

8. *Euphorbia* L.

Syns. *Tithymalus* Graetn., *Euphorbium* Hill, *Anisophyllum* Haw.,
Chamaesyce S. F. Gray, *Poinsettia* Graham, *Agaloma* Raf.

Monoecious herbs, shrubs, trees or succulents; milky latex always present; leaves alternate, opposite or whorled, the lower or stem-leaves usually alternate, the median or pseudumbel-leaves whorled, the upper or ray leaves whorled or opposite, all usually sessile, rarely shortly-petiolate, simple, entire or toothed, penni- or palmi-nerved; stipules present or absent; inflorescence a cyathium, with several male flowers and 1 female flower, enclosed in a gland-bearing involucre; cyathia axillary or in pseudumbels; involucre usually 5-lobed, with 1-5 glands alternating with them; *male flowers*: 1 stamen borne on its own pedicel; *female flower*: 3-locular ovary on a pedicel, usually elongate in fruit; ovules 1 per locule; styles 3, free or connate at the base; stigmas often 2-fid; fruit 3-celled capsule, dehiscent into 2-valved, 1-seeded cocci; seeds carunculate or not, smooth or wrinkled. About 2000 species, cosmopolitan, but especially tropical, subtropical and warm-temperate regions.

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|---|----------------------------------|
| 1. Succulent shrubs, sometimes leafless | 2 |
| + Non-succulent shrubs or herbs | 4 |
| 2. Stems 4-5(-7) angled, with spine-shields continuous along the ribs | 15. <i>E. polyacantha</i> |
| + Stems terete, unarmed | 3 |
| 3. Seeds ovoid, minutely tuberculate, yellowish-brown | 16. <i>E. consobrina</i> |
| + Seeds oblong, smooth, greyish | 17. <i>E. mauritanica</i> |
| 4. Leaves asymmetric, with obliquely rounded base; stipules present | 5 |
| + Leaves symmetric, base not obliquely rounded; stipules absent, if present, glandular | 19 |
| 5. Leaves linear, about 10 times as long as broad | 13. <i>E. arabica</i> |
| + Leaves suborbicular, ovate, elliptic, ovate-oblong or -lanceolate, 1-3 times as long as broad | 6 |
| 6. Leaves 1-4 (-5) x 0.5-2 (-2.5) cm; cyathia 10 or more, clustered in terminal and axillary pedunculate, often capitate, cymes to 1.5 cm diam. | 7 |

- + Leaves (0.1-) 0.3-0.9 (-1.2) x 0.2-0.8 cm; cyathia solitary to 5 together in congested leafy cymes 10
7. Capsule completely glabrous, both when young and mature 4. *E. hyssopifolia*
 + Capsule pubescent, at least when young 8
8. Leaves acute, margin sharply serrate 1. *E. hirta*
 + Leaves obtuse, margin crenulate or denticulate 9
9. Leaves ovate-oblong to elliptic; capsule sparsely hairy or glabrous 2. *E. indica*
 + Leaves oblong; capsule densely pubescent 3. *E. lasiocarpa*
10. Plant entirely glabrous 11
 + Plant all or partly pubescent 13
11. Leaves suborbicular, 1-3 mm diam. 8. *E. serpens*
 + Leaves oblong, ovate or ovate-oblong, 3-8 mm broad 12
12. Leaves thin, petiole 1-1.5 mm, margin serrate or obscurely serrate; capsule 1.5-1.75 mm; seeds 1.25 mm (garden weed) 10. *E. inaequilatera*
 + Leaves fleshy, sessile, margin repand-dentate or entire; capsule 3-4 mm; seeds 2 mm (coastal sands) 5. *E. peplis*
13. Capsule glabrous or hairy only along the keels 14
 + Capsule hairy all over 16
14. Glands with minute appendages 12. *E. prostrata*
 + Glands with prominent white petaloid appendages 15
15. Leaves suborbicular to obliquely ovate, finely denticulate 7. *E. chamaesyce*
 + Leaves obovate to linear-oblong, entire 6. *E. granulata*
16. Leaves obliquely ovate-oblong, margins serrate-spinulate 11. *E. scordifolia*
 + Leaves suborbicular, ovate, obovate or elliptic, margins entire, remotely dentate or serrulate-crenate near the apex 17
17. Leaves entire 6. *E. granulata*
 + Leaves remotely dentate or serrulate-crenate near the apex 18
18. Plant hirsute to canescent; leaves 2-5 (-7) x 2-3 mm, suborbicular to ovate, almost all alike 7. *E. chamaesyce*
 + Plant appressed- and/or crispate-hairy; leaves 0.4-1.2 x 0.3-0.8 cm, oblong-elliptic, variable 9. *E. forsskaolii*
19. Branchlets spinescent 20
 + Branchlets not spinescent 21
20. Small tree or shrub to 4 m; cymes reduced to solitary cyathia or clustered in terminal 2-5-branched umbels (Gebel Elba) 18. *E. cuneata*
 + Low shrub to 40 cm; cyathia solitary on terminal or dichotomous branchlets (Sinai) 26. *E. erinacea*

21. Cyathia in short, axillary cymes	19. E. acalyphoides	22
+ Cyathia umbellate		
22. Leaves all petiolate		23
+ Leaves sessile or tapering at the base		24
23. Plant densely villous; leaf blade 1.2-3.5 x 0.8-1.5 cm; cyathial glands 4 or 5, lobed	20. E. petiolata	
+ Plant glabrous, or sparsely pilose; leaf blade 4-10 x 2-5 cm, cyathial glands solitary, ± funnel-shaped	14. E. heterophylla	
24. Caruncle at least 1/2 as long as the seed		25
+ Caruncle, absent or less than 1/2 as long as the seed		26
25. Caruncle about as long as or longer than the seed	23. E. grossheimii	
+ Caruncle about 1/2 as long as the seed	22. E. retusa	
26. Leaves serrate, serrulate or pectinate-dentate		27
+ Leaves entire		31
27. Seeds smooth	24. E. arguta	28
+ Seeds reticulate		
28. Leaves dentate-pectinate; seeds 2-3.25 mm		29
+ Leaves serrulate; seeds 1.25-2 mm		30
29. Seeds 2 mm, prominently and irregularly reticulate-rugulose	27. E. oxyodonta	
+ Seeds 2.5-3.25 mm, very shallowly and irregularly reticulate-rugose	30. E. sintenisii	
30. Capsule 1 x 1.5 mm, with 2 undulate wings on each valve	28. E. pterococca	
+ Capsule 2.5 x 3.5 mm, not winged	29. E. helioscopia	
31. Shrubs with woody stems		32
+ Herbaceous perennials, sometimes woody at the base, or annuals		34
32. Capsule covered with conical and cylindrical warts	25. E. hierosolymitana	33
+ Capsule smooth		
33. Leaves to 1 x 1.2 cm, broadly obovate to suborbicular, fleshy; capsule 3-3.3 x 3 mm	38. E. obovata	
+ Leaves 3-8 x 0.4-0.8 cm, linear to lanceolae, thin; capsule 5 x 6 mm	21. E. dendroides	
34. Seeds tetragonous, with 1 row of 4-6 transverse furrows or pits on each of the 4 faces	34. E. falcata	35
+ Seeds not as above		
35. Perennial; capsule 3-5 x 3-6 mm; seeds smooth		36
+ Annual; capsule 1.5-2 x 1.5-2.5 mm; seeds tuberculate or rugulose, pitted or sulcate		38

36. Leaves 0.6-1.1 x 0.4-0.8 cm, obovate to suborbicular; capsule 3 mm diam., not deeply sulcate 41. *E. sanctae-catharinae*
 + Leaves to 4 (-6) x 1.5 cm, ovate-oblong, elliptic-oblong to linear-lanceolate; capsule 4-6 mm diam., deeply sulcate 37
37. Cauline leaves to 2 cm, elliptic to oblong, sessile, with rounded broad base, densely imbricate, fleshy; caruncle minute 40. *E. paralias*
 + Cauline leaves to 4 (-6) cm, oblong-linear to linear-lanceolate, rather spaced, thin; caruncle conspicuous, boat-shaped 39. *E. terracina*
38. Seeds tuberculate or rugulose 39
 + Seeds pitted or sulcate 41
39. Stems much-branched from the base; leaves 1.5-5 x 0.3-0.5 cm; capsule 2.5-2.8 mm; seeds 2-2.25 mm 33. *E. dracunculoides*
 + Stems with few braches; leaves 0.3-2.5 x 0.1-0.2 cm; capsule 1.5-2 mm, seed 1-1.25 mm 40
40. Plant not more than 10 cm; leaves to 1 cm; cyathium glands with 2 short horns or unappendaged 31. *E. parvula*
 + Plant 10-30 cm; leaves to 2.5 cm; cyathium glands with 2 conspicuous horns 32. *E. exigua*
41. Plant c. 3 cm; cauline leaves sessile; seeds 1 x 0.8 mm 37. *E. punctata*
 + Plant 5-30 cm; cauline leaves petiolate; seeds 1.5 x 1 mm 42
42. Leaves thin, of variable shapes and sizes; capsule with 2 wing-like ridges on each keel; seed pits dark grey 35. *E. peplus*
 + Leaves rather fleshy, almost all alike; capsule not winged along the keels; seed pits pale grey with black median slit 36. *E. chamaepeplus*

1. *Euphorbia hirta* L., Sp. Pl., ed. 1, 454 (1753).

Syns. *Euphorbia pilulifera*, sensu Boiss. in DC., Prodr. 15(2): 21 (1862), non L. (1753).

Chamaesyce hirta (L.) Millsp., Publ. Field Columb. Mus., Bot. 2: 303 (1909).

Hispid annual 20-50 cm; hairs multicellular, drying yellow; stems erect to ascending, branched mainly from the base; leaves 1-4 x 0.5-1.5 cm, opposite, rhombic-ovate to -lanceolate, asymmetrically cuneate at the base, acute, the margin sharply serrate; stipules 1-2 mm, subulate; cyathia in dense axillary clusters 0.5-1 cm diam.; peduncle 3-8 mm, capsule c. 1.2 x 1.2 mm, sharply trigonous, appressed-hirsute; seeds 0.8 mm, tetragonous, transversely wrinkled.

N, M, S; weed of cultivation, lawns, roadsides; naturalized. Pantropical weed.

2. *Euphorbia indica* Lam., Encycl. 2: 423 (1786).

Syns. *Euphorbia hypericifolia*, sensu Täckh., Stud. Fl. Egypt, ed. 2, 323 (1974); sensu Greuter *et al.*, Med-Checklist 3: 215 (1986), non L. (1753).

Chamaesyce indica (Lam.) Croizat, Lilloa 8: 406 (1942).

Annual 30-60 cm, with sparse unicellular white hairs; stems decumbent, ascending or erect; leaves opposite; petiole 1-1.5 mm; blade 1-2.5 x 0.5-1(-1.5) cm, ovate-oblong to elliptic, obliquely round at the base, serrulate; stipules 1-1.5 mm, triangular; cyathia in loose axillary clusters; cyathial glands with white or pink orbicular petaloid appendages; capsule 1.5 x 2 mm, trigonous, sparsely hairy or glabrous; seeds 1 x 0.8 mm, ovoid-quadrangular, grey, smooth, ecarunculate.

N; roadsides, canal banks, edges of cultivation. Africa, Arabia, eastwards to China.

3. **Euphorbia lasiocarpa** Klotzsch, Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 19, Suppl. 1: 414 (1843).
Syn. *Chamaesyce lasiocarpa* (Klotzsch) Arthur, Torreya 11: 260 (1911).

Like *Euphorbia indica*, but leaves oblong with crenulate margins; capsule densely pubescent.

S; cultivated and waste ground. Native to Mexico extending to Peru, West Indies; naturalized elsewhere.

4. **Euphorbia hyssopifolia** L., Sp. Pl., ed. 1, 454 (1753).
Syns. *Euphorbia brasiliensis* Lam., Encycl. 2: 423 (1786).
Chamaesyce hyssopifolia (L.) Small, Bull. New York Bot. Gard. 3: 429 (1898).

Erect or ascending annual 10-40 cm, glabrous except for a few scattered hairs on young branches and leaves; stems branched; leaves 1-2.5 x 0.4-1 cm, lanceolate or ovate-elliptic, base obliquely rounded, the apex rounded, the margin minutely dentate; petiole 1-1.5 mm; stipules 0.8 mm, triangular, fimbriate; cyathia 1 x 1 mm, in terminal and axillary cymes, peduncle to 1 cm; glands minute, green tinged red; *male flowers*: with fimbriate bracteoles; stamens 1 mm; *female flower*: with short-pedicellate ovary; styles 0.5 mm, 2-fid; capsule 2 x 2 mm, glabrous, exerted on a 1.5 mm reflexed pedicel; seeds 1 x 0.5 mm, oblong-conical, with 3 transverse ridges.

N (Qalioubia, Nile Delta); cultivated ground, naturalized. Central America; naturalized in tropical East and West Africa.

5. **Euphorbia peplis** L., Sp. Pl., ed. 1, 455 (1753).
Syn. *Tithymalus peplis* (L.) Scop., Fl. Carniol., ed. 2, 1: 340 (1771).

Glabrous glaucous fleshy annual, 10-25 cm; stems procumbent, branched from the base; leaves 1-1.5 x 0.5-0.8 cm, opposite, sessile, fleshy, ovate-oblong to rhombic, repandentate or entire; base asymmetric, with an obtuse auricle; stipules 2-2.5 mm, with 2-3 subulate lobes; cyathia c. 1.5 mm, solitary, axillary; peduncle c. 3 mm thick; styles 2-lobed; capsule 3-4 mm, obovoid, glabrous, smooth; seeds 2 x 1.5 mm, ovoid, greyish-white, smooth, ecarunculate.

M, S; sandy and gravelly sea shores. Mediterranean region, Sinai, Southwest Europe, extending along Atlantic coasts to North France, Black Sea region.

6. **Euphorbia granulata** Forssk., Fl. Aegypt.-Arab. 94 (1775).
Syn. *Chamaesyce granulata* (Forssk.) Soják, Cas. Nár. Muz. (Praha) 140 (3-4): 169 (1972).

Prostrate annual 5-25 cm, covered with short straight hairs, or sparsely covered with long spreading hairs and the upper surface of leaves glabrous; stems much-branched from the base; leaves 3-8 x 2-4.5 mm, obovate or oblong-ovate, base obliquely rounded, the apex rounded, margin entire; petiole 0.5-1 mm; stipules 1-1.5 mm, ending with 2-4 linear teeth; cyathia c. 1 x 1 mm, solitary; peduncle c. 0.5 mm; glands 4, with white or pink appendages; *male flowers*: stamen 1 mm; *female flower*: ovary pedicellate; styles minute, spreading; capsule 1.5 x 1.5 mm, sharply 3-lobed; pedicel 1.5 mm; seeds 1 x 0.5 mm, oblong-conical, 4-angled, pinkish-brown, wrinkled, ecarunculate.

Two varieties occur in Egypt:

var. **granulata**

Whole plant covered with short straight hairs.

D, R, GE, S; desert wadis.

var. **glabrata** (J. Gay) Boiss. in A. DC., Prodr. 15(2): 34 (1862).

Syn. *Euphorbia forsskaolii* J. Gay var. *glabrata* J. Gay in Webb & Berthel., Phyt. Canar. 3(3): 243 (1847).

Plant sparsely covered with long spreading hairs, the upper surface of leaves glabrous.

D, R, GE, S; desert wadis, sandy and alluvial plains.

Area of the species: Canary Islands, North and tropical Africa, Sinai, Palestine, Syria, Arabia, Iran, Pakistan, Afghanistan, North India, Central Asia.

NOTE: Both varieties are widespread and fairly common in the deserts of Egypt.

7. **Euphorbia chamaesyce** L., Sp. Pl., ed. 1, 455 (1753).

Syns. *Euphorbia canescens* L., Sp. Pl., ed. 2, 652 (1762).

Tithymalus chamaesyce (L.) Moench, Methodus 666 (1794).

Euphorbia massiliensis DC. in Lam. & DC., Fl. Fr., ed. 3, 5: 357 (1815).

Euphorbia libassii Lojac., Fl. Sicula 2(2): 329 (1907).

Euphorbia pinnulosa Lojac., Fl. Sicula 2(2): 329 (1907).

Chamaesyce hirta Millsp., Publ. Field Columb. Mus., Bot. 2: 303 (1909).

Chamaesyce chamaesyce (L.) Hurus., J. Fac. Sci. Univ. Tokyo, sect. 3, Bot., 6: 283 (1954).

Like *Euphorbia granulata*, but leaves suborbicular to obliquely ovate, finely denticulate.

Dw; cultivated ground. South Europe, North Africa, West and Central Asia.

NOTE: Uncommon, known only from a few localities in the Western Desert.

8. **Euphorbia serpens** Kunth, Nov. Gen. & Sp. 2: 52 (1817).

Syns. *Euphorbia minutiflora* N. E. Br., Fl. Trop. Afr. 6(1): 1036 (1913).

Chamaesyce serpens (Kunth) Small, Fl. Southeast U. S. 709 (1903).

Glabrous annual; stems 10-20 cm, prostrate, often rooting at nodes; leaves 1-4 mm, opposite, suborbicular, base obliquely cordate, margin entire; petiole 0.2-0.8 mm;

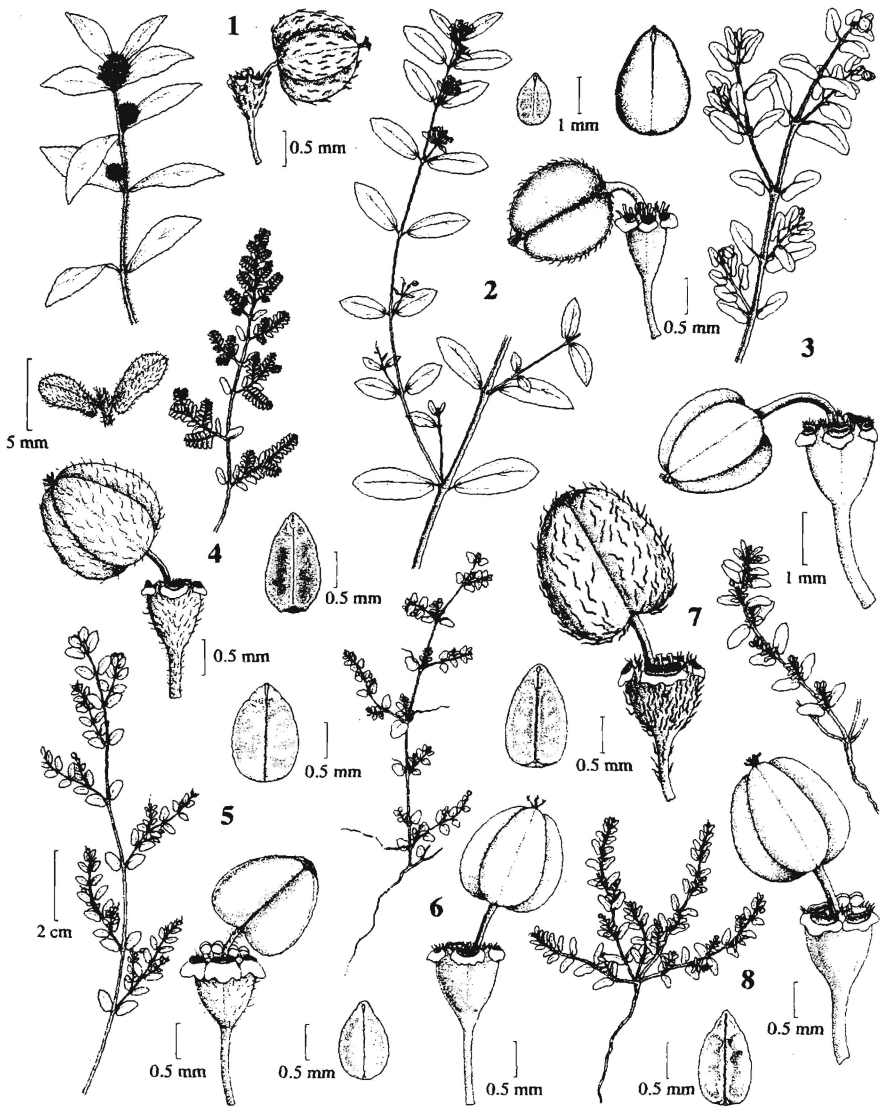


Plate 11. EUPHORBIACEAE: *Euphorbia hirta* 1, flowering and fruiting branch; cyathium with a capsule (right). *Euphorbia indica* 2; flowering and fruiting branch; cyathium with a capsule (right); seed (up right). *Euphorbia pepelis* 3, flowering and fruiting branch; cyathium with a capsule (down); seed (up left). *Euphorbia granulata* var. *granulata* 4, flowering and fruiting branch; branchlet with two leaves (left); cyathium with capsule (down left); seed (down right). *Euphorbia chamaesyce* 5, flowering and fruiting branch; cyathium with capsule (down right); seed (up right). *Euphorbia serpens* 6, habit; cyathium with capsule (down right); seed (down). *Euphorbia forskaolii* 7, habit; cyathium with capsule (left); seed (left to the capsule). *Euphorbia inaequilatera* 8, habit; cyathium with capsule (right); seed (down right). All drawings to the same scale, except the enlarged parts (scale given).

stipules c. 0.5-1.2 mm, connate at the swollen nodes, triangular; cyathia 0.8 x 0.8 mm, solitary; peduncle 0.5-1.5 mm; glands 4, minute, with white petaloid appendages; *male flowers*: stamens 0.8 mm; *female flower*: ovary short-pedicellate; styles 0.2 mm, 2-fid; capsule c. 1.5 x 1.8 mm, 3-lobed, yellowish-green; seeds 1 x 0.6 mm, oblong-conical, pinkish, smooth.

N; cultivated ground, naturalized. Pantropical weed.

9. ***Euphorbia forsskaolii*** J. Gay in Webb & Berthel., Phyt. Canar. 3: 240 (1847).

Syn. *Euphorbia aegyptiaca* Boiss., Cent. Euphorb. 13 (1860), nom. illeg.

Prostrate annual, appressed- and/or crispate-hairy, 10-30 cm; stems many, branched from the base; leaves 0.4-1.2 x 0.3-0.8 cm, opposite, oblong-elliptic, the base obliquely rounded, the margin obscurely serrate-crenate near the apex; petiole 0.5-1 mm; stipules 1.5 mm, connate at the base, ending with narrow lanceolate teeth; cyathia 1-1.5 mm, in short axillary leafy racemes; involucre hirsute; glands reddish, with narrow appendages; capsule 1.5-2 mm, 3-lobed, crispate-white-hairy; seeds 1 mm, oblong-conical, whitish-pink.

N, O, M, D, GE, S; weed of cultivation, waste ground, desert sandy soils. Libya, Egypt, Palestine, Syria, Arabia, Sudan, Ethiopia, Canary Islands, Cape Verde Islands.

10. ***Euphorbia inaequilatera*** Sond., Linnaea 23: 105 (1850) var. ***inaequilatera***

Syns. *Euphorbia sanguinea* Boiss. in DC., Prodr. 15(2): 35 (1862).

Euphorbia inaequalis N. E. Br., Fl. Trop. Afr. 6(1): 512 (1911).

Prostrate glabrous annual 10-30 cm; stems branched, longitudinally ridged and narrowly winged, especially when dry; leaves 0.5-1.5 x 0.2-0.6 cm, oblong elliptic; base obliquely rounded, the apex obtuse, the margin serrate; petiole 0.5-1.5 mm; stipules 1-1.5 mm, divided into 3-5 narrow teeth; cyathia 1 x 1 mm, solitary; peduncle c. 1 mm; glands 4, minute, red, with small white or pink appendages; involucre lobes with sharply toothed margins; *male flowers*: stamen 1-2 mm; *female flower*: ovary pedicellate; styles 0.5 mm. 2-fid, capsule 1.5 x 1.75 mm, exerted on a reflexed 2 mm pedicel, strongly 3-lobed, the angles usually purple-tinged; seeds 1.25 x 0.75 mm, oblong-conical, greyish, with shallow pits.

N (Aga, Nile delta), probably more widespread; garden weed. Egypt, Arabia, Somalia, Ethiopia, tropical East and southern Africa.

11. ***Euphorbia scordifolia*** Jacq., Ic. Pl. Rar. 3: t. 476 (1794).

Syn. *Chamaesyce scordifolia* (Jacq.) Croizat in Degener, Fl. Hawaii. Fam. 190, leafl. 3, in obs. et in adnot. (1937).

Prostrate annual 10-30 cm, all parts densely white-hairy; stems branched, striate; leaves 0.4-1.2 x 0.3-0.8 cm, opposite, obliquely ovate-oblong, the margin serrate-spinulate; petiole 0.5-1.5 mm; stipules 1-1.5 mm, linear, caducous; cyathia on short dense lateral branches; peduncle 1-1.5 mm; involucre c. 1 mm, cup-shaped; gland appendages 1 mm, pinkish or white; capsule 1.8 x 1.8 mm; seeds 1.2 x 0.8 mm, ovoid, grey, smooth, with shallow pits.

De, R, GE; coastal sandy plains. Southeast Egypt, Arabia, Somalia, Ethiopia, westwards to Cape Verde Islands.

12. **Euphorbia prostrata** Aiton, Hort. Kew., ed. 1, 2: 139 (1789).

Syns. *Tithymalus prostratus* (Aiton) Samp., Anais Fac. Sci. Porto 17: 45 (1931).
Chamaesyce prostrata (Aiton) Small, Fl. Southeast U. S. 713 (1903).

Prostrate annual 10-25 cm; leaves glabrous beneath, pilose with short curled white hairs on the upper; stems much-branched, often tinged purplish; leaves 3-8 x 2-4mm, ovate; base obliquely rounded, apex rounded, margin obscurely dentate; petiole *c.* 1 mm; stipules 0.5-1 mm, triangular, with 2 apical teeth; cyathia 1 mm, solitary, on short leafy shoots; peduncle 1-1.25 mm; involucre barrel-shaped; glands 4, minute, red, with minute white or pink appendages; *male flowers*: few; stamens 1 mm; *female flower*: with pedicellate ovary; styles 0.25 mm, 2-fid; capsule 1.25 x 1.25 mm, exserted on a pilose 1.5 mm pedicel, strongly 3-lobed; sutures purple-tinged, pilose; seeds 1 x 0.5 mm, conical-oblong, acutely 4-angled, greyish, with transverse ridges.

N, M, S; weed of cultivation, waste ground, roadsides; naturalized. Pantropical weed, originating from the West Indies.

13. **Euphorbia arabica** T. Anderson, Fl. Aden, J. Linn. Soc. 5, Suppl. 34 (1860),

Hochst. & Steud. ex Boiss. in DC., Prodr. 15(2): 33 (1862).

Syn. *Chamaesyce arabica* (Hochst. & Steud. ex Boiss.) Soják, Cas. Nár. Muz. (Prah) 140 (3-4): 168 (1972).

Glabrous annual 10-25 cm; stems erect, slender, branched; leaves linear, about 10 times as long as broad, 1.5-2.3 x 0.15-0.2 cm, base obliquely rounded, apex acute, margin entire; petiole *c.* 1 mm; stipules 0.8 mm, linear; cyathia 1 x 1 mm, solitary, glands minute; peduncle *c.* 1 mm; *male flowers*: stamens 1.5 mm; *female flower*: ovary pedicellate; styles 0.5 mm, 2-fid; capsule *c.* 1.5 x 1.5 mm, sharply 3-lobed, on a pedicel 1-1.25 mm; seeds 1.2 x 0.8 mm, pinkish, pitted.

GE; stony sheltered cliffs. Southeast Egypt, Northeast Sudan, Ethiopia, Eritrea, Djibouti, Somalia, Kenya, Arabia.

NOTE: *Euphorbia arabica* was described by T. Anderson in 1860. Boissier, using the same type material, and applying the same name, described the same species in 1862. *Euphorbia arabica* Boiss. is therefore a later homotypic name.

14. **Euphorbia heterophylla** L., Sp. Pl., ed. 1, 453 (1753).

Syns. *Euphorbia geniculata* Ortega, Hort. Matr. Dec. 18 (1797).

Euphorbia prunifolia Jacq., Hort. Schoenbr. 3: 15, t. 277 (1798).

Erect annual 30-60 cm, glabrous or sparsely pilose in the upper parts; stems dichotomously branched; leaves 4-10 x 2-5 cm, elliptic, base cuneate, apex acute, margin with distant minute gland-tipped teeth; petiole 2-4 cm; glandular stipules rather large; cyathia 3.5 x 2.5 mm, glabrous, in densely clustered axillary and terminal cymes; bracts similar to leaves but progressively smaller, more lanceolate and sessile above; involucre cylindrical-obovoid, glabrous; lobes ovate, fringed; cyathial gland solitary, \pm funnel-shaped; *male flowers*: stamens 4 mm long; *female flower*: ovary pedicellate; styles 1 mm, 2-fid; capsule 4.5 x 5.5 mm, exserted on a reflexed pedicel to 5 mm, deeply 3-lobed; seeds 2.5 x 2 mm, conical, tuberculate.

N, O, M; weed of cultivation, naturalized. Pantropical weed, originating from Central America.

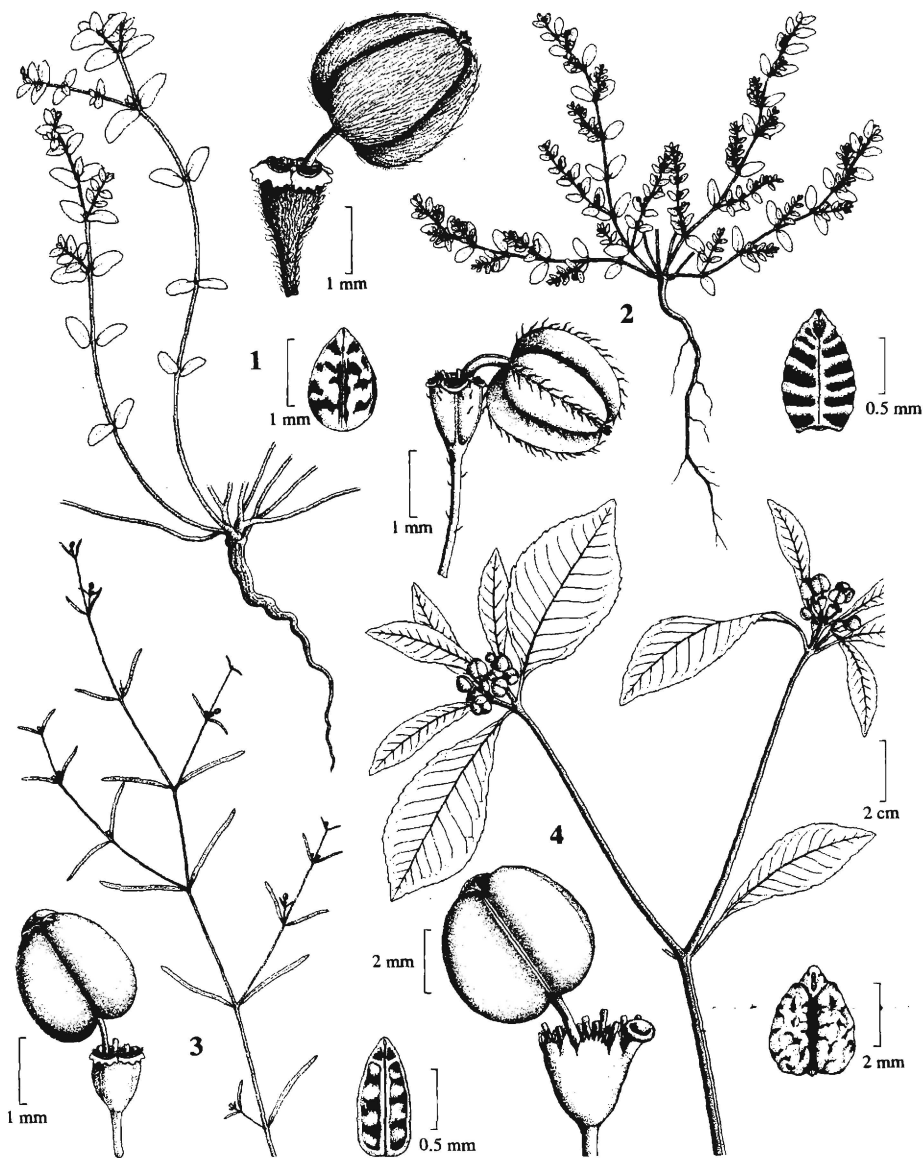


Plate 12. EUPHORBIACEAE: *Euphorbia scordifolia* 1, habit; cyathium with capsule (up right); seed (down right). *Euphorbia prostrata* 2, habit; cyathium with capsule (down left); seed (down right). *Euphorbia arabica* 3, flowering and fruiting branch; cyathium with capsule (down left); seed (down right). *Euphorbia heterophylla* 4, flowering and fruiting branch; cyathium with capsule (down left); seed (down right). All drawings to the same scale, except the enlarged parts (scale given).

15. **Euphorbia polyacantha** Boiss., Cent. Euphorb. 25 (1862).

Syns. *Euphorbia tetragona* A. Rich., Fl. Abyss. 2: 238 (1851), non Haw. (1826).

Euphorbia thi Schweinf., Verh. Zool.-Bot. Ges. Wien 18: 660 (1868).

Euphorbia polyacantha Boiss. var. *subinarticulata* Schweinf., Bull. Herb.

Boissier 7, Append. 2: 323 (1899).

Euphorbia polyacantha Boiss. subsp. *rosenii* Pax, Bot. Jahrb. 39: 632 (1907).

Euphorbia thi Schweinf. var. *subinarticulata* (Schweinf.) N. E. Br., Fl.

Trop. Austr. 6(1) 582 (1912).

Euphorbia infausta N. E. Br. in Dyer, Fl. Trop. Afr. 6(1) 580 (1912), non N. E. Br. (1915).

Spiny leafless succulent glabrous shrub, 0.6-1.2 m, densely branched from the base; stems erect, 4-5(-7)-angled, 2-4 cm diam., shallowly segmented; spine-shields continuous along the ribs; spines paired, 0.3-1(-1.5) cm; cymes 3-5 mm excluding the capsule; peduncle 4-8 mm; involucre 1.5-2 x 2.5-3 mm, cupular; capsule 3-4 x 3.5-4.5 mm, not exerted from the involucre, subglobose, 3-lobed, dark purple; seeds 1.5 x 1.3 mm; broadly ovoid, greyish, rugose.

GE; rocky terraces and slopes at high altitudes, usually above 1000 m. Southeast Egypt, Northeast Sudan (Red Sea Hills), Ethiopia, Eritrea.

16. **Euphorbia consobrina** N. E. Br. in Dyer, Fl. Trop. Afr. 6(1): 555 (1911).

Syns. *Euphorbia nubica*, sensu Täckh., Stud. Fl. Egypt, ed. 2, 327 (1974);

Greuter *et al.*, Med-Checklist 3: 217 (1986).

Euphorbia schimperii, sensu Boulos, Fl. Egypt Checklist 85 (1995).

Unarmed glabrous shrub 0.4-1.5 m; stems erect to spreading, dense and much-branched from the base, terete, with prominent callose, brownish leaf-scars; old stems woody; young branchlets succulent; leaves 0.5-2.5 x 0.2-0.5 cm, alternate, sessile, linear-lanceolate, exstipulate, caducous; cymes in terminal umbels, 2-5-branched; bracts 3 x 3 mm, ovate, sessile, semi-persistent; cyathia 5.5-6.5 mm diam.; glands 4-5, separate, 2 mm broad, yellow becoming red; ovary glabrous; styles 2.5 mm, 2-fid; capsule 4.5 x 5.5 mm, exerted on a recurved pedicel 3-5 mm, distinctly 3-lobed; seeds 2.5 x 2 mm, ovoid, minutely tuberculate, yellowish-brown; caruncle 0.5 mm.

R, GE; rocky slopes and sandy soils. Southeast Egypt, Northeast Sudan (Red Sea Hills), Somalia, ?Eritrea, Arabia.

17. **Euphorbia mauritanica** L., Sp. Pl., ed. 1, 452 (1753).

Like *Euphorbia consobrina*, but margin of glands \pm crenulate; cyathia larger; capsule larger; seeds oblong, smooth, greyish.

N, M; sandy and rocky soils, naturalized. Native to Southern Africa.

18. **Euphorbia cuneata** Vahl, Symb. Bot. 2: 53 (1791).

Shrub or small tree 1.5-4 m, with purplish peeling bark; branches with alternate spinescent branchlets, spreading at right angles; leaves 0.8-2.2 x 0.2-0.6 cm, shortly petiolate to almost sessile, cuneate-spattulate, the apex rounded or notched; stipules

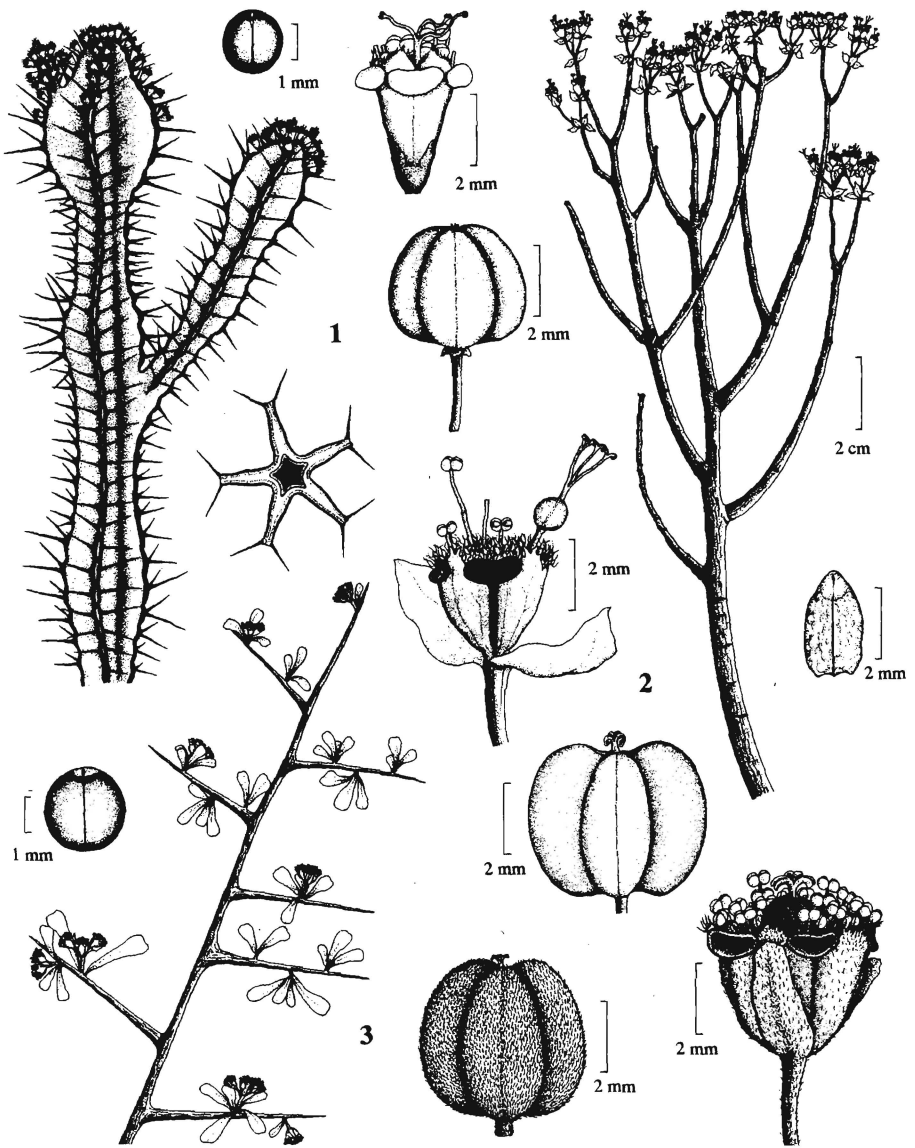


Plate 13. EUPHORBIACEAE: *Euphorbia polyacantha* 1, flowering branch; transverse section in stem (down right); capsule (right); cyathium (up right); seed (up). *Euphorbia consobrina* 2, flowering and fruiting branch; capsule (down left); cyathium (left); seed (right). *Euphorbia cuneata* 3, flowering and fruiting branch; capsule (down right); seed (left), cyathium (right to the capsule). All drawings to the same scale, except the enlarged parts (scale given).

glandular, small; cymes reduced to solitary cyathia or clustered in terminal 2-5-branched umbels; bracts 1.5-4 mm, leaf-like, the margin ciliate; cyathia 4-6 mm diam.; glands 5, 1.5-2.5 mm broad, funnel-shaped, yellow; stamens exserted; styles 2 mm; capsule 4-6 x 5-7 mm; seeds 2-2.5 mm, subglobose, smooth, brownish.

De, R, GE; rocky slopes. Southeast Egypt, Northeast Sudan (Red Sea Hills), Ethiopia, Somalia, Kenya, Tanzania, Mozambique, Arabia.

19. **Euphorbia acalyphoides** Hochst. ex Boiss. in DC., Prodr. 5(2): 98 (1862).

Syns. *Euphorbia fodhliana* Defflers, Bull. Soc. Bot. France 43: 230 (1896).

Euphorbia incurva N. E. Br. in Dyer, Fl. Trop. Afr. 6(1): 552 (1911).

Pilose annual 15-40 cm; stems branched, spreading, grooved; leaves 2-5 x 0.5-1.5 cm, ovate-lanceolate, base cuneate, apex obtuse or rounded, margins entire; petiole 1-2.5 mm; stipules glandular, minute; cymes axillary, 1-2-forked; bracts 2-4 mm, suborbicular; cyathia 2-3 mm diam., in axillary short cymes; involucre funnel-shaped; glands 4, 1 x 1.5 mm, reddish-yellow, hairy; *male flowers*: few, stamens 2 mm; *female flower*: with a densely pubescent ovary; styles 2 mm, 2-fid; capsule 3.5 x 4.5 mm, exserted on a pedicel 1.75 mm, 3-lobed, covered with crispate hairs; seeds 2.5 x 2 mm, conical, with acute apex and 2 horizontal constrictions, blackish-brown.

GE; sandy soils in open *Acacia* scrub. Southeast Egypt, Northeast Sudan, Ethiopia, Somalia, Kenya, Tanzania, Angola, Arabia.

20. **Euphorbia petiolata** Banks & Sol. in Russell, Nat. Hist. Aleppo, ed. 2, 2: 253 (1794).

Syns. *Euphorbia lanata* Spreng., Syst. Veg. 3: 792 (1826).

Euphorbia petiolata Banks & Sol. var. *microphylla* (Post) Eig, J. Bot. London 75: 192 (1937).

Densely villous annual 15-40 cm; stems erect or spreading, branched, striate; all leaves opposite; blade 1.2-3.5 x 0.8-1.5 cm, ovate to ovate-elliptic, margin dentate-spinulose, apex mucronate; petiole 3-8 mm; stipules minute; cyathia c. 2 mm, axillary, umbellate, short-pedunculate; involucre campanulate, lobes triangular-ovate, fimbriate; cyathial glands 4 or 5, pectinately 3-8-lobed; capsule 5 x 5-6 mm, subglobose-ovoid, 3-lobed, densely white-villose; seeds 3.5-4 x 2.5 mm, tetragonous, truncate, tuberculate; caruncle transversely oblong.

S; cultivated ground. Algeria, Sinai, Palestine, Syria, Lebanon, Turkey, eastwards to Pakistan and Turkmenistan.

21. **Euphorbia dendroides** L., Sp. Pl., ed. 1, 462 (1753).

Shrub 0.5-1.5 m; stems dichotomously branched, the old branches with leaf-scars, the young branches leafy; cauline leaves 3-8 x 0.4-0.8 cm, linear to lanceolate, thin, sessile, entire, tapering at the base, the apex acute; floral leaves 6-8 mm, cordate-orbicular, acute, exceeding the campanulate involucre; umbels 3-10-rayed, dichotomously branched; cyathia 4-5 mm, pedunculate; involucre lobes 2-3-fid, fimbriate; glands semilunate, lobed; capsule c. 5 x 6 mm, depressed-globular, 3-lobed, glabrous, smooth; seeds 3.5 mm, broadly ovoid, smooth; caruncle crested.

M (Mersa Matruh - Sollum); maritime cliffs. Mediterranean region.

22. **Euphorbia retusa** Forssk., Fl. Aegypt.-Arab. 93 (1775).

Syns. *Euphorbia kahirensis* Raeusch., Nomencl. Bot., ed. 3, 140 (1797), nom. illeg.

Euphorbia cornuta Pers., Syn. Pl. 2: 17 (1806), nom. illeg.

Glabrous glaucous perennial 20-60 cm, sometimes flowering the first year; stems erect, many from a woody base; leaves sessile, the cauline 1-3.5(-5) x 0.3-0.6 cm, oblong-linear, alternate; base rounded, apex acute to retuse, margin acutely serrate; umbellar and floral leaves opposite, broadest at the base, sharply serrate-denticulate; cyathia 2.5-3 mm, in forked umbels, pedunculate; involucre campanulate, lobes triangular, fringed; glands with 2-fid horns; capsule 5-6 x 4 mm, conical-ovoid, 3-lobed, smooth; seeds 2.5 mm; caruncle yellowish, about 1/2 as long as the seed, smooth.

M, D, S; sandy plains and desert wadis. Macaronesia, Mauritania, North Africa, Sinai, Palestine, Arabia to Pakistan.

23. **Euphorbia grossheimii** (Prokh.) Prokh., Fl. SSSR 14: 391 (1949).

Syns. *Tithymalus grossheimii* Prokh., Bull. Jard. Bot. Princ. SSSR 29: 551 (1930).

Euphorbia isthmia Täckh., Svensk Bot. Tidskr. 26: 374 (1932).

Euphorbia mariae Tamamsh., Dokl. Akad. Nauk Arm. SSR 1: 44 (1944).

Glabrous annual or short-lived perennial, 10-30 cm; stems branched from the base, erect or ascending; leaves 3-5 x 0.3-0.6 cm, sessile, linear to oblong-lanceolate, the cauline almost entire and acute; pseudumbellar leaves tricuspidate and denticulate towards the apex; cyathia c. 2 mm, in a 2-3-rayed pseudumbel, pedunculate; involucre campanulate, with triangular fimbriate lobes; glands minute, truncate; capsule 7-8 x 5-5.5 mm, ovoid-conical; seeds 3-3.5 mm, ovoid-spherical, smooth; caruncle yellow, about as long as or longer than the seed.

De, S; sandy and gravelly plains and desert wadis. Egypt, Palestine, Arabia, Iraq, Caucasus, Pakistan.

24. **Euphorbia arguta** Banks & Sol. in Russell, Nat. Hist. Aleppo, ed. 2, 2: 253 (1794).

Villous annual 20-50 cm; stems erect, simple or branched from the base, striate; cauline and umbellar leaves 2-5(-7) x 0.5-1.5 cm, sessile, oblong-lanceolate, serrate, acute; floral leaves c. 1-2 x 0.5-1.5 cm, rhombic-ovate; umbels 3-5 rayed, dichotomously branched; cyathia c. 1 mm, turbinate, glabrous, the lobes fringed-dentate; glands transversely oblong; capsule c. 3.5 mm, depressed-globose, 3-lobed, glabrous or slightly hirsute; seeds 2 x 1.5 mm, globose-ovoid, smooth, brownish; caruncle depressed-globular.

N, O, M, Dw; weed of cultivation. East Mediterranean region.

25. **Euphorbia hierosolymitana** Boiss., Diagn. Pl. Orient., ser. 1, 12: 110 (1853).

Syns. *Euphorbia thamnoides* Boiss., Cent. Euphorb. 33 (1860).

Euphorbia ramanensis B. R. Baum, Bull. Soc. Bot. France 110: 49, f. 2 (1963).

Euphorbia bivonae, sensu Täckh., Stud. Fl. Egypt, ed. 2, 330 (1974).

Glabrous shrub 20-60 cm; old stems woody, much-branched; bark greyish; young branches herbaceous, striate, yellowish-green; cauline leaves 0.5-1.5(-2.8) x 0.4-0.8 cm,

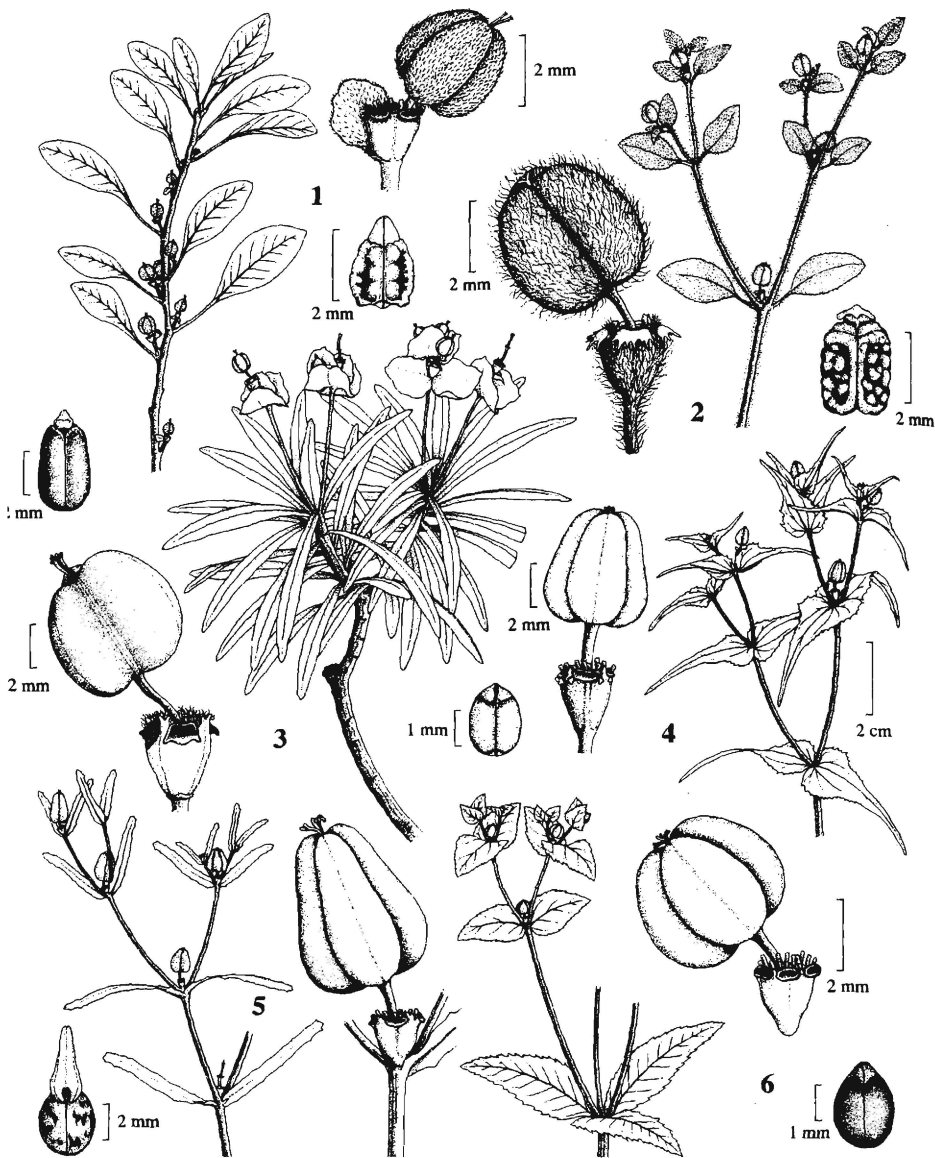


Plate 14. EUPHORBIACEAE: *Euphorbia acalyphoides* 1, flowering and fruiting branch; cyathium with capsule (up right); seed (right). *Euphorbia petiolata* 2, flowering and fruiting branch; cyathium with capsule (left); seed (right). *Euphorbia dendroides* 3, flowering and fruiting branch; cyathium with capsule (down left); seed (up left). *Euphorbia renusa* 4, flowering and fruiting branch; cyathium with capsule, and seed (left). *Euphorbia grossheimii* 5, flowering and fruiting branch; cyathium with capsule (right); seed (left). *Euphorbia arguta* 6, flowering and fruiting branch; cyathium (up right); seed (down right). All drawings to the same scale, except the enlarged parts (scale given).

alternate, sessile or subsessile, oblong-obovate, tapering at the base, apex rounded to obtuse, margin entire or repand; umbellar and floral leaves smaller; umbel rays 3-5; cyathia 2-3 mm, pedunculate; gland crescent-elliptic; capsule 3.5-4 mm, \pm globose, 3-lobed, covered with conical warts, seeds *c.* 3 x 2.5 mm, broadly ellipsoid, smooth, glossy; caruncle globose-depressed.

M, S; stony wadis and calcareous terraces. East Mediterranean region, Sinai.

NOTE: The East Mediterranean *Euphorbia hierosolymitana* known from Turkey, Syria, Lebanon, Palestine and Egypt, has been confused with *E. bivonae* Steud. from North Africa (excluding Egypt), Malta and Sicily (El-Hadidi in Täckholm, Stud. Fl. Egypt, ed. 2, 330, 1974). Some authors consider both species as conspecific (Jafri & El-Gadi, Euphorbiaceae 89: 8, 1982). According to Smith & Tutin in Tutin *et al.*, Fl. Europ. 2: 220 (1968), *E. bivonae* has linear-lanceolate to ovate-lanceolate, acute or acuminate leaves, and a glabrous capsule to 4.8 mm. On the other hand, *E. hierosolymitana* has oblong-obovate leaves with rounded to obtuse apex and the 3.5-4 mm capsule is covered with conical warts. Although Jafri & El-Gadi, *l.c.*, list *E. hierosolymitana* as a synonym of *E. bivonae*, they confine the species area to North Africa, Malta and Sicily which is the area of *E. bivonae*, *sensu str.*

26. ***Euphorbia erinacea*** Boiss. & Kotschy in Boiss., Diagn. Pl. Orient., ser. 2, 4: 87 (1859).

Like *Euphorbia hierosolymitana*, but branchlets spinescent after anthesis, bearing a single capsule at their tips; leaves serrulate; cyathium with involucre hirsute within; capsule with flattened orbicular warts; caruncle subspherical.

S; rocky ground. Sinai, Palestine (Gaza), Syria, Lebanon.

NOTE: This species has been overlooked by Zohary, Fl. Palaest. 2 (1972) although it has been collected by Bové 490, sables de Gaza, juillet 1882 (K!).

27. ***Euphorbia oxyodonta*** Boiss. & Hausskn. in A. DC., Prodr. 15(2): 1267 (1866).

Sparingly villous annual 10-40 cm; stems erect, branched from the base; cauline and umbellar leaves 1-4 x 0.6-1.5 cm, sessile, deeply dentate-pectinate, elliptical; lower leaves spatulate, petiolate; floral leaves 0.5-1.8 x 0.5-0.8 cm, ovate-triangular; umbels with 3-6 dichotomously branched rays; cyathia *c.* 2 mm, pedunculate; involucre turbinate, glabrous, the lobes ciliate; glands ovate, orange-yellow; capsule *c.* 3 x 4 mm, broadly ovoid, 3-lobed, glabrous; seeds 2.2 x 2 mm, broadly ovoid, prominently and irregularly reticulate-rugose, brown; caruncle 0.8 mm, whitish.

N; weed of cultivation. East Mediterranean region.

28. ***Euphorbia pterococca*** Brot., Fl. Lusit. 2: 312 (1804).

Glabrous annual 10-25 cm; stems erect, simple; leaves 1-2.5 x 0.6-0.8 cm, alternate, sessile, oblong-obovate, serrulate, obtuse, the lower spatulate, petiolate; ray-leaves similar to the cauline but slightly narrower; rays usually 5, 1-2 cm, trichotomously branched, then dichotomously, slender; glands without petaloid appendages; capsule 1 x

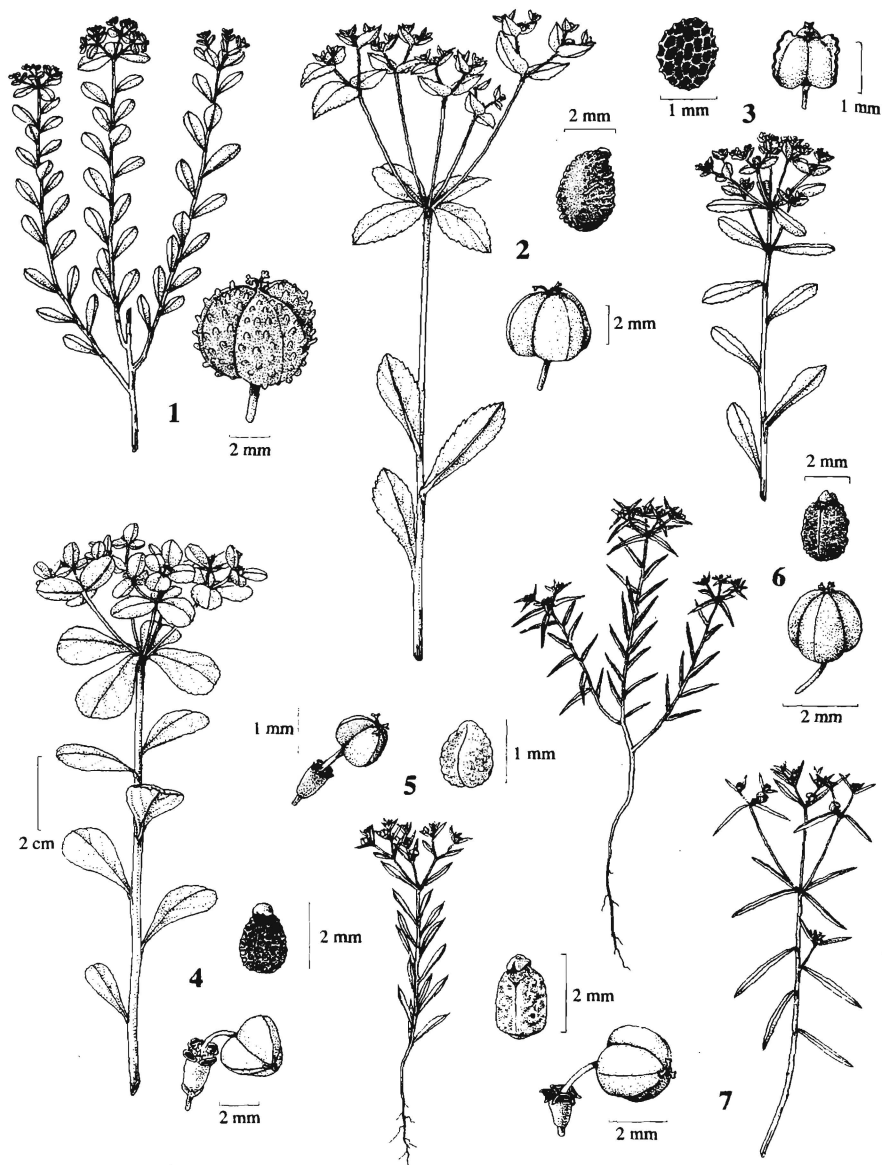


Plate 15. EUPHORBIACEAE: *Euphorbia hierosolymitana* 1, flowering and fruiting branch; capsule (right). *Euphorbia oxydonta* 2, flowering and fruiting branch; seed and capsule (right). *Euphorbia pierococca* 3, flowering and fruiting branch; seed and capsule (up). *Euphorbia helioscopia* 4, flowering and fruiting branch; seed and cyathium (down right). *Euphorbia parvula* 5, habit; cyathium and seed (up). *Euphorbia exigua* 6, habit; seed and cyathium (right). *Euphorbia dracunculoides* 7, flowering and fruiting branch; cyathium and seed (left). All drawings to the same scale, except the enlarged parts (scale given).

1.5 mm, with 2 undulate wings on each valve, smooth; seeds 1.25 mm, reticulate-alveolate, dark brown.

M; cultivated ground. Mediterranean region.

29. **Euphorbia helioscopia** L., Sp. Pl., ed. 1, 459 (1753).

Glabrescent annual 10-40 cm; stems erect, single or branched from the base; cauline leaves 1-4 x 0.5-1.5 cm, caducous, spatulate, tapering at the base, sessile, serrulate especially towards the rounded apex; umbellar and floral leaves larger, obovate; umbel rays 4-5, dichotomously or trichotomously branched; cyathia 2 mm, pedunculate; involucre lobes fringed; glands ovate, entire; capsule 2.5 x 3.5 mm, subglobose, 3-sulcate, glabrous; seeds 2 x 1.5 mm, ovoid, foveolate-reticulate, brown; caruncle 0.5 mm, sessile, flat, transversely ovate.

N, M; weed of cultivation. Europe, North Africa, West Asia; introduced into many temperate regions.

30. **Euphorbia sintenisii** Boiss. ex Freyn, Bull. Herb. Boissier 6: 986 (1898).

Like *Euphorbia helioscopia*, but leaves elliptic-oblong, coarsely dentate-pectinate, acute; seeds very shallowly and irregularly reticulate rugose, black; caruncle protuberant, hemispherical-conical.

N; weed of cultivation. Libya, Egypt, Palestine, Syria, Cyprus.

31. **Euphorbia parvula** Delile, Descr. Egypte, Hist. Nat. 235 (1814).

Tiny glabrous annual 3-10 cm; stems branched, striate; cauline leaves 0.2-1 x 0.1-0.2 cm, alternate, spatulate, entire, the apex mucronate; ray leaves 0.5-1 x 0.1-0.2 cm, oblong-lanceolate, acuminate; rays 2-3, twice forked; cyathium 1 x 0.5 mm; cyathial lobes oblong, ciliate; glands transversely ovate, with 2 short horns or unappendaged; capsule 1 x 1.5 mm, conical-spherical, glabrous; seeds 1-1.2 x 0.8 mm, ovoid, white, tuberculate; caruncle absent.

M; cultivated ground. Egypt, Libya.

32. **Euphorbia exigua** L., Sp. Pl., ed. 1, 456 (1753).

Glabrous annual 10-30 cm; stems branched from the base; cauline leaves 0.5-2.5 x 0.1-0.2 cm, linear to oblong-cuneate, the apex acute; ray leaves similar to the upper cauline leaves or broader at the base; rays 3-5, forked several times; cyathium 1.5 mm, glands with 2 conspicuous horns; capsule 1.5-2 mm, conical, 3-lobed, glabrous; seeds 1.2 x 1 mm, ovoid-quadangular, tuberculate, grey.

O (Dakhla); cultivated ground. Canary Islands, North Africa, Europe, West Asia.

33. **Euphorbia dracunculoides** Lam., Encycl. 2: 428 (1788) subsp. **dracunculoides**

Glabrous annual 10-25 cm; stems much-branched from the base; cauline leaves 1.5-5 x 0.3-0.5 cm, linear to linear-lanceolate, sessile; ray leaves shorter; rays 2-3, several times

dichotomously branched; bracts leaf-like; cyathia 1.5 x 1.5 mm, sessile, with cup-shaped involucre; glands 4, transversely oblong, 0.75 mm diam., with 2 horns to 0.75 mm, the margin ciliate; capsule 2.5-2.8 mm, conical-subglobose, exerted on a pedicel 3-4 mm, deeply 3-lobed, glabrous; seeds 2-2.25 x 1.75 mm, ovoid, blackish-brown, with whitish network of thin ridges; caruncle 0.5 mm.

De, GE; sandy soils. Spain, North Africa, Tanzania.

34. ***Euphorbia falcata*** L., Sp. Pl., ed. 1, 456 (1753).

Glabrous annual 10-25 cm; stems much-branched, sometimes simple, erect or spreading; lower leaves 1-2 x 0.2-0.5 cm, linear-lanceolate to spatulate, alternate, sessile, often caducous; umbellar and floral leaves 0.5-1.5 cm, ovate-elliptic to broadly ovate, mucronate; rays 3-5, forked several times; cyathia c. 1 mm, pedunculate; involucre turbinate, fringed; glands with long, short or no horns; capsule 1.5-2 mm, ovoid, 3-lobed; seeds 1-1.5 x 1 mm, tetragonus, with 1 row of 4-6 transverse furrows or pits on each face.

M, S; sandy soils. Mediterranean region, West Asia.

35. ***Euphorbia peplus*** L., Sp. Pl., ed. 1, 456 (1753).

Syns. *Euphorbia peploides* Gouan, Fl. Monsp. 174 (1764).

Euphorbia peplus L. var. *peploides* (Gouan) Vis., Fl. Dalm. 3: 229 (1852).

Annual glabrous herb 10-30 cm; stems much-branched, erect or spreading; leaves 0.5-2 x 0.3-1 cm, entire; lower cauline leaves opposite, petiolate, obovate, tapering at the base, the apex obtuse to rounded; umbellar leaves larger, subsessile; floral leaves broadly ovate; umbel rays 3, forked several times; cyathia 1-1.5 mm, pedunculate; involucre turbinate, the lobes ovate, fimbriate; glands lunate, with slender horns to 1 mm; capsule c. 2 x 2 mm, ovoid-subglobose, 3-lobed, glabrous; carpels keeled, with 2 wing-like ridges on each keel; seeds 1.5 x 1 mm, ovoid-hexagonal; caruncle depressed-conical, white, sulcate on 2 ventral facets, pitted on lateral and dorsal facets.

N, O, M, D, S; widespread weed of cultivated ground. Macaronesia, Europe, Mediterranean region, West and Central Asia; introduced into many other regions of the world.

36. ***Euphorbia chamaepeplus*** Boiss. & Gaill. in Boiss., Diagn. Pl. Orient., ser. 2, 4: 88 (1859).

Syn. *Euphorbia chamaepeplus* Boiss. & Gaill. var. *sinaica* Hochst. ex Boiss. in DC., Prodr. 15(2): 142 (1862).

Glabrous annual 5-15 cm; stems branched from the base, erect or spreading, striate; leaves 3-8 x 3-5 mm, ovate to elliptic, almost all alike, rather fleshy, sessile or petiole to 3 mm, entire, the apex acute or apiculate; rays 2-3, simple, rarely forked; cyathia c. 1 mm, pedunculate; involucre with fringed lobes; glands red, with 2 slender horns to 0.5 mm; capsule c. 2 x 2 mm, broadly ovoid, 3-lobed, glabrous; carpels keeled, not winged along the keels; seeds 1.5 x 1 mm, cylindrical-hexagonal, with 2 longitudinal furrows and 4 rows of transverse deep pits; raised network white, furrows and pits black; caruncle depressed-conical, white.

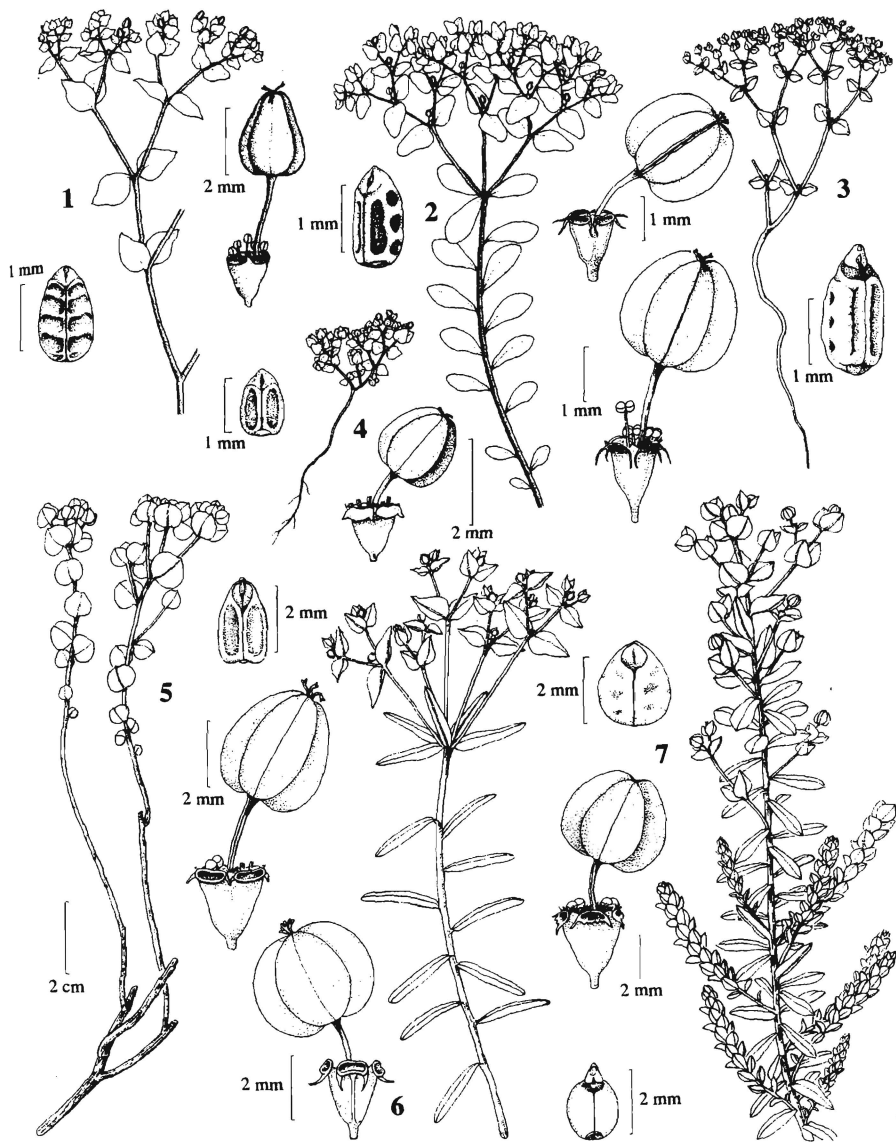


Plate 16. EUPHORBIACEAE: *Euphorbia falcata* 1, flowering and fruiting branch; cyathium (right); seed (down left). *Euphorbia pepus* 2, flowering and fruiting branch; cyathium (up right); seed (left). *Euphorbia chamaepeplus* 3, habit; cyathium (down left); seed (right). *Euphorbia punctata* 4, habit; cyathium (right); seed (left). *Euphorbia obovata* 5, flowering and fruiting branch; cyathium (middle right); seed (up right). *Euphorbia terracina* 6, flowering and fruiting branch; cyathium (down left); seed (down right). *Euphorbia paralias* 7, flowering and fruiting branch; cyathium (middle left); seed (up left). All drawings to the same scale, except the enlarged parts (scale given).

M, De, S; shaded crevices and hillsides, edges of cultivation. Egypt, Palestine, Syria, Lebanon, Cyprus, Arabia, Iraq.

NOTE: The differences between var. *chamaepeplus* and var. *sinaica* seem to overlap and therefore var. *sinaica* is listed here as a synonym.

37. **Euphorbia punctata** Delile, Descr. Egypte, Hist. Nat. 234 (1814).

Like *Euphorbia chamaepeplus*, but plant c. 3 cm; stems narrowly winged; leaves fleshy; cauline leaves sessile, broadly obovate, usually caducous; umbellar leaves broadly ovate; seeds 1 x 0.8 mm.

M, S; cultivated ground. Endemic.

38. **Euphorbia obovata** Decne., Ann. Sci. Nat. Bot., sér. 2, 2: 241 (1834).

Low shrub 20-30 cm; stems much-branched, terete, striate; leaves fleshy; cauline leaves 3-8 x 2-6 mm, alternate, obovate, subsessile, entire, apiculate, caducous; umbellar leaves to 1 x 1.2 cm, broadly ovate to suborbicular, sessile, entire, apiculate; floral leaves smaller; umbel rays 3-5, repeatedly forked; cyathia 2 mm, short-pedunculate; involucre campanulate, with fringed lobes; glands lunate, horned; capsule 3-3.5 x 3 mm, ovate, 3-lobed, glabrous, smooth; seeds 2-2.5 mm.

S; in the mountains. Endemic.

NOTE: The type was collected by Schimper 325, from Mt. Sinai (K!).

39. **Euphorbia terracina** L., Sp. Pl., ed. 2, 654 (1762).

Syns. *Euphorbia modesta* Boiss., Cent. Euphorb. 34 (1860).

Euphorbia terracina L. var. *modesta* (Boiss.) Boiss. in DC., Prodr. 15: 158 (1862).

Euphorbia terracina L. var. *alexandrina* (Delile) El-Karemy, Fedd. Repert. 105 (5-6): 280 (1994).

Perennial 20-60 cm, woody at the base, sometimes flowering the first year; stems erect or ascending, sometimes prostrate, branched especially from the base; leaves 1-4(-6) x 0.4-0.8 cm, entire; lower cauline leaves alternate, oblong to oblong-linear or linear-lanceolate, obtuse or truncate, mucronate, rather spaced; upper cauline leaves acute; umbellate leaves 1-2.5 cm, oblong-elliptic; floral leaves smaller, ovate-triangular to suborbicular; umbel rays 3-5, repeatedly forked; cyathia c. 2 mm, pedunculate; involucre campanulate, the lobes ovate, fimbriate; glands with 2 horns to 2 mm; capsule 3-4 x 3 mm, depressed-globose, 3-lobed, smooth, glabrous; seeds 2 x 1.5 mm, ovoid, laterally compressed, smooth, greyish; caruncle prominent and boat-shaped, depressed-conical, white.

M, S; coastal sandy soils. Mediterranean region, Sinai.

40. **Euphorbia paralias** L., Sp. Pl., ed. 1, 458 (1753).

Glabrous glaucous low shrub, 30-50 cm; stems many from the base, erect, leafy; cauline leaves 1-2 x 0.2-0.5 cm, elliptic to oblong, sessile, with rounded broad base, densely imbricate; umbellar and floral leaves 0.6-1.2 cm, broadly ovate with cordate base,

mucronate, all leaves fleshy; umbel rays 3-5, short, simple or branched; cyathia c. 3 mm, pedunculate; involucre campanulate, the lobes oblong, ciliate; glands lunate, dentate, with 2 short horns; capsule 4 x 5.5 mm, depressed-globose, 3-lobed, finely wrinkled, glabrous; seeds 3 x 2.5 mm, broadly ovoid, grey with blackish rounded spots, smooth; caruncle small, reniform.

M, S; maritime sands. Atlantic Islands, Mediterranean region, West Europe, Black Sea coasts.

41. ***Euphorbia sanctae-catharinae*** Fayed, Folia Geobot. Phytotax. (Praha) 18: 321 (1983).

Short-lived glabrous perennial 10-35 cm; stems procumbent; cauline leaves 0.6-1.1 x 0.4-0.8 cm, obovate to suborbicular, subsessile, entire, obtuse, mucronate; cyathia in terminal or lateral umbels; umbel rays 3-5, forked several times; bracts ovate, elliptic, suborbicular or triangular; involucre 1-2 mm, campanulate; glands 4, lunate, with 2 horns; capsule c. 3 mm diam., glabrous; seeds 3 x 2 mm, smooth, with few spaced shallow pits; caruncle 0.5 mm diam., on a short stalk, yellow.

S; in the mountains, Gebel Katherine. Endemic.

NOTE: The above description is based mainly on the original publication; no material has been examined. The type was collected from Gebel Katherine, alt. 2350 m, southern Sinai, by El-Hadidi *et al.*, 20.8.1982 (CIA).