

AL FAATEH UNIVERSITY  
FACULTY OF SCIENCE  
DEPARTMENT OF BOTANY

# FLORA OF LIBYA

59

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## **Editors :**

S.M.H. JAFRI & A. EL-GADI  
Al Faateh University,  
Faculty of Science,  
Department of Botany, Tripoli.

CARYOPHYLLACEAE

by ABDUL GHAFOOR

Illustrations by  
M. RAFIGUDDIN

## CARYOPHYLLACEAE

ABDUL GHAFOR

Herbs or subshrubs, often  $\pm$  woody at the base. Stem often dichotomously branched and swollen at the nodes. Leaves simple, opposite, rarely alternate or whorled, entire, exstipulate or with scarious stipules. Inflorescence cymose; cymes loose, dichasial, sometimes congested, umbellate or flowers solitary. Flowers usually bisexual rarely unisexual, pentamerous, actinomorphic, hypogynous rarely perigynous. Sepals (4-) 5, free or united partly or throughout into a (4-) 5-toothed or lobed calyx tube, imbricate, often persistent and scarious in fruit. Petals as many as sepals, rarely absent, free, mostly distinctly clawed in gamosepalous genera, with or without coronal scales, claw and limb not clearly marked out in polysepalous genera, entire to serrate or emarginate to deeply 2-lobed, imbricate. Stamens 10, in 2 whorls of 5 each, rarely fewer by reduction or absent. Ovary 2-5-carpellary, syncarpous, superior, rarely semi-inferior, unilocular or 2-5-loculed at the base, sessile or rarely stipitate; ovules many, placentation axile or free central; styles as many as carpels, free or partially united; stigmas 2-5. Fruit mostly a capsule, dehiscent at apex by 2-5 or 4-10 apical teeth, rarely bursting irregularly or indehiscent and berry-like. Seeds with curved embryo and very little or no endosperm.

A large family comprising c. 80 genera and 2000 species, distributed in all the continents, more especially in the North temperate regions; represented in Libya by 18 genera and 62 species.

Taxa marked with an asterisk (\*) are known only from cultivation in our area. Specimens cited are present in the Herbarium, Department of Botany, Faculty of Science, Al-Faateh University, Tripoli, Libya (ULT).

- |    |   |                      |
|----|---|----------------------|
| 1. | + Leaves stipulate  | 2                    |
|    | -- Leaves exstipulate   | 8                    |
| 2. | + Bracts with lateral lobes, green. Sepals unequal, with setose bristles on either side | 1. <i>Loeflingia</i> |
|    | -- Bracts unlobed, membranous. Sepals without setose bristles.                          | 3                    |

## CARYOPHYLLACEAE

3.	<ul style="list-style-type: none"> <li>+ Leaves alternate</li> <li>-- Leaves opposite or apparently whorled</li> </ul>	2. <b>Telephium</b> 4
4.	<ul style="list-style-type: none"> <li>+ Styles free to the base</li> <li>-- Styles united below</li> </ul>	5 6
5.	<ul style="list-style-type: none"> <li>+ Leaves falsely or apparently whorled; stipules connate. Styles 5. Capsule 5-valved</li> <li>-- Leaves opposite; stipules not connate. Styles 3. Capsule 3-valved</li> </ul>	3. <b>Spergula</b> 4. <b>Spergularia</b>
6.	<ul style="list-style-type: none"> <li>+ Bracts and stipules with a thick green midrib. Petals clawed</li> <li>-- Bracts and stipules entirely membranous. Petals clawless</li> </ul>	7. <b>Robbairea</b> 7
7.	<ul style="list-style-type: none"> <li>+ Leaves oblong or obovate-orbicular, not mucronate. Sepals keeled</li> <li>-- Leaves linear to linear-oblongate rarely ovate, mucronate. Sepals not keeled</li> </ul>	5. <b>Polycarpon</b> 6. <b>Polycarpaea</b>
8.	<ul style="list-style-type: none"> <li>+ Sepals free to the base. Petals mostly not differentiated into claw and limb</li> <li>-- Sepals united into a 5-toothed or-lobed calyx tube or slightly basally united. Petals usually distinguished into claw and limb</li> </ul>	9 16
9.	<ul style="list-style-type: none"> <li>+ Styles (2-) 3</li> <li>-- Styles 4-5</li> </ul>	11 10
10.	<ul style="list-style-type: none"> <li>+ Leaves linear or subulate, <math>\pm</math> connate at the base. Capsule dehiscent almost to the base into 4-5-valves</li> <li>-- Leaves lanceolate-ovate to suborbicular or obovate-spathulate to oblong, never connate at the base. Capsule dehiscent by twice as many teeth (8-10) as styles</li> </ul>	7. <b>Sagina</b> 12
11.	<ul style="list-style-type: none"> <li>+ Capsule dehiscent by 3 valves with broad</li> </ul>	

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- |  |  |
|--|--|
| <p style="margin-left: 40px;">obtuse teeth</p> <p>-- Capsule dehiscent by (4-) 6 (-10) acutish teeth</p>   | <p><b>12. Minuartia</b><br/>13</p>                     |
| <p>12. + Leaves lanceolate-ovate. Sepals with a prominent midrib. Petals entire or rarely <math>\pm</math> emarginate. Capsule globose-ovoid or ovoid-oblong, not exceeding sepals</p> <p>-- Leaves obovate-spathulate to oblong. Sepals without a prominent midrib. Petals deeply bilobed or sometimes emarginate. Capsule exceeding the sepals</p> | <p><b>10. Arenaria</b></p>                             |
| <p>13. + Petals 2-fid to half way or more (almost to the base) rarely entire or absent.</p> <p>-- Petals emarginate or 2-fid to nearly or less than half way down, rarely entire or absent</p>   | <p>14</p> <p>15</p>                                    |
| <p>14. + Sepals prominently veined. Petals entire or <math>\pm</math> emarginate</p> <p>-- Sepals indistinctly veined. Petals bifid almost to the base</p>   | <p><b>10. Arenaria</b></p> <p><b>11. Stellaria</b></p> |
| <p>15. + Petals deeply bifid or sometimes emarginate. Capsule oblong-cylindrical, exceeding sepals, sometimes curved</p> <p>-- Petals entire or sometimes <math>\pm</math> emarginate. Capsule globose-ovoid or ovoid-oblong, not exceeding sepals, straight</p>   | <p><b>9. Cerastium</b></p> <p><b>10. Arenaria</b></p>  |
| <p>16. + Calyx teeth foliaceous, more than 10 (usually 15-35) mm long, exceeding the petals</p> <p>-- Calyx teeth not foliaceous, less than 10 mm long, shorter than the petals</p>  | <p><b>13. Agrostemma</b></p> <p>17</p>                 |
| <p>17. + Styles 3-5. Fruit usually a stipitate capsule dehiscent by 3-10 apical teeth</p> <p>-- Styles 2. Fruit dehiscent by 4 apical teeth</p>  | <p><b>14. Silene</b><br/>18</p>                        |
| <p>18. + Calyx tube with 5 very narrow wings</p>   | <p><b>15. Vaccaria</b></p>                             |

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- Calyx tube not winged 19
  
- 19. + Calyx with membranous hyaline spaces between the nerves; bracteoles or epicalyx scales not closely adpressed to calyx if present 20
  - Calyx without membranous hyaline spaces between the nerves; bracteoles or epicalyx scales 2-many and closely adpressed to calyx 16. **Dianthus**
  
- 20. + Seeds reniform, not compressed, convex on both sides, with curved embryo and lateral hilum 17. **Gypsophila**
  - Seeds dorso-ventrally compressed, peltate with straight embryo and facial hilum 18. **Petrorrhagia**

### 1. LOEFLINGIA

L., Sp. Pl. 35. 1753; Gen. Pl. ed. 5: 22. 1754

Dwarf, dichotomously branched annual herbs. Leaves stipulate, linear-subulate, setaceous. Inflorescence in dense axillary, monochasial or dichasial, cymose fascicles or spicate. Flowers minute, sessile, perigynous, bracteate; bracts with 2 lateral lobes. Sepals 5, free or  $\pm$  united at the base, unequal, keeled, the outer 3 longer and broader than the inner 2 and often with setose bristles on each side, scarious on margins. Petals 3 or 5, indistinct, hyaline. Stamens as many as petals. Ovary tricarpellary, unilocular, multiovulate; style 1, 3-fid or 3-lobed at the apex, stigmas 3. Fruit a 3-valved capsule, enclosed by sepals. Seeds obovate.

A genus of c. 7 species, distributed in North America and Mediterranean region and S.W.Asia (Iran); represented in Libya by the following species.

**Loeflingia hispanica** L., Sp. Pl. 35.1753; Durand & Barratte, Fl. Lib. Prodr. 42 & 316. 1910; Pamp., Pl. Trip. 73. 1914; Maire, Fl. Afr. Nord. 9.84. 1963; Quezel & Santa, Nouv. Fl. Alger. 1: 320. 19. 1962; Keith, Prelim. Check List Lib. Fl. 622. 1965,(Fig. 1).

Annual, diffusely branched, up to 10 (-15) cm tall herb. Stem glandular pubescent, glands  $\pm$  sand adherent. Leaves opposite to pseudoverticillate, sessile, linear to linear-lanceolate, 5-10 (-14) x 1-2 mm, connate at the base, rigidly

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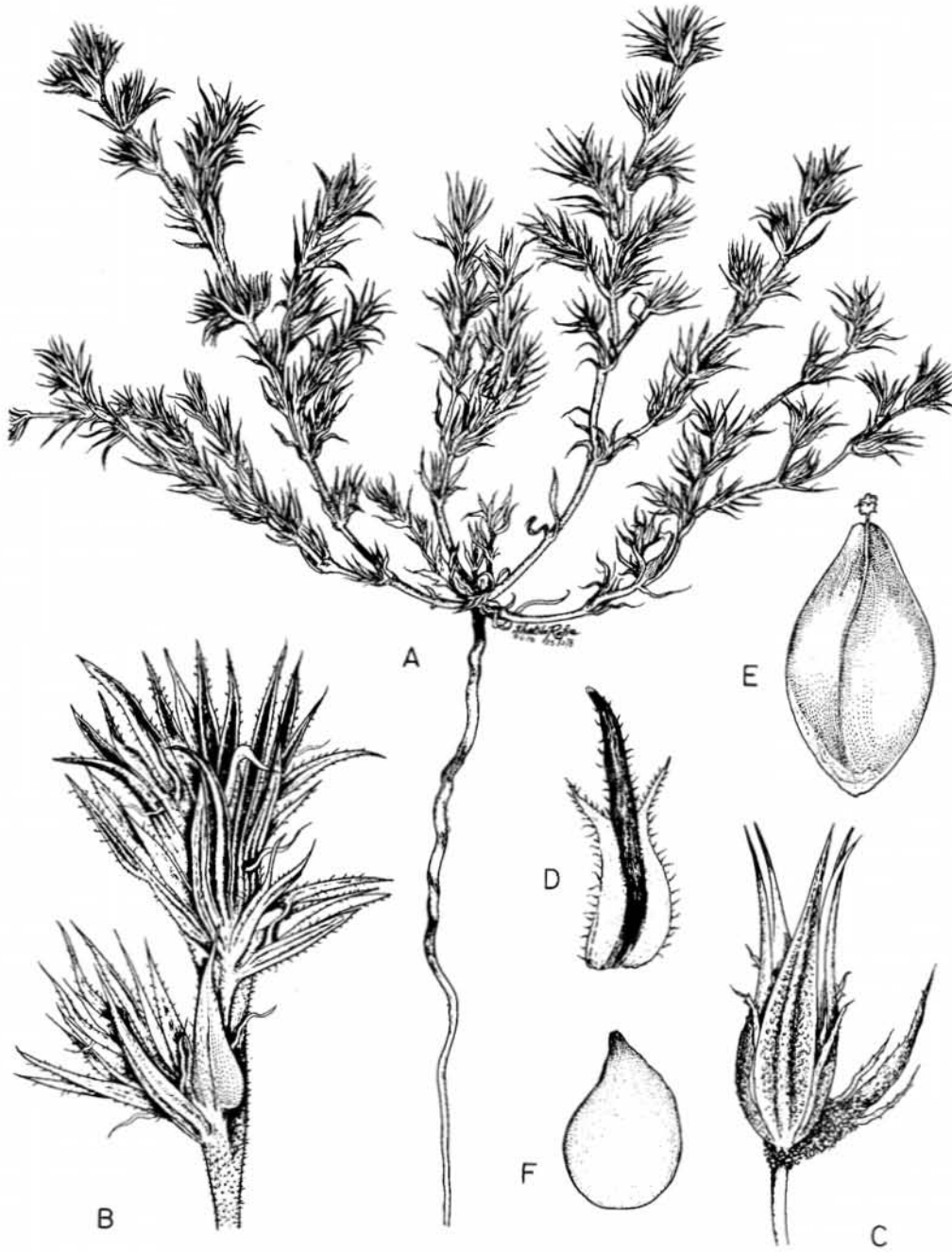


Fig. 1 *Loellingia hispanica*: A, Habit x 1.5; B, Flower fascicles x 7.5; C, Flower with bract x 12.5; D, Sepal x 10; E, Fruit x 20; F, Seed x 50.

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mucronate-aristate, acute,  $\pm$  glabrous; stipules scarious, filiform, ciliate on the margins. Inflorescence condensed or fasciculated dichasial cymes or sometimes of solitary flower. Flowers sessile; bracts leafy, scarious-ciliate on margins, setose laterally. Sepals  $\pm$  carinate, 2-4 mm long, all with almost equally long, 2 setose appendages from near the base. Petals white, retuse. Stamens mostly 3, anthers subglobose. Ovary ovoid, c. 1.5 mm long, glabrous; style less than half the size of ovary, elongated in fruit. Capsule ovoid-subglobose or  $\pm$  oblongish, membranous, c. 2-2.5 mm long, yellowish-green. Seeds  $\pm$  compressed, obliquely obovate, c. 0.5 mm long, finely papillose, white.

Type: Described from Spain, Herb. Linn 54/1 (LINN).

A-3 Near Tripoli Airport, 10 m, sandy fields (irrigated), annual, 6 April 1970 *Davis & Boulos* D 50584; Ministry of Agriculture, Sidi El Masri, 22.4.1967, *L. Boulos* 1722; Barley fields facing Faculty of Science, Al-Faateh University, in sandy soil, 18.4.1967, *L. Boulos* 1675; *id.* 14.4.1977, *M.A. Siddiqi* 223.

Distribution: S. West to S. East Europe, North Africa, Lebanon, Palestine, Turkey, Syria, Iraq and South Iran.

*Fl.* March-June.

### 2. TELEPHIUM

*L.*, *Sp. Pl.* 271. 1753; *Gen. Pl.* ed. 5: 131. 1754.

Perennial, rarely annual, basally woody, glabrous to glaucous herbs with procumbent to ascending stems. Leaves alternate, usually one-sided, oblong-obovate or ovate; stipules small and membranous. Cymes terminal congested, capitate-corymbose. Flowers pentamerous, white. Sepals 5, free,  $\pm$  carinate, obtuse with membranous white margins, persistent. Petals 5, free, inserted on inconspicuously perigynous disc, white, entire. Stamens 5, free, antisepalous,  $\pm$  hypogynous, anthers linear-bblong. Ovary 3 (-4)-carpelled, syncarpous, ovoid-trigonus 3-4-loculed below, multiovulate; styles 3 (-4), free from the base, recurved, stigmatic on the inner side. Fruit a trigonus-pyramidal, beaked, incompletely 3 (-4)-chambered capsule, dehiscing loculicidally up to base by 3-4-valves. Seeds rounded-reniform to subglobose or sphaeroidal, embryo annular.

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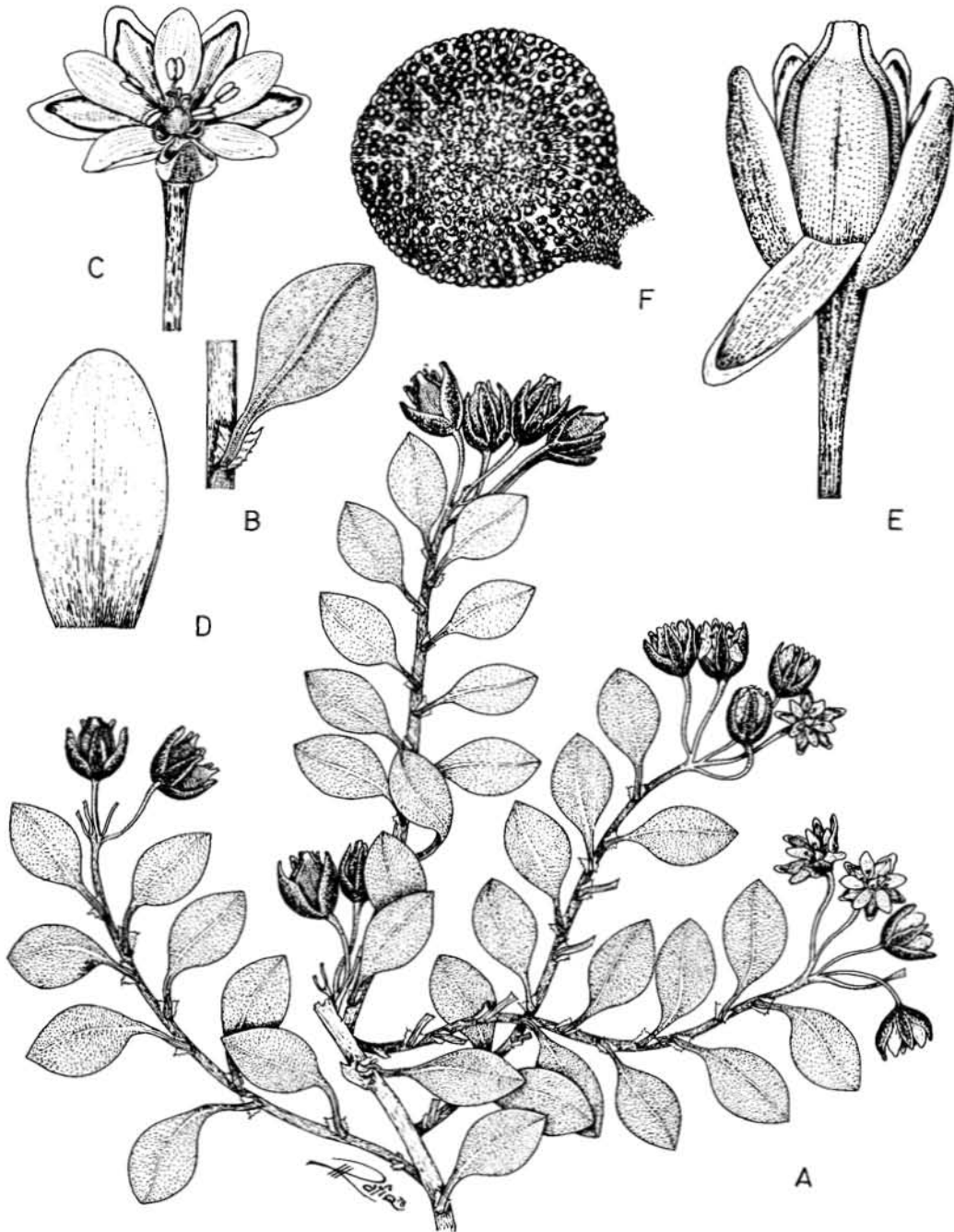


Fig. 2 *Telephium sphaerospermum*: A, Flowering and fruiting shoots x 2.5; B, A leaf with stipules x 5; C, Flower x 5; D, Petal x 20; E, Fruit with persistent sepals x 7.5; F, Seed x 50.



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A genus of c. 6 species, 5 distributed in the Mediterranean region and 1 confined to Madagascar; represented by the following species in Libya.

The affinities of this genus in the *Centrospermae* are obscure. Following Bentham and Hooker, Hutchinson (*Evolution & Phylogeny Fl. Pl.* 530, 1969) and Meikle (*Fl. Cyp.* 1: 686, 1977) have placed it in Molluginaceae and Aizoaceae respectively. Davis (*Fl. Turk.* 2: 97, 1967) treated it in Caryophyllaceae, as it possesses capsular, many-seeded fruits though its affinities with the genus *Carrigiola* of *Illecebraceae* are also impressive.

**Telephium sphaerospermum** Boiss., *Diagn. Pl. Nov. Ser.* 1, 10: 12, 1849; *Fl. Orient.* 1: 754, 1867; Durand & Barratte, *l.c.* 316; Pamp., *Prodr. Fl. Ciren.* 191, 1931; Quezel & Santa, *Nouv. Fl. Alger.* 1: 320, 1962; Maire, *Fl. Afr. Nord.* 9: 128, fig. 46, 1963; Keith, *l.c.* 952, (Fig. 2).

*T. exiganum* Batt. in *Bull. Soc. Bot. France* 54: 146, 1907; *T. barbeyanum* Bornm. in *Mitt. Thur. Bot. Ver. N.F.* 22: 39, 1907; Pamp., *l.c.* 191.

Annual, up to 25 cm tall, glabrous-glaucous, much branched, basally  $\pm$  woody herb. Stem with prostrate, cylindrical, glabrous to  $\pm$  papillate shoots, spreading to c. 10-15 cm. Leaves shortly petioled, elliptic-obovate, 5-10 x 3-4 mm, attenuate at the base, acute,  $\pm$  papillose; stipules scarious, white, c. 1.5 mm long, serrate. Cymes terminal, uniparous, corymbose. Flowers c. 8 mm across, white, pedicel 4-5 mm long; bracts similar to stipules. Sepals 5, oblong, 3-4 mm long, keeled, obtuse and  $\pm$  cucullate at the apex, membranous margined, persistent. Petals 5, ovate-oblong, as long as sepals, obtuse. Stamens 5, shorter than petals, filaments dilated at the base, anthers ovoid, yellow. Ovary glabrous, ovoid-triangular; styles 3, less than 1 mm long. Capsule brown, 3-angled, ellipsoid-ovoid, c. 4-5 x 2.5 mm, 15-30-seeded. Seeds brown, sphaerical, c. 0.75 mm in diameter, not compressed, papillate.

Type: « Habitat in desertis Aegyptiaco-Arabicis ».

A-7 Wadi Derna, 20.1.1967, *L. Boulos* 1275.

Distribution: N. Africa (Libya, Egypt), Arabia Petraea.

*Fl.* June-October

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### 3.SPERGULA

L., Sp. Pl. 440. 1753; Gen. Pl. ed. 5: 199. 1754.

Herbs with numerous, ascending or decumbent branches from the base. Leaves opposite decussate or pseudoverticillate (due to short leafy lateral branches borne on both sides), linear, entire, obtuse; stipules not united to surround the node, free lateral, scarious. Inflorescence terminal, cymes dichasial, lax. Flowers bisexual, pentamous, pedicellate. Sepals 5, free, scarious on margins. Petals 5, free, white, entire. Stamens 5-10, free, inserted on a perigynous disc. Ovary 5-carpelled, syncarpous, unilocular; styles 5, rarely 3, free, alternating with sepals. Fruit an ovoid to subglobose, 1-loculed capsule, dehiscing at apex by as many deep valves as styles. Seeds lenticular, black, sharply keeled or winged.

A genus of c. 5 species, distributed in temperate regions; represented in Libya by the following species.

***Spergula fallax*** (Lowe) Krause in Sturm, Deutschl. Fl. ed. 2. 5: 19. 1901; Andrews, Fl. Pl. Anglo-Egypt. Sudan 1: 90. 1950.(Fig. 3)

*Spergularia fallax* Lowe in Hook., Kew Journ. Bot. Misc. 8: 289. 1856;  
*Spergula flaccida* (Roxb.) Aschers., Verh. Bot. Ver. Prov. Brandenb. 30: 311. 1889 (*nom. illegit*); Durand & Barratte, Fl. Lib. Prodr. 40. 1910; Pamp., Prodr. Fl. Ciren. 193. 1931; Maire, l.c. 94; Keith, l.c. 925; *Arenaria flaccida* Roxb., Hort. Beng. 34. 1814; Fl. Indica 2: 447. 1832, non Clairv. (1811); *S. pentandra* L. var. *intermedia* Boiss., Diagn. ser. 2, 1: 93. 1853; *S. pentandra* L. ssp. *flaccida* (Roxb.) Jafri, Fl. Kar. 124. 1966.

Annual, glabrous-glaucous, up to 25 cm tall herb, with ascending shoots. Leaves opposite to pseudo-verticillate (due to development of very short lateral shoots on one side), linear-filiform, 10-25 mm long, not grooved below; stipules ovate-triangular, c. 1 mm long, acute. Flowers in a paniced cyme, c. 5 mm across, white; pedicels filiform, up to 1.5 mm long; bracts c. 1 mm long. Sepals ovate-oblong, 3-4 mm long, narrowly membranous margined,  $\pm$  glabrous. Petals ovate-lanceolate, slightly shorter than sepals, obtuse or  $\pm$  acute. Stamens 10, rarely fewer, shorter than petals, anthers yellow. Ovary ovoid-subglobose, glabrous; style 3, a little recurved. Capsule ovoid-subglobose, 4-5 x 3.5-4 mm, 3-valved. Seeds winged, lenticular, c. 1 mm in diam (Excl. wing), black, wing nearly as broad as seed, tubercular or smooth.

Type: « In maritimis Maderae, Portus Sancti, Insulaeque Desertae Septentrionalis et

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Fig. 3 *Spargula fallax*: A, Flowering and fruiting branch x 1; B, Flower x 5; C, Petals x 15; D, Dehiscent fruit within persistent sepals x 8; E, Seed x 15.

## CARYOPHYLLACEAE

Australis ».

**A-3** Sharshara, near Tarhuna, fls. pinkish white, *A. Ghafoor* 30; **B-4** Jufra Project, c. 8 km from the road (c. 28 km from Weshka) near water, 26.3.1975, *S.I.Ali* 2401.

Distribution: N. Africa, eastwards to Afghanistan, India and Pakistan.

*Fl.* January-April.

### 4. SPERGULARIA

(Pers.) J. & C. Presl. Fl. Cech. 94. 1819 (nom. cons.).

*Arenaria* L. sect. *Spergularia* Pers., Syn. Pl. 1: 504. 1805.

Herbs, mostly halophytic, diffusely branched, with erect, decumbent or procumbent,  $\pm$  flattened stem. Leaves opposite decussate, or pseudo-fasciculate (due to short leafy lateral branches but borne only on one side), linear, usually fleshy; stipules united to surround the node, interpetiolar,  $\pm$  triangular, pale-scarious. Cymes terminal, dichasial, lax. Flowers bisexual, pentamerous, pedicellate, bracteate. Sepals 5, free, green with membranous margins. Petals 5, rarely absent, free, white or pink, entire. Stamens (1-) 2-5-10, free, inserted on a perigynous disc. Ovary unilocular, multi-ovulate; styles 3, free or partly united at the base. Fruit a subglobose-ovoid, 1-chambered capsule dehiscing almost to base by 3 valves. Seeds ovoid, spherical or pyriform, often scarious winged; testa smooth, rugose or variously tuberculate.

A genus of c. 40 species, distributed throughout the world; 5 species are recorded from Libya.

1. + Perennial with thick woody rootstock. Sepals mostly exceeding 4 mm in length. Capsule 7-9 (-11) mm long. Seeds all winged 1. *S. media*  
-- Annual (rarely perennating). Sepals mostly not exceeding 4 mm in length. Capsule up to 6 mm long. Seeds either all wingless or winged and wingless seeds in the same fruit 2
2. + Stipules on young shoots united for c. 0.5 their length with opposite ones to form a sheath. Seeds light brown, winged and wingless in the

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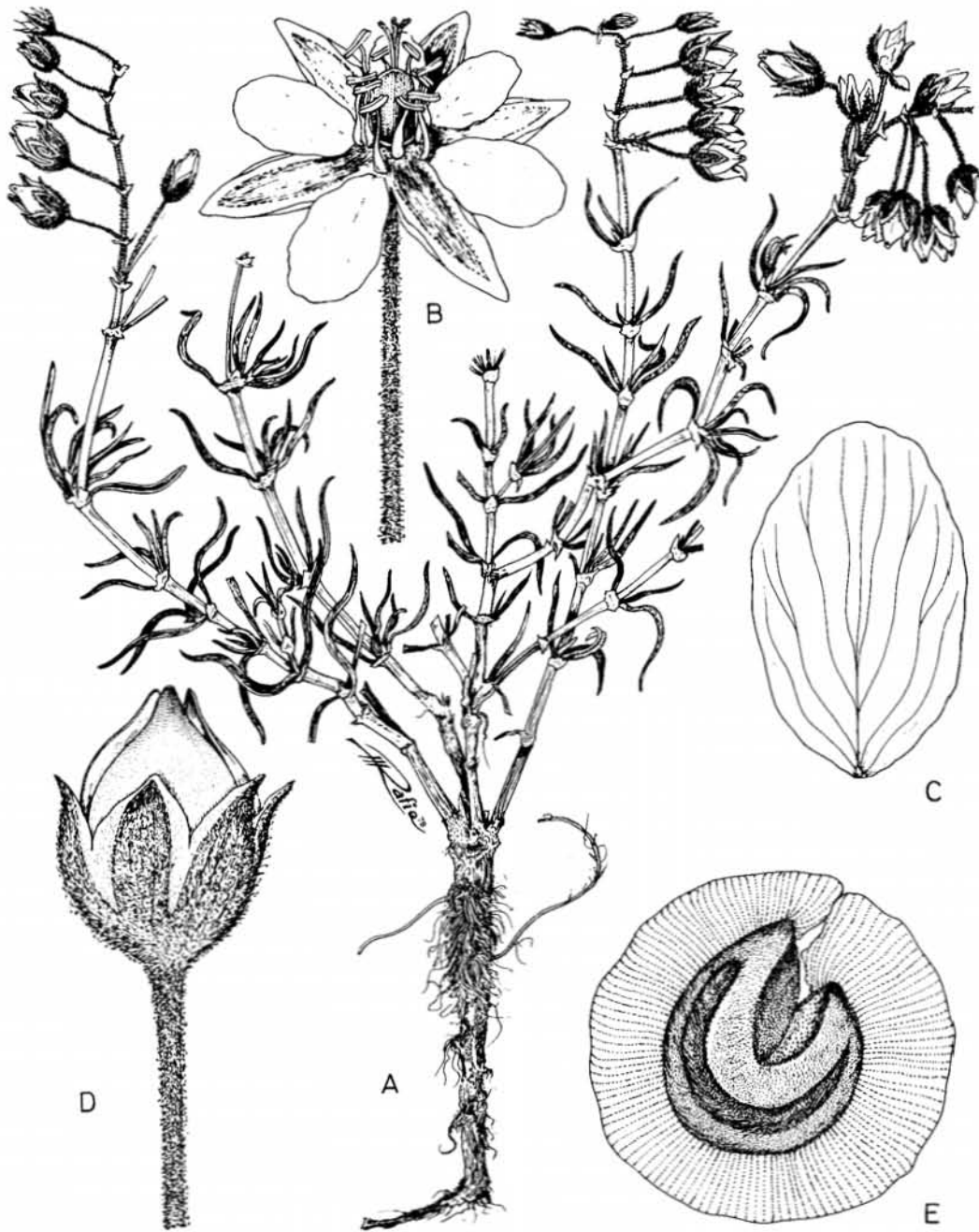


Fig. 4 *Spargularia media*: A. Habit x 1; B. Flower x 5; C. Petal x 10; D. Fruit with persistent sepals x 5; E. Seed x 50.

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- |   |  |
|---|--|
| <p style="text-align: center;">same capsule</p> <p>-- Stipules on young shoots united for considerably less than half their length. Seeds dark brown to black or greyish brown, all wingless</p>                  | <p><b>2. <i>S. marina</i></b></p> <p style="text-align: center;">3</p> |
| <p>3. + Stipules c. 2.5 mm long. Inflorescence leafy. Stamens usually 10. Capsule 4-5 mm long</p> <p>-- Stipules c. 1.5 mm long. Inflorescence not leafy. Stamens 2-5 (-8). Capsule less than 4 mm long</p>       | <p><b>3. <i>S. rubra</i></b></p> <p style="text-align: center;">4</p>  |
| <p>4. + Cymes dichasial. Stamens 2-3. Capsules subglobose to globose. Seeds dark brown to black</p> <p>-- Cymes dichasial, later becoming uniparous helicoid. Stamens 5-8. Capsule ovoid. Seeds greyish-brown</p> | <p><b>5. <i>S. diandra</i></b></p> <p><b>4. <i>S. bocconii</i></b></p> |
| <p>1. <b><i>Spergularia media</i></b> (L.) C. Presl, Fl. Sic. 161.1826; Rattes in Davis, Fl. Turk. 2: 93. 1967. (Fig. 4).</p>   |  |

*Arenaria media* L., Sp. Pl. ed. 2: 606. 1762; *A. marginata* DC. Fl. Fr. 5: 793. 1815; *S. marginata* (DC.) Kittel, Taschenb., ed. 2: 1003. 1844; *S. marginata* (DC.) Murbeck, Contr. Fl. Tunis 1: 45. 1897; Maire, Fl. Afr. Nord 9: 105, fig. 39. 1962; *S. munbyana* Pomel, Nouv. Mat. 203. 1874; Pamp., Pl. Trip. 85. 1914; Fl. Ciren. 195. 1931; *Spergula battandieri* Durand & Barratte, Fl. Lib. Prodr. 42. 1910. (*nom. nud.*)

Perennial, diffusely branched, up to 40 cm tall herb, with woody rootstock and  $\pm$  glandular hairy younger parts. Leaves sessile, linear, 15-40 x 1-1.5 mm, fleshy, rarely  $\pm$  fascicled, mucronate; stipules triangular-ovate, 2-3 x c. 1.5 mm, connate on young shoots for more than half their length, acute, white scarious. Inflorescence terminal, lax, non-leafy dichasial cyme. Flowers c. 8 mm in diameter, white or pink; pedicel much longer than sepals and fruit, up to 1.5 cm long, glabrous or glandular; bracts similar to stipules. Sepals oblong-ovate, 4-6 x 1.5-2.5 mm, obtuse with broad membranous margins, glabrous or glandular hairy. Petals narrowly obovate, (4-) 5-7 x c. 1.5 mm, obtuse, pink or white. Stamens rarely less than 10, filaments dilated at the base, 3-4 mm long; anthers yellow, oblong, c.

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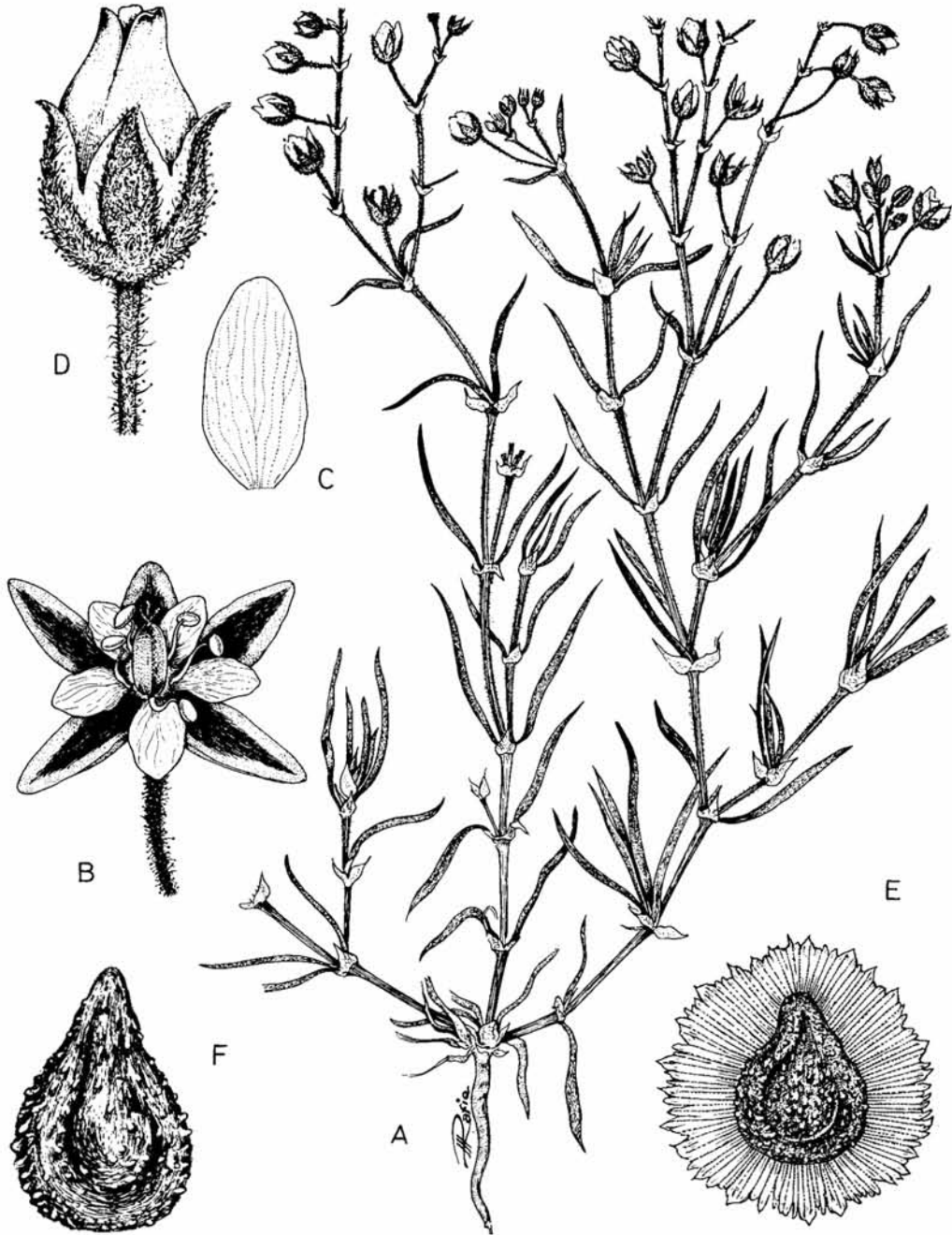


Fig. 5 *Spargularia marina*: A, Habit x 1; B, Flower x 5; C, Petal x 10; D, Fruit with sepals x 7.5; E, winged seed x 25; F, seed without wing x 50.

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1.25 mm long. Ovary ovoid-oblong, c. 2 mm long, glabrous; styles 3,  $\pm$  united below. Capsule ovoid-oblong, conical, 7-9 (-11) mm long, glabrous, yellowish. Seeds brown, compressed, rounded, smooth or tubercled, c. 0.8-1 mm in diameter, mostly all winged, wings membranous, entire or  $\pm$  laciniate.

Type: Described from Europe, Herb. Linn. 585/23 (LINN).

**A-3** Sarshara, c. 5 km from Tarhuna, fleshy perennial, c. 20 cm tall, fls. pinkish-white, 14.11.1976, A. Ghaffoor & S.A. Alavi 30.

Distribution: Europe, Russia, China, S.W. Asia and N. Africa.

Fl. Aug.-Dec.

2. **Spergularia marina** (L.) Gariseb., Spicil. Fl. Rumel. et Bith. 1: 213. 1843; Meikle, Fl. Cyp. 276. 1977. (Fig. 5).

*Arenaria rubra* L. var. *marina* L., Sp. Pl. 423. 1753; *A. marina* (L.) All., Fl. Ped. 2: 114. 1785; *Spergula satina* J. & C. Presl. Fl. Cechica 95. 1819; Pamp., Prodr. Fl. Ciren. 194. 1931; *S. salina* (Presl.) Dietr. Syn. Pl. 2: 1598. 1840; Maire, Fl. Afr. Nord. 9: 109. 1962; Keith, l.c. 928; *Spergularia heterosperma* Lebel, Mem. Soc. Sc. Nat. Cherbourg 14:45. 1869; Pamp., Pl. Trip. 84. 1914; Keith, l.c.

Annual to rarely perennial, prostrate to suberect, up to 35 cm tall, glandular to glabrescent herb with diffuse branches from  $\pm$  woody tap root and slightly fleshy stock. Leaves sessile, 10-30 x 1 mm, fleshy, rarely  $\pm$  fascicled, mucronate; stipules interpetiolar, 2.5-3.5 mm long, obtuse and  $\pm$  bifid at apex, united to about half their length with opposite one to form a sheath. Inflorescence terminal, many-flowered  $\pm$  congested to lax dichasial cymes becoming monochasial. Flowers c. 3-4 mm long, c. 6 mm across, pink, rarely white; pedicel 5-6 (-7) mm long, glabrous or glandular hairy; bracts similar to stipules. Sepals oblong-elliptic, 3-4 (-5) mm long, obtuse with membranous margins. Petals elliptic-oblong, shorter than sepals, 2-3 x c. 1 mm, pink above, white near the base. Stamens (1-) 4-5 (-8), filament dilated towards the base, white; anthers oblong, c. 0.5 mm long, yellow. Ovary oblong, c. 1.5 mm long; styles 3, united at the base. Capsule conical-oblong, (3-) 4-6 mm long, usually longer than sepals, yellowish. Seeds light brown, compressed, rounded, smooth or tubercled, c. 0.6-0.8 mm in diameter, wingless or winged, both in the same fruit, wings scarious, erose to laciniate.



CARYOPHYLLACEAE



Fig. 6 *Spargularia rubra*: A, Habit x 2.5; B, Flower x 15; C, Petal x 25; D, Fruit within sepals x 15; E, Seed x 60.

## CARYOPHYLLACEAE

Type: Described from Europe Herb. Cliff. (BM).

**A-3** Near Endir Clinic, Tripoli, 12.3.1977, *A. Ghafoor* 281; Bu Ghilan, 24.1.1970, *M. M. Khalifa* s.n.; Leptis Magna, 5 km after El-Khoms, 1.5.1974, *A.M. Abdelrazig* 466; **A-4** Twarga, saline flat, 18.4.1975, *S. I. Ali* 2920; **A-7** Wadi Lathrun, Gebel Akhdar, c. midway along the coastal road between Derna and Susa, ditch near the sea, 19.1.1967, *L. Boulos* 1218; **B-1** Valleys stretch, 90 km before Nalut and 40 km before Teiji, 6.12.1976, *Fathi B. Ratib* 129; **D-3** Cultivated Fields near Askadda, c. 18 km before Brack (c. 110 km from highway), *S. I. Ali* 1410.

Distribution: Europe, N. Africa, eastwards to India, Pakistan, China and Russia.

Common along seashores and in brackish marshy ground.

Fl. Dec.-June.

3. ***Spergularia rubra*** (L.) J. & C. Presl, Fl. Cechica 94. 1819; Maire, Fl. Afr. Nord. 9: 119. 1963 (Excl. ssp. *atheniensis*). (Fig. 6)

*Arenaria rubra* L., Sp. Pl. 423. 1753; *S. campestris* (L.) Aschers. in Bot. Zeit. 17: 292. 1859; *A. rubra* L. var. *campestris* L., l.c. 423.

Annual to sometimes perennating, erect to procumbent, up to 25 cm tall, glandular hairy to glabrescent herb with diffuse branching. Leaves narrowly linear, 10-40 x 1-2 mm, not fleshy, glandular-hairy to glabrous, mucronate; stipules interpetiolar, silvery scarious, ovate-acuminate, c. 2.5 mm long,  $\pm$  lacerate or bifid at the tip. Inflorescence terminal, dichasial, more or less leafy, lax or dense cyme. Flowers pink, c. 4 mm across; pedicel longer than sepals, glandular hairy; bracts leafy. Sepals oblong or ovate-oblong, 3-4 (-5) mm long, obtuse, with membranous margins, glandulose outside. Petals ovate-obovate, as long as or slightly shorter than sepals. Stamens (5-) 10, filaments shorter than petals, anthers yellow. Ovary ovoid-subglobose, somewhat stiped; styles 3, free. Capsule conical-oblong, 4-5 mm long, greenish-yellow, usually not exceeding the sepals. Seeds obovate-triangular or  $\pm$  trigonous, c. 0.5 mm long, all wingless, dark brown or black, finely tuberculate.

Type: Described from Europe, Herb. Linn. 585/20 (LINN)

**A-2** Telleel beach, c. 10 km from Sabrata, rocky slopes, 12.6.1976, *S.M.H. Jafri* 6684; **A-7** Ras el Hilal, limestone rocks and boulders (Alatroon), fls. pink, erect, c. 5-10

## CARYOPHYLLACEAE

cm, 19.6.1972, *S.I.Ali* 695.

Distribution: Mainly Mediterranean and Euro-Siberian, N. America; introduced in Australia and elsewhere.

Used in Medicine.

*Fl.* Feb.-July.

4. ***Spergularia bocconii*** (Scheele) Asch. & Graebn., *Syn. Mittel-Europ. Fl.* 5(1): 849. 1919; Corti, *Fl. Veg. Fez.* 99. 1940; Meikle, *Fl. Cyprus* 1: 275. 1977

*Alsine bocconii* Scheele in *Fl.* 26: 431. 1843; *S. atheniensis* Ascherson & Schweinf., *Beitr. Fl. Aethiop.* 267. et 307. 1867; Durand & Barratte, *l.c.* 41; Pamp., *Prodr. Fl. Ciren.* 194. 1931; Keith, *l.c.* 926; *S. rubra* var. *atheniensis* Heldr. & Sart., *Herb. Graec. Norm.* no. 590. 1856; *S. rubra* ssp. *atheniensis* (Heldr. et Sart.) Rouy, *Fl. Sr.* 310. 1896; Maire, *l.c.* 9: 122. 1963.

Annual, up to 25 cm tall, much branched,  $\pm$  glabrous towards base, with densely glandular hairy shoots. Leaves opposite, not fasciculate, linear, 10-30 x c. 1 mm, mucronate; stipules triangular, c. 1.5 mm long, acute. Inflorescence many-flowered, dichasial; elongated later and becoming helicoid uniparous cyme. Flowers pink or pinkish, c. 3 mm across; pedicel subequal to sepals; bracts similar to stipules but minute. Sepals oblong, 2-3.5 mm long, glandular-hairy. Petals shorter to equalling the sepals. Stamens 5-8, dilated towards the base, anthers yellow. Capsule ovoid, 2-3.5 mm long. Seeds triangular-ovate, c. 0.5 mm long, all wingless, greyish-brown, finely tubercled.

Type: Corsica, Calvi, 1825, *Soleirol*.

Reported from Cyrenaica (Benghazi, Scleidima, Derna) and Tripolitania (Kussabat, Tarhuna) by Corti (*l.c.*), Maire (*l.c.*) and Keith (*l.c.*).

Distribution: S. Europe, North Africa, eastwards to Iran.

*Fl.* April-July.

5. ***Spergularia diandra*** (Guss.) Helder and Sart., *Hb. Graec. Norm.* no. 492.

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Fig. 7 *Spargularia diandra*: A, Habit x 1.5; B, Inflorescence x 1.5; C, Flower x 7.5; D, Petal x 12.5; E, Fruit within sepals x 7.5; F, Seed x 60.

## CARYOPHYLLACEAE

1855; Boiss., Fl. Orient. 1: 733. 1867; Pamp., Pl. Trip. 84. 1914; Prodr. Fl. Ciren. 194. 1931; P. Monnier in Quezel & Santa, l.c. 324; Keith, l.c. 926.(Fig. 7)

*Arenaria diandra* Guss., Fl. Sic. Prodr. 1: 515. 1827; *Spergula diandra* (Guss.) Murbeck, Contr. Pl. Tun. 1: 44. 1897; Durand & Barratte, l.c. 41; Maire, l.c. 114. fig. 41; *Spergularia salsuginea* Fenzl in Ledeb., Fl. Ross. 2: 166. 1844-46.

Annual or sometimes biennial, prostrate to erect, up to 15 cm tall, glandular hairy all over or glabrescent at the base, dichotomously branched herb. Leaves opposite or rarely sub-fasciculate, linear-oblong, 1-25 x 0.5-1.5 mm, not or slightly fleshy, mucronate; stipules triangular-ovate, c. 1.5 mm long, acute, dull white. Inflorescence much branched, lax, dichasial, leafless cymes. Flowers c. 2-3 mm long, pink or pinkish-white; pedicel filiform, glandular hairy, usually longer to much long in fruit. Sepals oblong-elliptic, 2-3 mm long, obtuse, margins membranous. Petals ovate-elliptic, slightly shorter than sepals, obtuse. Stamens 2 or 3, filaments dilated towards the base, anthers yellow. Ovary subglobose. Capsule subglobose-globose, as long as to  $\pm$  longer than the sepals, 3-valved, valves eventually purplish-black. Seeds triangular-obovate, c. 0.5 mm long, all wingless, dark brown to black, beset with rigid bristly papillae or rugulose.

Type: Sicily: « In argillosis inundatis martimis, Girgenti Sciacca, Marina di Menfrici, Comiso a S. Lorenzo » *Gussone* (FI, NAP).

**A-2** Sabrata Ruins, stony & sandy ground, 12.6.1976, *S.M.H.Jafri* 6709<sup>n</sup>; Azizia, weed of cultivated fields, 12.3.1970, *I.I. Chaudhari* s.n.; Gharian Youth Hostel compound, 12.4.1974, *S.I.Ali* 2088; Rumia (limestone hills), 15 km from Yefren, 9.4.1974, *S. I. Ali* 1849; **A-3** Near Endir Clinic, Tripoli, prostrate herb with sand adhering glands, fls. pinkish-white, *A. Ghafoor* 282; Leptis Magna, c. 5-10 cm, 29.3.1975, *S.I.Ali* 2576; **A-6** Qaminis-Benghazi road, 9.3.1968, *L. Boulos* 1980; **A-7** 19-25 km S.E. Derna, 13.3.1968, *L. Boulos* 2309; Labrag, c. 15 km from Lamluda, stony roadside, 13.6.1972, *S.I.Ali* 744; **A-8** Libya C: Timini to Omm Rezem, 5-50 mm, sandy wadis (flooded last autumn), annual 30 March 1970, *Davis* 50262; **B-2** c. 24 km from Mezda, *S.I.Ali* 1981; **B-2** Gebel Nefousa, 108 km S.E. of Giado, 700 m, plain of Loess by barley field, prostrate, annual, 15 March, 1970, *Davis* 49587; **B-4** Salt Marsh near Al-Kararim, 8.3.1968, *L. Boulos* 1923.

Distribution: Mediterranean region, Russia, Iraq, Iran, Pakistan and India.

## CARYOPHYLLACEAE

Common along sandy or rocky seashores or in the premaritime zones as a weed in gardens and cultivated field or along roadsides.

Fl. Feb.-June.

### 5. POLYCARPON

Loefl. ex Linn., Syst. Nat. ed. 10. 881. 1759.

Small herbs, glabrous or hairy with dichotomously branched stems. Leaves opposite or apparently whorled, oblong or obovate-orbicular; stipules scarious. Inflorescence terminal, many-flowered congested cymes. Flowers small, pentamerous, bracts scarious. Sepals 5, free, green, keeled with membranous margins, often hooded at the apex. Petals 5, hyaline, obovate-oblong, shorter than sepals, entire or generally emarginate. Stamens 3-5,  $\pm$  united into a ring at the base. Ovary 3-carpelled, syncarpous, unilocular, multiovulate; styles 3, shortly united, with 3 elongated stigmas. Fruit a capsule, dehiscing almost to the base into 3 spirally twisting tubular valves. Seeds ovoid, compressed.

A cosmopolitan genus of c. 16 species; represented in Libya by 2 species.

- |   |                           |
|---|---------------------------|
| + Leaves obovate to spatulate. Petals emarginate                      | 1. <b>P. tetraphyllum</b> |
| -- Leaves oblong-lanceolate or oblanceolate.<br>Petals not emarginate | 2. <b>P. prostratum</b>   |

1. **Polycarpon tetraphyllum** (L.) L., Syst. Nat. ed. 10, 1: 881. 1759; Durand & Barratte, Fl. Lib. Prodr. 42. 1910; Pamp., Pl. Trip. 76. 1914; Prodr. Fl. Ciren. 186. 1931; Quezel & Santa, Nouv. Fl. Alger. 1: 320. 1962; Maire, Fl. Afr. Nord 9: 67. 1963; Keith, Prelim. Check List Lib. Fl. 786. 1965 (Fig. 8).

*Mollugo tetraphyllum* L., Sp. Pl. 89. 1753; *Illecebrum alsinifolium* L., Mant. 1: 51. 1767; *P. alsinifolium* (L.) DC., Prodr. 3: 376. 1828.

Annual rarely perennating herb, up to 15 (-20) cm tall, glabrous, much branched with ascending or prostrate-procumbent shoots. Leaves shortly petioled, opposite or usually in whorls of 4, obovate to spatulate, 8-15 x 4-7 mm, glabrous, obtuse; stipules ovate, 2.5-3 x 1.5-2 mm, acuminate-acute. Inflorescence many-flowered, lax or dense, terminal, dichasial cymes. Flowers small, c. 4 mm across, greenish-white; pedicel c. 2-3 mm long; bracts scarious, ovate-lanceolate,

CARYOPHYLLACEAE

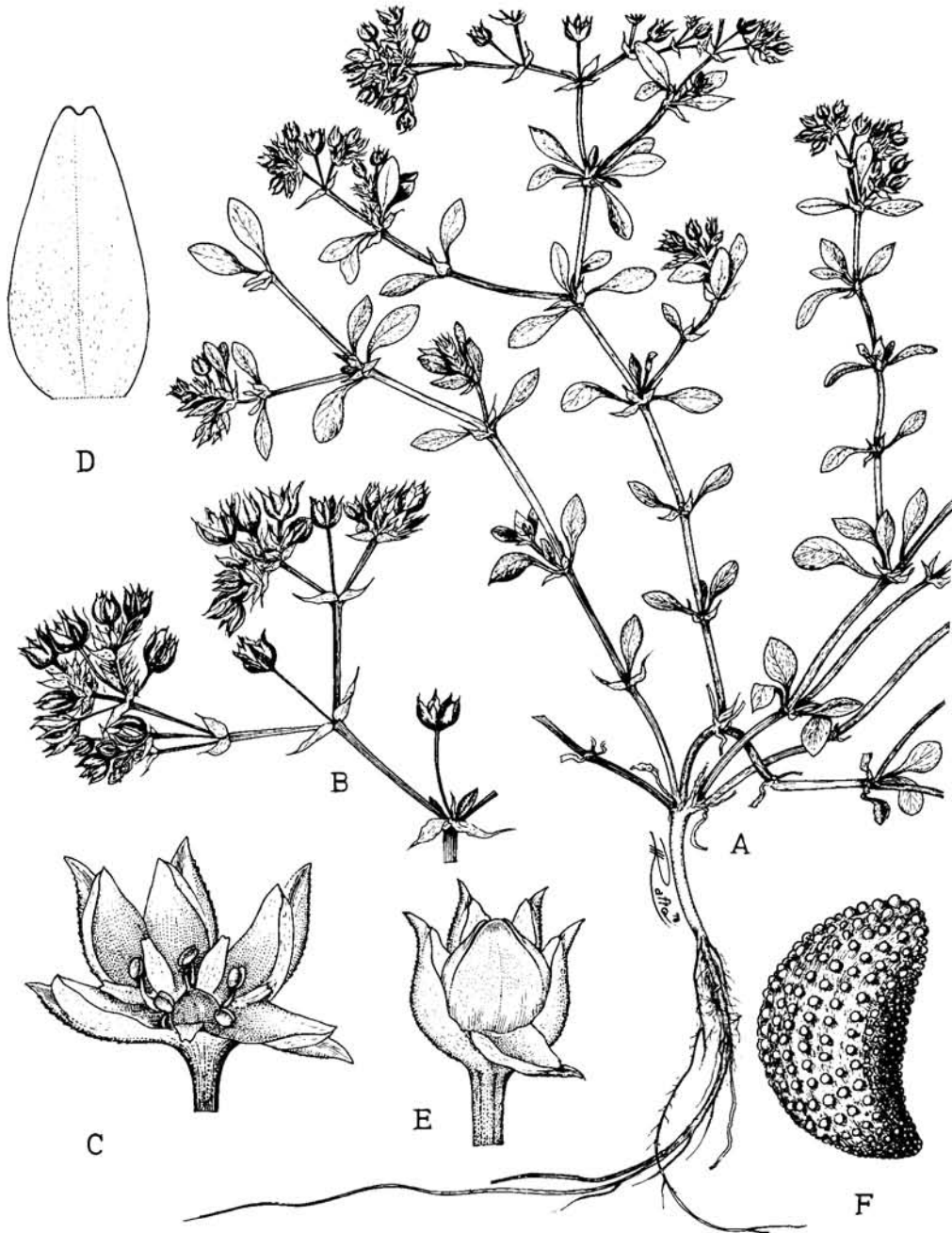


Fig. 8 **Polycarpon tetraphyllum**: A, Habit x 1; B, flowering shoot x 3; C, Flower x 15; D, Petals x 40; E, Fruit with sepals x 15; F, Seed x 50.

## CARYOPHYLLACEAE

acuminate. Sepals almost free, ovate-lanceolate, 1.5-2.3 (-2.5) mm long, mucronate, green with membranous margins. Petals oblong, shorter than sepals, emarginate, white. Stamens (1-) 3-5, filaments filiform, anthers whitish-yellow, less than 0.25 mm long. Ovary ovoid; styles c. 0.5 mm. Capsule subglobose, c. 1.2 mm in diameter, thin walled. Seeds  $\pm$  triangular-ovoid, brown, usually c. 0.5 mm long, punctulate or smooth.

Type: Described from Italy and Narbonne (France).

**A-3** Tripoli, University Campus, Hadaba Sharqia-Campus, along the street, under shade, fairly common, *S.M.H.Jafri* 6636 and 6644; Behind Science Faculty, in front of Hospital, 15.2.1976. *S.M.H.Jafri* 6299; Tripoli, lawn weed in house in Hadaba Khizra, 11.6.1972, *S.I.Ali*, 439; Faculty of Agriculture Farms, University Campus, soil sandy, 1.4.1977, *A. Ghafoor* 288; Shara Ben Aashoor, plant purplish tinged, 11.8.1977, *A. Ghafoor* 301; **A-7** Wadi Derna, 20.1.1967, *L. Boulos* 1298; 19-25 km S.E.Derna, 13.3.1968, *L. Boulos* 2320.

Distribution: Europe, North Africa, W. Asia, Russia (Georgia), Northern Iran, Arabia and Sudan.

A very common weed in gardens and sandy waste lands especially after winter rains in coastal areas in Libya and elsewhere.

A very variable species requiring experimental investigations to justify the status of its various infraspecific taxa, which have often been recognized on the basis of branching pattern, colour of stem and leaves, sepal length, number of stamens and the size of seeds etc.

*Fl.*: Feb.-July. *Vern.*: Bou Degega

2. ***Polycarpon prostratum*** (Forsk.) Aschers. & Schweinf. in Oesterr. Bot. Zeitschr. 39: 128. 1889; Andrews, Fl. Pl. Anglo-Egypt. Sudan 1: 89. 1950; Turrit in Turrit & Milne-Redhead, Fl. E. Trop. Afr. (Caryophyllaceae) 5. 1956 (Fig. 9).

*Alsine prostrata* Forsk., Fl. Aegypt.-Arab. 207. 1775; *Pharmaceum depressum* L., Mant. 2: 562. 1771; *Polycarpon depressum* (L.) Rohrb. in



CARYOPHYLLACEAE

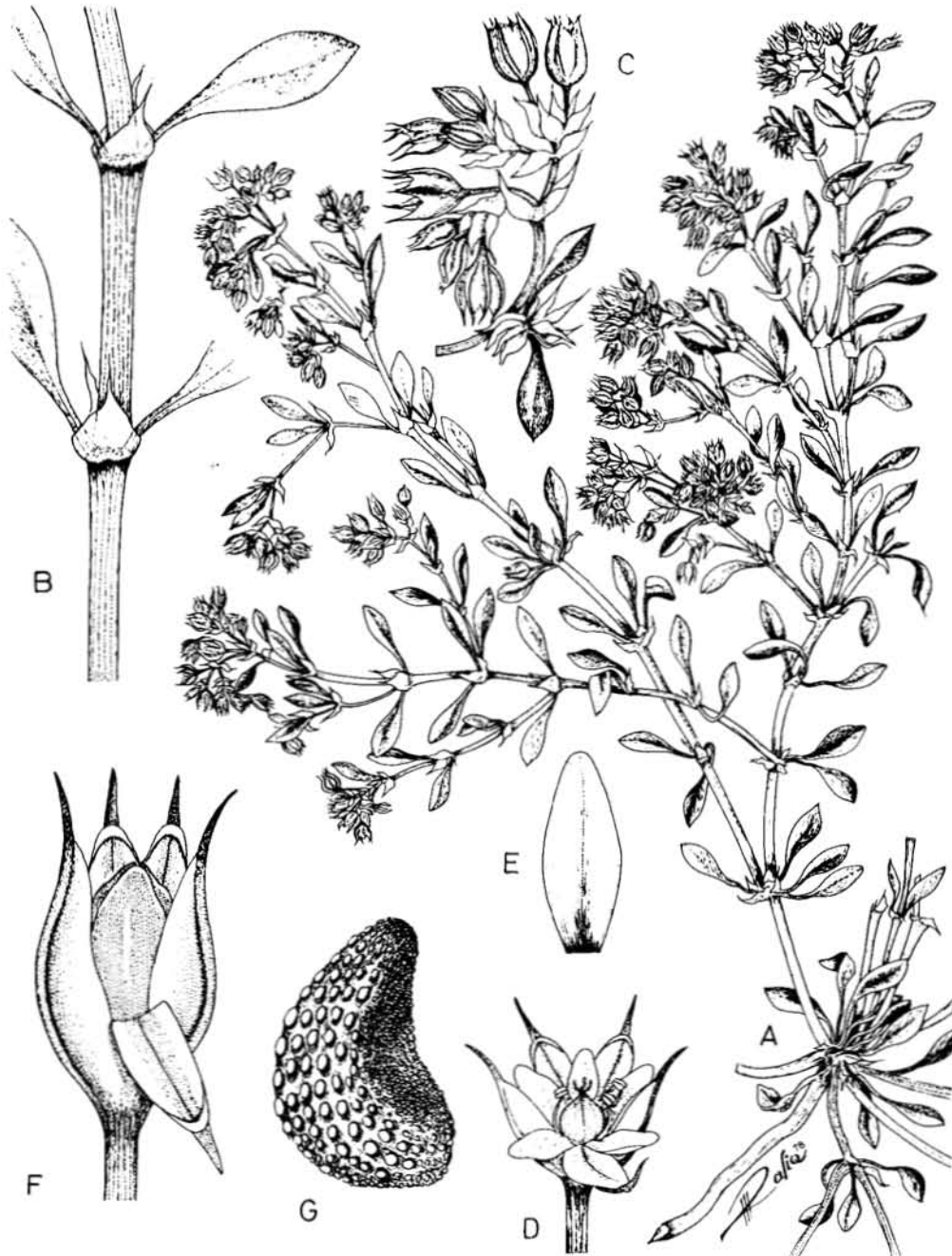


Fig. 9 *Polycarpon prostratum*: A, Habit x 1.5; B, Part of shoot showing stipules x 5; C, Inflorescence x 4; D, Flower x 7.5; E, Petal x 15; F, Fruit with calyx x 15; G, Seed x 50.

## CARYOPHYLLACEAE

Mart., Fl. Bras. 14 (2): 257. t. 59. 1872, *nom. illegit.*; *P. loeflingii* (Wight & Arn.) Benth. in Benth. & Hook. f., Gen. Pl. 1: 153. 1862 - *nom. illegit.*

Annual, much branched, prostrate to suberect, up to 5 cm tall herb; branches  $\pm$  hairy, glabrescent or almost glabrous. Leaves subsessile to almost sessile, opposite or subverticillate, linear-oblongate, 2-25 x 2-5 mm, glabrous, acute; stipules lanceolate or narrowly ovate, c. 2.5 mm long, acuminate. Inflorescence usually terminal, lax or dense, many-flowered dichasial cymes. Flowers c. 3.5 mm across, greenish-white, sessile or with 2-5 mm long pedicels; bracts scarious, lanceolate, c. 2 mm long, acuminate. Sepals lanceolate, (2-) 2.5-3 (-4) mm long, median part green, margins transparent membranous. Petals 5 (-3) or rarely absent, shorter than sepals, not emarginate, thin and translucent. Stamens 3-5, filaments slightly shorter than petals; anthers whitish-yellow, c. 0.25 mm long. Capsule subglobose, c. 1.2 mm in diameter, thin walled. Seeds  $\pm$  triangular-reniform, light brown, nearly 0.5 mm long.

Holotype: Egypt, near Cairo, *Forskal* (C).

**A-3** Leptis Magna, 5.3.1968, *L. Boulos* 1875; **A-3** Tripoli, barley fields facing faculty of Science, Sidi El-Masri, in sandy soil, 18.4.1967, *L. Boulos* 1673; Faculty of Agriculture Farms, University Campus, 1.4.1977, *A. Ghaffoor* 290; **A-4** Qaminis-Benghazi Road, 9.3.1968, *L. Boulos* 1996; **A-6** Deriana, c. 40 km from Benghazi, c. 0.5 km from sea, near cultivated field, saline flat, limestone, soil dark brown, 16.6.1972, *S.I.Ali* 488; **A-7** Wadi Mahbool, coastal road from Baida to Derna, 1.3.1973, *S.I.Ali* 1121; Gebel Akhdar, El-Karsa, coastal road, Derna-Ras el-Hilal, 11.3.1968, *L. Boulos* 2146; c. 5 km from Susa on way to Shahat, 20.6.1972, *S.I.Ali* 789; Shahat, roadside among stones, 18.6.1972, *S.I.Ali* 622; Martuba, waste land, 21.6.1972, *S.I.Ali* 853; Wadi Derna, 14.3.1968, *L. Boulos* 2382; Apollonia (Marsa Susa) nr. sea level, among ruins, annual, flowers white, 27 March, 1970, *P. H. Davis* 50131; Below ruins of Cyrene (Shahat) 500-600 m, rocky limestone gully dominated by phrygana, annual, prostrate, on bare earth, 26 March 1970, *P.H. Davis* 50035; **A-8** Omm Rezum, S.E.Derna, 13.3.1968, *L. Boulos* 2345.

Distribution: Tropical and subtropical countries of both the hemispheres.

A very common species in sandy wadis and other damp places in Libya. It has been recorded here for the first time.

*Fl.* Almost throughout the year.

CARYOPHYLLACEAE

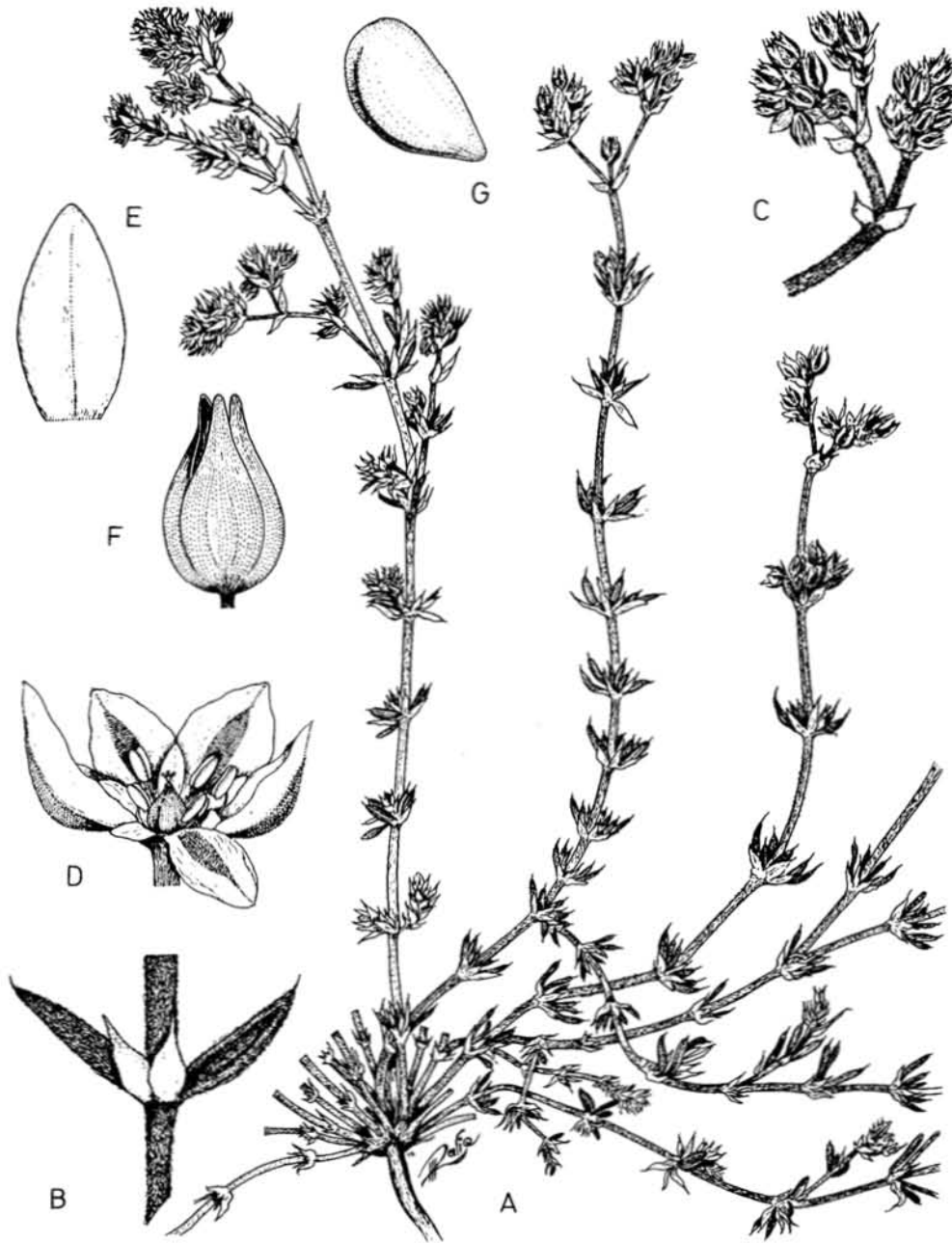


Fig. 10 *Polycarpaea repens*: A, Habit x 1.5; B, Internode showing stipules x 4; C, Flowering shoot x 2.5; D, Flower x 15; E, Petals x 20; F, Fruit x 15; G, Seed x 25.

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### 6. POLYCARPAEA

Lam. in Journ. Hist. Nat. Par. 2: 3. t. 25. 1792 (nom. cons.).

Herbs, usually woody at the base, with erect or ascending, much branched stems. Leaves  $\pm$  rigid, opposite or pseudowhorled, linear or oblanceolate to rarely ovate, acute; stipules scarious. Cymes terminal, many-flowered, loose or dense paniculate. Flowers 5-merous, hypogynous or subperigynous; bracts entirely membranous. Sepals 5, free, scarious, white, brown or rosy to purple, rarely green with membranous margins, not keeled, acute. Petals 5, lanceolate, entire or denticulate, much shorter than sepals. Stamens 5, antisepalous, free, inserted on disc. Ovary 3-carpelled, syncarpous, unilocular, few to many-ovuled; style 3, united, stigmas 3, shortly elongated or capitate. Fruit a 3-valved capsule. Seeds obovoid, laterally  $\pm$  compressed.

A genus of c. 50 species, mainly distributed in tropical and subtropical parts of Africa and Asia and a few in America; represented in Libya by the following species.

*Polycarpaea repens* (Forsk.) Asch. & Schweinf. in Oestr. Bot. Zeitschr. 39: 126. 1889; Corti, Fl. Veg. Fezzan 101. 1942; Ozenda, Fl. Sah. 210. 1958; Quezel & Santa, Nouv. Fl. Alg. 1: 321. 1962; Maire, Fl. Afr. Nord. 9: 78. fig. 27. 1963; Keith, l.c. 786 (Fig. 10)

*Corrigiola repens* Forsk., Fl. Aeg.-Arab. 207. 1775; *P. fragilis* Del., Ill. Fl. Egypt. 209. 241, tab. 24. fig. 1. 1813; Pamp., Pl. Trip. 76. 1914; Prodr. Fl. Ciren. 187 1931.

Perennial,  $\pm$  villous, spreading to suberect, up to 25 cm tall, dichotomously branched shrublet. Leaves sessile, opposite to pseudovercillate, linear-oblong to lanceolate, 6-12 x 1-2 mm, attenuate at the base, revolute on margins, mucronate at the apex, glabrescent; stipules scarious white, ovate-lanceolate to lanceolate, 3-4 x c. 1.5-2 mm long, acuminate, glabrous. Inflorescence dense, paniced dichasial cymes. Flowers whitish, c. 5 mm across; bracts similar to stipules, mucronate to aristate, smaller than flowers. Sepals 5, broadly ovate, c. 2 x 1.5 mm, median part green with broad membranous white margins, acuminate. Petals 5, lanceolate, c. half as long as sepals, white. Stamens 5, filaments filiform, slightly shorter than and alternate with petals; anthers ovoid-oblong, c. 0.5 mm long. Ovary ovoid, glabrous; style 3-lobed with capitate stigmas. Capsule ovoid-conical, yellowish-brown, c. 1.5 mm long, enclosed by persistent sepals. Seeds obovoid-oblong, less than 1 mm long, slightly compressed.

CARYOPHYLLACEAE

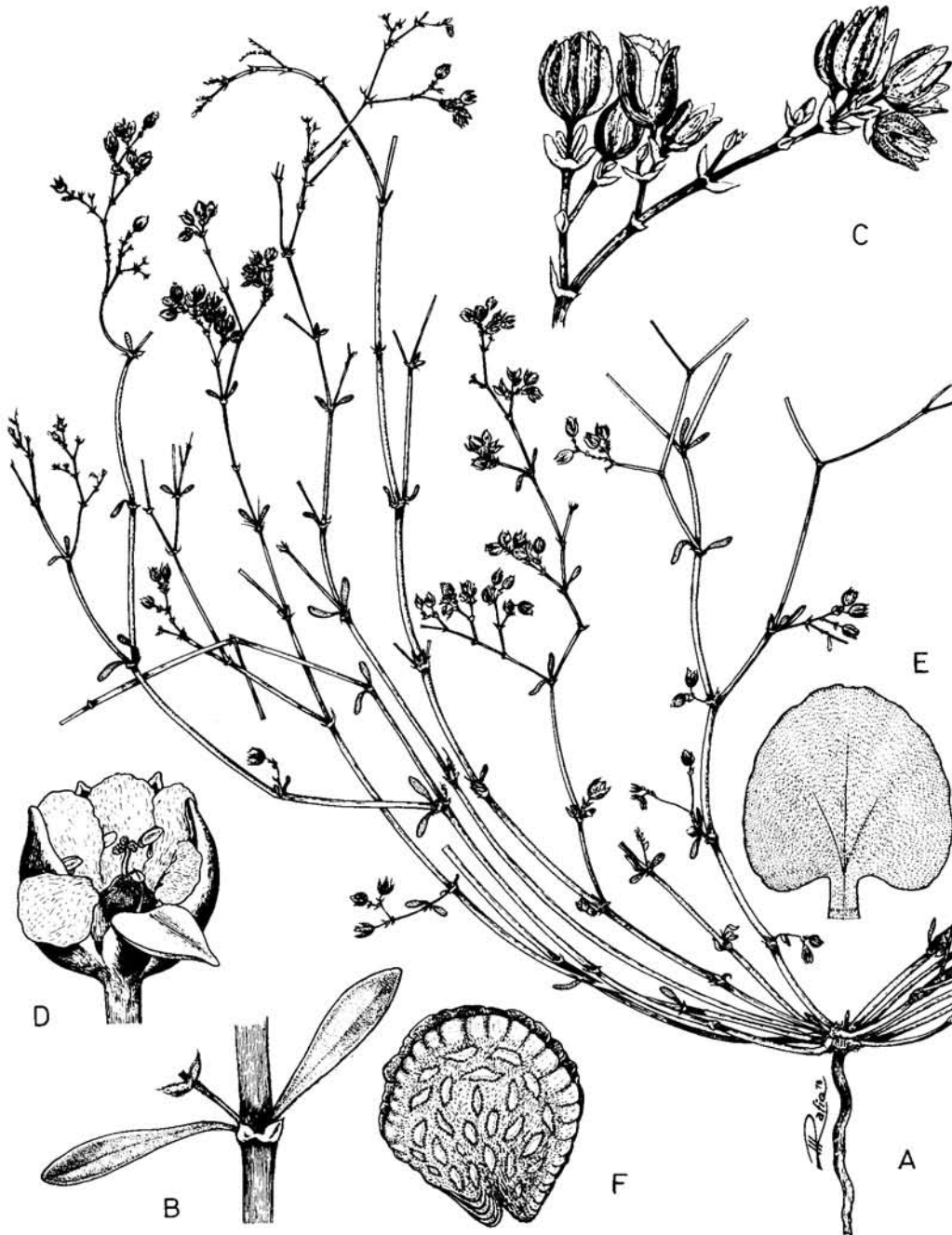


Fig. 11 **Robbairea delileana**: A, Habit x 1; B, Internode with stipules x 5; C, Flowering shoot x 5; D, Flower x 10; E, Petals x 15; F, Seed x 40.

## CARYOPHYLLACEAE

Type: Described from Egypt.

Libya, without locality and name of collector s.n.

Also reported by Pampanini (l.c.), Corti (l.c.) & Maire (l.c.) from Syrtique Orientale (Cyrenaica) and Entre Bou-Hdjeim & Djebel Soda, Beni Oulid and Bir Tininai & Chemak (Tripolitania). Keith (l.c.) has reported it from Brak, Wadi Zigza and other places.

Distribution: N. Africa and Sudan eastwards to Pakistan.

Reported to be common in Sirte and Gebel Soda.

*Fl.* February-June     *Vern.* Somfya

### 7. ROBBAIREA

Boiss., *Fl. Orient.* 1: 735. 1867.

Prostrate, glabrous herbs with opposite or pseudoverticillate, stipulate leaves. Cymes lax. Flowers 5-merous, subhypogynous; bracts with a thick green midrib. Sepals 5, united at the base, with narrow membranous margins. Petals 5, free, clawed. Stamens 5, united at the base into a  $\pm$  perigynous ring, anthers dithecous, yellow. Ovary tricarpellate, syncarpous, unilocular, many-ovuled; styles united below, 3-fid, stigmas 3. Fruit a 3-valved capsule. Seeds convex with a dorsal groove, cuneate, incurved.

A genus of 2 species distributed in N. Africa and W. Asia; known by 1 species in Libya.

**Robbairea delileana** Milne-Redhead, *Kew Bull.* 1948; 452. 1949; Andrews, *Fl. Anglo-Egypt. Sudan* 1: 89. 1950 (Fig. 11).

*R. prostrata* (Delile) Boiss., *Fl. Orient.* 1: 735. 1867 - *nom. conf.*; *Alsine prostrata* Delile, *Descr. Egypt, Hist. Nat.* 2: 212. t. 24. fig. 3. 1813 - *nom. illeg.*, non Forsk., (1775); *Polycarpaea prostrata* (Delile) Decne, *Fl. Sinaica* 262. 1835 (*nom. illeg.*); Maire, *Fl. Afr. Nord* 9: 80. fig. 28. 1963 (*nom. conf.*); *P. confusa* Maire in *Bull. Soc. Hist. Nat. Afr. Nord.* 39: 129. 1949; Quezel & Santa, *Nouv. Fl. Alger.* 1: 321. 1962.

Annual, rarely perennial; prostrate, glabrous herb, with thin, filiform

## CARYOPHYLLACEAE

dichotomously branched, up to 25 (-30) cm long shoots from the  $\pm$  woody base. Leaves sessile, narrowly oblong to linear-oblongate, 5-10 (-15) x 1-1.5 (-2) mm, entire, acute; stipules triangular-ovate, c. 1 mm long, membranous, acute, glabrous. Flowers small, in loose dichasial cymes, whitish-pink, c. 2.5 mm across, shortly pedicellate; bracts triangular-ovate, c. 2 mm long, midrib green, broadly membranous margined, glabrous. Sepals ovate, 2-2.5 x c. 1 mm, the inner 3 longer than the outer 2, narrowly membranous margined. Petals as long as or longer than the sepals, limb  $\pm$  orbiculate, cordate, obtuse. Stamens c. 2/3 of petal length, anthers yellow, c. 0.5 mm long. Ovary ovoid-subglobose. Capsule ovoid, c. 2 mm long, yellowish, enveloped by persistent sepals and petals. Seeds minute, smooth, shiny.

Type: Described from Egypt, *Delile*.

**D-4** c, 240 km from Sebha, along highway, dry flat with loam on top, prostrate, fls. pink, 31.3.1973, *S.I.Ali* 1428; **A-2** Gebel Nafousa, 108 km S.E. of Giadu, 700 m, plain of loess by barley field, annual, prostrate, flowers pale-pink, 16 March 1970, *P.H.Davis* 49590; Near Jadoo, Hilly area, c. 15 km from Shakshook on way to Jadoo, *A. Ghafoor & S.A.Alavi* 200; **E-1** Wadi Ighigi, c. 70 km from Ghat towards Algerian border, 19.2.1977, *M.A.Siddiqi* 109.

Distribution: N. Africa, Palestine, Arabia and Sudan.

A species of arid regions of Gebel Nafousa, Fezzan and Ghat.

*Fl.* January-April

### 8. SAGINA

L., *Sp. Pl.* 128. 1753; *Gen. Pl.* ed. 5: 62. 1754.

Tufted or caespitose herbs, with procumbent stems. Leaves exstipulate, opposite, linear or subulate,  $\pm$  connate at the base. Inflorescence terminal, few-flowered cymes or flowers solitary. Flowers small, 4-5-merous. Sepals 4-5, free, larger than petals. Petals as many as and alternating with sepals, white, often minute, occasionally absent, entire. Stamens 4-5 or 10 in 2 whorls, free, antisepalous. Ovary 4-5-carpelled, unilocular, multiovulate; styles 4-5, antipetalous. Fruit a capsule dehiscent almost to the base into 4-5 valves. Seeds minute, reniform, not winged.

## CARYOPHYLLACEAE

A small genus of c. 25 species, distributed in North temperate regions, S.E. and N. African mountains, Andes, New Guineae and Himalayas.

- |  |                       |
|--|-----------------------|
| + Leaves and outer sepals mucronate        | 1. <i>S. apetala</i>  |
| -- Leaves and outer sepals never mucronate | 2. <i>S. maritima</i> |

1. *Sagina apetala* Ard. in Animadv. Bot. Spec. Alt. 2: 22. 1764; Pamp., Pl. Trip. 80. 1914; Quezel & Santa, Nouv. Fl. Alger. 1: 328. 1962; Maire, Fl. Afr. Nord 9: 240. 1963; Keith, l.c. 853. (Fig. 12)

*S. ciliata* Fries in Liljeb., Utk. Svensk. Fl. ed. 3. 713. 1816.

Annual, erect, up to 15 cm tall, glabrous to slightly glandular hairy herb. Stem much branched, branches ascending to  $\pm$  prostrate, not rooting near the base, internodes cylindrical, glabrous. Leaves opposite, linear, 5-15 x c. 1.5 mm, vaginate-connate and  $\pm$  ciliate at the base, mucronate at the apex. Flowers solitary, terminal and axillary, tetramerous, c. 4 mm across; pedicel erect, as long as or longer than leaves, filiform, glabrous or glandular in the upper part. Sepals 4, ovate-oblong, 2 x 1 mm,  $\pm$  cucullate at the apex, obtuse, the outer 2 mucronate, very slightly whitish membranous on margins, persistent. Petals 4, white, obovate, c. half as long as sepals, early caducous. Stamens 4, shorter than sepals, with minute yellow anthers. Ovary 4-carpelled, ovoid, slightly stiped, glabrous; styles 4, recurved, stigmatic in the upper part. Capsule ovoid-oblong, membranous, equal to or slightly longer than spreading to adpressed sepals, dehiscent by 4-valves with truncate teeth. Seeds compressed, reniform, less than 0.4 mm long, brown.

Type: Italy (Probably from Padua or its environs but not properly designated), *Arduino*

A-3 Tripoli, coastal area near Endir Clinic, soil sandy, not common, 25.4.1977, A. *Ghafoor* 313; Leptis Magna, 29.3.1975, S. I. *Ali* 2579; A-7 Libya C: Below ruins of Cyrene (Shahat), 500-600 m, rocky limestone gully dominated by phrygana, annual, 26.3.1970, P.H. *Davis* 50001; Omm Rezum, S.E. Derna, 13.3.1968, L. *Boulos* 2342.

Distribution: N. Africa, Europe, S. Asia, and Russia.

Bare sandy soils near the coasts in Libya but seems to be undercollected or not common.



CARYOPHYLLACEAE

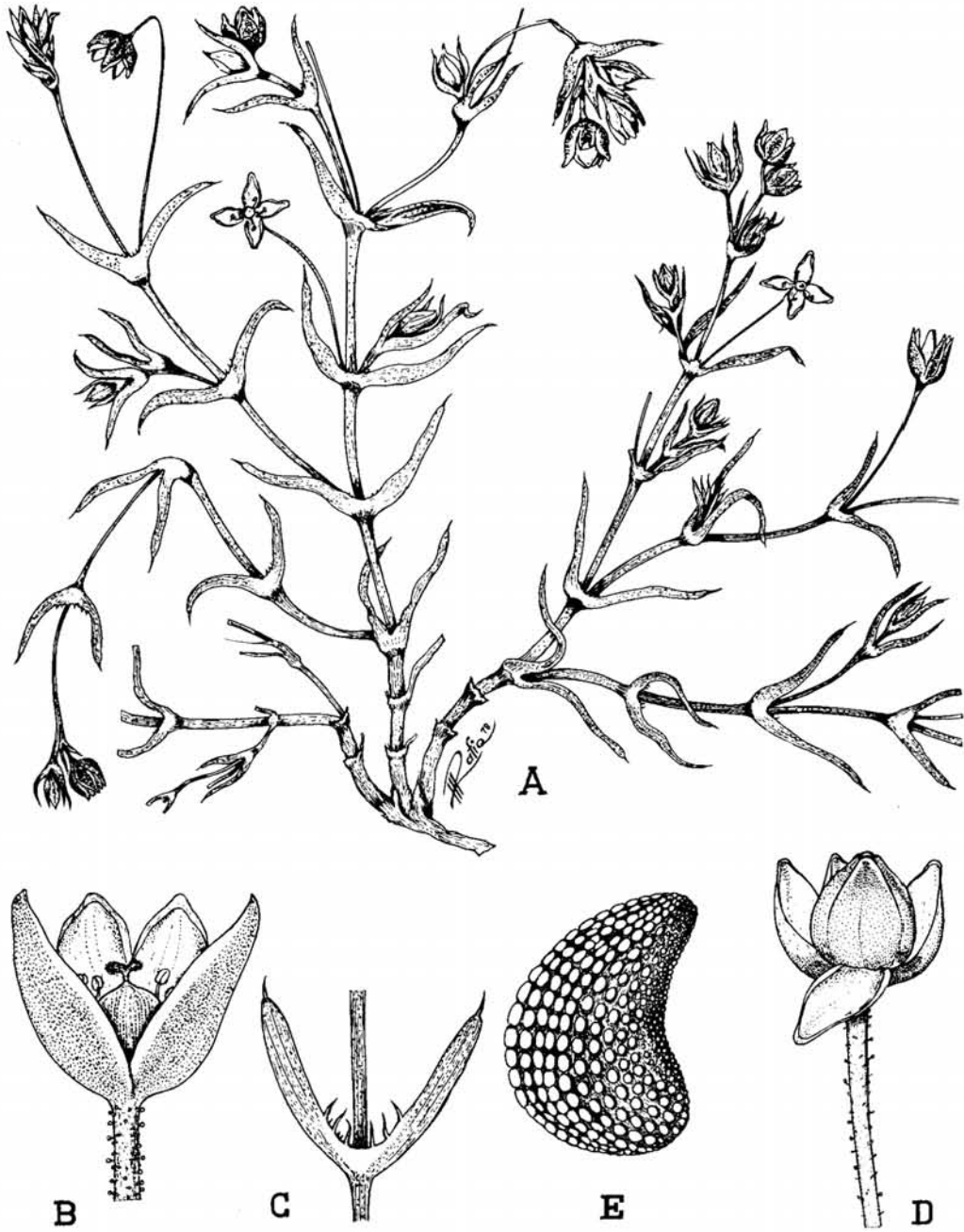


Fig. 12 *Sagina apetala*: A, Habit x 3; B, Flower x 15; C, a leaf pair x 5; D, Fruit with sepals x 7.5; E, Seed x 20.

## CARYOPHYLLACEAE

*Fl.* Jan.-April

2. ***Sagina maritima*** G. Don, *Herb. Brit.*, fasc. 7: 155. 1806; Durand & Barratte, *Fl. Lib. Prodr.* 39.1910; Pamp., *Prodr. Fl. Ciren.* 192. 1931; Maire, *l.c.* 243; Keith, *l.c.* 853 (Fig. 13).

Annual, erect, up to 10 cm tall, glabrous herb. Stem filiform, much branched, branches ascending to erect, not rooted at the nodes, internodes subcylindrical. Leaves opposite, slightly vaginate-connate at the base, linear or linear-lanceolate, 5-10 x c. 1.5 mm, obtuse or acute, not or hardly mucronate, glabrous. Flowers solitary, axillary or terminal, tetramerous. c. 4 mm across; pedicels erect, longer than leaves, glabrous. Sepals 4, ovate, 2 x 1 mm, obtuse,  $\pm$  cucullate, not mucronate, margins generally purplish, persistent. Petals 4 or sometimes absent, much shorter than sepals, white. Stamens 4 with basally dilated filaments and ovoid-subglobose yellowish anthers. Ovary 4-carpelled, ovoid, glabrous; styles 4, recurved, stigmatic in upper part. Capsule ovoid-oblong, membranous, equal to slightly shorter than sepals, dehiscent by 4 valves with truncate teeth. Seeds compressed, reniform to  $\pm$  triangular, c. 0.4 mm long, brown papillose.

Type: Scotland: « on the sea coast not infrequent, in Angus-shire, Isles of Sky, near Aberdeen, Queensferry, and Edinburg *G. Don* (K).

A-7 Roman aqueduct near Labrag, E. of Shahat (Cyrene), 700 m, limestone pavement in Roman cart-tracks, annual, 29.3.1970. *P.H. Davis* 50236.

Distribution: Mediterranean regions, Northern and Western Europe.

*Fl.* Jan.-June.

### 9. CERASTIUM

*L.*, *Sp. Pl.* 437. 1753; *Gen. Pl.* ed. 5. 199. 1754.

Small herbs, mostly glandular hairy or hirsute, basally  $\pm$  woody, rarely undershrubs. Leaves exstipulate, sessile, opposite, obovate-spathulate to oblong, entire. Inflorescence terminal, dichasial cymes. Flowers penta or tetramerous, white. Sepals (4-) 5, free, membranous margined. Petals as many as sepals, free, emarginate or 2-fid to nearly half way down, rarely entire or absent. Stamens mostly 10, rarely 5 or fewer. Ovary (3-4) 5-carpelled, syncarpous, unilocular, multiovulate;

CARYOPHYLLACEAE



Fig. 13 *Sagina maritima*: A. Flowering and fruiting branch x 5; B. Flower x 20; C. Fruit with calyx x 15; D. Seed x 60.

## CARYOPHYLLACEAE

styles (3-4-) 5, free, opposite the sepals, stigmatic internally. Fruit an oblong-cylindrical, somewhat curved, unilocular capsule exceeding the sepals and dehiscent at apex by (6-8-) 10 short teeth. Seeds reniform or sphaeroidal,  $\pm$  compressed, rugose.

A cosmopolitan genus of c. 60 species; represented in Libya by 7 species.

- |   |                         |
|---|-------------------------|
| 1. + Stem and pedicels with deflexed-appressed eglandular hairs. Leaves and sepals long pilose. Capsule teeth minute, (apparently dehiscent by pore)  | 1. <b>C. illyricum</b>  |
| -- Stem, pedicels leaves and sepals not hairy as above. Capsule teeth distinct with flat or revolute margins  | 2                       |
| 2. + Sepals with a tuft of eglandular hairs at and extending beyond the apex. Petals ciliate on both sides near the base  | 2. <b>C. glomeratum</b> |
| -- Sepals without a tuft of hairs at apex and hairs not extending beyond the apex. Petals glabrous at the base  | 3                       |
| 3. + Bracts entirely green, not scarious on margins or at the apices. Pedicels mostly shorter than sepals   | 4                       |
| -- Bracts partly green, with scarious margins and apices or scarious in the upper half, rarely entirely scarious. Pedicels mostly subequal to or slightly longer to much longer than the sepals | 5                       |
| 4. + Sepals 8-12 mm long. Capsule 1.5-2.5 cm long, long exserted with entire or flat teeth  | 3. <b>C. dichotomum</b> |
| -- Sepals 4.5-6 mm long. Capsule 7-8 mm long, slightly exserted, with revolute margined teeth   | 4. <b>C. siculum</b>    |
| 5. + Petals 1.5 to twice as long as sepals  | 5. <b>C. ligusticum</b> |
| -- Petals shorter to slightly longer than the sepals  | 6                       |
| 6. + Bracts with upper half scarious. Petals with   |                         |

CARYOPHYLLACEAE

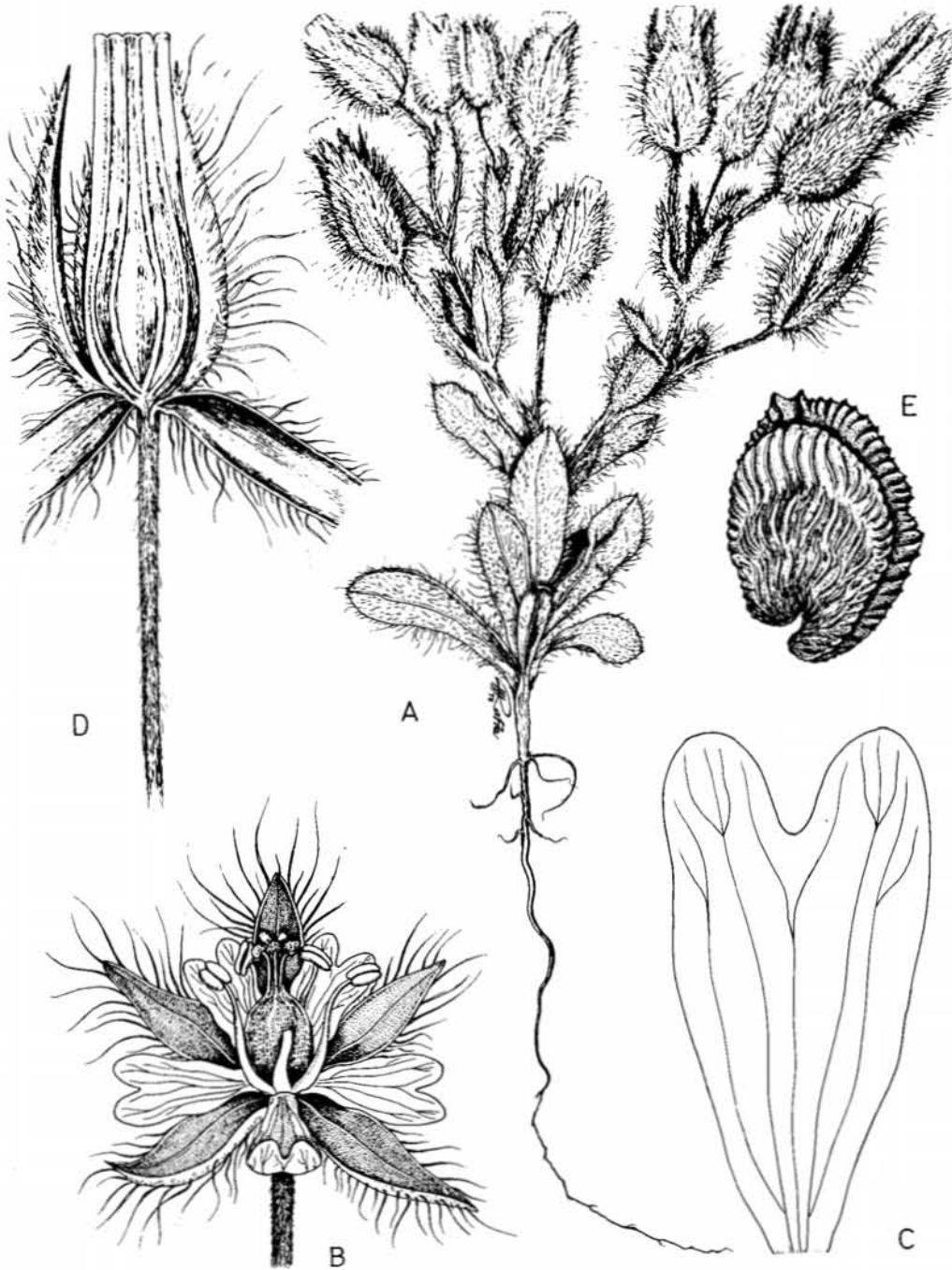


Fig. 14 *Cerastium illyricum*: A, Habit x 3; B, Flower x 7.5; C, Petal x 25; D, Fruit with calyx x 10; E, Seed x 50.

## CARYOPHYLLACEAE

unbranched veins and slightly emarginate to denticulate apex

6. *C. semidecandrum*

-- Bracts with only margins and the apices scarious. Petals with branched veins and apices bifid for c. 1/4 of their length

7. *C. pumilum*

1. *Cerastium illyricum* Ard. in Animadv. Bot. Spec. 2: 26. t. 11. 1763; Post, Fl. Pal. Syria & Sinai ed. 2, 1: 204. 1932. (Fig. 14).

*C. comatum* Desv. in J. Bot. Appl. 3: 228. 1816; Maire, Fl. Afr. Nord. 9: 195. 1963; *C. illyricum* ssp. *comatum* (Desv.) P.D. Sell & Whitehead in Feddes Rept. 69: 15. 1964.

Annual, up to 15 cm tall, dichotomously branched densely eglandular hairy herb. Stem and branches with long, simple, deflexed hairs. Leaves sessile, spatulate or narrowly obovate below, oblong to elliptic-ovate above, 5-14 x 2-5 mm,  $\pm$  vaginate at the base, pilose and  $\pm$  appressed hairy. Flowers in lax, terminal dichasial cymes, white; bracts lanceolate, green; pedicels longer than sepals, elongated up to 2 cm in fruit, with deflexed appressed hairs. Sepals 5, oblong-lanceolate, to lanceolate, 5-7 (-8) mm long, inner ones with scarious margins, acute, pilose, hairs c. 2 mm long. Petals oblong-narrowly obovate, shorter than sepals, emarginate, minutely auricled and glabrous at the base. Stamens 10,  $\pm$  equal to slightly shorter than petals, filaments glabrous, anthers yellow, ovoid. Ovary ovoid-oblong, shortly stiped, glabrous; styles 5, recurved, internally stigmatic. Capsule ovoid-oblong, pale-yellow, 6-8 mm long, usually included or rarely subexserted, dehiscing by apical pore, not or minutely 10-toothed. Seeds obovate, c. 0.5 mm long, light brown, minutely tuberculate.

Type: Described from plants grown from seed sent to Arduino by Seslerio from Dalmatia.

A-7 Shahat (Cyrene) to Faïda, S. of Beida crossroads, 700 m, limestone pasture, annual, 1 April 1970, *P.H. Davis* 50519.

Distribution: S. Europe, W. Asia and North Africa.

*Fl.* March-May

## CARYOPHYLLACEAE

2. **Cerastium glomeratum** Thuill., Fl. Par. ed. 2,266. 1799; Maire, l.c. 210; Meikle, Fl. Cyp. 255. 1977. (Fig. 15)

*C. viscosum* L., Sp. Pl. 437. 1753 (p.p.), *nom. ambig.*; Durand & Barratte, l.c. 40; Pamp., Prodr. Fl. Ciren. 192. 1931; Keith, l.c. 348.

Annual, up to 45 cm tall, usually yellowish glandulose herb, with ascending to erect, sulcate branches. Leaves sessile, oblanceolate to obovate or broadly elliptic to almost orbiculate, 10-25 (-30) x 3-10 mm, attenuate at the base, apex obtuse-apiculate. Flowers in terminal, compact, dichasial clusters, white; bracts green, lanceolate; pedicels c. 3-4 mm long, shorter than to equalling the sepals, patent glandulose. Sepals 5, oblong-lanceolate, (3-) 4-5 mm long, narrowly scarious margined, glandular hairy outside, acute with a tuft of eglandular hairs extending beyond the tip. Petals 5, oblong-oblanceolate to narrowly obovate, as long as sepals to slightly longer or rarely absent, apically 2-fid for up to a quarter of their length, ciliate on both sides near the base. Stamens 10, filaments as long as petals, glabrous, anthers ovoid, yellow. Ovary ovoid, shortly stiped, glabrous; styles 5, stigmatic in upper part. Capsule straw coloured, narrowly cylindrical,  $\pm$  curved above, 8-10 mm long, dehiscent by 10, acute teeth with revolute margins. Seeds subreniform, pale-brown, c. 0.5 mm long, finely tuberculate.

Type: France: Paris, « Se trouv. dans le bois de Boulogne; a Vincennes et ailleurs », Thuillier (G).

A-3 Tripoli, Hadaba Sharqia-University lane, 25.3.1976, *S.M.H.Jafri* 6452; Faculty of Agriculture Fields, Al-Faateh University Campus, common, 1.4.1977, *A. Ghafoor* 298; A-7 near Labrag, Gebel Akhdar, 11.3.1968, *L. Boulos* 2187.

Distribution: Throughout Europe (except N.E.), N. Africa, W. & S.W. Asia, N. & S. America and Australia.

A common weed in cultivated fields and garden lawns.

Fl. Feb.-June

3. **Cerastium dichotomum** L., Sp. Pl. 438. 1753; Pamp., Pl. Trip. 78.1914; Maire, l.c. 230; Keith, l.c. 348.

Annual, erect, up to 20 cm tall, densely viscid-glandulose herb with

CARYOPHYLLACEAE

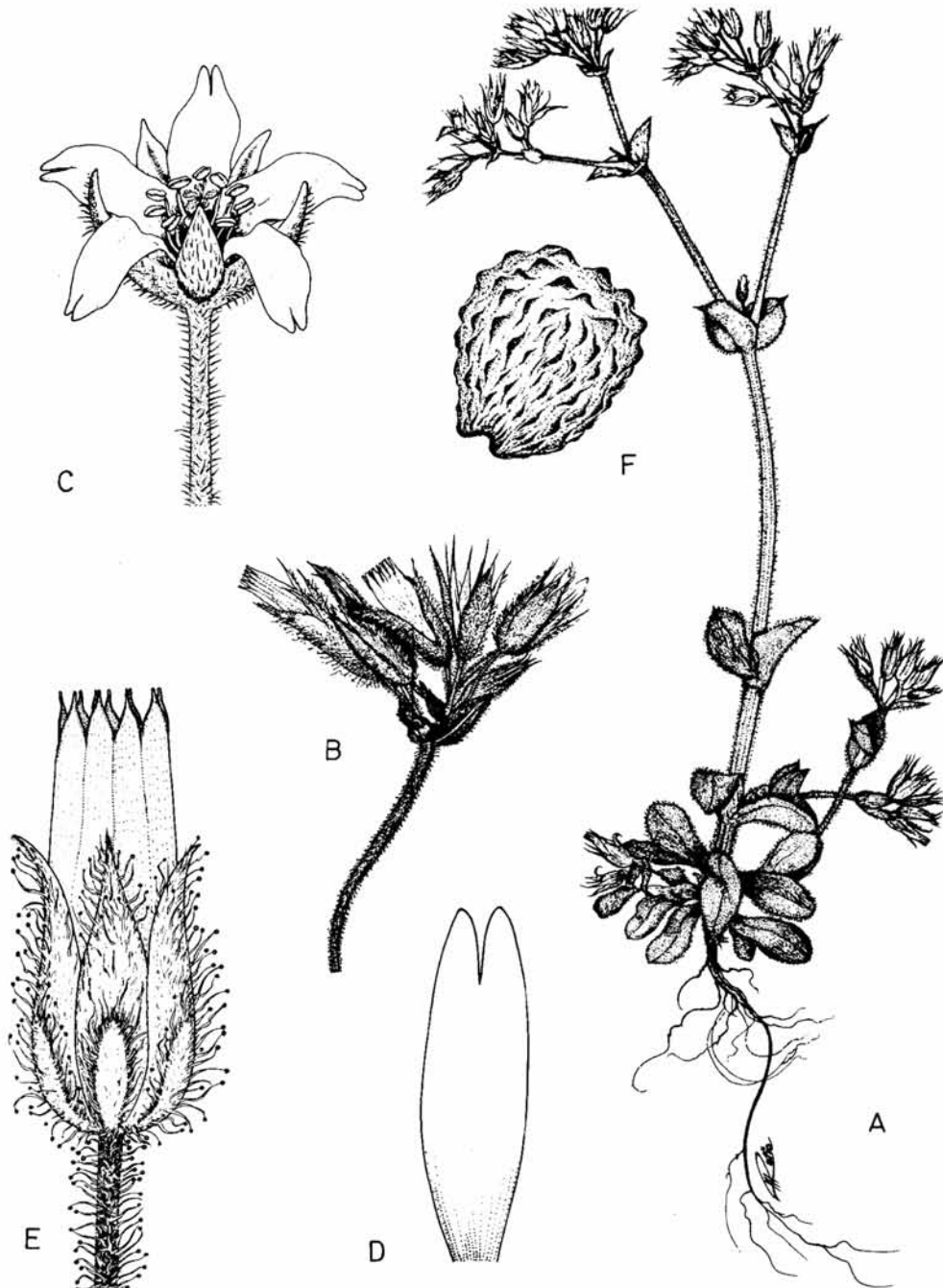


Fig. 15 *Cerastium glomeratum*: A, Habit x 1; B, Flower cluster x 2.5; C, Flower x 7.5; D, Petal x 10; E, Fruit with sepals x 10; F, Seed x 40.



## CARYOPHYLLACEAE

dichotomously and divaricately branched ascending stem. Leaves ovate-oblong to oblanceolate or  $\pm$  linear, up to 25 x 5-6 mm, densely viscid-glandular attenuate at the base,  $\pm$  obtuse. Flowers in lax to dense dichasial cymose clusters; bracts green, without membranous margins; pedicels shorter than the sepals. Sepals 5, oblong-lanceolate, 8-12 mm long, membranous margined, glandular and simple hairy, glabrous at the acute apex. Petals 5, obovate-oblong, 4-7 mm long, 2-fid at the apex to c.  $\frac{1}{4}$  of their length, glabrous. Stamens 5-10, filaments shorter than petals, anthers yellow, ovoid. Ovary oblong, glabrous, styles 5, revolute, stigmatic on inner side. Capsule pale-yellow, oblong-cylindrical, 1.5-2.5 cm long, membranous, dehiscent by 10, short,  $\pm$  obtuse, flat teeth. Seeds  $\pm$  obovate, c. 1 mm long, reddish-brown, tuberculate.

Type: Described from Spain, Herb. Linn. 603/1 (LINN).

Reported from Gharian and Yefren mountains by Maire (l.c.) and Keith (l.c.).

Distribution: S. Europe, N. Africa and S.W. Asia.

Fl. April-June

4. **Cerastium siculum** Guss., Suppl. Fl. Sic. Prodr. 137. 1832; Pamp., Pl. Trip. 79. 1914; Maire, l.c. 225. fig. 84; Keith, l.c. 348.

*C. aggregatum* Dur. ex Brignoli in Flora 23: 123. 1840; *C. pumilum* ssp. *siculum* (Guss.) Maire in J. & M., Cat. Maroc. 197. 1932.

Annual, erect to ascending, up to 12 cm tall herb, with minute glandular and sparsely eglandular simple hairs on stem. Leaves oblanceolate (basal) or ovate-lanceolate to broadly elliptical (cauline), 5-15 x 2-7 mm, hairy, obtuse or acute. Flowers in terminal, dense dichasial clusters; bracts green, glabrous above; pedicels shorter than the sepals, hairy. Sepals 5, oblong or oblong-lanceolate, 4.5-6 mm long, glandular and simple hairy outside, hairs not surpassing the scarious acute apex. Petals oblong, shorter than sepals, 2-fid at the apex to c.  $\frac{1}{4}$  of their length. Stamens 10, rarely less, filaments shorter than petals, filiform; anthers yellow, ovoid. Ovary ovoid-oblong, glabrous; styles 5, arcuate-divergent. Capsule

## CARYOPHYLLACEAE

pale-yellow, conical-cylindrical, 7-8 mm long, exerted, dehiscing by 10, apical, revolute margined teeth. Seeds rounded-reniform, 0.4-0.5 mm long, pale-brown, finely tubercled.

Type: Described from Sicily.

Reported by Maire (l.c.) from Khoms and Garian, with reference of Pampanini (l.c.); Keith has also reported it from Kussabat, Tarhuna and Gharian.

Distribution: S.W. Europe, N. Africa (Libya).

*Fl.* March-April

5. ***Cerastium ligusticum*** Viv., *Elenc. Pl. Hort. Bot.* 15.1802; Pamp., *Prodr. Fl. Ciren.* 192. 1931; Keith, l.c. 348

*C. campanulatum* Viv. in *Annali Bot.* 1: 171. 1804; Keith, l.c. 347.

Annual, erect, up to 30 cm tall herb. Stem with fine glandular hairs and few, simple eglandular hairs, branches ascending, articulate. Leaves subspathulate and shortly petioled (basal) or elliptical-oblong and subvaginate (cauline), 12-27 x 6-8 mm, obtuse-apiculate, hairy. Flowers many in lax dichasial cymes, c. 10 mm across, white; bracts lanceolate, green or scarious at most  $\frac{1}{4}$  of their length and margins; pedicels much exceeding the sepals, deflexed in fruit. Sepals 5, ovate-lanceolate, 3-8 mm long, scarious margined, obtuse, densely glandular hairy outside, with or without a bunch of simple eglandular hairs usually not at the apex. Petals 5, obovate, one and half to twice as long as sepals, 2-fid at the apex to c. 33% of their length, glabrous. Stamens 5-10, as long as sepals, filaments glabrous; anthers ovate-oblong, c. 1 mm long, yellow. Ovary ovoid, glabrous, subsessile; styles 5, filiform, divergent. Capsule straw coloured, slightly longer than sepals, dehiscing by 10 apical, revolute margined teeth. Seeds ovoid-reniform, c. 0.5-0.9 mm long, brown, sharply and minutely tuberculate.

Type: Not designated

Reported from Tripoli and Benghazi by Pampanini (l.c.), Maire (l.c.), and Keith (l.c.). It is probably cultivated in gardens in the littoral zone. The collections cited by the above authors are perhaps escapes.

## CARYOPHYLLACEAE

Distribution: S. Europe, Asia minor and N. Africa (Libya, Algeria).

*Fl.* March-May.

6. **Cerastium semidecandrum** L., Sp. Pl. 438. 1753; Durand & Barratte, l.c. 40; Pamp., Pl. Trip 69. 1914; Maire, l.c. 216 (Excl. ssp. *glutinosum*); Keith, l.c. 348.

*C. pentandrum* L., Sp. Pl. 438. 1753; Pamp., Pl. Trip. 98. 1914; Maire, l.c. 219. - p.p.; *C. dentatum* Moschel in Oest. Bot. Zeitschr. 82: 230. 1935; Keith, l.c. 348; *C. fallax* Guss., Fl. Sic. Prodr. Suppl. 1: 139. 1832; *C. balearicum* Hermann, Verh. Bot. Ver. Prov. Brand. 54: 247. 1913.

Annual, procumbent to erect, up to 30 cm tall, pale green, glandular-pubescent herb. Leaves oblanceolate to ovate-oblong, up to 18 x 8 mm, attenuate, the basal shortly petioled, the cauline sessile and subvaginate, pilose. Flowers in terminal, lax, ± umbelloid dichasial clusters; bracts green in the lower half, scarious and glabrous in upper half, rarely entirely scarious; pedicel equalling or slightly longer than sepals, sharply bent downwards in fruit. Sepals lanceolate, 3-5 mm long, glandular-pubescent outside, with broad scarious margins, acute. Petals 5, lanceolate, slightly shorter to as long as sepals, glabrous, with unbranched veins, slightly emarginate to denticulate. Stamens 5, rarely more, filaments 2-3 mm long, anthers ovoid, yellow. Ovary oblong, glabrous, styles 5, stigmatic internally up to the base. Capsule pale coloured, 5-7 mm long, glabrous, dehiscent by 10, marginally revolute teeth. Seed somewhat rounded-reniform, pale brown, c. 0.4-0.5 mm long, finely tuberculate.

Type: Described from N. Europe, Herb. Linn. 603/7 (LINN).

Reported from Tripoli and Ghiran by Durand & Barratte (l.c.) and from Tarhuna by Keith (l.c.), but its occurrence seems doubtful in Libya.

Distribution: N. Iran, Lebanon, Turkey, Cyprus, Europe and N. Africa (?).

*Fl.* March-May

7. **Cerastium pumilum** Curtis, Fl. Lond. 2(6): t. 30. 1874; Keith, l.c. 348. (Fig. 16).

CARYOPHYLLACEAE

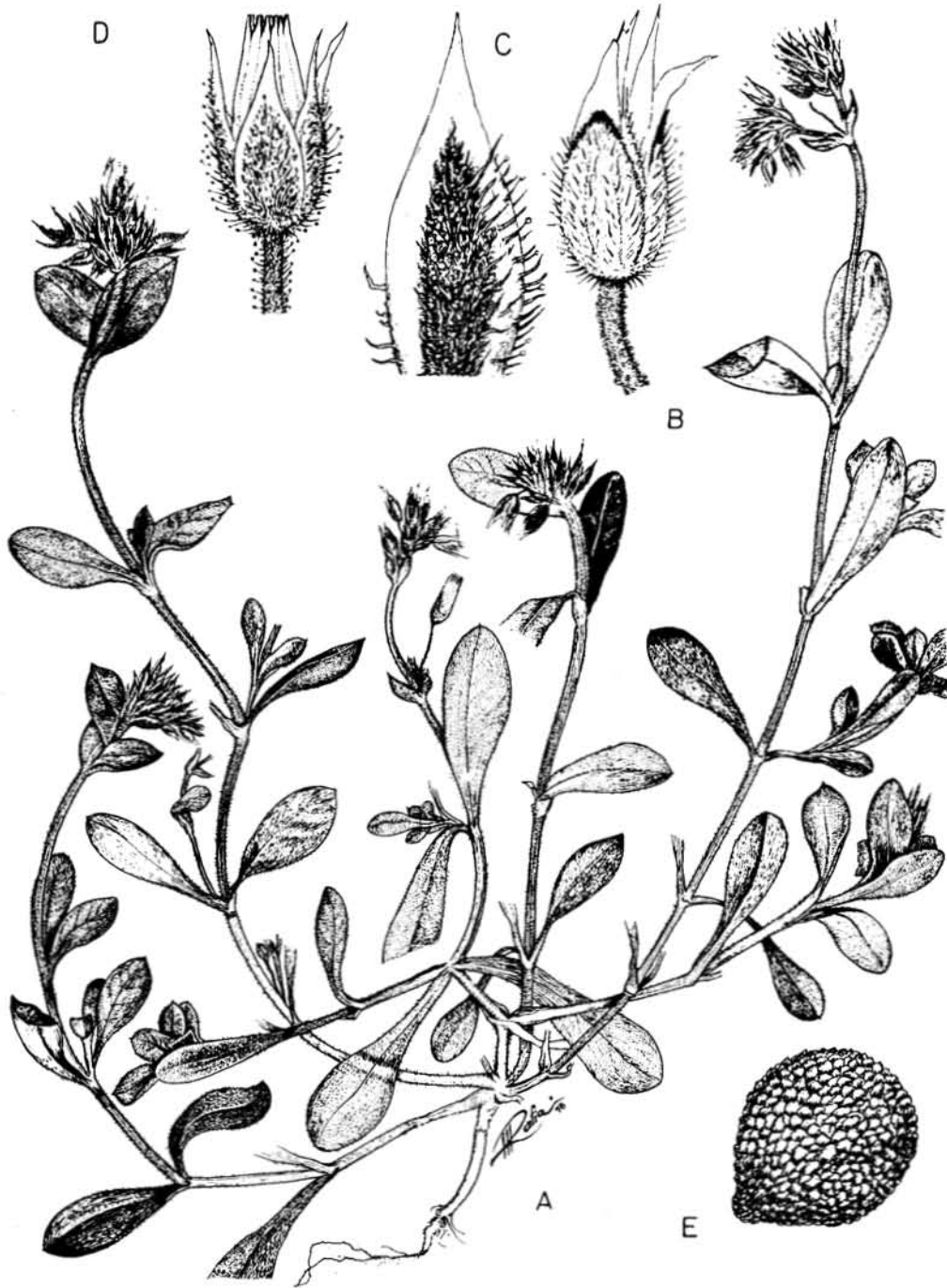


Fig. 16 *Cerastium pumilum*: A. Habit x 1; B. Flower x 7.5; C. Bract x 10; D. Fruit enveloped by Calyx x 5; E. Seed x 50.

## CARYOPHYLLACEAE

*C. glutinosum* Fries, Novit. Fl. Suec. Mant. 4: 51, 104. 1817; *C. semi-decandrum* L., ssp. *glutinosum* (Fries) Maire et Weiller in Maire, Fl. Afr. Nord 9: 218. 1963.

Annual, usually erect, up to 15 cm tall, reddish tinged or pale green herb. Stem beset with glandular and eglandular, subpatent hairs. Leaves oblanceolate to ovate-oblong or the upper ones ovate, 5-20 x 3-8 (-10) mm, eglandular hairy on both sides, attenuate at the base, apex obtuse-apiculate. Flowers in terminal,  $\pm$  lax, many-flowered clusters; bracts with only margins and apices scarious; pedicels 4-8 mm long, mostly longer than sepals, densely glandulose. Sepals 5, lanceolate to oblong-lanceolate, 4-5 x 1.5 mm, glandular and simple hairy outside, with acute, c. 1 mm apical part membranous, without a tuft of hairs at the apex. Petals 5, oblong-oblanceolate, shorter to slightly longer than sepals, apically 2-fid to a quarter of their length, with branched veins. Stamens 5 (-10), filaments alternating with and equalling to c. 0.5 as long as petals, dilated towards the base; anthers yellow, Ovary ovoid-oblong, glabrous; styles 5, internally stigmatic. Capsule straw yellow, narrowly cylindrical, semi-transparent, 6-8 mm long, dehiscent by 10, truncate teeth with revolute margins. Seed  $\pm$  reniform, pale brown, c. 0.5 mm long, finely tuberculate.

Type: Not properly designated.

A-3 8 km from Tripoli University, from cultivated field of Broad beans, 16.2.1976, *Fathi, B.R.* 185; *ibid.*, Loquat garden, *Fathi, B.R.* 129; *ibid.*, weed in Alfa alfa fields, *Fathi, B.R.* 191.

Distribution: Europe, N. Africa, Turkey, N. Iran and Caucasia.

Fl. Jan.-March

### 10. ARENARIA

L., Sp. Pl. 423. 1753; Gen. Pl. ed. 5. 193. 1754.

Herbs, often caespitose or tufted, rarely small under-shrubs. Leaves exstipulate, opposite, generally lanceolate-ovate to suborbicular, rarely linear or setose, entire, acuminate. Inflorescence a terminal or rarely axillary panicle or cluster of dichasial cymes, rarely flowers solitary or in monochasial cymes. Flowers small, bisexual, pentamerous, rarely tetramerous, white rarely pinkish; disc hypogynous, glandular. Sepals (4-) 5, free, entire or sometimes slightly emarginate.

## CARYOPHYLLACEAE

Stamens (8-) 10 in two whorls, inserted on the disc, the outer with glands at the base. Ovary (2-) 3 (-5)-carpelled, syncarpous, unilocular; styles (2-) 3 (-5), free. Fruit a unilocular, globose-ovoid or ovoid-oblongish capsule, dehiscent by twice as many teeth or valves as styles. Seeds pale reddish brown to black, reniform, very rarely globose, unappendaged, tuberculate to smooth.

A large genus of c. 250 species, distributed mainly in North temperate regions; represented in Libya by the following species only.

***Arenaria serpyllifolia*** L., Sp. Pl. 423. 1753; Durand & Barratte, Fl. Lib. Prodr. 39.1910; Pamp., Pl. Trip. 77. 1914; Prodr. Fl. Ciren. 193. 1931; Quezel & Santa, Nouv. Fl. Alger. 1: 332. 1962; Maire, Fl. Afr. Nord. 9: 146. fig. 53. 1963; Keith, l.c. 248.(Fig. 17)

Annual, up to 25 cm tall, glandular hairy, lush green herb. Stem filiform, usually dichotomously branched, branches suberect to ascending, internodes up to 2 cm long. Leaves sessile, triangular-ovate to broadly lanceolate, 3-6 (-7) x 2-3 (-4) mm, 3-5-nerved, entire, acute-acuminate, sparsely glandular hairy to glabrescent. Cyme usually monochasial, many-flowered. Flowers small, c. 5 mm across, whitish-green; pedicel up to 8 mm long, filiform, glandular-hairy. Sepals 5, ovate-lanceolate to lanceolate 3-4 x 1.5 mm, 3-5-nerved, acute-acuminate, margins white membranous, glandular outside. Petals 5, white, ovate-oblong, 1.5-3 mm long, entire, glabrous. Stamens 10, filament filiform, white, anthers subglobose, inconspicuous. Ovary subglobose, 0.5 mm in diameter, glabrous; style 3, free, c. 1 mm long, white. Capsule, ovoid-oblong or  $\pm$  subglobose, pale yellow with brittle wall, slightly shorter than persistent enveloping sepals, dehiscent by 6 apical teeth. Seeds rounded-reniform, c. 0.5-0.7 mm long, blackish-brown, with papillate tubercles.

Type: Described from Europe

A-3 Tripoli, Ministry of Agriculture, Sidi El-Misri, 22.4.1971, *L. Boulos* 1732; Faculty of Agriculture fields, University Campus, Tripoli, sandy soil, 1.4.1977, *A. Ghafoor* 187; 8 km from Tripoli University, in cultivated field with turnip crop, as weed, 3.12.1975, *Fathi, B.R.* 27; *ibid.* lawn near the Hospital, common, fls. small, white, 20.3.1976, *S.M.H.Jafri* 6424; El-Geddaieda, 9 km E. Tripoli, 3.3.1967, *Issa S. Faraq* s.n.

Distribution: Europe, Asia, N. Africa and N. America.

CARYOPHYLLACEAE

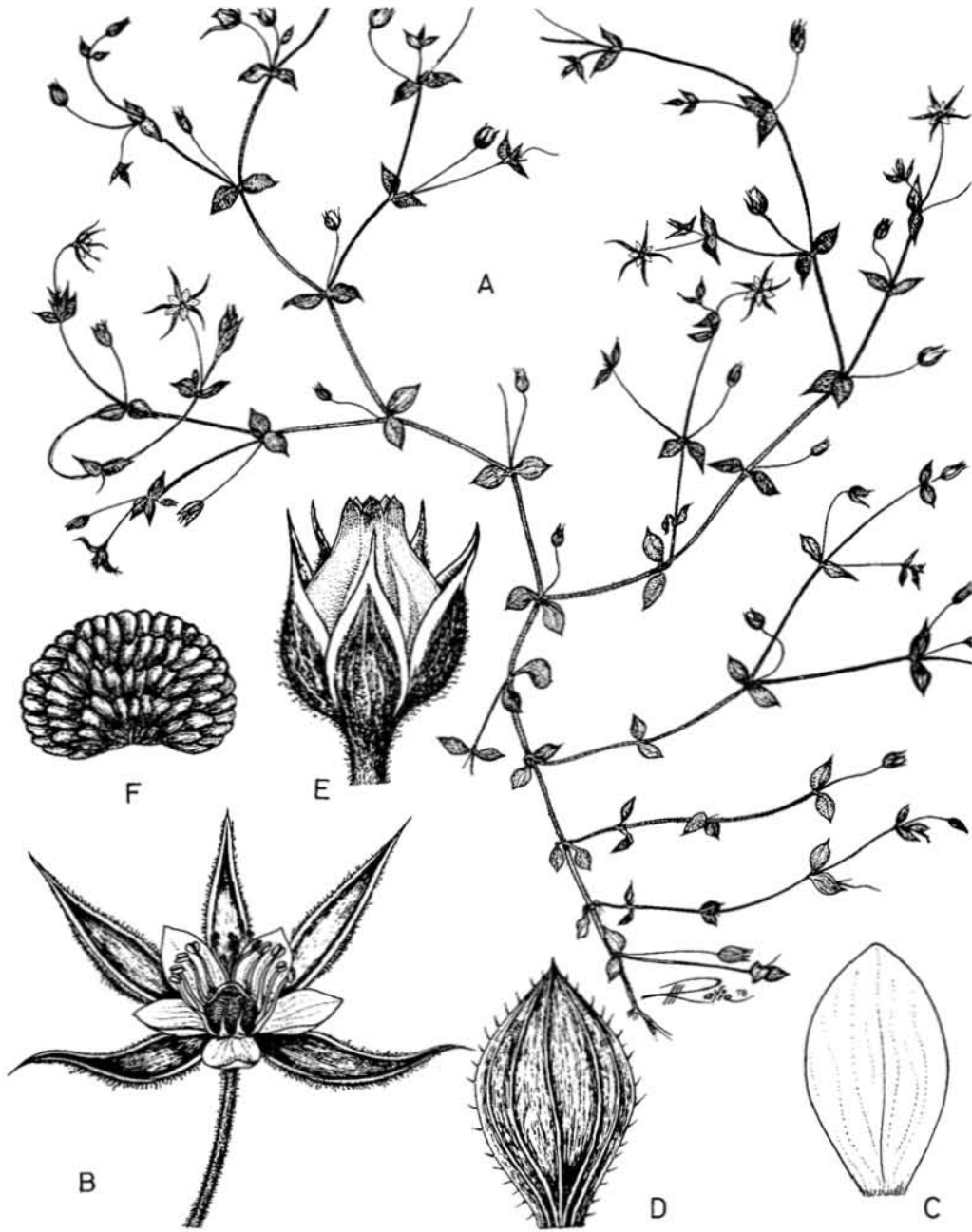


Fig. 17 *Arenaria serpyllifolia*: A. Flowering and fruiting branch x 1; B. Flower x 10; C. Petal x 20; D. Sepal x 7.5; E. Fruit with calyx x 10; F. Seed x 40.

## CARYOPHYLLACEAE

It is a common weed in cultivated fields and gardens.

*Fl.* Dec.-June

### 11. STELLARIA

L., *Sp. Pl.* 421.1753; *Gen. Pl.* ed. 5: 193. 1754.

Herbs, glabrous or hairy, diffusely branched. Leaves exstipulate, ovate or rarely linear, opposite, simple, entire. Inflorescence terminal, dichasial cymes, rarely 1 or 2-flowered. Flowers white, pentamerous, hypogynous or sometimes perigynous; disc annular with nectariferous glands; bracts scarious or herbaceous. Sepals (4-) 5, free, indistinctly veined. Petals (4-) 5, rarely reduced or absent, usually bifid almost to the base, white, rarely greenish. Stamens (3-) 5-10 in 2 whorls, sometimes absent. Ovary tricarpellary, unilocular; styles 3, free alternating with sepals. Fruit a subglobose-globose or ovoid-oblong, 1-loculed capsule, dehiscing from the apex downwards by twice as many deep teeth as styles. Seeds rounded-reniform, compressed, exstrophiolate, papillose.

A genus of c. 120 species, distributed in all parts of the world; represented in Libya by the following species only.

*Stellaria media* (L.) Cyrill., *Charac. Comm.* 36.1784; Vill., *Hist. Pl. Dauph.* 3: 615. 1789; Maire, *Fl. Afr. Nord.* 9: 175. 1963; Keith, l.c. 936 (Fig. 18).

*Alsine media* L., *Sp. Pl.* 272. 1753; *S. apetala* Ucria in *Rome Arch.* 1 (1): 68. 1796; Durand & Barratte, l.c. 40; Pamp., *Prodr. Fl. Ciren.* 191. 1931; Keith, l.c. 936; *S. neglecta* Weihe in *Bluff. & Fing., Comp. Fl. Germ.* 1: 560. 1825; Keith, l.c.; *S. pallida* (Dumort) Pire in *Bull. Soc. Bot. Belg.* 2: 49. 1863.

A pale green, annual, straggling or  $\pm$  suberect, diffusely branched, c. 5-10 cm tall herb, with branches spreading up to c. 90 cm. Stem cylindrical, filiform, almost glabrous to hairy all-round or with 1 or 2 longitudinal rows of hairs changing sides at the nodes, hairs multicellular, usually eglandular. Leaves very variable in size and shape, lower with up to 3 cm long petiole, ovate or  $\pm$  elliptic-ovate, 0.5-5 x 0.4-3 cm, cordate or  $\pm$  attenuate at the base, acute or shortly acuminate, hairy to glabrous, rarely  $\pm$  glandular. Upper leaves mostly sessile or so,  $\pm$  cordate-amplexicaul at the base. Inflorescence axillary, lax leafy dichasial cymes. Flowers greenish-white, c. 5 mm across; pedicels filiform, 5-10 mm long, hairy to glabrous. Sepals 5,  $\pm$  equal, oblong or ovate-oblong, 2.5-7 x 1.5-2 mm,  $\pm$  obtuse.



CARYOPHYLLACEAE



Fig. 18 *Stellaria media*: A, Flowering and fruiting branch x 1; B, Flower x 10; C, Fruit with calyx x 10; D, Seed x 30.

## CARYOPHYLLACEAE

glabrous or hairy. Petals 5, well developed to reduced or absent, white, linear-oblong, deeply bilobed, usually shorter than sepals. Stamens 3-10, filaments shorter than sepals, linear-subulate; anthers subglobose, c. 0.5 mm long, whitish yellow. Ovary ovoid, glabrous, styles 3, filiform, whitish, stigmatic in upper one third part. Capsule oblong, glabrous, light straw yellow, slightly longer than sepals. Seeds reniform, rounded, up to 1.5 mm long, compressed, light to dark brown.

Type: Described from Europe.

A-3 Tripoli, Faculty of Agriculture Field, El-Faateh University Campus, 1.4.1977, A. *Ghafoor* 301; Ministry of Agriculture, Sidi El-Masri, 22.4.1967, L. *Boulos* 1736; c. 8 km from Tripoli University, in cultivated fields of bean crop, weed, 16.2.1976, *Fathi B.R.* 180; A-7 Wadi El-Kouf, wadi bed, Gebel Akhdar, 12.3.1968, L. *Boulos* 2231.

Distribution: Throughout the world.

A very variable and complex species. A number of infraspecific taxa, having the status of independent species, have been recognized by Maire (l.c.) and Davis (Fl. Turk. 2: 69. 1966). This species exhibits much variation in the size and shape of leaves, hairiness of stem, size and hairiness of sepals, presence or absence and size of petals, number of stamens, colour and shape of the seeds etc., that it becomes difficult to separate or recognize the variants even as subspecies, because of overlap in these characters. *S. apetala* Ucria, *S. neglecta* Weihe and *S. pallida* (Dumort) Pire, reported by Keith (l.c.), are treated here conspecific with this species.

A common weed in gardens and cultivated fields.

Fl. Throughout the year. Vern. Hashish el raml

## 12. MINUARTIA

L., Sp. Pl. 89. 1753; Gen. Pl. ed. 5. 39. 1754

Herbs or rarely subshrubs with opposite, exstipulate, setose or linear-lanceolate, acute leaves. Cymes terminal, 1-many flowered, corymbose or lax paniculate dichasia. Flowers small, pentamerous, usually white or rarely pink, hypogynous rarely perigynous. Sepals (4-) 5, free, patent at anthesis, each usually 3-9-nerved, rarely nerves obscure. Petals (4-) 5, rarely absent, free, usually entire,

## CARYOPHYLLACEAE

sometimes fimbriate or emarginate. Stamens 10 rarely fewer, in 2 whorls, inserted on perigynous disc, outer whorl provided with entire or 2-fid glands at the base. Ovary 3-carpelled, syncarpous, superior, unilocular, styles 3, free. Fruit an ovoid-oblong capsule dehiscing by 3 valves with broad and obtuse teeth. Seeds usually brown, reniform rarely lenticular, unwinged and exstrophiolate.

A genus of c. 130 species, distributed mostly in Northern hemisphere with 1 species confined to Chile; represented by 5 species in Libya.

- |  |                           |
|--|---------------------------|
| 1. + Inflorescence lax or $\pm$ dense, dichasial peduncled cymes. Pedicels usually much longer (2-4 times) than the sepals           | 2                         |
| -- Inflorescence dense, dichasial sessile or subsessile cymose clusters. Pedicels absent or shorter to slightly exceeding the sepals | 3                         |
| 2. + Perennial, with unicostate leaves. Sepals apparently veinless. Petals pale-pink, as long as sepals                              | 2. <b>M. geniculata</b>   |
| -- Annual, with 3-costate leaves. Sepals 3-veined. Petals white, about half to as long as sepals                                     | 1. <b>M. hybrida</b>      |
| 3. + Sepals 3-5 mm long, glandular hairy outside. Lower pedicels longer and upper pedicels shorter than sepals                       | 3. <b>M. mediterranea</b> |
| -- Sepals 5-9 mm long, glabrous or sparsely glandulose on margins. All pedicels about half as long as sepals                         | 4                         |
| 4. + Stem and linear setaceous leaves beset with white, curled, eglandular hairs. Sepals 1-veined                                    | 4. <b>M. montana</b>      |
| -- Stem and ovate-lanceolate leaves beset with glandular hairs or glabrescent. Sepals 3-veined                                       | 5. <b>M. campestris</b>   |

**Minuartia hybrida** (Vill.) Schiskin in Fl. URSS 6: 488. 1936; G. Halliday in Tutin *et al.*, Fl. Europ. 1: 127. 1964; Mc Neill in Davis, Fl. Turk. 2: 66. 1967.

*Arenaria tenuifolia* L., Sp. Pl. 424. 1753; *Alsine tenuifolia* (L.) Crantz, Instit. 2: 407. 1766; Durand & Barratte, Fl. Lib. Prodr. 39. 1910; Pamp., Pl. Trip. 77. 1914; Keith, l.c. 216; *Arenaria hybrida* Vill., Prosp. Pl. Dauph. 48. 1779; *M.*

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*tenuifolia* (L.) Hiern in J. Bot. 37: 321. 1899 (non Nees Ex Mart. 1814); Pamp., Prodr. Fl. Ciren. 193. 1931 - p.p.; Maire, Fl. Afr. Nord 9: 250. 1963 (excl. ssp. *mediterranea*); Quezel & Santa, l.c. 328; Keith, l.c. 670 - p.p.

Annual, mostly glandular hairy, up to 25 cm tall herb with ascending to erect branches from the base and from above the middle. Leaves subulate to linear-lanceolate, 5-12 mm long, 3-costate, dilated and  $\pm$  connate-vaginate at the base, apex acute-mucronate. Inflorescence usually densely glandular-pubescent, many-flowered, lax to  $\pm$  dense dichasial cymes. Flowers white, c. 4 mm across; pedicels (7-) 10-20 mm long, suberect. Sepals lanceolate to linear-lanceolate, 3-nerved, 2.5-3.5 (-5) mm long, always shorter than pedicels, acute-acuminate, scarious margined. Petals ovate or oblong-lanceolate, half to almost as long as sepals, cuneate at the base, glabrous. Stamens 5-10, anthers ovoid, 0.3 mm, yellow. Ovary ovoid, glabrous, styles recurved. Capsule ovoid-cylindrical, equal to slightly longer than sepals, yellowish. Seeds reniform, 0.3-0.6 mm long, brown, finely tuberculate.

Type: France: Dauphine, « Sortant par la porte de la Graille, suivant l'Ilfere jusqu'à sa jonction avec le Drac, remontant ce torrent pour revenir par la Rondeau. Pres le Chemin de la Butte » *Villars*.

Reported from Ras Tekout by Maire (l.c.) and from Maatan Borghy, Derna, near Megaret Bu Fraina by Pamp. (l.c.), Keith (l.c.)

Distribution: S. Europe, N. Africa and S. W. Asia.

*Fl.* March-June

2. ***Minuartia geniculata*** (Poiret) Thell., Fl. Adv. Montpellier 232. 1912; Quezel & Santa, Nouv. Fl. Alger. 1: 327. 1962; Maire, Fl. Afr. Nord 9: 274. fig. 101. 1963; Keith, l.c. 670 (Fig. 19).

*Arenaria geniculata* Poiret, Voy. Barb. 2: 166. 1789; *A. procumbens* Vahl., Symb. Bot. 2: 50. tab. 33. 1791; *A. herniariifolia* Desf., Fl. Atlant. 1: 358. 1798; *Alsine procumbens* (Vahl) Fenzl. Verbr. Alsin. 57. 1833; Pamp., Pl. Trip. 77. 1914; *Rhodalsine procumbens* (Vahl) J. Gay, Ann. Sc. Nat. ser. 4,3: 25. 1845; *R. geniculata* (Poir.) F.N. Williams in Bull. Herb. Boiss. 6: 3. 1898; *M. procumbens* (Vahl) Aschers. & Graebn. Syn. 5(1): 1918; Pamp., Prodr. Fl. Ciren. 192. 1931; Keith, l.c.

CARYOPHYLLACEAE

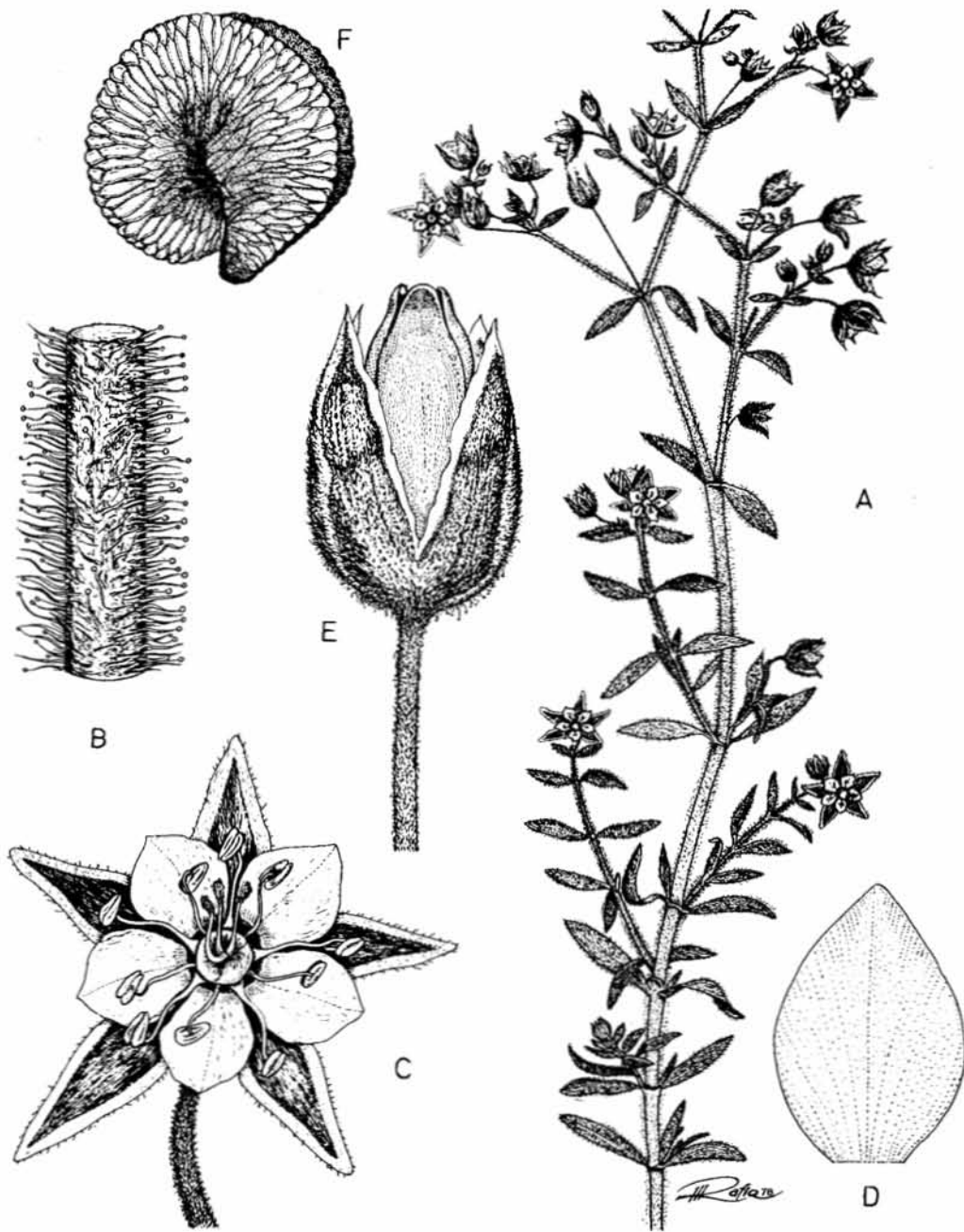


Fig. 19 *Minuartia geniculata*: A, Flowering and fruiting twig x 1.5; B, part of stem showing glandular hairs x 10; C, Flower x 7.5; D, Petal x 10; E, Fruit with persistent calyx x 15; F, Seed x 70.

## CARYOPHYLLACEAE

Perennial, glandular-hairy, basally woody much branched herb, with up to 30 cm long, procumbent and ascending shoots. Leaves linear to linear-lanceolate or oblong-lanceolate to elliptical, 6-35 x 1-5 (-6) mm, dilated and  $\pm$  connate-vaginate at the base, prominently 1-nerved beneath, acute. Inflorescence lax, many-flowered, axillary and terminal dichasial cymes. Flowers pink or pale-pink, c. 4-5 mm across; pedicel 8-25 mm long, glandulose. Sepals 5, united basally, oblong to ovate-lanceolate, 3-4 (-5) mm long, membranous margined, apparently veinless, mostly obtuse. Petals as long as sepals, glabrous, obtuse. Stamens 10 in 2 whorls; anthers ovoid, yellow. Ovary minutely stiped, glabrous; styles 3, spreading to  $\pm$  recurved. Capsule oblong, 3-5 mm long, thin, straw coloured. Seeds rounded-reniform, c. 0.5-0.8 mm long, brown, with slightly rugose margin.

Type: Algeria: « Environs de la Calle » *Poiret* (P).

**A-2** Sabrata, around the Roman ruins, 2.12.1966, *L. Boulos* 1025; Sabrata beach, sandy soil, 19.5.1977, *M. A. Siddiqi & A. Ghafoor* 249; 10 km before Gharian, c. 80 km from Tripoli, dry western slopes, on mountains - Gebel Nefousa range, prostrate herb with pink flowers, *S.A. Alavi* 1182; Garian, outside Youth Centre, limestone hills, exposed place, fls. pink, prostrate, 12.4.1974, *S.I. Ali* 2114; Sabrata ruins, stony and sandy ground, 12.6.1976, *S.M.H. Jafri* 6709; **A-6** Al-Tamini, S.E. Derna, 13.3.1968, *L. Boulos* 2294; **A-7** Susa, prostrate, flowers white, 28.2.1973, *S.I. Ali* 1066; c. 17 km from Agaigan on way to Martuba, *S.I. Ali* 852; c. 5 km from Susa on way from Shahat, 20.6.1972, *S.I. Ali* 780; Apollonia (Marsa Susa) near sea level, among ruins, perennial, flowers pale-pink, 27 March 1970, *P.H. Davis* 50152.

Distribution: S. Europe, N. Africa (Mediterranean region).

A polymorphic species particularly in leaf-shape, size and hairiness.

Common in the dry sandy habitats in the maritime zone by the seashores throughout Libya.

*Fl.* March-June.

3. ***Minuartia mediterranea*** (Ledeb.) K. Maly in *Glasn. Muz. Bosn. Herceg.* 20: 263. 1908; Mc Neill in *Notes Roy. Bot. Gard. Edinb.* 24: 396. 1963.

*Arenaria mediterranea* Ledeb. in *Link. Enum. Hort. Berol. Alt.* 1: 431. 1821; *Alsine mediterranea* (Ledeb.) J. Maly, *Enum. Pl. Austr.* 296. 1848; Post, *Fl. Palest. Syria & Sinai ed. 2.* 1: 197. 1932; *M. tenuifolia* (L.) Hiern. ssp.

## CARYOPHYLLACEAE

*mediterranea* (Ledeb.) Briq., Fl. Cors. 532. 1910; Maire, Fl. Afr. Nord 9: 253. 1963 - p.p.; Keith, l.c. 670

Annual, erect or suberect, up to 15 cm tall, simple or basally branched, often viscid-hairy herb. Leaves linear-subulate to setose, up to 15 mm long, 3-nerved, acuminate. Inflorescence axillary, dense, dichasial sessile or subsessile cluster. Flowers on stiffly erect, 0.5-7 mm long pedicels, lower pedicels longer and upper shorter than sepals, glandular hairy. Sepals linear-lanceolate, 3-5 mm long, 3-costate, acute to acuminate, glandular hairy outside. Petals mostly c. half as long as sepals or absent. Stamens usually 5. Capsule oblong-cylindrical, shorter than sepals, usually included, glabrous. Seeds reniform, c. 0.4-0.6 mm long, smooth.

Type: Probably described from a plant cultivated in Botanic Garden Berlin.

Reported from Cyrenaica (Kouba) by Maire (l.c.) and Keith (l.c.).

Distribution: Around Mediterranean.

Fl. Feb.-June.

4. **Minuartia montana** L., Sp. Pl. 90. 1753; Quezel & Santa, l.c. 1: 328; Maire, Fl. Afr. Nord 9: 255. 1963; G. Halliday in Tutin *et al.*, Fl. Europ. 1: 128. 1964.

*Alsine montana* (L.) Fenzl., Verbr. Alsin. 46. 1833 (non (L.) Crantz Inst. 2: 406. 1766); Pamp., Pl. Tripl. 77. 1914; Keith, l.c. 216.

Annual, up to 10 cm tall herb. Stem simple or branched from the base with erect or suberect shoots beset with white crisped hairs. Leaves linear- setaceous, up to 3 mm long, 3-costate, membranous margined, dilated and  $\pm$  connate-vaginate at the base with few white curled hairs, acuminate. Inflorescence terminal and axillary, dense, subsessile, dichasial clusters. Flowers subsessile or pedicels up to c. 2 mm long,  $\pm$  erect. Sepals linear-lanceolate, 6-9 mm long, erect, 3-costate, nerves with calcium oxalate discoid crystals, acute-acuminate, glabrous or sparsely glandulose on margins. Petals minute or absent. Stamens 10, unequal much shorter than sepals; anthers ovoid, yellow. Ovary ovoid, glabrous. Capsule ovoid-oblong, c. half or 2/3 as long as sepals, glabrous. Seeds rounded-reniform, 0.6-0.8 mm long, dark brown, obscurely and minutely tuberculate.

Type: Herb. Linn. 113/9 (LINN).

## CARYOPHYLLACEAE

Reported by Maire (l.c.), Keith (l.c.) from A-3 collines de Tarhouna and seems to be rare or undercollected.

Distribution: S. Europe, Turkey, Iran and N. Africa.

*Fl.* April-June

5. **Minuartia campestris** L., Sp. Pl. 89. 1753; Quezel & Santa, Nouv. Fl. Alger. 1: 328. fig. 848. 1962; Maire, Fl. Afr. Nord 9: 260. fig. 97. 1963.

*Alsine campestris* (L.) Fenzl., Verbr. Alsin. 57. 1833; Pamp., Pl. Trip. 76. 1914; Keith, l.c. 216.

Annual, glandular-hairy to glabrescent herb with up to 30 cm long, ascending shoots. Leaves suberect, ovate-lanceolate, up to 2 cm long, sharply long acuminate, 3-nerved. Inflorescence axillary, dense, dichasial, sessile, cymose cluster. Flowers on 2-3 mm long pedicels. Sepals unequal, unicostate, linear-lanceolate, 5-8 mm long, acute-acuminate. Petals ovate, less than half as long as sepals, white. Stamens 5 (-10), as long as petals; anthers yellow. Ovary ovoid, minutely stiped, glabrous. Capsule membranous, oblong-cylindric, shorter than and enveloped by sepals. Seeds rounded-reniform, 0.4-0.7 mm long, brown, finely tuberculate.

Type: Herb. Linn. 113/3,4 (LINN).

Reported from Khoms and Garian by Pamp. (l.c.), Maire (l.c.) and from Mesellata, Tarhouna and Wadi Garian by Keith (l.c.).

Distribution: S.W. Europe (Spain) and N. Africa.

*Fl.* May-June

### 13. AGROSTEMMA

L., Sp. Pl. 435. 1753; Gen. Pl. ed. 5: 198. 1754.

Tall, annual herbs. Leaves opposite, linear-lanceolate, exstipulate. Inflorescence of few-flowered dichasial cymes or flowers solitary. Flowers large, showy, pentamerous, violet to white. Sepals 5, united below into a 10-ribbed, 10-veined,  $\pm$  cylindrical-ovoid tube with as many foliaceous, patent lobes, shorter to



## CARYOPHYLLACEAE

longer than petals. Petals 5, without coronal scales, claw 2-winged, limb  $\pm$  entire. Stamens 10. Ovary 5-carpelled, syncarpous, unilocular, multiovulate styles 5, free, alternating with sepals, hairy, stigmas papillate. Fruit a sessile, coriaceous, unilocular capsule dehiscing by 5 simple apical teeth. Seeds numerous, reniform, black,  $\pm$  tuberculate with  $\pm$  annular, filiform embryo.

A genus of 3 species distributed in Europe, North Africa and South Asia; represented by 1 species in Libya.

This genus is very closely allied to and sometimes merged in *Lychnis* L., but is distinct due to long calyx teeth, absence of coronal scales and fruit stalk.

***Agrostemma githago* L.**, Sp. Pl. 435. 1753; Durand & Barratte, Fl. Lib. Prodr. 34. 1910; Pamp., Pl. Trip. 76. 1914; Maire, Fl. Afr. Nord. 10: 5. 1963; Keith, Prelim. Check List Lib. Fl. 203. 1965.

*Githago segetum* Desf., Fl. Atl. 1: 363. tab. 159. 1805.

An erect, up to 1 meter tall, dichotomously branched, densely patent hairy herb. Leaves sessile, linear-lanceolate to oblong-lanceolate, 10-12 cm x 5-8 (-10) mm,  $\pm$  connate-vaginate at base, acute, pilose. Flowers solitary, axillary, large, c. 4-5 cm across, on c. 10-12 cm long, hairy peduncles. Calyx tube strongly ribbed, up to 20 mm long, patent hairy, lobes 5, linear, 20-35 x 2-3 mm, glabrous within, patent hairy outside, caducous. Petals mostly shorter than calyx lobes, violet-red to white, claw narrow, limb broadly obovate, entire, truncate to  $\pm$  retuse, glabrous. Stamens in 2 whorls of 5 each,  $\pm$  unequal and as long as calyx tube; anthers linear-oblong, c. 3 x 1.5 mm. Ovary sessile, ovoid, glabrous; styles filiform, white-purplish, villous. Capsule sessile, oblong-ovoid, up to 45 mm long, glabrous, 5-toothed at apex. Seeds  $\pm$  reniform, c. 3 mm or more long, acutely tubercled, black.

Type: Described from Europe, Herb. Linn. 601/1 (LINN).

Reported from Tripoli and Gharian by Maire (l.c.) and Keith (l.c.).

Distribution: N. Africa, Canary Islands, Europe and Asia.

Fl. April-July.

## CARYOPHYLLACEAE

### 14. **SILENE**

L., Sp. Pl. 416. 1753; Gen. Pl. ed. 5: 193. 1754.

*Melandrium* Roehl., Deutschl. Flora ed 2.2:37, 274. 1812.

Herbs or subshrubs, mostly basally woody, erect to suberect, caespitose or mat-forming. Leaves exstipulate, opposite, free or  $\pm$  connate at the base, variable in shape and size. Inflorescence basically cymose, cymes in simple or compound dichasia or forming one-sided raceme-like monochasium or panicle rarely flowers solitary. Flowers 5-merous, bisexual, rarely unisexual (plants then dioecious) or functionally female, hypogynous; calycine bracts or epicalyx scales absent. Sepals 5, united into a 5-toothed cylindrical or dilated and vase-like, 10,20,30-60-veined calyx tube. Petals 5, rarely absent, free, with a long often 2-auricled claw at the junction with bilobed or emarginate rarely entire limb, coronal scales usually present at the throat. Stamens 10, in 2 whorls in male or bisexual flowers or occasionally fewer. Ovary 3 (-5)-carpelled, syncarpous, superior, stipitate or sessile, 3(-5)-loculed at the base, unilocular in the upper part; styles usually 3 or 5, alternating with the sepals, free to the base, filiform. Fruit usually a stipitate, coriaceous capsule, with as many locules as in ovary, dehiscent at apex by twice as many teeth as there are styles. Seeds rounded-reniform, compressed with plane, concave, concave-convex or excavate faces, margins on back plane, grooved, ridged, winged or variously sculptured.

A large and heterogenous genus of c. 500 species, mainly distributed in North temperate regions and especially around the Mediterranean and W. Asia, but also found in Tropical and S. Africa, represented in Libya by 23 species.

- |    |   |                       |
|----|---|-----------------------|
| 1. | + Calyx tube 30-nerved  | 1. <b>S. conoidea</b> |
|    | -- Calyx tube up to 20-nerved   | 2                     |
| 2. | + Calyx tube contracted at the apex in fruit  | 3                     |
|    | -- Calyx tube not contracted at the apex in fruit   | 7                     |
| 3. | + Calyx glabrous all-round and on nerves  | 4                     |
|    | -- Calyx beset with dimorphic indumentum of short glandular or eglandular hairs and 2-3 long multicellular articulate patent or subpatent hairs | 5                     |
| 4. | + Perennial with woody, branched rootstock and flowers in panicle. Calyx nerves not anastomosed. Claws and staminal filaments                   |                       |

## CARYOPHYLLACEAE

- |  |                                  |
|--|----------------------------------|
| <p>hairy at the base. Carpophore retrorsely pubescent. Seeds obtusely 1-grooved on back</p>  | <p>2. <b>S. longipetala</b></p>  |
| <p>-- Annual with flowers in lax dichasia, becoming monochasial above. Calyx nerves anastomosed. Claws and staminal filaments glabrous. Carpophore glabrous. Seeds with 4-5-furrowed wide back</p> | <p>3. <b>S. behen</b></p>        |
| <p>5. + Calyx teeth 4-5 mm long in fruit, hairy all-round. Petals almost included</p>  | <p>4. <b>S. tridentata</b></p>   |
| <p>-- Calyx teeth up to 3.5 mm long in fruit, hairy on margins only</p>  | <p>6</p>                         |
| <p>6. + Shorter hairs on calyx eglandular, non-viscid. Petal limb bifid. Carpophore 2-4 mm long</p>  | <p>5. <b>S. cerastioides</b></p> |
| <p>-- Shorter hairs on calyx glandular, sand adherent. Petal limb entire or emarginate. Carpophore c. 1 mm long</p>  | <p>6. <b>S. gallica</b></p>      |
| <p>7. + Seeds with 2 undulate wings on narrowly deep-grooved back</p>  | <p>8</p>                         |
| <p>-- Seeds without undulate wings on back</p>   | <p>11</p>                        |
| <p>8. + Carpophore more than 4 mm long. Corolla usually long exerted</p>   | <p>9</p>                         |
| <p>-- Carpophore 3 mm or less long. Corolla not exerted or subexserted to absent</p>   | <p>10</p>                        |
| <p>9. + Flowers in helicoid cyme with zigzag axis. Calyx antrorsely appressed hairy throughout</p>   | <p>8. <b>S. cyrenaica</b></p>    |
| <p>-- Flowers in scorpioid cyme, axis not zigzag. Calyx antrorsely appressed hairy on nerves alone</p>   | <p>7. <b>S. colorata</b></p>     |
| <p>10. + Calyx 13-16 mm long with dimorphic hairs. Capsule 10-12 mm long on c. 3 mm long. retrorsely hairy carpophore</p>  | <p>9. <b>S. articulata</b></p>   |
| <p>-- Calyx 6-10 mm long with antrorse hairs. Capsule 6-8 mm long on less than 2 mm long.</p>  |                                  |

## CARYOPHYLLACEAE

- glabrous carpophore
- |     |   |                          |          |
|-----|---|--------------------------|----------|
| 11. | <ul style="list-style-type: none"> <li>+ Perennial or more rarely biennial. with vegetative shoots at the time of flowering and branched woody rootstock. Inflorescence, if compound, often paniced with equal and opposite branches</li> <li>— Annual, without vegetative shoots at the time of flowering and no rootstock. Inflorescence never paniced</li> </ul>   | 10. <b>S. apetala</b>    | 12<br>16 |
| 12. | <ul style="list-style-type: none"> <li>+ Calyx ovoid-vesiculose, inflated at anthesis and in fruit, 15-20-nerved, nerves reticulately anastomosing, glabrous and glaucous</li> <li>— Calyx oblong-cylindrical or subcylindrical at anthesis, clavate in fruit, 10-nerved. glandular-hairy</li> </ul>  | 11. <b>S. vulgaris</b>   | 13       |
| 13. | <ul style="list-style-type: none"> <li>+ Plant succulent, beset with viscid sand adherent glandular hairs. Flowering branches procumbent. Claw long exerted. Capsule slightly longer than the deflexed hairy carpophore</li> <li>— Plant not succulent, ± retrorsely eglandular pubescent or somewhat viscid on younger parts and inflorescence. Flowering branches erect. Claw slightly exerted. Capsule c. 1.5 times as long as carpophore</li> </ul> | 12. <b>S. succulenta</b> | 14       |
| 14. | <ul style="list-style-type: none"> <li>+ Flowers in a lax terminal panicle. Capsule broadly attenuate above; carpophore retrorsely pubescent throughout or at the base only</li> <li>— Flowers in a dense, usually unbranched raceme. Capsule beaked at the apex; carpophore entirely glabrous</li> </ul>   | 13. <b>S. fruticosa</b>  | 15       |
| 15. | <ul style="list-style-type: none"> <li>+ Calyx up to 22 mm long with monomorphic obtuse teeth. Capsule 8-10 (-12) mm long; carpophore slightly shorter to more or less</li> </ul>   |                          |          |

## CARYOPHYLLACEAE

- equalling the capsule, retrorsely pubescent throughout, not adherent to the calyx tube
14. **S. italica**
- Calyx 23-27 mm long with dimorphic acute teeth. Capsule c. 15 mm long; carpophore c. 2/3 of capsule, almost glabrous except the retrorse pubescent base,  $\pm$  adherent to the calyx tube
15. **S. marmarica**
16. + Flowers in regular or irregular dichasia, not in raceme-like monochasia
- 17
- Flowers in simple or branched monochasia, with or without alar flowers
- 19
17. + Plant usually glabrous, more rarely younger shoots  $\pm$  viscid. Calyx glabrous with anastomosing nerves. Seeds with plane faces
16. **S. muscipula**
- Plants retrorsely puberulent or beset with contorted, patent multicellular hairs. Calyx minutely antrorsely puberulent or beset with glandular and multicellular long hairs. Seeds with concave or subexcavate to excavate faces
- 18
18. + Plant minutely puberulent. Leaves without undulate margins. Calyx antrorsely puberulent, eglandular, whitish. Carpophore 2-3.5 mm long, retrorsely pubescent
17. **S. rubella**
- Plant with contorted, patent, multicellular hairs. Leaves with undulate margins. Calyx beset with glandular multicellular long hairs. Carpophore 4.5-7 (-8) mm long, glabrous
18. **S. fuscata**
19. + Carpophore up to 2 mm long
- 20
- Carpophore much longer than 2 mm
- 21
20. + Leaves fleshy, up to 1 cm long, pedicels patent in fruit, slender, usually longer than calyx. Carpophore glabrous
19. **S. sedoides**
- Leaves not fleshy, up to 4 cm long pedicels erect in fruit,  $\pm$  stout, usually shorter than calyx. Carpophore puberulent
20. **S. nocturna**

## CARYOPHYLLACEAE

21. + *Calyx tube more than 9 mm long, Carpophore*  
 as long as or shorter than the capsule 22  
 — Calyx tube c. 9 mm long. Carpophore longer  
 than the capsule. Seeds narrowly acutely  
 grooved on back 21. *S. biappendiculata*
22. + Plants patently viscid-glandulose. Leaves  
 oblong-oblancoate or oblong-lanceolate.  
 Fruiting pedicels reflexed. Calyx 15-20 (-25)  
 mm long. Carpophore glabrous 22. *S. villosa*  
 — Plants non-viscid, retrorsely, appressed  
 puberulent. Leaves linear-lanceolate to setose.  
 Fruiting pedicels erect. Calyx 11-15 mm long.  
 Carpophore retrorsely-pubescent 23. *S. viviani*
1. ***Silene conoidea*** L., Sp. Pl. 418. 1753; Pamp., Pl. Trip. 81. 1914; Quezel &  
 Santa, Nouv. Fl. Alger. 1: 337. 1962; Maire, Fl. Afr. Nord. 10: 38. fig. 10.  
 1963; Keith, Prelim. Check List Lib. Fl. 896. 1965 (Fig. 20).

*Cucubalus conoideus* (L.) Lamk., Fl. Franc. 3: 27. 1778; *S. cylindrica* Otth in  
 DC., Prodr. 1: 371. 1824.

Annual, erect, up to 60 cm tall, densely viscid-glandular herb. Stem  
 unbranched or branched from the base, branches upright with 2-6 cm long  
 internodes. Leaves sessile, oblong-oblancoate to lanceolate or ± linear-lanceolate  
 above, 2-8 x 0.5-2 cm, shortly connate-vaginate at the base, basal ones puberulent or  
 glabrescent, obtuse to acute. Flowers pink or pale-pink, 10-12 mm across, few to  
 many, dichasial; pedicels 8-12 mm long, elongated in fruit to 2 cm, glandular hairy;  
 bracts leafy, linear-lanceolate. Calyx tube conical-cylindrical at anthesis, 18-25 (-30)  
 x c. 3-4 mm, strongly inflated, umbilicate globose and 10-15 mm across in fruit with  
 attenuate-contracted apex, 30-nerved, nerves distinct and covered with short  
 glandular hairs; teeth lanceolate-subulate, 6-8 mm long, acute-acuminate. Petal limb  
 obovate-cuneate, 5-8 mm long, entire, irregularly notched or emarginate, pink or  
 reddish; claw white, oblong-oblancoate, 25-35 mm long, glabrous; coronal scales  
 oblong, c. 2 mm long, truncate, fringed or bidentate. Stamens 10, filaments mostly  
 hairy in lower half, anthers c. 1.5 mm long, yellow. Ovary ovoid-subglobose,  
 minutely stipitate; styles filiform, exserted. Capsule subglobose-pyriform, 15-18  
 (-20) x c. 10 mm, coriaceous, with c. 6-8 mm long narrow neck, included in the  
 calyx; carpophore c. 1.5-2 mm long. Seeds rounded-reniform, 1.25-1.5 mm long,

CARYOPHYLLACEAE

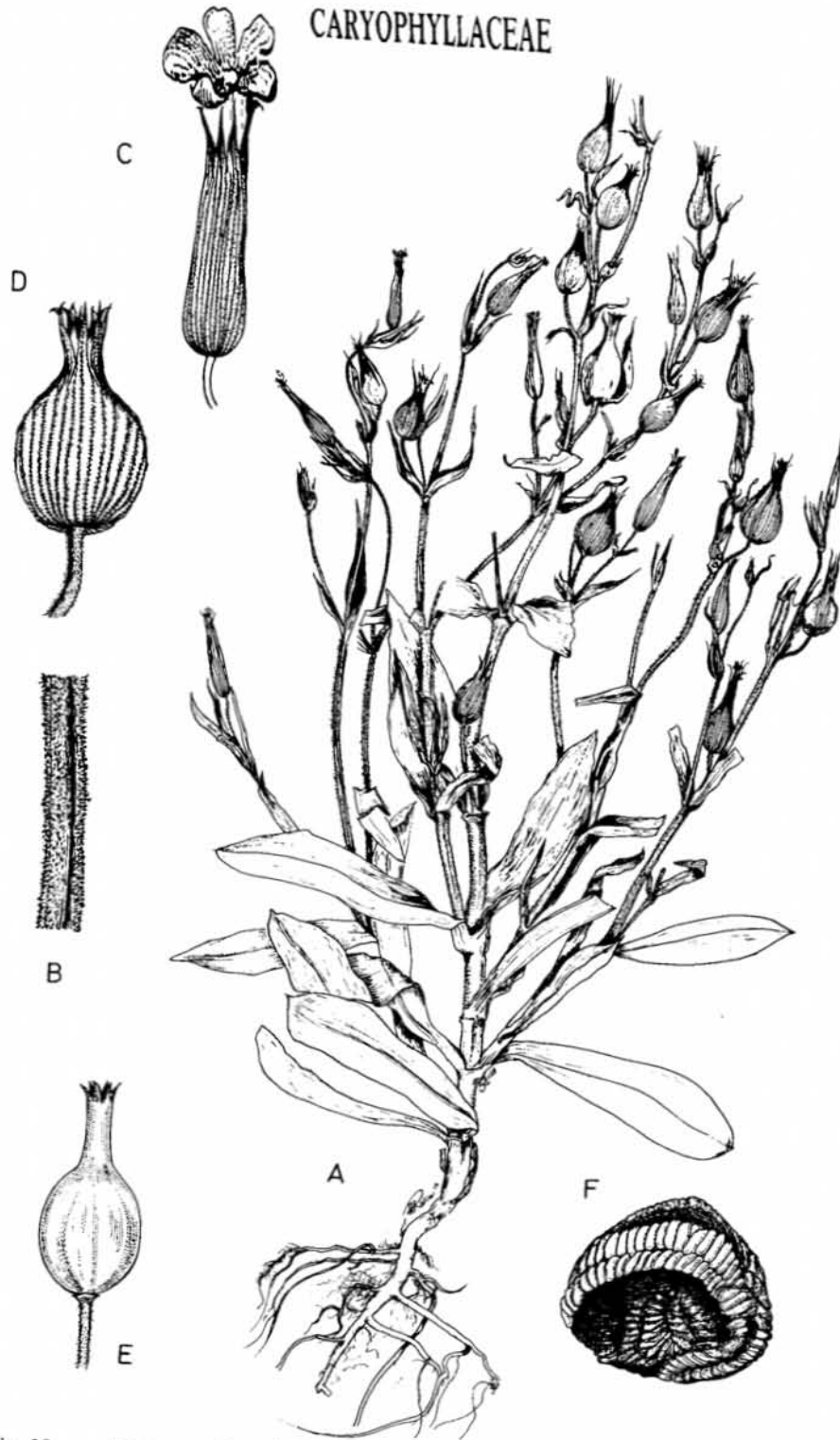


Fig. 20 *Silene conoidea*: A, Habit x 0.5; B, Part of stem x 3; C, Flower x 2; D, Fruit with calyx x 1.5; E, Fruit without calyx x 1.5

## CARYOPHYLLACEAE

concave on one side, bluntly tuberculate, dark brown.

Type: Described from Spain, Herb. Linn. 583/29 (LINN).

**A-2** Tagma, near Yefren, c. 93 cm tall, 9.4.1974, *G. Faris* 373; **A-3** Tripoli, Faculty of Science, University of Al-Faateh, 31.3.1969, *L. Boulos* s.n.

Distribution: S. Europe (N.W.Italy) N. Africa, W. Asia eastwards to Pakistan and India.

A weed of grain fields with showy flowers.

*Fl.* Feb.-May

2. ***Silene longipetala*** Vent., *Jard. Cels.* 83. t. 83. 1800; Durand & Barratte, *Fl. Lib. Prodr.* 38. 1910; Pamp., *Pl. Trip.* 82. 1914; Prodr. *Fl. Ciren.* 199. 1931; Quezel & Santa, l.c. 350. 1962; Maire, l.c. 247. fig. 93; Keith, l.c. 898.

Perennial, procumbent to erect, up to 85 cm tall herb, with a branched woody rootstock. Stem thickened at the nodes, retrorsely hairy below, glabrescent and viscid glandulose on inflorescence and younger shoots. Leaves with 1-3 cm long petiole, oblong-obovate or oblanceolate below, upper linear-lanceolate, attenuate, 3-7 x 1-3 cm, acute, grey-green. Flowers white, c. 1.5 cm across, in a large divaricately branched panicle bearing lax dichasia with the terminal flower distinctly overtopped by lateral 2-bracted branches; pedicels glabrous, usually as long as calyx, deflexed; bracts lanceolate glabrous. Calyx tube obconical at anthesis, (7-) 8-12 mm long, slightly inflated and turbinate or puriform in fruit with a constriction below the apex, 10-nerved, nerves green, glabrous; teeth ovate, 2-2.5 mm long, obtuse, white and ciliate on margins. Petal limb obovate-cuneate, c. 7 mm long,  $\pm$  deflexed, 2-partite into linear-oblong lobes; claws not or subexserted, finely ciliate on margins at the base; coronal scales triangular-ovate, indistinct, obtuse. Stamens 10, filaments filiform, 5 long exserted and 5 included or slightly exserted, ciliate at the base; anthers oblong, c. 2 mm long, brownish. Ovary oblong, longer than the stipe; style filiform, basally ciliate, exserted. Capsule ovoid, 7-10 mm long, included in the calyx; carpophore 2-4 mm long, retrorsely pubescent. Seeds rounded-reniform,  $\pm$  2 mm long, plane or  $\pm$  concave on faces, obtusely grooved on the back, finely wrinkled.

Type: Syria, « aux environs d'Alep », *Bruguere & Olivier* (P.).



CARYOPHYLLACEAE



Fig. 21 *Silene behen*: A. Vegetative shoot x 0.5; B. Flowering shoot x 1; C. Flower x 5; D. A petal and a stamen x 4; E. Fruit x 5.

## CARYOPHYLLACEAE

Reported from Garian, Benghazi, Derna, Wadi Naga and Marabut at Sidi Kahlik by Durand & Barratte (l.c.) and entre Karmous et Tecna by Maire (l.c.).

Distribution: Greece, Cyprus, N. Africa and Asia (E. Mediterranean and Irano-Turanian regions).

*Fl.* March-May

3. ***Silene behen*** L., Sp. Pl. 418. 1753; Durand & Barratte, l.c. 38; Pamp., Prodr. Fl. Ciren, 199. 1931; Quezel & Santa, Nouv. Fl. Alger. 1: 346. 1962; Maire, l.c. 232. fig. 86; Huxley & Poulunin, Fl. Medit, 63. fig. 324. 1965; Keith, l.c. 895 (Fig. 21)

*S. pseudobehen* Boiss., Diagn. Nov. Pl. Orient. ser. 1 (1): 36. 1843; *S. cretica* auct. non L. (1753); Batt. & Trab., Fl. Alger. 137. 1888; *S. reinholdii* Heldr. in Atti Congr. Bot. Firenze 238. 1876.

Annual, erect, up to 90 cm tall, entirely glabrous,  $\pm$  glaucous herb with simple or dichotomously branched stem. Leaves sessile or  $\pm$  petioled, obovate-lanceolate or narrowly elliptic-lanceolate to oblanceolate, up to 10 cm x 5-20 mm, connate-vaginate at the base, acute, glaucous, minutely dentate or entire on margins. Flowers pink or whitish-pink, up to c. 10 mm across, in lax dichasia becoming monochasial above, pedicels up to 20 mm long, shorter to equalling calyx; bracts lanceolate, whitish-membranous,  $\pm$  ciliate on margins. Calyx tube broadly oblong-ovoid at anthesis, 10-12 mm long, inflated, umbilicate and slightly contracted at the apex in fruit, glabrous,  $\pm$  membranous, 10-nerved, nerves reddish, anastomosed to form reticulum; teeth ovate, c. 1.5 mm long, whitish margined. Petal limb obovate, c. 2.5-3 mm long, bipartite almost to the base; claws hardly exerted, glabrous; coronal scales minute, bidentate or bifid. Stamens 10, filaments filiform, exerted, glabrous, anthers ovoid, c. 1.2 mm long, yellow. Ovary oblong, longer than the c. 2 mm long stipe; styles exerted. Capsule ovoid, 8-10 mm long, included and loosely enveloped by calyx; carpophore c. 2-2.5 mm long, very stout, glabrous. Seeds rounded-reniform, c. 1.5 mm long, faces concavo-convex, back wide, 4-5-furrowed with 4 rows of acute, conical tubercles, brown.

Type: Described from Crete, Herb. Linn. 582/3 (LINN).

**B-1** Wadi Maleh, c. 3 km from Nalut; near top of hill, gorge in protected place, up to 90 cm tall, flowers white, 18.4.1975, *S.I.Ali* 2866.

## CARYOPHYLLACEAE

Distribution: S. Europe, N. Africa, Cyprus, Crete and W. Asia.

*Fl.* March-May

4. ***Silene tridentata*** Desf., *Fl. Atl.* 1: 340. 1798; Pamp., *Pl. Trip.* 83. 1914; Ozenda, *Fl. Sahara* 214. fig. 53. 1958; Quezel & Santa, *l.c.* 342; Maire, *l.c.* 59. fig. 18; Chatter & Walters in Tutin *et al.*, *Fl. Europ.* 1: 180. 1964; Keith, *l.c.* 900 (Fig. 22)

*S. calycina* Salzm. ex Robr., *Monogr. Sil.* 99. 1868; *S. cerastioides* (auct. non L.); Lindberg f., *Iter Cypr.* 15. 1946; *S. cerastioides* L. var. *tridentata* Lindman, *Act. Hort. Berg.* 1: 6. 1891.

Annual, erect, up to 40 cm tall, antrorsely appressed eglandular hairy herb with simple or branched stem. Leaves sessile, narrowly lanceolate-oblongate, 15-30 x 3-8 mm, densely antrorse pubescent, lower ones attenuate,  $\pm$  petiolate, upper connate-vaginate and ciliate at the base, acute. Flowers pink, 6-8 mm across, in lax scorpioid raceme-like monochasia; pedicels absent or minute; bracts leafy, linear, c. half as long as leaves. Calyx tube ellipsoid-oblong at anthesis, c. 6-9 x 3-4 mm, dilated, apically slightly contracted, ovoid-subglobose and c. 5-6 mm across in fruit; 10-nerved, nerves anastomosing above, with dimorphic indumentum of short appressed antrorse hairs and long, multicellular, c. 2.5-3 mm long, articulate hairs; teeth linear-subulate, 4-5 mm long, suberect, hairy all-round. Petal limb obovate, c. 2.5-3 (-4) mm long, 2-lobed, included, claws included,  $\pm$  connate in upper part, glabrous; coronal scales c. 1.5 mm long. Stamens 10, filaments glabrous, anthers oblong, c. 1 mm long, purplish. Ovary oblong-cylindrical, stipe c. 1 mm long, hairy; styles included. Capsule ovoid-subglobose, 7-10 x 4-5 mm, included and closely appressed by calyx; carpophore 1-2 mm long, pubescent. Seeds rounded-reniform, c. 0.8 mm long, dark brown, faces concave, striate, back wide with 1 or sometime 2 shallow grooves.

Type: « In arvis Algeriae » *Desfontaines* (P.).

**A-2** Al-Rumia, *unknown collector* 146; **A-7** Gebel Al-Akhdar, near Al-Ghraib, sandy-loam soil, c. 25 cm tall, 20.4.1978. *A. Ghafoor* 338.

Distribution: Spain, N. Africa, Jordan and Palestine.

*Fl.* March-April

CARYOPHYLLACEAE

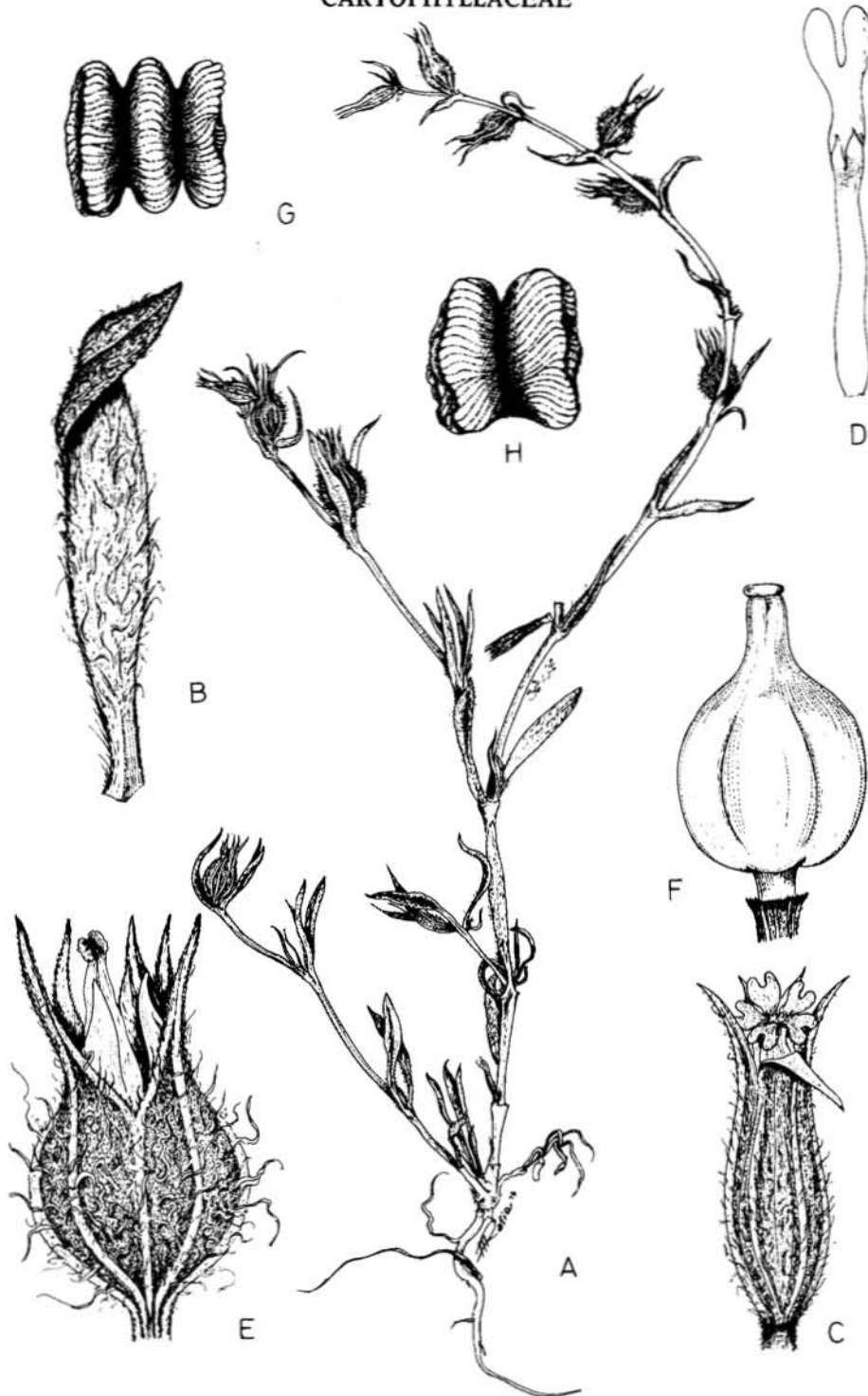


Fig. 22 *Silene tridentata*: A, Habit x 0.75; B, A leaf x 4; C, Flower x 4; D, Petal x 5; E, Fruiting calyx x 5; F, Fruit (calyx removed) x 5; G, H, Seeds x 30.



Fig. 23 *Silene cerastioides*: / Habit x 2; B, Flower x 5; C, Calyx hairs x 10; D, Petal x 5; E, Fruit with calyx x 5; F, Fruit (without calyx) x 7.5; G, Seed (side view) x 50; H, Seed (back view) x 50.

## CARYOPHYLLACEAE

5. **Silene cerastioides** L., Sp. Pl. 417. 1753; Durand & Barratte, Fl. Lib. Prodr. 35 & 315. 1910; Pamp., Pl. Trip. 80. 1914; Prodr. Fl. Ciren. 196. 1931; Quezel & Santa, Nouv. Fl. Alger. 1: 342. 1962; Maire, l.c. 56 fig. 17; Keith, l.c. 895. (Fig. 23).

*S. coarctata* Lag., Nov. Gen. et Sp. No. 193. 1816; *S. tridentata* Desf. var. *coarctata* (Lag.) Pau, Broteria 25: 140. 1931.

Annual, erect, often branched from the base, up to 35 cm tall, antrorsely hispid herb. Leaves lanceolate-subspathulate and attenuate to short petiole below, upper ones sessile, linear-lanceolate, all antrorse hairy ciliate on margins, acute. Flowers small, pink, c. 8 mm across, in lax, racemoid monochasium; pedicels suberect, shorter than the calyx, elongated in fruit; bracts herbaceous, unequal, ciliate on margins. Calyx tube narrowly oblong-clavate at anthesis, 8-11 mm long, ovoid, not umbilicate, strongly contracted both above and below in the fruit, nerves 10, conspicuously anastomosing above, beset with dimorphic indumentum of shorter eglandular hairs and c. 2 mm long articulate subspreading hairs; teeth linear-lanceolate, c. 3-3.5 mm long, ciliate on margins, acute. Petal limb oblong, 3-3.5 mm long, bifid; claws white, free, glabrous, hardly exerted; coronal scales minute, oblong, c. 1 mm long, emarginate to bilobed. Stamens 10, filaments filiform, glabrous; anthers oblong, less than 1 mm long, purplish. Ovary oblong-ovoid, longer than the retrorsely pubescent stipe; styles filiform,  $\pm$  exerted. Capsule ovoid-subglobose, 6-8 mm long, shortly narrowed at the apex; carpophore 2-4 mm long, retrorsely pubescent. Seeds rounded-reniform, dark brown,  $\pm$  0.6 mm long, faces deeply concave, striate, back wide, shallowly obtusely narrow grooved.

Type: Herb. Linn. 583/13 (LINN).

A-2 Talil beach, c. 10 km from Sabrata, drying up, rare, 12.6.1976, *S.M.H.Jafri* & *S.A.Alavi* 6711.

Also reported from Badia, Garian, Mellaha and oudi Ganima by Durand & Barratte (l.c.), Maire (l.c.) and Keith (l.c.).

Distribution: S. Europe and N. Africa (Libya westwards).

*Fl.* March-May

6. **Silene gallica** L., Sp. Pl. 417. 1753; Durand & Barratte, l.c. 35; Pamp., Pl.

CARYOPHYLLACEAE



Fig. 24 *Silene gallica*: A. Habit x 0.5; B. Inflorescence x 1.5; C. Flower x 5; D. Calyx nerve to show hairs x 10; E. Petals and stamens x 3; F. Fruit (calyx removed) x 2.5; G. Seed x 30.

## CARYOPHYLLACEAE

Trip. 81. 1914; Prodr. Fl. Ciren. 195. 1931; Quezel & Santa, l.c. 340; Maire, l.c. 52; Polunin & Huxley, Fl. Medit, 62. fig. 323. 1965; Keith, l.c. 897 (Fig. 24).

*S. quinquevulnera* L., Sp. Pl. 416. 1753; *S. anglica* L., l.c.; *S. lusitanica* L., l.c.; *S. gallica* L. var. *quinquevulnera* (L.) Mert. & Koch in Rohl. Deutschl. Fl. 3: 230. 1831.

Annual, erect, up to 45 (-60) cm tall, hirsute to hispidulous herb often with glandular young shoots. Stem simple to much branched, branches ascending, covered with c. 2 mm long, white, patent hairs and short glandular hairs. Leaves sessile to shortly petioled, oblanceolate or spatulate-oblanceolate, 1.5-7.5 x 0.5-2 cm, attenuate, obtuse and mucronate at the apex, with sparse long whitish hairs. Flowers white or pink, 10-12 mm across, in 1-many, racemoid, subsecund, up to 10-flowered monochasia; pedicels as long as to much shorter than calyx; bracts linear-lanceolate, 8-20 mm long, herbaceous. Calyx tube oblong-cylindrical at anthesis, 7-10 (-11) mm long, ovoid-subglobose, contracted at the apex, and not umbilicate in fruit, 10-nerved, nerves green, non-astamosing, with dimorphic indumentum of long multicellular articulate hairs and short, sand adherent, glandular hairs; teeth linear-lanceolate or  $\pm$  triangular, 2-3 mm long,  $\pm$  recurved; ciliate on margins. Petal limb obovate, 5-6 mm long, entire or emarginate, white or pink, occasionally with a crimson spot in the centre; claws white, c. 8-12 mm long, subconnate, slightly exserted or not; coronal scales oblong, c. 2 mm long, entire or emarginate. Stamens 10, filaments hairy, anthers oblong, 1-1.5 mm long. Ovary oblong, glabrous, on short densely hairy stipe; styles filiform, not exserted. Capsule ovoid-conical, 6-8 x 4-5 mm, included and closely appressed by calyx; carpophore up to 1 mm long, pubescent. Seeds rounded-reniform, c. 1 mm long, dark brown to black, with deeply concave, striate faces and wide, plane or concave back, slightly tuberculate.

Type: Described from France, Herb. Linn 583/11 (LINN).

A-3 Tripoli, University Campus, erect herb, 25-30 cm tall, claw green, limb violet, 25.4.1977, A. Ghaffoor 303; Hadaba Sharqia-University lane, under shade, flowers pink, 30.2.1976, S. M. H. Jafri 6460; El-Faateh University, Faculty of Science garden, erect, densely hairy herb, c. 20-25 cm tall, fls. pinkish-purple, 6.3.1977, A. Ghaffoor 278; 8 km from Tripoli, in orange orchard, 20.11.1975, Fathi, B.R. 14; 58 and 91.



CARYOPHYLLACEAE

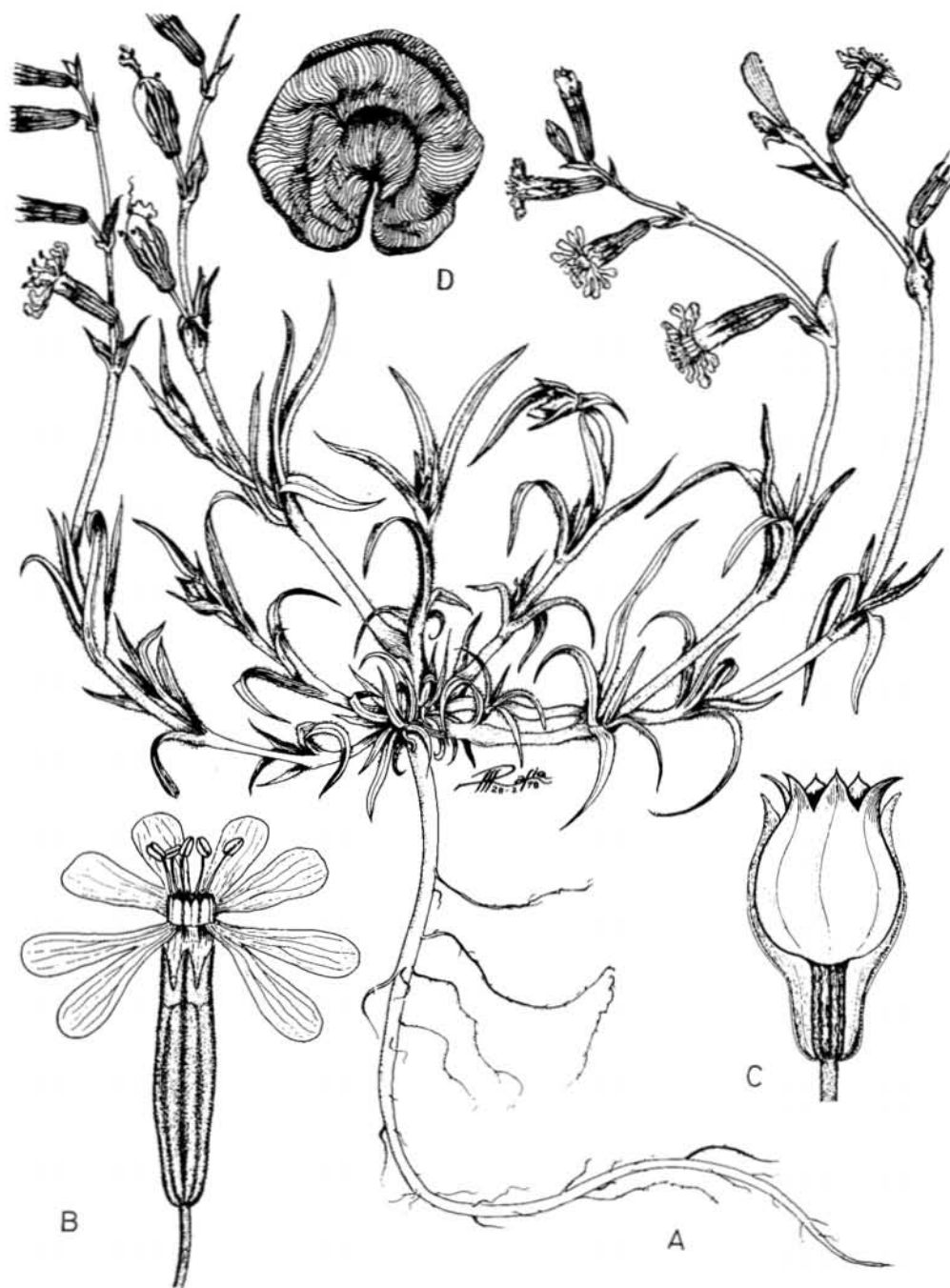


Fig. 25 *Silene colorata*: A, Habit x 0.75; B, Flower x 2.5; C, Fruit (calyx partly removed) x 3; D, Seed x 20.

## CARYOPHYLLACEAE

Distribution: N. Africa, Europe, Asia; introduced and naturalized in New World, E. Tropical Africa and Australia.

Common weed of cultivated fields, gardens and waste places in coastal belt in Libya and elsewhere.

Fl. November-April

7. ***Silene colorata*** Poiret, Voy. Barb. 2: 163. 1789; Durand & Barratte, l.c. 36; Pamp., Pl. Trip. 80. 1914; Prodr. Fl. Ciren. 196. 1931; Quezel & Santa, l.c. 340; Maire, Fl. Afr. Nord 10: 112. 1963; Polunin & Huxley, l.c. 63. pl. 16; Keith, l.c. 855. (Fig. 25).

*S. bipartita* Desf., Fl. Atl. 1: 352. t. 100. 1798; *S. ligulata* Viv., Fl. Lib. Spec. 24. t. 12. f. 3. 1824; Tackholm, Stud. Fl. Egypt ed. 2. 89. 1974; *S. leucophaea* Sibth. et Sm., Fl. Graec. Prodr. 1: 297. 1809.

Annual, decumbent to erect, up to 50 cm tall, simple or diffusely branched, retrorsely appressed pubescent, hispid or puberulent herb. Leaves sessile or lower petioled, ovate-spathulate or linear-oblong to oblong-lanceolate, 3-10 x up to 1.5 cm, puberulent to almost glabrous, ciliate on margins, acute or obtuse. Flowers bright pink or sometimes whitish, c. 12-20 mm across, in a lax scorpioid monochasium; pedicels mostly shorter than calyx, retrorse hairy; bracts of a pair usually unequal, as long as or shorter than pedicels. Calyx tube cylindrical at anthesis, 10-14 (-18) mm long, slightly inflated, broadly clavate and not contracted at the apex in fruit, umbilicate, 10-nerved, nerves red, purple or green, non-anastomosing, appressed puberulent on nerves alone; teeth ovate, 1.5-4.5 mm long, obtuse, densely ciliate. Petal limb obovate, 5-9 mm long, deeply bipartite into oblong-linear or narrowly oblanceolate-obovate lobes; claws usually long exserted, 12-20 mm long; coronal scales white, obovate to oblong-lanceolate, c. 2-3 mm long, obtuse or  $\pm$  acute rarely retuse. Stamens 10, filiform, glabrous; anthers oblong, c. 1.5-1.75 mm long, yellow, exserted. Ovary oblong-cylindrical, stipitate, as long as or longer than the retrorse hairy stipe; styles exserted. Capsule ovoid, 8-10 mm long, usually included, rarely  $\pm$  exserted; carpophore 4-8 mm long, usually included, rarely  $\pm$  exserted; carpophore 4-8 mm long, retrorse hairy. Seeds rounded-reniform, 1-1.5 mm long, dark brown, faces plane and smooth to somewhat tuberculate, deeply grooved with 2 undulate or wavy wings.

Type: Described from N. Africa, probably near Tunis, 1785-86, *Poiret* (P.)

CARYOPHYLLACEAE

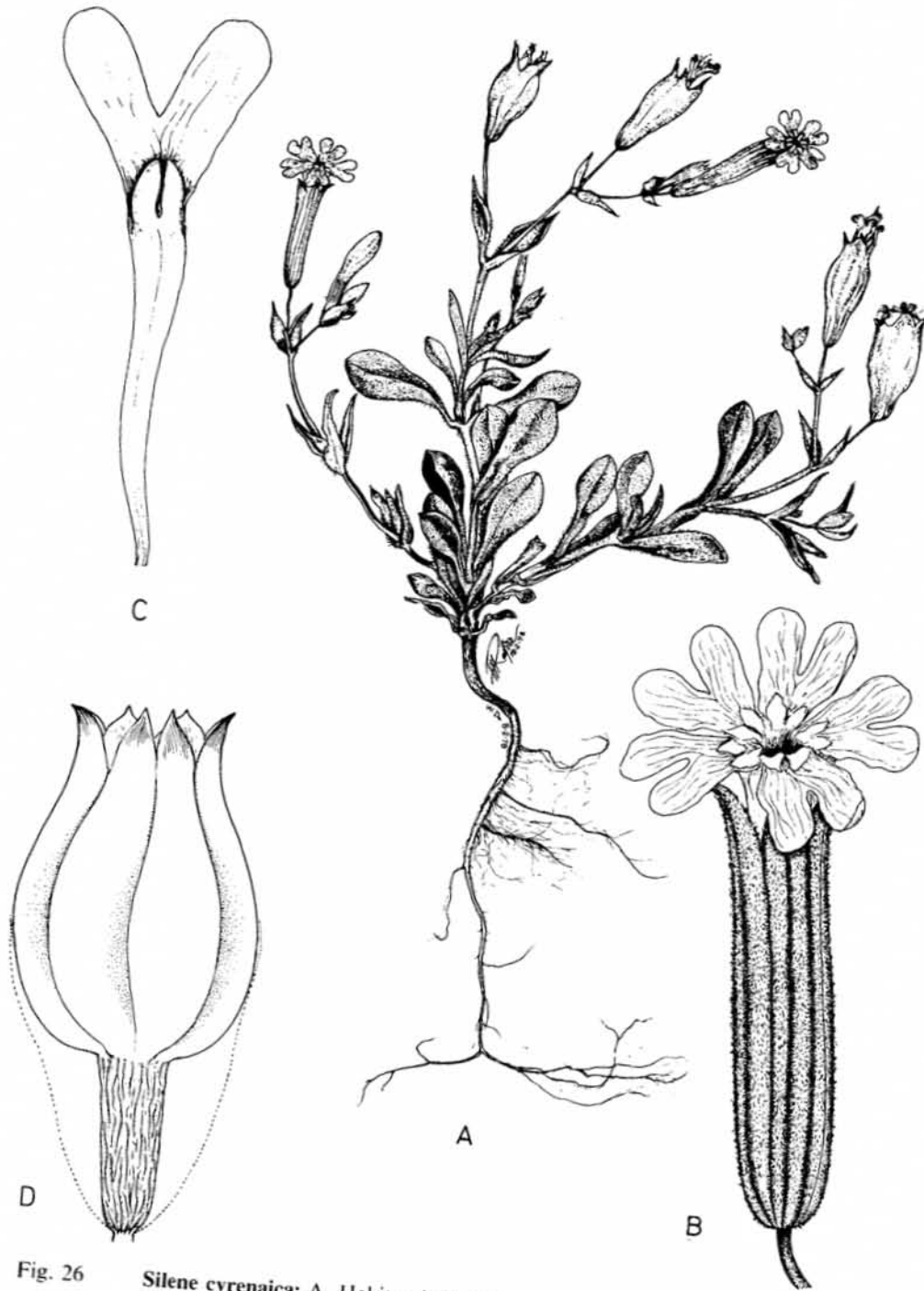


Fig. 26 *Silene cyrenaica*: A. Habit x 1; B. Flower x 4; C. Petals x 5; D. Fruit x 5.

## CARYOPHYLLACEAE

**A-2** 5 km after Asaba (c. 24 km from Garian) near cultivated field, flowers pink, c. 40 cm tall, 9.4.1974, *S.I.Ali* 1775; Reana, sandy plain, moist soil, c. 25-35 cm tall, fls. pink, 5.5.1972, *S.I.Ali* & *M.M.Khalifa* 411; c. 10 km from Zuara on way to Ferua, sandy soil, prostrate-ascending, flowers pinkish white, 25.11.1976, *A. Ghafoor* & *S.A.Alavi* 117; **A-3** Tripoli, Barley fields facing Faculty of Science, Sidi El-Masri, in sandy soil, 18.4.1967, *L. Boulos* 1665; *Ibid.* erect herb, c. 15 cm tall, fls. purple, 6.3.1977, *A. Ghafoor* 279; *ibid.*, c. 35-45 cm tall, sandy soil, common, fls. pink, 1.4.1977, *A. Ghafoor* 295; *ibid.*, sandy reddish soil, common, fls. pink-violaceous, 1.3.1976, *S.M.H.Jafri* 6420; Fundak Tugar, c. 32 km from Tripoli, sandy soil, wet ground, c. 25 cm tall, fls. pink, 6.4.1972, *S.I.Ali* 94 & 95; 8 km from Tripoli University, 4.1.1976, *Fathi, B.R.* 82; 6 km from Tarhuna (Maryyad's Farm), c. 40 cm tall, fls. pink, petals divided, 14.4.1972, *S.I.Ali* 192; **B-2** Kaleba, c. 30 km from Garian, barley field, sandy soil, flowers pink, 10.4.1974, *S.I.Ali* 1908; 24 km from Mizda towards Al-Ghariat, 13.2.1977, *M.A. Siddiqi* 23; **B-4** 2 km from Sirte, 7.1.1977, *M.A.Siddiqi* 78.

Distribution: S. Europe, Turkey, Russia, N. Africa, eastwards to Arabia and Pakistan.

A very common and widely distributed species, very variable in habit, hairiness, calyx length and petal colour. These characters have insufficient correlation, at least in our area, and hence no infraspecific taxa are worth recognizing here.

*Fl.* Jan-June *Vern.* Ommagrain

8. *Silene cyrenaica* Maire & Weiller in Bull. Soc. Hist. Nat. Afr. Nord 30: 267. 1939; in Maire, Cat. 2667. 1939; Fl. Afr. Nord 10: 110. fig. 39. 1963; Keith, Prelim. Check List Lib. Fl. 896. 1967 (Fig. 26).

Annual, erect to ascending, up to 30 cm tall herb. Stem simple or basally branched, retrorsely short appressed pubescent to glabrescent below,  $\pm$  villous with up to 1 mm long whitish, articulate hairs above. Leaves up to 2.5 cm long, lower obovate-oblongate, obtuse-mucronate and attenuate to a short petiole, upper ones elliptic-lanceolate, acute, all ciliate on margins and hispid hairy on both sides. Flowers purplish-pink, 1.5-1.8 cm across, in a 2-6-flowered lax helicoid monochasium; pedicels erect, retrorsely appressed hairy, shorter than the calyx; bracts green, lanceolate, shorter to equalling the pedicels, ciliate on margins, acute. Calyx tube oblong-cylindrical at anthesis, 13-16 mm long,  $\pm$  umbilicate, clavate-turbinate and not contracted at the apex in fruit, 10-nerved, nerves green to

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purplish, antrorsely appressed-puberulent throughout; teeth triangular-ovate, 3-4 mm long, ciliate and whitish on margins. Petal limb obovate-cuneate, 7-8 mm long, divided into oblong-linear, subtruncate lobes; claws white, included,  $\pm$  connate at the apex; coronal scales oblong-linear, c. 2 mm long, obtuse, subtruncate to retuse at the apex,  $\pm$  connate. Stamens 10, filaments filiform, glabrous; anthers oblong, c. 1 mm long, greenish-yellow. Ovary oblong, shorter than the retrorse hairy stipe. Capsule ovoid-oblong, 7-9 mm long, slightly exerted or not; carpophore shorter than the capsule, 5-6 mm long, retrorsely pubescent. Seeds rounded reniform, c. 2 mm long, faces plane, back grooved with 2 undulate wings.

Type: Described from Libya (Cyrenaica).

A-7 Wadi Mahbool, coastal road from Baida to Derna, fls. pink, 1.3.1973, *S.I.Ali* & *S.A.Faruqi* 1076; Gebel El-Akhdar, 26 Feb-3rd March 1973, *Nuria El-Migirby* s.n.; Wadi El-Mahbool, erect herb, c. 15 cm tall, pink flowers, 1.3.1973, *A. El-Tiafe* 22.

Distribution: Endemic to Libya.

Fl. Feb.-April

9. ***Silene articulata*** Viv., Fl. Libyc. Spec. 23, tab. 12, fig. 1. 1824; Pamp., Prodr. Fl. Ciren. 195. 1931; Maire, Fl. Afr. Nord 10: 127. fig. 44. 1963; Keith, l.c. 895.

*S. gallica* L. var. *articulata* (Viv.) Durand & Barratte, Fl. Lib. Prodr. 35. 1910; Pamp., Pl. Trip. 81. 1914.

Annual, erect, up to 35 cm tall,  $\pm$  hairy herb with articulated, often unbranched stem. Leaves sessile, lanceolate to linear-lanceolate above, oblanceolate-spathulate below, hispid-pubescent to glabrescent,  $\pm$  connate vaginate at the base, ciliate on margins, obtuse to acute. Flowers pale-pink, 10-12 mm across, few-flowered monochasia, pedicels longer to shorter than calyx, retrorsely hairy; bracts green, lanceolate, pubescent to glabrescent, ciliate on margins, acute. Calyx tube oblong-cylindrical at anthesis, 13-16 mm long, ovoid-subglobular to pyriform and not or hardly contracted at the apex in fruit, slightly contracted at the non-umbilicate base, 10-nerved, nerves with dimorphic hairs, shorter hairs appressed and long ones spreading, multicellular, articulate and c. 3 mm long; teeth lanceolate, 3.5-4 mm long, scarios on margins, sparsely to densely ciliate. Petal limb obovate-cuneate, 4-5 mm long, 2-fid to c. 1/3-0.5 into oblong-obtuse lobes; claw

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white, not exerted; coronal scales oblong, c. 2 mm long. Stamens 10, filaments glabrous; anthers linear-oblong, c. 1.5 mm long, purplish. Ovary ovoid, stipitate, slightly shorter than pubescent stipe, glabrous; styles filiform, included. Capsule ovoid, 10-12 mm long, included; carpophore c. 3 mm long, finely retrorse pubescent. Seed rounded reniform, much compressed,  $\pm$  2 mm long, with 2 undulate wings, finely punctate-papillose.

Type: « Habitat in Littore Magnes Syrteos ».

Reported from Benghazi & Tobruk etc by Durand & Barratte (l.c.), Maire (l.c.) and Keith (l.c.).

Distribution: Endemic

This species was reduced to a var. of *S. gallica* L. by Durand & Barratte (l.c.) but seems to differ from it by its longer calyx tube and teeth, c. 3 mm long carpophore rather than c. 2 mm long, seeds with 2 undulate wings. Herbarium specimens are needed for studies to ascertain its true nature.

Fl. March-April

10. ***Silene apetala*** Willd., Sp. Pl. 2: 703. 1799; Durand & Barratte, l.c. 36; Pamp., Pl. Trip. 80. 1914; Prodr. Fl. Ciren. 197. 1931; Corti; Fl. & Veg. Fezzan 104. 1942; Quezel & Santa, Nouv. Fl. Alger. 1: 339 & 355. 1962; Maire, l.c. 107 fig. 35; Keith, l.c. 894. (Fig. 27).

*S. decipiens* auct. non Ball (1877): Barce in Ann. Soc. Esp. Hist. Nat. 8: 340. 1879.

Annual, erect, up to 40 cm tall, appressed-pubescent herb. Stem simple or dichotomously branched from base, beset with retrorse deflexed hairs. Leaves sessile to  $\pm$  petiolate-attenuate, lanceolate or linear-lanceolate to narrowly oblanceolate, upper ones ovate-lanceolate, up to 4 x 0.5 (-0.7) cm, marginally ciliate, acute. Flowers c. 5 mm across, in terminal and lateral monochasium or in irregular and somewhat congested cymes; pedicels varying in length, up to 3 cm long, lower as long or up to thrice the length of calyx, upper shorter; bracts ovate-lanceolate, ciliate. Calyx tube ellipsoid-cylindrical at anthesis, 6-10 mm long, broadly campanulate and neither contracted nor umbilicate in fruit, 10-nerved, nerves green, purple or red, appressedly antrorse puberulent or hispid with up to 2 mm long,

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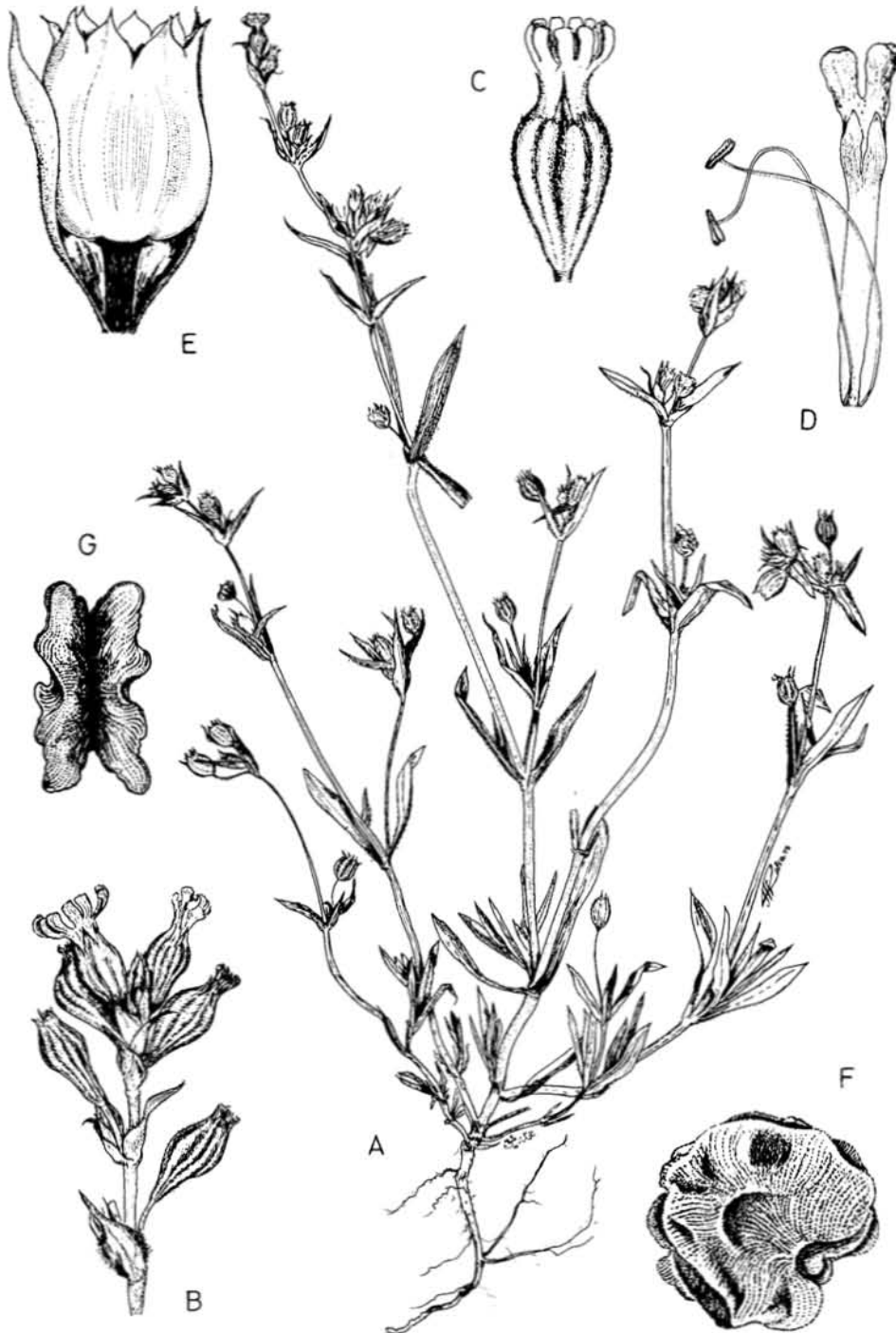


Fig. 27 *Silene apetala*: A, Habit x 0.5; B, Inflorescence x 1.5; C, Flower x 3; D, Petal x 5; E, Fruit (calyx partly removed) x 5; F, Seed (side view) x 30; G, Seed (back view) x 30.

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non-articulate hairs; teeth triangular-lanceolate. 2-3 mm long, acute with scarious ciliate margin. Petals absent or if present usually included rarely slightly exerted with bifid, up to 3 mm long, pinkish or white limb and white glabrous claws; coronal scales truncate or retuse. Stamens 10, filaments filiform, glabrous, usually longer than petals, anthers ovoid, c. 0.5 mm long, yellow. Ovary ovoid, minutely stipitate; styles shorter than ovary, included. Capsule ovoid-subglobose, 6-8 mm long; carpophore up to 2 mm long, hairy. Seeds rounded-reniform, c. 1 mm long, dull blackish-brown, faces plane, deeply grooved on back with undulate wings.

Type: Not designated

**A-2** Hansheer boyedder, after Janduba, near Gharian, erect, widely distributed, 8.4.1974, *G. Faris* 207; **A-3** Tripoli, Faculty of Agriculture farms, Al-Faateh University, sandy soil, common, erect herb, 25-35 cm tall, flowers without petals, 1.4.1977, *A. Ghafoor* 292; *ibid*, c. 30-40 cm tall, capsule dehiscent by 6 apical teeth, 6.3.1977, *A. Ghafoor* 280; Tripoli, Shara Ashur, 11-32 cm tall, growing near wall, 6.1.1972, *S.I.Ali* s.n.; 20-23 km E. Tripoli along the seashore road to Khoms, 8.3.1967, *L. Boulos* 1562; Tripoli, Faculty of Science, Sidi El-Masri, 22.4.1967, *L. Boulos* 1746; Leptis Magna, 8.3.1968, *L. Boulos* 1820; Near Tripoli Air Port, 100 m, sandy fields (irrigated), annual, 5 April 1970, *Davis & Boulos* D 50587; **A-6** Qaminis-Benghazi road 9.3.1968, *L. Boulos* 1993; Mirawa near Benghazi, 2.3.1973, *S.I.Ali* 1217; 19-25 km S.E.Derna, 13.3.1968, *L. Boulos* 2317.

Distribution: S. Europe, Turkey, N. Africa, eastwards to Pakistan and Asia; introduced in Tropical Africa.

Common in the maritime sandy zone throughout Libya.

*Fl.* March-April

11. ***Silene vulgaris*** (Moench) Garcke, *Fl. Nord Mitteldeutsch.* ed. 9. 64. 1869; Polunin & Huxley, *Fl. Medit.* 62. 1965 (Fig. 28).

*Behen vulgaris* Moench, *Meth.* 709. 1794; *S. cucubalus* Wibel., *Prim. Fl. Wert.* 241. 1799; Durand & Barratte, *l.c.* 34; Quezel & Santa, *l.c.* 337; Maire, *Fl. Afr. Nord* 10: 33. fig. 8. 1963; *Cucubalus behen* L., *Sp. Pl.* 414. 1753 (non *S. behen* L. 1753); *C. venosus* Gilib., *Fl. Lithuan.* 2: 165. 1781-*nom. illegit.*; *S. venosa* (Gilib.) Aschers., *Fl. Brandenb.* 2: 23. 1859; Pamp., *Prodr. Fl. Ciren.* 195. 1931; Keith, *l.c.* 900; *C. inflatus* Salisb., *Prodr. Stirp.* 302. 1796 - *nom. illeg.*; *S. inflata* (Salisb.) Sm., *Fl. Brit.* 467. 1800; Keith, *l.c.* 897; *S.*



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Fig. 28 *Silene vulgaris*: A, Flowering branch x 0.75; B, Flower x 2.5; C, Petals x 2.5; D, Stamen x 2.5; E, Fruiting calyx x 2.5; F, Fruit x 2.5; G, seed x 15.

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*latifolia* (Miller) Rendle & Britton, List Brit. Seed Pl. 5. 1907.

Perennial, erect, up to 1 m tall, often basally woody, usually glabrous-glaucous or sometimes pubescent herb with or without stolons. Stem branched above. Leaves sessile and vaginate above, basal or lower petiolate, lanceolate to ovate-lanceolate or elliptic-oblong to obovate, (3-) 4-10 x 1-3 cm, acute-acuminate. Flowers white, rarely pinkish, c. 1.8-2 cm across, bisexual and unisexual, few to many in loose compound dichasium; pedicels as long as to much longer than the calyx, glabrous; bracts mostly scarious, triangular-lanceolate, 6-10 mm long, acute. Calyx tube ovoid-vesiculose, 10-18 (-21) x 8-12 mm, membranous, green to purplish, inflated in flower and fruit, umbilicate, not contracted at the apex, glabrous, 15-20-nerved, nerves reticulately anastomosing, glabrous; teeth broadly triangular, c. 2 mm long, marginally ciliate, acute. Petal limb obovate-cuneate, 6-8 mm long, deeply bipartite, white to pink, sometimes red; claw glabrous, long exserted; coronal scales gibbous or occasionally absent. Stamens 10, filaments glabrous, exserted; anthers oblong, 1.5-2.5 mm long, yellow to  $\pm$  purplish. Ovary oblong, glabrous, minutely stipitate; styles filiform, exserted. Capsule broadly ovoid-subglobose, 6-15 x 8-10 mm, included and loosely enveloped by calyx; carpophore c. 2-3 mm long, glabrous. Seeds rounded-reniform, c. 1.5 mm long, tuberculate.

Type: « In Europae septentrionalioris pratis Siccis ».

A-2 Ain Rumia Gebel Nefousa, 1.12.1967, *L. Boulos* 1846; Ain El Romiah, 9.4.1974, *G. Faris* 352; *ibid*, white flowers, 9.4.1974, *Karima Ratimi* 129; Garian, 23.3.1967, *Issa S. Farage* 37; A-7 Wadi Derna, 20.1.1967, *L. Boulos* 1252; *ibid*, 14.3.1968, *L. Boulos* 2380.

Distribution: Europe, N. Africa eastwards to most of Asia; introduced in N. and S. America.

A highly polymorphic and extremely variable species and often divided into a number of infraspecific taxa on the basis of habit, presence or absence of stolons, shape of leaves, colour of petals, lack or presence of coronal scales, size of carpophore and tuberculations of seeds. More material is needed for further studies in this species from the area.

*Fl.* March-July *Vern.* Ragal

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Fig. 29 *Silene succulenta*: A. Flowering and fruiting branch x 1; B. Flower x 2; C. Petal x 1.5; D. Fruit (calyx removed) x 2; E. Seed x 30.

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12. *Silene succulenta* Forsk., Fl. Aegypt. 71 & 89. 1775; Durand & Barratte, l.c. 37; Pamp., Pl. Trip. 83. 1914; Prodr. Fl. Ciren. 198. 1931; Maire, l.c. 161. fig. 57; Keith, l.c. 899 (Fig. 29).

*S. corsica* DC., in Lam., Fl. Fr. 4: 756.1805; *S. cryptantha* Viv., Fl. Lib. Spec. 23. t. 9. f. 3. 1824; *S. succulenta* var. *cryptantha* (Viv.) Durand & Barratte, l.c.

Perennial, basally woody, up to 40 cm tall, fleshy herb densely beset with viscid sand adherent glandular papilla-like hairs. Stem diffusely branched from the base, branches articulate, procumbent or ascending. Leaves sessile, obovate or oblanceolate-oblong to lanceolate, 10-40 x 5-15 (-20) mm, shortly connate-vaginate at the base, ciliate on margins, obtuse or subacute at the apex, fleshy. Flowers white or pinkish-white, c. 1.5-1.8 cm across, shortly pedunculate; pedicellate, pedicels up to 1 cm long, elongated in fruit, solitary or paired in axils of lanceolate leafy bracts, forming a raceme-like inflorescence. Calyx tube oblong-cylindrical at anthesis, 1.5-2.0 cm long,  $\pm$  umbilicate-clavate in fruit, 10-nerved, nerves greenish or reddish glandular-hairy; teeth lanceolate or subulate, 5-6 (-8) mm long, acute, ciliate. Petal limb obovate to obovate-oblong, 2-fid to c. 1/3-1/2, c. 1 cm long, white with pinkish-tinge; claws long exerted, white, strap-shaped, c. 20-25 mm long; coronal scales broadly ovate, conspicuously toothed. Stamens 10, filaments glabrous; anthers oblong, 1.5-1.8 mm long, brown. Ovary oblong, c. 5 mm long, glabrous; stipe c. 8 mm long, densely villous; styles 3, filiform, c. twice as long as the ovary. Capsule oblong, slightly longer than the deflexed-hairy carpophore. Seeds rounded-reniform, c. 1 mm long,  $\pm$  smooth or finely striate, brown.

Type: Described from Egypt

**A-2** Tilel, c. 11 km from Sabrata on way to Zuara c. 3 km towards North from highway, prostrate to suberect, fls. pinkish-white, 25.11.1976, A. Ghafoor & S.A. Alavi 43; *ibid*, sandy soil, A. Ghafoor & S.A. Alavi 50; Sabrata, 10.2.1967, L. Boulos 1516; **A-3** 10-20 km E. Tripoli, along the coastal road to Khoms, in maritime sand, 22.11.1966, L. Boulos 1007; Ras-el Masan, c. 110 km from Tripoli, before Khoms, c. 20 cm tall, branches spreading, growing near wall in clump, limestone hillock, 23.3.1972, S.I. Ali 43; Leptus Magna, erect, 25-30 cm tall, flowers white, 29.3.1975, S.I. Ali 2588; Labda, 29.3.1967, L. Boulos s.n.; Aulad Mohammed, near sea beach, a succulent perennial herb, flowers pinkish-white, 13.5.1977, M.A. Siddiqi & A. Ghafoor 229; **A-6** Dariana, c. 40 km from Benghazi, c. 0.5 km from sea, near cultivated field, 16.6.1972, S.I. Ali 445.

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Distribution: S. Europe, N. Africa, Palestine, Lebanon, Corsica, Sardinia and Crete.

A common plant in the maritime sands.

The plant parts, particularly roots, contain considerable quantity of saponine and are used as detergent for washing wool in Benghazi area.

*Fl.* Feb.-July     *Vern.* Ghassul, Rhasul, Rorhol, Tefel

13. ***Silene fruticosa*** L., Sp. Pl. 417. 1753; Pamp., Prodr. Fl. Ciren. 199. 1931; Maire, l.c. 242. fig. 91; Chatter & Williams in Tutin *et al*, Fl. Europ. 1: 164. 1964; Keith, l.c. 897; Coode & Cullen, in Davis, Fl. Turk. 2: 193. 1967.

Perennial, up to 60 cm tall shrublet with older parts almost glabrous and  $\pm$  viscid younger shoots, branched from the base. Leaves obovate to narrowly spatulate-oblongate below, lanceolate above, all glabrous with tough shining papillae,  $\pm$  connate-vaginate at the base, ciliate on margins, acute. Flowers large, pink or red, 2-2.5 cm across, in a dense, usually unbranched raceme; pedicels upright, much shorter than the calyx and bracts; bracts green, lanceolate, glabrous, scarious and ciliate on margins. Calyx tube subcylindrical at anthesis, (18-) 20-24 (-25) mm long, clavate and not contracted at the apex in fruit,  $\pm$  umbilicate, 10-nerved, patently glandular hairy; teeth ovate-lanceolate, 4-4.5 mm long, unequal, acute, densely ciliate on scarious margins. Petal limb obovate-cuneate, 9-12 mm long, shallowly bifid with obovate, obtuse lobes; claws white, shortly exserted, glabrous; coronal scales ovate-oblong, c. 1 mm long, entire or sometimes laciniate, acute, pink. Stamens 10, filaments filiform, glabrous; anthers oblong, c. 2 mm long, yellowish-white, exserted. Ovary oblong-cylindrical, as long as the stipe; styles filiform, exserted, violaceous. Capsule ovoid, 13-17 mm long, beaked, included in the calyx; carpophore 7-10 mm long, sometimes equalling the fruit, glabrous. Seeds rounded-reniform, c. 1.5 mm long, faces plane or slightly concave, striate, obtusely grooved on the back.

Type: Described from Sicily, Herb. Linn. 583/24 (LINN).

Reported by Pampanini (l.c.), Maire (l.c.) and Keith (l.c.) from Cyrenaica (Wadi Derna).

Distribution: Greece, Aegean Islands, Turkey, Cyprus, Sicily and Libya (Gebel Akhdar).

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14. ***Silene italica*** (L.) Pers., Synops., Pl. 1: 498. 1805; Maire, l.c. 260. fig. 97; Chatter & Walters in Tutin *et al.*, l.c. 163; Keith, l.c. 898; Coode & Cullen in Davis, l.c. 192.

*Cucubalus italicus* L., Syst. Nat. ed. 10. 1030. 1759; *S. sieberi* Fenzl, Pug. 22. 1842; *S. papillifolia* Williams in J. Linn. Soc. Bot. 32: 91. 1896.

Perennial, erect, up to 80 cm tall, branched from the woody rootstock, beset with soft short pubescence especially in the lower parts, viscid above. Leaves obovate-lanceolate, up to 8 cm long, lower petioled, upper linear-lanceolate, sessile and 2-3 cm long, pubescent, ciliate on margins, acute. Flowers creamy-white, c. 15-18 mm across, in large lax panicles bearing 3-flowered dichasia on ascending opposite viscid branches; pedicels of alar flowers as long as or longer than calyx, the rest shorter; bracts linear or linear-lanceolate, lower green, upper  $\pm$  membranous. Calyx tube somewhat tubular-obconical at anthesis, (11-) 14-22 mm long, purplish, clavate and not contracted at the apex in fruit, umbilicate, 10-nerved, nerves green or red, glandular-pubescent or sparsely puberulous to glabrescent; teeth ovate, obtuse, margins white-ciliate. Petal limb obovate-cuneate, 6-8 mm long, deeply bifid into oblong-oblancoate lobes; claws white, shortly exerted, glabrous; coronal scales very small or absent. Stamens 10, filaments filiform, glabrous; anthers oblong, 1.25-2.5 mm long, purplish. Ovary oblong, shorter than the pubescent stipe; styles filiform, white to purplish above, exerted. Capsule ovoid-oblong, 8-10 (-12) mm long, included in the calyx; carpophore shorter to more or less equalling the capsule, retrorsely pubescent. Seeds rounded-reniform, 1-1.5 mm long, faces plane, obtusely grooved on the back.

Type: Described from Italy, Herb. Linn. 582/13 (LINN).

Reported by Maire (l.c.) and Keith (l.c.) from Cyrenaica (Macchia, El-Abrag & Lamouda).

Distribution: Europe, N. Iran, Syria, S. Russia (Crimea, Caucasia & Turkestan) Turkey, Palestine and Libya (Gebel Akhdar).

*Fl.* April-July

15. ***Silene marmarica*** Beg. & Vacc. in Ann. di Bot. 12: 100. 1913; Pamp., Fl. Cir. 199. 1931; Maire, l.c. 253; Keith, l.c. 898.

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Perennial, basally woody, somewhat retrorse pubescent, erect to ascending herb with minutely glandulose tender shoots and inflorescence. Leaves thickened, sessile, lower obovate-spathulate,  $\pm$  obtuse, upper and middle ones lanceolate, acute to  $\pm$  acuminate, dotted by remains of basally tubercled retrorse hairs on both sides, ciliate-scabrous on margins. Flowers greenish-white, 18-20 mm across, in a terminal lax panicle; pedicels longer than bracts but shorter than the calyx, glandular-hairy; bracts green, linear-lanceolate to linear, densely ciliate on margins. Calyx subcylindrical at anthesis, 23-27 mm long, clavate,  $\pm$  umbilicate and attenuate at apex, glandular, 10-nerved, nerves green, filiform, branched reticulately in upper part; teeth 4-4.5 mm long, all acute, outer lanceolate, whitish-membranous and densely ciliate on margins, inner ovate-lanceolate, broad margined with sparse cilia. Petal limb obovate-cuneate, c. 8 mm long, shortly 2-lobed, lobes c. 1.5 mm long; claws moderately exerted, glabrous; coronal scales ovate-lanceolate, less than 1 mm long, free. Filaments glabrous, filiform. Ovary oblong, hardly equalling the stipe, styles filiform. Capsule ovoid-conical, c. 15 x 6 mm, broadly attenuate at the apex, not or slightly exceeding the calyx; carpophore 9-10 mm long, straight, almost glabrous except the retrorse pubescent base,  $\pm$  adherent to calyx tube (Maire, l.c.)

Type: Described from Tobruk (Libya).

Distribution: Endemic and known from type gathering only.

*Fl.* May-June

16. ***Silene muscipula*** L., Sp. Pl. 420. 1753; Pamp., Pl. Trip. 82. 1914; Corti, Fl. & Veg. Fezzan 103. 1942; Quezel & Santa, Nouv. Fl. Alger. 1: 346 & 357. 1962; Maire, l.c. 226. fig. 84; Chatter & Walters in Tutin *et al.*, l.c. 176; Keith, l.c. 898.

*S. arvensis* Loscos, Trat. Pl. Arag. 31. 1863 (non Salisb. 1796).

Annual, erect, up to 60 cm tall, glabrous herb with younger shoots occasionally viscid. Leaves sessile, lower oblanceolate-spathulate, upper linear-lanceolate, up to 6 x 2 cm, narrowed at the base, glabrous. Flowers pink, 8-10 mm across, in terminal, many-flowered, more or less regularly branched dichasium; pedicels much shorter than calyx; bracts linear, usually as long as or longer than the calyx, scarious at the base. Calyx tube oblong-cylindrical at anthesis, (12-) 13-17 mm long, not contracted at the apex and oblong-clavate in fruit, umbilicate, glabrous, 10-nerved, nerves anastomosing, green or  $\pm$  reddish; teeth ovate-lanceolate, c. 2

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mm long, acute. Petal limb cuneate, obovate, 3-3.5 mm long, deeply emarginate or shortly notched; claws white, not or hardly exerted, glabrous; coronal scales oblong, 1.5-2 mm long, bifid. Stamens 10, filaments filiform, glabrous; anthers oblong, 1-1.25 mm long, yellow. Ovary oblong-cylindrical, stipitate, equal to slightly longer than the retrorse hairy stipe; styles filiform, exerted. Capsule oblong, 8-10 (-12) mm long, slightly exerted; carpophore 3-6 (-7) mm long, hairy. Seeds rounded-reniform, c. 1-1.2 mm long, faces plane, finely tuberculate, obtusely grooved on back, dark brown to blackish-brown.

Type: Described from Spain.

Reported from Tarhuna and Garian by Pampanini (l.c.), Maire (l.c.) and from Sebha by Corti (l.c.). Keith (l.c.) has also reported it from Bu Gheilan.

Distribution: S. W. Europe, N. Africa, Canary Isles and Palestine.

Fl. March-June.

17. *Silene rubella* L., Sp. Pl. 419. 1753; Durand & Barratte, Fl. L. Lib. Prodr. 38. 1910; Pamp., Pl. Trip. 83. 1914; Prodr. Fl. Ciren. 199. 1931; Quezel & Santa, Nouv. Fl. Alger. 1: 348. 1962; Maire, Fl. Afr. Nord 10: 205. fig. 76. 1963; Keith, Prelim. Check List Lib. Fl. 899. 1965 (Fig. 30).

*S. segetalis* Dufour in Bull. Soc. Bot. Fr. 7: 241. 1860.

Annual, erect, up to 60 cm tall, minutely puberulent herb. Stem basally branched or simple, retrorsely appressed hairy. Leaves sessile, lower obovate-spathulate to obovate-oblong, upper ones oblong-lanceolate, 1.5-8 x 0.5-2 cm, pubescent, obtuse, subundulate. Flowers pink, c. 10-12 mm across, 2-6 together in pedunculate, terminal dichasia with erect alar flower; lower pedicels up to 1.5-3.5 cm long, upper ones shorter. bracts leafy, ovate to ovate-lanceolate, acute. Calyx tube broadly oblong-obconical at anthesis, 8-12 mm long, pinkish or purplish-white, turbinate or subclavate, apically non-contracted in fruit, 10-nerved, antrorsely puberulent all-round; teeth broadly ovate-oblong, c. 1.25 mm long, very obtuse, ciliate on margins. Petals limb obovate-cuneate, c. 4 mm long, emarginate; claws white, slightly exerted or not, glabrous,  $\pm$  connate at the apex; coronal scales linear-oblong, c. 1 mm long, obtuse. Stamens 10, filaments filiform, glabrous, anthers oblong, c. 1 mm long, yellow. Ovary oblong, nearly as long as retrorsely pubescent stipe; styles not exerted. Capsule oblong-ovoid, 7-8 mm long, pale;



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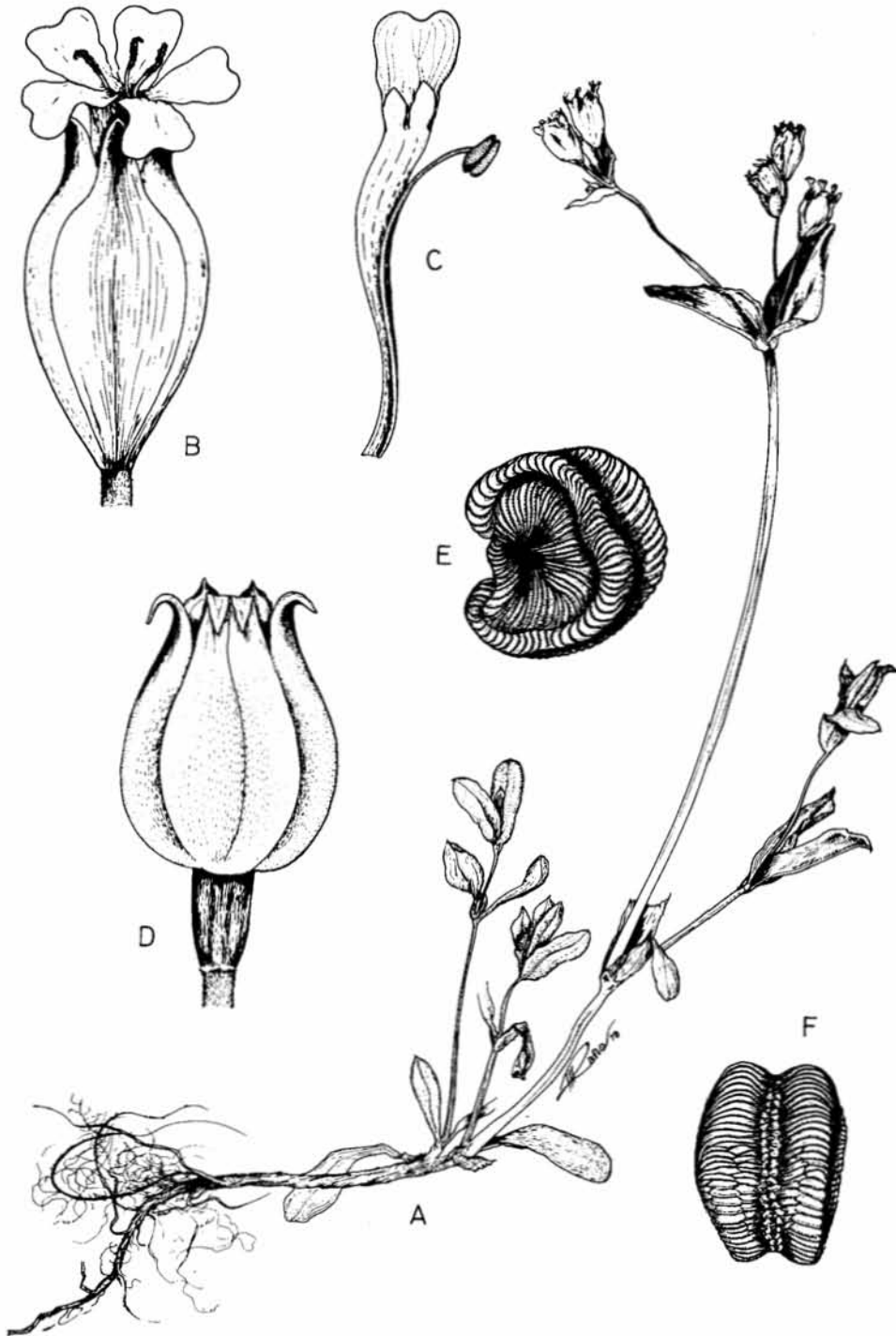


Fig. 30 *Silene rubella*: A, Habit x 0.75; B, Flower x 5; C, Petal x 5; D, Fruit x 5; E, Seed (lateral view) x 30; F, Seed (back view) x 30.

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carphophore 2-3.5 mm long, retrorsely puberulent. Seeds rounded-reniform, 0.75-1 mm long, excavate or  $\pm$  concave on faces, obtusely grooved on moderately wide back, tubercled.

Type: «Habitat in Lusitania», Herb. Linn. 583/43 (LINN).

**A-2** 3 km from Garian town, hills, 13.4.1973, *S.A.Faruqi* s.n.; **A-3** 15 km from Benghashir, sandy soil, cultivated area, erect, c. 20 cm tall, pink flowers, 25.3.1976, *M.A.Terbellou* 13; Sof el Subat, sandy soil, fls. rose with yellow anthers, 25.3.1976 *Abdul Latif M. Dlango* 7; **A-7** Gebel Akhdar, 26.2.1973, *Samira & Nuria* s.n.; Emrawh, near Shahat, 2.3.1977, *A. Eltiafe* s.n.

Distribution: S. W. Europe, North Africa and Palestine.

Cultivated fields and waste places in the maritime zone in Gebel Akhdar, Gebel Nefousa area.

*Fl.* March-April

18. *Silene fuscata* Link in Brot., *Fl. Lusit.*, 2: 187. 1804; Durand & Barratte, l.c. 38 & 315; Pamp., *Pl. Trip.* 81. 1914; Quezel & Santa, l.c. 347; Maire, l.c. 183; Keith, l.c. 898.

*S. crispa* Poir in Lamk., *Encycl. Method. Bot.* 7: 162. 1806; *S. undulatifolia* Moris, *Stirp. Sard. Elench.* 8. 1827; *S. simplicicornis* Mutel, *Fl. Fr.* 1: 148. 1834.

Annual, erect, up to 40-50 cm tall herb, beset with contorted, patent, multicellular hairs. Stems stout, simple or branched, ribbed or angled. Leaves  $\pm$  petioled, lower rosetted and obovate to obovate-oblong, obtuse, upper ones oblong-lanceolate, acute, all undulate margined, sparsely hispid to glabrescent. Flowers pink or purple, 12-15 mm across, in axillary and terminal, up to 9-flowered compound panicle-like dichasium with erect alar flowers; pedicels glandular hairy, variable in length, those of alar flowers longer than the rest; bracts leafy, lanceolate to linear-lanceolate, ciliate,  $\pm$  glandulose. Calyx tube reddish-brown, oblong-cylindrical at anthesis, 12-16 mm long,  $\pm$  inflated, clavate and not contracted at the apex in fruit, umbilicate, 10-nerved, nerves reddish, beset with glandular and multicellular long hairs; teeth triangular-ovate, c. 2 mm long, obtuse, densely ciliate on scarious margins, deflexed in fruit. Petal limb oblong-obovate, 5-6 mm long,

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entire or inconspicuously emarginate, obtuse; claws  $\pm$  united into tube, white, not or hardly exerted, glabrous; coronal scales oblong-linear, 2-3 mm long, united in a tube, notched or crenulate at the apex. Stamens 10, filaments filiform, glabrous; anthers ovoid, c. 1 mm long, purplish-brown. Ovary oblong-cylindrical, glabrous, shorter than the glabrous stipe; styles exerted. Capsule ovoid, 6-8 (-10) mm long, included in the calyx; carpophore 4.5-7 (-8) mm long, glabrous. Seeds reniform, c. 1 mm long, faces concave or subexcavate and tuberculate, back tuberculate, ungrooved or shallowly grooved, or  $\pm$  convex.

Type: Portugal, «in collibus circa cabeca Montachique, nec non circa olidos, et alibi in Extremadura».

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

Distribution: S. Europe, N. Africa (Libya westwards), Turkey, Lebanon, Palestine and Cyprus.

Fl. January-May

19. **Silene sedoides** Poiret, Voy. Barb. 11: 164. 1789; Durand & Barratte, l.c. 38; Pamp., Prodr. Fl. Ciren. 199. 1931; Quezel & Santa, l.c. 349 9 356; Maire Fl. Afr. Nord. 10: 224. fig. 83. 1963; Keith, l.c. 899.

Annual, erect, up to 15-20 (-30) cm tall, simple or densely patent hairy and glandular-pilose, diffusely branched herb. Leaves fleshy, sessile, lower oblong, upper oblong-spathulate to oblanceolate, up to c. 1 cm long, glandular hairy, obtuse. Flowers reddish, c. 5 mm across, in a lax terminal compound dichasium with the alar flower long pedicelled, reflexed, branches forming racemoid monochasium, pedicels as long or up to twice the length of calyx, patent or deflexed in fruit; bracts green, similar to leaves, glandular hairy. Calyx tube oblong-cylindrical at anthesis, 5-7 (-9) mm long, oblong-clavate and not contracted at the apex in fruit, subumbilicate, 10-nerved, nerves green or reddish, glandular and stiffly retrorse pubescent; teeth ovate, c. 1.5 mm long, obtuse or subacute. Petal limb oblong to obovate-oblong, 1.5-2 mm long, shortly 2-lobed or retuse; claws not or slightly exerted, glabrous; coronal scales linear-lanceolate, c. 1 mm long, dentate white. Stamens 10, filaments filiform, glabrous; anthers ovoid, c. 0.5 mm long, yellow. Ovary oblong, glabrous, much longer than glabrous stipe; styles filiform, not exerted. Capsule oblong, 5-6 mm long, membranous; carpophore 1.5-2 mm long, glabrous. Seeds reniform, 0.3-0.5 mm long, faces plane or  $\pm$  concave, striate, back

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obtusely grooved, black.

Type: N. Africa, Barbarie, probably from the vicinity of Cap Bon in Tunisia *Poiret* (P).

Reported from Maritime sands of Derna and Kenissie by Durand & Barratte (l.c.).

Distribution: N. Africa, Cyprus, W. Asia and S. Europe.

Seems to be rare or undercollected.

*Fl.* Dec.-June

20. ***Silene nocturna*** L., Sp. Pl. 416. 1753; Durand & Barratte, l.c. 35; Pamp., Pl. Trip. 82. 1914; Prodr. Fl. Ciren. 196. 1931; Maire, l.c. 64. fig. 20; Keith, l.c. 898 (Fig. 31)

Annual, erect, up to 40 cm tall herb. Stem simple or branched, finely crisped retrorse hairy below, usually viscid glandular above. Leaves obovate to oblanceolate or oblong to linear-lanceolate, up to 4 x 1.5 cm, basal  $\pm$  petioled, pubescent, obtuse to acute and  $\pm$  mucronate, ciliate at the base. Flowers white or bluish-white, up to 1.5 cm across, in few to many-flowered raceme-like monochasium, lower pedicels longer than upper ones; bracts linear-lanceolate, herbaceous, unequal, usually longer than pedicels, ciliate. Calyx tube oblong-cylindrical at anthesis, 7-11 x c. 2-3 mm, oblong-obovoid and not contracted at the apex in fruit, green, pubescent with ascending hairs, 10-nerved, nerves anastomosing; teeth triangular-lanceolate, 1.5-2 mm long, ciliate, suberect to spreading in fruit. Petal limb obovate-cuneate, up to 7 mm long, emarginate or bifid to bipartite; claws greenish-white, as long as calyx tube or slightly exerted, glabrous; coronal scales 2-partite or sometimes absent. Stamens 10, filaments glabrous or alternately hairy at the base; anthers oblong, c. 1.5 mm long. Ovary oblong, minutely stipitate, stipe puberulent; styles included. Capsule oblong or ovoid-oblong, 8-11 mm long, usually included in the calyx; carpophore c. 1-1.5 mm or almost absent, puberulent. Seeds rounded-reniform, c. 0.75-1.2 mm long, with concave faces and wide, obtusely grooved, tuberculate back, unwinged.

Type: Described from Sicily Pennsylvania, Herb. Linn. 583/8 (LINN).

A-2 Garian, stem angular, 28 cm tall, 12.4.1974, *B. Faris* 542; A-7 19-25 km

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Fig. 31 *Silene nocturna*: A, Habit x 0.75; B, Flower x 4; C, Fruiting calyx x 4; D, Fruit x 3; E, Seed x 15.

## CARYOPHYLLACEAE

S.E.Derna, 13.3.1968, *L. Boulos* 2315.

Distribution: Mediterranean region and Arabia.

A highly polymorphic species occurring in the coastal areas of Libya.

*Fl.* March-June

21. ***Silene biappendiculata*** Ehrenb. ex Rohrbach, Bot. Zeit. 82. 1867; Durand & Barratte, l.c. 36 & 315; Pamp. Prodr. Fl. Ciren. 197. 1931; Maire l.c. 80. fig. 25. 1963; Keith, l.c. 895; Tackholm, l.c. 89.

*S. canopica* Del., Illust. Fl. Egypte 444. 1813 - *nomen nudum*.

Annual, procumbent, simple or dichotomously branched herb with ascending shoots and crisped spreading hairs. Leaves small, oblong or oblong-lanceolate to  $\pm$  linear, 2-3 times shorter than the calyx, connate-vaginate, membranous and ciliate at the base, apically  $\pm$  acute-apiculate. Flowers white or pinkish, in terminal scorpioid cymes; pedicels erect, as long as leaves; bracts ovate, acute-acuminate, densely ciliate. Calyx tube cylindrical at anthesis, c. 9 mm long, clavate, umbilicate and not contracted at the apex in fruit, 10-nerved, whitish appressed-hairy, rarely glabrous; teeth ovate-lanceolate, densely crisped ciliate, obtuse. Petal limb bifid to c. half into linear, obtuse lobes; claws hardly exerted, glabrous; coronal scales  $\pm$  connate, obtuse. Stamens 10, filaments filiform, glabrous; anthers oblong, c. 1.5 mm long. Ovary glabrous, shorter than the stipe. Capsule ovoid, as long as to shorter than the retrorse hairy carpophore. Seeds reniform, faces slightly concave, narrowly acutely grooved on back, striate (teste Maire, l.c.).

Type: Described from Egypt.

Reported from Cyrenaica (Badia) by Durand & Barratte (l.c.).

Distribution: Endemic to N.E.Libya and Egypt.

*Fl.* March-May

22. ***Silene villosa*** Forsk., Fl. Aeg.-Arab. 88. 1775; Pamp., Pl. Trip. 84. 1914; Corti, Fl. & Veg. Fezzan 104. 1941; Ozenda, Fl. Sahara 217. fig. 54. 1958; Quezel & Santa, Nouv. Fl. Alg. 1: 344. 1962; Maire, Fl. Afl. Nord 10: 97. fig. 53. 1963; Keith, l.c. 900; Zohary, Fl. Palaest. 1: 93. 1972 (Fig. 32)

## CARYOPHYLLACEAE

Annual, procumbent to erect, up to 25 cm tall, patent viscid-glandulose, much branched herb. Leaves sessile,  $\pm$  fleshy, oblong-oblongate or oblong-lanceolate, 2-4.5 cm x 3-8 mm, subobtusely. Flowers white to pink or pink-violet, c. 1 cm across, few to many in lax monochasia; pedicels erect at anthesis, shorter to as long as or longer than calyx, reflexed in fruit; bracts leafy, linear-lanceolate, shorter than pedicels. Calyx tube subcylindrical at anthesis, 15-20 (-25) x c. 2-3 mm, clavate, basally umbilicate, not contracted at the apex in fruit, 10-nerved, glandular hairy; teeth ovate-oblong, 2-3 mm long, obtuse, ciliate and white margined. Petal limb obovate, 3-6 mm long, 2-fid or partite; claws glabrous, long exerted,  $\pm$  united; coronal scale oblong to triangular-ovate, 1-3 mm long. Stamens 10, filaments glabrous, exerted, anthers violaceous, oblong, up to 1.5 mm long. Ovary oblong-cylindrical, c. 6 mm long, glabrous, stiped, stipe c. twice as long as ovary; styles 3, exerted. Capsule ovoid-oblong, 8-12 mm long, carpophore as long as or slightly shorter than the capsule, glabrous. Seeds rounded-reniform, c. 0.75 mm long, brown, reticulate,  $\pm$  convex on faces, grooved on the back, unwinged.

Type: Prope Pyramida Gizensis, *Forskal* 550 (C).

**B-1** c. 9 km after Sinawan, c. 109 km from Nalut (Ghadames-Nalut road, sandy roadside with small stones, 26.2.1975, *S. I. Ali* 2175; **B-2** 121 km from Mizda towards Al-Ghariat, annual herb with pinkish flowers, 13.2.1977, *M.A. Siddiqi* 66; **C-4** c. 98 km towards Hun along the main highway from Sebha, Wadi Soda, along the main dried water stream, sandy soil with loamy top at some places, flowers pink violet, 31.3.1973, *S.I.Ali* 1451; c. 94 km from Hun (towards Wadi Soda) sandy soil, at places with loamy top, 1.4.1973, *S.I.Ali* 1494; c. 100 km from Hun, along Sebha-Hun highway, prostrate, flowers light violet, 31.3.1973, *S.I.Ali* 1446; Grega, c. 150 km from Sebha towards Jerma, prostrate, near water course, flowers light violet-tipped, 20.3.1973, *S.I.Ali* 1350; Jafra Project, c. 8 km from the road (c. 28 km from Weshka), near water, flowers pink, petals emarginate, 26.3.1975, *S.I.Ali* 2397; c. 5 km after Weshka (towards Hun), dried Wadi (river bed), among stones, 26.3.1975, *S.I.Ali* 2394.

Distribution: N. Africa eastwards to Iraq and Arabia.

A common desert species in Libya.

*Fl.* March-May     *Vern.* intelmellet (Tuar)

23. *Silene viviani* Steud., *Nom. Bot.* ed. 2. 2: 588. 1841; Zohary, *Fl. Palaest.* 1:

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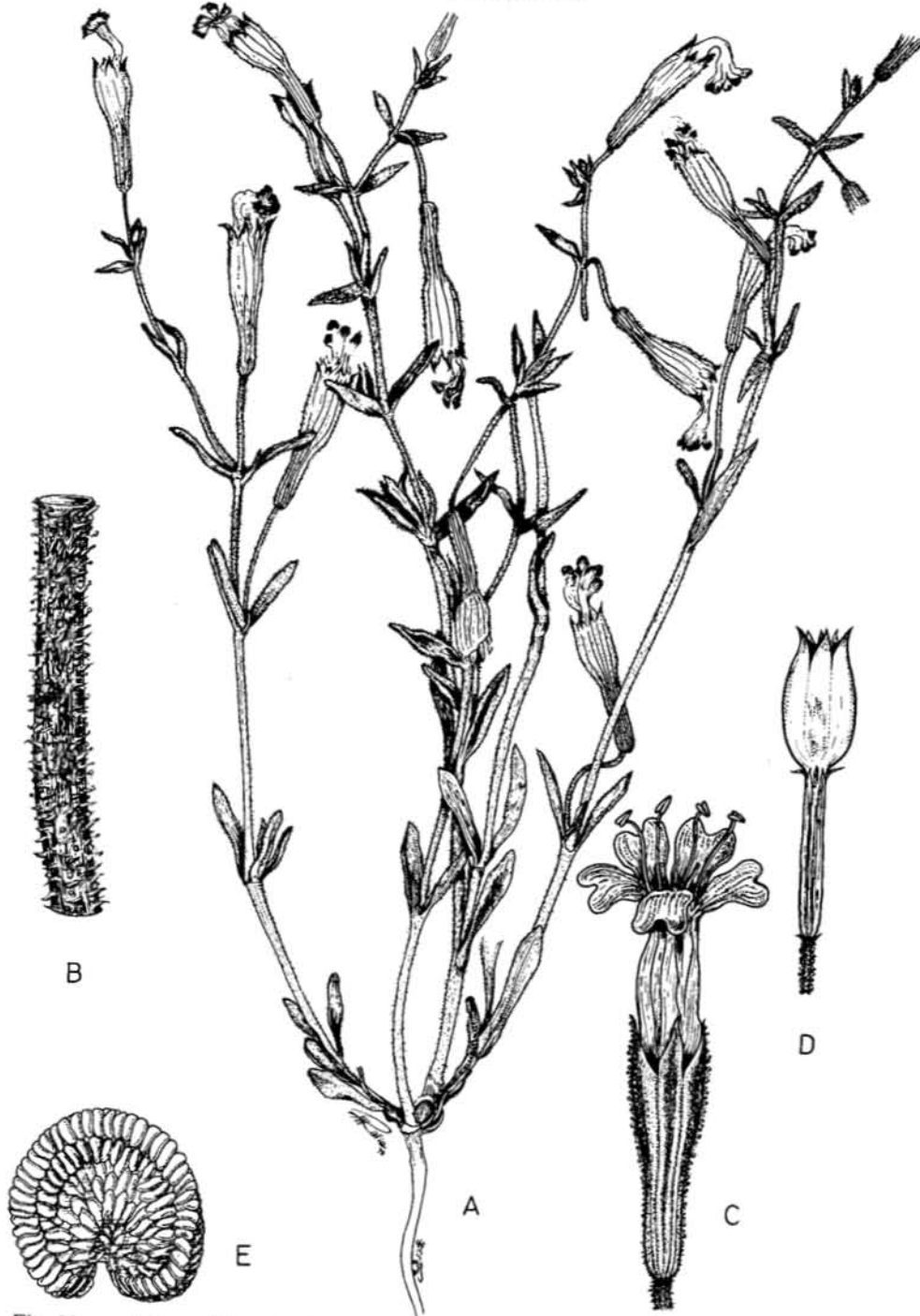


Fig. 32 *Silene villosa*: A, Habit x 1; B, Stem with hairs x 5; C, Flower x 2; D, Fruit (calyx removed) x 2.5; E, Seed x 30.



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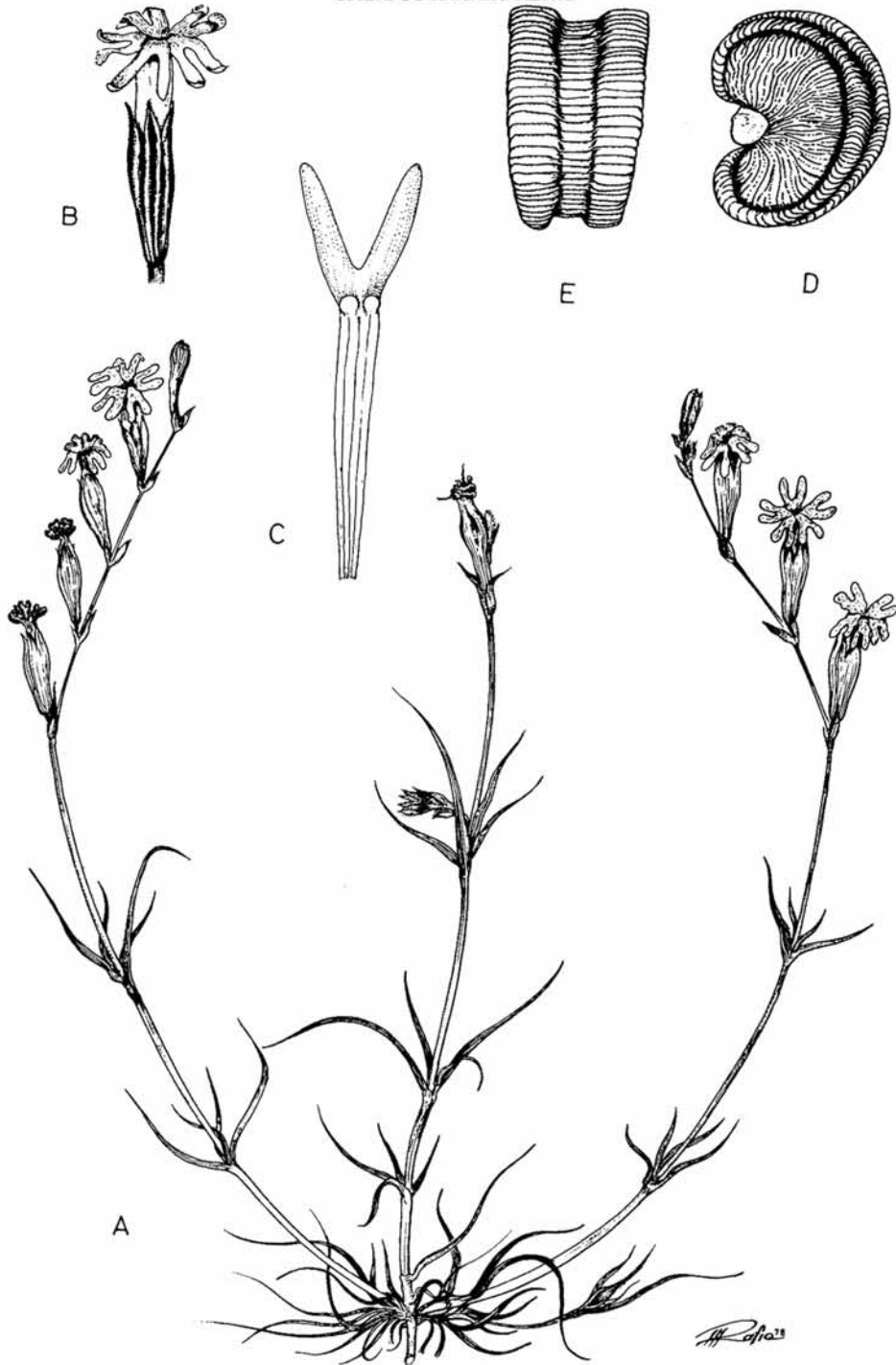


Fig. 33 *Silene viviani*: A, Habit x 1; B, Flower x 2; C, Petal x 5; D, Seed (lateral view); x 25; E, Seed (back view) x 25.

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95. 1966 (Fig. 33).

*S. setacea* Viv., Fl. Lib. Spec. 23. t. 12. f. 2. 1824 (non Otth. in DC., Prodr. 1: 372. 1824); Durand & Barratte, l.c. 36; Pamp., Pl. Trip. 83. 1914; Prodr. Fl. Ciren. 197. 1931; Ozenda, Fl. Sah. 217. 1958; Quezel & Santa, l.c. 343; Maire, Fl. Afr. Nord 10: 81. fig. 26. 1963; Keith, l.c. 899.

Annual, ascending to erect, up to 30 cm tall, non-viscid, retrorsely appressed puberulent to pubescent herb. Leaves linear-lanceolate to setaceous, up to 4 cm long, densely to sparsely antrorse hairy, plicate, connate-vaginate at the base, acute. Flowers pinkish-white, c. 1.5-2 cm across, in terminal, scorpioid monochasial cymes; pedicels mostly shorter than bracts and much shorter than calyx, hairy; bracts unequal, linear-setose, ciliate. Calyx tube cylindrical-subclavate at anthesis, 11-15 mm long, clavate and umbilicate in fruit, 10-nerved, pubescent or puberulent, nerves green; teeth oblong-lanceolate, c. 3 mm long,  $\pm$  acute, ciliate on white margins. Petal limb 7-10 mm long, deeply bipartite into divergent, linear-oblong lobes with dark veins below; claws white,  $\pm$  exserted, glabrous or sparsely pubescent at the base; coronal scales ovate, less than 1 mm long, obtuse. Stamens 10, filaments filiform, glabrous, included; anthers oblong, 1-1.5 mm long. Ovary oblong-cylindrical, longer than the hairy stipe; styles filiform, included in the calyx; carpophore as long as or slightly shorter than capsule, retrorse-pubescent.

Type: « In littores Magnae Syrteos », *Viviani*

A-7 Qaminis-Benghazi road, 9.3.1968, *L. Boulos* 1995.

Distribution: N. Africa, Palestine, Jordan.

*Fl.* January-March.

*Species of doubtful occurrence.*

1. ***Silene divaricata*** Clem., Elench. Hort. Madrit. 103. 1806.

This Spanish species has been doubtfully recorded by Keith, (Prelim. Check List Lib. Fl. 897. 1965), without giving locality.

2. ***Silene coeli-rosa*** (L.) A. Br. in Flora 26: 373. 1843.

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*Agrostemma coeli-rosa* L., Sp. Pl. 436. 1753; *Lychnis coeli-rosa* (L.) Desv. in Lamk., Encycl. Method. Bot. 3: 644. 1789.

This S.W. European species is doubtfully recorded by Keith (l.c. 629) as an exotic, and Maire (l.c. 10: 42) reports it from Tripolitania, Dahara (*Spigai*). It might have been introduced and cultivated by Italians during the occupation of this area in the present Sooq Dahara area but has not been collected after that.

### 15. VACCARIA

Medik., Phil. Bot. 1: 96. 1789.

Dichotomously branched, glabrous annual herb. Leaves exstipulate simple, ovate-lanceolate, subsessile to sessile. Inflorescence a terminal corymbose panicle of dichasial cymes. Flowers large, pink. Sepals united into a 5-winged, 5-toothed vase-like calyx tube inflated below, without commissural veins. Petals 5, without coronal scales, claw long, exerted, limb oblong-linear or obovate-oblong, minutely toothed or crenate. Stamens 10, anthers oblong, dorsifixed. Ovary bicarpellary, syncarpous, ovoid, shortly stipitate, unilocular above, almost 2-locular at the base; styles 2, free, stigmatose in the upper two third part. Fruit an ovoid-subglobose or ovoid-oblong capsule, dehiscing at the apex by 4 teeth. Seeds  $\pm$  globose.

A widely distributed, monotypic genus, distinguished from closely allied *Saponaria* in the green winged calyx tube and absence of coronal scales.

*Vaccaria pyramidata* Medik., Phil. Bot. 1: 96. 1789; Pamp., Pl. Trip. 85. 1914; Prodr. Fl. Cir. 201. 1931; Quezel & Santa, Nouv. Fl. Alger. 1: 358. fig. 933. 1962; Maire, Fl. Afr. Nord. 10: 322. 1963; Keith, Prelim. Check List. Lib. Fl. 996. 1965 (Fig. 34).

*Saponaria vaccaria* L., Sp. Pl. 409. 1753; *S. segetalis* Necker, Delic. Gallo-Belg. 1: 194. 1768-nom. illeg; *Vaccaria segetalis* (Necker) Garcke in Aschers, Fl. Prov. Brand. 1: 84. 1864; Keith, l.c.; *V. parviflora* Moench, Meth. 63. 1794; *V. perfoliata* (Gilib) Nal., Prodr. Fl. Graec. 1: 189. 1904.

Glabrous-glaucous, erect, up to 90 cm tall herb. Leaves ovate-lanceolate or oblong-lanceolate to lanceolate, 3-6 (-11) x 1-3 (-4) cm, cordate or attenuate to  $\pm$  perfoliate-connate at the base, entire, acute, glabrous. Inflorescence many-flowered, widely and laxly branched. Flowers large, showy, c. 1.5 cm across, long pedicelled;

CARYOPHYLLACEAE

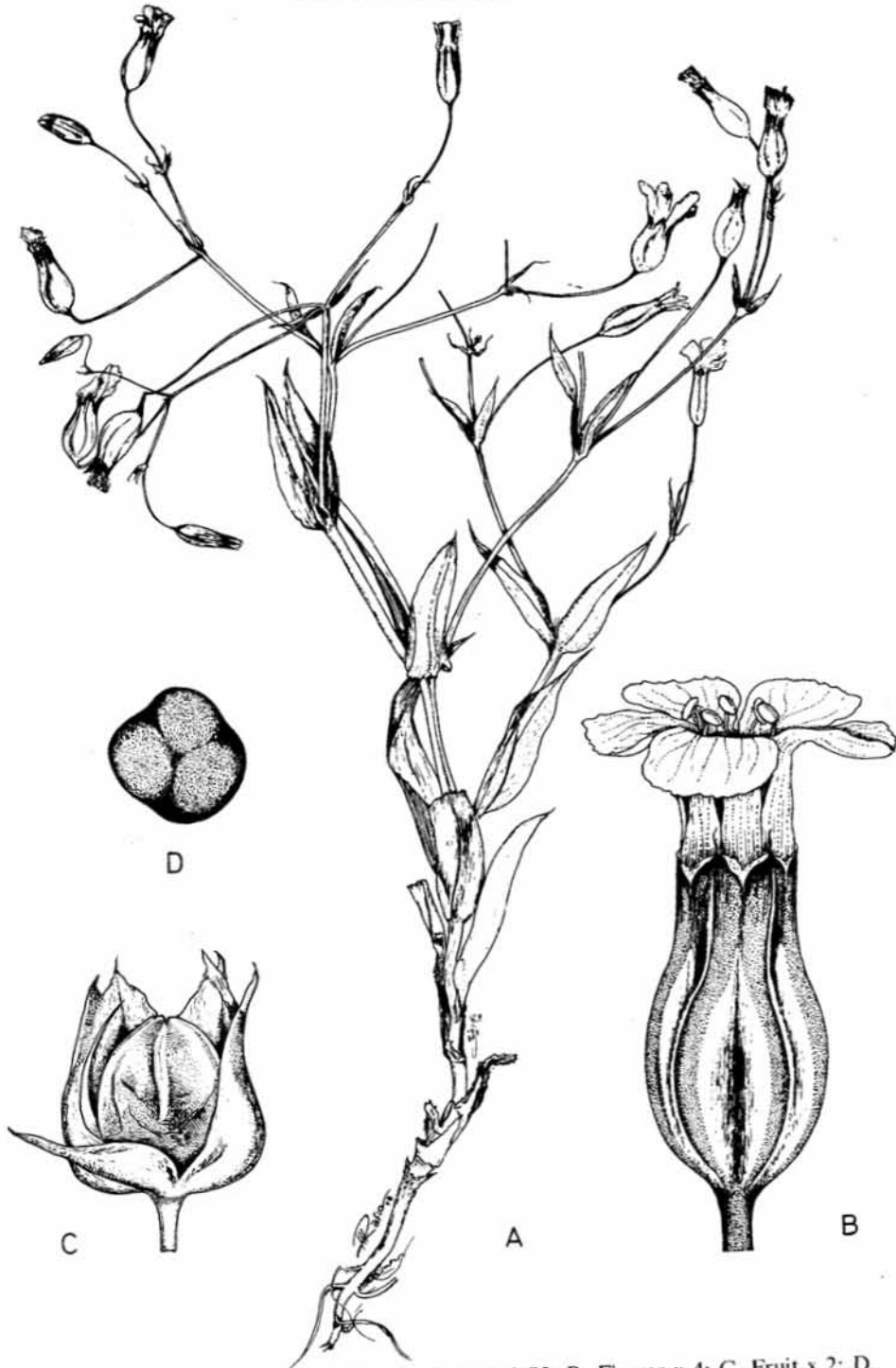


Fig. 34 *Vaccaria pyramidata*: A, Habit x 0.75; B, Flower x 4; C, Fruit x 2; D, Seed x 10.

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bracts linear-lanceolate, scarious-white, 1-nerved, acute. Calyx tube oblong-ovoid, 10-16 mm long, whitish-green, with 5 green wings and 5 short triangular to broadly triangular, acuminate, c. 2 mm long, membranous margined teeth. Petals pink or purplish-pink, claw slightly to distinctly exserted, 11-18 mm long; limb linear-oblong to obovate, c. 3-6 mm long, irregularly dentate or submarginate and  $\pm$  truncate at the apex. Stamens with  $\pm$  exserted, filiform filaments. Ovary glabrous, very shortly stiped, styles c. 4-5 mm long. Capsule ovoid-subglobose, 4-chambered at base, 1-loculed above, dehiscing by 4 apical teeth. Seeds subglobose-globose, 2-2.5 mm in diameter, dark brown-black.

Type: « Inter segetes Galliae, Germaniae ».

A-2 Tagma, 5 km jefren Radio Station, 9.4.1974, *S. El-Jaley* 184; 5 km North of Jefren, *M. Godeh* 124; 2 km before Kaleba, Mangh El Behar, cultivated fields, 8.4.1974, *S.I.Ali* 1685; Orreda, (Gawasem area) c. 9 km from Gharian, barley fields, *S.I.Ali* 2722; 5 km after Assaba (c. 24 km from Garian), near cultivated fields, 7.4.1974, *S.I.Ali* 1771; Wadi El-Hai Project, c. 40 km W. of Al-Azizia on way to Nalut, fls. pink, 31.3.1978, *Fathi B.R.* 198; A-7 Gebel Akhdar, Gasr El-Libya, c. 150 km from sea level, clay loam soil, erect herb, c. 35 cm tall, fls. purplish-pink, 5.5.1978, *A. Ghafoor & El-Makahal* 390.

Distribution: Europe, Turkey and N. Africa, eastwards to Pakistan and India; introduced in N. America, Australia and New Zealand.

A common weed of cultivated and fallow fields in Gebel Nefousa. The herb contains a toxic saponin and its seeds are diuretic. The roots are sometimes used as a substitute for soap.

*Fl.* Feb.-May

*Vern.* Ful-el-Arab.

### 16. DIANTHUS

L., *Sp. Pl.* 409. 1753; *Gen. Pl.* ed. 5. 191. 1754.

Caespitose herbs or subshrubs with jointed stems. Leaves exstipulate, opposite, linear-lanceolate, acute, often glaucous with parallel venation,  $\pm$  connate at the base. Inflorescence terminal, cymes densely paniced or capitate rarely flowers solitary. Flowers large, showy, bisexual or unisexual, protandrous, creamish yellow or pink; bracteoles or epicalyx scales 2-many, closely adpressed to the calyx.

## CARYOPHYLLACEAE

Sepals 5, united into a cylindrical shortly 5-toothed, green tube, commissures indistinct, neither scarious nor veined. Petals 5, free, claw narrow and long, limb oblong or obovate, wedge shaped, entire, laciniate or dentate, never 2-fid, coronal scales absent. Stamens twice the number of petals or sometimes fewer. Ovary bicarpellary, syncarpous, unilocular, multiovulate; styles 2, free, filiform. Fruit a cylindrical, oblong-ovoid capsule, dehiscent by 4-apical teeth or valves. Seeds compressed, peltate or discoid, concave on one side, with facial hilum, embryo straight.

A genus of c. 300 species, distributed in Europe, Asia and Africa, in somewhat arid regions. Represented in Libya by 4 species.

- |    |  |                           |
|----|--|---------------------------|
| 1. | + Calyx teeth 7-11 mm long. Petal limb fimbriate to less or more than half   | 2                         |
|    | -- Calyx teeth up to 6 mm long. Petal limb unequally toothed or dentate (cultivated)   | 3                         |
| 2. | + Leaves 3 mm or more broad. Petal limb fimbriate to less than half its length, ± barbulate at the base  | 1. <b>D. serrulatus</b>   |
|    | -- Leaves less than 3 mm broad. Petal limb fimbriate to more than half its length, not barbulate at the base   | 2. <b>D. crinitus</b>     |
| 3. | + Leaves up to 4 mm broad. Bracteoles below the calyx broadly ovate, c. 1/4 as long as calyx, cuspidate  | 3. <b>D. caryophyllus</b> |
|    | -- Leaves more than 1 cm broad. Bracteoles below the calyx lanceolate to ovate-lanceolate, c. 0.5 to as long as or slightly longer than the calyx, acute-acuminate | 4. <b>D. chinensis*</b>   |

1. **Dianthus serrulatus** Desf., Fl. Atl. 1: 346. 1798; Pamp., Pl. Trip. 79. 1914; Quezel & Santa, Nouv. Fl. Alger. 1: 359. 1962; Maire, Fl. Afr. Nord. 10: 300. 1963; Keith, l.c. 433.

Perennial, erect, up to 60 cm tall, glabrous, basally woody herb, with spreading flowering shoots. Leaves flat, linear-lanceolate, up to 8 cm x 3-7 mm, glabrous, connate at the base, attenuate-acute, ± serrulate. Flowers usually purplish, solitary, sometimes 2 or 3 at apices; bracteoles 4-10, ovate-lanceolate,

CARYOPHYLLACEAE

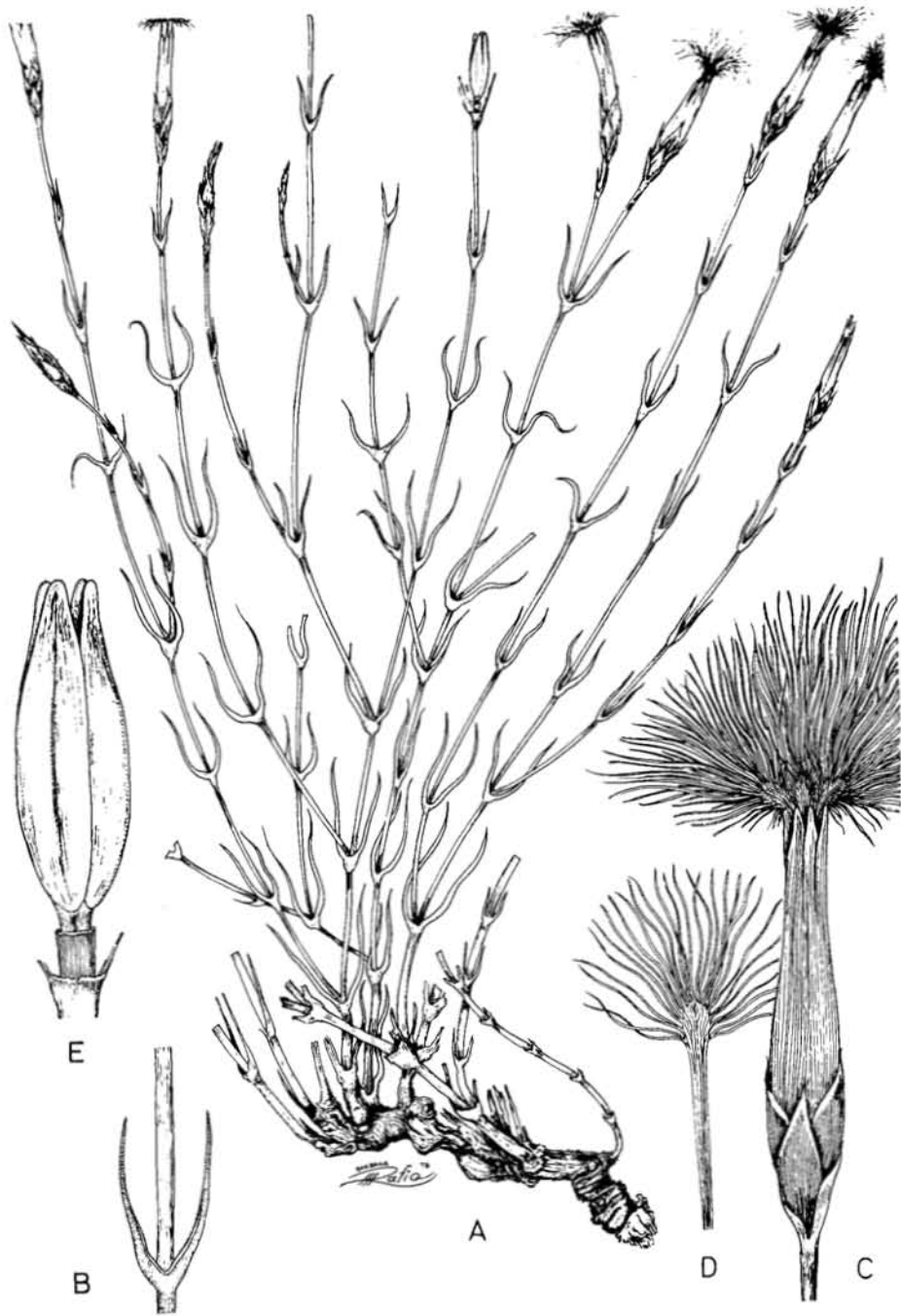


Fig. 35 *Dianthus crinitus*: A, Habit x 0.5; B, Leaf pair x 2; C, Flower x 2; D, Petal x 2; E, Fruit x 3.

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1/3-1/2 of calyx length, green with scarious margins, acuminate-acute. Calyx tubular, 20-35 mm, narrowed upwards, many-nerved; teeth lanceolate, 7-11 mm long, 5-10-nerved, margins whitish scarious, acute. Petal limb obovate-cuneate, 6-8 mm long, fimbriate to less than half,  $\pm$  barbulate at the throat, claw white, glabrous. Filaments glabrous, anthers oblong-linear, 2.5-3 mm long. Ovary glabrous, on c. 1.5-2 mm long, glabrous stipe. Capsule cylindrical, shorter than and enclosed by calyx; carpophore shorter than capsule. Seeds rounded-ovate, 3-3.5 x 2.5 mm, black, peltate, finely papillate.

Type: « Habitat in arenis prope Sfan et Elgem apud Tunetanes ».

Reported from Tripolitania (Tarhuna) by Maire (l.c.) and Keith (l.c.).

Distribution: N. W. Africa.

Fl. June-Nov.

According to Tutin (Fl. Europ. 1: 196. 1964), S. W. European *D. malacitanus* Haenseler ex Boiss. may well be conspecific with this but differs from it in the narrower leaves (1-2 mm wide) and larger flowers with petal limb c. 15 mm long.

2. ***Dianthus crinitus*** Sm. in Trans. Linn. Soc. Bot. 2: 300. 1794; Ozenda, Fl. Sahara 214. 1958; Quezel & Santa, Nouv. Fl. Alger. 1: 297. 1962; Maire, Fl. Afr. Nord. 10: 297. 1963 (Fig. 35).

*D. broteri* Batt. in Batt. & Trab., Fl. Alger. 144. 1888- p.p. (non Boiss. et Reut. 1852); *D. fimbriata* Munby, Cat. Pl. Alg. ed. 2.6.1866; *D. amoenus* Pomel, Nouv. Mat. 210. 1874.

Perennial, erect, up to 35 cm tall, glabrous-glaucous, robust herb with numerous branches from the woody rootstock. Leaves flat, linear, 2-8 cm x 1-1.5 mm, connate-vaginate at the apex. Flowers white or pinkish-white, solitary, terminal; bracteoles 4-8, ovate-lanceolate, c. 1/3 of calyx, aristate to cuspidate-acute, membranous margined. Calyx cylindrical, 25-40 mm long, glaucous, multinerved; teeth linear-lanceolate, 8-10.5 mm long, mostly 8-nerved, acute-acuminate, scarious and  $\pm$  ciliate on margins. Petal limb obovate-cuneate, 1.5-1.7 cm long, fimbriate to more than half its length, not barbulate, lacinae unequal, linear-filiform; claw exerted, 30-42 mm long, dilated upwards. Filaments filiform, glabrous; anthers oblong-linear, 2-2.5 mm long. Ovary glabrous, on c. 3 mm



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long, glabrous stipe. Capsule cylindrical, c. 1.5-2 cm long, included in the calyx; carpophore glabrous, c. 3 mm long. Seeds rounded-ovate, c. 2.5 mm long, peltate, black, finely papillate.

Type: Described from Armenia.

**B-2** Wazen, Libyan Tunisian boundary, Dheba edges, 9.6.1974, *B. Faris* 597 and 598.

Also reported from Tripolitania; Ouadi Tininai and Ouadi Belaroug by Maire (l.c.)

Distribution: Morocco to Libya and Aegean Isles, Turkey, Caucasia, Turkestan and Iran.

*Fl.* March-May

3. \**Dianthus caryophyllus* L., Sp. Pl. 410. 1753; Durand & Barratte, Fl. Lib. Prodr. 34. 1910; Quezel & Santa, l.c. 1: 360; Maire, l.c. 316.

Perennial, laxly to densely caespitose, usually glaucous, up to 90 cm tall, basally woody herb with ascending to spreading flowering shoots. Leaves linear to linear-lanceolate, up to 10 cm x 2-4 mm, connate-vaginate at the base, margins entire or serrulate. Flowers showy, rose, red, purple or white, 1.5-5.5 cm across, solitary or 2-4 at apices; bracteoles 4, broadly ovate, c. 1/4 as long as calyx, cuspidate. Calyx cylindrical, 20-35 mm long,  $\pm$  narrowed upwards; teeth triangular-lanceolate or linear-lanceolate, 5-6 mm long, 7-10-nerved, acute or obtuse, shortly mucronate with scarious, glabrous or ciliolate margins. Petal limb obovate-cuneate, 8-25 mm long, spreading, dentate; claw whitish, not or slightly exerted, glabrous. Filaments white, filiform, glabrous, anthers oblong, c. 2.5 mm long. Ovary oblong, glabrous, on c. 2-2.5 mm long, glabrous stipe. Capsule oblong-cylindrical, shorter than and enclosed by calyx. Seeds ovate, 2-3 mm long, finely papillate.

Type: Herb. Linn. 581/8 (LINN).

**A-3** Tripoli, Faculty of Agriculture gardens, El-Faateh University Campus, suberect herb with prostrate branches, flowers red, 1.4.1977, *A. Ghafoor* 299; Andulus area, herb, erect, c. 30 cm tall, 5.5.1976, *Randa M. Bughrara* s.n.

## CARYOPHYLLACEAE

Distribution: An European species, widely cultivated in Africa, Asia, Australia and the New World.

Cultivated as an ornamental in Libya.

*Fl.* March-August.

4. \**Dianthus chinensis* L., Sp. Pl. 410. 1753; Maire, l.c. 304; Bailey, Stand, Encyclp. Hort. 1: 1000. 1963.

Annual or biennial, erect, up to 60 cm tall, somewhat caespitose glaucescent-glabrous herb with angular shoots. Leaves flat, linear-lanceolate to lanceolate, up to 10 x 1.8 (-2) cm, attenuate to short petiole and  $\pm$  connate-vaginate at the base, ciliolate-scabrous on margins, acute. Flowers reddish pink or purplish-pink, occasionally whitish, 3-5 cm across, solitary or in lax, terminal, few flowered clusters; bracteoles 4, lanceolate to ovate-lanceolate, c. half to as long as or slightly longer than the calyx, acute-acuminate. Calyx tubular, 1.5-1.8 cm long, slightly broadened rather than attenuate above, striate, glabrous; teeth triangular-lanceolate, 3.5-6 mm long, scarious and ciliolate on margins, acute-acuminate. Petal limb broadly obovate, patent, 1.5-2.5 cm long, unequally toothed, barbate or hairy at the base; claw slightly or not exerted. Filaments white, glabrous, anthers oblong-linear, c. 1.5 mm long, blue. Capsule shorter than and enclosed by calyx. Seeds ovate, c. 3 mm long.

Type: Herb. Linn. 581/13 (LINN).

A-3 Tripoli, University Agricultural Farms, herb, 25 cm high, flowers red, *Randa M. Bughrara* 87.

Distribution: A native of China, cultivated elsewhere.

Cultivated in Tripoli for its beautiful single or sometimes double flowers.

*Fl.* May-August.

### 17. GYPSOPHILA

L., Sp. Pl. 406. 1753; Gen. Pl. ed. 5. 191. 1754.

Herbs,  $\pm$  woody, glandular hairy to glabrescent-glaucous. Leaves sessile, exstipulate, opposite, linear-subulate to lanceolate or subspathulate, entire,

## CARYOPHYLLACEAE

somewhat fleshy. Inflorescence a loose panicle or dense capitate cluster of dichasial cymes. Flowers small, bisexual, pentamerous, white or pink; bracts scarious or green; bracteoles absent. Sepals 5, united into a turbinate or campanulate rarely cylindrical, 5-toothed calyx tube, with palescarious veinless commissures between the teeth, mostly with calcium oxalate crystals. Petals 5, free, linear-narrowly obovate, limb indistinct, gradually narrowed into unwinged exerted claw, coronal scales absent. Stamens twice the number of petals. Ovary bicarpellary, unilocular, multiovulate; styles 2 (-3), stigmas terminal. Fruit a unilocular, globose to ovoid, sessile capsule dehiscent by 4 (-6) teeth. Seeds somewhat reniform, auriculate, echinate with lateral hilum and prominent radicle.

A genus of c. 125 temperate Eurasian, especially E. Mediterranean species. Represented by 2 species in Libya.

- + Plants villous or hispid in the middle, glabrous above and below; hairs glandular. Flowers pale pink or reddish-purple, c. 5 mm across 1. **G. pilosa**
- Plant glabrous-glaucous throughout. Flowers mediocre, white, c. 12 mm across 2. **G. elegans**

1. **Gypsophila pilosa** Hudson in Phil. Trans. Roy. Soc. Lond. (B) 56: 252. 1767; Barkoudah, in Wentia 9: 151. 1962; Huber-Morath in Davis, Fl. Turk. 2: 170. 1967. (Fig. 36).

*Hagenia filiformis* Moench, Meth. 61. 1794; *G. porrigens* (Gouan ex L.) Boiss., Fl. Orient. 1: 557. 1867; Maire, Fl. Afr. Nord. 10: 272. fig. 101. 1963; Keith, l.c. 528; *Silene porrigens* Gouan ex L., Syst. Nat. ed. 12. 3: 230. 1768.

Annual, up to 60 (-80) cm tall herb. Stem dichotomously branched, usually glabrous towards base and flowering shoots, villous or hispid in the middle, hairs glandular, 1.5-2.5 mm long. Leaves sessile to subsessile, lanceolate, 3-10 x 1-2.5 cm, obscurely 3-5-nerved, entire, acute-acuminate, glandular hairy to rarely subglabrous. Inflorescence a lax panicle of loose dichasial cymes. Flowers pale-pink or reddish-purple, c. 5 mm across; pedicel filiform, up to 6 cm long, glabrous, purplish, ± deflexed; bracts leaf-like, linear-lanceolate, hairy, acute. Calyx tubular-campanulate, 5-7 mm long, dilated in fruit, commissures scarious-white, teeth 5, triangular, c. 1.5-2.5 mm long, ± obtuse-acute, glandular hispid outside. Petals 5, claw linear-oblong, 8-10 mm long, gradually dilated upwards, limb obovate, c. 1.5-2 mm long, emarginate to shallowly 2-lobed. Stamens 10, filaments filiform, white, 8 mm long, anthers ovoid, yellow. Ovary sessile, ovoid, c. 2.5 mm in

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Fig. 36 *Gypsophila pilosa*: A, Flowering and fruiting branch x 0.5; B, Stem part with hairs x 1.5; C<sub>1</sub>, Flower x 3; C<sub>2</sub>, Petal x 5; D, Fruit x 4; E, Seed x 15.

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diameter, glabrous; styles 2, filiform, c. 3 mm long, stigmatic on inner side. Capsule subglobose, 6-8 mm in diameter, straw yellow, glabrous, brittle. Seeds reniform, c. 1.5 mm long, obtusely tubercled.

Type: Described from material cultivated at the Chelsea Physic Garden (BM).

**A-2** Tagma (near Yefren Broadcasting station), c. 6 km from Yefren towards Gharian, limestone hills, 9.4.1974, *S.I.Ali* 1872; Garian stadium, 12.9.1974, *M. Godeh* 269; El-Asaba, 24 km from Garian, 9.4.1974, *S. El-Jalely* 102; Wadi El-Hai Project, c. 40 km W. of Al-Azizia on way to Nalut, fl. pinkish-white, c. 50 cm tall, 31.3.1978, *Fathi B. Rateeb* 196; **B-2** c. 1 km from Kabao on way to Jadu, sandy soil, 5.5.1972, *S.I.Ali* 386; 15 km after Kalab towards Mizda, dry sandy ground near dry wadi, 10.4.1974, *S.I.Ali* 2037.

Distribution: S.W. Asia, N. Africa; introduced and naturalized in Europe.

*Fl.* March-June

2. ***Gypsophila elegans*** Bieb., *Fl. Taur.-Cauc.* 1: 319. 1808; Maire, *l.c.* 271; Hubar Morath in Davis, *l.c.* 165.

*G. producta* Stapf in *Denk. Akad. Wiss. Wien, Math. Nat. Kl.* 51: 280. 1886; *G. ceballosii* Pau & Vicioso in *Bol. Soc. Esp. Hist. Nat.* 19: 493. 1919; *G. elegans* var. *latipetala* Bark. in *Wentia* 9: 135. 1962.

Annual, up to 60 cm tall, glabrous-glaucous,  $\pm$  woody, dichotomously branched herb. Leaves sessile, oblong-lanceolate or uppermost linear, 2-7 x (0.5-) 1.0-1.5 cm, entire, acute, glabrous. Inflorescence a lax panicle of dichasial cymes. Flowers mediocre, white, c. 1.2 cm across; pedicels filiform, up to 4 cm long, glabrous; bracts scarious white,  $\pm$  triangulate. Calyx tube campanulate, c. 2-3 mm long, commissures scarious; teeth 5, c. 3-4 mm long,  $\pm$  obtuse-acute, glabrous. Petals 5, indistinctly clawed, claw c. 3-4 mm long, limb oblong-obovate, 5-6 mm long, truncate to  $\pm$  retuse at the apex. Stamens 10, filaments c. 8 mm long, anthers oblong, c. 1 mm long, purplish. Ovary ovoid, c. 2.5 mm long, sessile; styles filiform, c. 4 mm long. Capsule subglobose, c. 8 mm in diameter, yellowish, glabrous. Seeds  $\pm$  rounded-reniform, c. 1.5 mm long, obtusely tubercled.

Type: Caucasus, district Trek, Kasbek, *Bieberstein* (LE).

## CARYOPHYLLACEAE

A-3 Tripoli, Agricultural Farm, Univeristy Campus, Randa M. Bughrara 89.

Distribution: A Irano-Turanian species, often cultivated and naturalized in many countries including Libya; S. Russia and Turkey.

Keith (l.c.) has mentioned a *Gypsophila* species with vernacular name *Shersh el halawa* and remarks that dried roots are imported from Turkey and Greece and used in the manufacture of *Halawa*, a popular middle East sweet. It may be the above described plant.

Fl. March-July      Vern. Shersh el halwa

### 18. PETRORHAGIA

(Ser.) Link, Handb. Enkenn. Gewchse 2: 235. 1831.

*Gypsophila* sect. *Petrorhagia* Ser. in DC., Prodr. 1: 354. 1824; *Tunica* sensu Mert. & Koch, Rohl. Deutsch. Fl. 3: 182. 18131; *Gypsophila* subgen. *Tunica* Reichb., Fl. Germ. Encurs. 802. 1832; *Kohlrauchia* Kunth, Fl. Berol. Fam. Nat. Dispos. 1: 108. 1838; *Dianthus* sect. *Kohlrauschia* (Kunth) Fenzl in Endl., Gen. Pl. 971. 1840.

Annual or perennial and  $\pm$  basally woody herbs. Leaves exstipulate, opposite, subulate to oblong, entire or finely serrate. Inflorescence a dichasial cyme or fasciculate or capitulum like cluster of flower, with an involucre of 2-5 or more membranous bracts or these sometimes absent. Flowers pentamerous; bracts present or absent membranous or thick, lanceolate to suborbicular. Sepals 5, united into obconic to cylindric, 5-toothed tube with broad membranous veinless commissures between the teeth. Petals 5, free, linear or oblong-lanceolate, clawed or not, entire or bifid or rarely toothed at apex, coronal scales absent. Stamens twice as many as petals. Ovary bicarpellary, unilocular above, 4-loculed in the lower part; styles 2, free. Capsule 4-loculed below, 1-loculed above dehiscent by 4 apical teeth. Seeds dorsiventrally compressed, rugose, with straight embryo.

A small genus of c. 25 species, mainly distributed in S.E. Europe, Madeira, Canary Isles and N. Africa, eastwards to Pakistan. Represented in Libya by 3 species.

- |  |                       |
|--|-----------------------|
| 1.    + Bracts below the calyx absent                  | 1. <i>P. illyrica</i> |
| -- Bracts below the calyx present                      | 2                     |
| 2.    + Petals distinctly clawed; limb obcordate, pink |                       |

CARYOPHYLLACEAE

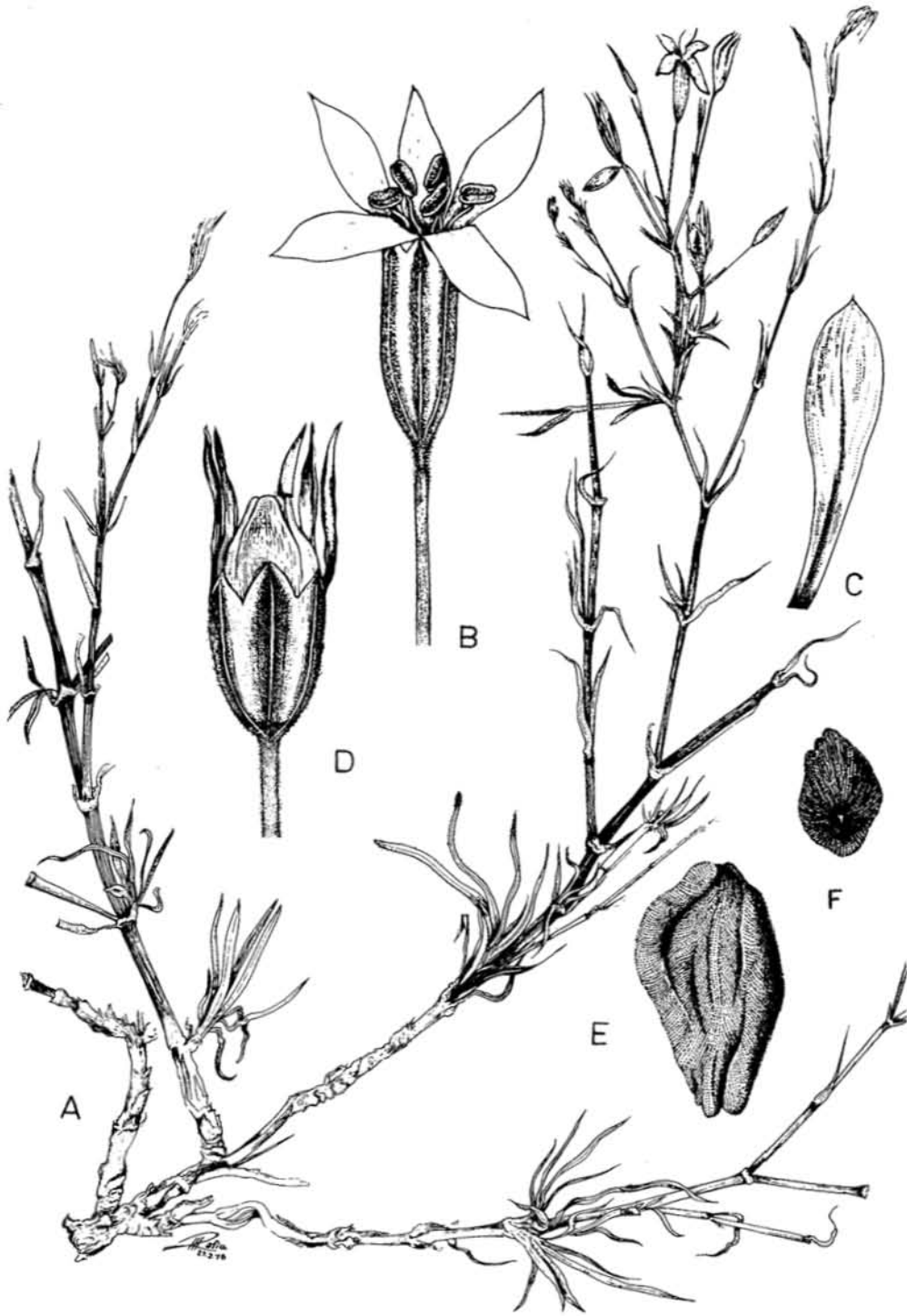


Fig. 37 *Petrorhagia illyrica*: A. Habit x 1; B. Flower x 5; C. Petal x 5; D. Fruit with persistent petals x 5; E. Seed x 15; F. Seed showing hilum x 7.5.

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or purplish. Largest bract below the calyx usually more than 4 mm broad

2. *P. velutina*

-- Petals not distinctly clawed or if clawed then limb elliptic, white. Largest bract less than 3 mm broad

3. *P. cyrenaica*

1. ***Petrorhagia illyrica*** (Ard.) Ball & Heywood, Bull. Brit. Mus. Nat. Hist. (Bot.) 3: 133. 1964; Ball in Tutin et al, Fl. Europ. 1: 186. 1964 (Fig. 37).

*Saponaria illyrica* Ard., Animadv. Bot. Specim. Alt. t. 9. 1764; Linn., Syst. Nat. ed. 12,2: 307. 1767; Mant. Pl. 70. 1767; *Gypsophila illyrica* (Ard.) Smith, Fl. Graec. Prodr. 1: 281. 1809; *Tunica illyrica* (Ard.) Fisch. & Meyer, Index Sem. Hort. Bot. Petrop. 4: 49. 1837; Maire, Fl. Afr. Nord 10: 281. 1963; *Tunica compressa* (Desf.) Fisch et Mey., Ind. Sem. Hort. Petrop. 4: 50. 1837; Durand & Barratte, Fl. Lib. Prodr. 33. 1910; Pamp., Pl. Trip. 85. 1914; Prodr. Fl. Ciren. 200. 1931; Keith, l.c. 990; *G. compressa* Desf., Fl. Atl. 1: 343. t. 97. 1798; *Tunica davaeana* Coss. in Bull. Soc. Bot. France 36: 103. 1889; Maire, l.c. 284; Keith, l.c. 990; *T. scoparia* Pamp., in Arch. Bot. Forli 12: 25. 1936; Maire, l.c. 285; *T. illyrica* ssp. *angustifolia* (Poir.) Maire in Bull. Soc. Hist. Nat. Afr. Nord. 30: 265. 1939; Maire, l.c. 283.

Perennial, erect, up to 40 cm tall, much branched, densely glandular hairy to glabrous below, rarely completely glabrous herb with woody stocks. Leaves linear-subulate to linear-oblong, up to 30 x 1-2 mm, 3-costate, glandular pubescent to glabrous, connate-vaginate at the base, acute. Flowers white or pale-yellow, solitary or in lax to  $\pm$  fastigiate clusters, shortly pedicellate; bracts below the calyx absent. Calyx  $\pm$  turbinate or obconic, (3.5-) 4-6 (-6.5) mm long, glabrous to glandular-hairy, costae 1 or weakly 3-nerved, not contracted at the apex; teeth triangular-ovate, c. 1.25-1.5 mm long, acute with or without mucro, membranous on margins. Petals lanceolate-oblong, not distinctly clawed, 5.5-10 (-12) mm long, entire, with pink veins below, glabrous, obtuse. Stamens 10, filaments filiform, glabrous, anthers oblong, less than 1 mm long, usually purple. Ovary oblong, glabrous, shortly stipitate. Capsule oblong-cylindrical, 5-7 mm long  $\pm$  exserted, shortly stipitate. Seeds oblong, black, 1.5-2.3 x c. 1 mm, smooth, margins thin.

Isotype: Herb. Linn. 580/7 (LINN).

A-3 Abu Ghilan, before Gharian Hills, sandy and stony ground, very common, flowers white, 28.11.1975, S.M.H.Jafri 6230; c. 4 km before Abu Ghilan, flowers



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white, petals with pink veins on the back, c. 15-20 cm tall, 28.11.1975, *S.I.Ali* 2953; Al-Galeaa near Gussbat, white flowers, limestone rocks, 3.6.1977, *A. El-Gadi* 285.

Distribution: Balkan peninsula, S. Italy, Sicily, North Africa.

*Fl.* Feb.-June

A very variable species in hairiness, pedicel, calyx and petal size and divided into 4 subspecies by Ball & Heywood (l.c.). Our material belongs to subsp. **angustifolia** (Poir.) Ball & Heywood and has a range of variation parallel to that found in subsp. **illyrica** and **haynaldiana** (Janka) Ball & Heywood.

2. **Petrohagia velutina** (Gauss.) Ball & Heywood, *Bull. Brit. Mus. (Bot.)* 3: 166. 1964 (Fig. 38).

*Dianthus velutinus* Guss., *Index Sem. Hort. Bocc.* 1825: 2. 1825; Durand & Barratte, l.c. 34; Pamp., *Pl. Trip.* 79: 1914; *Prodr. Fl. Ciren.* 201. 1931; *Tunica velutina* (Guss.) Fisch. & Meyer, *Index Sem. Hort. Petrop.* 6: 66. 1839; *Gypsophila velutina* (Guss.) D. Dietr., *Synop. Pl.* 2: 1542. 1840; *Kohlruschia velutina* (Guss.) Reichb., *l.c. Fl. Germ. & Helv.* 4: 43. 1844; *T. prolifera* (L.) Scop. ssp. *velutina* (Guss.) Briq., *Prodr. Fl. Cors.* 1: 570. 1910; Maire, l.c. 277; Keith, l.c. 991.

Annual, erect, up to 50 cm tall, mostly unbranched herb, with middle internodes of stem densely glandular-hairy, or pubescent, sometimes entirely glabrous. Lower leaves oblanceolate-spathulate to oblong-linear, with  $\pm$  scabrous margins, upper ones linear, connate and scarious at the base, leaf sheath at least twice as long as broad, 3-costate, smooth margined, all up to 50 x 4-5 mm, acute or mucronulate. Flowers pink or purplish, shortly pedicellate, in 2-3-flowered, terminal  $\pm$  capitate clusters; outer bracts of involucre many, brown scarious, enclosing the calyx ovate to obovate, largest 7-12 x 4.5-8.5 mm, acute or mucronate. Calyx tubular, 8-12 (-14) mm long, whitish membranous, glabrous, costae 3-nerved; teeth short, oblong, c. 1 mm long, obtuse. Petals distinctly clawed, 10-16 mm long, claw exerted, limb obcordate or occasionally 2-fid, up to c. 2.5 mm broad. Capsule narrowly ovoid-oblong, 6-8 mm long, 3-4 mm broad, shortly stipitate. Seeds black, boat-shaped, 1-1.3 x 0.7-0.8 mm, strongly tuberculate or cylindrical-papillate.

Type: Sicily, « Val de Mazzara, e val di Noto, Madanie », *Gussone*.

CARYOPHYLLACEAE

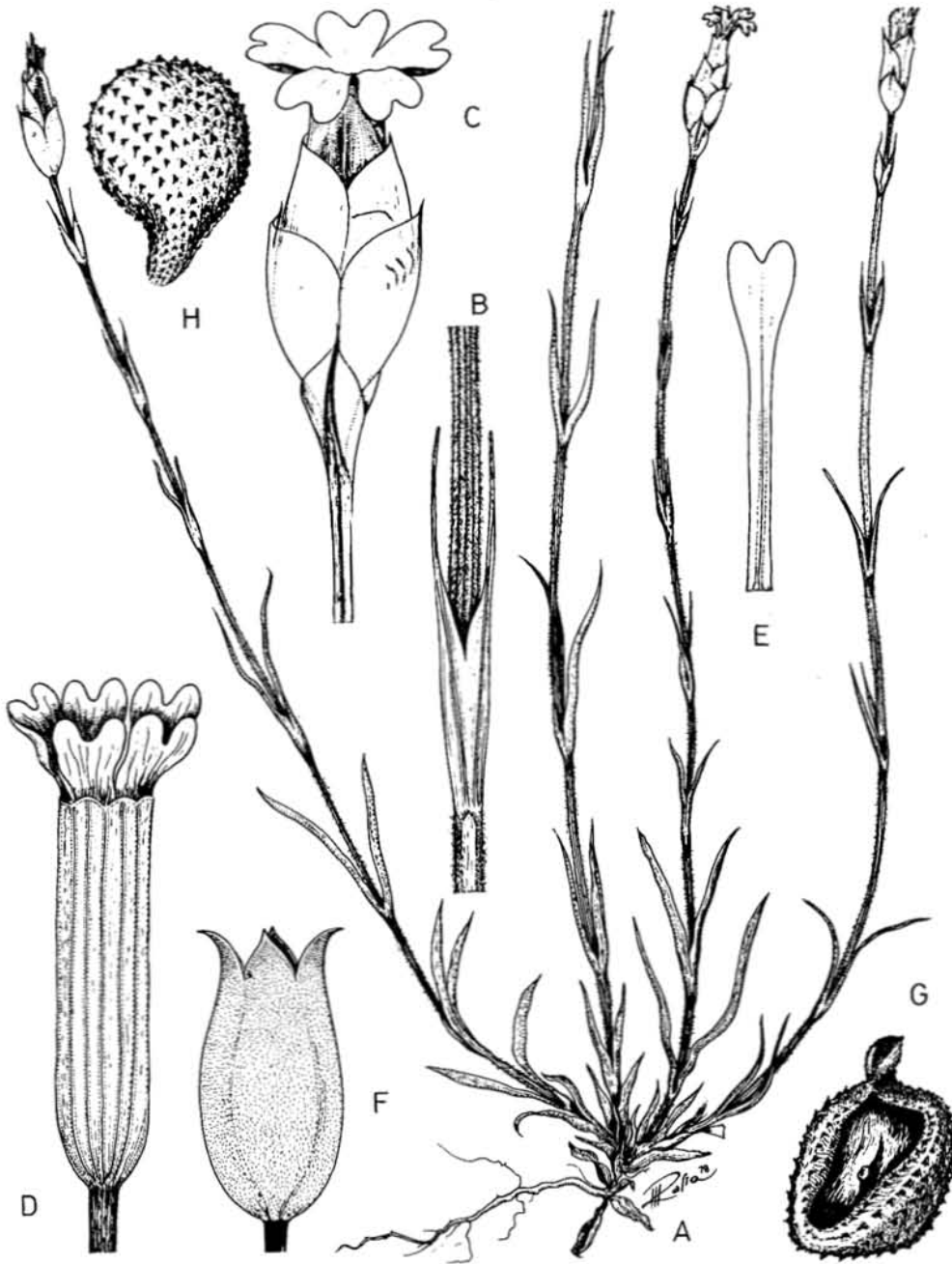


Fig. 38 *Petrorhagia velutina*: A. Habit x 1; B, pair of leaves x 2.5; C, Flowers enveloped by bracts x 3; D, Flower x 5; E, Petals x 4; F, Fruit x 10; G, H, Seeds (two views) x 30.

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**A-7** Slonta to Marawa (S. Road from Derna to El-Merj (Barce), 750 m, Cupressus & Pistacia machie/Forest, annual, flowers pink, 1 April 1970, *P.H.Davis* 50558.

Distribution: West Asia, S. Europe, Crete, Cyprus, N. & S. Africa, Hawaii, Western Australia.

*Fl.* Feb.-May

3. ***Petrorhagia cyrenaica*** (Durand & Barratte) Ball. & Heywood in Bull. Brit. Mus. Nat. Hist (Bot.) 3 (4): 158. 1964 (Fig. 39).

*Tunica thessala* var. *cyrenaica* Durand & Barratte, Fl. Lib. Prodr. 33. 1910; Pamp., Prodr. Fl. Ciren. 201. 1931; Maire, l.c. 279. 1963; Keith, l.c. 991.

Annual, 5-30 cm tall, glaucous-glabrous or basally papillate scabrid herb. Leaves linear to setaceous, up to 20 mm long,  $\pm$  membranous, connate-vaginate at the base, sharply acute. Flowers white, 1-3 in each cluster; outer bracts of involucre many, ovate-lanceolate, largest 4-8 x 1.5-2.5 mm, shorter than and not enclosing the flowers or calyx, almost entirely white-scarious with brown-membranous nerves. Calyx  $\pm$  turbinate, 4.5-6 mm long, whitish-membranous, sparsely eglandular pubescent to glabrous; teeth oblong, 2-2.5 mm long, ciliolate on margins, obtuse. Petals not distinctly clawed, linear-oblong, 5.5-8 mm long, white, pale-red beneath, entire-rounded at the tip. Stamens 10, filaments filiform, glabrous, anthers oblong, c. 1 mm long, violaceous. Ovary ovoid-oblong, glabrous, with subexserted styles. Capsule oblong, shorter than calyx, sessile. Seeds (immature) 1.3-1.5 x c. 1.1 mm, black.

Type: Libya: Zaouia Sidi-Mahdi entre Kouba et Lamoude, 13 May 1887, *Taubert* 559 (E-Iso).

**A-7** Ain Mara, near El-Marj, among stones, Gebel Akhdar area, flowers light purplish veined on petals, stem filiform, 20.10.1977, *M.A.Siddiqi* 99; El-Hania, 8 May 1934, *Pampanini & Pichi-Sermolli* 2577 (FI); **A-7** Wadi Derna, 8 April 1939, *Sandwith* 2487 (K).

Distribution: Endemic to Libya.

*Fl.* April-May

CARYOPHYLLACEAE

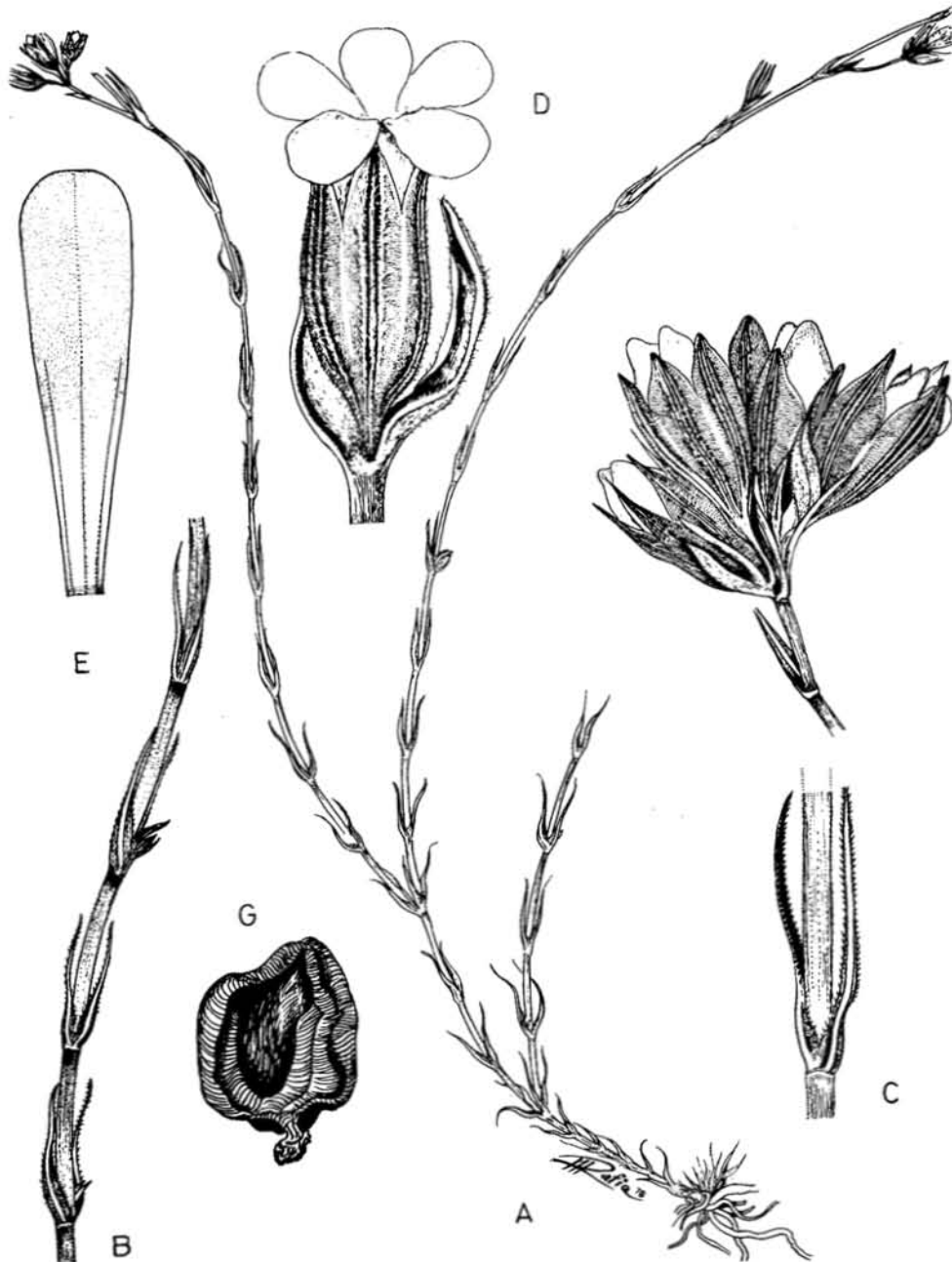


Fig. 39 *Petrorhagia cyrenaica*: A, Habit x 1; B, Vegetative branch (enlarged) x 2.5; C, Pair of leaves x 5; D, Flower x 7.5; E, Petal x 10; F, Cluster of fruits with persistent bracts and calyces x 5; G, Seed x 30.

## CARYOPHYLLACEAE

### Excluded Species

The material cited under the following species or their infraspecific taxa by Durand & Barratte (l.c.), Pampanini (l.c.) or Maire (l.c.) need confirmation. They probably do not occur in our area.

1. **Petroghagia prolifera** (L.) Ball & Heywood, Bull. Brit. Mus. (Bot.) 3 (4): 161. 1964.
2. **Petrorrhagia thessala** (Boiss.) Ball & Heywood, Bull. Brit. Mus. (Bot.) 3 (4): 161. 1964.

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