

15. HELIOTROPIUM

L., Sp. Pl. 130. 1753; Gen. Pl. ed. 5: 63. 1754.

Herbs, variously villous or scabrous, rarely glabrous, sometimes woody at base. Leaves alternate, rarely subopposite. Inflorescence terminal or pseudoaxillary scorpioid cyme. Flowers small, regular, sessile, white or yellow. Calyx 5-lobed, lobes linear or lanceolate. Corolla hypocrateriform, tube usually without scales, limb mostly spreading. Stamens included; anthers almost sessile, ovate, oblong or lanceolate, apex obtuse, mucronate or shortly appendiculate. Ovary completely or incompletely 4-celled, entire; style terminal, (not gynobasic), usually very short, stigma large, disc-like, conical or subulate, entire or bifid. Nutlets 4 or 2 by abortion, each 1-seeded, remaining entire; seeds straight or curved.

c. 250 species, chiefly distributed in temperate and tropical regions: represented by 7 species in Libya.

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| 1. | +Plants glabrous; leaves fleshy (holophyte) | 1. <i>H. curassavicum</i> |
| | –Plants hairy; leaves not fleshy (mostly glyco-phytes) | 2 |
| 2. | +Nutlets 1 (-2), enclosed by the calyx | 2. <i>H. supinum</i> |
| | –Nutlets 4, not enclosed by the calyx | 3 |
| 3. | +Corolla 5-8 mm long with 5 scales in the throat.
Stem clothed with yellow-yellowish-green spreading hairs | 4. <i>H. hirsutissimum</i> |
| | –Corolla 2-4.5 (-5) mm long, without scales in the throat. Stem hairs not yellow-yellowish-green | 4 |

BORAGINACEAE

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| 4. | +All leaves petiolate | 5 |
| | –At least upper leaves sessile, lower shortly petio-
late | 6 |
| 5. | +Flowers bracteate. Cymes 2-3 mm broad. Stigma
minutely hairy | 3. H. ovalifolium |
| | –Flowers ebracteate. Cymes 4-5 mm broad. Stigma
glabrous | 7. H. europaeum |
| 6. | +Nutlets glabrous, with carinate margin or free,
rugolose | 6. H. bacciferum |
| | –Nutlets covered with long hispid hairs without
carinate margin | 5. H. ramosissimum |

1. **Heliotropium curassavicum** L., Sp. Pl. 130.1753; Pamp., Prodr. Fl. Cir. 374.1931; Keith, Prelim. Check List Lib. Fl. 548.1965; Brummit in Tutin et al., Fl. Europ. 3:86.1972.

A perennial, halophytic, glabrous, up to 70 cm procumbent herb, often with fleshy stem, turning black when dried. Leaves fleshy, spatulate, linear-oblong, 15-30 (-35) x 2-7 (10) mm, entire, obtuse, lateral veins not very prominent, flowers sessile, small, white. Sepals ovate, 1-2 x 1 mm. Corolla 1-2.5 mm, limb about 2 mm in diameter. Anthers c. 1 mm long, $\pm$ sagittate, with short filaments. Stigma shortly conical. Nutlets 4, glabrous, rugose, c. 2 mm long, ventrally angled, reniform.

Type: Described from Tropical America. Herb. Linn. 179.11 (LINN).

A-6 Benghazi, near water, fls. white, 21.10.1977, *M.A. Siddiqi & F.B. Ratib* 127; El-Gaigam Road, side waste ground, prostrate, fls. white, 21.6.1972, *S.I. Ali* 825; 10 km before Benghazi on way to Darian, around the lake, saline soil, leaves fleshy, fls. white, 8.5.1978, *A. El-Gadi et al.* 1973; **A-8** Tobruk, saline soil near the sea, fls. white, common in a localized area, prostrate, 25.10.1975, *S.M.H. Jafri* 6084; *id.*, An annual herb, fls. white in saline soil near the sea, 18.10.1977, *M.A. Siddiqi & F.B. Ratib* 74.

Distribution: A native of the New World, widely introduced and naturalized in the old world. In Libya it is localized in the saline areas near the sea in Cyrenaica. In all our species of *Heliotropium*, this is the only halophytic and glabrous species.

BORAGINACEAE

2. ***Heliotropium supinum*** L., Sp. Pl. 130.1753; Durand & Barratte, Fl. Lib. Prodr. 172.1910; Pamp., l.c. 374; Brumitt in Tutin et al., l.c.; Keith, l.c. 549; Riedl in Rech. f., Fl. Iran. 48.52.1967. (Fig. 19)

A decumbent annual herb with whitish to yellowish pubescence. Leaves opposite or alternate, elliptic, oval or suborbicular with rounded or cuneate base, $\pm$ crenate, (5-) 10-20 x (4-) 5-10 (12) mm, acute, slightly acuminate or obtuse with 3-12 (-18) mm long petiole, veins conspicuous. Cymes simple or 1-forked, up to 14 cm long. Flowers sessile, white. Calyx 2-2.5 mm long, partite about 1/4 of its length, hairy outside, lobes obtuse, accrescent, persistent, enclosing the fruit and becoming pyriform. Corolla as long as the calyx or slightly longer, limb very short, rounded. Stamens inserted almost in the middle of corolla tube. Ovary glabrous, c. 2 mm long; style as long as stigma, inserted obliquely on the ovary; stigma conical, c. 0.5 mm long. Nutlet 1(-2), c. 3 mm long, plano-convex, dark brown, obscurely tubercled.

Type: "Habitat Salmanticae Juxta agros Monspelii in litore", *Alstroemer* 48a Herb. Linn. 179.8 (LINN).

A-6 Near Benghazi, subsaline and sandy ground, common, prostrate, 27.10.1975, *S.M.H. Jafri* 6164; **A-7** c. 87 km from Baida in barley field, prostrate, fls. white, 23.6.1972, *S.I. Ali* 896.

Distribution: Most of the North Africa, Southern Europe, South Asia, Arabia and Syria.

In Libya, this species seems to be localized in coastal areas of the former Cyrenaica.

3. ***Heliotropium ovalifolium*** Forsk., Fl. Aegypt.-Arab. 38.1775; Pamp., Pl. Trip. 197.1914; Keith, l.c. 548; Tackh., l.c.

Heliotropium coromandelianum Retz. Obs. 2:9.1781; *H. obovatum* D. Don, Prodr. 101.1802; *H. syenites* Spreng. Syst. 1:539.1825.

A greyish hispid annual with a woody stem, branched at the base, up to 30 cm tall. Leaves elliptic or obovate, slightly attenuate at the base, apiculate or obtuse, 9-18 x 4-8 mm, with 8-12 mm long petiole, nerves not prominent, densely clothed with adpressed hairs. Cymes mostly 1-forked, narrow, 2-3 mm broad, up to 20 cm long in fruit. Flowers white, bracteate; bract 2.5-4 mm long, ovate, acute. Calyx c. 2 mm long, lobes reaching up to the base, lanceolate, acute. Corolla c. 4 mm long with about 2.5 mm long cylindric tube:

BORAGINACEAE

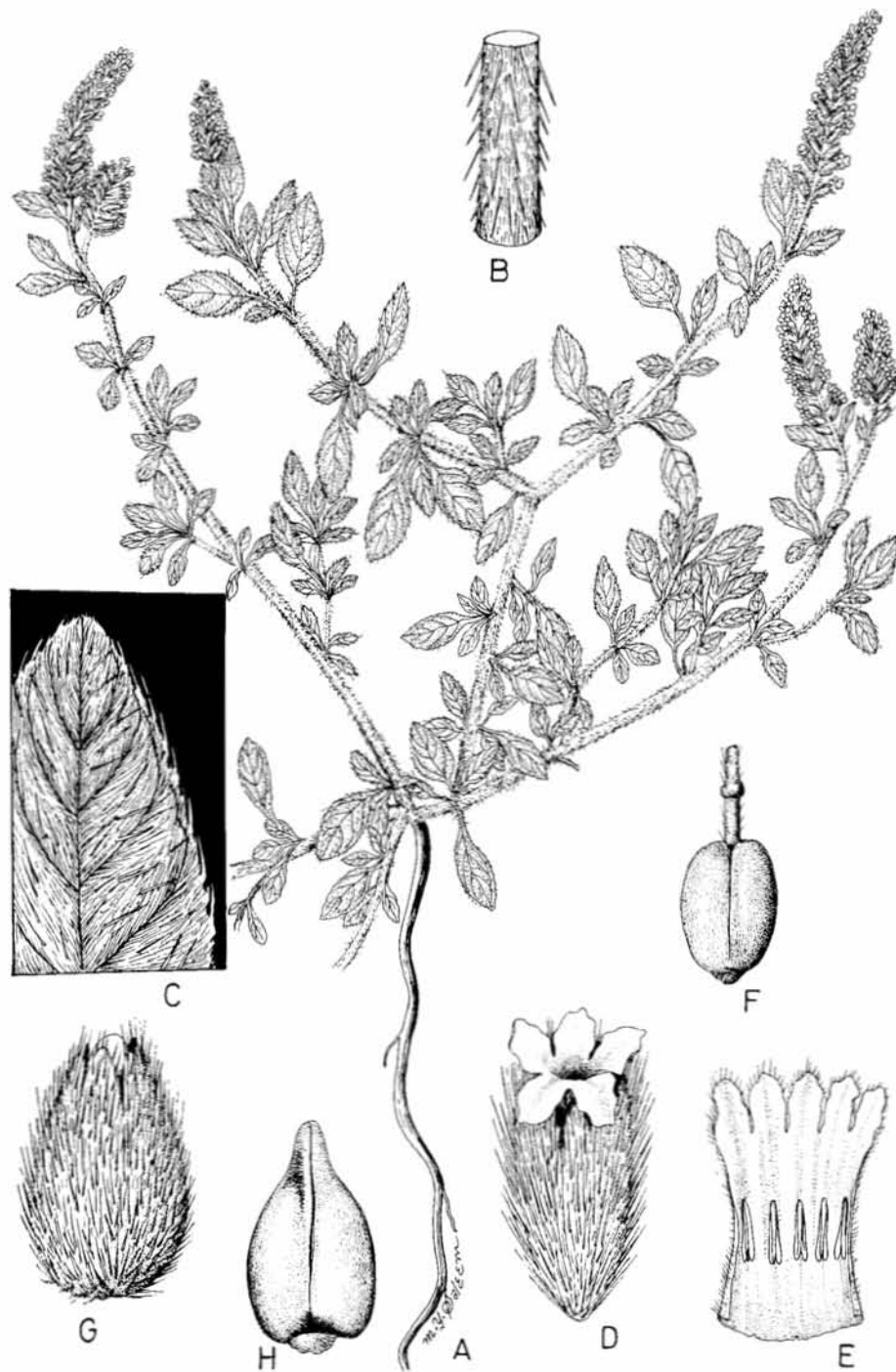


Fig. 19. ***Heliotropium supinum***: A. habit x 0.5; B. portion of stem x 8; C. dorsal side of leaf x 5; D. flower x 10; E. dissected corolla showing stamens x 10; F. gynoecium x 10; G. nutlet enclosed within the persistent calyx x 10; H. nutlet x 10.

BORAGINACEAE

lobes small, spreading, acute. Stamens inserted below the middle of the corolla tube. Filaments very short: anther c. 1 mm long, with almost an equally long apex produced into a connective. Stigma minutely hairy; style thick; ovary glabrous. Nutlets 4, c. 1.5 mm long, convex on the back, densely setulose.

Type: Described from Egypt, *Forskal* (C).

Keith (l.c.) has reported this species from the former Tripolitania. I have not seen any authentic specimen as yet from our area.

Distribution: Tropical Asia, Tropical and North Africa.

4. ***Heliotropium hirsutissimum*** Grauer, Pl. Min. Cogn. Dec. 1.1784; Brumitt in Tutin et al., Fl. Europ. 3:85.1972; Tackh., St. Fl. Egypt 442.1974. (Fig. 20)

H. villosum Willd. Sp. Pl. 1:741.1798; Durand & Barratte, l.c. 172; Pamp., Prodr. Fl. Cir. 374.1930; Keith, l.c. 550.

An annual, stems 10-40 cm with erect or ascending branches, clothed with long, erect or patent dense yellowish green hairs. Leaves ovate or elliptic, 20-50 x 10-28 mm, entire, cuneate or rounded at base, acute to obtuse, with up to 35 mm long petiole. Scorpioid cyme single or in pairs, the lateral or terminal on distinctly peduncled. Flowers yellow-white, sweet scented. Calyx 3-4 mm long, lobes villous, linear oblong, reaching only up to the base of corolla tube. Corolla 5-8 mm with a limb of 4-8 mm in diameter, hairy outside with 5 distinct scales inside. Stamens inserted near the base of corolla tube; anthers subsessile, c. 1 mm long. Stigma hardly conical, cap-shaped, pubescent, style c. 0.5 mm long. Nutlets 4, tuberculate, glabrous, c. 1.5 mm long.

Type: Described from Aegean region.

A-7 from Baida, towards Shahat, near cult. field, c. 5-20 cm, fls. white, 20.6.1972, *S.I. Ali* 748; Shahat, roadside waste ground, branches ascending, flowers white, 20.6.1972, *S.I. Ali* 768.

Distribution: Mediterranean region.

This species can be easily distinguished from *H. europaeum* L. by its $\pm$ conical, capitate pubescent stigma, larger flowers and scales in the corolla throat.

BORAGINACEAE

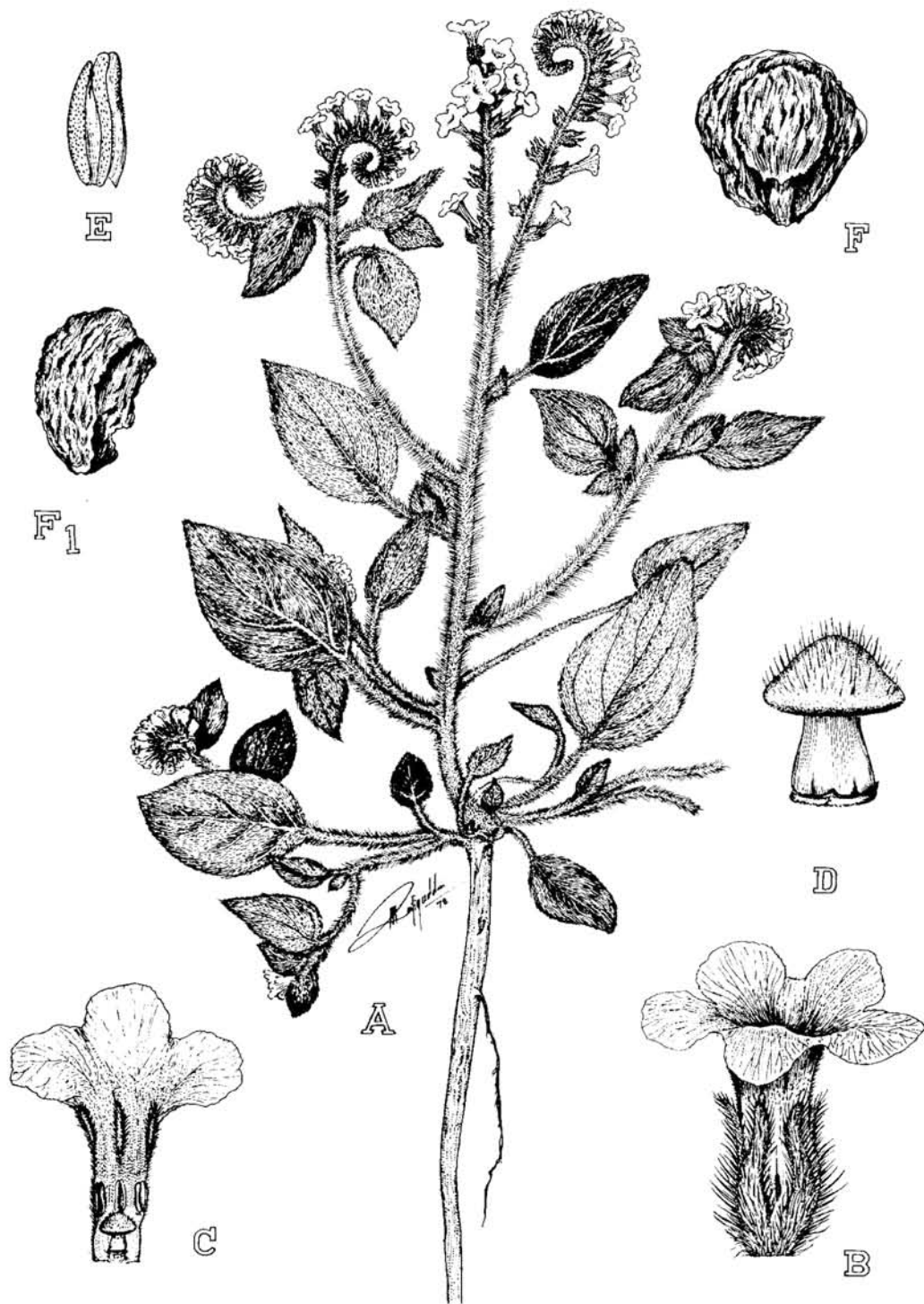


Fig. 20. ***Heliotropium hirsutissimum***: A, habit x 1; B, flower x 5; C, dissected corolla x 5; D, stigma and style x 15; E, anther x 15; F, F₁, different views of nutlets x 15.

BORAGINACEAE

Fl. April-June

5. **Heliotropium ramosissimum** (Lehm.) DC., Prodr. 9:536.1845; Reidl in Rech. f., Fl. Iran. 48:18.1967. (Fig. 21)

Lithospermum hispidum Forsk., Fl. Aegypt.-Arab. 39.1775; *H. crispum* Desf., Fl. Atl. 1:151. tab. 41.1789; *H. undulatum* auct. non Vahl (1790); Durand & Barratte, l.c. 173.p.p.; *H. undulatum* Vahl var. *ramosissimum* Lehm., Icon. Dec. Strip. 1. Icon Asperif. 24, t. 40.1831; *H. nubicum* Bunge in Bull. Soc. Nat. Mosc. 42/1: 320.1869; *H. afghanum* Boiss., Fl. Or. 4:143.1879; *H. sparthocodos* Bornm. Beit. Bot. Centrbl. 61/B:89.1941; *H. undulatum* ssp. *euundulatum* Maire, in Mem. Soc. Hist. Nat. Afr. N. 3, 2:177.1933; *H. undulatum* ssp. *euundulatum* Maire var. *nubicum* (Bge.) Maire in Botan. Miss. Tib. Mem. Acad. Sc. Ist. Fr. 62:27.1937; *H. undulatum* ssp. *erosum* (Lehm.) Maire in Bull. Soc. Hist. Nat. Afr. N. 22:306.1931 & var. *kralikii* (Pomel) Maire, l.c.: *Bourjoia kralikii* Pomel, Nouv. Mat. Fl. Atl. 89. 1874.

Perennial, erect to suberect herb, woody and much branched at base with setulose-hispid somewhat spreading hairs. Leaves 15-30 (40) x 5-7 (8) mm, subsessile to sessile or lower petiolate, lanceolate, acute, rough, flat with often crisped, margin greyish with semi- appressed bristles on large solid tubercles. Cymes 20-50 mm, lax, ebracteate small, sessile. Flowering calyx 2-2.5 mm long, lobes lanceolate, persistent, grey with small rough hairs. Corolla white, tube glabrous inside, puberulous outside, lobes oblong, obtuse, c. 0.75 mm long with crenulate margin. Anthers inserted below the middle of the tube, sessile, c. 1 mm long, oblong-subovate. Stigma conical, longer than style, c. 1 mm long. Nutlets 4, separating from each other, covered with long, hispid hairs and becoming glabrescent, 1.5-2 mm long, ovate, brown.

Type: Aegypti ad Woadi Gamuls, *Sieber*.

A-2 Between Sokna & Wadi Washka, sandy and stony ground, fls. white and small, 21.2.1976, *S.M.H. Jafri* 6310; **A-3** Tarhouana, 30.3.1975, *Zenab A.* 223; **B-1** 184 km from Nalut, c. 64 km from Senoan, sandy soil, dry area, c. 15 cm, 25.2.1975, *S.I. Ali* 2134; **B-4** 6 km from Abu Hadi Al Ghariba, 28.3.1975, *Amina G.* 75, 127; **C-4** 50 km from Hun, c. 30 km from Wadan, towards Tripoli, branches scandent, fls. white, 2.4.1973, *S.I. Ali* 1562; 43 km from Washka, 25.3.1975, *Fouzia* 12; c. 80 km from Hun, limestone, dry place, fls. white, 2.4.1973, *S.I. Ali* 1568; Gara al Taparni, from Weshka, white, branches procumbent, 26.3.1975, *S.I. Ali* 2373; **D-3** Herb, prostrate, fls. white, about 10 km to the right from Sebha main road, 23.12.1972, *Fathi, B.R.* 176; **G-8** Gebel Uweinat, 7.11.1968, *L. Boulos* 3299.

BORAGINACEAE

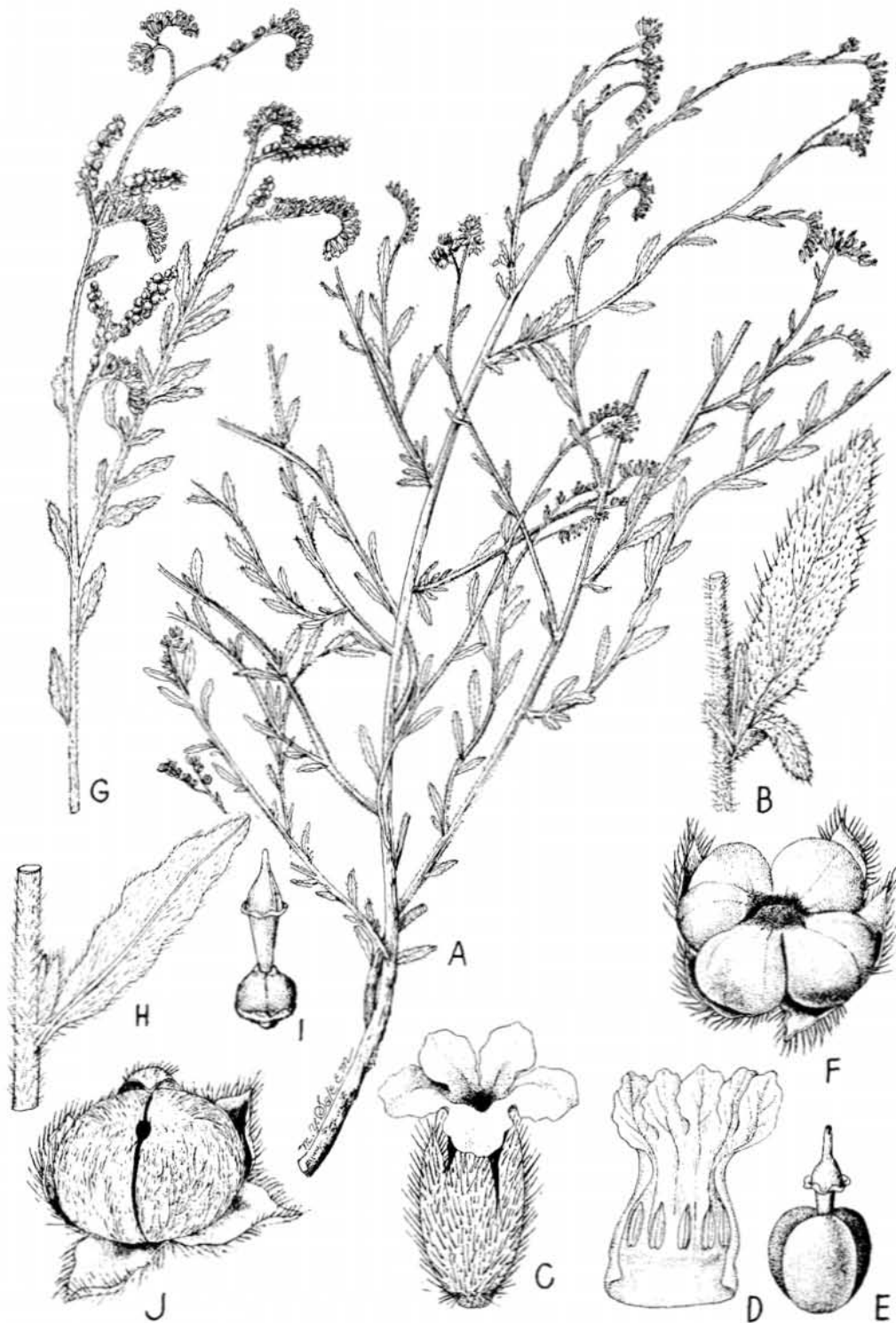


Fig. 21, **Heliotropium bacciferum**: A, habit x 0.5; B, leaf x 3; C, flower x 8; D, dissected corolla x 8; E, gynoecium x 8; F, nutlets (fruit) x 8. **H. ramosissimum**: G, habit x 0.5; H, leaf x 3; I, gynoecium x 8; J, nutlets (fruit) x 8.

BORAGINACEAE

Distribution: Iran, Afghanistan, Arabia, N. Africa.

Fl. Dec.-Mar. *Vern.* tahanna, tahenna.

A very variable species, often divided into a number of infraspecific categories of uncertain status on the degree of pubescence on the leaves and fruits etc.

6. ***Heliotropium bacciferum*** Forsk., *Fl. Aegypt.-Arab.* 38.1775; Riedl in *Rech. f. l.c.* 19; Tackh., *St. Fl. Egypt.* 441.1974, p.p. (excluding synonym *H. ramosissimum*). (Fig. 21, A-F)

H. undulatum Vahl, *Symb. Bot.* 1:13.1790 *nom. illeg.*; Durand & Barratte, *l.c.* 172. (p.p.); Keith, *l.c.* (p.p.).

A perennial undershrub with woody and short branches at the base, covered with short tuberculate, somewhat spreading hairs. Lower leaves shortly petiolate, upper sessile: 10-20 (-25) x (1-) 2-3 (6) mm, lanceolate, with a revolute margin, nerves inconspicuous. Inflorescence 20-50 mm, lax with ebracteate sessile flowers. Calyx 2.5-3 mm long, lobes ovate-lanceolate, acute, persistent. Corolla almost as long as calyx or slightly longer, tube ventricose with a constricted throat, limb erect with ovate lobes. Anthers, oblong, subsessile, inserted almost in the middle of corolla tube. Stigma conical; style almost equalling the stigma. Nutlets 4, glabrous, with carinated or liberated margin, c. 2 x 1 mm, plano convex.

Type: Arabia Felix: Lojha, *Forsk.* (C).

A-2 Shakshuk, prostrate, 5.5.1972, *S.I. Ali & M.M. Khalifa* 393; **A-4** 3 km before Misrata, 7.1.1977, *M.A. Siddiqi & F.B. Ratib* 57; **B-4** Taworgha, c. 91 km from Bugrain on way to Khums, 6.4.1977, *S.A. Alavi & S.A. Faruqi* 1302, 52 km from Bugrain on way to Hun, stony ground, c. 15 cm procumbent herb, fls. white with yellow throat, corolla c. 5 mm in diameter, *S.A. Alavi & Fathi, B.R.* 1726; **B-5** 15 km before Ras Lanuf, fls. white, 9.5.1978, *A. El-Gadi et al* 2085-G; **B-8** 225 km from Tobruk on way to Jaghbub, prostrate, fls. white, *Ramadan, Fathi & Siddiqi* 638/Z; **C-4** 31 km from Weshka, sandy soil, fls. white, procumbent, 25.3.1975, *S.I. Ali* 2291; 43 km from Weshka, roadside sandy soil, fls. white, prostrate, procumbent, 25.3.1975, *S.I. Ali* 2282; 7 km from Hun on way to Sebha, sandy soil, roadside, prostrate, with inflorescence branches procumbent, fls. white, corolla lobe c. 3 mm, *S.A. Alavi & Fathi, B.R.* 1749; **C-5** 149 km from Bu Njim, prostrate, fls. white, 27.3.1975, *S.I. Ali* 2445; c. 87 km from Bu Njim, sandy loam, prostrate, fls.

BORAGINACEAE

white, 27.3.1975, *S.I. Ali* 2439; **D-3** 100 km from Hun along main highway, prostrate, fls. yellow, 31.3.1973, *S.I. Ali* 1445; c. 98 km to Hun, along the main highway from Sebha, Wadi Soda along the main dried water stream, sandy soil with loamy top at some places, prostrate-scandent, fls. white, 31.3.1973, *S.I. Ali* 1456; **F-3** Wadi Atiq, c. 150 km from Wegh, dry sandy (water course?) c. 30 cm procumbent branches, fls. white, 26.3.1973, *S.I. Ali* 1369; **G-8** Gebel Uweinat, 7.11.1968, *L. Boulos* 3333.

Distribution: Arabia, Iran, Pakistan and North Africa.

Fl. Nov.-Mar. *Vern.* ramram, rumrum.

This species is a new record for our area, formerly confused with the preceding species. Like the following species but differs by having upper sessile leaves and conical stigma.

7. ***Heliotropium europaeum*** L., *Sp. Pl.* 130.1753; Durand & Barratte, l.c. 172; Pamp., *Prodr. Fl. Cir.* 374.1931; Keith, l.c. 548; Brummit in Tutin et al., l.c. 85. (Fig. 22)

H. commutatum Roem. & Schult. *Syst. Veg.* 4:219.1819; *H. stevenianum* Andr. in Besser, *Enum. Pl. Volhyn.* 116.1822; *H. canescens* Andr. in Besser, l.c.

Perennial undershrub, up to 40 cm tall, usually densely branched at the base, clothed with erect, patent or appressed hairs. Leaves 10-55 (-65) x 7-20 (-30) mm, ovate-elliptic, somewhat cuneate-rounded at base, petiole 10-30 mm long, green above, somewhat canescent below, with appressed hairs borne on tubercles. Cymes scorpioid, 1-4 at the end of branches, up to 100 mm long. Flowers white, sessile and scentless. Sepals 2-3 (-3.5) x 1 mm, linear to linear oblong or narrowly triangular downy to villous, up to 4 mm long and spreading in fruit. Corolla tube 2-3 (-4) mm long, hairy outside, lobes of the limb 1 mm long, ovate, obtuse with almost entire margin. Anthers 0.7-1 mm long, stigma linear-subulate. Nutlets glabrous or pubescent, usually rugose, ovoid, c. 2 mm long.

Type: Described from S. Europe.

A-2 35 km after Al-Hbaielia on way to Shakshook, erect, perennial, shrublet, c. 25 cm, flowers white, 26.11.1976, *A. Ghafoor, S.A. Alavi & Fathi, B.R.* 159; Wadi Carrine, Kabaw, corolla white, clay soil, 7.6.1974, *B. Faras* 516; **A-3** Faculty of Science, Tripoli University, 3.7.1968, *L. Boulos*; Tajura, 12 km W. of Tripoli, colour of fls. white with

BORAGINACEAE

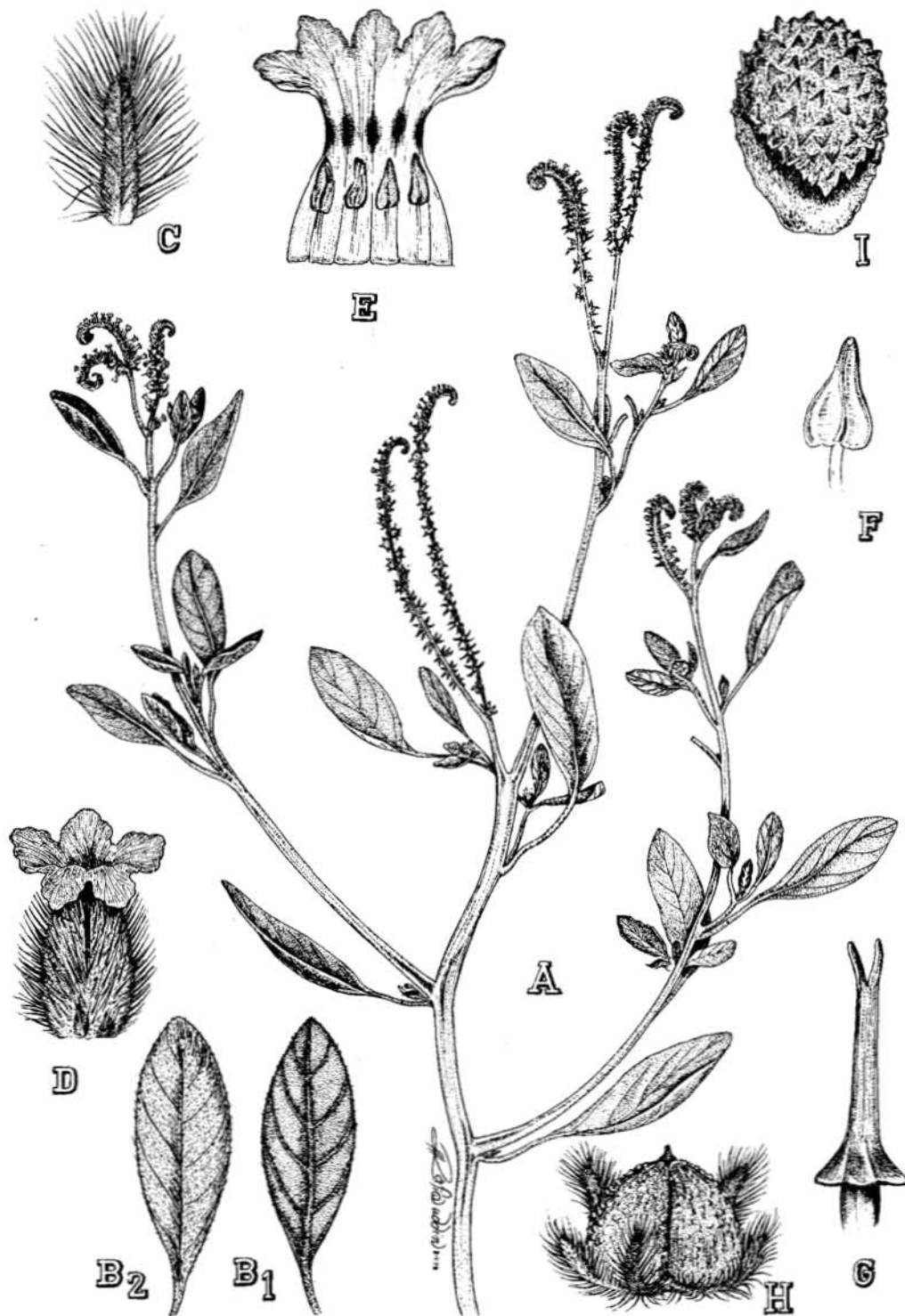


Fig. 22, ***Heliotropium europaeum***: A, habit x 0.5; B₁, B₂, leaf (dorsal and ventral side) x 1; C, calyx x 10; D, flower x 10; E, dissected corolla x 10; F, stamen x 20; G, style and stigma x 25; H, nutlets x 10; I, nutlet x 20.

BORAGINACEAE

yellow throat, 20.4.1978, *J.A. Ali* 64; **B-6** Dariana, c. 40 km from Benghazi, c. ½ km from sea, sand, erect, c. 50 cm, fls. white, 16.6.1972, *S.I. Ali* 470; **A-7** Shahat, near the museum on rocks, common, prostrate plant with white fls., 26.10.1975, *S.M.H. Jafri* 6109; Susa, sandy ground with small stones c. 25 cm, fls. white, 20.6.1972, *S.I. Ali* 778.

Distribution: Asia Minor, Central & Southern Europe, North Africa extending up to Iraq and Iran (?).

This is a highly variable taxon and often much confused with its allied species viz. *H. ellipticum* Ledeb. and *H. lasiocarpum* Fischer & Meyer, but differs from them by having the smaller flowers and linear subulate stigma.

Fl. Nov.-April