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# Limonium creticum (Plumbaginaceae), a new species from Kriti island (Aegean sea) Greece

R. ARTELARI

## RÉSUMÉ

ARTELARI, R. (1989). *Limonium creticum* (Plumbaginaceae), une espèce nouvelle de l'île de Crète (Mer Egée), Grèce. *Candollea* 44: 415-421. En anglais, résumés français et anglais.

*Limonium creticum* Artel., espèce nouvelle pour la science est décrite de l'île de Crète (Mer Egée). Le nombre chromosomique hexaploïde ( $2n = 51$ ), le caryotype, les caractéristiques du pollen et du stigmate donnent l'impression que cette espèce est apomictique et doit son origine à l'hybridisation. Ses relations avec *L. pigadiense* (Rech. fil.) Rech. fil. et d'autres espèces voisines sont brièvement présentées.

## ABSTRACT

ARTELARI, R. (1989). *Limonium creticum* (Plumbaginaceae), a new species from Kriti island (Aegean sea) Greece. *Candollea* 44: 415-421. In English, French and English abstracts.

*Limonium creticum* Artel., from Kriti island (Aegean sea) is described as a species new to science. The hexaploid chromosome number ( $2n = 51$ ), the karyotype and the pollen and stigma combination support the view that this species is apomictic originated through hybridization. Its relationships with *L. pigadiense* (Rech. fil.) Rech. fil. and other related species are briefly discussed.

***Limonium creticum* Artel., spec. nov.** (Figs. 1, 2).

**Typus:** Kriti island, Nomos Irakliou, Ep. Pirjiotissis: on maritime marls of village Matala, *Artelari & Chondropoulos 1028* (Holotypus UPA, Isotypi B, C, LD, M, W).

Planta perennis, 20-45 cm alta. Folia 2.0-8.5 cm longa  $\times$  0.5-2.0 cm lata, obovato-spathulata, coriacea, subtus 1-3-nervia, obtusa vel paulo mucronata, in dimidio laminae latissima, angustissime cartilagineo-marginata, margine ca. 0.1 mm lata, in petiolum lamina longiore vel subaequante abrupte attenuata, pallide viridia. Caules floriferi flexuosi, a tertia parte inferiore vel dimidio ramosi, arcuato-adscedentes, pallide virides, ramis sterilibus nullis vel subnullis. Inflorescentia pyramidata. Spicae 1.5-4.5 cm longae, arcuatae. Spiculae 6.5-7.0 mm longae, suberectae vel paulo incurvae, 2-4 pro cm dispositae, saepissime secundae. Bractea exterior 2.1-2.6(-2.8) mm longa, ovato-triangularis, acuta, interiore triplo brevior. Bractea interior 6.1-6.8 mm longa  $\times$  3.4-3.7 mm lata, elliptica, apice rotundata vel paulo emarginata, margine hyalina ca. 1 mm lata, parte centrali herbacea, acuminata, acumine 0.7-1.2 mm longa. Calyx (5.6-)6.0-6.2 mm longus, tubo limbo longiore vel subaequilongus, a basi et costas dense piloso; lobi calycis 0.6-0.8 mm longi, ovati, obtusi.

Affinis *L. pigadiensis* (Rech. fil.) Rech. fil., sed foliis in dimidio laminae latissimis in petiolum abrupte attenuatis, spicis laxissimis arcuatis, bracteis interioribus longioribus ellipticis, calycibus longioribus, differt.

*Numerus chromosomaticus:*  $2n = 51$

Perennial, 20-45 cm. Leaves obovate-spathulate, 1-3-veined, 2.0-8.5  $\times$  0.5-2.0 cm, obtuse to lightly mucronate, broader at the middle of the lamina, coriaceous, pale green, with indistinct, very

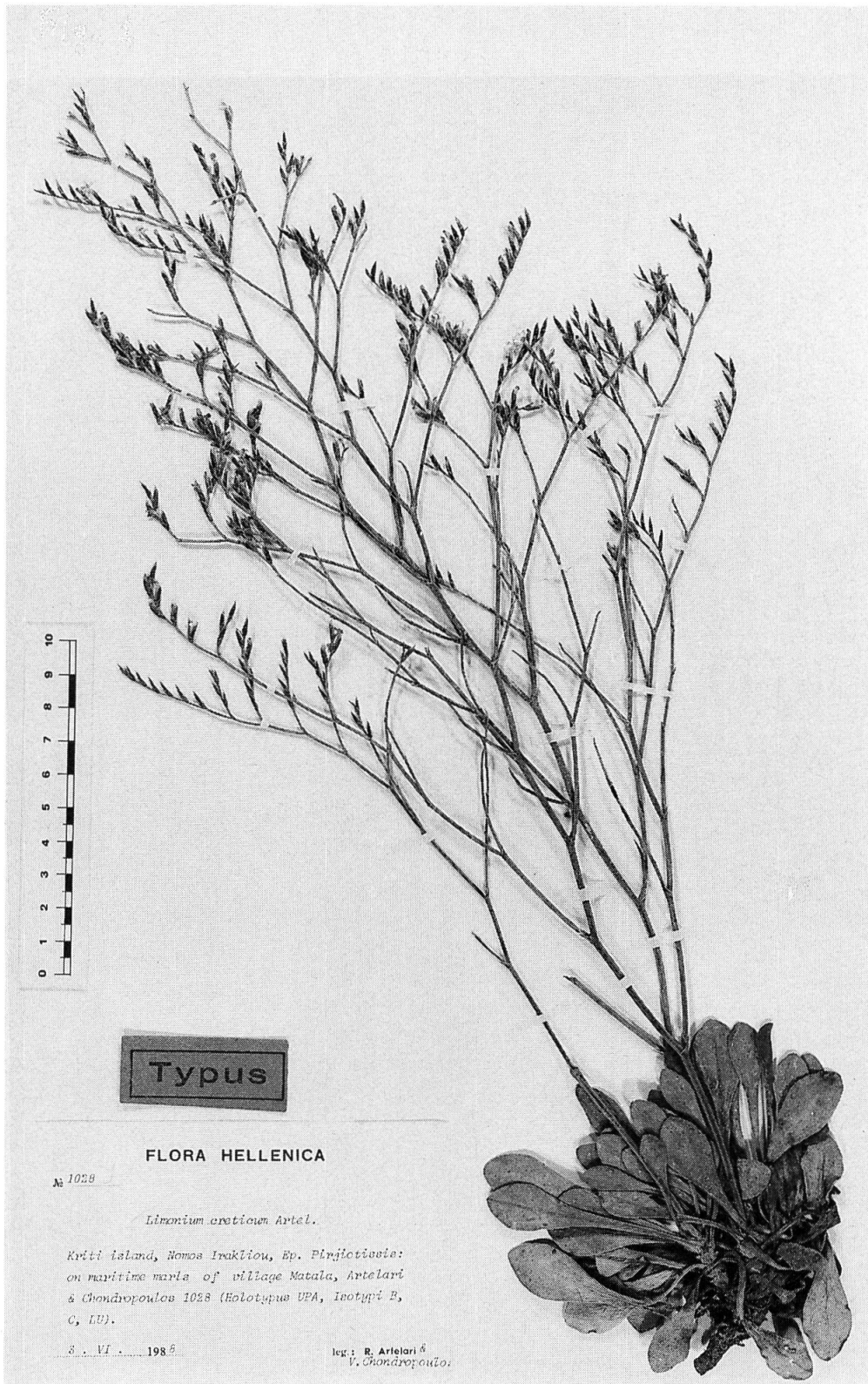


Fig. 1. — *Limonium creticum* Artel.

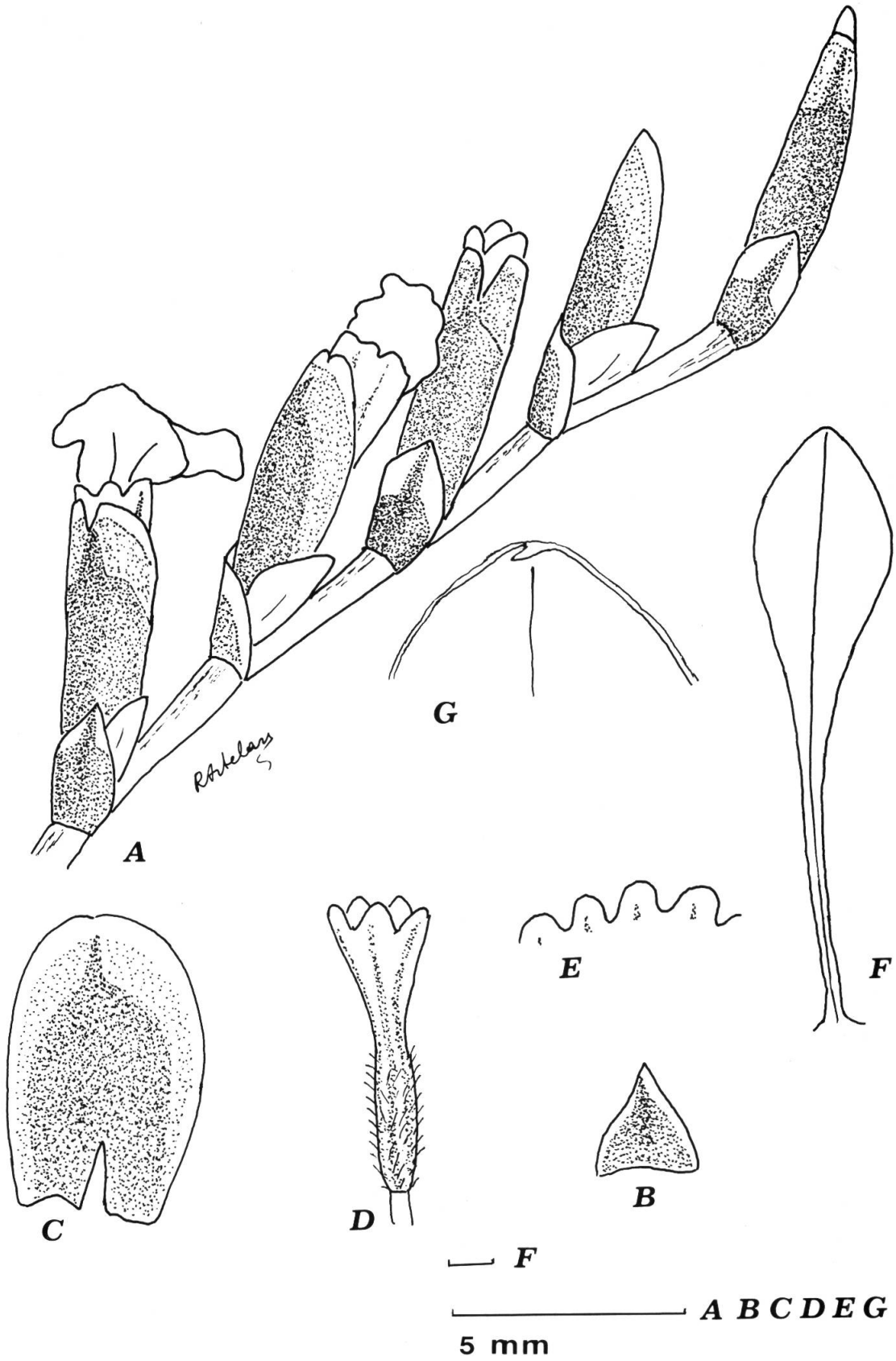


Fig. 2. — *Limonium creticum* Artel.  
 A, spike; B, outer bract; C, inner bract; D, calyx; E, calyx lobes; F, leaf; G, leaf margin.

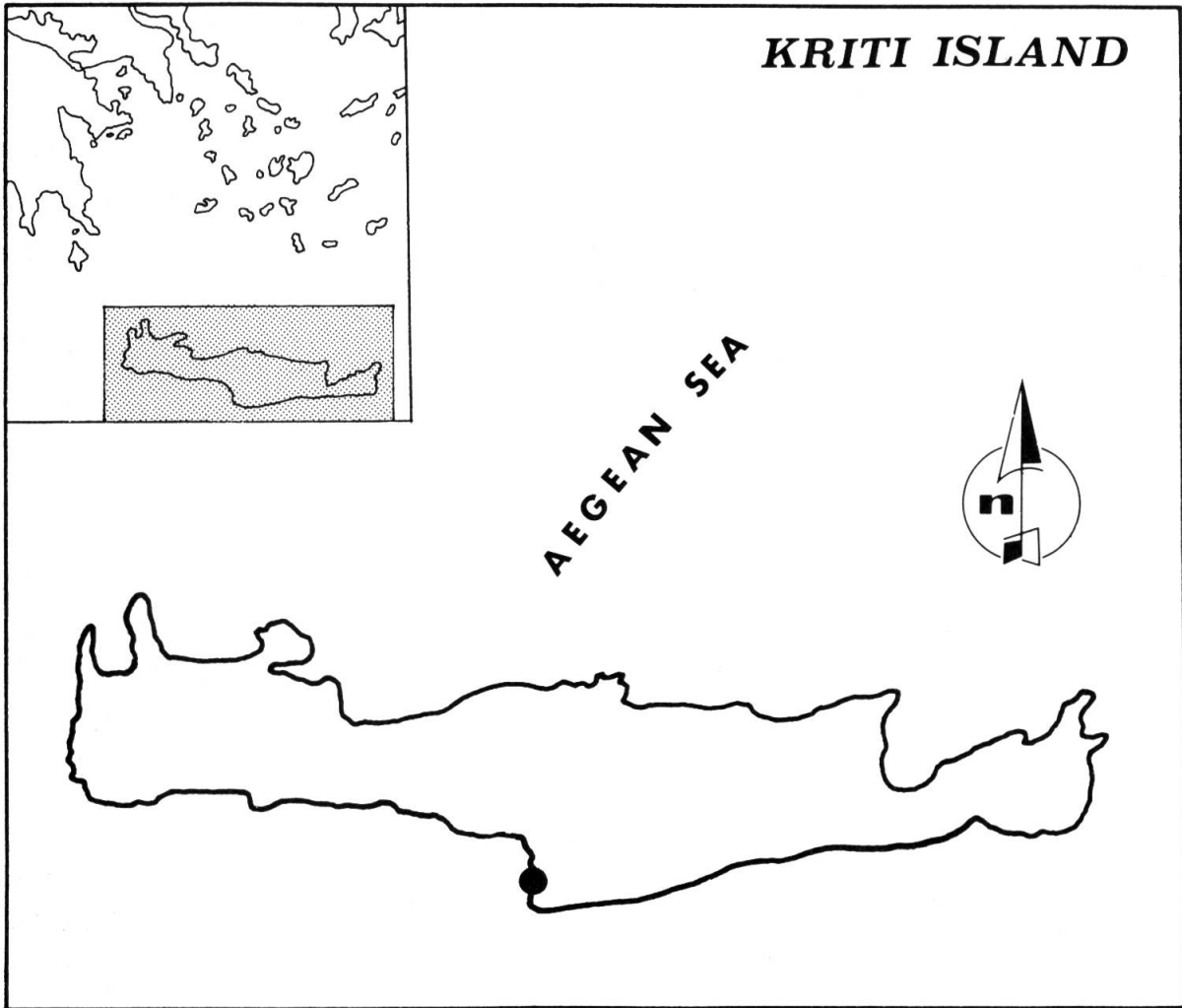


Fig. 3. — Map of Kriti island showing the type locality of *Limonium creticum*.

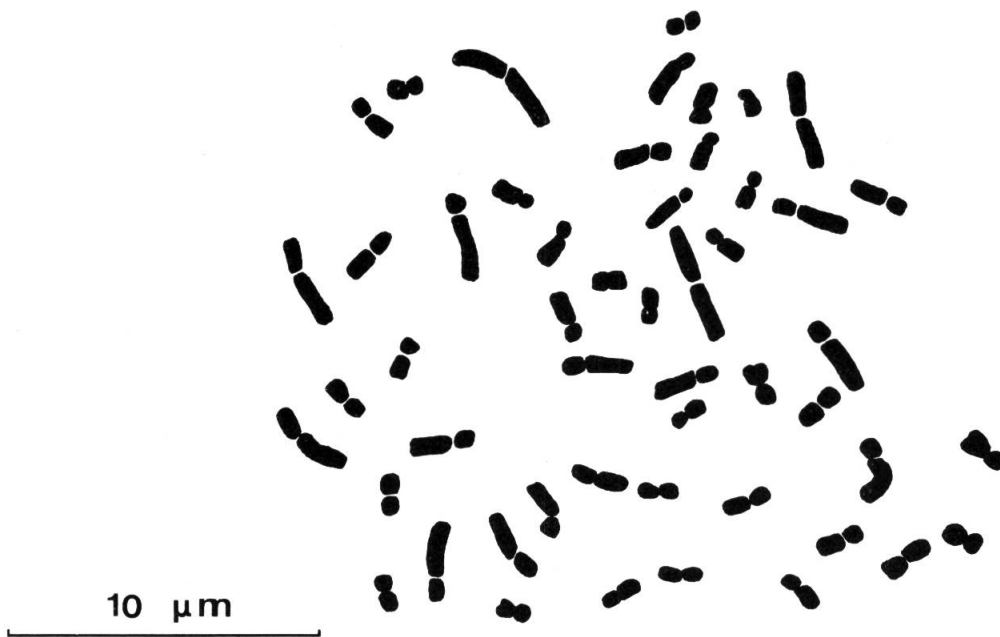


Fig. 4. — Mitotic metaphase plate of *Limonium creticum* with  $2n = 51$  chromosomes.

narrow cartilaginous margin about 0.1 mm wide, abruptly tapering into petiole usually longer than lamina. Flowering stems branched in the lower 1/3-1/2, usually arcuate, ascending, flexuose, pale green; non-flowering branches absent or sometimes 2-3 at the lower part. Inflorescence pyramidal. Spikes 1.5-4.5 cm long, arcuate, with 2-4 spikelets per cm, the most of them unilateral. Spikelets 6.5-7.0 mm long (including calyx), suberect or lightly curved. Outer bract 2.1-2.6(-2.8) mm long, ovate-triangular, acute, overlapping 1/3 of the inner. Inner bract 6.0-6.8 mm long  $\times$  3.4-3.7 mm wide, elliptical, rounded at apex or lightly emarginate, with rusty-brown and white hyaline margin about 1 mm wide; white part of the margin about 0.2 mm wide; herbaceous part of the bract forming a thin point, 0.7-1.2 mm long, nearly reaching to the apex. Calyx (5.6-)6.0-6.2 mm long, densely pilose with thin, long (about 0.5 mm), silken hairs; lobes ovate, obtuse, 0.6-0.8 mm long.

*Specimina visa* (Fig. 3)

Kriti island, Nomos Irakliou, Ep. Pirjiotissis: on maritime marls of village Matala, 3.6.1988, Artelari & Chondropoulos 1028 (UPA).

#### Karyology — Reproduction

The karyological study of *L. creticum* showed that it is hexaploid with  $2n = 51$  chromosomes. In the karyotype three long (3.9-3.3  $\mu\text{m}$ ) metacentric chromosomes exist, while the rest ones are shorter (3-1  $\mu\text{m}$ ) and metacentric to acrocentric (Fig. 4). These data, according to ERBEN's (1979) hypothesis concerning polyploid taxa with odd chromosome numbers and long metacentric "marker" chromosomes, indicate that *L. creticum* has a hybrid origin and the number  $2n = 51$  has derived from the combination of the two *Limonium* basic chromosome numbers  $x = 8$  and  $x = 9$ , i.e.  $(3 \times 8) + (3 \times 9) = 51$ . It should be noted that the number  $2n = 51$  is found for the first time in the genus. The hexaploid number  $2n = 54$  is already known (ERBEN, 1979; ARTELARI & ERBEN, 1986).

The study of the pollen and stigma combination as well as of the pollen fertility revealed that the new species is apomictically reproduced. Only the self-incompatible combination A (BAKER, 1948; ERBEN, 1978) occurs in the population and the pollen fertility is low (mean value 11.1%). Fertile pollen grains are much larger than sterile and 4- to 5-colpate. Moreover all plants showed good seed production.

### Taxonomic relationships

*L. creticum* together with *L. pigadiense* (Rech. fil.) Rech. fil., *L. hierapetrae* Rech. fil., *L. ocymifolium* (Poiret) O. Kuntze and *L. runemarkii* Rech. fil. constitute a species group distributed in the central and southern Aegean area. *L. pigadiense* has been described by RECHINGER (1938) from Karpathos and also reported from Kriti (RECHINGER, 1943b), Rodhos (HANSEN & SNOGERUP, 1966) and Kithira (GREUTER & RECHINGER, 1967). *L. hierapetrae*, also described by RECHINGER (1943b), seems to be endemic of Kriti, while *L. runemarkii* is known only from Evvia (RECHINGER, 1961). *L. ocymifolium* has a central and south Aegean range (RECHINGER, 1943a; BOKHARI & EDMONDSON, 1982; ARTELARI, 1988).

The detailed morphological comparison of *L. creticum* to the other taxa mentioned above lead us to the following conclusions:

The new species is more closely related to *L. pigadiense*. Comparing to that, *L. creticum* has leaves broader at the middle of the lamina and abruptly tapering into petiole, spikes more lax and arcuate, inner bract longer and elliptical (instead of obovate in *L. pigadiense*) and calyx longer and hairy in all veins.

In respect to *L. hierapetrae*, *L. creticum* has leaves obovate-spathulate with narrower cartilaginous margin, inflorescence pyramidal, shorter and denser spikes, longer, elliptical inner bract, longer calyx, hairy in all veins, as well as different chromosome number (in *L. hierapetrae*  $2n = 43$ , ARTELARI, in press.).

The differentiation of *L. creticum* from *L. ocymifolium* concerns the leaves which are broader at the middle of the lamina and abruptly tapering into petiole, the more branched arcuate flowering stems, the longer elliptical inner bract, the longer calyx and the chromosome number (in *L. ocymifolium*  $2n = 43$ , ARTELARI, 1988).

Regarding to *L. runemarkii*, *L. creticum* is characterized by long-petioled leaves having narrower cartilaginous margin, pyramidal inflorescence, shorter, arcuate, denser spikes, acute outer bract, longer, denser calyx hairs and longer calyx lobes.

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