province, south-eastern Spain) were described at specific rank, first as *L. benitoi* by FERNÁNDEZ CASAS (1982), and later as *L. tuberculata* by SUTTON (1988). Although the priority name for this taxon was that proposed by FERNÁNDEZ CASAS (1982), its correct relationships were outlined by SUTTON (1988), when comparing the new species with *L. oblongifolia*, instead of with *L. glauca*.

New data are presented here to justify subordination of *L. benitoi* (= *L. tuberculata*) to *L. oblongifolia* at the subspecies rank.

MATERIAL AND METHODS

Studies were made on dry specimens from the herbaria ABH, BC, GDA, HUAL, MA, MUB and SEV (acronyms according to HOLMGREN & al., 1990, and HOLMGREN & HOLMGREN, 1993). Specimens were studied under a binocular stereoscopic microscope. Data were also tested on living plants from wild populations.

RESULTS AND DISCUSSION

Taxonomic characters

The main morphological characters studied are listed below. Their potential taxonomical value is discussed.

Habit and leaves: *Linaria oblongifolia* s.l. and *L. benitoi* are annual plants, showing decumbent to suberect fertile stems,

simple or branched. Leaves are variable in shape from linear to ovate-elliptical. Leaf width (and also shape) has been used as a diagnostic character: leaves are oblanceolate to ovate-elliptical in *L. oblongifolia* subsp. *oblongifolia* [(1)1,2-4,5(5,5) mm width], whilst they are mainly linear and narrower [0,25-1(2,5) mm width] in *L. oblongifolia* subsp. *haenseleri*, *L. oblongifolia* subsp. *aragonensis*, and also in *L. benitoi*.

Pedicel length: Flowers are arranged in bracteate racemes. Pedicels are accrescent, and length of fruiting pedicels is sometimes variable within a single taxon. The pedicel length in relation to the adjacent bract has been used as a diagnostic character (VALDÉS, 1970; SUTTON, 1988). According to SUTTON (1988) pedicels are short in *L. tuberculata* [1,5-2,5 mm long]. However, some specimens collected in the area of Cabo de Gata bear fruiting pedicels rather variable (1,5-6,5 mm long), overlapping those of *L. oblongifolia* subsp. *haenseleri*, and *L. oblongifolia* subsp. *aragonensis*.

Corolla: It is somewhat variable in size. All taxa in the group produce yellow corollas, although in *L. oblongifolia* subsp. *aragonensis*, the palate and the spur are sometimes darker (orange to reddish). The smallest flowers can be found in *L. oblongifolia* subsp. *aragonensis*, and the longest in *L. oblongifolia* subsp. *oblongifolia* (Table 1). Corolla size of *L. benitoi* falls within the variation range of *L. oblongifolia* s.l.

Seeds: Seeds are winged, suborbicular, with the body of the seed surrounded by an encircling membranous, usually whitish wing. Disc is black or greyish, smooth or covered with acute or obtuse tubercles. The periclinal walls of testa cells are not papillate. *Linaria benitoi* shows the smallest seeds in the *L. oblongifolia* group (Table 1) although the size is noticeably

bigger than those SUTTON (1988) stated for *L. tuberculata* [1-1,2 mm]. Populations from Cabo de Gata were characterized by the disc covered by dense elongate tubercles (SUTTON, 1988), although in this area plants with sparsely tuberculate seeds, showing short tubercles, can be found together with typical *L. benitoi*. On the other hand, *L. oblongifolia* subsp. *haenseleri* and *L. o.* subsp. *aragonensis* show a wide range of intraspecific seed coat sculpturing patterns (Table 1).

Taxonomic status of *Linaria benitoi*

Morphological characters and seed features have been used to circumscribe taxa in *Linaria* sect. *Supinae* (VALDÉS, 1970; SUTTON, 1988; JUAN & al. 1999; SEGARRA & MATEU 2001; SÁEZ & al. 2004). Seeds of taxa included in this section can be highly variable and sometimes show a wide range of seed-coat sculpturing patterns within a single taxon (SEGARRA & MATEU, 2001; SÁEZ & al. 2004; SÁEZ & CRESPO, 2005). In this sense, all taxa included in the *L. oblongifolia* group, with the exception of *L. oblongifolia* subsp. *oblongifolia*, show some variability.

The close similarities in habit, floral features and the seed-coat sculpturing of taxa of the *L. oblongifolia* group (Table 1), together with the scanty morphological discontinuities and the same chromosome number ($2n=12$) suggest that they are very closely related. According to the geographic speciation model proposed by VALDÉS (1970) for taxa included in *Linaria* subsect. *Supinae*, and considering the weak morphological differentiation between *L. benitoi* and *L. oblongifolia*, we support the maintenance of a single species with several geographic races, recognized at subspecific rank, to better reflect the relationships and the morphological variation according to biogeographic patterns in this group of plants. This taxono-

mic arrangement is in accordance with previous treatments of some closely related groups integrated by several subspecies, such as the complex of *Linaria tristis* (L.) Mill. (SUTTON, 1988), the *L. aeruginosa* (Cav.) Gouan aggregate (SÁEZ & al., 2004) and the *L. verticillata* group (SÁEZ & CRESPO, 2005).

Therefore, we propose the following nomenclatural adjustment:

- Linaria oblongifolia* subsp. *benitoi***
 (Fern. Casas) L. Sáez, M.B. Crespo, Juan & M. Bernal, **comb. & stat. nov.**
 = *L. benitoi* Fern. Casas in *Fontqueria* 2: 29, fig. 3. 1982 [basion.]
 = *L. tuberculata* D.A. Sutton, Revis. Antirrhineae: 386. 1988

Key to taxa of the *L. oblongifolia* gr.:

1. Leaves of fertile stems (1)1,2-4,5(5,5) mm width; fruiting pedicels (0,5)1-4(5) mm long, usually shorter or nearly as long as bracts, rarely longer
 **a.** subsp. ***oblongifolia***
- Leaves of fertile stems 0,25-1(2,5) mm with; fruiting pedicels 1-8(10) mm, usually longer than bracts 2
2. Leaves of fertile stems 0,25-0,6(0,9) width; corolla 9,5-15(17) mm long
 **c.** subsp. ***aragonensis***
- Leaves of fertile stems 0,4-1,5(2,5) mm width; corolla 13-24 mm long 3
3. Seeds with disk surface smooth or sparsely tuberculate **b.** subsp. ***haenseleri***
- Seeds with disk surface usually densely tuberculate, rarely sparsely tuberculate .
 **d.** subsp. ***benitoi***

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Table 1.- Main morphological diagnostic features of taxa included in the *Linaria oblongifolia* group. Measurements in mm.

	<i>L. oblongifolia</i> subsp. <i>oblongifolia</i>	<i>L. oblongifolia</i> subsp. <i>aragonensis</i>	<i>L. oblongifolia</i> subsp. <i>haenseleri</i>	<i>L. oblongifolia</i> subsp. <i>benitoi</i>
Leaves of fertile stems width	(1)1,2-4,5(5,5)	0,25-0,6(0,9)	0,4-1(2,5)	(0,5)0,7-1,5(2,5)
Fruiting pedicels length	(0,5)1-4(5)	1-8(9)	(1,5)2-8(10)	1-6,5
Corolla size	17-24	9,5-17	15-24	13-21
Seed size	1,6-2,1 × 1,5-2,1	1,6-2 × 1,5-2	1,6-1,8 × 1,5-1,7	1-1,7 × 0,9-1,5
Disc surface	Smooth	Smooth or sparsely tuberculate	Smooth or sparsely tuberculate	Densely (or rarely sparsely) tuberculate