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## Two new species of *Limonium* (*Plumbaginaceae*) from Lebanon

### Abstract

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*Limonium postii* and *L. mouterdei*, two new species belonging to the *L. palmare* aggr., are described and illustrated from the coast near Beirut, Lebanon. Their relationships with *L. graecum*, *L. sieberi* and *L. galilaeum* are examined.

*Key words:* Flora, eastern Mediterranean, new species, *Limonium postii*, *Limonium mouterdei*.

### Introduction

As recently pointed out (cfr. Domina & al. 2006) new studies on the genus *Limonium* in the Eastern Mediterranean are required. According to Post (1933), Bouloumoy (1930), Mouterde (1978) and Greuter & al. (1989) eight species of *Limonium* occur in Lebanon and Syria distributed along the coast on rocky terrain, salt-marshes and stabilized dunes [*L. sinuatum* (L.) Miller, *L. sieberi* (Boiss.) Kuntze, *L. virgatum* (Willd.) Fourr., *L. graecum* (Poir.) Rchb. f. and *L. narbonense* Miller] or in the inland on salty, wet and dry soils [*L. globuliferum* (Boiss. & Heldr.) Kuntze, *L. palmyrense* (Post) Dinsm. and *L. lobatum* (L. f.) Chaz.].

During herbarium investigations on the taxa belonging to the *Limonium palmare* aggr. (*sensu* Greuter & al. 1989) two new species, whose specimens were previously referred to *L. sieberi* (Boiss.) Kuntze and *L. graecum* (Poir.) Rchb. f., were discriminated.

These two species, here described as new to science, are morphologically well differentiated from the other belonging to the *L. palmare* aggr.

***Limonium postii*** Domina, Erben & Raimondo, **spec. nova.** – Fig. 1.

= *Limonium sieberi* *sensu* Post et *sensu* Mouterde non Kuntze (1891).

**Type:** Lebanon, PLANTAE SYRIAE LITTORALIS, EX. HERB. POSTIAN. APUD COLLEGE. SYRIENS. PROTEST. *Statice graeca* Boiss., Beirut, May 1876 [manu Post] (Holo–FI!, Iso–BEI Photo!).

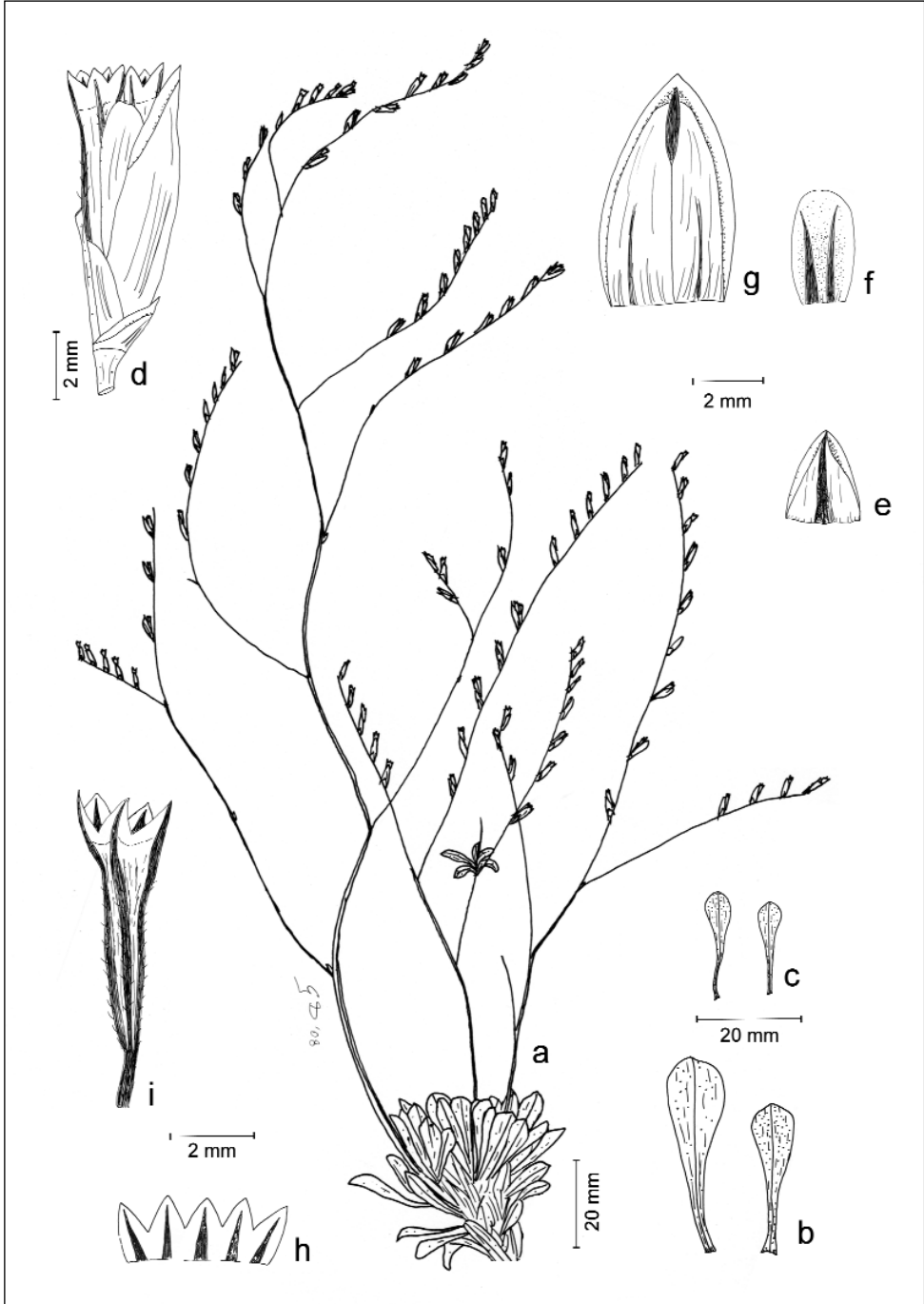


Fig. 1. *Limonium postii* Domina, Erben & Raimondo: a, habit; b, basal leaves; c, stem leaves; d, spikelet; e, outer bract; f, middle bract; g, inner bract; h, calyx lobes; i, calyx (drawing by G. Domina).

Planta perennis, glabra, tuberculata, oligocaulis. Caudicauli 2.5-7 cm longi, ramosi. Folia basalia 15-30(45) mm longa et 3-8(10) mm lata, oblanceolato-spatulata, obtusa, plana, uninervia, tempore florendi persistentia vel partim emarcida. Caules 10-40 cm longi, 1-2 mm in diametro. Rami steriles pauci. Rami fertiles erecti,  $\pm$  flexuosi, verrucosi, ad aliquot nodos rosulas foliorum radicalibus similes gerentes; squamae acutae, 3-4.5 mm longae. Spicae 5-18 cm longae, flexuosae vel subrectae. Spiculae 7-9 mm longae, 2-4 florum, ad 4-6 in 2 cm dispositae. Bractea inferior 2.2-3  $\times$  1.9-2.6 mm, triangulari-ovata, acuta, margine anguste membranaceo, parte media subcarnulosa. Bractea media 2.5-3.5  $\times$  1-1.6 mm, oblongo-elliptica, rotunda ad submarginata, membranacea. Bractea superior 6-7(8)  $\times$  2-4.5 mm, elliptica, margine  $\pm$  anguste membranaceo, dorso recto. Pedicelli 1-2 mm longi, 0.5-0.6 mm diametro. Calyx 5.5-6.5 mm longus, ex bractea superiore 0.5-1.5 mm exsertus, tubo sparse piloso, post tempore florendi limbo lacero et hypocratiformi; dentes calycis ca. 2-2.5 mm longi, triangulares; costae tubi basim dentium calycis superantes. Petala 5.6-6.3 mm longa, liliacina. Semina fusca, cylindrica, 1.7-2.3  $\times$  0.5 mm.

***Limonium mouterdei*** Domina, Erben & Raimondo, **spec. nova.** – Fig. 2.

= *Limonium graecum* sensu Post et sensu Mouterde non Rechb. f (1943).

**Type:** Lebanon, Saint Elie [Beirut], 14.10.1934, [sub *Limonium graecum* (Poir.) Kuntze, manu Mouterde] (Holo – G 2334 photo !).

Planta perennis, glabra, scabro-tuberculata, multicaulis. Caudicauli 0.7-2 cm longi, ramosi. Folia basalia 10-20(30) mm longa et 3-9 mm lata, oblanceolato-spatulata, obtusa, plana, uninervia, tempore florendi persistentia. Caules 10-40 cm longi, 0.8-1.2 mm in diametro. Rami steriles plures. Rami fertiles erecti, verrucosi, ad aliquot nodos rosulas foliorum radicalibus similes gerentes; squamae acutae, 1.5-3.5 mm longae. Spicae 5-15 cm longae, subrectae vel subcurvatae. Spiculae 6-8 mm longae, 2-5 florum, ad 2-4 in 2 cm dispositae. Bractea inferior 2-2.8  $\times$  1.9-2.8 mm, triangulari-ovata, acuta, margine anguste membranaceo, parte media subcarnulosa. Bractea media 2-3  $\times$  1-1.5 mm, oblongo-elliptica, rotunda ad submarginata, membranacea. Bractea superior 6-7(8)  $\times$  3-5 mm, elliptica, margine  $\pm$  anguste membranaceo, dorso recto. Pedicelli 1-1.8 mm longi, 0.4-0.5 mm diametro. Calyx 6.0-7.5 mm longus, ex bractea superiore 0.8-1.8 mm exsertus, tubo sparse piloso, post tempore florendi limbo lacero et hypocratiformi; dentes calycis ca. 1-1.5 mm, triangulares; costae tubi basim dentium calycis superantes. Petala 7-8 mm longa, liliacina.

### Ecology and Distribution

*Limonium postii* and *L. mouterdei* are rare plants occurring along the Mediterranean rocky coast of Lebanon, on calcareous rocks and sandstones.

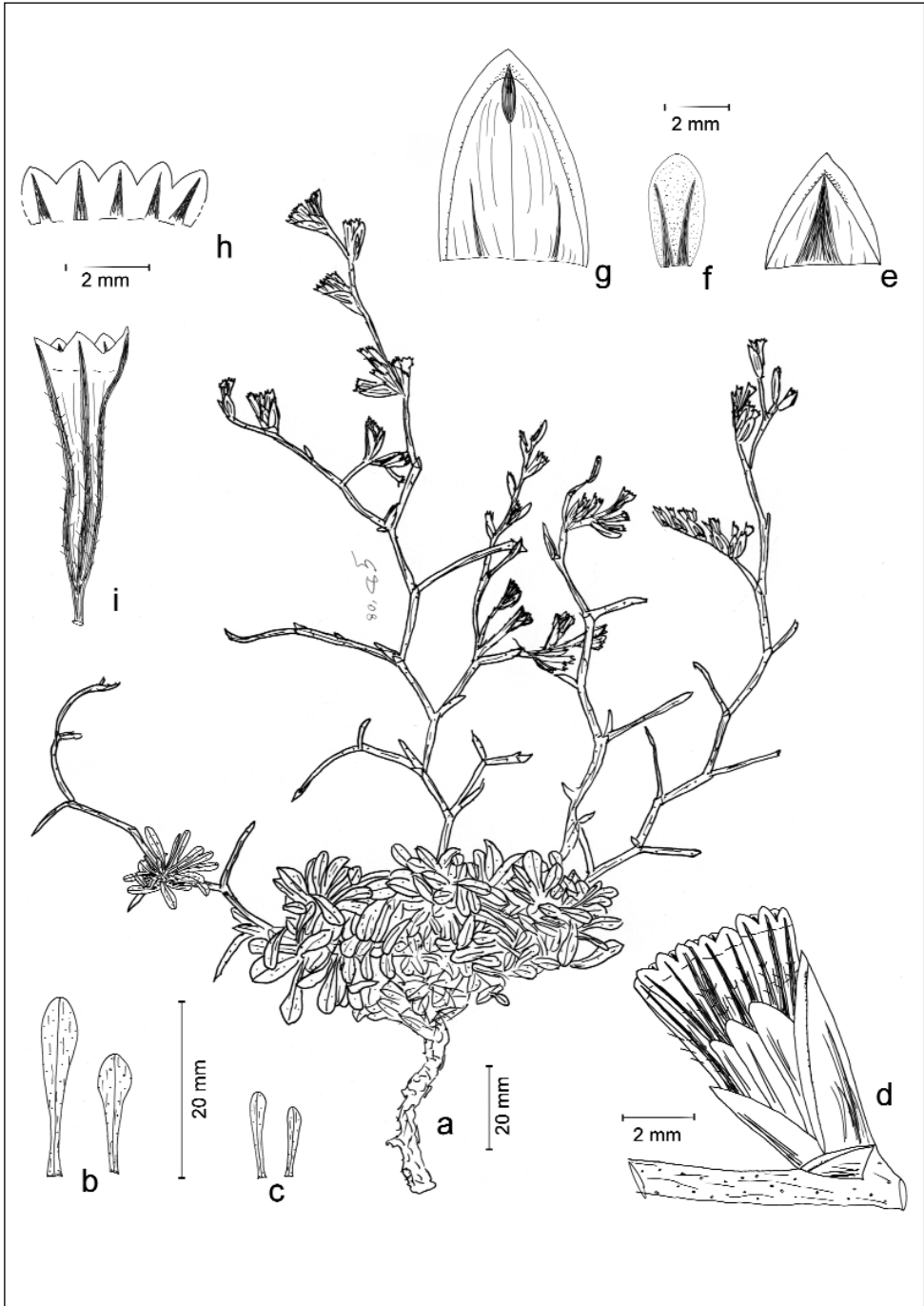


Fig. 2. *Limonium mouterdei* Domina, Erben & Raimondo: a, habit; b, basal leaves; c, stem leaves; d, spikelet; e, outer bract; f, middle bract; g, inner bract; h, calyx lobes; i, calyx (drawing by G. Domina).

## Taxonomic position

Both these new species belong to the *Limonium palmare* aggr., *L. postii* differs from *L. sieberi* mainly by smaller leaves, shorter spikes and a smaller middle bract. It differs from *L. galilaeum*, mainly by the teeth of the calyx 2-2.5 mm long instead than less than 1 mm, few sterile branches, thicker base of the inflorescence, denser spikes.

*L. mousterdei* is well differentiated from *L. graecum* by smaller leaves, shorter caudices, more sterile branches, looser inflorescences and shorter spikelets; from *L. galilaeum* by the shape of the inflorescence, shorter internodes and by the shape of the outer bracts of the spikelets. The diagnostic characters to differentiate among *Limonium* species here considered are displayed in Table 1. The other species belonging to the *Limonium palmare* aggr.: *L. cyrenaicum* (Rouy) Brullo, *L. hyssopifolium* (Girard.) Rchb. f., *L. palmare* (Sm.) Rchb. f., *L. pigadiense* (Rchb. f.) Rchb. f., *L. runemarkii* Rchb. f. and *L. sitiicum* Rchb. f. are narrow endemics of the CE Mediterranean (Greuter & al. 1989) and are morphologically well characterized.

Table 1. Diagnostic characters of the taxa considered (all length are in mm).

Character / species	<i>L. postii</i>	<i>L. mousterdei</i>	<i>L. galilaeum</i>	<i>L. graecum</i>	<i>L. sieberi</i>
Sterile branches	few	abundant	abundant	absent or few	absent or few
Inflorescence base diam.	0.7-1.9	0.8-1.2	0.7-1	1.5-1.8	1-1.8
Basal internode length	25-70	7-20	45-50	30-35	30-70
Scale below the first inflorescence branch length	3-4.5	1.5-3.5	1.5	2.5-3	2.5-4
Leaves	green, oblanceolate-spathulate	green, oblanceolate-spathulate	green, oblanceolate-spathulate	glaucous, spathulate to oblanceolate	green, spathulate to oblanceolate
Spikelets in the spike per cm	2-3	1-2	1-2	2-4	2-3
Inner bract length	6-7(8)	6.5-7(8)	5.8-7	7.3-8.0	5-7.1
Middle bract length	2.5-3.5	2-3	2.5-3	2.7-3.6	2.2-3.2
Outer bract length	2.2-3	2-2.8	2-2.5	2.2-3.2	2-2.8
Calyx length	5.5-6.5	6-7.5	5.7-6.2	6.2-7.1	5.2-6.8

## Specimens seen

### *LIMONIUM POSTII*

Lebanon: Beirut, May 1876 [sub *Statice graeca* Boiss., manu Post] (FI!); Ad rupes maritimas ad Beirut Palestina, May 1889, Pichler [sub *Statice sieberi* Boiss.] (FI!); Ad rupes maritimas inter Jbail ac Beritheum, 23.6.1887 (FI!); Beirut, 6.1886 [partim sub *Statice rorida*, manu Post] (BEI-photo !), Beirut, May 1876 [sub *Statice sieberi*, manu Post] (BEI-photo !), Jbail, 15.07.1866 [sub *Statice sieberi*, manu Post] (BEI-photo !), Ras Beyrouth, 3.7.[19]51, [sub *Statice sieberi*, manu Pabot] (G2322-photo !); Ras Beyrouth, 21.4.[19]51, [sub *Statice sieberi*, manu Pabot] (G 2323-photo !); Ras Chekka, 27.7.[19]55, [sub *Statice*

*sieberi*, manu Pabot] (G 2324-photo !); Nahr el Kelb, 8.6.1933, [sub *Statice sieberi* manu Mouterde] (G 2325-photo !); Ras Beyrouth, 28.6.1933, [sub *Statice sieberi* manu Mouterde] (G 2326-photo !); Jounie, 3.10.1933, [sub *Statice sieberi* manu Mouterde] (G 2327-photo !); Ras el Bassir, 22.7.1955, [sub *Statice sieberi*] (G 2328-photo !); Mohafaza Mount Lebanon, Casa Jbail, Amshit, 38°8'N 35°30' E, 28.10.1999, Jury & al. (RNG!).

#### *LIMONIUM MOUTERDEI*

Lebanon: Beirut, 6.1886 [partim sub *Statice rorida*, manu Post] (BEI-photo !); Beyrouth, Saint Elie, automne 1931, [sub *L. graecum*] (G 2330-photo !); Saint Elie, 14.10.1934, [sub *Limonium graecum*] (G 2334-photo !); Ras Beyrouth, 3.7.[19]51, [sub *Limonium graecum*, manu Pabot] (G 2332-photo !).

#### *LIMONIUM GALILAEUM*

Israel & Lebanon: Upper Galilee, Akhziv, on carbonate rocky coast, 4.12.2005, Domina & Joel (PAL); Ras el Nakura (possibly in Lebanon), 1.5.1913, Meyers & Dinsmore (HUJ!); Coastal Galilee, Rosh Hanikra, 13.4.1925, A. Eig (HUJ!); Yad LaYD beach, crevices in hard calcareous sandstone. 5.3.2006, Danin (HUJ!, PAL!).

#### *LIMONIUM GRAECUM*

Greece: Fl. Greca, s.d., (P-photo !); = *L. roridum*! Kiklades islands: Naxos, Lionas bay, on marbles, 5.8.2000, R. Artelari & B Chondropoulos (UPA1698!); Denousa, 2 km ESE of Aspron. In N-exposed screes near the sea, 25.05.1958, *Runemark & Snogerup* (LD !) – Denoussa, SW of Akr. Moskonar, calcareous rocks c. 180 m, 24.05.1958, *Runemark & Snogerup* (LD !).

#### *LIMONIUM SIEBERI*

Greece: Creta, s.d., Sieber (G-photo !); Archipel grec., s.d., H. Fauchè [sub *Statice oleifolium* var...] (G-photo !); = *L. creticum* ! Crète, Rettimo al Mare, *Sieber* (M!, P!, W!) – Creta, in arenosis maritimis ad Petra distr. Rethimnotika, 11.07.1899, *Baldacci* (W!, WU!).

## Discussion

*Limonium postii* and *L. mouterdei* were previously recorded as *L. sieberi* (= *Statice sieberi*) and *L. graecum* (= *S. graeca*) respectively (Post 1933; Bouloumoy 1930; Mouterde 1978 and Greuter & al. 1989). However, from herbarium studies it became obvious that *L. sieberi* and *L. graecum* do not occur in Lebanon and Syria. The newly described *L. postii* and *L. mouterdei* also have some morphological affinities with *L. galilaeum* recently described by Domina & al. (2006) from Akhziv in Israel at the borderline with Lebanon. All these species belong to *L. palmare* aggr. but meaningful differences allow us to differentiate them.

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