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PLUMBAGINACEAE

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PLUMBAGINACEAE

M. QAISER & M.A. SIDDIQI

Perennial or rarely annual herbs, shrubs or subshrubs, sometimes lianous. Leaves simple, exstipulate, alternate or spirally arranged often in basal rosettes, entire or sometimes pinnatifid to pinnatisect, often sheathing at the bases, and usually covered with salt secreting glands. Inflorescence cymose; the cymes either spicate, paniculate or rarely capitate. Flowers regular, bisexual, bracteate, 5-merous. Calyx gamosepalous, infundibuliform, obconical or tubular, angled or winged; limb scarious, persistent. Corolla gamopetalous with the lobes extending almost up to the base, convolute. Stamens 5, epipetalous with ± dilated filaments, rarely free, opposite the petals or connate at the base. Gynoecium 5-carpellary, syncarpous, ovary superior, unilocular with 1-basal, anatropous ovule; styles 5, free from base or united in their whole length; stigmas 5, filiform, cylindrical or capitate, opposite the petals, finely or coarsely glandular. Fruit a membranous, one seeded utricle or capsule; seeds endospermic, embryo straight.

A family of 10 genera and about 500 species, mostly maritime or in saline habitats; represented by 3 genera and 15 species in Libya. Taxa marked with an asterisk (*) are known from cultivation here.

1. +Sepals densely covered with stipitate glands. Stamens free. Styles united throughout their whole length — 1. **Plumbago***
   −Sepals eglandular or rarely minutely glandular. Stamens epipetalous. Styles free at least above — 2

2. +Stamens inserted in the middle of corolla tube. Styles united below — 2. **Limoniastrum**
   −Stamens inserted at the base of the corolla tube. Styles free throughout — 3. **Limonium**

1. **PLUMBAGO***

L., Sp. Pl. 151. 1753; Gen. Pl. ed. 5: 75. 1754.

Perennial herbs, subshrubs or shrubs. Leaves alternate, simple, somewhat amplexicaul or auricled at the base. Flowers large, subsessile, usually 3-bracted in terminal, ± capitate spikes. Calyx tubular with 5-greenish ribs, covered with large stipitate glands, 5-toothed above. Corolla-tube long, narrow, much longer than the calyx; limb 5-lobed, rotate. Stamens free; filaments linear with concave-dilated base. Ovary oblong; style 5, free or connate at the base, glabrous at lenght but covered with long hairs below; stigmas 5, filiform. Fruit oblong-ovoid, capsule circumscissile near the base, splitting apwards into 5 valves.

A small genus with 15 species, chiefly tropical; represented by one exotic species in Libya.

***Plumbago auriculata** Lam., Encycl. Meth. Bot. 2: 270. 1786. (Fig. 1)

P. capensis Thunb., Prodr. Pl. Cap. 33. 1794.

A diffusely branched, semi-climbing shrub, glabrous except the inflorescence. Leaves elliptic-spathulate, or elliptic ovate, 1-5 x 0.5-1.5 cm, obtuse or shortly mucronate. Calyx tubular, c. 1 cm long, finely pubescent with stipitate glands on the upper part, limb 5-lobed. Corolla pale-blue, tube 3 cm long, limb c. 2.5 cm in diam., 5-lobed, lobes obovate, subacute. Stamens 5, free, reaching the mouth of the tube, filaments filiform, anthers blue, dorsifixed. Capsule 5-8 mm long, oblong-oblong ovoid.

Type: E. Indies, *Sonnerat*.

A-3 Tripoli, Gurji, shrub almost 125 cm tall, colour of flower, bluish-white, 14.12.1975, *Randa M. Bughrara* 42 (ULT); Al-Faateh University Campus, Fls. bluish, 23.9.1981, *M.A. Siddiqi* 453 (ULT).

Distribution: Indigenous to S. Africa. Cultivated in warmer climates as an ornamental plant.

P. scandens L. with white flowers is also reported as cultivated in Sidi Mesri by Keith, in Prelim. Check List. Lib. Fl. 782. 1965.

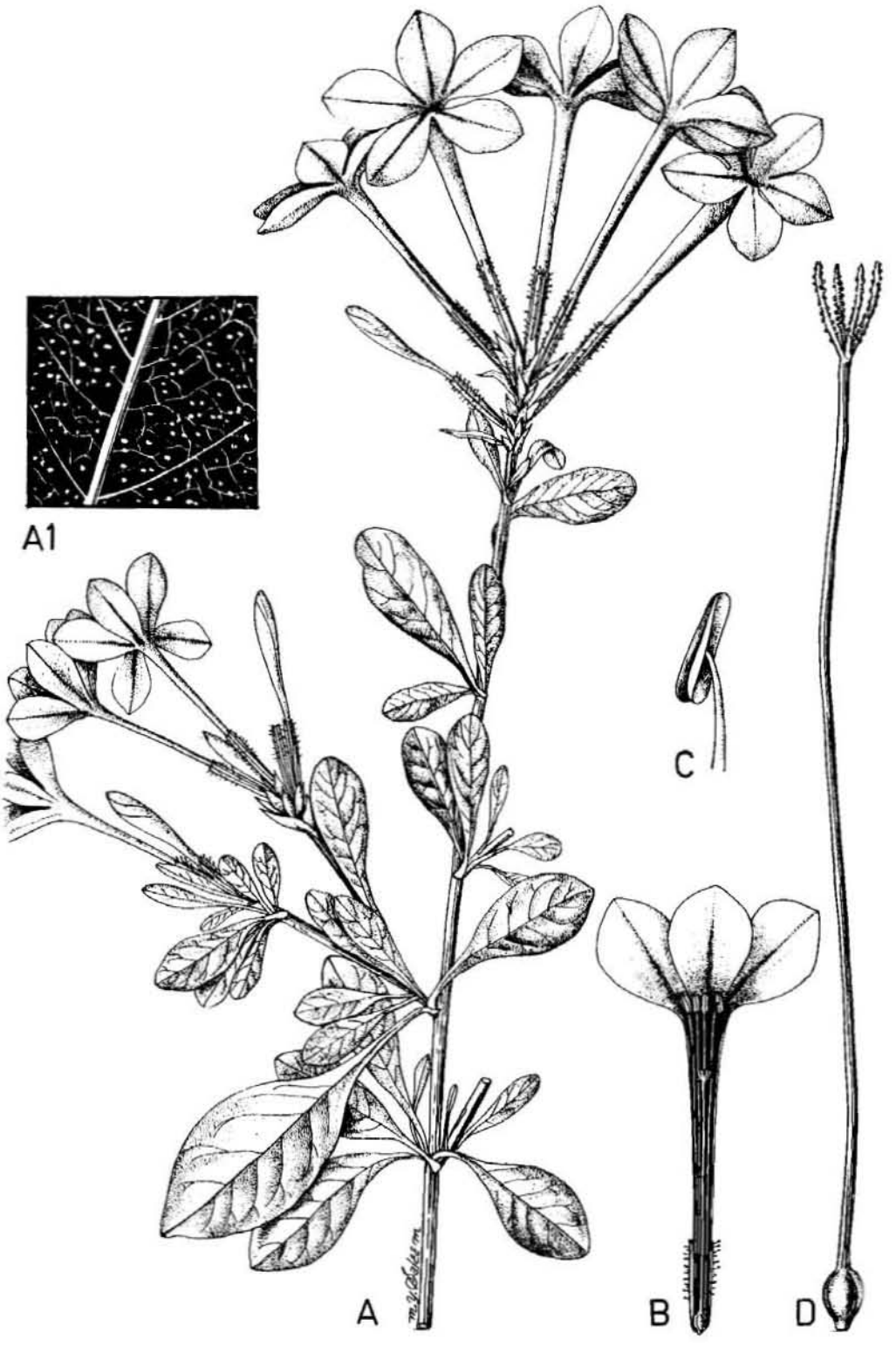


Fig. 1 **Plumbago auriculata**: A, flowering branch x 1; A_1, a portion of leaf (ventral view) x 25; B, v.s. flower x 1½; C, a stamen (upper portion) x 9; D, gynoecium x 6.

2. LIMONIASTRUM

Moench, Meth. 423. 1794.

Shrublets. Leaves entire or scarcely dentate, greyish, fleshy and somewhat coriaceous covered with calcareous scales. Flowers loosely spiked; spikelets 3-bracted, closely appressed to the rachis. Calyx tubular, membranous, ribless; limb minute, 5-lobed, acute. Corolla infundibuliform, tube long, slender, ± as long as the lobes; lobes obovate. Stamens inserted in the middle of the corolla tube. Styles united in basal half; stigma filiform-cylindrical. Utricle membranous, indehiscent.

A genus with c. 10 species, confined to the Mediterranean region; represented by 2 species in Libya.

+Leaves lanceolate 5-16 mm broad; spikelets closely appressed along the axis, not divaricate; outer bracts 6-8 mm long. Flowers 12-20 mm long — 1. **L. monopetalum**

–Leaves narrowly linear or semi-cylindrical, 2-4 mm broad. Spikelets divaricate; outer bracts 2-3 mm long. Flowers 8-10 mm long — 2. **L. guyonianum**

1. **Limoniastrum monopetalum** (L.) Boiss. in DC., Prodr. 12: 689. 1848; Keith, Prelim. Check List, Lib. Fl. 610. 1965. (p.p.) (Fig. 2)

Statice monopetalum L., Sp. Pl. 276. 1753; *L. articulatum* Moench, Meth. 423. 1794.

Perennial, shrubby bush, 50-120 cm tall, glaucous, densely brached, covered with calcareous scales, very leafy. Leaves 20-30 (100) x 5-(-16) mm, oblong to linear-spathulate, obtuse, tapering to an amplexicaul sheathing petiole, fleshy. Spikes 5-10 cm, stiff, short panicled; rachis flexuosus, jointed, very fragile and brittle. Spikelets (1-) 2-flowered, 5-10 mm apart, closely appressed to the rachis; outer bract 4-8 mm long, narrowly cupuliform, obliquely truncate, covering the spikelet and rachis at the base; inner bract 8 mm long, ellipsoid, enclosing the flower. Calyx tube 9 mm long, slender, membranous; teeth minute, acute. Corolla 10-20 mm in diam, pink, violet when dry; limb ± rotate. Utricle compressed, c. 1 cm long.

Type: Described from Sicily.

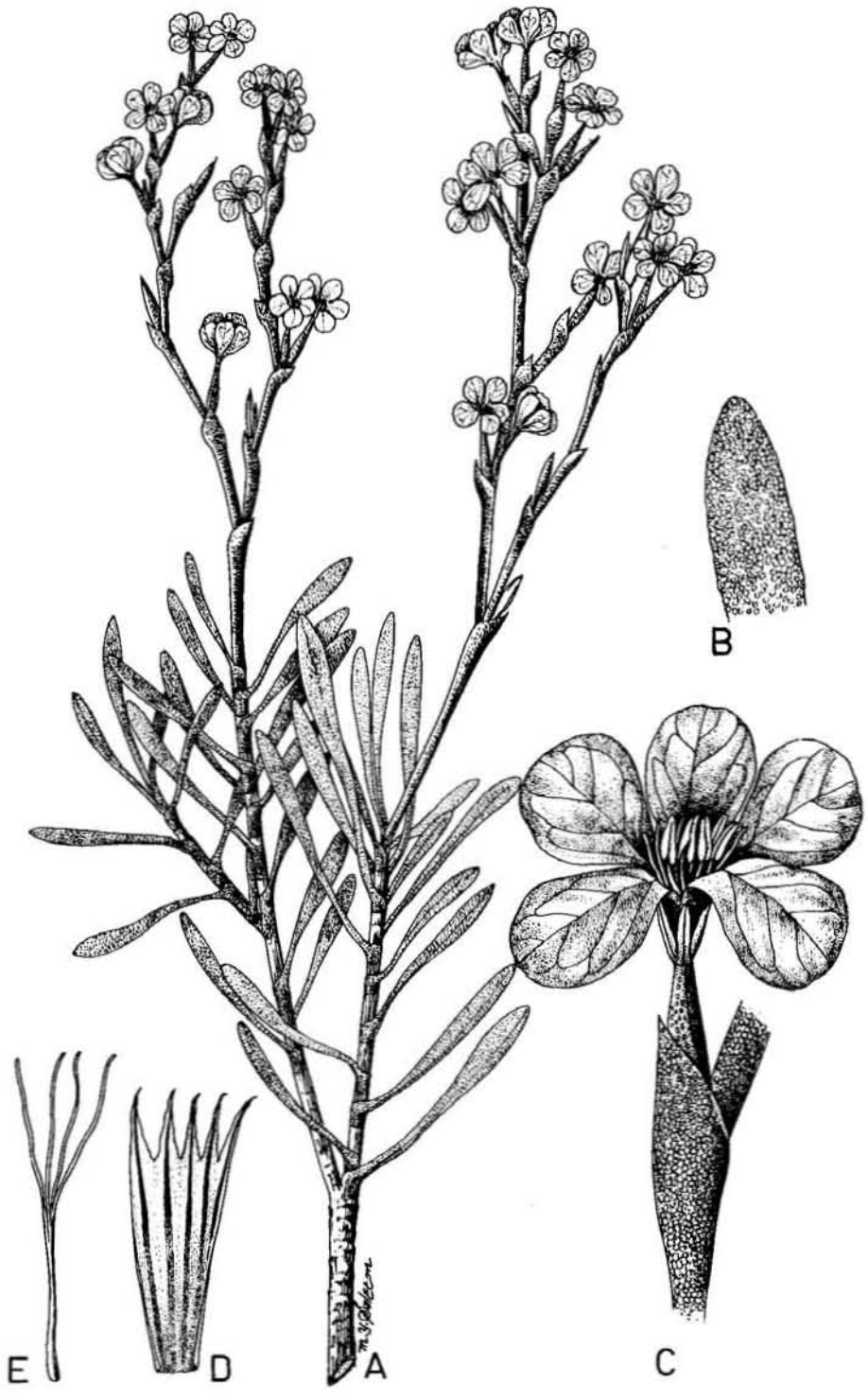


Fig. 2 **Limoniastrum monopetalum**: A, flowering branch x ½; B, leaf apex x 2; C, a flower with bracts x 3; D, calyx spread open x 3; E, gynoecium x 3.

A-2 c. 10 km from Zawara on way to Farwa, sandy soil, 25.11.1976, *A. Ghafoor, S.A. Alavi & F.B. Ratib* 105 (ULT); **A-4** Twarga, saline flat, common c. 50-80 cm forming mounds, flowers violet pink in different bushes 15.5.1975, *S.I. Ali* 2913 (ULT); id. *A. Gammudi* 450 (ULT); **A-7** Ras-Hilal, 5 km from marble-limestone rocks and boulders (Alatroon), shrubby, ascending branches, c. 20-30 cm, flowers violet, 19.6.1972, *S.I. Ali* 684 (ULT); Susa coastal road, very common in rocks, insect galls very prominent, 26.10.1975, *S.M.H. Jafri* 6132 (ULT); Road between Bugrain and Al-Buayrat, in a salt marsh, 15.1.1967, *L. Boulos* 1076 (ULT); 10 km before Sirte, saline soil, very common, pink violaceous, 22.10.1975, *S.M.H. Jafri* 6008 (ULT); **B-4** 1 km W. of poultry farm before Sirte, bush, flowers deep pink, 2.5.1978, *A. El-Gadi, Jafri & others* 1281 (ULT); 50 km E. of Bugrain on Benghazi Highway on way to Sirte, 2.5.1978, *A. El-Gadi, Jafri & others* 1261 (ULT).

Distribution: Mediterranean region; S. Portugal.

A species of maritime area in sandy and saline habitats.

Fl.:May-Aug.

2. **Limoniastrum guyonianum** Dur. ex Boiss. in DC., Prodr. 12. 689. 1848; Keith, l.c. ex parte (Fig. 3)

Like the preceding species but the leaves are narrowly linear or semi-cylindrical, 30-60 x 2-4 mm. Spikelets divaricate with external bracts c. 2.3 mm long. Flowers 8-10 mm long.

Type: Algeria: In rupibus Salsis, Barbarie interioris Biskrah, ubi detexit, *Guyon* (G).

A-2 Sabrata sea coast, soil sandy and rocky, 20.5.1977, *A. El-Gadi* 242 (ULT); **B-4** 5 km before Bugrain on way to Khoms, c. 1-1.5 m. flowers violet, common, 6.4.1977, *S.A. Alavi & Shamim A. Faruqi* 1298 (ULT); Road between Bugrain and Al'Buayrat, in a salt marsh, 15.1.1967, *L. Boulos* 1078 (ULT); 7 km from Bugrain on way to Sirte, an undershrub, flowers deep pink or purple, very common in sandy soil, 16.4.1978, *Ramadan, Fathi & Siddiqi* 252 (ULT).

Distribution: N. Africa (except Egypt).

Fl.:April-May



Fig. 3 **Limoniastrum guyonianum**: A, flowering branch x ½; A_1, leaf apex x 4; B, a flower with bracts x 4; C, calyx spread open x 4; D, gynoecium x 4.

3. **LIMONIUM**

Mill., Gard. Dict. ed. 4. 1754. (*nom. conserv.*)
Statice L. Sp. Pl. 274. 1753, partin. emend. Willd., Enum. Pl. Hort. Berol. 335. 1809.

Perennial herbs, rarely annuals with woody caudex and rather large and broad basal rosette-leaves. Flower subsessile, small, in 1- to many-flowered spikelets, each with 3-scale like bracts, further aggregated into lax or dense spikes, borne at the end of terminal, angled or ± winged branches of usually compound panicled scapes. Calyx infundibuliform, 5-10-ribbed below, with 5-lobed, scarious and usually coloured limb above, with or without smaller teeth between the lobes. Corolla often with avery short tube. Stamens inserted at the base of the corolla tube. Slyles almost free up to the base. Fruit dehiscing circumscissily above or irregularly below.

c. 300 species, chiefly in Eurasia, growing in saline soils mostly in plains; represented by 12 species in Libya.

1.	+Leaves sinuate or lobed (pinnatifid). Spikes subtended by leaf-like wings	2
	–Leaves neither sinuate nor lobed. Spike not subtended by leaf like wings	4
2.	+Calyx limb yellow	1. **L. bonduellei**
	–Calyx limb pale blue, violet or white	3
3.	+Annual, 10-20 (-35) cm tall. Calyx lobes acute with 5 bristles in the sinus	2. **L. thouinii**
	–Perennial, 35-50 cm tall. Calyx lobes entire, bristles absent	3. **L. sinuatum**
4.	+Scapes winged	4. **L. mucronatum**
	–Scapes not winged	5
5.	+Calyx lobes completely divided up to the base. Flowers intensely rose coloured, 1 cm across	5. **L. tubiflorum**
	–Calyx lobes divided up to ⅓-½. Flowers pale or violet, less than 1 cm across	6
6.	+Annuals, entirely herbaceous. Inner bract	

	dorsally tuberculate	6. **L. echioides**
	–Perennials, with woody stock. Inner bract not tuberculate	7
7.	+Leaves caducous. Plants densely pruinose	7. **L. pruinosum**
	–Leaves persistent. Plants not pruinose	8
8.	+Leaves 1 nerved	9
	–Leaves 3-9 nerved	11
9.	+Leaves 10-12 mm broad. Spikelets 5-6 per cm, 1-flowered	8. **L. sibthropianum**
	–Leaves up to 8 (-9) mm broad. Spikelets up to 4 per cm, often 3-4 (-5)-flowered	10
10.	+Sterile branches abundant. Spikelets arcuate. Inner bract 4-5 mm long. Calyx tube 2-3 times longer than the limb	9. **L. oleifolium**
	–Sterile branches absent or very few. Spikelets erect. Inner bract 6-6.5 mm long. Calyx tube almost equalling the limb	10. **L. cyrenaicum**
11.	+Leaves with rounded or retuse apex. Spikelets 2-4 per cm; outer bract 5 mm long. Corolla violet	11. **L. subrotundifolium**
	–Leaves acute to mucronate. Spikelets 5-6 cm. Outer bract up to 2.5 mm long. Corolla pale pink.	12
12.	+Leaves 10-12 mm broad. Spikelets 1-flowered	8. **L. sibthropianum**
	–Leaves 18-32 mm broad. Spikelets 2-3 flowered	12. **L. delicatulum**

1. **Limonium bonduellei** (Lestib.) O. Kuntze, Rev. Gen. Pl. 2: 395. 1891; Pignatti in Tutin et al., Fl. Europ. 40. 1972.

Statice bonduellei Lestib. in Ann. Sc. Nat. Ser. 3. (16): 81, t. 17. 1851; Durand & Barratte, Fl. Lib. Prodr. 194. 1810; Pamp., Pl. Trip. 188. 1914; *L. sinuatum* ssp. *bonduellei* (Lestib.) Sauv. et Vindt.; Quezel & Santa, Nouv.

Fl. Alger 2: 731. 1963; *L. bonduellei* forma *gigantifolia* Corti, Fl. Veg. Fezz. 203. 1942.

A glabrous annual, 10-30 (-55) cm tall. Leaves in basal rosette, sinuate to pinnatifid, sparsely hairy especially on the margins, 4-7 lobed on each side, 40-100 (-150) x 15-35 (-40) mm, attenuate at base. Flowering stems cylindrical, not winged or wing less than 1 mm wide. Spikes dense, with 3 dentate wings or auricles, wing 10-15 (-20) x 4-6 mm. Spikelets 2-flowered; inner bract 6-7 mm long with 2-3 unequal apical spines. Calyx c. 5 mm, tube hispid, limb 5-5.5 mm, entire to undulate, yellow with 5 distinct veins. Corolla yellowish.

Type: Described from Algeria.

B-1 Wadi Malah, c. 3 km from Nalut, protected gorge, growing in crevices, fls. pale yellow, 18.4.1975, *S.I. Ali* 2875 (ULT).

Also reported from Fezzan by Corti (l.c.)

Distribution: N. Africa (excetp Egypt)

A rare or undercollected species but easily recognized by its sinuate-pinnatifid leaves and yellow calyx.

Fl.: Apr.-May

2. **Limonium thouinii** (Viv.) O. Kuntze, Rev. Gen. Pl. 2: 396. 1891; Keith, l.c. 612; Pignatti in Tutin et al., l.c. 40; N. Fein-Dothan, Fl. Palaest. 3: 9. 1978; Brullo in Webbia 33 (1): 138. 1978. (Fig. 4)

Statice thouinii Viv., Cat. Hort. Di-Negro 3.4.1802; Fl. Lib. Spec. 18. t. 11. f. 1. 1824; Durand & Barratte, l.c. 194; Pamp., l.c. 375; *Statice aegyptiaca* Pers., Syn. Pl. 1: 334. 1805.

A glabrous, glaucous annual herb, 10-20 (-35) cm tall, leaves in basal rosette, sinuate to pinnatifid, 4-7 lobed on each side, 30-60 x 10-20 mm, attenuate at base, sparsely hirsute and ciliate on the ventral side. Scapes 3-winged; wing 0.5-1 (-5) mm broad, one of the wings ending at the nodes in a short, blunt, oblong appendage. Spikes compact; with 3-dentate wings or auricles, 10-20 x 5-7 mm, falling at maturity

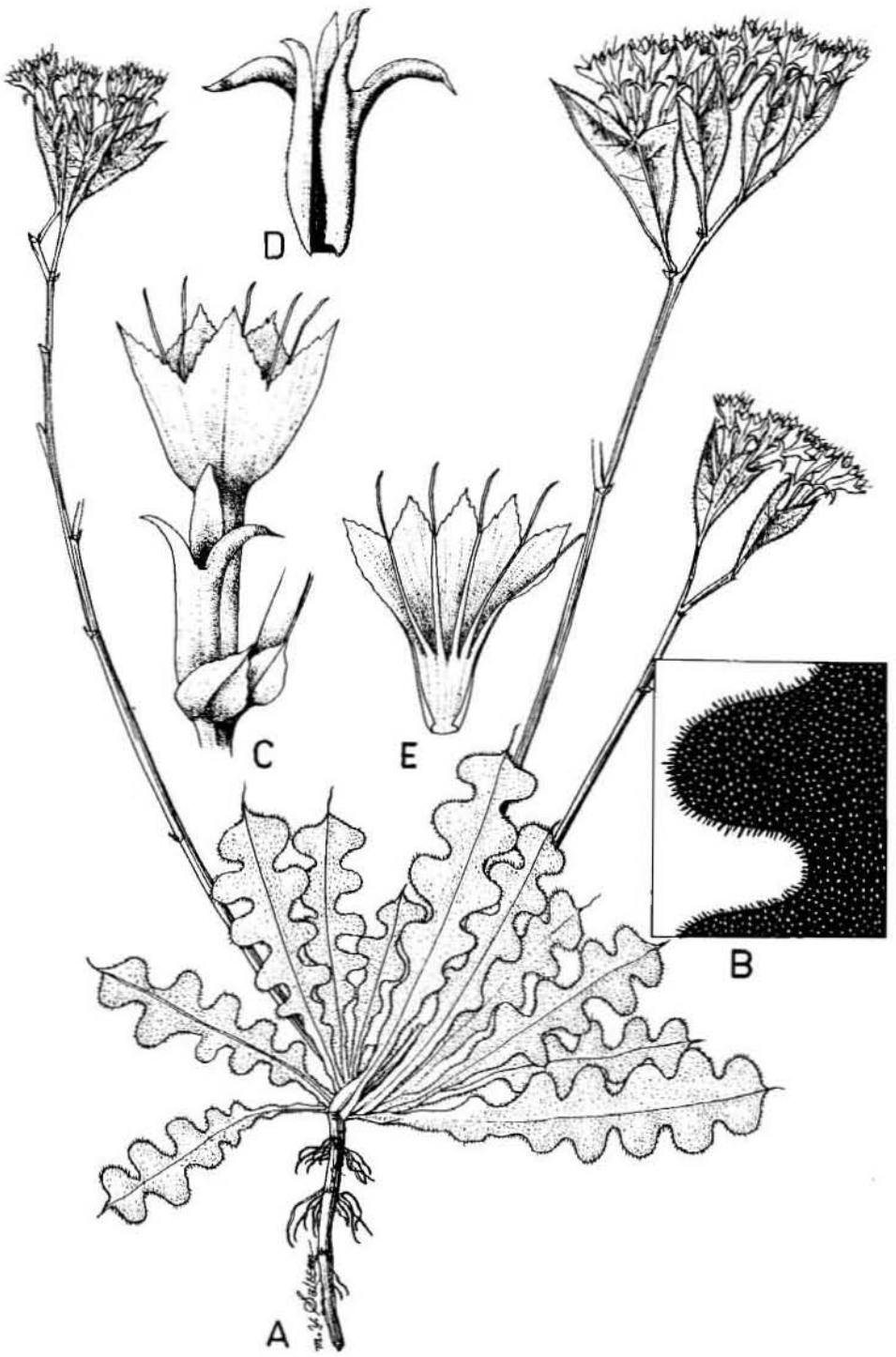


Fig. 4 **Limonium thouinii**: A, habit x 1; B, portion of leaf (ventral view) x 2; C, a flower with bracts x 5; D, inner bract x 5; E, calyx spread open x 3.

for dispersal; spikelet 2 (-3) flowered, 2 outer bracts small, membranous; the inner bract c. 6 mm long, coriaceous and green with 2 unequal horn-like teeth. Calyx c. 10 mm long with c. 5 mm long tube, membranous-scarious; limb c. 5 mm, pale blue or white, with triangular, 5-lobed teeth with 5 long bristles in the sinuses; lobes acute, glabrous. Corolla pale yellow, nearly as long as calyx or slightly longer. Stamens 5, attached with the base of corolla-tube. Styles 5; ovary globose. Fruit circumscissile.

Type: Described from a cultivated plant of Iraq.

A-2 c. 6 km before Garian, soil clayey sand, on the edge of cultivated fields, erect, annual herb, fls. white, 27.3.1977, *S.A. Alavi, M.A. Siddiqi & Mohammad Ahmad* 1197 (ULT); Fort of Garian mountains, near main road, from Tripoli, sandy soil with stones, petals light blue, 30-35 cm, 28.2.1975, *S.I. Ali* 2260 (ULT); 74 km before Tripoli, 15 km before Garian, Gebel Nefousa range, with stony dry west slope, annual herb, *S.A. Alavi* 1161 (ULT); **A-3** Sharshara, fls. pink blue or very light blue 20.3.1974, *G.H. Faris* 130 (ULT); id., 20.3.1974, *Milood, K.* s.n. (ULT); id., 30.3.1975, *Amina, G.* 282 (ULT); id., leaves rosette, fls. blue, 17.3.1978, *R. Labani* 34 (ULT); id. petals light blue, erect, c. 25-30 cm, 30.3.1975, *S.I. Ali* 2623 (ULT); Wadi Kharwa, white fls. 19.5.1978, *Naima Ahmad* 36 (ULT); id., herb, fls. white bluish, *S.M. Mustafa* 10 (ULT); Misellata, c. 8 km from Gusbbat mountains, with sandy clay soil, fls. bluish white, very commn, 14.4.1978, *A. El-Gadi* 1086 (ULT); Bugheilan valley, petals light blue, stony ground, 29.4.1976, *S.I. Ali* 3019 (ULT); id., erect herb, annual, blue flower, 29.4.1976, *Krekshi K* 43 (ULT); id., among stones, flowers light blue, erect, c. 15-30 cm, 17.3.1973, *S.I. Ali* 1658 (ULT); id., erect 15 cm long, blue flowers, rosette leaves, 25.3.1976, *Fathi, B.R.* 79 (ULT); **A-6** Road between Benghazi and Al Kuwayfiyah, 10.3.1968, *L. Boulos* 2000 (ULT); **A-8** Al Tamimi, S.E. Derna, 13.3.1968, *L. Boulos* 2275 (ULT); **B-1** Near Wadi Malah, c. 3 km from Nalut, 30-40 cm, 8.4.1975, *S.I. Ali* 2860 (ULT); **B-2** Ain El Rumia, 30.4.1968, *L. Boulos* s.n. (ULT); id., fls. either pink or blue light, 9.4.1974, *G. Faris* 370 (ULT); 15 km after Kaleba towards Mizda, dry sandy ground, near dry wadi, flowers light blue, 10.4.1974, *S.I. Ali* 2004 (ULT); **B-6** 79 km from Ajdabiyah on way to Benghazi fls. white, common, 3.5.1978, *A. El-Gadi, Jafri & Siddiqi* 1353 (ULT); **C-7** Gialo, fls. white, 16.4.1978, *R. Labani, Fathi & Siddiqi* 422 (ULT).

Distribution: South Spain, N. Africa, Syria, Palestine, S. Arabia, S. Iran and Australia.

Fl.: March-Oct.

3. **Limonium sinuatum** (L.) Miller, Gard. Dict. ed 8: 6. 1768; Pignatti in Tutin et al., l.c. 40; N. Fein-Dothan, l.c. 9; Brullo l.c. 137. (Fig. 5)

Statice sinuata L., Sp. Pl. 276. 1753.

A perennial, 30-50 cm tall, sparsely hispid herb. Leaves many in basal rosettes, sinuate to pinnati-lobed, hispid on both sides, 30-100 x 10-15 (-18) mm, with 4-7 rounded lobes on each side; lobes rounded, the terminal one acuminate. Scapes 3-4 winged; wings 1-3 mm wide, ending at nodes in linear appendages, sometimes wings narrower or rarely lacking. Spikes dense, short, with 3-dentate wings or auricles; wings 15 x 4 mm. Spikelets 2-flowered. The outer bracts of the spikelets membranous, usually rust coloured, lanceolate- subulate; inner bract up to 8 mm long, coriaceous, semigreen with 2-3 pungent, apical spines. Calyx 10-12 mm long; tube c. 7 mm long, glabrous; limb blue or white but never yellow, truncate or entire. Corolla shorter than calyx, yellowish or pink, becoming purple after drying. Fruit circumscissile.

Type: Described from Mediterranean region.

A-7 Marg, 17.5.1978, *M.Mashina* 163 (ULT); **B-2** Alghazaya, (towards Wazen) off the road, a perennial herb with white flowers, 25.1.1977, *M.A. Siddiqi & Fathi, B. R.* 270 (ULT); **B-4** 18 km form W. of Bugrain, clayey soil, flowers white, 2.5.1978, *A.El-Gadi* 1237 (ULT).

Distribution: Mediterranean region, Palestine and Portugal.

4. **Limonium mucronatum** (L.f.) O. Kuntze, Rev. Gen. 394-396. 1891; Jahan. & Maire, Cat. Pl. Maroc. 568. 1934.

Statice mucronata L.f., Suppl. 187. 1781; Durand & Barratte, l.c. 195; Pamp., Pl. Trip. 188. 1914; Keith, l.c.

A glabrous, glaucous, perennial, 25-45 (-50) cm tall; scapes ± pruinose; upper part undulately winged; wings up to 4 mm broad; sterile branches few. Leaves in basal rosette; petiole 4-10 (-15) cm long; lamina spathulate to oblanceolate, entire, 4-6 x 2-4.5 cm, slightly mucronate or muticus, those of sterile branches similar to basal leaves but smaller. Cauline scales 2-2.5 (-3) mm long. Spikes 1.5-2 cm long; spikelet 1-2-flowerd. Outer bract 2.5-3 mm long, ovate, obtuse with hyaline margin; middle bract hyaline, inner bract 6-7 mm with broad membranous apex, glabrous. Calyx tube

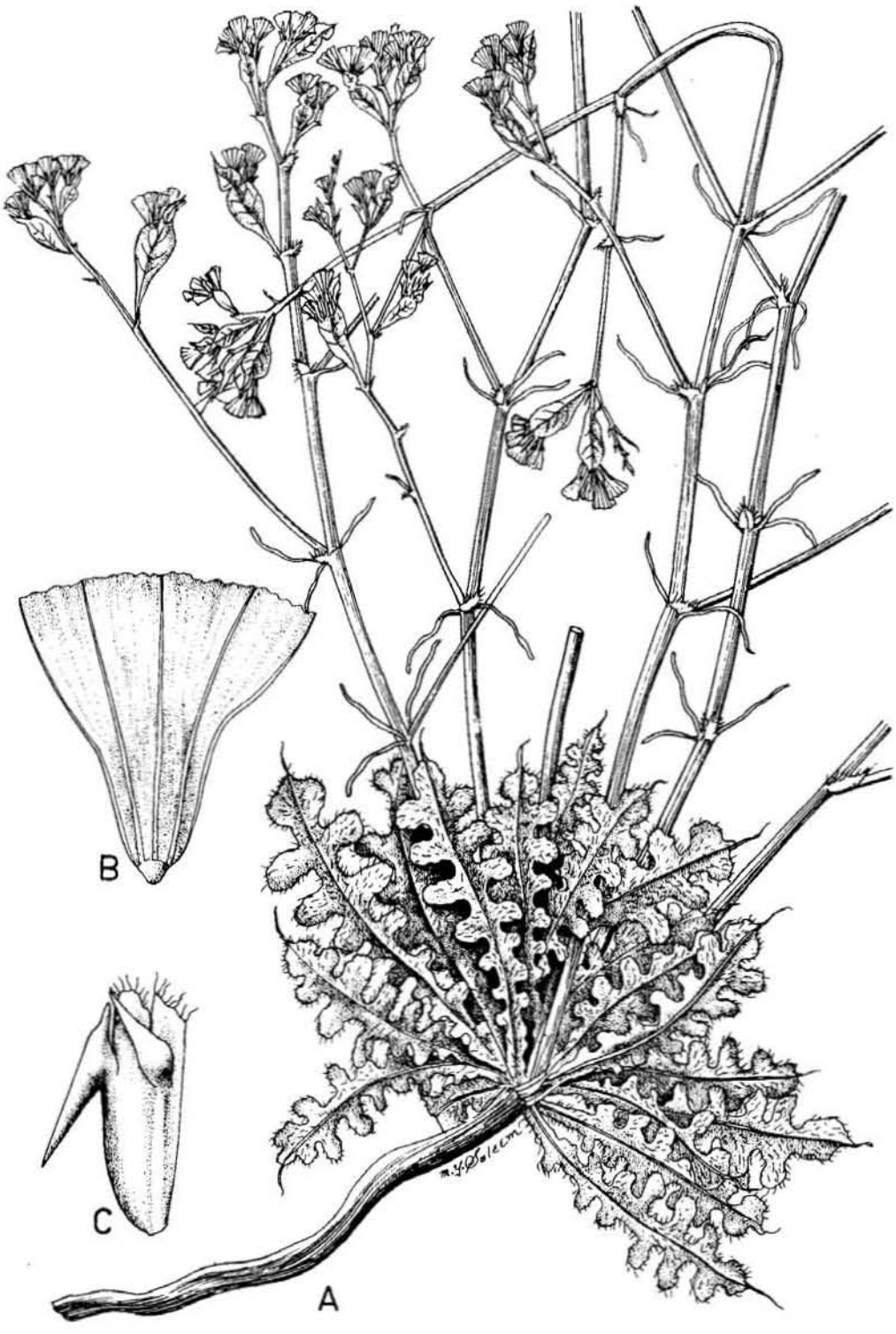


Fig. 5 **Limonium sinuatum**: A, habit x ½; B, calyx spread open x 5; C, inner bract x 6.

hairy on the 5 distinct veins; limb almost absent, minutely 10- toothed. Corolla rose pink.

Type: Described from Morocco.

Reported from Tripoli by Durand & Barratte, (l.c.)

Distribution: Morocco & Libya (?)

The occurrence of this species in Libya needs confirmation.

5. **Limonium tubiflorum** (Del.) Kuntze, Rev. Gen 394. 1891; Keith, l.c. 612; Tack., St. Fl. Egypt 403. 1974; Brullo, l.c. 141. (Fig. 6)

Statice tubiflora Delile, Fl. Egypt. t. 25. f. 2. 1813; Durand & Barratte, l.c. 197; Pamp., Pl. Trip., 189. 1914; Prodr. Fl. Ciren. 360. 1931; *S. squamata* Poir., Encycl. Suppl. 5: 237. 1817; *S. tubiflora* forma *intermedia* Pamp. in Nouvo Giornale bot. It. 24: 149. 1917: *S. tubiflora* var. *zanonii* Pamp. l.c. 148: *L. tubiflorum* var. *zanonii* (Pamp.) Maire in Bull. Soc. Hist. Nat. Afr.Nord. 29: 435. 1938; *L. tubiflorum* ssp. *zanonii* (Pamp.) Brullo, l.c. 142.

A perennial, 10-30 cm tall or procumbent herb with woody base. Scapes glaucous, ± tuberculate, usually with calcarious deposition; branches fragile at the nodes. Leaves in dense basal rosette, 5-16 (-18) x 2-5 (-6) mm, glaucous, ovate, rhomboid, 1-nerved, ± mucronate to acute, entire; petiole 5-10 mm long; scales brown, 3-4 mm long, acuminate. Spikes 10-15 (-20) mm long, 1-2 flowered. Flowers rose-coloured, c. 1 mm im diameter. Outer and middle bracts c. 3 mm long, glabrous to pubescent, entire, acute, ± triangular; inner bract c. 7 mm long, acute with hyaline margin, uninerved, strongly clasping the calyx tube. Calyx 11-12 mm long, tube 4.5-6 mm long; limb completely divided up to the tube; lacinae 5-5.5 (-6) mm long, membranous; awns 2-4 mm long. Corolla 15-16 mm long, tube c. 4-5 mm long, lobes ± ovate. Anthers oblong, 0.5-0.75 mm long; filaments filiform.

Type: Described from Egypt.

A-7 c. 31 km from Alaigan, fls. pink, prostrate-procumbent 21.6.1972, *S.I. Ali* 846a (ULT); c. 20 km from Taknes on way to Baida, c. 20-30 cm, flowers violet pink, road side, stony soil, *S.I. Ali* 579 (ULT); **A-8** Al-Tamimi, S.E. of Derna, 13.3.1968, *L.*

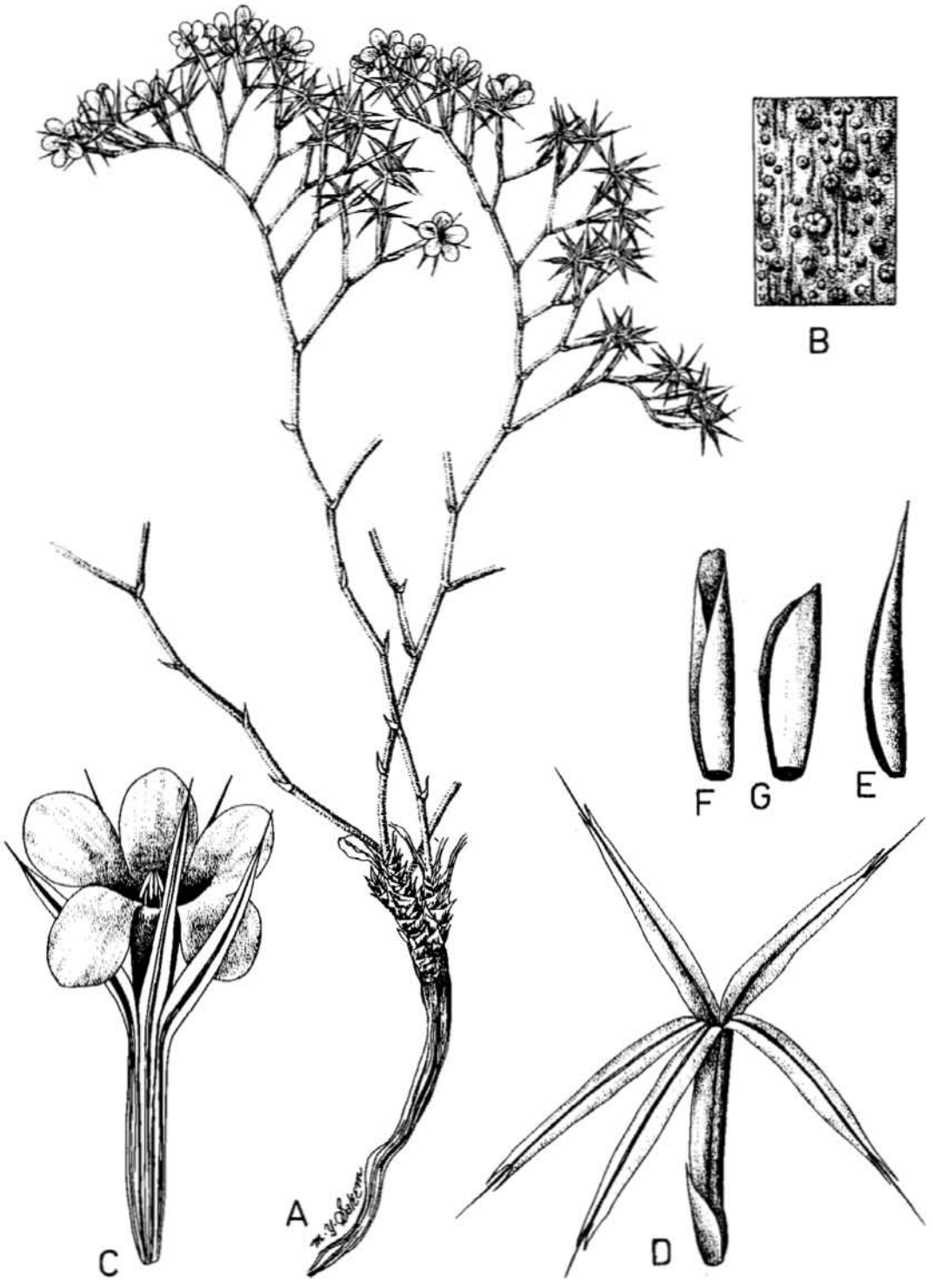


Fig. 6 **Limonium tubiflorum**: A, habit x 1; B, portion of stem x 50; C, flower x 5; D, calyx x 5; E, inner bract x 5; F, outer bract x 10; G, middle bract x 10.

Boulos 2260 (ULT); c. 8 km after Al-Tamimi on way to Tobruk, near an old rest house, perennial herb, spiny, fls. purple, 18.4.1978, *Ramadan, Fathi & Siddiqi* 547 (ULT).

Distribution: N. Africa

This species is usually divided into 2 or 3 infraspecific categories on the basis of the pubescence or glabrous condition of bracts and size of the awns. More material is needed in order to decide the fate of these infraspecific categories. Our specimens cited above agree with the var. *tubiflorum*.

6. **Limonium echioides** (L.) Mill., Gard. Dict. ed. 8, no. 11. 1768; Pignatti in Tutin et al., l.c. 50; Brullo, l.c. 139. (Fig. 7)

Statice echioides L., Sp. Pl. 275. 1753; *S. echioides* var. *exaristata* Murb.; Keith, l.c. 933; *L. echioides* ssp. *exaristata* (Murb.) Tack., St. Fl. Egypt. 403. 1974; Keith, l.c. 933.

Annual herb, 5-30 (-40) cm tall. Leaves in basal rosettes, 20-40 x 10-14 mm, obovate to spathulate, obscurely pinnately veined with tuberculate glands. Scales (3-) 5-6 mm. Spikes 2-10 (-20) cm long, with up to 2 spikelets per cm; spikelets 2-flowered; curved outer bracts overlapping, 1/6 of the inner bract; inner bract 4-8 mm long, tuberculate on the dorsal side. Calyx c. 5 mm, with 5 distinct veins; limb c. 3 mm long; teeth uncinate in fruit. Corolla pinkish, fading quickly. 2n=18.

Type: Described from Montpelliar.

A-2 Sabrata ruins, stony and sandy ground, flowers white, very common, prostrate herb, 12.6.1976, *S.M.H. Jafri & S.A. Alavi* 6700 (ULT); **A-3** Wadi el Kharwa, herb, 19.5.1978, *S.M. Mustafa* 44 (ULT); id., *N. Ben Yezza* 57 (ULT)

Distribution: Mediterranean region, S. Portugal, Libya, Egypt in dry saline soils.

Fl.: May-July

7. **Limonium pruinosum** (L.) O. Ktze, Rev. Gen. Pl. 2: 396. 1891; Tack., St. Fl. Egypt 190. 1956; Keith, l.c.; N. Fein-Dothan, l.c. 11; Brullo, l.c. 140. (Fig. 8)

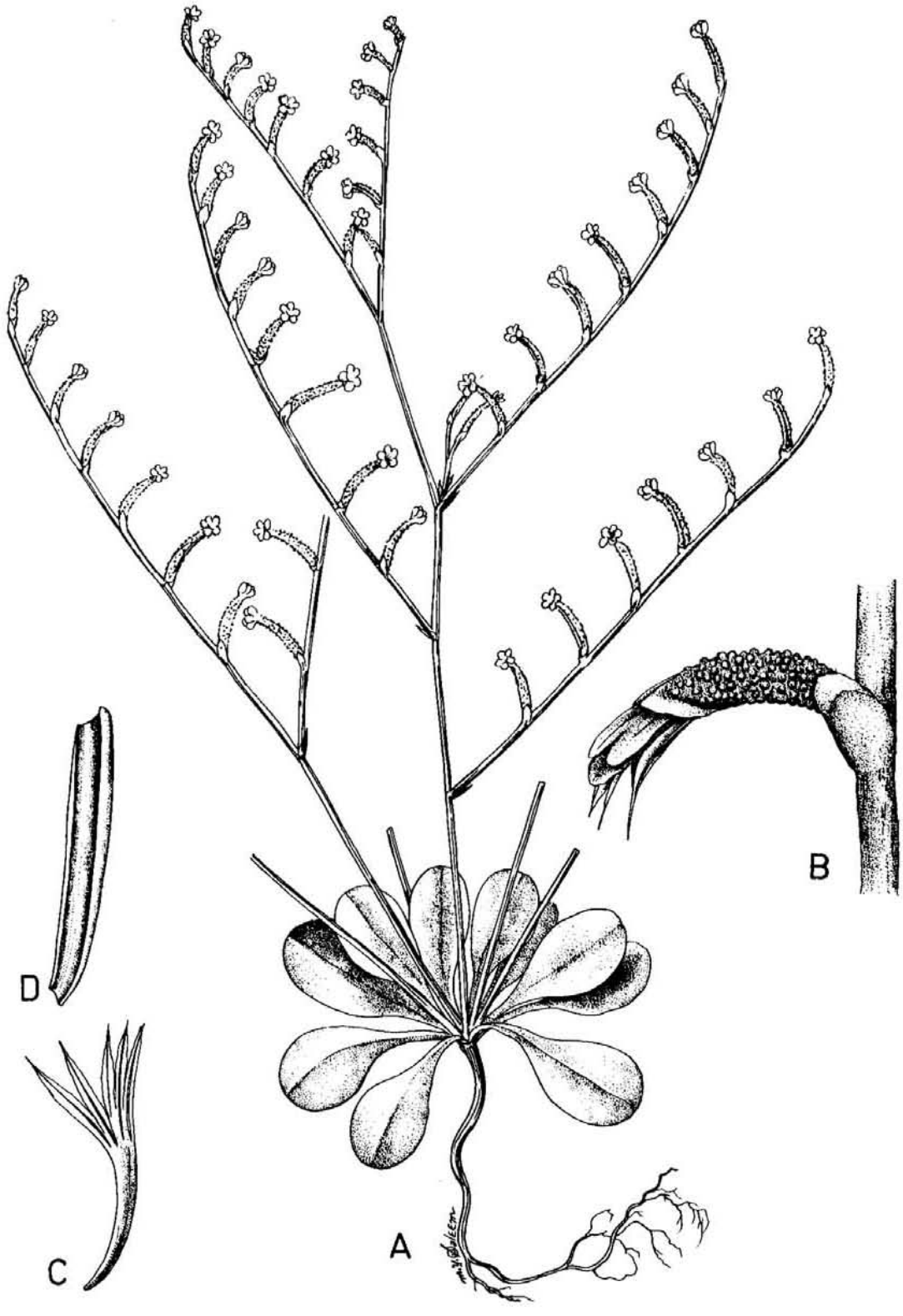


Fig. 7 **Limonuim echioides**: A, habit x 1½; B, spikelet x 10; C, calyx x 5; D, inner bract (inner view) x 10.

Statice pruinosa L. Mant. 59. 1767; Viv., Fl. Lib. Spec. 17, t. 27, f. 1. 1824; Durand & Barratte, l.c.; Pamp., l.c. 359.

Perennial, intricately branched undershrub, up to 40 cm tall; branches greyish-pruinose, densely covered with scale-like puberulent tubercles. Leaves caducous, ovate, spathulate, obovate, tapering into a petiole. Scapes paniculate, brittle, flexuosus- with triangular brown, 5-15 mm long scales at the nodes. Lower branches sterile, forked, jointed. Spikelet 1-flowered, arranged in scorpioid cymes. Bracts white margined, outers ovate, subacute, inner bract 2-3 mm long, obtuse glabrous or hairy. Calyx broadly infundibuliform, c. 5 mm long, glabrous or hairy; limb 5-lobed spreading, obtusely lobed. Corolla purplish, c. 4.5 mm long, limb small, lobes rounded.

2 subspecies have been recognized viz. ssp. *pruinosum* and ssp. *allezettei* by Maire (in Bull. Soc. Hist. Nat. Afr. Nord. 304. 1931) and Brullo, (l.c.) from our area on the basis of the: (i) size of inner bracts and calyx; (ii) glabrous or hairy bracts and calyx tube. The size of the bract and the calyx is not correlated with the second character. Though the hairy or glabrous character is fairly constant, however, a few specimens marked with asterisks are even somewhat intermediate between the hairy and glabrous condition. Moreover there is no geographical segregation between the 2 taxa and the recognition of 2 subspecies is not feasible. Following Tackholm, (l.c.) and N.F. Dothan, (l.c.) the latter taxon does not deserve more than a varietal rank.

In our area 2 varieties can be recognized:

+Bracts and calyx tube glabrous	a) var. **pruinosum**
−Bracts and calyx tube hairy	b) var. **hirtiflorum**

a) var. **pruinosum**

Type: Habitat in Palaestina.

A-1 Wadi Malah, c. 10 km from Nalut, fls. purplish white, only scale leaves, c. 30-45 cm, 4.51972, *S.I. Ali* 293; **A-2** c. 10 km fro. Zuara on way to Ferwa, sandy soil, a small shrub, c. 35 cm, fls. pink, fading to white, 25.11.1976, *A. Ghafoor, S.A. Alavi & F.B. Ratib* 108; c. 6 km from Ras El-Jadir towards Abou-Kmash-Sabrata, along roadside, soil sandy, perennial, bush, 35 cm, common, 26.11.1976, *A. Ghafoor, S.A. Alavi & F.B. Ratib* 132; Talil beach, c. 10 km from Sabrata, rocky ground near the beach, flowers withe or pinkish, common, 12.6.1976, *S.M.H. Jafri* 6669; **A-3** Aulad Mohammad, near beach in calyey and stony soil, common, 13.5.1977, *M.A. Siddiqi* 228;

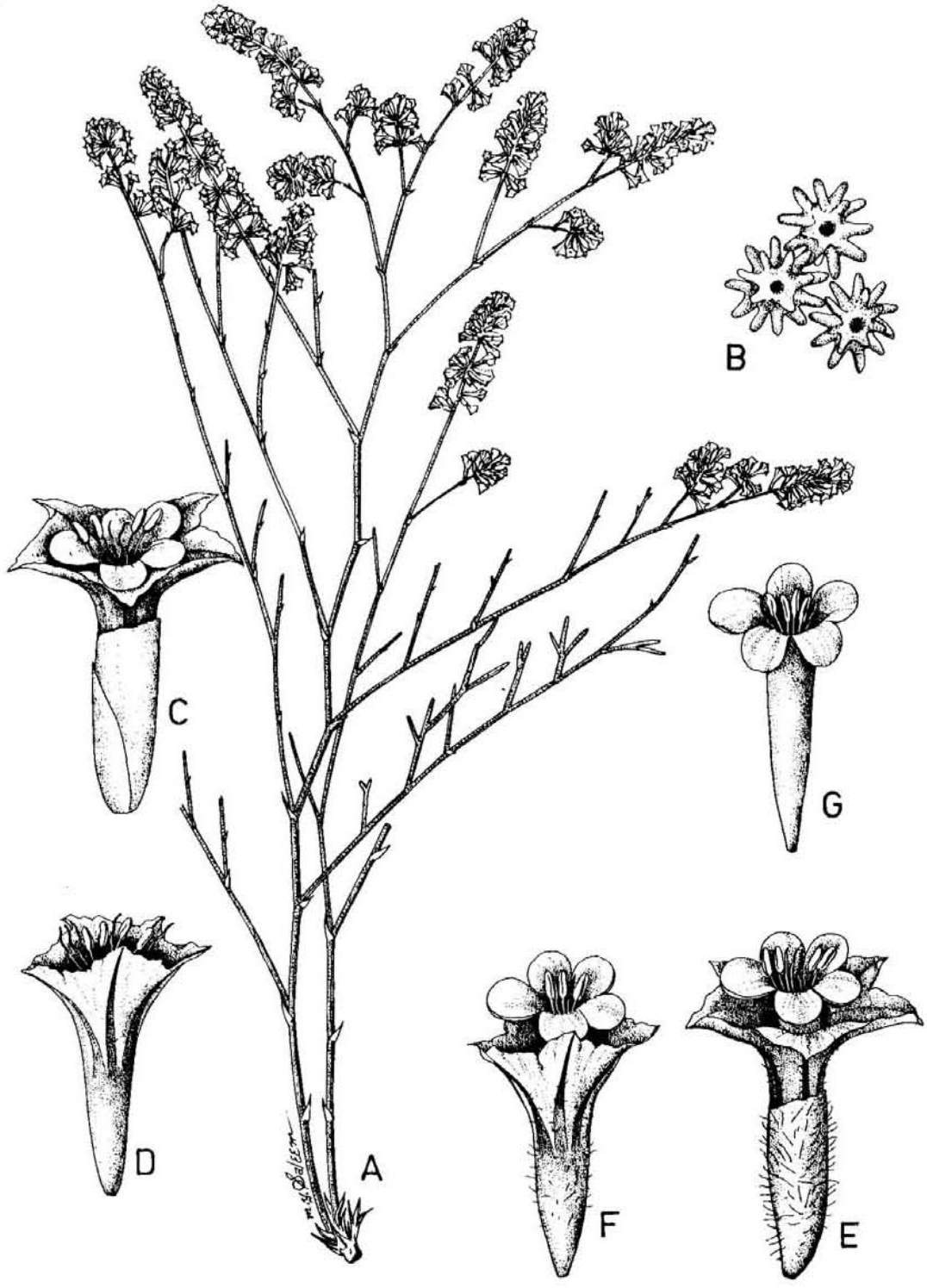


Fig. 8 **Limonium pruinosum** var. **pruinosum**: A, habit x ½; B, scales from stem x 200; C, flower with bracts x 10; D, flower with bracts removed x 10.
var. **hirtiflorum**: E, flower with bract x 10; F, flower with bract removed x 10.

Tripoli coast of Tajura, 30.5.1970, s.n., collector unknown*; **A-4** Tawurgha, c. 200 km before Tripoli, on way to back from Benghazi, very common, fls. pinkish, 28.10.1975, *S.M.H. Jafri* 6182; **A-6** Tockra, bush, 30-40 cm tall, 3.3.1973, *S.I. Ali* 1268; **A-7** c. 31 km from Alaigan on way to Martuba, fls. pink, prostrate, procumbent, 21.6.1972, S.I.Ali 846*; Gebel Akhdar, 26.2.1973, *N. Elmigirby* s.n.; **A-8** 2 km before Tamini on Tobruk road, 18.10.1977, *M.A. Siddiqi & F.B. Rateeb* 59; **B-1** 25 km from Nalut towards Wazan, soil clayey, rocky, 20-30 cm, corolla white, 9.6.1974, *Bashir Faris* 580; 8 km from Nalut on Ghadames road, near the road leading towards Wazen, fls. minute, white, 25.1.1977, *M.A.Siddiqi & F.B. Rateeb* 319; **B-4** 4 km from Sirte towards Tripoli, before roadside, air strip, subglobular bush, c. 20-25 cm, fls. pinkish whitish violet turning white with age, common, 6.4.1977, *S.A. Alavi & S.A. Faruqi* 1287; salt marsh, near Al Kararim, 8.3.1968, *L. Boulos* 1926*; c. 10 km before Sirte, saline ground, fls. pinkish whitish, 22.10.1975, *S.M.H. Jafri* 6007; road between Bugrein and Al-Buaryat in a salt marsh, 15.1.1967, *L. Boulos* 1074; **B-6** 7 km W. of Ajdabia on the roadside, 22.10.1977, *M.A. Siddiqi* 149.

Distribution: N. Africa to Palaestine and Syria.

Fl.: Oct.-Apr.

b) var. **hirtiflorum** (Cavara) Tack., St. Fl. Egypt, 190. 1956; N. Fein-Dothan, l.c. 11.

Statice pruinosa L. var. *hirtiflora* Cavara in Pamp., Bull. Ort. Bot. Nap. 9:49. 1928; Pamp., Prodr. Fl. Ciren. 359. 1931; *S. alleizettei* Pau in Cavanillesia 2: 192. 1929; *S. pruinosa* ssp. *alleizettei* (Pau) Maire in Bull. Soc. Hist., Nat. Afr. Nord, 304. 1951; Brullo, l.c. 140.

Type: Described from Cirenaica, probably Bardia (Libya).

A-2 10 km from Zuara on way to Ferwa, sandy soil, a small shrub, c. 35 cm, flowers pink, fading to white, 25.11.1976, *A. Ghafoor, S.A. Alavi & F.B. Rateeb* 108; Alazizia, shrublet, 30-35 cm, corolla white, 7.6.1974, *Bashir Faris* 519; **A-7** c. 4 km from Ras-El-Tin, near cultivated field, 21.6.1972, *S.I. Ali* 864; **A-8** 2 km before Tamimi, 18.10.1977, *M.A. Siddiqi & F.B. Rateeb* 52; 2 km before Tamimi on Tobruk road, flowers light purple, 18.10.1977, *M.A. Siddiqi & F.B. Rateeb* 55;**B-4** Near Twarga, saline flat, c. 25 cm, fls. pink, 23.3.1972, *M.A. Siddiqi* 33; 10 km before Sirte,

saline ground, roadside, very common, flowers pinkish-whitish, 22.10.1975, *S.M.H. Jafri* 6007a; Gulf of Sirte, between Misurata and Bugren, 20 m, Sabkha, flowers liliac-pink, 25.3.1970, *P.H. Davis* 49821; Between Sirte & Tripoli saline ground, 28.10.1975, *S.M.H. Jafri* 6173; 15 km before Sirte, white to pinkish (purplish) flower, 8.1.1977, *M.A. Siddiqi & F.B. Rateeb* 120.

Distribution: Same as that of type variety.

Fl. Oct.-June

8. **Limonium sibthorpianum** (Guss.) O. Kuntze, Rev. Gen. Pl. 2: 396.1891; Pignatti in Tutin et al., l.c. 49; Brullo, l.c. 153. (Fig. 9)

Statice sibthorpianum Guss., Fl. Sic. Prodr. Suppl. 87. 1832; Durand & Barratte, l.c. 195; Keith, l.c. 933; *S. delicatula* Beguinot & Vacc., Contr. Fl. Lib. 56. 1912 (p.p.), non Girard 1844; *L. sibthorpianum* ssp. *vaccarii* Pignetti in Webbia 18: 86. 1936 *nom. nud.*; *L. vaccarii* Pignatti in Brullo, l.c. 148.

A perennial, up to 40 cm tall, glabrous herb, with somewhat pruinose branches; sterile branches absent. Leaves in basal rosette, 1(-5) nerved, acute, 20-60 (-80) x 10-12 mm, lanceolate-spathulate with a very small mucro, ± glaucous, petiole 20-30 mm long; scales 6-7 mm long, ovate, acute-acuminate. Spikes 1-3 cm long, with 5-6 spikelets per cm. Spikelets 1 (-2)-flowered. Outer bract over lapping, ± ½-⅓ of the inner bracts, (1.8-) 2-2.5 mm long, acute, triangular, with membranous margin; middle bract 1.5-2 mm long; internal bract 3-3.5 (-4) mm long, mucronate with membranous margin. Calyx 3-4 mm long, extending up to 1 mm beyond the internal bract, tube hairy, teeth 0.5 mm long.

Type: Described from Sicily.

A-2 Near Shakshuk, Qasar Alhaj, a perennial herb with woody rootstock, leaves mostly rosette, rough, obovate, scape c. 25 cm, 20.1.1978, *S.A. Alavi, M.A. Siddiqi & F.B. Rateeb* 1500 (ULT); 8 km after Zwara, collector unknown, 72 (ULT); **A-3** Tripoli, grown by *I.I. Chaudhri* from the seeds obtained at Twarga, c. 60 cm, flower violet, 25.5.1972, *S.I. Ali* 437 (ULT); Tawarga, c. 200 km before Tripoli on way back from Benghazi, *Casuarina* plantation area, only rosette leaves present, fls. violet, 28.10.1975, *S.M.H. Jafri* 6179, 6180; id., 14.5.1975, *A. Gammudi* 448 (ULT).



Fig. 9 **Limonium sibthorpianum**: A, lower and basal part of plant x ¾; B, inflorescence x ¾; C, spikelets x 5; D, flower with bracts x 10; E, flower with bracts removed x 10; F, outer bract x 10; G, inner bract x 10.

Also reported from Tobruk by Brullo (l.c.) under the name *L. vaccarii*.

Distribution: Sicily and Libya.

This species has previously been confused with *L. delicatulum* Girard from which it differs by having 1-flowered spikelet, much narrowed, glaucous, 1 (-5) veined leaves, 2-3-flowered spikelet and green leaves, much broader and 3-9 veined.

Fl. Jan.-May

9. **Limonium oleifolium** Mill. Gard. Dict. ed. 8: 3. 1768; Pignetti in Tutin et al, l.c. 46; N. Fein-Dothan, l.c. 11; Brullo, l.c. 139.

Statice oleifolia (Mill.) Scop. Delic. Fl. Insubr 1: 24. 1786; *S. virgata* Willd., Enum. Pl. Hort. Berol. 336. 1809; Durand & Barratte, l.c. 196; Pamp., Fl. Ciren. 359. 1931; *L. virgatum* (Willd.) Fourro in Ann. Soc. Linn. Lyon, n.s. 17: 141. 1869.

A perennial herb, 10-40 cm tall, glabrous, smooth or somewhat tuberculate. Leaves 30-40 (-50) x 3-9 mm, linear spathulate to oblong, obtuse, 1-veined, attenuate into a long petiole. Stems many with sterile lower branches; upper branches usually rigid. Spikes 4-5 cm with usually up to 4 spikelets per cm; spikelets distinctly arcuate, compressed, 1-2 (-5)-flowered. Inner bract rust-coloured, membranous at margin, 4-5 mm long, dorsally keeled, incurved; outer and middle bracts 1-2 mm long, ovate with hyaline margins. Calyx infundibuluform, tube, curved, appressed hairy at the base; limb 2-3 times shorter than tube, white or pale violet. Corolla c. 8 mm long. Fruit dehiscing irregularly.

Type: Described from the Western Mediterranean region.

A-7 Susa, coastal road, beyond Baida, Jebel Akhdar, on rock near the sea, flowers blue, very common, 28.10.1975, *S.M.H. Jafri* 6127 (ULT).

Distribution: Mediterranean region.

A very variable species, usually divided into a number of infraspecific categories on reticulate, smooth or tuberculate branches and number of flowers per spikelet. More material is needed to reach any conclusion.

10. **Limonium cyrenaicum** (Rouy) Brullo in Webbia 33 (1): 144. 1978. (Fig. 10)

Statice cyrenaica Rouy in Rev. Bot. Syst. Geograf. Bot. 1 (10): 155. 1903; Durand & Barratte, l.c. 195; Pamp., Prodr. Fl. Ciren. 358. 1931; Keith, l.c.; *S. psiloclada* Cosson in Bull. Soc. Bot. Fr. 36: 102. 1889 (non Boiss. 1848); *S. graeca* auct. non Poiret (1817); Durand & Barratte, l.c. 196; *S. delicatula* var. *minor* Beg. & Vacc., Sec. Contr. Fl. Lib. 29. 1913; *S. prolifera* auct., non Urv. (1822): Pamp., l.c. 360.

15-40 cm tall, perennial; scape and branches tuberculate, rugose, glaucous; sterile branches absent or very few. Leaves ± fleshy, glaucous, oblong-spathulate, with one nerve, 10-25 (-35) x 2-5 (-6) mm, obtuse or mucronate, margin entire but slightly revolute at the apex, gradually attenuate, rugose-tuberculate. Cauline scales 2.5-4.5 mm long, curved. Spikes 1-2 (-3) in 1 cm; spikelets often 3-4 (-5) flowered, mostly straight. Internal bract 6-6.5 mm long with ± broad margin, leathery, oblong, with rounded-obtuse apex; the middle bract 3-3.5 mm long, reddish in colour, membranous, obtuse and the outermost bract acuminate, reddish rough, leathery 2.5-3 mm long. Calyx 5-6 mm long; tube appressed hairy all over, especially in the lower part, limb equalling the tube; corolla 6-7 mm long, blue or violet.

Type: Libya: Cyrenaique, Derna, Juillet 1875 *Dauveau* (MPU).

A-7 Wadi Al-Teier, Gebel Akhdar, c. 24 km W. of Derna, along the coastal road to Susa, near the sea shore, 19.1.1967, *L. Boulos* 1181 (ULT); 5 km from Ras el Hilal on way to Derna, 60-70 cm, fls. pink common, 19.6.1972, *S.I. Ali* 683 (ULT); Susa, coastal road, beyond Baida, Jabal Akhdar on rocks, near sea, flowers white, very common, 26.10.1975, *S.M.H. Jafri* 6137 (ULT); Ras-el-Hilal, *M.A. Siddiqi & F.B. Rateeb* 103 (ULT); id., near coastal road, 6.5.1978, *A.El-Gadi & S.M.H. Jafri* 1660 (ULT); Susa Apollinea, erect, fls. violet, c. 45 cm tall, 20.6.1972, *S.I. Ali* 784 (ULT).

Distribution: Endemic

This species seems to be confined only in Jabal Akhdar area. This has been confused with *L. graecum* (Poir) O. Kuntze by the previous workers but the latter taxon differs from the former by having more sterile branches and 4 times longer calyx tube than the limb.



Fig. 10 **Limonium cyrenaicum**: A, habit x ½; B, flower with bracts x 5; C, inner bract x 5; D, calyx x 5.

Fl. Almost throughout the year.

11. **Limonium subrotundifolium** (Beguinot & Vacc.) Brullo in Webbia, 33 (1): 145. 1978.

Statice delicatula var. *subrotundifolia* Beguinot & Vacc., Mon. Rapp. Col. 7: 29.1913; Keith, l.c. 933.

Similar to the following species but differs in having the rounded or retuse leaf apex, fewer spikelets (2-4) per cm, outer bigger 5 mm long bract and violet corolla.

Type: Libya: Cyrenaica, Derna in Collibus aridis saxosis maritimis prope il faso, 21.10.1912, *Vaccari* 148.

Also reported from Wadi el Naga by Brullo (l.c.)

Distribution: Endemic

12. **Limonium delicatulum** (Girard) O. Kuntze, Rev. Gen. Pl. 2: 395. 1891.

Statice delicatula Girard in Ann. Sc. Nat. Ser. 3: 2. 327. 1844; Durand & Barratte, l.c. 195; Pamp., l.c. 357; Keith, l.c. 933; *S. tunetana* Barratte, Ill. Fl. Tunis. t. 15. 1895; *L. tunetanum* (Barratte) Quezel & Santa, Nuov. Fl. Alg. 2: 734. 1963; *L. teuchirae* Brullo, l.c. 148.

(20-) 40-70 cm tall perennial, with rough branches; sterile branches absent or very few. Leaves spathulate or oblanceolate, 3-5 (-9) veined, 35-50 (-80) x 10-32 mm, with a conspicuous mucro, margin ± undulate, cartilaginous; petiole equalling or longer than the lamina, 1.5-3 mm broad. Cauline scales (3-) 4-9 mm long. Spike flexuose, (1.5-) 2-4 cm with 3-7 spikelets per cm. Spikelets 2-3 flowered. Inner bract 2.5-3 mm long, incurved, with a narrow dorsal hyaline margin; outer bract obtuse 0.8-1 mm long. Calyx 3-3.5 mm long, tube pilose on the lower side, limb 1/2-2/3 as long as the tube. Corolla pale pink, 4-6 mm long.

Type: Described from Spain.

A-2 15 km before Shakshuk, April 1977, *M.A. Siddiqi & F.B. Rateeb* s.n. (ULT); **A-3** Ain Kaam, 18.4.1978, *Howeidy* 32 (ULT); Lebda, 110 km West of Tripoli, fls.

yellowish pink, 5.5.1978, *J. Abdu-Al* 5 (ULT).

Distribution: Spain and N. Africa.

Brullo (l.c.) described a new species *L. teuchirae* and claimed that the true *L. delicatulum* do not exist in Libya. However, judging from the description and the figure it is obvious that *L. teuchirae* is nothing but a minor variant of the *L. delicatulum*.

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