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A new species of *Limonium* (*Plumbaginaceae*) from Israel

Abstract

Domina, G., Danin, A. & Raimondo, F. M.: A new species of *Limonium* (*Plumbaginaceae*) from Israel. — *Fl. Medit* 16: 133-138. 2006. — ISSN 1120-4052.

Limonium galilaeum, a new species belonging to *L. palmare* aggr., is described and illustrated from the Upper Galilee, Israel. Its ecology and relationships with *L. graecum* and *L. sieberi* are examined.

Introduction

According to Eig & al., (1931, 1948) Feinbrun-Dothan (1978), Zohary (1976), Einav (1983), and Danin (2004) the genus *Limonium* is represented in Israel by six species, distributed along coastal places (rocky terrain, salt-marshes and stabilized dunes) or wet and dry saline soils in deserts.

During field investigations carried out in the Coastal Galilee in Northern Israel, a very peculiar population, previously referred to *L. graecum* (Poir.) Rchb. f. was investigated.

This species is morphologically well differentiated from the other species of *L. palmare* aggr. (*sensu* Greuter & al. 1989) to which it belongs.

In the present paper this *Limonium* is described as a species new to science.

Limonium galilaeum Domina, Danin & Raimondo, spec. nova. – Fig. 1.

Type: Israel, Upper Galilee, Akhziv, on carbonate rocky coast, 4.12.2005, G. Domina & D. Joel (Holo – PAL, Iso – HUJ).

Planta perennis, glabra, tuberculata, multicaulis. Caudiculi 1.5-4 cm longi, ramosi, tenui. Folia basalia 15-30 mm longa et 3-6 mm lata, oblanceolata-spatulata obtusa, plana, uninervia, florendi tempore pro maxima parte non emarcida. Caules steriles plurimi 10-20 cm longi. Caules fertiles 15-40 cm longi, erecti, ± flexuosi, verrucosi ad nodos rosulas foliorum radicalibus similes gerentes, minus quam 1 mm in diametro; bractee acutae, 1.5-3.2 mm longae. Spicae laxae dispositae, 30-100 mm longae, subrectae. Spiculae 6.0 -7.0 mm longae 2-4 florum, ad 2-3 in 2 cm dispositae. Bractea inferior 2-2.5 × 1-1.4 mm, triangulari-

ovata, acuta, margine anguste membranaceo, parte centrale submembranacea. Bractea media 2.5-3 × 0.8-1 mm, oblonga. Bractea superior 5.8-7(8) × 2-3 mm elliptica, margine late membranaceo, dorso recto. Pedicelli 1-2 mm longi, 0.4-0.5 mm diametro Calyx 5.7-6.2 mm longus, ex bractea superiore 0.7-1.5 mm exsertus, tubo sparse piloso; dentes calycis ca. 0.5-1.0 mm, semi-elliptici; costae calycis basim dentium calycis superantes. Petala 5.8-6.2 mm longa, liliacina. Semina fusca cylindracea 2-2.5 × 0.5 mm.

Ecology and Distribution: *Limonium galilaeum* is a rare plant which occurs along the Mediterranean rocky coast of northern Israel, on calcareous sandstones and on limestone outcrops from Acco to Rosh Hanikra (at the borderline with Lebanon, Fig. 2).

Flowering: (March-) April-May (- October). Off season flowering branches may be found during a long time of the year. The diaspore is the seed subtended by the calyx. Abcission tissue in this species is located below the flower pedicel.

Chromosome number: The studied population of *Limonium galilaeum* was found to be $2n = 36$ (Fig. 3). This is closest to be regarded as a tetraploid when compared to the data presented by Georgakopoulou & al. (2006). The latter report the following chromosome numbers: *L. palmare* (Sm.) Rchb. f. ($2n = 4x = 34$), *L. roridum* (Sibth. & Sm.) Brullo & Guarino ($2n = 5x = 43$), *L. graecum* ($2n = 6x = 52$). The chromosome numbers for *L. sieberi* (Boiss.) O. Kuntze are $2n = 5x = 43$ and $2n = 6x = 51$ (Artelari & Georgiou 2002). *Limonium galilaeum* differs from the closely related species *L. graecum* and *L. sieberi*.

The diagnostic characters, including those discussed by Domina & Mazzola (2003), are displayed in Table 1. Of 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). They are morphologically well characterized and differ from *L. galilaeum*.

Table 1. Diagnostic characters of *Limonium galilaeum*, *L. graecum* and *L. sieberi* (all measures are in mm).

Character / species	<i>Limonium galilaeum</i>	<i>L. graecum</i>	<i>L. sieberi</i>
Steriles branches	abundant	few	few
Inflorescence base diam.	0.7-1	1.5-1.8	1-1.8
Basal internode	45-50	30-35	30-70
Scale below the first inflorescence branch	1.5	2.5-3 mm long	2.5-4
Leaves	green, oblanceolate-spathulate	glaucous, spathulate to oblanceolate	green, spathulate
Spikelets in the spike	1-2 per cm	2-4 per cm	3-4 per cm
Inner bract	5.8-7	6.8-8.1	5.0-5.2
Middle bract	2.5-3	2.7-3.6	3-3.8
Outer bract	2-2.5	2.2-3.2	2.0-2.4
Calyx	5.7-6.2	6.2-6.8	4.8-5.3
Diaspore	Single flower	Entire spikelet with a conicle tuberculated puduncle	Single flower
Location of the abscission tissue	Above each flower pedicel	Below the spikelet peduncle	Above each flower pedicel

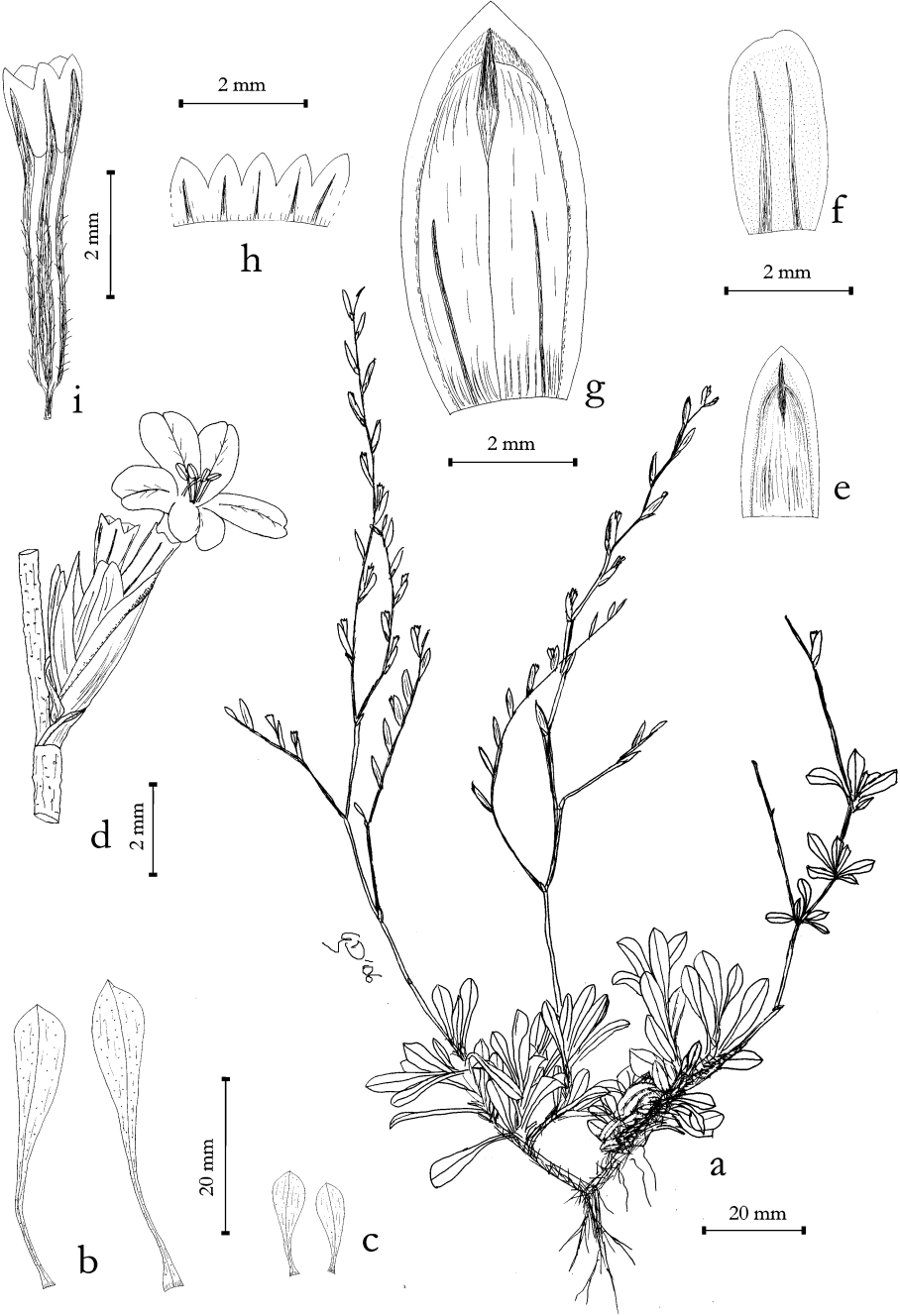


Fig. 1. *Limonium galilaeum* Domina, Danin & Raimondo. a: habit; b: basal leaves; c: stem leaves; d: spikelet; e: outer bract; f: middle bract; g: inner bract; h: calyx lobes; i: calyx.

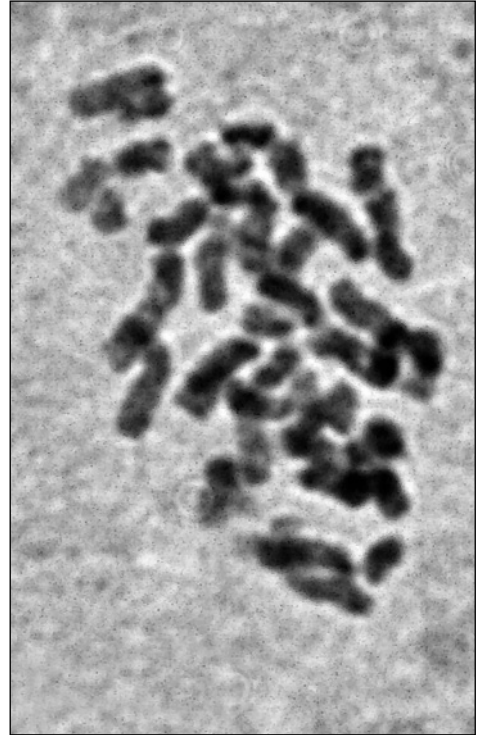
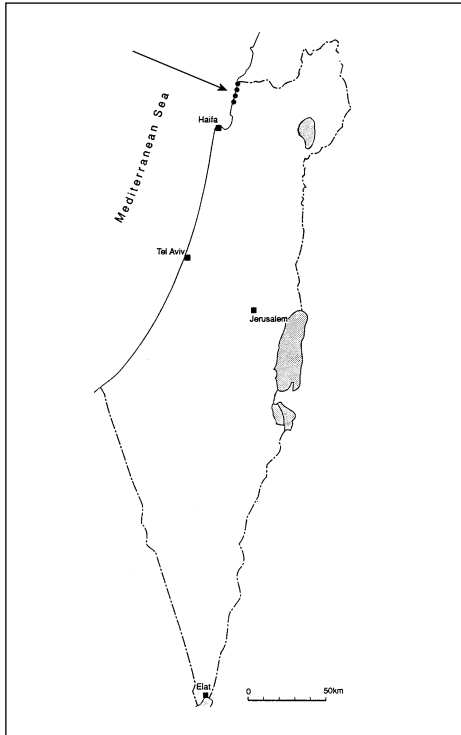


Fig. 2. Distribution map of *Limonium galilaeum*. Fig. 3. Mitotic metaphase plate of *L. galilaeum*.

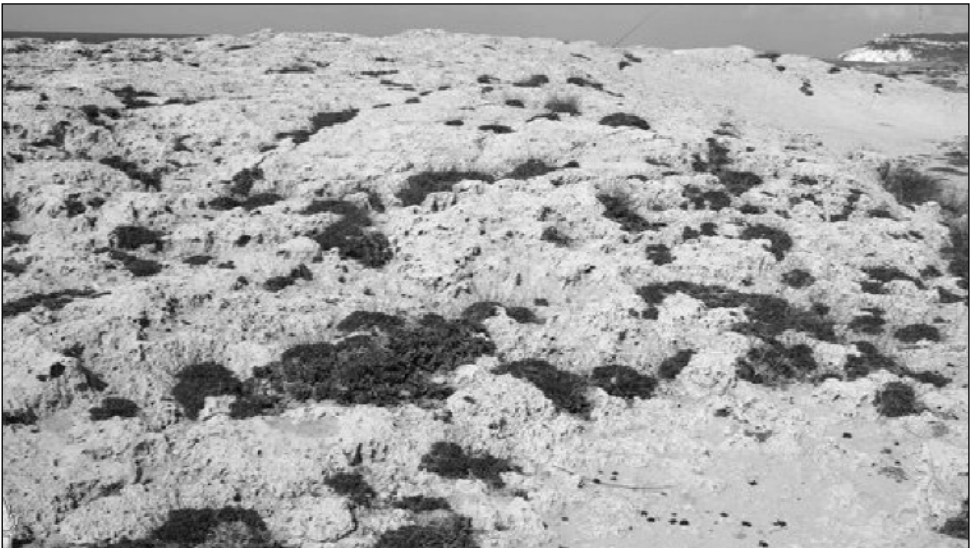


Fig. 4. *Limonium galilaeum* in its natural habitat.

Specimens seen:***Limonium galilaeum***

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* subsp. *graecum

Fl. Greca, s.d., (P-photo !); Kiklades islands: Naxos, Lionas bay, on marbles, 5.8.2000, R. Artelari & B Chondropoulos (UPA! 1698);

Limonium sieberi

Creta, s.d., Sieber (G-photo !); Archipel grec., s.d., H. Fauchè [sub *Statice oleifolium* var...] (G-photo !); Crete, Kommos excavation site near Pitsidia, 5.9.1984, J.M. Shay (B-photo!); Crete, Kommos, 1.3 Km W of Pitsidia W Mesara, 5.9.1984, J.M. Shay (B-photo !).

Discussion

This species was previously recorded as *Limonium graecum* (Poir.) O. Kuntze or *Statice graeca* Poir. [Eig & al. (1931, 1948) Feinbrun-Dothan (1978), Zohary (1976), Einav (1983), and Danin (2004)]. However, from field observations and herbarium studies it became obvious that *L. graecum* does not occur in Israel. The newly described *L. galilaeum* also has some morphological affinities with *L. sieberi* described from Greece. All the latter three species belong to *L. palmare* aggr. but meaningful differences allow us to differentiate them. *Limonium graecum* and *L. sieberi* are recorded by Post (1932-33) from Lebanon. From preliminary observations of Post's material (FI & BEI-photos!) it is evident that this material does not belong to either species. We suggest that further investigations to the *Limonium* species of Lebanon will be carried out.

Acknowledgments

The authors express their thanks to Dr. Anna Geraci of the Dipartimento di Scienze Botaniche of the University of Palermo for the caryological analysis, to Ms. Mimi Gilboa, the director of the Botanical Garden of Mt. Scopus, Jerusalem, for the seeds used in that analysis and to Dr. Matthias Erben of the Institute of Systematic Botany and Mycology of the Ludwig-Maximilians-Universität of München for reviewing the manuscript. A special thank to Dr. Daniel Joel for having invited G. Domina at the Neve-Ya'ar Research Center in Israel and having guided him across northern Israel making possible the finding of this new species.

References

- Artelari, R. & Georgiou, O. 2002: Biosystematic study of the genus *Limonium* (*Plumbaginaceae*) in the Aegean area, Greece. III. *Limonium* on the islands Kithira and Antikithira and the surrounding islets. – Nord. J. Bot. **22(3)**: 483-501.
- Danin, A. 2004: Distribution Atlas of Plants in the Flora Palaestina Area. – Jerusalem.

- Domina, G. & Mazzola, P. 2003: A phenetic approach to the genus *Limonium* (*Plumbaginaceae*) in Sicily. – *Bocconea* **16**(2): 597-606.
- Eig, A., Zohary, M. & Feinbrun, N. 1931: The Plants of Palestine, an analytical key. – Jerusalem (in Hebrew).
- , — & — 1948: Analytical Flora of Palestine. – Hamagdir (in Hebrew).
- Einav R. 1983: The distribution of *Limonium* species at the Mediterranean coast of Israel. – *Rotem* **6**: 32-43.
- Feinbrun-Dothan, N. 1978: *Limonium*. – Pp. 8-11 in *Flora Palaestina*, **3**. – Jerusalem
- Georgakopoulou, A., Manousou, S. Artelari R. & Georgiou O. 2006: Breeding systems and cytology in Greek populations of five *Limonium* species (*Plumbaginaceae*). – *Willdenowia* **36**: 741-750.
- Greuter, W., Burdet, H. M. & Long G. 1989: *Limonium*. – Pp. 321-344 in *Med Checklist*, **4**. – Genève.
- Post, G. E. 1932-3: *Limonium*. – P. 413 in *Flora of Syria, Palestine and Sinai* (ed. 2, J.E. Dinsmore), **2**. – Beirut.
- Zohary, M. 1976: *Limonium*. – Pp. 280-282 in *A new analytical flora of Israel*. – Tel Aviv. (in Hebrew).

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Additional photos of this and other *Limonium* species see the website <http://flora.huji.ac.il>