

## LIMONIUM EJULABILIS, A NEW ENDANGERED ENDEMIC SPECIES FROM MAJORCA (BALEARIC ISLANDS, SPAIN)\*

by

JOSEP A. ROSSELLÓ, MAURICI MUS & JAUME X. SOLER\*\*

### Resumen

ROSSELLÓ, J. A., M. MUS & J. X. SOLER (1994). *Limonium ejulabilis*, un nuevo endemismo amenazado de Mallorca (Islas Baleares, España). *Anales Jard. Bot. Madrid* 51(2): 199-204 (en inglés).

Se describe una nueva especie de *Limonium* del suroeste de Mallorca, *L. ejulabilis*. La especie propuesta es un taxon triploide perteneciente al complejo *L. delicatulum*. Se comentan y discuten sus afinidades, algunas características del hábitat y aspectos sobre su conservación. Se excluye de la flora balear *L. cossonianum*.

Palabras clave: *Plumbaginaceae*, *Limonium*, endemismo, saladares, flora amenazada, Islas Baleares.

### Abstract

ROSSELLÓ, J. A., M. MUS & J. X. SOLER (1994). *Limonium ejulabilis*, a new endangered endemic species from Majorca (Balearic Islands, Spain). *Anales Jard. Bot. Madrid* 51(2): 199-204.

A new species of *Limonium* from the southwest of Majorca is proposed here as *L. ejulabilis*. This taxon is a triploid species belonging to the *L. delicatulum* complex. Some aspects of its relationships, habitat characteristics, and conservation trends are discussed. *L. cossonianum*, previously confused with *L. ejulabilis*, is excluded from the Balearic flora.

Key words: *Plumbaginaceae*, *Limonium*, endemism, salt marshes, endangered flora, Balearic Islands.

*Limonium* is the most diversified genus of the Balearic vascular flora. Through the works of PIGNATTI (1955, 1959, 1960, 1962, 1971), LLORENS (1986a, b) and especially that of ERBEN (1978, 1981, 1986, 1988, 1989, 1993) a basic knowledge of the Balearic taxa has been achieved. However, many unresolved taxonomic and nomenclatural questions still remain and a reinterpretation of some taxa should be done in order to provide the basis for a sound biosystematic revision.

In the course of a botanical trip devoted to

the salt marshes of Southwest Majorca (Magalluf), several taxa of *Limonium* already known from the area were collected, viz. *L. boirae* L. Llorens, *L. magallufianum* L. Llorens, *L. validum* Erben and *L. virgatum* (Guss.) Fourr. A very small population of another, unknown taxa with striking blue flowers was also found.

*Limonium cossonianum* O. Kuntze has also been reported in the vicinity of Magalluf (LLORENS, 1986a). Unfortunately this author gave neither a description nor an iconography

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\*\* Departamento de Biología Vegetal (Botánica), Facultad de Biología, Universidad de Valencia. E-46100 Burjassot (Valencia).



Fig. 1.—*Limonium ejulabilis*: Habit.

for the reported *L. cossonianum*, but referred to it as the identity he reached for his OTU #17. However, the comprehensive description and the good illustrations given by the same author some years before (LLORENS, 1979) for the OTU #17 (sub *L. eugeniae*) convince us that the taxon we collected at Magalluf was identical to the plants used to define that OTU. The comparison of our samples with Iberian specimens of *L. cossonianum* has shown obvious differences which eliminate all possible confusion between them.

Since the combination of morphological characters does not fit well with any of the known taxa of *Limonium*, we have decided to describe it as a new species, *L. ejulabilis*. The reasons for this are given below.

## RESULTS

### *Limonium ejulabilis*, sp. nov. (fig. 1)

*Derivatio nominis*: from the latin *ejulabilis*, -e = pained. Referring to the problems which involved its classification.

*Planta perennis, glabra, oligocaulis. Caudiculi 1-5 cm longi, laxe ramosi, in parte superiore spiraliter foliati. Folia basalia erecta, florendi tempore persistentia, 45-96 × 16-39 mm, obtusa, mucronata, marginibus planis, supra laeviter, 6-7 nervia, in petiolum 1/1 longitudinis laminae attingentem, 2-4 mm latum attenuata. Caules usque 100 cm longi, erecti, breviter papilloso, in partibus superioribus ramosi. Inflorescentia paniculata, forma rombica. Rami laxe distiche dispositi, omnes fertiles, usque ad 30 cm longi, subarcuati, oblique sursum spectantes, sub angulis 45-70° abeuntes, laxe ramosi.*

*Spicae 12-20 mm longae, rectae ad subcurvatae, subpatentes.*

*Spiculae 3-4 mm longae, 2-3(4) florum, ad 6-7 in 1 cm dispositae. Bractea inferior 1-1.5 × 1.5-1.7 mm, triangularis ad triangularis-ovata, acuta, margine late membranaceo (0.4-0.5 mm), parte centrali subcarnosula, longe acuminata, acumine marginem non attingente. Bractea media 1.5-2 × 0.8-1 mm, oblongo-elliptica, rotunda ad submarginata, membranacea. Bractea superior 3-3.5 × 2.2-3 mm, obovata ad elliptica, rotunda ad*

*obtusa, margine late membranaceo; parte centrali carnosula 2.3-2.5 × 1.7-2 mm, oblonga ad oblonga-elliptica, acuminata, acumine 0.8-1 mm longo, marginem non contingente. Calyx 3-3.5 mm longus, ex bractea superiore 0.5-1 mm exertus, tubo plerumque dense longae piloso; dentes calycis ca. 0.7-1 mm, semiellipticis; costae tubi ante basim dentium calycis desinentes. Corolla infundibuliformis. Petala cuneata, pallide violacea.*

Perennial with few stems, glabrous. Caudices 1-5 cm long, loosely branched, spirally leafy in upper part. Basal leaves erect, green at anthesis, 45-96 × 16-39 mm. Blade elliptical to ovate-elliptical, tip obtuse to rounded, with a thin 3 mm long apiculus; flattened at the margins, smooth on both faces, 6-7 nerved. Petiole canaliculate, as long as the blade, 2-4 mm wide.

Stem to 100 cm long, erect, with a short indument of eglandular hairs in the lowest part; ramified in the upper part. Inflorescence paniculate, loosely branched, rhombic. Branches loosely distichous, up to 30 cm long, subcurved at the ends, obliquely inserted (45-70°), non-flowering branches few or absent. Spikes 12-22 mm long, straight to subcurved, subpatent, with 6-7 spikelets per cm. Spikelets 3-4 mm long, 2-3(4)-flowered. Outer bract 1-1.5 × 1.5-1.7 mm, triangular to triangular-ovate, acute, margin broadly membranous (0.4-0.5 mm); central part slightly subfleshy, longly acuminate, the acumen not reaching the margin. Middle bract 1.5-2 × 0.8-1 mm, oblong-oval, blunt to subemarginate, membranous. Inner bract 3-3.5 × 2.2-3 mm, obovate to elliptical, blunt, with a broad membranous margin; central part subfleshy, 2.3-2.5 × 1.7-2 mm, oblong to oblong-elliptic, acuminate, acumen 0.8-1 mm long, not reaching the margin. Calyx 3-3.5 mm long, surpassing by 0.5-1 mm the inner bract, tube hairy, with long eglandular hairs; tooth ca. 0.7-1 mm, semielliptic; midrib not reaching the calyx lobes. Corolla funnel-shaped. Petals cuneate, pale violet (fig. 2).

*Typus: Insulis Balearibus, Majorica, locus dictus Es Prat de Magalluf in paludibus argillosis salsis ubi 18-VIII-1993, M. Mus et J. A. Rosselló legerunt (VAB 933797 holotypus; MA, G, Herb. Erben isotypi).*

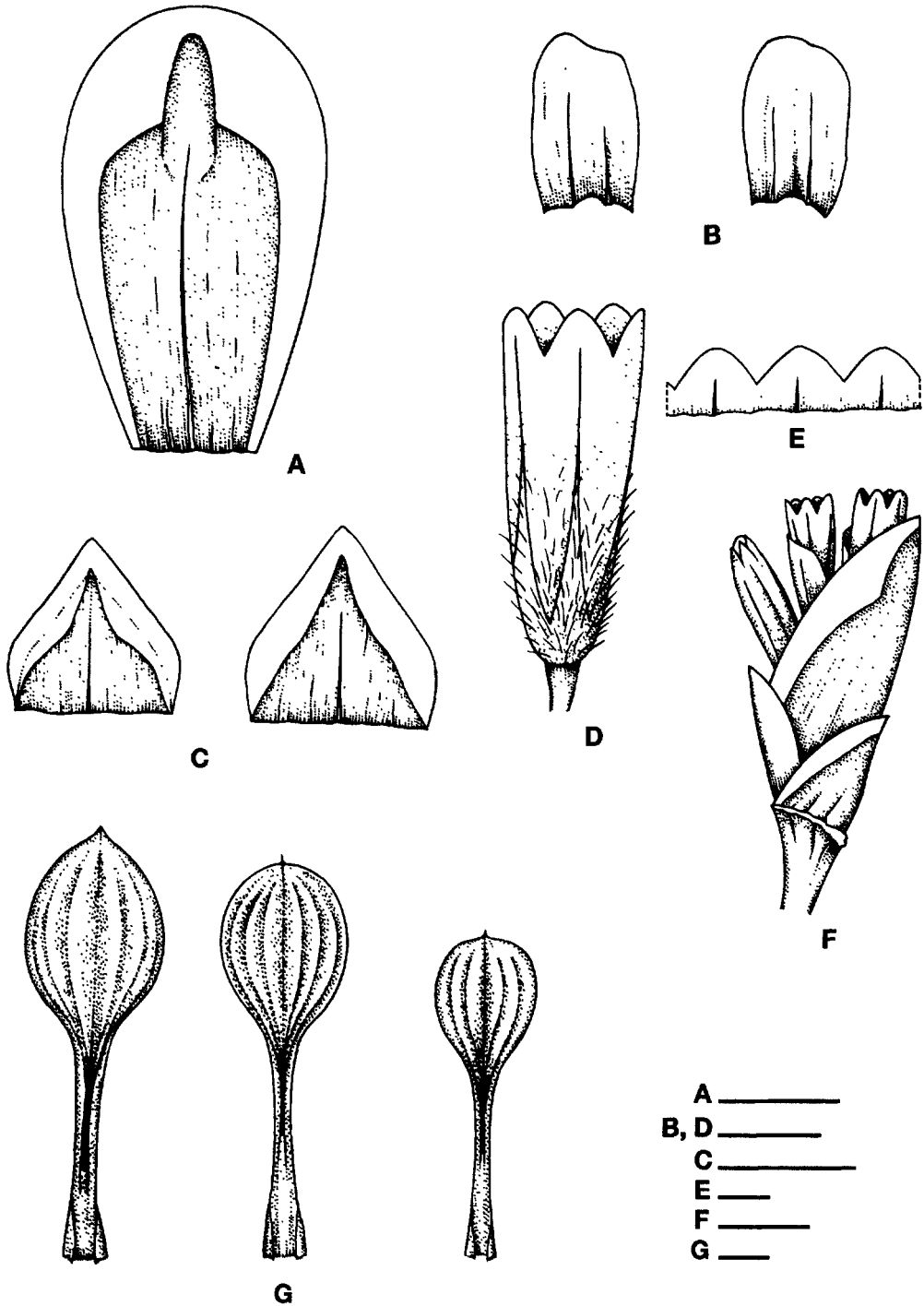


Fig. 2.—*Limonium ejulabilis*: A, inner bract; B, middle bract; C, outer bract; D, calyx; E, calyx teeth; F, spikelet; G, leaves (scales: A-F = 1 mm; G = 1 cm).

Material examined: Es Prat de Magalluf, 11-VII-1993, *M. Mus* (VAB 930691); *ibidem*, 18-VIII-1993, *M. Mus* & J. A. Rosselló (VAB 933798).

#### COMPARISON WITH OTHER SPECIES

The analysis of morphological and cytological characters of *Limonium ejulabilis* suggests that it is a member of the *L. delicatulum* complex (ERBEN, 1978). The taxonomy and evolutionary relationships of this complex are far from being clearly understood. Therefore, only a limited discussion of the affinities of *L. ejulabilis* can be attempted. As stated before, the new species has been confused in the past with *L. cossonianum* O. Kuntze (LLORENS, 1986a), a taxon which can be readily distinguished from all the species of the *L. delicatulum* complex by its white petals. Moreover, *L. ejulabilis* differs from the latter species by the branching pattern of the inflorescences, the lower density of spikelets (6-7 cm in *L. ejulabilis* versus 6-11 cm in *L. cossonianum*), the lower number of flowers per spikelet (2-3 in *L. ejulabilis* versus 3-7 in *L. cossonianum*), and the distinct length and shape of the inner bracts. In addition, *L. cossonianum* is a diploid species with  $2n = 16$  (ERBEN, 1978) whereas *L. ejulabilis* is a triploid taxon with probably  $2n = 25$  chromosomes. The root cells we examined had very few metaphasic plates and the chromosomes did not spread well and tended to clump together (despite the colchicine pretreatment), thereby preventing an accurate count. However, we are confident that its triploid status is beyond doubt. The only reliable morphological characters relating both species are the similar ratio between the petiole and the blade (1 : 1) and the shape of the leaves.

*Limonium ejulabilis* is quite different from the other members of the *L. delicatulum* group. The greater petiole-blade ratio as well as the lower density and shortness of the spikes differentiate the former from *L. delicatulum* (Girard.) Kuntze and *L. angustibracteatum* Erben. The new species differs from *L. santapolense* Erben by having the leaves more abruptly narrowed, the stems branched in the upper part, less dense spikes, smaller spikelets and by the acumen of the inner bract not reaching the upper margin.

*Limonium magallufianum*, which grows in the vicinity, has a superficial similarity with *L. ejulabilis*. However, they are readily distinguished on the basis of the following features present in *L. ejulabilis*: leaves not clearly spatulate, petiole as long as the blade, absence of trichomes in the adaxial part of the petiole, stem branched in the upper part.

It could be argued that the rarity of the taxon merely reflects a hybridization process between the extant species of *Limonium* present in the Magalluf area. However, the data we have at hand do not support this view. The morphology of the *Limonium* species growing at the Prat de Magalluf does not suggest anyway that they were involved in the origin of *L. ejulabilis*. Moreover, any of the relevant features of *L. magallufianum*, the only species of the *L. delicatulum* complex growing in the vicinity and the main candidate as hypothetical parent of the latter, are present in the specimens of *L. ejulabilis*.

In order to incorporate *L. ejulabilis* into the recent comprehensive treatment of the Iberian taxa of *Limonium* (ERBEN, 1993), thereby facilitating its identification, we present here a partial modification of the key provided in *Flora Iberica*. It should be pointed out, however, that the provision of this key does not imply, in fact, full agreement with the taxonomic treatment provided there.

The key is the same until couplet #114, where it should be modified as follows:

- |  |                         |
|--|-------------------------|
| 115. Spikelets 7-7,5 mm .....  | <b>L. ebusitanum</b>    |
| – Spikelets 3,5-6,9 mm .....   | 116                     |
| 116. Spikelets 3,5-5,4 mm .....  | 117                     |
| – Spikelets 5,5-6,9 mm .....   | 130                     |
| 117. Leaves with revolute to rolled margin .....   | 118                     |
| – Leaves with flat margin .....  | 121                     |
| 121. Petiole with short hairs in the lower side .....                                    |                         |
| .....  | <b>L. magallufianum</b> |
| – Petiole glabrous .....   | 122                     |
| 122. Spikelets 3,5-5,1 mm .....  | 123                     |
| – Spikelets 5,2-5,4 mm .....   | 125                     |
| 123. Leaves 16-40 mm broad .....   | 124                     |
| – Leaves 6-14 mm broad .....   | 125                     |
| 124. Petiole as long as leaf blade; spikelets 3,5-4 mm; calyx length 3,3-4,2 mm .....    | <b>L. ejulabilis</b>    |
| – Petiole 1/2-3/4 as long as leaf blade; spikelets 4,1-5 mm; calyx length 3-3,2 mm ..... |                         |
| .....  | <b>L. biflorum</b>      |

## HABITAT AND CONSERVATION

The only population of *L. ejulabilis* so far known is restricted to the highly disturbed remains of a salt marsh located several hundred meters from the sea. Touristic development of Magalluf greatly diminished the extension of the halophyte communities. The plants of *L. ejulabilis* were found to grow only in argillaceous-sandy soils of the desiccated salt marsh and we were not able to trace the original habitat for the species. LLORENS (1986a) suggested that *L. magallufianum*, a species growing nearby, originally grew in brackish argillaceous-gypseous soils. At present, *L. ejulabilis* can be found associated with the following predominant species: *Arthrocnemum macrostachyum* (Moric.) Moris, *Halmione portulacoides* (L.) Aellen, *Suaeda vera* Forsskål, *Inula crithmoides* L., *Juncus acutus* L. and *Brachypodium phoenicoides* (L.) Roemer & Schultes. Two other congeneric species, *L. magallufianum* and *L. boirae*, also grow in the vicinity. This fact suggests that the species belongs to littoral halophytic communities of the *Salicornietea* Br.-Bl. & Tüxen 1943 class, particularly to the most summer drought tolerant ones (*Salicornion fruticosae* Br.-Bl. 1931, *Arthrocnemion macrostachy* Rivas Martínez & Costa in Rivas Martínez & al., 1980). It could also grow on *Limonietalia* Br.-Bl. & O. Bolòs 1957 em. Rivas Martínez & Costa 1984 communities, better developed when the salt marshes were unaltered.

It is possible to suppose that other better developed populations were once present in the salt marsh habitats of the southwest part of Majorca, before this area suffered irreversible changes in its vegetation and floristic composition. Herbarium collectors, trampling, trash accumulation, the increasing rate of civil construction and the creation of public recreation areas in the Magalluf salt marsh area, all constitute severe threats to the short term conservation of this species. In our opinion collecting seeds for long term storage as well as for nursery propagation are the most urgently needed measures to preserve this taxon from imminent extinction. Also, it would be necessary to establish and enforce protection of the area, where other seriously endangered species are present (*L. boirae*, *L. magallufianum*). The status of Natural Reserve, according to the

4/89 Spanish Law of Conservation of Natural Territories and wild Flora and Fauna, would be the most appropriate for insuring the survival of this group of interesting and extremely localized species in their natural habitat.

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