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On the taxonomic identity and status of *Silene sericea* var. *balearica* (sect. *Dipterosperma*, Caryophyllaceae)

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Abstract. This paper presents a re-evaluation of the taxonomic relationships of *Silene sericea* var. *balearica* based on morphological features. Critical examination of herbarium specimens (including type material) and living plants has shown that *S. sericea* var. *balearica* should be recognized at species level. Therefore, the new name, *Silene migjornensis,* is proposed to designate the endemic species growing on maritime sands in southern Mallorca (Balearic Islands, Spain). This taxon is described, illustrated and compared with its morphologically closest relatives from *Silene* sect. *Dipterosperma*.
Keywords: *Silene*; endemic plants; Mediterranean Region; Balearic Islands; Taxonomy.

Sobre la identidad taxonómica y el estatus de *Silene sericea* var. *balearica* (sect. *Dipterosperma*, Caryophyllaceae)

Resumen. En este trabajo se presenta una reevaluación de las relaciones taxonómicas y morfológicas de *Silene sericea* var. *balearica*. La revisión crítica de especímenes de herbario (incluyendo material tipo) y plantas vivas indica que *S. sericea* var. *balearica* debe ser reconocida en rango de especie. En consecuencia, se propone un nombre nuevo para este taxon, *Silene migjornensis*. Se trata de una especie endémica que vive en arenales marítimos del sur de Mallorca (Islas Baleares, España). Este taxon es descrito, iconografiado y comparado con aquellos morfológicamente más relacionados de *Silene* sect. *Dipterosperma*.
Palabras clave: *Silene*; plantas endémicas; región Mediterránea; Islas Baleares; Taxonomía.

Introduction

Silene L. (Caryophyllaceae) is a large genus of flowering plants, distributed mainly across the Northern Hemisphere. The number of species included in the genus varies between taxonomic treatments, but some of the latest studies (Melzheimer, 1980; Greuter, 1995; Zhou *et al.*, 2001; Morton, 2005) estimate between 600 and 700. The genus is particularly diverse around the Mediterranean Basin where more than 350 species have been recorded (Greuter *et al.*, 1984). Section *Dipterosperma* (Rohrb.) Chowdhuri is a taxonomically complex aggregate comprising 15 species which is diversified around the Mediterranean Basin (Brullo *et al.*, 2017). This section comprises annual plants, characterized by hairy-pubescent (non-glandular) indumentum, erect flowers, arranged in monochasia or dichasia, calyx hairy, not inflated, 10-nerved, anthophore pubescent, petal limb deeply bifid, coronal scales present, seeds orbicular-reniform, laterally flat and dorsally furrowed between two more or less undulate wings (Talavera, 1990; Brullo *et al.*, 2012, 2017).

In the Balearic Islands, the presence of two species of sect. *Dipterosperma* (*S. apetala* Willd. and *S. secundiflora* Otth) is widely accepted and well documented (Bolòs & Vigo, 1990; Talavera, 1990; Chater *et al.*, 1993). On the contrary, the presence in the Balearic archipelago of another species of this section, usually referred to *S. sericea* All., is controversial. Willkomm (1876) described *S. sericea* var. *balearica* Willk. from southern Mallorca. The description provided in the protologue is rather scarce [Differt a forma typical (corsicana) floribus minoribus matutinis, calyce breviore (non nisi 10 mm l.) basi minus attenuato, anthophoro breviore (calycem medium aequante), capsula anthophoro aequilonga]. The taxonomic value of this variety has been considered null (see Talavera & Muñoz Garmendia, 1989) or scarce in recent floras (see e.g., Talavera, 1990). It has been included within the range of variation of *S. colorata* Poir. (a widespread Mediterranean species), without any formal recognition. On the contrary, Bolòs & Vigo

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(1990) accepted the presence of *S. sericea* var. *balearica* in the Balearic Islands (distributed in southern Mallorca), whereas Chater *et al.* (1993) listed typical *S. sericea* for the Balearic arhipelago. The presence of *S. colorata* in the Balearic Islands was not supported by Bolòs & Vigo (1990), Chater *et al.* (1993) and, surprisingly, by Talavera (1990). However, it was listed by Pla *et al.* (1992) as present in the flora of Mallorca. In a detailed taxonomic study (but apparently unnoticed among botanists dealing with the Spanish flora), Valsecchi (1995) circumscribed the distribution area of *S. sericea* only to Liguria (north-western Italy). At the same time, several species of this group were described, all of them being restricted to the central and western Mediterranean region. Valsecchi (1995) considered doubtful the presence of *S. sericea* in the Balearic Islands, doubts that go back to Chater & Walters (1964).

Our study of the type material of *S. sericea* var. *balearica* preserved at COI (in the Willkomm herbarium) and living plants from the type locality show that the stems of this taxon are prostrate-ascending, the flowers are solitary and the seed wings are flat. These characters do not match with those shown by *S. colorata* (erect stems, inflorescences 4–10 flowered and seeds with undulate wings) according to several authors (e.g., Bolòs & Vigo, 1990; Talavera, 1990; Chater *et al.*, 1993). Therefore, our initial identification, based on Bolòs & Vigo (1990) and Chater *et al.* (1993), led us to consider this plant as *S. sericea*, without granting taxonomic value to the variety described by Willkomm (Rosselló & Sáez, 2001; Sáez *et al.*, 2017).

Valsecchi (1995) and Brullo *et al.* (2012, 2015, 2017) provided useful information on the main morphological characters discriminating taxa included within *Silene* sect. *Dipterosperma* and discussed in detail their taxonomy and distribution. However, no plant material from the Balearic Islands was included in the mentioned studies.

During a revision of the Balearic plants of the genus *Silene*, the taxonomic position of *S. sericea* var. *balearica* has been questioned in light of the recent and detailed revisions of *Silene* sect. *Dipterosperma* (Brullo *et al.*, 2015, 2017). Our study shows that the Majorcan plants called *S. sericea* var. *balearica* differ from the currently recognized taxa by a unique combination of characters, and in our opinion this variation merits their recognition at the species rank.

Material and Methods

Morphological characters recognised as taxonomically discriminant within *Silene* sect. *Dipterosperma* (e.g., Talavera, 1990, Valsecchi, 1995; Brullo *et al.*, 2015, 2017, and our own observations) were scored either in the field and herbarium specimens (BC, BCN, COI and MPU; acronyms according to Thiers 2019+). Terminology and delimitation of characters follow Brullo *et al.* (2017). The morphological comparisons with the allied species are base on detailed data recently published by Brullo *et al.* (2015, 2017). Morphological observations of materials were carried out under a Zeiss Stemi DV4 binocular stereoscopic microscope. Micromorphology was observed on dry leaves and stems, pollen and seeds which were glued directly to aluminium stubs, coated with 40–50 nm gold, and examined with a scanning electron microscopy (Hitachi 2300-S) at 20 kV. The extent of occurrence and area of occupancy were calculated using the GeoCAT tool (Bachman *et al.*, 2011).

Results and Discussion

Silene migjornensis L. Sáez, Guasp, P.P. Ferrer, López-Alvarado & Rosselló, nomen novum [or replacement name]

≡ *Silene sericea* var. *balearica* Willk. in Linnaea 40: 118 (1876) [replaced synonym]

Lectotype [designated by Rosselló & Sáez (2001: 52)]: [Balearic Islands] Mallorca: in sabulosis zonae littoralis prope Salobrar de Campos in consortio Helichrisi Stoechadis Legi d. 20 Apr. 1873, *M.H. Willkomm* [*Herb. Balear n. 303*], COI (barcode COI00059139, http://coicatalogue.uc.pt/index.php?t=results_specimen&q=COI00059139&orderby=relevance&orderdirection=DESC&size=10&page=0)

Etymology. The specific epithet *migjornensis* is derived from "Migjorn", the name of the area where the type locality is found, in southern Mallorca (Balearic Islands, Spain).

Description

Annual herb 5–35(42) cm tall, greyish-green, green or purplish-green. Stems prostrate-ascending (very rarely suberect in small plants), with stems branched at the nodes, also sometimes at the base, usually densely pilose-pubescent, with eglandular hairs 0.3–1.7 mm long. Lower internodes 0.4–2.5 cm long, upper ones 1.0–5.2 cm long. Leaves 7–35 × 3–12 mm, more or less flat, moderately succulent, rounded or sometimes subapiculate, petiolate, 1-nerved, widely spathulate, with eglandular hairs (0.2)0.5–2(2.7) mm long. Bracts ovate-lanceolate to lanceolate, 3–7 mm long. Flowers erect, solitary, terminal. Pedicels 3–12(17) mm long. Calyx 11.5–15.5 mm long, densely pubescent, with eglandular hairs 0.4–1.5 mm long, subtubulose, greyish-green to purplish-green, 10-nerved, without anastomoses; teeth 2.3–3.5 × 1.5–2.0 mm, triangular-oblong to triangular, obtuse to subacute, with margin membranous, ciliate at margins (Figures 1, 2 and 4). Petals 11.5–14.0 mm long; limb 5.0–7.0(7.5) mm long, deeply two-lobed, pale pink to pink, with lobes (3.5)4–5 × 2–3.5 mm, obovate-spathulate, smooth; coronal scales 1.0–1.6 mm, white in the adaxial side, white to pale pink in the abaxial surface, deeply retuse, undulate below, rarely smooth; claw 6–7 mm long, whitish, 3-nerved, glabrescent, with eglandular hairs 0.1–0.2 mm long, along the basal and terminal area of the midrib. Stamens shorter than

petals, with filament 8.0–9.5 mm long, white; anthers 1.3–1.5 mm long, pinkish. Pollen grains spheroidal, pantoporate; pollen diameter 41–48 µm; pore shape isodiametric and rounded, pore diameter 3.6–5.7 µm (Figure 4). Ovary 3.0–3.5 mm long, glabrous, green. Styles 3, filiform. Capsule 5–7 mm long, ellipsoid-ovoid. Carpophore 4.5–5.5 mm long, pubescent. Seeds 1.1–1.4 mm in diameter, blackish, orbicular-reniform, flat laterally, winged and deeply canaliculate dorsally, and with flat wings (Figure 3).

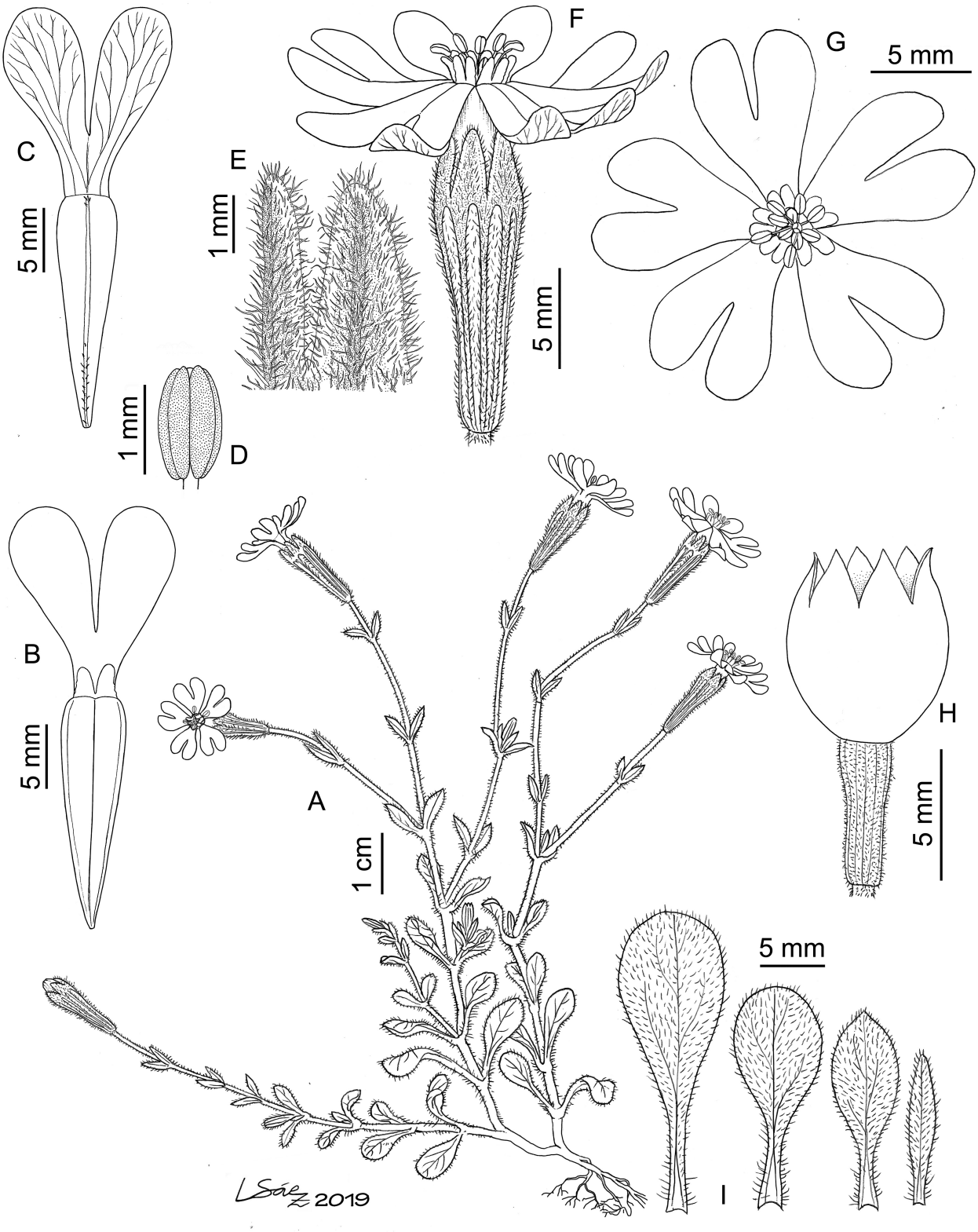

Figure 1. *Silene migjornensis*. A: Habit. Flower (lateral view). B: Petal (ventral view). C: Petal (dorsal view). D: Anther; E: Calyx teeth. F: Flower (lateral view). G: Flower (above view). H. Capsule. I: Leaves. Illustration by L. Sáez based on living material from Mallorca, Ses Covetes (L. Sáez, herb. pers., no. LS-5337).

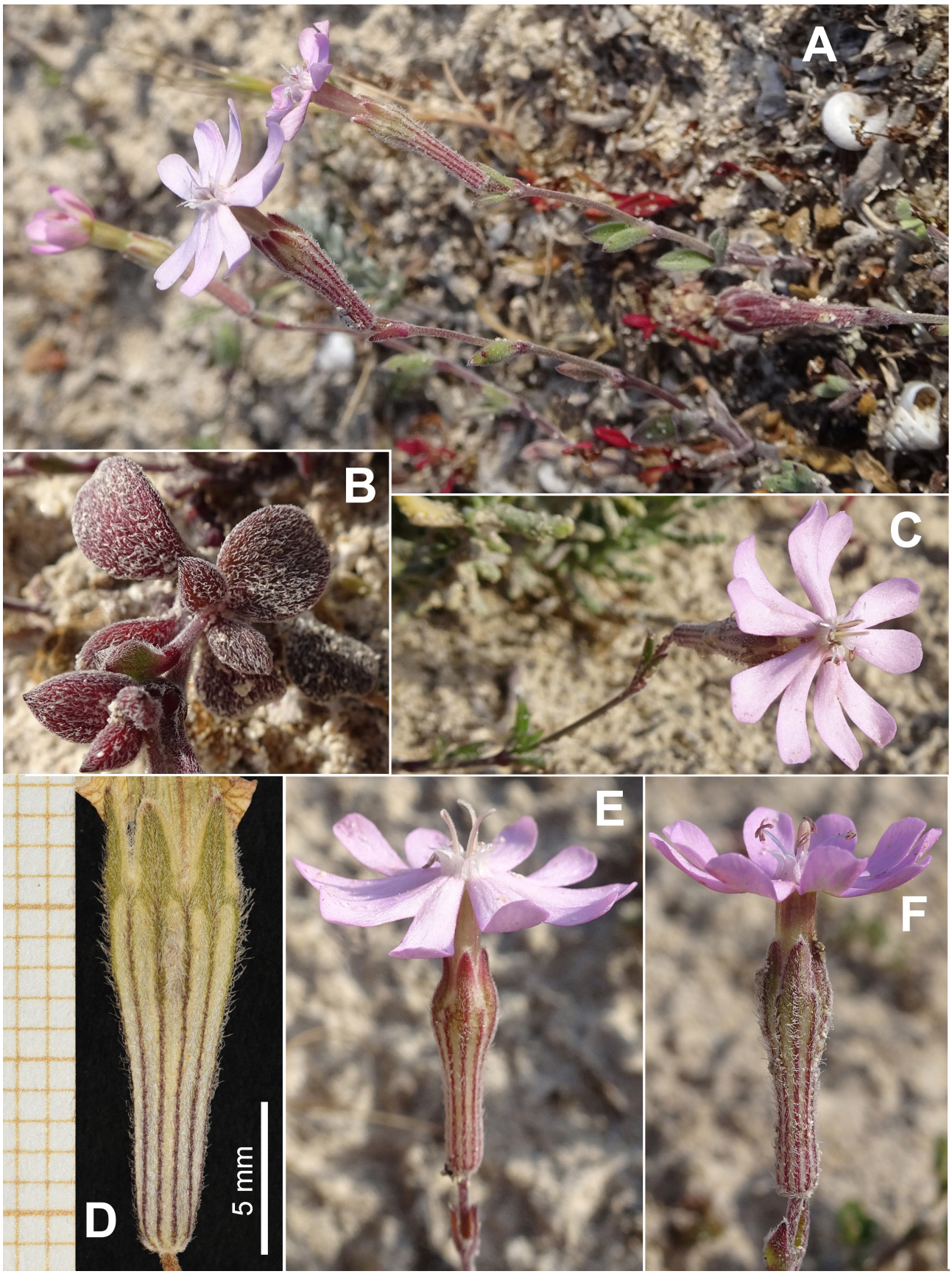

Figure 2. *Silene migjornensis*. A: Habit. B: Leaves. C-F: Flower (Field photographs taken by E. Guasp in Mallorca, Es Trenc, 16 April 2019). D: Calyx of a herbarium specimen from the same location (L. Sáez, herb. pers., no. LS-5337).

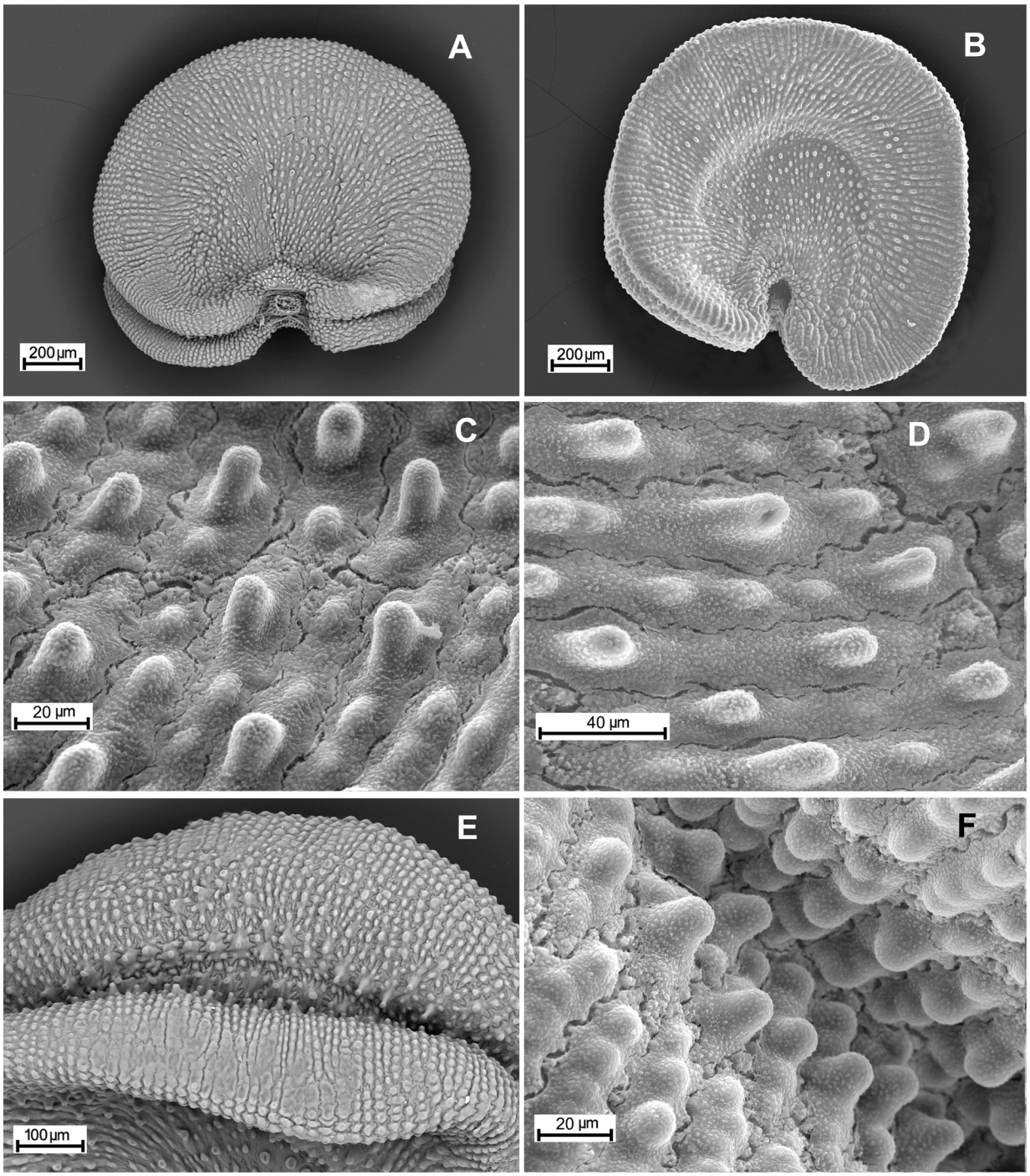

Figure 3. Scanning-electron micrographs of seeds of *Silene migjornensis*. A-B: Seed (lateral view). C-D. Seed coat detail (lateral view). E: Seed (dorsal view). F: Seed coat detail (dorsal view). (L. Sáez, herb. pers., no. LS-5337).

Geographical distribution and habitat

Silene migjornensis is known from Es Trenc, a coastal area in Southern Mallorca. The population at this location is restricted to a narrow strip of dune vegetation, along 2 km, at an altitude of 1–5 m asl. A considerably smaller population occurs at Ses Covetes, about 2 km at the NW of the first location. In both locations *Silene migjornensis* is part of a therophytic ephemeral sandy community. Associated species are: *Cutandia maritima* (L.) Barbey, *Lagurus ovatus* L., *Maresia nana* Batt., *Pseudorlaya pumila* Grande, and *Vulpia membranacea* (L.) Dumort. Schmitt (1994) also listed *S. sericea* in some vegetation plots made in northern Mallorca, where suitable habitats for *S. migjornensis* also exist. Further work is needed to locate possible additional populations in northern Mallorca.

Flowering period. End of March to early May.

Chromosome number. $2n = 24$ (Cardona & Contandriopoulos, 1983).

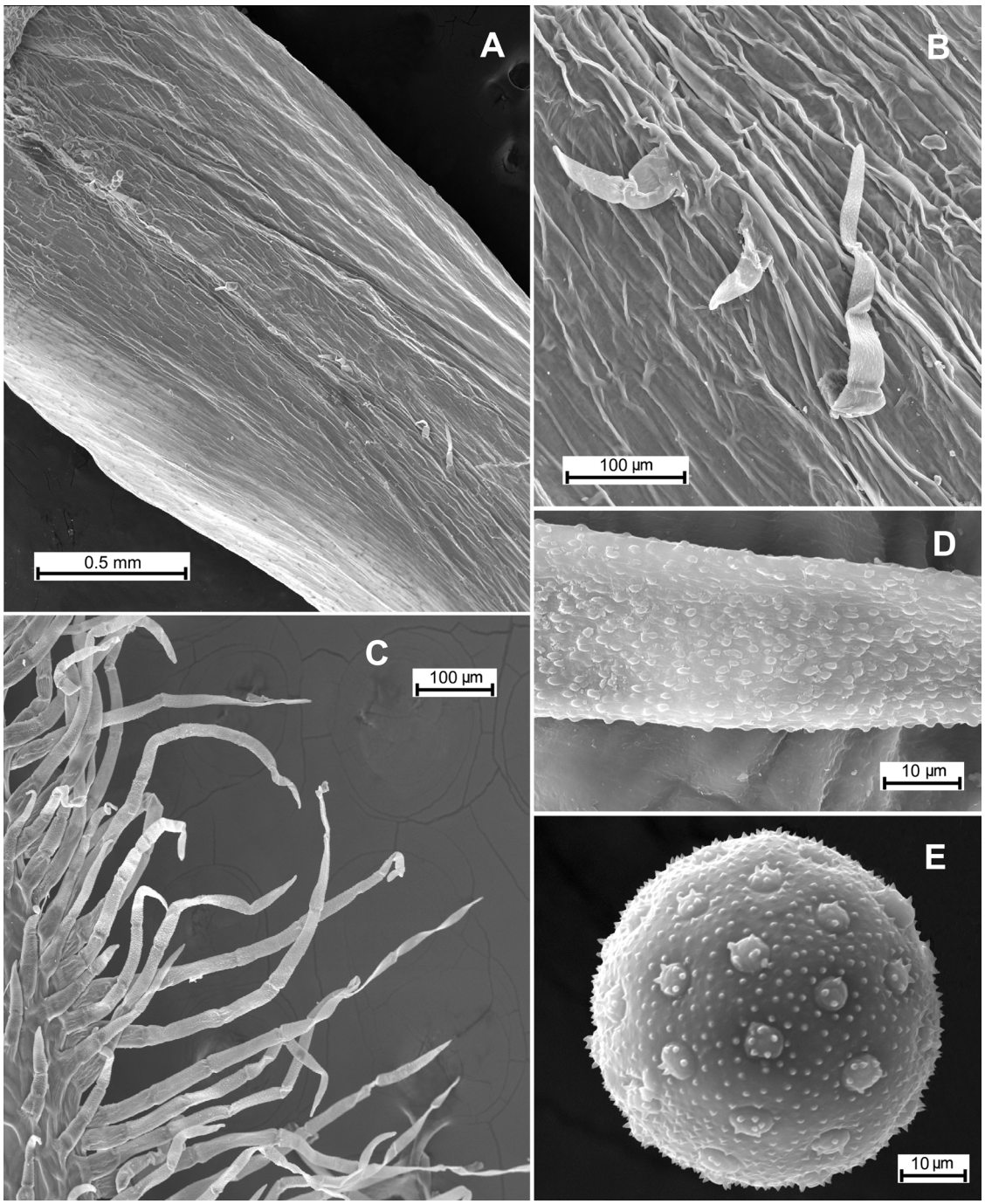

Figure 4. Scanning-electron micrographs of *Silene migjornensis*. A: Petal claw (abaxial surface). B: Hairs on petal claw (abaxial surface). C: Hairs on calyx lobe margin. D: Detail of hair on calyx lobe margin. E: Pollen grain. (L. Sáez, herb. pers., no. LS-5337).

Taxonomic relationships

Taxa of *Silene* sect. *Dipteropserma* constitute a difficult taxonomic aggregate in need of further work. Most species of this section are morphologically closely related. The group of plants that has been referred to *S. sericea* in a broad sense (Chater & Walters, 1964; Bolòs & Vigo, 1990; Chater *et al.*, 1993) displays a geographically structured morphological variation, which allows the recognition of taxonomic entities at the species level (Valsecchi, 1995; Brullo *et al.*, 2015, 2017). Our study reveals that plants from southern Mallorca traditionally identified as *S. sericea* var. *balearica*, should be considered as a separate taxon because of the well-defined morphological characters discriminating them from the other species currently recognized.

Selected characters of the most similar and likely most closely related taxa of *S. migjornensis* are shown in Tables 1 and 2, including *S. colorata*, which apparently seems to be non-closely allied. We also discuss the morphological relationships with *S. sericea*, which seem to be remote, so it is not included in Tables 1 and 2. The other taxa recognized within *Silene* sect. *Dipterosperma* show a quite different assemblage of characters (see Brullo *et al.*, 2015, 2017) and are not need not to be dealt with.

Table 1. Selected characters of *Silene migjornensis* and most closely related species belonging to sect. *Dipterosperma*, based on our own results as well as Brullo *et al.* (2017).

	S. migjornensis	*S. nummica*	*S. crassiuscula*	*S. melitensis*	*S. colorata*
Plant height (cm)	5–35(42)	5–10(15)	10–22	10–25	20–30
Plant indumentum	usually densely hairy	densely hairy	densely pilose-pubescent	densely pilose-pubescent	minutely pubescent
Stem	prostrate-ascending	prostrate-ascending	prostrate-ascending	prostrate-ascending	erect
Stem branching	at nodes, sometimes at the base	at the base, rarely at nodes	at nodes	at the base	not or few branched
Lower internode length (cm)	0.4–2.5	0.5–1.5	0.4–2	1–3	0.5–4.0
Upper internode length (cm)	1–5.2	1–3	2–4.5	1.5–6.0	up to 7
Leaf shape and thickness	oblanceolate to widely spathulate, succulent	narrowly spathulate, succulent	widely spathulate, succulent	oblanceolate to widely spathulate, succulent	linear-spathulate, thin
Leaf size (mm)	7–35 × 3–12	10–30 × 2–10	10–40 × 5–18	15–45 × 5–17	8–30 × 2–10
Leaf apex	rounded, sometimes subapiculate	rounded to retuse	rounded	rounded to obtuse	sub-acute to apiculate
No. flowers and inflorescence type	solitary	usually solitary	(1)2–5 helicoid monochasia	(1)2–3(5) helicoid monochasia	4–10 dichasia
Bract length (mm)	3–7	5–8(10)	3–10	3–10	4–8
Pedicel length (mm)	3–12(17)	5–20	5–18	2–8(10)	2–10
Calyx indumentum	tomentose-hirsute	tomentose-hirsute	minutely pubescent	tomentose-hirsute	minutely pubescent
Calyx length (mm)	11.5–15.5	11–13	12–15	11.5–12.5	13–14(15)
Calyx teeth size (mm)	2.3–3.5 × 1.5–2	2–2.5 × 1.4–1.8	2–2.8 × 1.5–2.5	2.5–2.7 × 1.3–1.6	2.0–2.5 × 1.4–2
Calyx teeth shape	triangular-oblong to triangular, obtuse to subacute	triangular, rounded	ovate-triangular, obtuse	ovate–triangular, obtuse	ovate, rounded
Corolla colour	pale pink to pink	pinkish to pink	purplish-pink	pink to purplish-pink	purplish-pink
Petal length (mm)	11.5–14	14–15	15.5–17	12.0–13.5	13–15
Petal limb length (mm)	5.0–7.0(7.5)	7.5–8	8–10	6.5–7.0	7–9
Petal lobe size (mm)	(3.5)4–5 × 2–3.5	5–5.5 × 3.5–4	6–6.5 × 3–5	4.8–5.2 × 2.2–2.7	5.0–5.5 × 2.5–2.7
Petal lobeshape	obovate-spathulate	obovate-spathulate	spathulate	obovate-spathulate	oblong
Petal claw length (mm)	6–7	7–7.5	7.5–8.5	6–7	6–8
Claw back	glabrescent, minutely pubescent in midrib	totally hairy	minutely pubescent in midrib	minutely pubescent in midrib	hairy in above midrib
Coronal scale length (mm)	1.0–1.6	1.4–1.8	2–2.4	1.5–1.8(2.0)	1.5–2.0
Coronal scale shape	deeply retuse, white to pale pink, undulate below (rarely smooth)	totally incised, white, undulate below	deeply retuse, white, smooth	deeply retuse, white, undulate below	deeply retuse, white, smooth
Stamen filament length (mm)	8.0–9.5	9–10	8–10	6.5–9.0	6.5–8.5
Anther colour	pinkish	greenish-white	pinkish	pink-lilac	yellowish-green
Anther length (mm)	1.3–1.5	1.8	2	1.6–1.8	1.8–2.0
Ovary length (mm)	3.0–3.5	3	3.5	2.2–3.0	2.4–2.8
Capsule length (mm)	5–7	4.5–6.5	8–9	7–8	7.5–8.0
Carpophore	4.5–5.5	6–6.5	5–5.5	4.5–5.2	5–6

On morphological grounds, *S. migjornensis* is mainly related to *S. nummica* Vals., endemic to Sardinia and Sicily (Peruzzi *et al.*, 2014), with which it shares most of the vegetative characters (prostrate-ascending stems, leaves moderately succulent and rounded) and some reproductive features (solitary flowers, and flat seed wings). However, a careful comparison of their morphological features (Tables 1 and 2) shows relevant differences: *S. migjornensis* is easily distinguished from *S. nummica* by its longer calyx and calyx teeth, smaller petals lobes, shorter and pinkish anthers, shorter carpophore and by its glabrescent abaxial surface claw (vs. totally hairy in *S. nummica*) (Figures 1, 4). Regarding seed characters, several discontinuities also exist, like seed size, and dorsal furrow epidermal cell size and shape, among others (Table 2).

Table 2. Comparison among seed features of *Silene migjornensis* and most closely related species belonging to sect. *Dipterosperma*, based on our own results and Brullo *et al.* (2017).

	S. migjornensis	*S. nummica*	*S. crassiuscula*	*S. melitensis*	*S. colorata*
Seed diameter (mm)	1.1–1.4	1.0–1.2	1.3–1.4	1.5–1.7	1.0–1.5
Seed wing	flat	flat	undulate	undulate	undulate
Lateral epidermal cell size (μm)	60–200× 20–45	80–170×20–35	140–222×27–45	100–200×20–37	65–110×22–30
Periclinal wall shape	manifestly colliculate	manifestly colliculate	manifestly colliculate	slightly colliculate	manifestly colliculate
Periclinal wall surface	densely and irregularly microgranulate	rugose and sparsely microgranulate	densely and uniformely microgranulate	irregularly granulate	densely and uniformely microgranulate
Periclinal wall sculptures	spaced and irregular tubercles	spaced and regular tubercles	contiguous and regular tubercles	spaced and irregular tubercles	contiguous and irregular tubercles
Anticlinal wall position	narrow and usually deeply depressed	deeply incise-depressed	narrow and slightly depressed	raised and thin	narrow and slightly depressed
Anticlinal wall groove	not lacerate	lacerate	not lacerate	not lacerate	not lacerate
Anticlinal wall shape	more or less irregularly lobated	irregularly lobated	regularly and uniformly lobated	more or less regularly lobated	irregularly lobated
Anticlinal wall undulation	S-like	S-like	U-like	S-like	S-like
Dorsal furrow epidermal cell size (μm)	50–90	40–55	60–90	80–160	80–115
Dorsal furrow epidermal cell shape	stellate-elongate-elliptical to isodiametric	stellate-isodiametric	stellate-isodiametric	elongate-elliptical	subcircular-isodiametric
Dorsal furrow epidermal cell surface	1 central and 1–4 lateral tubercles	1 central and several lateral tubercles	1–tuberculate	1–3 tubercles	1–tuberculate
Dorsal furrow epidermal cell tubercle	irregularly microgranulate	regularly microgranulate	irregularly microgranulate	irregularly granulate	loosely macrogranulate
Dorsal furrow epidermal cell undulation	V-like or U-like	V-like	V-like	V-like	no undulations

Morphological relationships with *S. colorata* (endemic to mountains of C and S Europe) appear to be more remote. This species can be easily discriminated by several characters, including erect stems, 4–10 flowers in dichasia, longer anthers and strongly undulate seed wings (Table 1). In addition, several seed characters allow an easy distinction between both species (Table 2).

Silene sericea, currently interpreted to be a Ligurian (north-western Italy) endemic species, (Valsecchi, 1995), can be easily separated by several vegetative and reproductive characters: erect stems; lanceolate leaves, longer calyx (18–22 mm long), longer capsule and carpophore (10–11 mm long and 12–14 mm long, respectively) (see Valsecchi, 1995 and Brullo *et al.*, 2015).

Geographic isolation is, most likely, linked to the speciation processes occurred within *Silene* sect. *Dipterosperma*. Apparently, polyploidy is not present within the section and all cytologically know species are diploid (2n=24). In this context, the geographic isolation of *S. migjornensis* with respect to the morphologically-related *S. nummica* (endemic to Sardinia) is interesting. The importance of restricted gene flow and genetic drift as a major evolutionary force driving plant diversification in Mediterranean continental islands is well known (Mayol *et al.*, 2012). Several, closely related taxa (putative sister species) replacing each other between the Balearic Islands and Corsica and Sardinia (and adjacent areas) are a well-documented phenomenon. Some examples include *Crocus cambessedesii* J. Gay *vs*. *C. minimus* DC., *Erodium richardii* (Murray) DC. *vs*. *E. corsicum* Léman ex DC., *Helleborus lividus* Aiton *vs*. *H. corsicus* Willd., and *Urtica bianorii* (Knoche) Paiva *vs*. *U. atrovirens* Req. ex Loisel.

Conservation status

Following the categories and criteria of IUCN (Anonymous, 2012), our data so far indicate that *S. migjornensis* should be listed as EN (Endangered): B1ab(iii)c(ii-iv) + 2ab(iii) c(ii-iv) based on: i) its geographic restriction: the extent of occurrence and the area of occupancy (calculated on a 2 × 2 km grid) is 12 km^2 (both values are 1.5 km^2 on a 0.5 × 0.5 km grid), ii) the number of locations or subpopulations (two locations are here recognized), iii) continuing decline inferred in area, extent and/or quality of habitat, and iv) extreme fluctuations in the number of mature individuals exist. The Balearic population is found in maritime dunes, so it is likely that anthropogenic disturbances (trampling and circulation of vehicles) can cause impact on *S. migjornensis*.

Identification key

In order to incorporate *S. migjornensis* into the recent identification key of the taxa of *Silene* sect. *Dipterosperma* (Brullo *et al.*, 2017), thereby facilitating its identification, we present here a partial modification of this key. The key is the same until couplet #14, where it should be modified as follows:

14. Inflorescence (1–)2–3(–5)-flowered. Seeds with undulate wings ..... *S. melitensis*

14' Flowers solitary. Seeds with flat wings..... 15
15. Petal claw totally hairy on the back. Carpophore 6.0–6.5 mm long..... *S. nummica*
15'. Petal claw glabrescent (minutely pubescent in midrib) on the back. Carpophore 4.5–5.5 mm long..... *S. migjornensis*

Studied specimens

Balearic Islands, Mallorca: in sabulosis zonae littoralis prope Salobrar de Campos in consortio Helichrisi Stoechadis Legi d. 20 Apr. 1873, *M.H. Willkomm* [*Herb. Balear n. 303*] (COI, barcode COI00059139 [lectotype]); Puerto de Campos, 2 m asl, 16 Apr 1907, *H. Knoche s.n.* (MPU); La Ràpita (Mallorca), 14 May 1986, *J. Orell s.n.* (BC 676502); Platja des Trenc, 22 May 1984, *I. Soriano s.n.* (BCN 124394); Mallorca, Es Trenc, Campos, 31SDD9855, 2 m asl, maritime sands, 22 Apr 2000, *L. Sáez LS-5336* (L. Sáez, herb. pers.); Mallorca, Ses Covetes, Campos, 31SDD9656, maritime sands, 22 Apr 2000, *L. Sáez LS-5337* (L. Sáez, herb. pers.); Mallorca, entre sa Ràpita i Ses Covetes, Campos, 31SDD9656, maritime sands, 20 Apr 2017, *E. Guasp s.n.* (L. Sáez, herb. pers.); Mallorca, Es Trenc, Campos, 31SDD9855, 2 m asl, maritime sands, Apr 2017, *E. Guasp* (L. Sáez, herb. pers.; 8 specimens).

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