

**TWO NEW SPECIES OF LIMONIUM (PLUMBAGINACEAE)
FROM ZAKYNTHOS ISLAND (GREECE)**

by

R. ARTELARI

BOTANICAL INSTITUTE OF PATRAS, (GREECE)

Abstract

ARTELARI, R.: Two new species of *Limonium* (Plumbaginaceae) from Zakynthos island.

Two new species, *Limonium zakyntium* Artel. and *L. phitosianum* Artel. from Zakynthos island (Ionian Sea) are described. Chromosome numbers ($2n = 18$), karyotypes and aspects of reproduction of the above species are also given.

In the process of the cytotaxonomical study of the genus *Limonium* in the Ionian islands we describe two new species from Zakynthos island (Map of Fig. 1):

1. *Limonium zakyntium* Artel., sp. nova

Typus: Ins. Zakynthos: ad sinum Keri; in saxosis calcareis, maritimis. ARTELARI 216 (Holotypus, UPA). Fig. 2 & 3.

Planta perennis, glabra, tuberculata, 18-40 cm alta. Caudiculi 2-4 cm longi, ramosi, tenui. Folia 15-42 mm longa et 4-10,5 mm lata + spatulata, obtusa vel emarginata, revoluta, in petiolum lamina subaequilongum attenuata, uninervia, florendi tempore non emarcida. Caules permultis, erecti, tenuissimi, a basi ramosi, ramis angulis acutis formantibus. Inflorescentia corymbosa. Rami steriles permulti, fertiles pauci superiores. Spicae 15-55 mm longae, erectae, laxae, graciles. Spiculae 7-8 mm longae, 2-3-florae, ad 1-2 (-3) pro cm dispositae, secundae vel biseriales. Bractea exterior (0,8-) 1,2-1,7 mm longa, triangulari-ovata, acuta. Bractea media (1,6-) 1,9-2,4 mm longa, obovata-elliptica, obtusa, membranacea. Bractea interior 4,2-4,9 mm longa, elliptica, acuta, margine membranacea c. 0,5 mm lata, parte centrali herbacea, acuminata, acumine 0,8-1,1 mm longo. Calyx (4,3-) 4,5-5 mm longus, tubo limbo brevior vel subaequilongus, laxe piloso. Lobi calycis 0,7-0,9 mm longi, elliptici, obtusi vel sensim acuminati. Corolla 6-7 mm longa, violacea.

Numerus chromosomaticus: $2n = 18$

Habitat in saxosis calcareis, maritimis. Floret ab Jul. ad Sept.

Area: Hellas: Ins. Zakynthos.

Plant 18-40 cm, glabrous, perennial, tuberculate. Woody basal branches 2-6 cm long, thin, branched. Leaves 15-42 mm long and 4-10,5 mm wide, green at anthesis, + spathulate, 1-veined, with revolute margin, apex obtuse or emarginate and petiole about as long as lamina. Stems numerous, very slender, erect or suberect, branched from the base, with the branches diverging at an acute angle. Inflorescence corymbose with numerous sterile branches and a few fertile at the upper 1/3. Spikes 15-55 mm long, slender, erect, with 1-2 (-3) spikelets per cm. Spikelets 7-8 mm long, 2-3-flowered. Outer bract (0,8-) 1,2-1,7 mm long, triangular-ovate, acute. Middle bract (1,6-) 1,9-2,4 mm long, ellipsoid, obtuse, membranous. Inner bract 4,2-4,9 mm long, ellipsoid, acute, with membranous margin c. 0,5 mm wide and the central herbaceous, acuminate with a point 0,8-1,1 mm long. Calyx (4,3-) 4,5-5 mm long, sparsely hairy; limb longer or equal to the tube; lobes 0,7-0,9 mm long, ellipsoid, obtuse or with a short point. Corolla 6-7 mm long, violet.

L. zakynthium is known only from the type locality, where it grows on calcareous maritime rocks. Based on its morphological characters, it should be considered relative to *L. corymbosa* group. However, it is clearly distinguished from that by the very slender, tuberculate stems, the more sterile branches, the longer inner bract and the longer calyx.

2. *Limonium phitosianum* Artel., sp. nova

Typus: Ins. Zakynthos: ad promontorium Skinari, prope pagum Korithi; in saxosis calcareis maritimis, PHITOS & KAMARI 18978 (Holotypus, UPA). Fig. 4 & 5.

Planta perennis, glabra, scabro-tuberculata, ad 30 cm alta. Folia permulta, pulviniformia, 6,5-30 mm longa et 2,5-6,5 mm lata, oblanceolata-spathulata, obtusa, valde revoluta, in petiololum lamina aequilongum attenuata, uninervia, florendi tempore pro maxima parte non emarcida. Caules pauci, erecti, fere a basi ramosi, ramis angulis acutis formantibus. Inflorescentia corymbosa. Rami articulis incrassatis, fragilibus as nodis, inferiores steriles pauci, superiores fertiles. Spicae 7-70 mm longae, laxae. Spiculae 8-8,5 mm longae, paucis incurvae, 2-3 florum, 3-4 (-6) pro cm dispositae, secundae vel biserialae. Bractea exterior 1-1,8 (-2) mm longa, triangulari-ovata, acuta. Bractea media (1,7-) 1,9-2,6 (-2,9) mm longa, elliptica, obtusa, membranacea. Bractea interior (3,7-) 4,5 (-5,7) mm longa, paucis incurva, elliptica, valde acuta ad acuta, margine membranacea 0,3-0,5 mm lata,

parto centrali herbacea, acuminata, acumine 0,3-0,8 mm longo. Calyx 5-5,8 (-6) mm longus, tubo limbo subaequilongus vel brevior, laxissime pilosus vel fere glabrus. Lobi calycis 0,8-1 mm longi, elliptici, obtusi vel acuti. Corolla 7-7,5 mm longa, violacea.

Numerus chromosomaticus: $2n = 18$.

Habitat in saxosis calcareis, maritimis et in arenosis maritimis. Floret ab Jul. ad Sept.

Area: Hellas: Ins. Zakynthos.

Plant 12-30 cm, glabrous, perennial, scabrid-tuberculate. Leaves 6,5-30 mm long and 2,5-6,5 mm wide, on numerous small rosettes gathered to a dense cushion-like formation, the most of them green at anthesis, spatulate-oblongate, 1-veined, with revolute margin, apex obtuse or sometimes emarginate and petiole about as long as lamina. Stems + few, erect, branched nearly from the base, with the branches diverging at an acute angle. Inflorescence corymbose with segments fragile and constricted at nodes lower branches sterile, few, upper fertile. Spikes 7-10 mm long, erect or curved. Spikelets 8-8,5 mm long, slightly curved, 2-4 (-6) per cm, 1-2 (-3)-flowered. Outer bract 1-1,8 (-2) mm long, triangular-ovate, acute. Middle bract (1,7-) 1,9-2,6 (-2,9) mm long, ellipsoid, obtuse, membranaceous. Inner bract (3,7-) 4-5 (-5,7) mm long, slightly curved, slightly acute to acute, with membranaceous margin 0,3-0,5 mm wide and the central part herbaceous, ellipsoid, acuminate, with a point 0,3-0,8 mm long. Calyx 5-5,8 (-6) mm long, very sparsely hairy or nearly glabrous: limb equal or longer than tube; lobes 0,8-1 mm long, ellipsoid, obtuse or acute. Corolla 7-7,5 mm long, violet.

Specimens seen:

Ins. Zakynthos: ad promontorium Skinari prope pagum Korithi; in saxosis calcareis, maritimis, PHITOS & KAMARI 18978 (UPA). Ad locum Porto Rona; in arenosis maritimis, VOMVAS 387 (UPA).

L. phitosianum is distinguished from *L. zaccynthium* from the obviously smaller number of sterile branches, the articulate segments of the inflorescence, the cushion-like rosettes, the curved spikelets and the longer calyx.

This species shows relation to *L. articulatum* because of its articulate inflorescence segments, but it differs from that from the well developed green leaves at anthesis, the longer spikes, the curved spikelets, the longer bracts and calyx and the chromosome number (*L. articulatum* $2n = 27$).

Cytology

The cytological study is based on living material cultivated in the experimental garden of the Botanical Institute of Patras.

The cytological investigation was limited to the mitotic metaphase plates and a root tip squash technique (ÖSTERGREN & HENEEN, 1962) was used. Root tips were pretreated for 3hrs in 2mM 8-hydroxyquinoline and then fixed in Carnoy (3:1) for about 24 hrs. Afterwards, they were hydrolyzed in 1N HCl at 60°C for 12 min and stained in Feulgen for 3-4 hrs.

Both species are diploid with basic number $x = 9$ and have the chromosome number $2n = 18$ (Fig. 6).

Reproduction

All the specimens of *L. saecynthium* and *L. phitosianum* examined have the self-sterile combinations A and B of pollen and stigma types (BAKER, 1948, 1953; ERBEN, 1978, 1979). Combination A is characterized by flowers with "cob"-stigmata and pollen grains broadly areolate, and combination B by flowers with "papillate" stigmata and pollen grains narrowly areolate.

In each population both A and B combinations appear with about the same frequency. This proves that the above species are sexual. Also, the chromosome number of both species, $2n = 18$, is commonly observed in sexual species of *Limnium*. Pollen investigations showed in all cases well developed pollen grains with a mean fertility of 92,3% for *L. saecynthium* and 93,6% for *L. phitosianum*.

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Legends of Figures

- Fig. 1: Collection sites of: ▲ *L. saecynthium* and ● *L. phitosianum*.
- Fig. 2: Holotype *L. saecynthium*.
- Fig. 3: *L. saecynthium*: a = spike, b = outer bract, c = middle bract, d = inner bract, e = calyx, f = calyx lobes, g = leaf.
- Fig. 4: Holotype *L. phitosianum*.
- Fig. 5: *L. phitosianum*: a = spike, b = outer bract, c = middle bract, d = inner bract, e = calyx, f = calyx lobes, g = petal, h = leaf.
- Fig. 6: Mitotic metaphase plates of: a. *L. saecynthium*.
b. *L. phitosianum*.

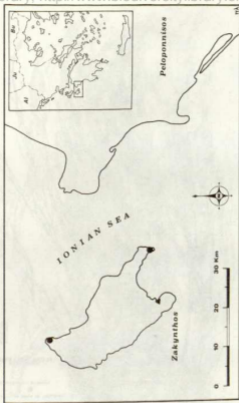
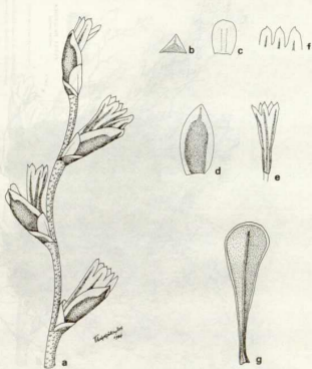


Fig. 1



Fig. 2



a, b, c, d, e, 1mm, f, 1mm, g, 4mm

Fig. 3

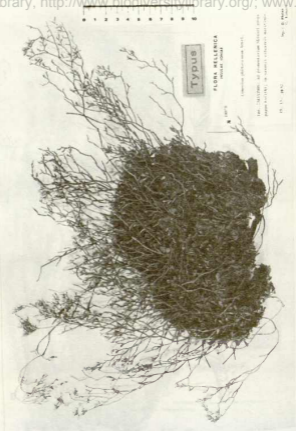
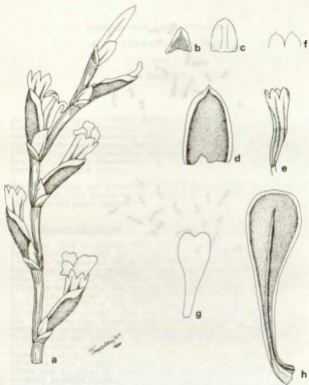


Fig. 4

Flourensia coccinea



a, b, c, d, e, g, h. 1mm, f. 1mm

Fig. 5

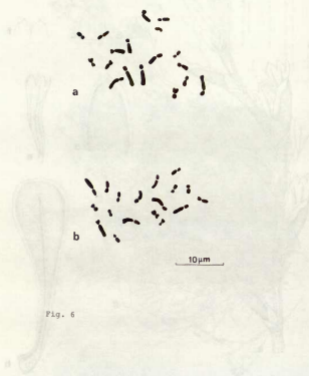


Fig. 6

Fig. 6. a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z