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FACULTY OF SCIENCE
DEPARTMENT OF BOTANY

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APIACEAE

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APIACEAE

S.M.H. JAFRI

Erect to prostrate, annual to perennating herbs, sometimes tall and shrubby; branching alternate or dichotomous, with usually fistulose, generally furrowed or striated stems; tap-roots or root-stock with or without fibrous collar. Leaves mostly exstipulate, alternate, rarely subopposite or whorled, simple or compound, with usually sheathing leaf bases; lamina frequently pinnately or palmately much dissected, rarely undivided or entire; hairs mostly simple, rarely stellate. Inflorescence umbel or umbellate, rarely short-spicate; umbels mostly compound or sometimes simple. Involucre bracts and involucre bractlets (bracteoles) present or absent. Flowers bisexual or unisexual (plants rarely dioecious), actinomorphic or sometimes \pm zygomorphic, epigynous, usually pentamerous, white, yellow, pink or purplish. Calyx teeth 5, sometimes obsolete. Petals, 5, rarely obsolete, free, often bifid and inflexed, valvate or \pm imbricate, equal or the outer ones larger and radiant. Stamens 5, antipetalous, inflexed; anthers dithecal, longitudinally dehiscent. Ovary inferior, usually bicarpellary, syncarpous, the 2 carpels often attached by a central axis (carpophore), (1-) 2-locular, with one, pendulous, anatropous, 1-integumented ovule in each cell; styles 2, often swollen at the base forming a stylopodium or epigynous disc, mostly divergent in fruit; stigmas usually short, terminal. Fruit schizocarpic, consisting of 2 mericarps; mericarps usually with 5 primary ridges with furrows (valleculae) between them; occasionally secondary ridges present; ridges variable, simple, thickened to winged; vittae (resin canals) present between or within the ridges, usually present on the commissural side; inner face of mericarps (seed) plane, concave or sulcate; seeds adnate to pericarp, rarely free, copiously endospermic with small embryo.

A large family with c. 300 genera and nearly 3000 species, cosmopolitan but chiefly distributed in the temperate regions; represented by 39 genera (26 of which are represented by 1 species each) and c. 75 species in Libya.

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A fairly constant and homogenous family inspite of its wide occurrence in various habitats, aquatic, mesophytic to xerophytic; resin canals are found in almost every part of the plant and many plants of this family are considered very important for medicine or as vegetables or spices. Structure of mature fruit make one of the important taxonomic character in addition to the arrangement of resin canals (vittae) in it.

Specimens cited are presented here in the Herbarium, Faculty of Science, Al-Faateh University, Tripoli (ULT); those seen elsewhere are so indicated. Cultivated taxa are marked with an asterisk (*).

- | | | |
|----|--|---------------------------|
| 1. | <ul style="list-style-type: none"> + Plants stellately hairy at least on lower surface of leaves or on fruits. (Leaves pinnate, with ovate lobes; fruits without prickles, strongly compressed) — Plants with simple hairs or glabrous | 29. Opopanax
2 |
| 2 | <ul style="list-style-type: none"> + All leaves simple, usually entire and flat — Leaves deeply and repeatedly divided sometimes crenate or dentate, at least lower | 19. Bupleurum
3 |
| 3 | <ul style="list-style-type: none"> + Flowers sessile or subsessile in capitula. (Leaves usually spinose coriaceous) — Flowers usually distinctly pedicellate in umbels or rarely whorls. (Leaves not spinose) | 1. Eryngium
4 |
| 4 | <ul style="list-style-type: none"> + All leaves \pm orbicular in outline (not deeply lobed; cauline leaves sessile or subsessile; flowers yellow) — Most or all leaves pinnately or ternately divided, usually distinctly longer than wide (rarely the upper cauline or outer basal entire) | 8. Smyrnum
3 |
| 5 | <ul style="list-style-type: none"> + Sepals finely pinnatisect; partial umbel with 1 flower. Ovary unilocular — Sepal entire or 0; partial umbels with more than 1 flower. Ovary 2-locular | 2. Lagoecia
6 |
| 6. | <ul style="list-style-type: none"> + Flowering stem with a flexuousè subterranean part usually ending in a tuber; basal leaves with | |

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- partly subterranean petioles. (Stylopodium abruptly contracted into the styles) **9. Bunium**
- Flowering stem without flexuose, subterranean part; leaves arising at or above the ground 7
7. + Beak of fruit at least as long as seed-bearing part **4. Scandix**
- Beak of fruit absent, or much shorter than seed-bearing part 8
8. + Fruits winged or thickened at the ridges (dorsal ridges sometimes not winged) 9
- fruits unwinged; ridges without thickened or wing-like edges (partly so in *Pachyctenium*) 17
9. + Margin of fruit conspicuously thickened, at least at its outer edges 10
- Margin of fruit not thickened, or with a wing which is thin, at least at the outer edges 11
10. + Petals yellow; (leaves 1-pinnate or pinnatisect) **30. Malabaila**
- Petals white or pinkish. (Leaves 1-pinnate or simple) **31. Tordylium**
11. + Petals yellow 12
- Petals white, pinkish or greenish 16
12. + Leaves 1-pinnate (very rarely some 2-pinnate); (plants glabrous, pruinose, rootstock fibrous) **33. Thapsia**
- Leaves at least 2-pinnate 13
13. + Slender annual **16. Anethum**
- Stout perennial 14
14. + Bracts numerous. Dorsal ridges of fruit with wings as wide as the lateral **18. Cachrys**
- Bracts 0 (-3) 15
15. + Lateral wings of fruit at least as wide as rest of

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| | mericarp, usually shiny. (Fruit flat, secondary ridges not winged) | 33. Thapsia |
| | — Lateral wings of fruit narrow, not shiny. (Bracteoles 0, rarely 1-2 and caducous; fruit flat) | 28. Ferula |
| 16. | + Dorsal ridges of fruit winged. (Bracts 5 or more, persistent, entire, glabrous) | 32. Elaeoselinum |
| | — Dorsal ridges of fruit unwinged. (Bracts 0-3) | 13. Seseli |
| 17. | + Flowers yellow | 18 |
| | — Flowers white, pink, greenish or yellowish white | 26 |
| 18. | + Bracts and bracteoles 0 or few | 19 |
| | — Bracts and bracteoles numerous | 22 |
| 19. | + Leaf-lobes filiform | 20 |
| | — Leaf lobes ovate to suborbicular in outline | 21 |
| 20. | + Perennial (or biennial); rays stout, usually c. 20, very unequal; fruit scarcely compressed | 15. Foeniculum |
| | — Annual; rays slender, usually c. 40, subequal; fruit strongly compressed | 23. Ridolfia |
| 21. | + Stems stout; petioles of cauline leaves strongly inflated | 8. Smyrniun |
| | — Stems slender; petioles of cauline leaves not inflated | 11. Pimpinella |
| 22. | + Leaf-lobes lanceolate to ovate; (leaves ternate; fruit. c. 3 mm; stem freely branched) | 22. Petroselinum |
| | — Leaf-lobes filiform to linear-obovate | 23 |
| 23. | + Fruit almost or quite smooth; ridges very wide, corky, \pm confluent | 18. Cachrys |
| | — Fruit with distinct ridges | 24 |
| 24. | + Bracts 0 (-3) | 13. Seseli |
| | — Bracts numerous | 25 |

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| 25. | + Leaf-lobes fleshy, narrowly obovate; fruits 4-6 (-8) x 4-6 mm | 12. Crithmum |
| | — Leaf-lobes not fleshy, filiform or linear; fruit 7-25 mm long | 18. Cachrys |
| 26. | + Fruit at least 3 times as long as wide | 27 |
| | — Fruit less than 3 times as long as wide | 29 |
| 27. | + Fruit without ridges, except in the well-developed beak | 3. Anthriscus |
| | — Fruit with ridges, beak very short or absent | 28 |
| 28. | + Fruit and ovary pubescent. (rays 5 or more) | 14. Athamantha |
| | — Fruit and ovary glabrous | 26. Carum |
| 29. | + Fruit glabrous, not prickly, though sometimes rugose, muricate or dense papillose | 30 |
| | — Fruit pubescent, hispid or with prickles | 54 |
| 30. | + Fruit rugose, muricate or densely papillose | 31 |
| | — Fruit smooth, except for the longitudinal ridges | 32 |
| 31. | + Fruit rugose or muricate. (Stocks without fibres; fruit without visible ridges) | 6. Bifora |
| | — Fruit densely papillose. (Bracteoles present; fruit distinctly longer than wide) | 13. Seseli |
| 32. | + Fruit globose; mericarps not separating at maturity | 5. Coriandrum |
| | — Fruit usually ovoid; mericarps readily separating at maturity | 33 |
| 33. | + Lowest leaves 1-pinnate or simple | 34 |
| | — Lowest leaves at least 2-pinnate or 2-ternate | 41 |
| 34. | + Stems creeping and often rooting at nodes. (Leaf segments ovate; bracts 0 or few and entire) | 21. Apium |
| | — Stems \pm erect, not rooting at nodes | 35 |

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35.	+ Upper leaves with filiform to narrowly oblong, ± parallel-sides lobes, or without lamina	36
	— Upper leaves with lanceolate to ovate or obovate lobes with distinctly curved sides	40
36.	+ Upper leaves palmately divided into filiform lo- bes	11. Pimpinella
	— Upper leaves pinnately divided into linear or oblong lobes or without lamina	37
37.	+ At least some bracts 3-fid or pinnatisect	24. Ammi
	— Bracts entire or 0	38
38.	+ Bracteoles 0, rarely 1-3 and caducous	39
	— Bracteoles several, persistent (fruit shorter than pedicel)	25. Ammoides
39.	+ Upper petioles strongly inflated; rays subequal	11. Pimpinella
	— Upper petioles scarcely inflated; rays very une- qual	26. Carum
40.	+ Bracts 0, rarely 1-3 and caducous. (Stem bran- ched)	11. Pimpinella
	— Bracts numerous, persistent. (Leaf segments lo- bed)	13. Seseli
41.	+ Finely divided submerged leaves present at flo- wering time. (Rays 1-3)	21. Apium
	— Not as above	42
42.	+ Larger bracts at least 0.5 as long as rays, often divided	43
	— Bracts much less than 0.5 as long as rays, some- times 0	45
43.	+ Bracteloes usually 3; rays 1-5	20. Cuminum
	— Bracteoles numerous; rays (-4) 10-150	44

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44.	+ Sepals conspicuous. (Fruit 2.5-4.5 mm) — Sepals 0 or very small. (Fruit not more than 2.5 mm)	13. Seseli 24. Ammi
45.	+ Bracteoles strongly dimorphic, some spatulate and often inflated, some subulate — Bracteoles all similar in shape	25. Ammoides 46
46.	+ Cauline leaves 0, or very small — Cauline leaves well-developed	47 49
47.	+ Bracts 0-2 — Bracts several. (Basal leaves several)	48 26. Carum
48.	+ Rootstock usually with abundant fibres — Rootstock without fibres	13. Seseli 7. Scaligeria
49.	+ Bracts 0 (-3) — Bracts several	50 52
50.	+ Basal leaves with ovate lobes. (Rhizome 0) — Basal leaves with linear to linear lanceolate lobes	21. Apium 51
51.	+ Fruit compressed laterally — Fruits subterete	26. Carum 13. Seseli
52.	+ Leaf-lobes filiform — Leaf-lobes linear-lanceolate to ovate	26. Carum 53
53.	+ Ridges of fruit strongly undulate; stem purple-spotted — Ridges of fruit smooth; stem not purple-spotted	17. Conium 26. Carum
54.	+ Outer mericarp of each fruit with straight prickles; inner mericarps tuberculate or with short, conical projections — Both mericarps similar	34. Torilis 55

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| 55. | + Fruit with broad or tubercle based prickles arranged in 1-3 rows on ridges | 56 |
| | — Not as above | 59 |
| 56. | + Calyx conspicuous, without spines; fruits seemingly short spinose-winged in the lower half | 36. Pachytenium |
| | — Calyx inconspicuous, fruits spinose from base to apex | 57 |
| 57. | + At least some bract 3-fid or pinnatisect | 37. Daucus |
| | — Bracts simple or 0 | 58 |
| 58. | + Rays and upper part of peduncle densely white-tomentose | 38. Pseudorlaya |
| | — Rays and upper part of peduncle not as above | 35. Turgenia |
| 59. | + Fruit densely covered with long or stiff, rough (sometimes minutely glochidiate) bristles | 60 |
| | — Fruit \pm hairy with short smooth (non glochidiate) hairs | 61 |
| 60. | + Fruit hairs stiff, rough, minutely glochidiate, bristly | 34. Torilis |
| | — Fruit hairs soft, long, non glochidiate | 39. Ammodaucus |
| 61. | + Lower leaves simple or 1-pinnate | 62 |
| | — Lower leaves at least 2-pinnate | 63 |
| 62. | + Almost leafless glaucous plant; leaves or leaf segments linear-oblong or filiform | 10. Pituranthos |
| | — Plants not as above; lower leaves often undivided or 1-pinnatisect with broader incised or dentate segments | 11. Pimpinella |
| 63. | + Bracteoles 0 (-2) | 64 |
| | — Bracteoles 3 or more | 65 |
| 64. | + Slender annual, up to 15 cm | 27. Brachypodium |
| | — Perennial, (10-) 30-100 cm | 11. Pimpinella |

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| 65. + Bracts as long as or longer than rays | 20. Cuminum |
| — Bracts much shorter than rays | 14. Athamanta |

1. **ERYNGIUM**

L., Sp. Pl. 232. 1753; Gen. Pl. ed. 5. 108. 1754.

Herbs, glabrous, often with thick, fleshy roots. Leaves usually pinnatisect, sometimes almost entire, generally rigid, at least the upper softly to pungently spiny, often conspicuously veined. Flowers crowded into compact heads, subtended by entire to lobed spinose bracts or bracteoles. Sepals rigid, usually longer than the erect, emarginate petals. Fruits ovoid to subglobose, generally covered with scales; carpophore 0; mericarps plano-convex, slightly ridged.

c. 250 species, distributed in tropical and temperate regions except tropical and S. Africa; represented by 3 species in Libya.

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|---|-------------------------|
| 1. + Outer bracteoles much smaller than bracts | 2 |
| — Outer bracteoles almost as large as bracts;
(bracts & bracteoles usually more than 12) | 1. E. barrelieri |
| 2. + Bracts ovate, rhombic to ovate-lanceolate; sepals
4-5 mm | 2. E. maritimum |
| — Bracts lanceolate to linear; sepals less than 4 mm | 3. E. campestre |

1. **Eryngium barrelieri** Boiss., Ann. Sc. Nat. Ser. 3 (Bot.). 1: 125. 1844; Durand & Barratte, Fl. Lib. Prodr. 101. 1910; Pamp., Pl. Trip. 164. 1914; Keith, Prelim. Check List Lib. Fl. 471. 1965; Fiori, Icon. Fl. Ital. Fig. 2221. 1933; Zohary, Fl. Palest. 2: 384. fig. 555. 1972.

Annual or biennial herb, up to 30 cm tall, usually erect, dichotomously branched; root blackish, c. 2 mm thick. Basal leaves persistent, linear-oblong or linear-oblong, repand-crenate to crenate-serrate, 7-10 x 1-1.5 cm, lamina decurrent on petiole. Inflorescence simple or sparingly branched; heads depressed-hemispherical, c. 1 cm (excluding bracts and bracteoles), sessile. Bracts and bracteoles 1-2 (-2.5) cm, coriaceous, linear-lanceolate, ± similar, entire or with 1 (-2) pairs of spines, especially near base. Sepals c. 2.5 mm, ovate, aristate. Fruit flattened, densely covered with scales and crowned by calyx teeth.

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Type: Described from the Mediterranean region (Orient).

A-3 Reported from Tripoli (*Letourneux*, April 1886) by Durand & Barratte (l.c.).

Distribution: Mediterranean region.

A rare species in our area; usually met in winter-flooded areas, swamps and elsewhere.

2. **Eryngium maritimum** L., Sp. Pl. 233. 1753; Durand & Barratte, l.c.; Pamp., l.c. 164; Keith, l.c. 472; Fiori, l.c. fig. 2216; Zohary, l.c. 386, fig. 559. (Fig. 1)

Perennial herb with thick rhizome, glabrous, glaucous, mostly forming globular tufts, up to 60 cm, branched above. Leaves leathery, thick, pale-yellowish or whitish, prickly-lobed, conspicuously veined; basal leaves 5-10 x 5-15 cm, long-petioled, suborbicular to truncate or cordate-reniform at base, undivided or palmately lobed, coarsely dentate or lobulate at margin; upper leaves 3-8 cm long and broad, clasping, palmately lobed, lobes triangular and terminating in long sharp spines. Heads many-flowered, usually 2-3 x (0.8-) 1-1.5 (-2) cm; bracts 3-5 (-7), broadly rhombic to ovate, 2-5 x 1-3 cm, usually with 3-5 spiny lobes; bracteoles c. 1 cm, longer than the flowers, narrowly lanceolate, 3-cuspidate. Sepals 4-5 mm, elliptic to lanceolate, aristate, broadly scarious-margined. Fruit c. 8 x 5 mm, brownish, spongy, densely scaly-prickly, crowned with the spreading calyx-teeth.

Type: "ad Europae littora arenosa maritima".

A-3 Leptis Magna, ruins, white slightly violet dirty coloured corolla, shrublet 30-60 cm, heads like flowers, spiny, 1.5.1974, *B. Faris* 328.

Distribution: Mediterranean region.

Sandy and stony places near sea-shores. Said to be used as diuretic and laxative in local medicines.

Fl. Apr.-Aug.

3. **Eryngium campestre** L., Sp. Pl. 233. 1753; Durand & Barratte, l.c.; Pamp.,

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Fig. 1 *Eryngium maritimum*: A, flowering and fruiting branch $\times 0.5$; B, flower $\times 4$; C, petal $\times 8$; D, fruiting flower $\times 4$.

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Prodr. Fl. Cir. 337. 1931; Keith, l.c. 471; Tutin in Tutin et al., Fl. Europ. 2:323. 1968; Fiori, l.c. fig. 2219. (Fig. 2)

Perennial, erect herb. up to 70 cm tall, branched above. ± similar to the preceding species in texture. Basal leaves usually persistent, coriaceous, with unwinged petiole equalling the lamina; lamina 3-sect, broadly ovate, the central lobe pinnatisect with opposite, pinnatisect lobes, the lateral lobes pinnatisect with alternate, often pinnatisect lobes; lobes spinose-serrate. Inflorescence usually corymbiform, pale greenish with numerous pedunculate, ovoid heads, mostly 1-1.5 cm in diam. (smaller than the preceding species). Bracts 5-7, linear-lanceolate, entire or with 1 (-2) pairs of spines, 1.5-4.5 cm long; bracteoles much smaller, usually entire. Sepals c. 2.5 mm, ovate-lanceolate, aristate. Fruit densely scaly with overlapping scales. $2n=14, 28$.

Syntypes: 'Habit in Germaniae, galliae, Hispaniae, Italiae incultis'.

A-6 Dariana, c. 40 km from Benghazi, erect, c. 40 cm, fls. white, basal leaves bigger, waste land with limestone rocks, saline, 17.6.1972, *S.I. Ali* 462; **A-7** Between El Merj and Taknes, erect, c. 40 cm, fls. white, 17.6.1972, *S.I. Ali* 545; East of Benghazi on way to Baida, farm on roadside, leaves spiny, 8.5.1978, *A. El-Gadi & Jafri* 1949; **B-6** c. 79 km East of Ajdabia on way to Benghazi, 3.5.78, 3.5.1978, *A. El-Gadi & Jafri* 1341.

Distribution: Europe, Mediterranean region, to Turkey and Caucasia.

This seems to be a common species from Benghazi eastwards. Flowers are mentioned as blue by Keith (l.c.).

Fl. Apr.-Aug.

2. LAGOECIA

L., Sp. Pl. 203. 1753; Gen. Pl. ed. 5. 95. 1754.

Erect, little branched annual herb. Leaves pinnatisect, sheathing at base. Umbels peduncled, compound, globose, many-rayed; umbellets 1-flowered. Bracts and bracteoles leaf-like, pinnatisect. Flowers bisexual. Sepals like bracteoles ± filiform, pinnatisect. Petals emarginate, with a long straight bristle on either side of inflexed apex, caducous. Ovary becoming 1-loculed by abortion; style single, longer than the

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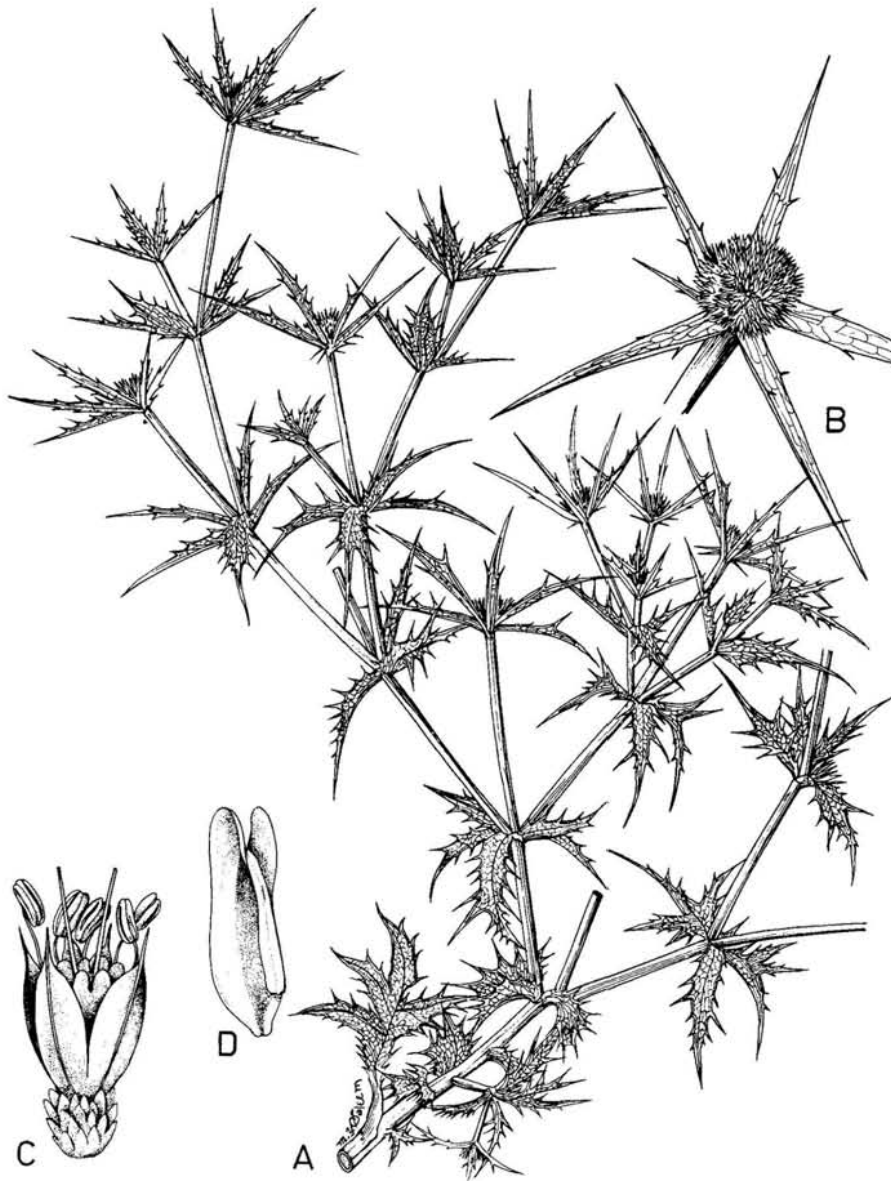


Fig. 2 *Eryngium campestre*: A, habit $\times 0.5$; B, a flowering head $\times 1.5$; C, flower $\times 8$; D, a petal $\times 20$.

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unilaterally inflated stylopodium. fruit of 1 mericarp, ovoid, beset with short, clavate, brittle hairs and crowned with persistent calyx; carpophore absent; dorsal oil ducts 3, obscure, commissural 2. Seeds \pm terete, plane on inner face.

A circum-Mediterranean monotypic genus.

Lagoecia cuminoides L., Sp. Pl. 203. 1753; Durand & Barratte, l.c. 102; Pamp., Prodr. Fl. Cir. 338. 1931; Keith, l.c. 591. (Fig. 3).

Erect annual herb, up to 45 cm tall, unbranched or corymbosely branched above, glabrous with striate, solid stem. Leaves with basal petiolar sheath, 5-10 mm long, thin and whitish, nearly sessile, linear-oblong to narrowly elliptic in outline, (2-) 3-15 (-18) x (0.3-) 0.5-1.5 cm, 1-pinnatisect into 7-20 pairs of alternate or subopposite, broadly ovate, 2-10 x 2-8 mm, sessile, deeply aristate-dentate, marginally cartilaginous-scabrid, glabrous segments or leaflets. Umbels many-rayed, globose, 10-20 mm across, nodding in bud condition, on 5-20 mm long, terminal and lateral, slender peduncles; rays 1-2 mm long, slender, glabrous. Bracts 6-10, oblong-ovate, 5-12 (-15) x 4-7 (-8) mm, pinnatipartite with numerous oblong, aristate lobes. Umbellules single-flowered. Pedicels filiform, 3-5 mm long. Bractlets 3-4 (-5) in a whorl, enclosing the flower ovate-oblong, 4-5 x 2-3 mm, finely pectinate with linear lobes. Sepals 5, erect, basally united, akin to bractlets, c. 2.5-3 x 1.5 mm, pectinate with filiform teeth, persistent in fruit. petals obovate, prolonged at the apex into 2, filiform awns. Anthers suborbicular, pale yellow. Stylopodium dome-shaped. Fruit narrowly oblong-ovoid, c. 2 x 1 mm, blackish-brown, 1-seed by abortion, beset with minute patent glandular hairs; mericarp ribs not distinct.

Type: Described from Crete, Lemnos, Lycia and Galatia, Herb. Linn. 282/1 (LINN).

A-7 Slonta to Marawa, S. road from Derna to El-Marj (Barce), 750 m Cupressus & Pistacia macchie/forest, annual, 1 April 1970, *P.H. Davis* 50559; 15 km W. of Baida, 8.5.1978, *A. El-Gadi, Jafri & others* 1786; 4 km from Ras-Hilal to the road of Baida, 15.4.1979, *Sakina M.* 79; El-Merj, 22.4.1978, *Ramadan L. & Siddiqui* 1054; Al-ghareeba, gebel El-Akhdar, c. 100 m from sea level, soil clay-loam, erect, c. 15-20 cm tall, annual herb, common, fls. in globose umbels with pinnatisect bracts, 5.5.1978, *A. Ghafoor* 366.

Distribution: Mediterranean region, extending eastwards to Iraq and Iran.

Confined to the Gebel Akhdar area in Libya; in cultivated fields, pastures, waste lands and grassy hills.

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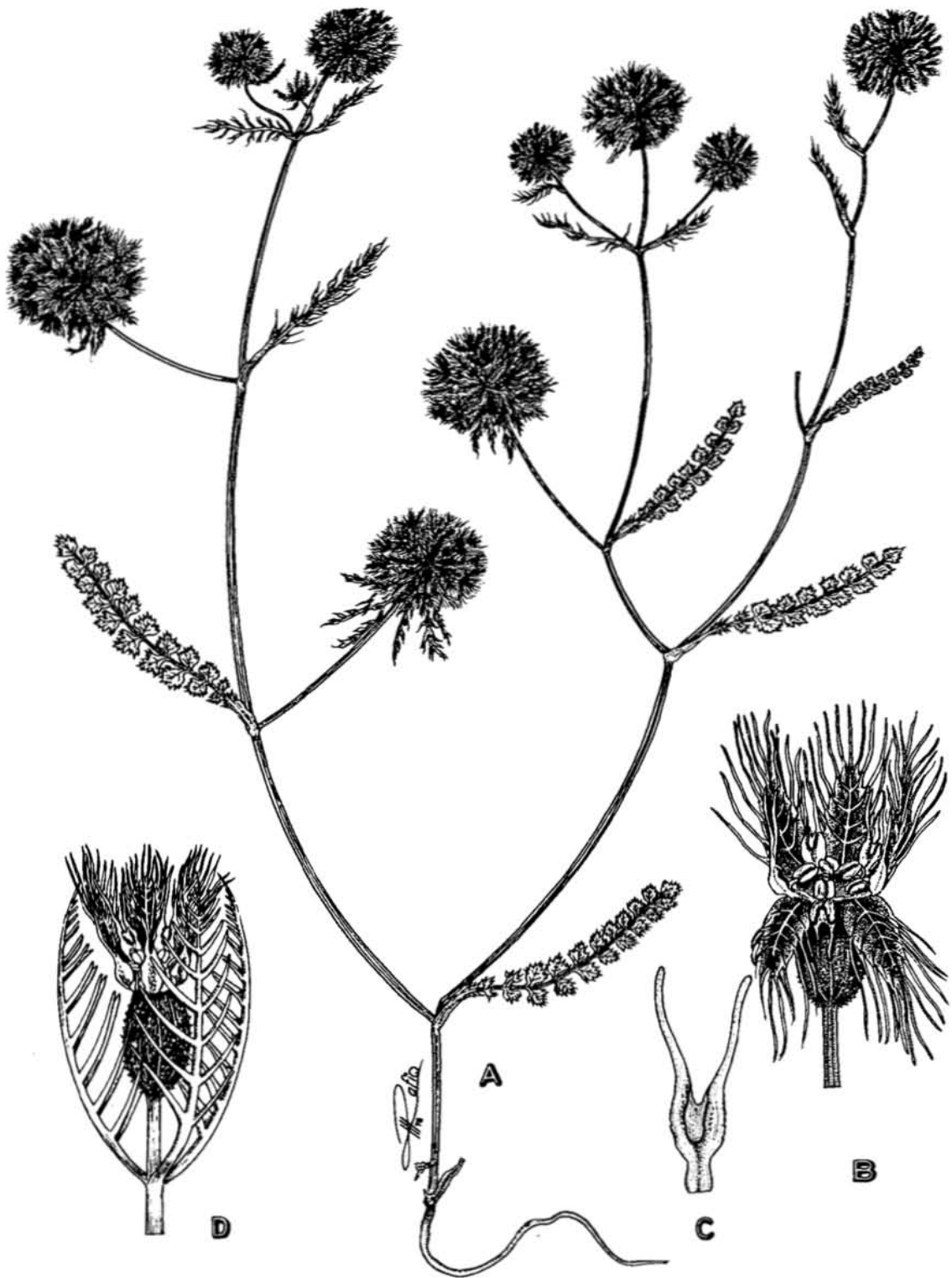


Fig. 3 *Lagoecia cuminoides*: A, habit $\times 1$; B, flower $\times 8$; C, petal $\times 20$; D, flower with bracteoles $\times 8$.

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Fl. Mar.-May

3. ANTHRISCUS

Pers., *Syn.* 1: 320. 1805 (*nom. cons.*)

Herbs, mostly annual with 2-3-pinnate leaves, glabrous or pubescent, sheathing at base; ultimate segments ovate to lanceolate, serrate to pinnatifid. Bracts 0-2; bracteoles several, usually unequal. Rays 10-15. Flowers white or pinkish; sepals minute or obsolete; petals emarginate sometimes radiant; stylopodium conical with divaricate styles. Fruits ovate to linear-oblong, glabrous, tuberculate or bristly; ridges not prominent; vittae minute or obscure.

About 20 species, mostly temperate Eurasian; represented by the following species in Libya.

Anthriscus cerefolium (L.) Hoffm., *Gen. Umbell.* 41. 1814; Durand & Barratte, *l.c.* 107; Pamp., *Pl. Trip.* 160. 1914; Keith, *l.c.* 239; Hedge & Lamond, in Davis, *Fl. Turk.* 4: 323. 1972; Butcher, *New Ill. Brit. Fl.* 1: 824, fig. 722. 1961; Fiori, *l.c.* 291, fig. 2367.

Scandix cerefolium L., *Sp. Pl.* 368. 1753; *Chaerophyllum trichospermum* Schultes, *Ost. Fl.* 2 (1): 504. 1814; *A. trichospermum* (Schultes) Spreng. in Roem. & Schults., *Syst. Veg.* 6: 525. 1820; *A. longirostris* Bert., *Fl. Ital.* 3: 197. 1837.

Annual herb, hispid to almost glabrous, erect wiry, up to 60 (-80) cm tall. Lower leaves 7-15 x 3-10 cm, triangular in outline, 2-3-pinnate; ultimate segments ovate to triangular, lobed, 5-20 x 4-12 (-15) mm. Umbels pedunculate or not; rays 2-4, \pm equal, 1-3.5 cm; bracts 0-1; bracteoles 1-3; pedicels 3-10, \pm equal, thickened in fruit, 2-7 mm long, glabrous. Flowers c. 4 mm, white, with subequal petals, with short, incurved point. Fruits 8-10 x c. 1.5 (-2) mm, glabrous, clavate with a longish beak.

Type: Described from Europe, Herb. Linn. 364/4 (LINN).

Reported as cultivated in Tripoli by Durand & Barratte (*l.c.*) etc.

Distribution: Most of Europe, N.W. Africa, Turkey, Caucasia to N. Iran.

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A much cultivated herb in gardens (called garden hedge Parsley) of Europe (especially Britain). It is reported as cultivated by Durand & Barratte (l.c.) but Hedge & Lamond in Davis (l.c.) give its distribution to Libya also.

4. SCANDIX

L., Sp. Pl. 256. 1753; Gen. Pl. ed. 5. 124. 1754.

Annual herbs with slender roots. Leaves petiolate, (1-) 2-3-pinnatisect with filiform to linear-oblong ultimate segments. Umbels terminal or leaf-opposed, compound, pedunculate, few-rayed, rarely single-rayed. Bracts 0-1, usually absent. Bracteoles several, entire, emarginate or incised. Flowers bisexual, sometimes a few males in the middle of umbellules, white. Calyx teeth absent or very minute. Petals often very unequal, outer often radiate, shallowly emarginate with involute apices. Styles as long as or longer than the depressed-conical stylopodium. Fruit oblong-linear, subterete or laterally \pm compressed, long-beaked, even when young; beak up to 4 times as long as mericarps, tapering upwards with bristly nerves and margins; carpophore setaceous, entire or apically bifid; mericarps with 5, prominent, obtuse ribs; each furrow with 1-3 obscure oil ducts; commissural oil ducts 0-2. Seeds with deeply grooved inner face.

c. 20 species, distributed in Europe, N. Africa, Asia but few in Australia and New World; represented in Libya by 3 species.

- | | | |
|----|--|-----------------------------|
| 1. | + Bracteoles pinnatisect, somewhat foliaceous,
hardly or not membranous at margin | 1. S. stellata |
| | — Bracteoles bifid or entire at apex, with membra-
nous margins | 2 |
| 2. | + Beak of fruit strongly compressed dorsally; car-
pophore usually entire at the top | 2. S. pecten-veneris |
| | — Beak of fruit subterete or slightly compressed;
carpophore usually 2-fid at the top | 3. S. australis |

1. **Scandix stellata** Banks and Soland. in A. Russell, Nat. Hist. Alepo (ed. 2) 2: 249. 1794; Cannon in Tutin et al., Fl. Europ. 2: 327. 1968; Zohary, Fl. Palest. 2: 392, fig. 567. 1972 (Fig. 4, F₁-F₂)

S. pinnatifida Vent., Descr. Pl. Jard. Cels. t. 14. 1801; Boiss., Fl. Or. 2: 916.

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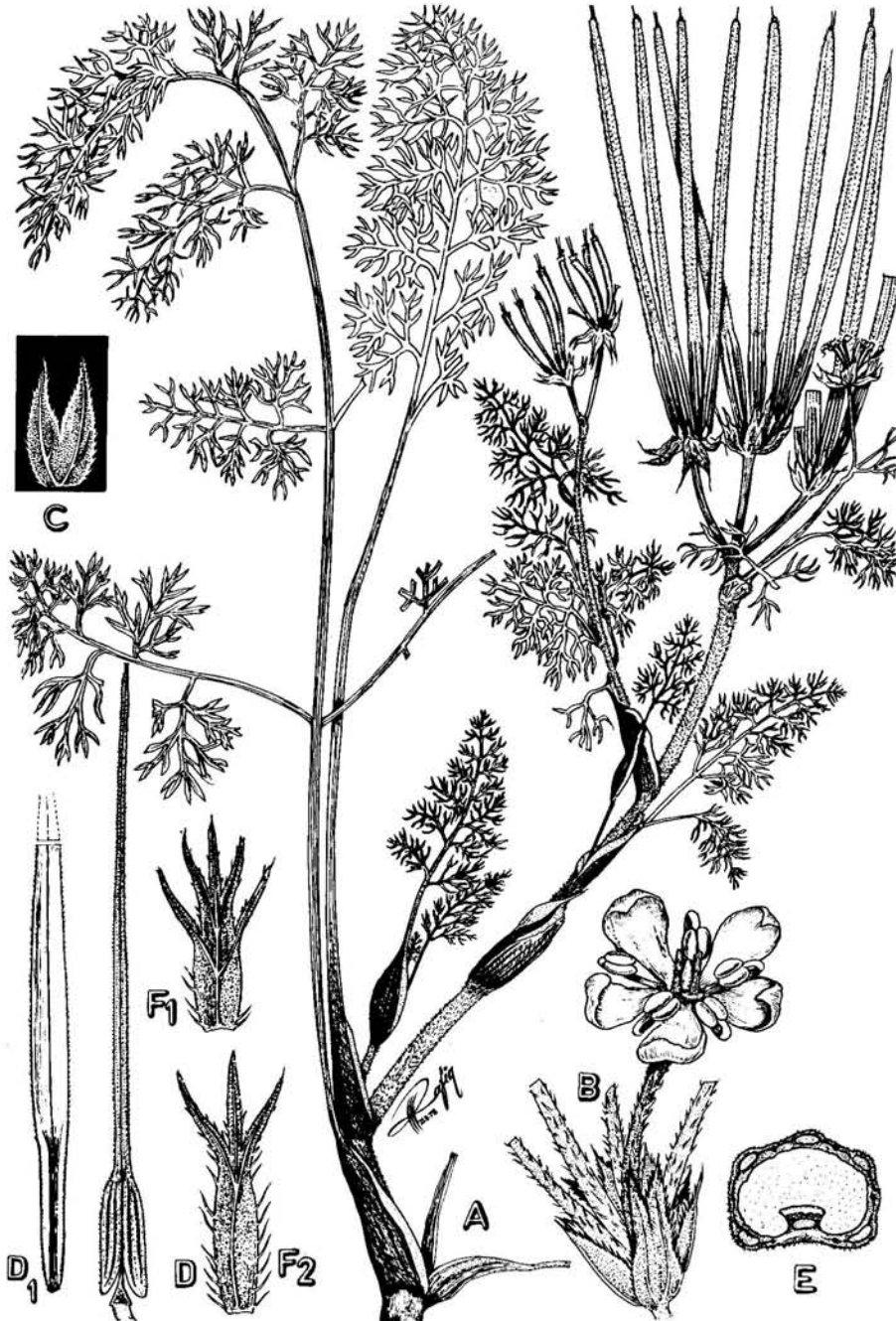


Fig. 4 *Scandix pecten-veneris*: A, habit $\times 1.5$; B, umbelule showing a flower $\times 10$; C, bracteole $\times 5$; D, fruit $\times 1.5$; D₁, mericarp (inner view) $\times 2$; E, t.s. seed (basal portion of mericarp) $\times 10$; *S. stellata*: F₁-F₂, bracteole variations $\times 4$.

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1872; *Scandicum stellatum* (Banks. & Sol.) Thell. in Fedds, Rep. Sp. Nov. 16: 16. 1919; Tack., St. Fl. Egypt (ed. 2): 391. 1974.

A slender, annual herb, up to 30 cm, hairy or glabrous, sparingly and dichotomously branched above. Leaves (1-) 2-3-pinnatisect with narrowly linear to filiform, acute lobes. Umbel rays 1-3. Bract usually absent. Bracteoles pinnate, usually 3-5-lobed above, without a distinct membranous margin. Flowers very small, white; outer petals scarcely radiate, notched. Styles minute, about as long as stylopodium. Fruit shorter, beak 1.5-3 times as long as the seed-bearing portion, strongly compressed dorsally, scabrous.

Type: Syria, around Aleppo (BM).

A-7 Shahat, 5.5.1978, A. *Abdul Kader* 28; Wadi Derna, 20.1.67, L. *Boulos* 1279; El-Gubba, flowers white, 1.3.1973, S.I. *Ali & S.A. Faruqi* 1203; 6 km E. of Labrag on way to Derna, 5.5.1978, A. *El-Gadi & Jafri* 1482.

Distribution: Widespread in the Mediterranean region and eastwards to C. Asia.

This is a new record for our area. It seems confined to the gebel Akhdar area and can be easily passed on to the following species, if the bracteoles are not carefully examined.

Fl. Jan.-May

2. ***Scandix pecten-veneris*** L., Sp. Pl. 256. 1753; Durand & Barratte, l.c. 107; Pamp., Pl. Trip. 167. 1914; Prodr. Fl. Cir. 338. 1931; Quezel & Santa, Nouv. Fl. Alger. 2: 657. 1963; Keith, l.c. 868. (Fig. 4, A-E).

Suberect to spreading, up to 35 (-50) cm tall much branched from base, pilose or hispid-villose to subglabrous, annual herb with furrowed stem. Leaves oblong to triangular-ovate, (1-) 5-20 x (0.5) 1-8 cm, 3-pinnatisect into linear-lanceolate, (0.75-) 2-5 (-8) x 0.5-2.5 mm, acute or obtusish, mucronulate, \pm recurved, setulose margined ultimate segments; lower leaves with slender, up to c. 10 cm or more long, canaliculate petiole; upper leaves short-petioled or sessile. Leaf sheath 0.3-2 cm long, villose on margins. Umbels 1-2 (-3)-rayed on terminal and lateral, glabrous, 1-3 cm long peduncles; rays subequal, 1-3 (-4) cm long, accrescent and thickened in fruit. Bracts absent or sometimes solitary (-few), narrowly linear-lanceolate, 3-8 x 1-2 mm,

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with villose margins. Umbellules 3-8 (-10)-flowered. Pedicels \pm equal, 2-4 mm long, thickened in fruit. Bractlets 3-5, lanceolate, (2-) 4-8 (-10) x (1-) 1.5-4 mm, often 2-3 (-5)-fid or deeply emarginate, rarely entire and acuminate at the apex, ciliate on margins. Petals unequal, obovate, (0.75) 2-3 mm long, \pm radiating, shortly notched, white. Anthers yellow. Styles erect, 2-3 times as long as stylopodium. Fruit linear-subulate, 3-5 (-7.5) x 0.2-0.35 cm (incl. beak), robust, strongly compressed dorsally, usually scabrid; beak 3-4 times as long as seed bearing part of the mericarps, gradually narrowed upwards, \pm striate; mericarps prominently ribbed.

Type: Described from Germany and S. Europe, Herb. Linn. 364. 2 (LINN).

A-3 Tripoli. University Campus, behind Science Faculty, in front of hospital, common, flowers white, fruits elongated, 15.2.1976, *S.M.H. Jafri* 6287; **A-6** Tokra, sea side, limestone rocks, flowers white, 3.3.1973, *S.I. Ali & S.A. Faruqi* 1266; road between Al-Kuwayfiah and Daryanah, N.E. Benghazi, 10.3.1968, *L. Boulos* 2026; Al-Bakur, near Tocra, Gebel Akhdar, 10.3.1968, *L. Boulos* 2094; Gasr Libya, c. 150 m from sea level, clay-loam soil, spreading to erect annual herb with beaked fruits, 5.5.1978, *A. Ghafoor* 396; **A-7** Marawa, flowers white, 2.3.1973, *S.I. Ali & S.A. Faruqi* 1224; id., 2.3.1973, *A.S. Sharif* 122, Wadi Mahbool, Beida-Derna coastal road, 1.3.1973, *S.I. Ali & S.A. Faruqi* 1126; Upper stream of Wadi El-Kouf, Gebel Akhdar, 12.3.1968, *L. Boulos* 2219; **A-8** Omm Rezum, S.E. Derna, 13.3.1968, *L. Boulos* 2364.

Distribution: Europe, N. Africa, W. Asia eastwards to Kashmir and N.W. India.

Very common in fallowland zones of Libya (Gebel Nafousa & Gebel Akhdar) from sea level to 800 m.

Fl. Feb.-June

3. ***Scandix australis*** L., *Sp. Pl.* 257. 1753; Durand & Barratte, l.c. 107; Pamp., *Prodr. Fl. Ciren.* 339. 1931; Keith, l.c. 868; Cannon in Tutin et al., *Fl. Europ.* 2:237. 1968. (Fig. 5).

Erect or spreading, up to 20 (-40) cm tall, much branched annual herb with subglabrous or basally pilose inconspicuously sulcate stem. Leaves with canaliculate, 2-5 cm long petiole, narrowly to broadly oblong-ovate, (1-) 2.5-10 (-13) x 0.75-2.5 cm, 3-pinnatisect into linear or narrowly oblanceolate, 3.5 x 0.5-1 mm, scabridulous

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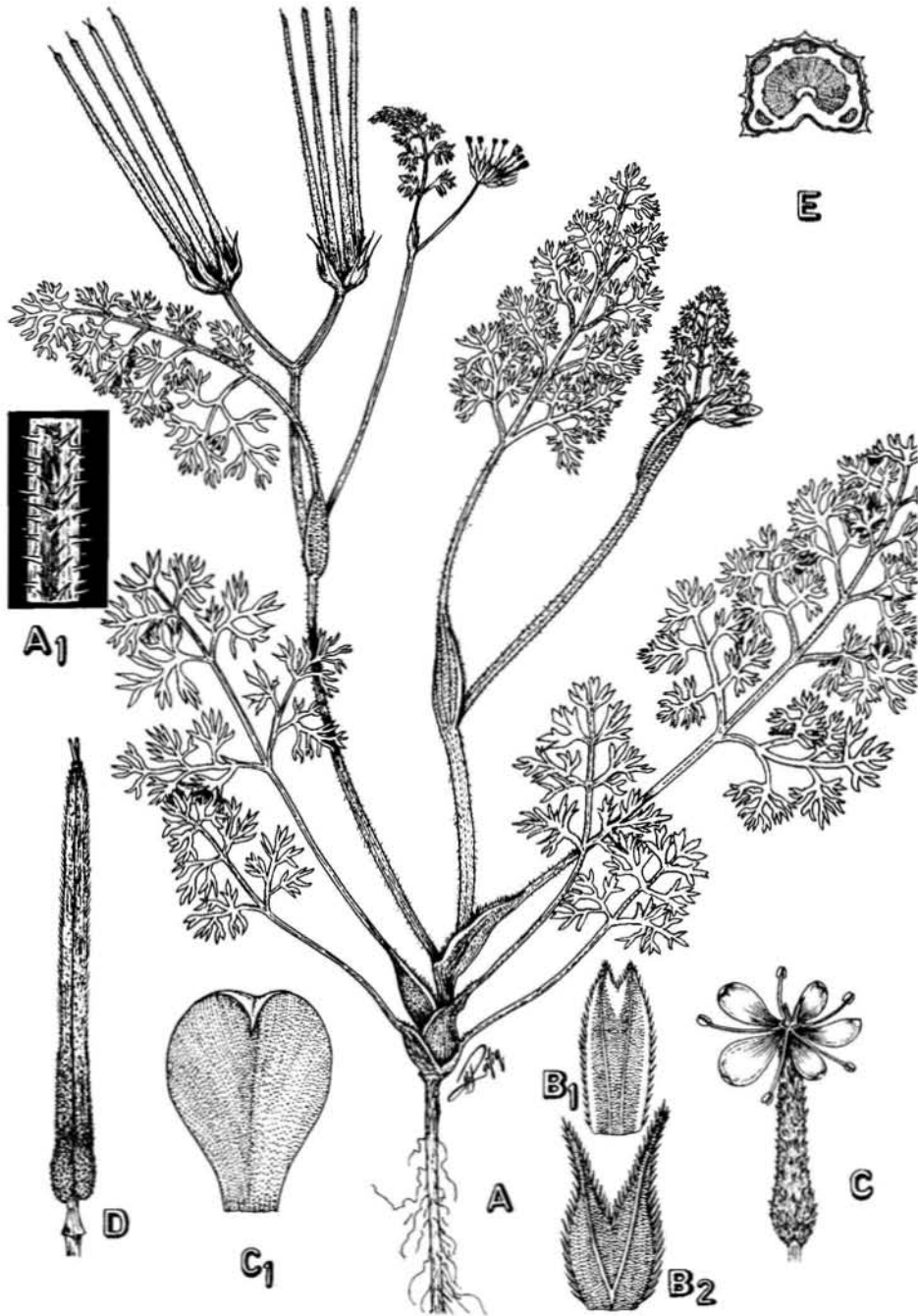


Fig. 5 *Scandix australis*: A, habit $\times 1$; A₁, portion of stem $\times 5$; B₁-B₂, bracteole variations $\times 8$; C, flower $\times 10$; C₁, petal $\times 15$; D, fruit $\times 2$; E, t.s. seed $\times 10$.

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margined, acute or obtuse ultimate segments; lower leaves with 2-5 cm long, canaliculate petiole, upper leaves subsessile. Leaf sheaths 8-15 mm long, sparsely villose or villose margined. Umbels 1-2 (-5)-rayed, on 2-4 cm long, scabridulous, leaf-opposed peduncles; rays subequal, patent, slender, (1-)2-5 (-6) cm long, glabrescent-glabrous, one ray often bearing a secondary umbel. Bracts absent. Umbellules 3-10 (-16)-flowered. Pedicels \pm equal, usually up to 2 (-4) mm long, hardly elongating in fruit. Bractlets 3-5, ovate-elliptic, 3-5 x 0.8-2 mm, entire or shortly bifid or emarginate at the tips, ciliate on narrowly membranous margins. Petals unequal, larger ones obovate, 1-1.5 x c. 1 mm, smaller c. 0.8 x 0.5 mm, all obtuse, white. Anthers yellowish or olive green. Styles erect, purplish, longer than the undulate-crenate margined, flattened stylopodium. Fruit linear-subulate, 1.5-4 x 1-1.5 cm (incl. beak) straight or \pm falcate, glabrous to hispid; beak subterete or \pm compressed laterally, usually twice or thrice as long as the mericarps, scabridulous along the margins; mericarps distinctly ridged, 8-10 mm long.

Syntypes: Described from Narbonne (S. France), Italy and Crete.

A-6 Around El-Abiar, 50-60 km E. of Benghazi, 300 m, corn fields on low plateau, annual, 24 March 1970, *P.H. Davis* 49930; **A-7** Upper stream of Wadi El-kouf, Gebel Akhdar, 12.3.1968, *L. Boulos* 2216; Slonta to Marawa (S. road from Derna to El-Merj Barce), 750 m, Cupressus & Pistasia macchie forest, annual 1 April 1970, *P.H. Davis* 50556.

Distribution: C. & S. Europe, N. Africa, Turkey to Caucasus.

Comon and confined to N.E. Libya (Gebel Akhdar) in forest/macchie under shade.

Fl. Mar.-May

5. CORIANDRUM*

L., *Sp. Pl.* 256. 1753; *Gen. Pl.* ed. 5. 124. 1754.

Annual or biennial, glabrous, profusely branched herb with slender tap root and heavy odour. Leaves petiolate, ternate with obovate-cuneate segments to 1-3-pinnatisect with filiform-linear ultimate segments. Umbels terminal and antiphyllous with many suberect rays. Involucral bracts absent or minute and 1-few. Bractlets

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small, linear, Flowers bisexual and staminate in each umbel, white to light purple. Calyx teeth unequal, prominent, persistent. Petals emarginate or deeply bilobed, often with one lobe suppressed, those of outermost flowers considerably enlarged and radiant or not, with inflexed apices. Styles longer than the conical stylopodium. Fruit globose to suborbicular, hardly compressed, glabrous; carpophore bifid at apex only; mericarps with 5, undulate primary and 4 more prominent secondary ribs, not or splitting at maturity; oil ducts absent on dorsal side; commissural oil ducts 0-2. Seeds with concave inner face.

2 species, mainly of Mediterranean area; represented in Libya by the following universally cultivated species.

***Coriandrum sativum** L., Sp. Pl. 256. 1753; Durand & Barratte, l.c. 114; Pamp., Pl. Trip. 160. 1914; Prodr. Fl. Cir. 340. 1931; Corti, Fl. Veg. Fezzan 480. 1942; Keith, l.c.; Zohary, Fl. Palest. 2: 401, fig. 579. 1972. (Fig. 6).

Erect, up to 60 cm tall, much branched herb with distinctly sulcate stem and thin, \pm fusiform root. Leaves heteromorphic, basal long petioled, early withering, oblong, up to 10 x 6 cm, imparipinnately pinnate or pinnatisect into broader obovate, cuneate, incised to shallowly lobed segments, the terminal segment more deeply lobed; cauline leaves subsessile to sessile, 1-3 cm long and broad, progressively more deeply dissected into linear, 2-10 x 0.5-1.5 mm, obtuse or subacute segments. Umbels 3-7-rayed, on 1-5 cm long peduncles; rays unequal, 5-15 mm long at anthesis. Bracts mostly absent or rarely solitary, linear-subulate. Umbellules 10-12-flowered. Pedicels slender, 1-3 mm long in flowers, enlarged in fruit. Bractlets 3-5, filiform or subulate, 2-5 mm long, unequal. Calyx teeth ovate-deltoid, 0.5-2 mm long, unequal. Petals purplish-white, those of outer flowers radiant, 3-4 (-6) mm long, deeply 2-lobed, the petals of inner flowers broadly obovate, much smaller incurved-emarginate at the tip. Filaments c. 1.5 mm long; anthers broadly oblong, yellow. Styles filiform, c. 1.5-2 mm long, twice or thrice as long as conical stylopodium. Fruit globose, 2-5mm across, greenish-brown, sweetly aromatic when mature and dry, dehiscent by pressure.

Type: Described from Italy, Herb. Linn. 363/1 (LINN).

A-3 Tripoli, Hadaba Sharqia, soil sandy, erect herb, c. 30 cm tall, fls. purplish-white, 8.4.1978, *A. Ghafoor* 328; **A-7** Wadi Derna, 14.3.1968, *L. Boulos* 2412; **G-8** Kufra, 7.11.1968, *L. Boulos* 3178.

Distribution: Almost throughout the world in cultivation or as an escape from cultivation.

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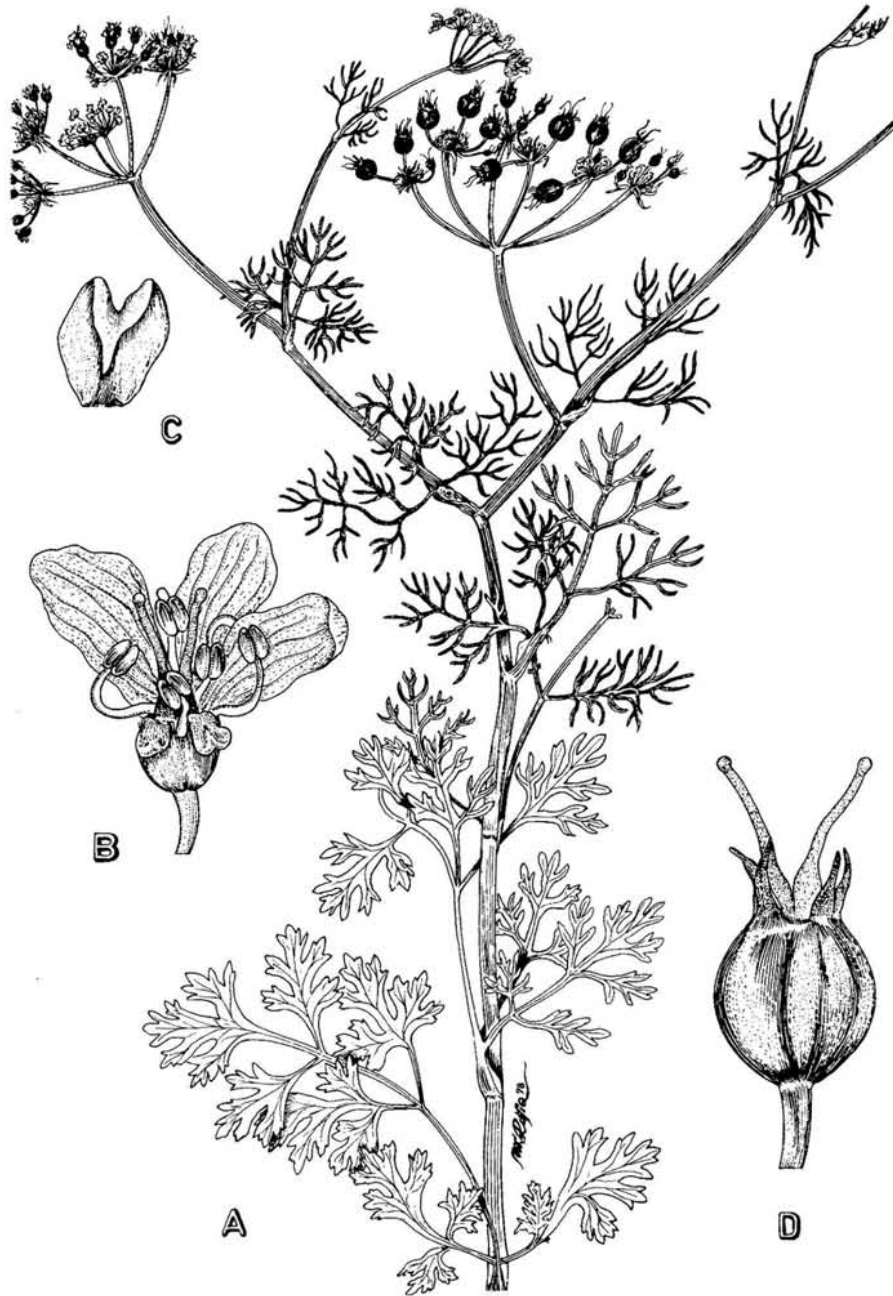


Fig. 6 *Coriandrum sativum*: A, habit $\times 1$; B, flower $\times 7.5$; C, smaller petal $\times 15$; D, fruit $\times 8$.

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The leaves and fruit are used as a condiment. The oil obtained by soaking the fruit in water for 12-16 hours, is used in making of perfumes and in the manufacture of soap. The fruits are also used in digestive ailments and as spice.

Fl. Mar.-April. & July-Nov. *Vern.* Cusber, Kussbur.

6. BIFORA

G. F. Hoffm., *Umb. Gen.* ed. 2. 191. 1816 (*nom. cons.*)

Annual, glabrous herbs with angled stems and stinking smell. Leaves petiolate; petiole winged, not sheathing at base uni-to tripinnatisect with linear or filiform ultimate lobes. Umbels compound, rays short, few. Involucral bracts absent or only 1 (-3) bracts present. Bractlets absent or present. Flowers all bisexual or some male in each umbellule, white. Calyx teeth small or absent. Petals obcordate, equal or unequal with inflexed apices. Stylopodium minute, conical. Fruit laterally flattened, much broader than long, didymous, pale brown or greenish; carpophore bifid; mericarps subglobose, ribs invisible, furrows \pm rugose; oil ducts absent in ripe fruit; commissural side perforated. Seeds almost spherical with concave inner face.

2 species, distributed in Mediterranean region to Central Asia: represented in Libya by the following species.

Bifora testiculata (L.) DC., *Bot. Glla.* 218. 1828; *Prodr.* 4:249. 1830; Durand & Barratte, l. c. 114; Pamp., *Pl. Trip.* 161. 1914; *Prodr.*, *Fl. Cir.* 340. 1931; Keith, l. c. 288; Zohary, *Fl. Palest.* 2:402, Fig. 580. 1972. (Fig. 7).

Coriandrum testiculatum L., *Sp. Pl.* 256. 1753; *B. dicocca* Hoffm., *Gen. Umb.* ed. 2. 192. 1816; "*B. testicula* Hoffm." Keith, *Prelim. Check List. Lib. Fl.* 289. 1965; *Biforis testiculata* (L.) Spreng ex Schultes in Roemer et Schultes, *Syst. Veg.* 6: xxxviii & 448. 1820 - *nom. illeg.*; *B. testiculata* (L.) Roth., *Enum.* 1(1):888. 1827.

Annual, erect, 10-30 (-50) cm tall, glabrous herb with angular or prominently ridged, narrowly hollow, basally much branched stems. Leaves ovate-oblong, 2.5-10 x 1.5-3 cm, basal long petioled, unipinnatisect into deeply pinnatisect, basally cuneate, incised-dentate segments, upper cauline leaves sessile or subsessile, 2-3-pinnatisect into narrowly oblong or linear-lanceolate, 6-10 mm long, acute segments. Umbels (1-)

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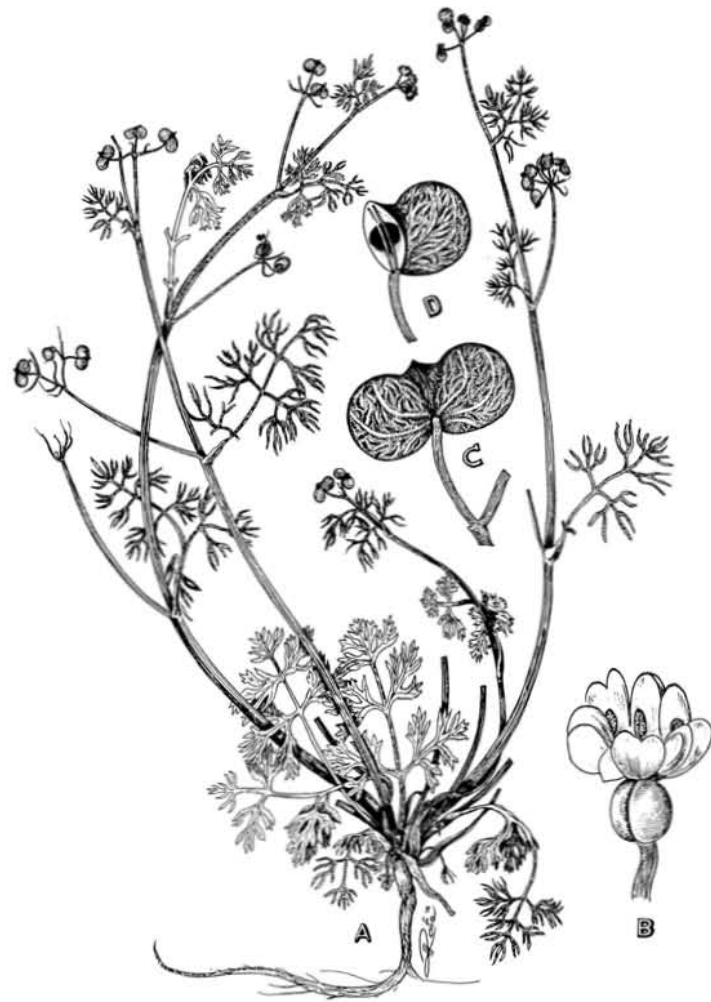


Fig. 7 *Bifora testiculata*: A, habit $\times 1$; B, flower $\times 12$; C, fruit $\times 6$; D, mericarp $\times 6$.

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2-3 (-5)-rayed, leaf-opposed and terminal, on 1-2 cm long peduncles at anthesis, these enlarged to c. 6 cm or more in fruit; rays subequal, 3-5 mm in flowering, enlarged in fruit, upright. Bracts absent or solitary, subulate or filiform, 6-8 mm long. Umbellules 2-6-flowered. Pedicels (2-) 3-5 mm long. Flowers all bisexual except sometimes the central pair functionally male. Bracteoles 0-2, filiform, up to 5 mm long. Petals white. c. 1 x 0.8 mm, hardly radiating, fugaceous. Filaments longer than petals; anthers oblong, purple. Styles as long as stylopodium, recurved. Fruit testicular, 2-4 x 4-6 (-8) mm, greenish or pale brown, cordate at the base; mericarps wrinkled, without ribs, apiculate.

Type: Described from S. Europe, Herb. Linn. 363/2 (LINN).

A-2 Garian, fls. pinkish-white, 10.4.1975, *Zenab A.* 364; Jado, annual herb, fls, white, 24.1.1977, *Siddiqi & Fathi R.* 191; **A-3** Misrata, 29.3.1975, *Zenab A.* 173; **A-7** Shahat area, 5.5.1978, *O. Shetawy* 9; Slonta to Marawa, S. Road from Derna to El-Marj (Barce), 750 m, cupressus & Pistacia macchie/forest, annual, 1 April 1970, *P. H. Davis* 50551; 7 km from Al-Fidia on way to Taknes, 22.4.1978, *Ramdan, Fathi & Siddiqi* 1002; 6 km E. of Labrag on way to Derna, 5.5.1978, *A. El-Gadi & Jafri* 1478.

Distribution: Mediterranean region, S. Europe eastwards to Caucasia and Iran.

A fairly common species in cultivated fields and fallow lands in the northern hilly areas of Libya. The plant parts smell like *Coriander* when rubbed and ground.

Fl. Feb.-May

7. SCALIGERIA

DC., Mem. Fam. Umbelleferes 70, t. 1, B, 1829 (*nom. cons.*)

Herbs, often perennating with thickened rootstock, glabrous, leafy mainly at base. Leaves usually (1-) 2-3-pinnatisect. Umbels compound, often forming branched inflorescences. Bracts and bracteoles generally inconspicuous linear or absent. Flowers mostly bisexual. Sepals obsolete. Petals white, not radiant, obcordate, inflexed at apices. Stylopodium conical or discoid, shorter than the deflexed styles. Fruits mostly broadly ovoid from a cordate base, somewhat compressed laterally, shortly beaked, with 5 ribs, glabrous, smooth; mericarps rounded dorsally; inner face of seed plane to \pm concave, 2-grooved.

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c. 22 species, mainly in C. & W. Asia to the Mediterranean area; represented by the following species in Libya.

Scaligeia cretica (Mill.) Boiss., *Diagn.*, I (10):52. 1849; Vis., *Fl. Dalm.* 3:70. 1852; Durand & Barratte, l. c. 108; Pamp., *Prodr. Fl. Cir.* 341. 1931; Tutin in Tutin et al, *Fl. Europ.* 2:328. 1968; Meikle, *Fl. Cyp.* 1:719. 1977. (Fig. 8)

Bunium creticum Mill., *Gard Dict.* (ed. 8) 2.1768; Urv. in *Mem. Soc. Linn. Par.* 1:287. 1822; *B. napiforme* Willd. ex Spreng., *Sp. Umb.* 95. 1818; *S. napiformis* (Willd. ex Spreng.) Grande in *Bol. Orto Bot. Nap.* 4:188. 1913; Davis, *Fl. Turk.* 4:334. 1972; Zohary, l. c. 428. Fig. 618.

Perennial or biennial erect, green, glabrous herbs, 30-60 (-100) cm tall and branched above, with a tuberous, fusiform to subglobose root, up to 3 cm thick. Basal leaves caducous, long-petioled, sheathing at base, with lamina usually 2-3-pinnatisect; ultimate segments rhombic-ovate, dentate or 3-fid. Cauline leaves reduced to sheaths terminating in linear or lanceolate lobes; umbels long-peduncled, (5-) 6-12 (-20)-rayed; rays mostly equal 2-6 cm. Bracts 0; bracteoles 1-4, linear-subulate. Fruit c. 1.5 (-2) mm, much shorter than the pedicels, ovoid to globular; ribs of mericarps thickened above.

Type: Crete, *Tournefort* (P).

A-6 Dariana, c. 40 km from Benghazi, c. ½ km from sea, near cult. field, 16.6.1972, *S. I. Ali* 449; Benghazi c. 10 km East of the town, in cult. field, c. 50 cm tall. fls. white, 21.4.1978, *A. Ghafoor* 344; **A-7** near Ras el-Hilal, flowers white, 5.5.1978, *A. El-Gadi & Jafri* 1579; Gasr Libya, clay loam soil, erect perennial c. 75 cm tall. flowers white, 5.5.1978, *A. Ghafoor* 375, Wadi el Kouf, *A. El-Gadi* 1484; 20 km E, fo Baida on way to Derna, rocky area terra-rosa soil among stones, flowers white, 4.5.1978, *El-Gadi & Jafri* 1437.

Distribution: E. Mediterranean region to Yugoslavia, Libya.

A species confined to Benghazi-Gebel Akhdar area in Libya; spontaneous near cultivated fields mostly. There is a difference of opinion about the correct name of this species, which has been well argued by Meikle (l. c.) in a note, in accepting the name followed here.

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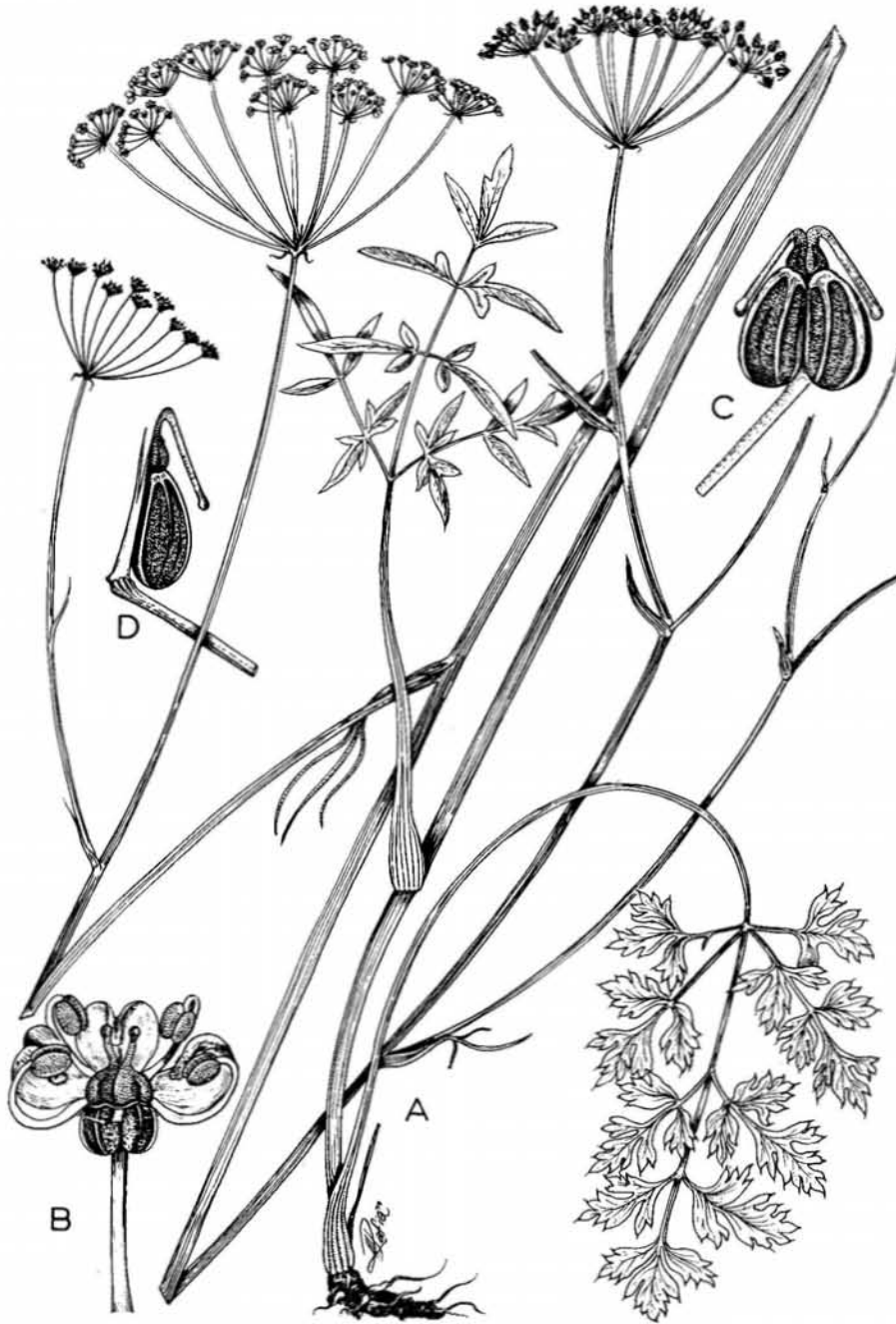


Fig. 8 *Scaligeria cretica*: A, habit $\times 0.5$; B, flower $\times 10$; C, fruit $\times 10$; D, mericarp $\times 10$.

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Fl. Apr.-June

8. SMYRNIUM

L., *Sp. Pl.* 262. 1753; *Gen. Pl. ed.* 5. 127. 1754.

Erect, glabrous, biennial or perennial herbs with fusiform tap root without a fibrous collar. Leaves petiolate, sheathing at the base, sometimes auricled, basal and lower ones usually 2-3-ternate-pinnate with broad ultimate segments, upper cauline leaves mostly simple, alternate or opposite. Umbels terminal and axillary, long-peduncled, few to many-rayed. Bracts present or absent. Bracteoles small or absent. Flowers mostly bisexual, yellow or greenish-yellow. Calyx teeth obscure or absent. Petals oblong, almost entire or slightly notched, and acute involute at the apices. Stylopodium conical, shorter than the patent styles. Fruit ovoid or \pm globose, didymous, laterally compressed, glabrous, dark brown to black; carpophore deeply bipartite; mericarps with 3, conspicuous, filiform and 2 lateral inconspicuous ribs or all ribs obscure; each furrow with numerous scattered oil ducts; commissural oil ducts many; seed with concave inner face.

c. 8 species, occurring chiefly in the Mediterranean region and middle East; represented in Libya by the following species.

Smyrnium olusatrum L., *Sp. Pl.* 262. 1753; Durand & Barratte. l. c. 107; Pamp., *Pl. Trip.* 167. 1914; Prodr. *Fl. Cir.* 341. 1931; Keith, l. c. 916; Zohary, l. c. 404. fig. 582; Meikle, l. c. 721. (Fig. 9)

S. vulgare S. F. Gray, *Nat. Arr. Brit. Pl.* 2:525. 1821.

Perennial, up to 1.5 (-2) m tall, robust, stout, glabrous herb with conspicuously furrowed, usually much branched, \pm fleshy, fistulose stem and thick roots. Lower leaves alternate, broadly deltoid-ovate, 20-50 cm long and broad, 2-4-ternate-or pinnatisect into oblong-ovate or obovate, 3-8 x 1.5-5 cm, petiolulate, usually 3-lobed, serrate, basally cuneate, apically acute or obtuse, dark green glossy segments; upper cauline leaves opposite or subalternate, ternatisect with entire or deeply 3-fid segments; petioles of lower leaves 15-20 cm long, canaliculate, fleshy, basally dilated into a long, conspicuous, papery, auriculate sheath, very short or almost absent in upper ones especially below the branched inflorescence. Umbels (3-) 5-15 (-18)-rayed, hemispherical on strongly ribbed, 3-8 (-10) cm long, terminal and axillary peduncles,



Fig. 9 *Smyrniolus satrum*: A, basal portion of plant $\times 0.5$; A₁, a lower leaf on a portion of stem $\times 0.5$; B, upper portion of plant $\times 1$; C, flower $\times 20$; D, bracteole $\times 5$; E, fruit $\times 8$.

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these considerably enlarging in fruit; rays 2-6 (-8) cm long. Bracts absent or few, short and filiform. Umbellules densely many-flowered. Pedicels 2-4 mm long, enlarged in fruit, \pm scabrous. Bracteoles 2-4, small, membranous, early deciduous. Petals oblong-obovate. 1.5-2 x 1-1.5 mm, yellowish-green. Anthers oblong, greenish. Styles somewhat longer than the flattish stylopodium. Fruit broadly ovoid or ovate to suborbicular, 6-8 x 8-10 mm, black didynamous; mericarps semicircular, with 3 prominent ribs on dorsal side; commissure narrow.

Type: Described from the British Isles. Wallia, Scotia prope Brevicum (Herb. Cliff.)

A-7 Shahat, ruins, 4.5.1978, *A. El-Gadi & Jafri* 1409; id. erect herb, 28.2.1973, *S. I. Ali & S. A. Faruqi* 1016; Gebel Akhdar, roadside, c. 1.5 m tall, 26.2.1973, *N. El-Migirby* s. n.; Shahat, near water, white milky juice from cut branches, greenish-yellow flowers, 28.2.1973, *S. I. Ali & S. A. Faruqi* 953; Ibid, *A. El-Tiafe* 1; Wadi Derna, large herb, c. 80 cm high, 20.1.1967, *L. Boulos* 1316; Shahat, descent to Ras el-Hilal, along roadside, *Ramadan & Siddiqi* 857.

Distribution: Mediterranean region, Atlantic Islands, W. Europe and Euro-Siberian region.

confined to the moist and shady places of Gebel Akhdar area in Libya. The young shoots are used as pot herbs and salad in some areas and once cultivated for this purpose in Libya. It is also used as an antiscorbutic in Palestine.

Fl. Jan.-Apr.

9. BUNIUM

L., *Sp. Pl.* 243. 1753; *Gen. Pl.* ed. 5:114. 1754.

Herbs, glabrous, mostly perennial with \pm globose, tuberous bulbiferous root-stock; subterranean part of stem slender and flexuose. Leaves 2-3-pinnate or pinnatisect, often rather distant and mostly basal or apparently basal, ultimate segments usually many, narrow filiform or linear. Umbels compound, usually terminal with or without bracts; bracteoles present, reduced, inconspicuous. Flowers bisexual or polygamous; sepals obsolete or very minute. Petals white or pink, obcordate; notched with inflexed apices. Stylopodium flattish or conical, styles usually longer and spreading, divaricate or deflexed in fruit. Fruit usually oblong, ovoid or prismatic,

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laterally compressed, with 5, filiform, prominent ribs and 1-3 vittae (oil ducts) in each furrow; inner face of seed plane; seedling usually with one cotyledon, the other abortive.

About 30 species in Europe, Mediterranean region, eastwards to C. Asia; represented by 2 species in Libya.

- + Pedicels short and thickened in fruit; fruits c. 3 times as long as broad **2. B. incrassatum**
- Pedicels longer and hardly or not thickened in fruits; fruits twice as long as broad **1. B. fontanesii**

1. **Bunium fontanesii** (Pers.) Maire in Bull. Soc. Hist. Nat. Afr. Nord. 28: 358. 1937; Quezel & Santa, Nouv. Fl. Alg. 2: 680. 1963. (Fig. 10).

Laserpitium fontanesii Pers., Syn. Pl. 1: 313. 1807; *Elaesolinum foetidum* Boiss., Elench. 91. 1838; *B. mauritanicum* (Boiss. et Reut.) Batt. in Batt. & Trab., Fl. Alg. (Dicot.) 346. 1895; Jehand. & Maire, Cat. Pl. Maroc. 2:539. 1932; *Carum mauritanicum* Boiss. & Reut., Pugill. 49. 1852; Pamp., Pl. Trip. 162. 1914; Keith, l.c. 332. *Bulbocastanum mauritanicum* (Boiss. & Reut.) Willk. in Linnaea 40: 84. 1876.

Perennial or biennial with a tuberous, \pm globose rootstock, up to 30 (-40) cm tall, \pm dichotomously branched. Leaves 3-ternate; basal leaves long petioled, sheathing at base, cauline 2-ternate, with linear to linear-lanceolate, mucronate ultimate segments. Bracts and bracteoles 6-9, persistent. Rays 6-9; slender; sepals minute, petals white or cream-coloured, \pm orbicular, emarginate with incurved apices. Pedicels up to c. 7 mm long, slender, not thickened in fruit. Fruits oblong-elliptic, c. twice as long as broad, glabrous, with prominent ridges with 1 oil ducts inbetween; carpophore, somewhat thickened, undivided; stylopodium short, conical, with deflexed longer styles.

Type: "Hab. in arvis prope Sibibam"

A-2 Rumia (near top of limestone hill), 15 km from Yefren, fls. white, 7.4.1974, *S.I. Ali* 1846; 5 km after Asaba (c. 24 km from Garian) near cult. field, fls. white, 9.4.1974, *S.I. Ali* 1768; *ibid.*, *G. Faris* 312; *ibid.*, *A.M. Abdelrazig* 220; **A-3** 22 km West Khoms, on calcareous slopes, 25.4.1967, *L. Boulos* 1794; El-Neggaza, 97 km from Tripoli, 1.5.1974, *A.M. Abdalrazig* 485.

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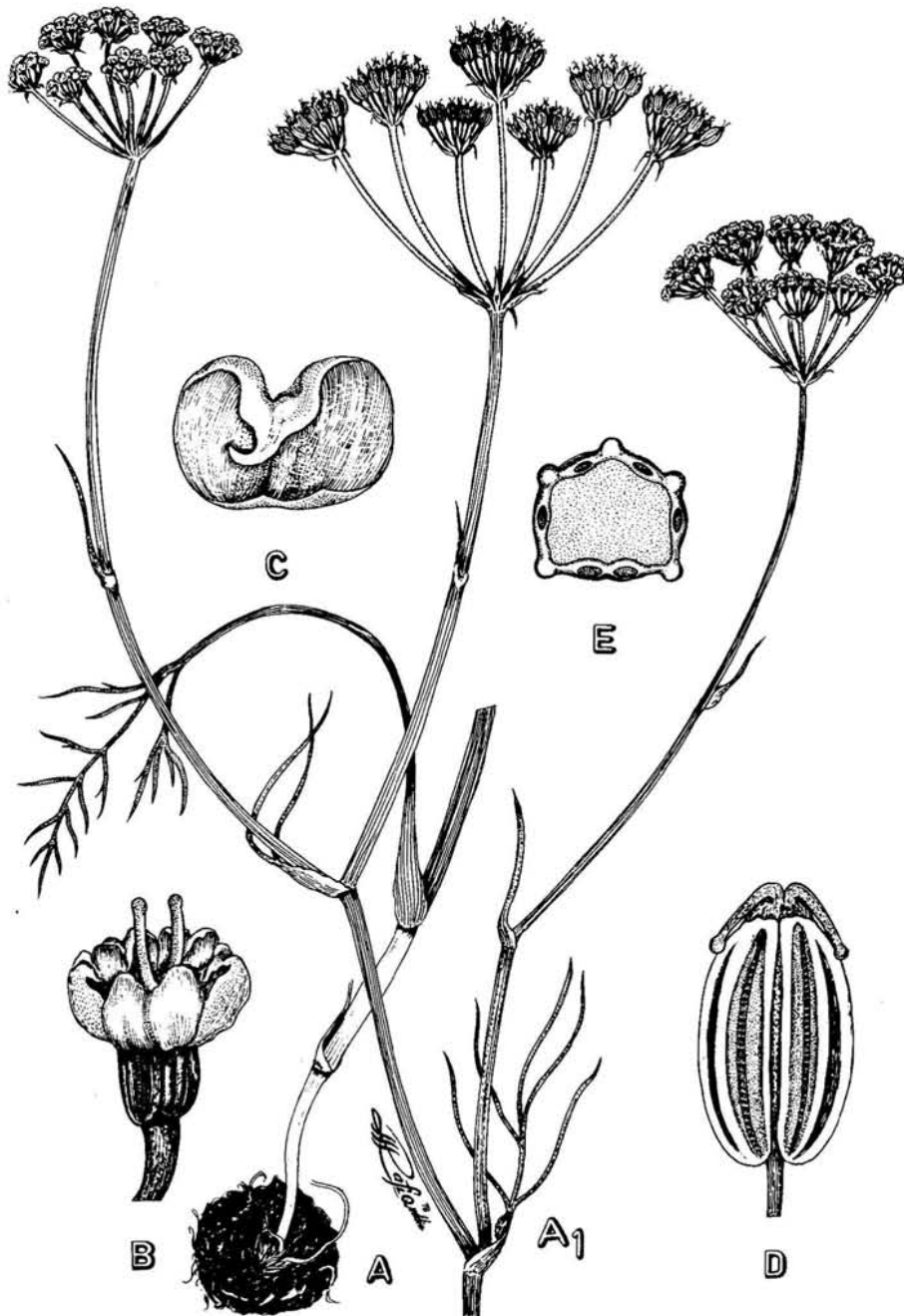


Fig. 10 *Bunium fontainesii*: A, basal portion of underground stem ending in a tuber \times 1; A₁, upper portion of plant \times 1; B, flower \times 10; C, petal \times 20; D, fruit \times 10; E, t.s. of mericarp \times 20.

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Also reported from Msellata, Tarhuna and Garian by Pampanini (l.c.).

Distribution: N. Africa.

A species seems to be confined here towards N.W. areas of Libya.

2. **Bunium incrassatum** (Boiss.) Batt. in Batt. & Trab., Fl. Alg. (Dicot.) 346. 1895; Keith, l.c. 306; Quezel & Santa, l.c. 678, Pl. 65, fig. 1998.

Carum incrassatum Boiss., Voy. Bot. Espagne 2: 239. & 731. 1839-41;
Bulbocastanum incrassatum (Boiss.) Lange in Willk. & Lange, Prodr. Fl. Hisp. 3: 88. 1880.

Perennial, glabrous herb, with tuberous rhizome, erect up to c. 60 cm tall, branched with rigid stems. Radical leaves petiolate, 3-ternatisect; cauline sessile, biternatisect or bipinnatisect, ultimate-segments linear, mucronate, rays 8-12, elongated, rigid in fruit, divaricately ascending. Bracts 6-8, lanceolate-subulate, cuspidate, whitish at margin; pedicels thickened in fruit. Calyx-teeth minute, rigid; petals white, conspicuously emarginate with inflexed apices; stylopodium thickened with divergent-arcuate styles; fruit apices broad, not elongated. Mericarps linear-cylindrical to ellipsoid; carpophore rigid, with bifid apices.

Syntypes: "Hab. in Hispania australi, insulis Balearicis (*Camb.*), Creta (*Tourn.*) Socio et Samo (*d'Urv.*), Cypro (*Sibth.*) Africa boreali prope Algeria (*Bove.*)

A-7 Between Cyrene and Apollina, barley fields and scrubs, 12.4.1939, *D.D. Simpson* 39543 (BM).

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

10. PITURANTHOS

Viv., Fl. Lib. Spec. 15. t. 7. fig. 1. 1824.

Deverra DC., Coll. Mem. 5: 45. 1829; DC., Prodr. 4: 143. 1830;

Cannon in Lannert, Fl. Zamb. 4: 585. 1978.

Perennial rigid, almost leafless above, green-glaucous herbs. Leaves mostly basal, almost entire to subternately divided, with oblong-linear to filiform lobes;

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uppermost leaves usually reduced to sheaths. Umbels terminal or axillary. Bracts and bracteoles often caducous, mostly oblong and ovate respectively. Flowers hermaphrodite. Sepals obsolete. petals greenish-white or yellowish, ovate or orbicular, slightly notched or entire with rather long inflexed point. Stylopodium conical or depressed-conical with usually undulate margin; styles, deflexed. Fruit ovoid to globular, laterally compressed, hairy or setulose; carpophore 2-parted; mericarps with 5, filiform, prominent ribs; oil ducts solitary in each furrow, commissural ducts.

2. About 10 species in Trop. Africa, adjacent deserts of N. Africa and W. Asia; represented by 3 (-4) species in Libya.

Cannon (l.c.) accepted the name *Deverra* DC. for this genus because of the pre-existence of the name *Pityranthus* Mart. (1814) (considered synonymous with *Alternanthera* of *Amaranthaceae*). However, there is some difference in the spelling of *Pituranthos* and *Pityranthus* and the former has been commonly used in literature. The name *Pituranthos* Viv. (1824) should be conserved, if necessary.

- | | | |
|--|---|------------------------|
| <p>1. + Plants caespitose, broom-like, with many erect, simple to sparingly branched stems. Umbels terminal and lateral; styles usually much exceeding the fruit apices. Flowers somewhat larger</p> <p>— Plants subcaespitose with single or few stems, densely branched above with divaricate, generally tortuose branches. Umbels mostly terminal; styles shorter and hardly or slightly exceeding the fruit apices</p> | 2 | 1. P. tortuosus |
| <p>2. + Petals glabrous or almost so at back on the narrow middle-nerve; branches erect; peduncle c. as long or slightly exceeding the umbel size; bracteoles \pm persistent</p> <p>— Petals pubescent at back on the broader middle-nerve</p> | | 3. P. scoparius |
| <p>3. + Plants usually taller, stems branched above with straight, ascending or erect branches; peduncle usually longer with broader umbels; bracteoles usually caducous to subsistent</p> <p>— Plants shorter, strictly erect with broom-like</p> | | 2. P. denudatus |

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dense stems, sparingly or hardly branched above
with erect branches; peduncles shorter with
smaller umbels; bracteoles persistent

4. *P. rholfsonianus*

1. ***Pituranthos tortuosus*** (Desf.) Benth in Benth & Hooker, Gen. Plant. 1 (3): 890. 1867; Aschers. & Schweinf. Mem. Inst. Eg. 2:80. 1887; Durand & Barratte, Fl. Lib. Prodr. 104. 1910; Pamp., Pl. Trip. 166. 1931; Prodr. Fl. Cir. 344. 1931; Keith, l.c. 775; Zohary, Fl. Palest. 2: 423. 610. 1972. (Fig. 11).

Bubon tortuosum Desf., Fl. Atlant. 1: 360. 1798; *Deverra tortuosa* (Desf.) DC., Prodr. 4: 143. 1830

Aromatic, shrubby perennial, up to 60 cm tall, erect glabrous, dichotomously and usually divaricately branched; stems striate, bluish-green or whitish or \pm glaucous, apparently leafless. Leaves usually caducous; basal 3-10 cm, 2-pinnatisect into stiff and divergent, short, oblong to linear-subulate, acute lobes; sheathing petiole short, broad, broadly scarious-margined; lower cauline leaves similar but reduced to sheaths with filiform-subulate apices. Umbels compound, mainly terminal, long-peduncled; umbellules 6-10, almost equal, 1-2 cm long; bracts and bracteoles persistent, oblong or ovate, scarious margined. Flowers semiclosed. Petals puberulent to glabrous along the green nerve at the back; styles longer than the stylopodium. Fruit 1-1.5 mm, usually shorter than the pedicels, ovoid to almost globular, usually hirtellous-whitish.

Type: Prope Kerwan in regno Tunetano, *Desfontaines*.

A-2 Talil, beach area, common, 12.6.1976, *S.M.H. Jafri*, after Zowara, *A.K. Ruby* s.n.; Shakshuk, c. 45-50 cm tall, flowers white, 5.5.1972, *S.I. Ali & M. Khalifa* 394; **A-3** Kosbat, 29.3.1975, *Fouzia* 218; c. 10 km from Tripoli, 25.12.1975, *F.B. Ratib* 74; 10-20 km Tripoli, along the coastal road, to Khoms, in sand, 22.11.1966, *L. Boulos*; University campus, in sandy soil, 18.4.1967, *L. Boulos* 1690; Sea shore, north Misurata, 26.4.1967, *L. Boulos* 1690; Sea shore, north Misurata, 26.4.1967, *L. Boulos* 1828; Ain Kaam, 25.4.1978, *O. Shetwy* 20; **A-6** c. 100 km before Benghazi on way back from Baida, roadside, common, 27.10.1975, *S.M.H. Jafri* 6156; Wadi Ramlah, 5 km N. Al Makali, 22.1.1967, *L. Boulos*; 10 km S. of Benghazi on way to Ajdabia, 8.5.1978, *El-Gadi & Jafri* 2002; **A-8** Near Tobruk, common, 24.10.1975, *S.M.H. Jafri* 6063; **B-4** 2 km east Bougrein, 27.1.1967, *L. Boulos* 1493; 66 km before Bugrain on way to Benghazi, roadside, small bushes, very common, 22.10.1975, *S.M.H. Jafri* 6001; 18 km W. Bugrein, 2.5.1978, clay soil, *A. El-Gadi & Jafri* 1249; Near Bugrein, sandy

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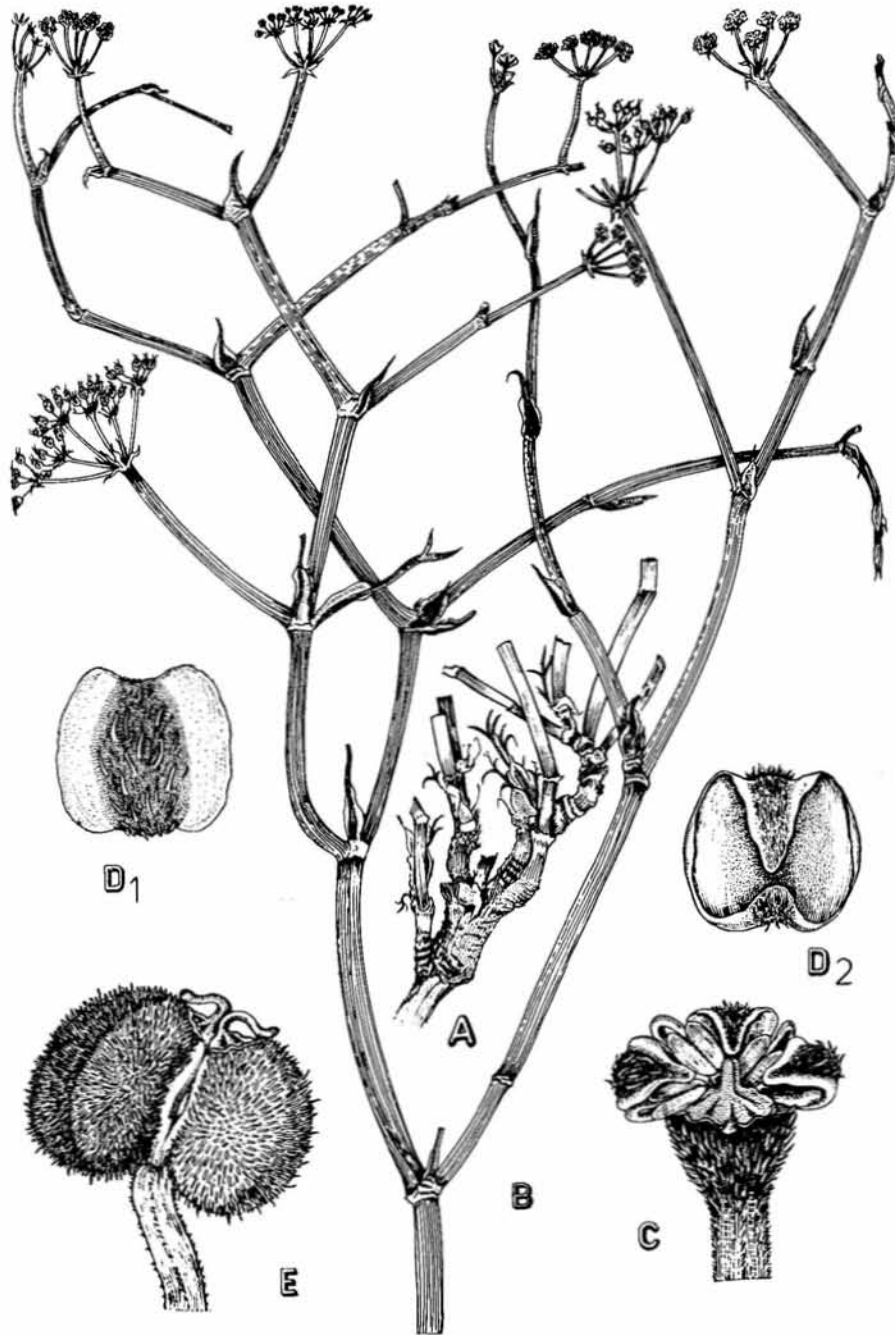


Fig. 11 *Pituranthos tortuosus*: A, basal portion of plant $\times 1$; B, upper portion of plant $\times 1$; C, flower $\times 15$; D₁, petal (back view) $\times 23$; D₂, same (front view) $\times 23$; E, fruit $\times 15$.

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ground, 27.2.1976, *S.M.H. Jafri* 6414; 70 km from Bungem towards Bugrain, sandy ground, shrubby, 27.2.1976, *S.M.H. Jafri* 6408; id. 28.3.1975, *S.I. Ali* 2454; 130 km from Hun, 2.4.1973, *S.I. Ali* 1575; c. 80 km from Hun, limestone, dry places, 2.4.1973, *S.I. Ali* 1570; Weshka, 25.3.1975, *K. Sifao* 1; id. *Fauzia* 9; id. *A. Gammudi* 6. **B-8** Al Masiad, near the border of Egypt, small bushes in sandy ground, common, 25.10.1975, *S.M.H. Jafri* 6066; c. 195 km from Tobruk on way to Al-Jaghbub, 19.4.1978, *Ramadan, Fathi & Siddiqui* 601; **C-8** c. 98 km to Hun, along the main highway from Sabha, Wadi Soda, along the main dried water stream, sandy soil, with loamy top at some places, 31.3.1975, *S.I. Ali* 1475.

Distribution: N. Africa (Tunisia, Libya, Egypt) Palestine.

Primarily a desert species, occurring almost throughout Libya; variable in stature and colour of plant, but divaricate, usually tortuose branches distinguish it easily.

Vern.: Gazzah

2. ***Pituranthos denudatus*** Viv., Fl. Lib. Spec. 15., tab. 7. fig. 1. 1824; Durand & Barratte, l.c. 104.

Deverra pituranthos DC., Prodr. IV: 144. 1830; *D. chloranthus* Coss. et Dur. ex Coss. in Bull. Soc. Bot. Fr. 2: 249. 1855; *P. chloranthus* (Coss. et Dur.) Benth. in Benth. & Hook. f., Gen. Pl. 1:890. 1867; Durand & Barratte, l.c. 103; Pamp., Pl. Trip. 166. 1914; Corti, l.c. 201; Ozenda, Fl. Sahara ed. 2. 125. 1977.

Similar to the preceding species but taller, branched above, with elongated, straight, spreading to suberect branches, rarely subtortuose, greenish to glaucous. Lower leaves, 2-3-sect with short linear-lobes, upper reduced to sheaths only or produced into a linear limb, early deciduous. Umbels lateral and terminal, larger, usually long-penduncled; bracts and bracteoles usually early deciduous; petals inflexed, externally densely hairy on the veins; fruit suborbicular, densely pubescent, laterally \pm compressed, 1.5 mm; style exceeding the stylopodium, margin of stylopodium undulate-crenate.

A very variable species; it is not possible to separate *P. chloranthus* (Coss. et Dur.) Benth and *P. battendieri* Maire from this species on the basis of colour of plant and persistent or deciduous leaves. However, 2 subspecies are recognized here, till more information is available.

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- + Leaves early deciduous; peduncles longer ssp. 2 (a) **denudatus**
— Leaves persistent; peduncles usually shorter ssp. 2 (b) **battendieri**

2 (a) ssp. **denudatus**

A ± greenish looking slender plant, usually almost leafless.

Type: Described from Libya (Cyrenaica).

A-1 Wadi Malah, c. 10 km from Nalut, base woody, c. 60-100 cm tall, 4.5.1972, *S.I. Ali & M. Khalifa* 304; id., flat limestone rocks, c. 1 m tall, many branches from the base, 18.4.1975, *S.I. Ali* 2858; 25 km from Nalut towards Wazen, soil clay rocky, corolla white, 9.6.1974, *B. Faris* 592; 4 km after Nalut towards Ghadames, 9.2.1976, *A. El-Tiafe* 77; **A-2** Wadi Kabau, steep valley slope, sandy soil, c. 1 m. tall, 5.5.1972, *S.I. Ali & M. Khalifa* 357; Rumiah, limestone rocks, c. 1 m. tall, 10.4.1975, *S.I. Ali* 2679; Between Sinawan and Shakshuk, 24.1.1977, *Siddiqi & Fathi* 227; 4 km before Garian, cult. field, sandy soil, erect, c. 0.5 m fruits yellow at the top, 4.11.1975, *S.I. Ali* 2960; Gebel Nafousa, 11.5.1970, *M. Khalifa*; **A-3** Al-Gusbat, 19. 1978, *S.M. Mustafa* 79; id. 18.5.1978, *Fatin Ahmed* 29; Wadi El Kharwa, 18.5.1978, *Salwa H.H.* **A-4** Al-Kararim, S. of Misurata, 27.1.1967, *L. Boulos* 1507; **C-4** c. 50 km from Hun, c. 30 km from Wadan, towards Tripoli, c. 60 cm in clumps, *S.I. Ali* 1555 & 1567.

2 (b) ssp. **battendieri** (Maire) Jafri, **st. nov.** (Fig. 12)

Pituranthos battendieri Maire in Bull. Soc. Hist. Nat. Afr. Nord. 9:177. 1918; Quezel & Santa, l.c. 666; Ozenda, l.c. 356. fig. 125; *P. crassifolius* Andreausky in Ind. Hort. Bot. Univ. Budapest 3:83. 1938; *P. tuzsoni* Andreausky, l.c. 84.

A glaucous-looking plant with usually persistent leaves.

Type: Described from Algeria.

A-1 Wadi Al-Aital, stony and sandy ground, roadside, common, 29.3.1976, *S.M.H. Jafri* 6569; Wadi Malah, 10 km from Nalut, c. 70 cm, flowers white, 4.5.1972, *S.I. Ali & M.A. Khailfa* 310; **A-2** Cabaw, soil sandy, 7.6.1974, *B. Faris* 477; Jado, El-Kafs rocky mountainous, 45-50 m., 6.6.1974, *B. Faris* 436; Ain Rumia, 9.1.1974, *M.A. Razig* 261; Ginoun near Jado, hilly area c. 15 km from Shakshuk, erect shrublet, c. 75

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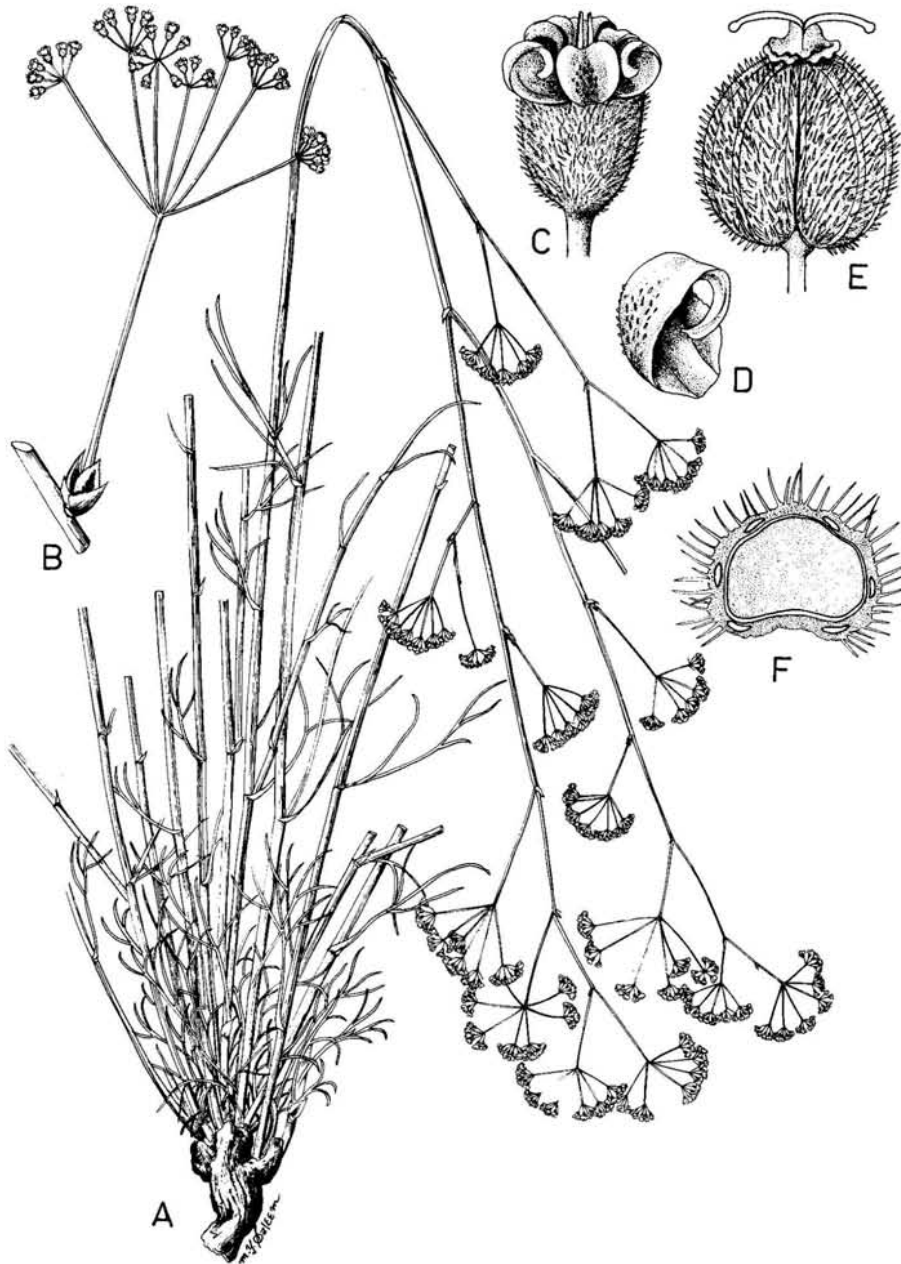


Fig. 12 *Pituranthos denudatus* ssp. *battendieri*: A, habit $\times 0.5$; B, umbel $\times 1.5$; C, flower $\times 13$; D, petal $\times 40$; E, fruit $\times 10$; F, t.s. mericarp $\times 20$.

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cm., fls. pale green, 27.11.1976, *A. Ghafoor & S.A. Alavi* 206; Gebel Nefousa, at Ain Zarga, near Jado, 700 m, rocky slope of escarpment, perennial, flowers pale yellowish, 17.3.1970, *P.H. Davis* 49702; Fort of Garian mountains, near main road from Tripoli, sandy soil with stone, erect, c. 40 cm, flowers pale yellow, 28.2.1975, *S.I. Ali* 226; id. 28.11.1975, *S.M.H. Jafri* 6246; Rumia, limestone hill, 15 km from Yafran, c. 1 m., 9.4.1974, *S.I. Ali* 1852; **A-3** Tripoli, University Campus, erect, up to c. 80 cm tall, flowers yellowish, 23.3.1978, *A. Ghafoor* 322; **B-1** c. 5 km from Gadamas (towards Berber castle) dry stony ground, not common, 25.2.1976, *S.I. Ali* 2140; 8-10 km N.E. of Derj, 30.1.1977, *Siddiqi & Fathi* 455; **B-2** 16 km from Mizda to Al Ghariat, flowers yellow, very common, 13.2.1977, *Siddiqi* 56; **B-4** c. 40 km from Weshka, roadside, sandy soil, bush 30-80 cm, common, 25.3.1975, *S.I. Ali* 2280; 52 km from Bugrain on way to Hun, *S.A. Alavi* 1738; 23 km W. Sirte, *Siddiqi* 158; **C-4** c. 82 km from Bu Njim towards Hun, sandy roadside, bush, c. 60 cm, 27.3.1975, *S.I. Ali* 2434; c. 15 km from Bu Njim, sand with pebbles; erect bush, c. 60 cm, 27.3.1975, *S.I. Ali* 2415; c. 12 km from Bu Njim towards Hun, sand, erect bush, c. 60 cm, 27.3.1975, *S.I. Ali* 2406; **C-5** c.

Fl. Feb.-June (almost the year round).

Vern. Gazzah

3. ***Pituranthos scoparius*** (Coss. et Dr. ex Coss.) Bentham in Benth. & Hook. f., *Gen. Pl.*, 1: 890. 1867; Durand & Barratte, l.c. 103; Pamp., *Pl. Trip.* 166. 1974; Quezel & Santa, l.c. 666, fig. 1941. 1963; Ozenda, *Fl. Sahara*, ed. 2: 356, fig. 125. 1977.

Deverra scoparia Coss. et Dur. ex Coss. in *Bull. Soc. Bot.* II. 248. 1855; Batt. & Trab. *Fl. Alg.* 1: 351. 1889; Rohlfs, *Kufra* 429. 1881.

Caespitose, erect, broom-like tall perennial herb, much branched at base with erect branched, leafless nodose, greenish stem, up to 60 (-80) cm tall; Basal and lower leaves 2-3-pinnatisect, cauline leaves reduced to small, ovate, virgate sheaths, membranous at margin, Umbels usually lateral and terminal, on peduncles 1-3 cm long. Bracts and bracteoles deciduous to subsistent, usually 4-6, lanceolate, glabrous, the latter \pm exceeding the young buds. Petals ovate-oblong, at flowering, becoming

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inflexed later; middle nerve narrow, glabrous. Stylopodium conical-depressed, margin hardly undulate-crenulate; style longer than stylopodium, deflexed, usually much exceeding the fruit apices. Fruits ovoid-or suborbicular, somewhat laterally compressed, usually villous with small whitish hairs.

Syntypes: 'in rupestribus glareosis et collibus incultis, in Algeria interiore et australiore (Blansa, Reboud etc.).

A-1 c. 184 km from Nalut, c. 4 km from Sinawan, sandy soil, dry area, 25.2.1975, *S. I. Ali* 2128; **A-3** Tarhuna-Sharshara, up on the cliff, smell of fruit cumin, flowers white, 19.1.1976, *S. Alavi, A. El-Gadi & Fathi R.* 1055.

Distribution: Arid areas of N. Africa (Tunisia, Algeria & Libya).

Easily recognized by its broom-like, straight branches and caespitose habit.

4. **Pituranthos rholfsonianus** (Aschers.) Schinz in Bull. Herb. Boiss., II, 209. 1894; Durand & Barratte, l.c.; Corti, Fl. Veg. Fez. & Ghat 200. 1942 (Fig. 13)

Deverra rholfsonianum Aschers. in Rohlfs, Quer durch Africa, II; 282. 1875; Rohlfs, Kufra, 429. 1881; *P. tripolitanus* Andreasky in Ind. Hort. Bot. Univ. Budapest 3-82. 1938.

Similar to *P. scoparius* in erect, simple or sparingly branched stems with erect branches, but plants usually shorter, up to 30 cm tall, (rarely up to 80 cm tall) with dense stems, often ending somewhat spinescently; bracts and bracteoles persistent, pubescent, the latter not overtopping the young buds; petals with broader middle nerves pubescent at the back; anthers yellow; stylopodium with distinctly crenulate-undulate margins.

Type: "Habitat in desertis Tripolit anis inter Djebel et Fezan, ubi cl. G. Rohlfs die 30 Sept. 1865 florentem et vix defloretum legit."

A-1 Nalut, Ejwabia, soil rocky, corolla white, 8.6.1974, *B. Faris* 521; **A-3** Sharshara, c. 5 km from Tarhuna, 14.11.1976, *A. El-Gadi et al.*, 27.

Distribution: Endemic to Libya.

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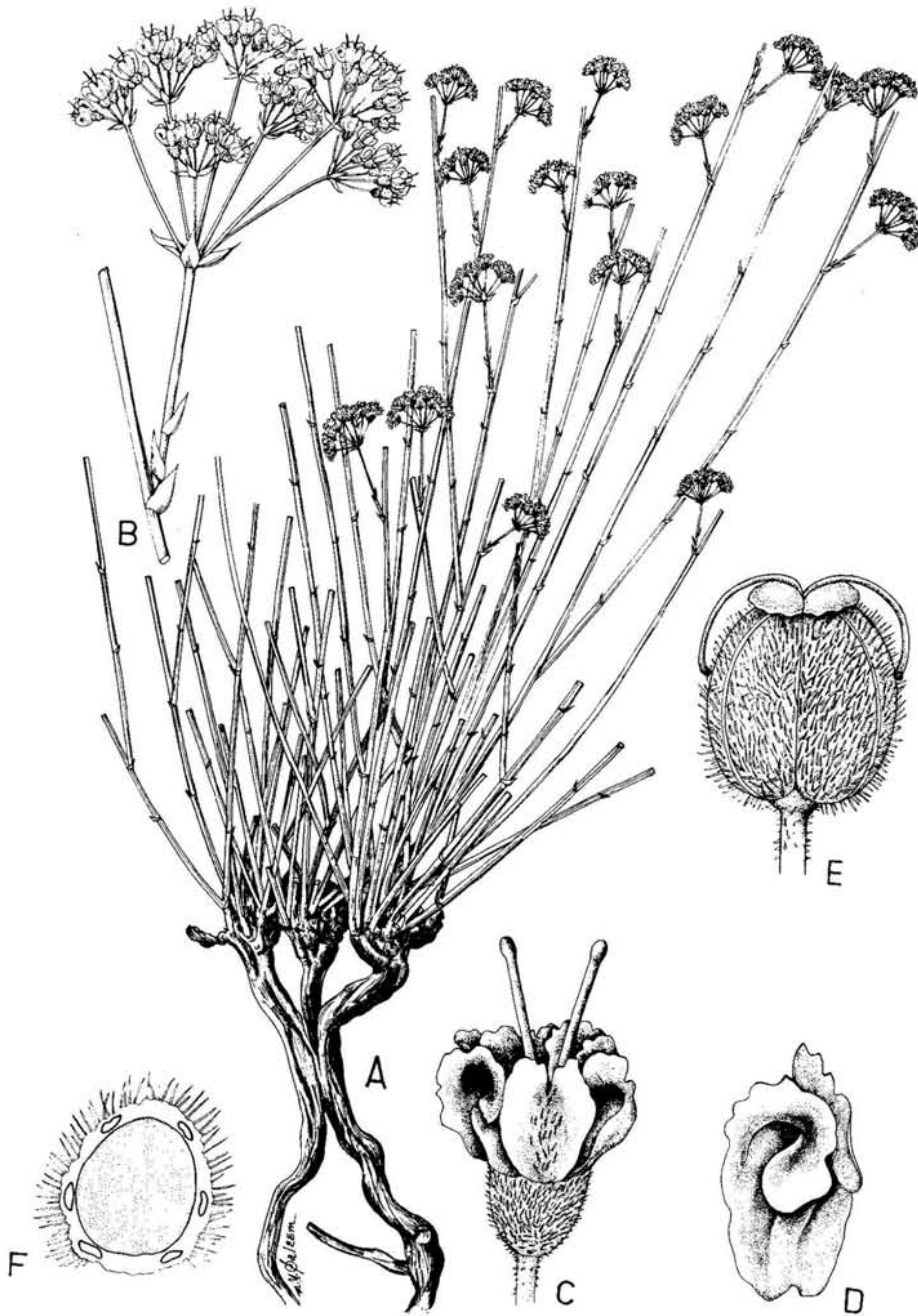


Fig. 13 *Pituranthos rholsianus*: A, habit $\times 0.5$; B, portion flowering branch $\times 3$; C, flower $\times 20$; D, petal $\times 40$; E, fruit $\times 20$; F, t.s. mericarp $\times 30$.

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It seems hardly different from *P. scoparius* and with more material it may come out as an extreme form of the preceding species with shorter habit and persistent bracts and bracteoles. Hair conditions on the back of petals seem to be very variable and hardly reliable character for taxonomic use.

11. PIMPINELLA

L., Sp. Pl. 263. 1753; Gen. Pl. ed. 5: 128. 1754.

Herbs, often perennial or biennial, rarely annual, tall. Basal leaves entire to trisect with incised or dentate segments; upper cauline leaves 2-pinnate with narrow lobes. Umbels mostly terminal, many-rayed. Bracts and bracteoles mostly absent (rarely 1-5). Flowers bisexual or staminate. Sepals obsolete or minute. Petals white or yellow, rarely pink or purplish, slightly radiating, obcordate or obovate, notched with inflexed apices, often papillose or hairy outside; stylopodium depressed or conical with mostly erect or deflexed, long styles. Fruits ovoid-oblong to subglobose, \pm compressed laterally, rounded to cordate at base, constricted at the commissure; ridges filiform, sometimes concealed by hairs, setae or tubercles, oil ducts (vittae) (1-) 2-3 (-5) in each furrow; seeds with convex back, inner face plane.

c. 150 species, mainly in temperate zones of the Old World; represented by 1 species in Libya.

Pimpinella peregrina L., Sp. Pl. 264. 1753; Pamp., Prodr. Fl. Cir. 347. 1931; Keith, l.c. 764; Zohary, l.c. 424, fig. 612. (Fig. 14).

Erect biennial, with a fusiform tap-root, 50-100 cm tall, subglabrous to pilose or hispid, generally sparingly branched above, with suberect branches. Basal leaves usually withered at anthesis, undivided or ternate with suborbicular, cordate, irregularly toothed segments, 3-5 cm diam., with longer petioles and inconspicuous basal sheaths; upper leaves pinnate, with 5-7 bluntly ovate, irregularly toothed, smaller segments, uppermost leaves sessile or subsessile bipinnately segmented into many narrowly ovate-cuneate or linear segments. Umbels leaf-opposed or terminal, pedunculate. Bracts and bracteoles absent; rays spreading, slender, 3-7 cm long. Flowers white mostly fertile; pedicels up to 1 cm long, slender, petals thinly pilose outside. Fruits ovoid, c. 1.5 x 1.2 mm, rather densely hispid with spreading bristles; carpophore slender, bipartite, mericarps brown when ripe, ridges very obscure.

Type: 'in Italiae pascuis sterilibus'.

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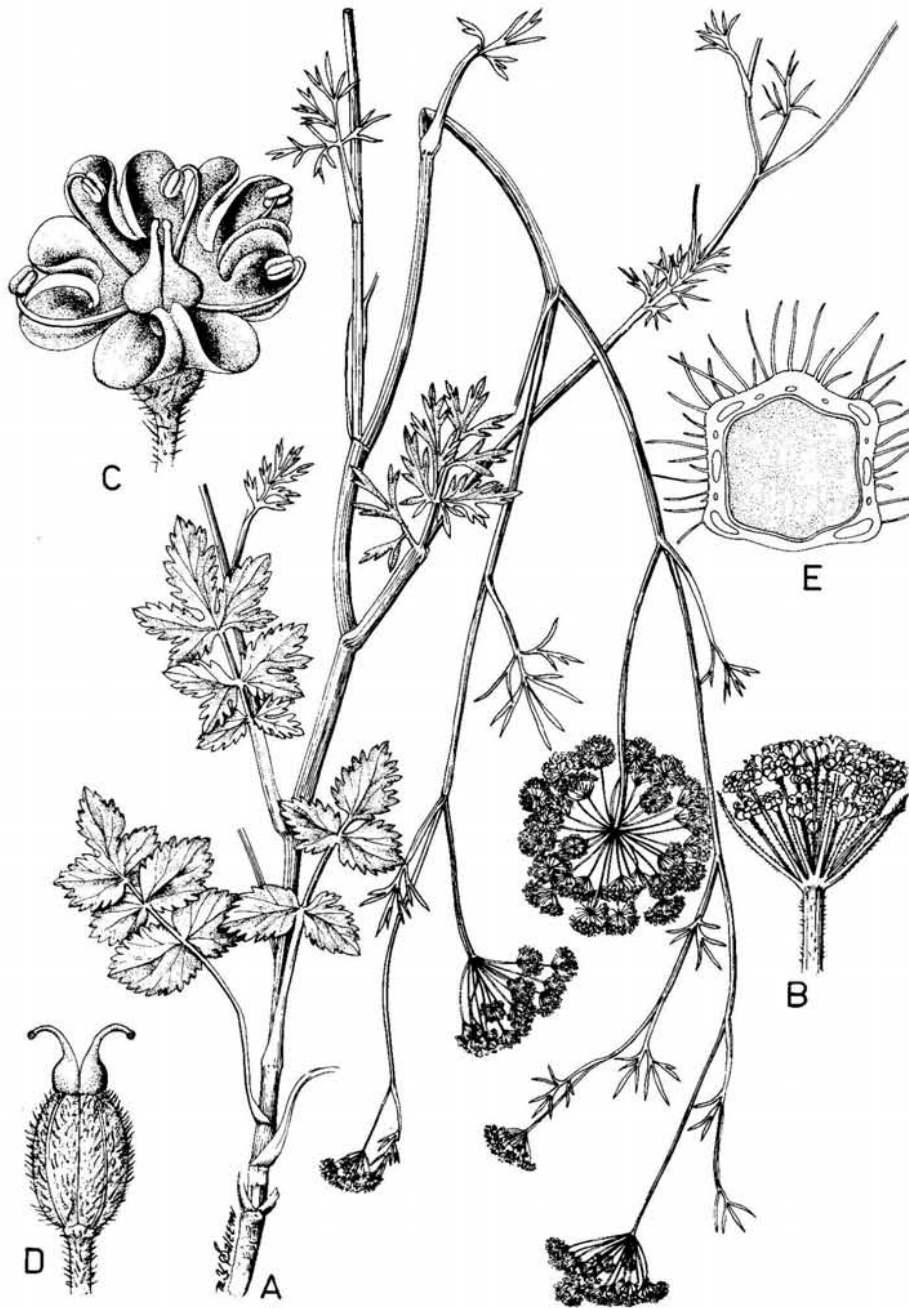


Fig. 14 *Pimpinella peregrina*: A, habit $\times 0.5$; B, umbellule $\times 4$; C, flower $\times 12.5$; D, fruit (immature) $\times 12.5$; E, t.s. mericarp $\times 50$.

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A-7 Shahat, ruins, flowers white, 23.4.1978, *Ramadan L., Fathi R. & Siddiqi* 1167; *id.*, 14.4.1979, *Sabah O.* 56; *id.* c. 8 cm, fls. white, 18.6.1972, *S.I. Ali* 635; *id.* 4.5.1978, *A. Abohalfaia* 30; *id.* 6.5.1978, *Salawi H.* 27.

Distribution: Mediterranean region eastwards to C. Asia.

A species confined to the Gebel Akhdar are in Libya.

P. anisum L., is known from the aromatic seed imported here from outside (vide Keith, l.c. 754). The plant is widely cultivated elsewhere and naturalized in many places of S. Europe. It differs from the above species by its short appressed hairs on fruit.

12. CRITHMUM

L., Sp. Pl. 246. 1753; Gen. Pl. ed. 5. 116. 1754.

Perennial, glabrous, decumbent or sprawling rhizomatous herb, without a fibrous collar. Leaves fleshy, 1-2-pinnatisect or ternate with subterete to lanceolate-elliptic segments. Umbels terminal or axillary, many-rayed. Bracts and bracteoles present. Flowers bisexual, yellow or yellowish-green. Calyx teeth minute or absent. Petals very small, obovate, notched or entire with inflexed apices. Stylopodium conical; styles very short. Fruit hardly compressed, ovoid-oblong or ellipsoidal, glabrous with thick spongy pericarp; carpophore bipartite; mericarps with 5, prominent ribs; each furrow shallow and broad with several oil ducts. Seeds with plane inner face.

A monotypic genus.

Crithmum maritimum L., Sp. Pl. 246. 1753; Durand & Barratte, l.c. 109; Pamp., Pl. Trip. 163. 1914; Prodr. Fl. Cir. 347. 1931; Keith, l.c. 395; Zohary, l.c. 429. fig. 621. (Fig. 15).

Fleshy, glabrous-glaucous, decumbent or sprawling, loosely tufted, dichotomously much branched perennial shrubby herb with thick, elongated rootstock and upright, up to 50 (-60) cm tall, solid, finely sulcate or striate stems. Leaves fleshy, deltoid in outline, (5-) 8-15 (-18) x (4-) 6-10 (-15) cm, ternately (1-) 2-pinnatisect into narrowly linear-lanceolate or oblong-oblong-lanceolate, 1-7 x 0.2-1.5 (-2) cm, basally attenuate acute, entire segments; petiole flattish or canaliculate, up to 6-8 cm long,

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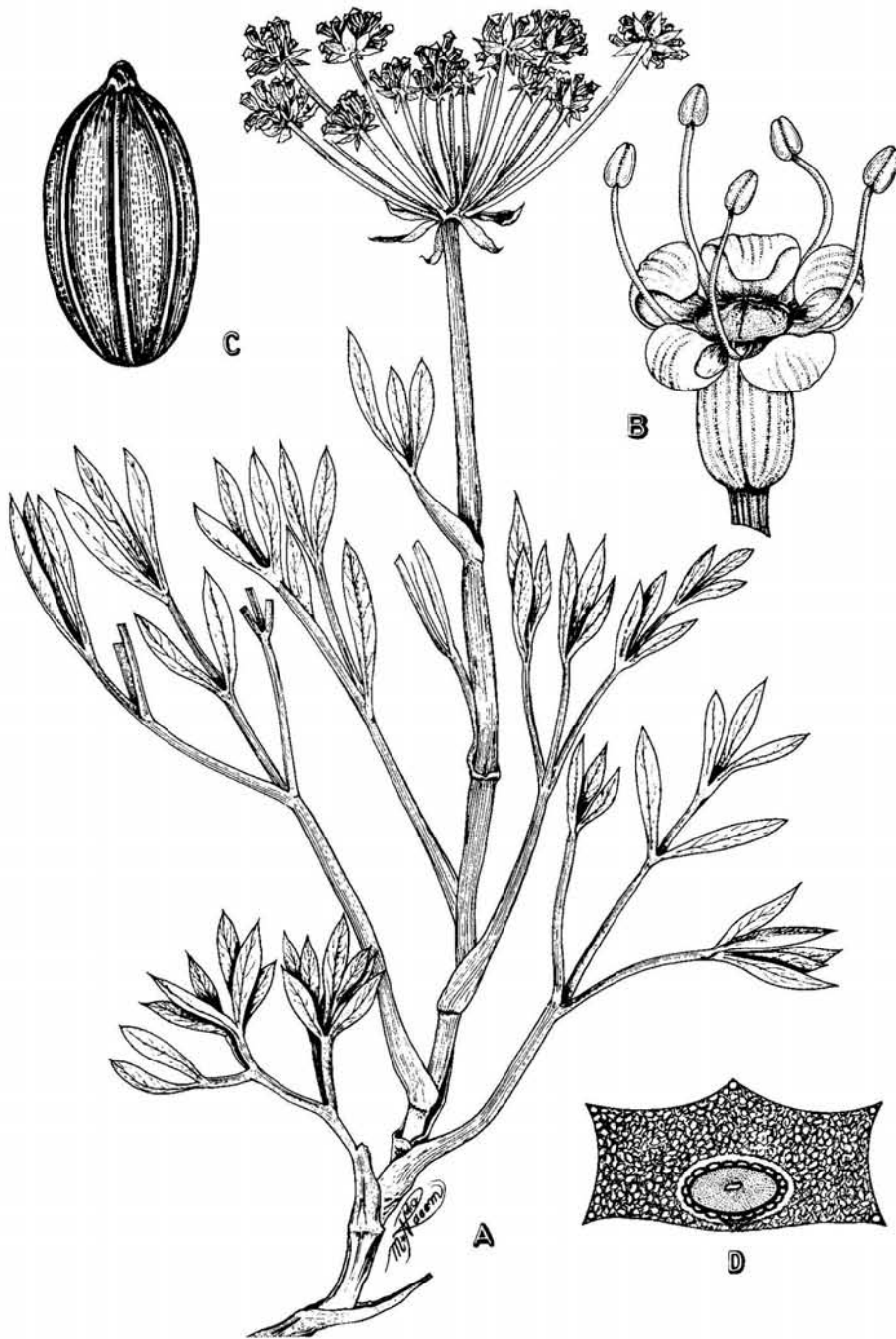


Fig. 15 *Crithmum maritimum*: A, habit $\times 1$; B, flower $\times 10$; C, fruit $\times 5$; D, t.s. mericarp $\times 10$.

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dilated at the base into a persistent, auriculate, 8-10 mm long sheath. Umbels (8-) 10-20 (-40)-rayed, on up to 8 cm long, thick, \pm fleshy terminal peduncles; rays subequal, (1.5-) 2-6 cm long, patent, grooved. Bracts 5-12, narrowly oblong to ovate-lanceolate, 5-8 (-11) x 1.5-6 mm, membranous margined, acute, persistent, reflexed in fruit. Umbellules 10-20-flowered. Flowers 1.5-2 mm across, yellowish-green. Pedicels 1.5-6 mm long. Bractlets 6-8, narrowly ovate-lanceolate, 2-4 x 1.5-2.5 mm, acute. Petals suborbiculate, yellowish-green, incurved and \pm emarginate at the tips. Anthers oblong, yellow. Styles as long as the \pm conical stylopodium. Fruit ovoid-oblong to ellipsoid, 4-6 (-8) x 4-6 mm, green to purplish; mericarps glabrous, \pm corky, ribs 5, prominent.

Type: Described from Maritime shore of Europe, Herb. Linn. 347/1 (LINN).

A-3 Leptis Magna, near coast, last year fruits present, 3.2.1978, A. *El-Gadi* 679;
A-7Susa, coastal area, among stones, leaves thick and fleshy, 17.10.1977, M.A. *Siddiqi* 15.

Distribution: Coastal belt of N. & N.W. Africa, S. & W. Europe, W. Asia, Black Sea.

Confined to rocky or rarely sandy sea shores in Libya. The fleshy leaves are eaten as salad and pickled in vinegar in East Mediterranean region.

13. SESELI

L., Sp. Pl. 259. 1753; Gen. Pl. ed. 5. 126. 1754.

Herbs, perennial or biennial, with or without a fibrous collar on the rootstock. Leaves 1-4 times pinnately or ternately divided. Umbels compound with (0-)-16 bracts; bracteoles present, free or united at base. Sepals absent or small. Petals white, rarely pink or yellow. Stylopodium conical. Fruits oblong to ellipsoid or ovoid, glabrous or pubescent, scarcely compressed; ridges conspicuous, vittae usually 1-3; styles persistent.

About 80 species, chiefly in Europe and C. Asia. A difficult genus, still needing a definite circumscription; represented by the following species in Libya.

Seseli tortuosum L., Sp. 260. 1753; Durand & Barratte, l.c. 108; Pamp., Prodr. Fl. Cir. 347. 1931; Keith, l.c. 892; Pau in Tutin et al, Fl. Europ. 2: 337. 1968; Fiori, Icon. Fl. Ital. 281, fig. 2288. 1933; Hedge & Lamond in Davis, Fl.

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Turk. 4: 371. 1972.

Perennial, sometimes biennial herb, (10-) 30-100 cm tall, with usually thick rootstock with a fibrous collar; stems glabrous, terete with fine ridges. Basal leaves up to 20 x 10 cm (or more), 3-4-pinnate, ovate in outline, glabrous or finely scabrid; ultimate segments ovate, divided into linear lobes, 5-25 x 1-1.5 (-2) mm; petiole shorter than rachis; upper leaves subsessile. Rays 5-15, up to 20 (-30) mm, puberulent, on inner side. Bracts 0 (-3); bracteoles 8-12, puberulent, with a membranous margin; umbellules 14-20-flowered. Petals yellowish-white, puberulent on back; pedicels shorter than fruits. Fruits ovoid to ellipsoid, puberulent, 3-4 x 1.5-2 mm.

Type: S. Europe, Herb. Linn. 367/14 (LINN).

Reported from El-Abiar (**A-6**) by Durand & Barratte (l.c.) and Pampanini (l.c.)

Distribution: S. Europe, N. Africa (Algeria, Tunisia & Libya), Crimea, Caucasia, Azerbaijan.

14. **ATHAMANTA**

L., Sp. Pl. 244. 1753; Gen. Pl. ed. 5. 115. 1854.

Annual to perennial herbs. Leave (1-) 2-5-pinnate with linear-lanceolate to ovate segments. Umbels compound, many-rayed. Bracts present or absent. Bracteoles many, free. Flowers mostly white. Calyx teeth small. Petals narrowed towards the base, emarginate or bilobed with inflexed apices, rarely hairy beneath or ciliate. Stylopodium conical, undulate-rugose. Fruit oblong-ovoid, hardly compressed, pubescent, shortly beaked, narrowed below the stylopodium; carpophore bipartite; mericarps semiterete, with inconspicuous ribs; each furrow and rib with single oil duct. Seeds plane and keeled in the middle on the inner face.

A genus of c. 12, mediterranean species; represented in Libya by the following species only.

Athamanta della-cellae Aschers et Barbey in Durand & Barratte, Fl. Lib. Prodr. 108. t. 7. 1910; Pamp., Prodr. Fl. Cir. 347. 1931; Keith, l.c. 272. (Fig. 16).

Perennial herb, basally woody, pale-green, branched or simple, up to 45 cm tall

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Fig. 16 *Athamanta della-cellae*: A, habit $\times 1$; B, flower $\times 10$; C, petal $\times 20$; D, fruit $\times 10$; E, mericarp $\times 10$.

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with inconspicuously hairy to glabrous branches. Leaves glabrous, fleshy, broadly oblong-elliptic in outline, 5-10 x 2-4 cm; lower long-petioled with imbricated marginally ciliolate sheaths, all unipinnatisect into cuneate, petioluled or sessile, 3-partite, incised-dentate leaflets with acute ultimate segments. Umbels 8-12-rayed, on 4-10 cm long, striate, glabrous, terminal peduncles; rays subequal, 1-2.5 cm long, minutely hairy. Bracts 5-6, oblong-lanceolate, 4-6 mm long, acute, hairy. Umbellules 15-20-flowered. Pedicels unequal, 4-5 mm long, pubescent. Bracteoles 5-6, oblong-elliptic, shorter to nearly as long as pedicels, pubescent, acute-acuminate. Petals ovate to \pm rotundate, c. 1.2 mm long, emarginate incurved at the tip. Styles erect, longer than the stylopodium. Fruit oblong, c. 3 x 1.8 mm, pale-brownish; mericarps with 5, filiform ribs, pubescent.

Syntypes: From Libya (gebel Akhdar area); Derna, 22. iv. 1887, *P. taubert* 449; Gebel Akhdar, *Della-Cella*; *Haimann* 149; Wadi Derna, 22.4.1887, *Taubert* 449; Derna, July 1875, *Daveau*.

A-7 Wadi El-Kouf, Gebel Akhdar, 25.1.1967, *L. Boulos* 1471; A deep Wadi, 15 km E. Susa, Gebel Akhdar, 11.3.1968, *L. Boulos* 2161; Wadi Derna, 14.3.1968, *L. Boulos* 2439; Ibid, 200 m, sunny limestone rock, perennial, brittle, flowers pinkish white, March 1970, *P.H. Davis* 50375; 15-20 km after Susa along the coastal line to Baida, 17.10.1977, *M.A. Siddiqi* 21; Gebel Akhdar, Oct. 1970, *L. Boulos* 4468.

Distribution: Endemic to Libya (gebel Akhdar area).

Fl. April-June

15. FOENICULUM

Miller, Gard. Dict. Abrd. ed. 4. 1754.

Erect, aromatic herbs, mostly perennating, with stout rootstock without a fibrous collar. Leaves petioled, narrowly sheathing at the base, 2-4-pinnatisect with filiform linear segments. Umbels long peduncled, lateral and leaf-opposed, terminal and axillary, many-rayed. Bracts and bracteoles absent. Flowers mostly bisexual, yellow. Calyx teeth absent. Petals oblong-ovate, shallowly emarginate with inflexed apices. Stylopodium conical. Styles short, recurved. Fruit ovoid-oblong, hardly compressed, glabrous; carpophore bipartite; mericarps with 5, prominent, stout ribs, lateral 2 slightly broader; each furrow with solitary, large oil duct; commissural ducts 2-4. Seeds with plane to slightly concave inner face.

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A genus of 1 (or few) species, widespread in Europe, Asia and Africa, and cultivated as a culinary herb in temperate and warm temperate regions of the world.

Foeniculum vulgare Miller, Gard. Dict. ed. 8 no. 1. 1768; Pamp., Prodr. Fl. Cir. 348. 1931; Keith, l.c. 503; Meikle, Fl. Cyp. 749. 1977; Fiori, l.c. 283, fig. 2307. (Fig. 17)

Anethum foeniculum L., Sp. Pl. 263. 1753; *F. capillaceum* Gilib., Fl. Lituan. 2: 40. 1781; Durand & Barratte, l.c. 109; Pamp., Pl. Trip. 164. 1914; Prodr. Fl. Cir. 348. 1931; Corti, Fl. Veget. Fezzan 480. 1942; Keith, l.c. *F. officinale* All., Fl. Pedem. 2: 25. 1785; *F. piperatum* (Ucria) DC., Prodr. 4: 142. 1830; Keith, l.c. 503; *Anethum piperitum* Ucria in Nouv. Racc. Opusc. Aut. Sic. 6:250. 1793; *F. piperitum* (Ucria) Sweet, Hort. brit. 187. 1826; Zohary, l.c. 433.

Erect perennating or biennial herb, up to 2-2.5 m tall, glabrous, dark green with fusiform root; stems \pm glaucous, finely sulcate, solid, terete. Lower leaves up to 5-20 cm long, petioles with conspicuous, 1-5 cm long, ribbed basal sheaths, lamina triangular or triangular-ovate, nearly as long as wide, 3-4-pinnatisect into numerous, filiform, 5-40 x 0.3-0.7 mm, acute-mucronate ultimate segments; upper leaves akin to basal, sessile, few and much reduced, sometimes represented by basal sheath with a short, aristate appendage. Umbels (3-) 5-25 (-30)-rayed, numerous, long peduncled; rays patent, 1-7 cm long, unequal, glabrous. Umbellules (10-) 15-25-flowered. Pedicels (1-) 2-10 mm long. Petals oblong-ovate, c. 1 x 0.8 mm, yellow. Anthers yellow, suborbicular. Fruit oblong-ovoid, 4-6 x 2-3 mm, pale-greenish or brownish, glabrous; mericarps with 5, prominent obtusely carinate ribs.

Type: Described from a plant which was probably cultivated at Chelsea Physic Garden.

A-3 Misurata, in moist ground, 15.1.1967, *L. Boulos* 1063; **A-7** Shahat, roadside, c. 1 m tall, fls. yellow, 18.6.1972, *S.I. Ali* 625; **G-8** Kufra, 7.11.1968, *L. Boulos* 3239.

Distribution: N. Africa, W., S. & C. Europe, W. Asia eastwards to C. Asia and Himalayas; introduced and cultivated elsewhere.

F. vulgare var. **dulce** is the Italian *finocchio* which is most commonly cultivated and

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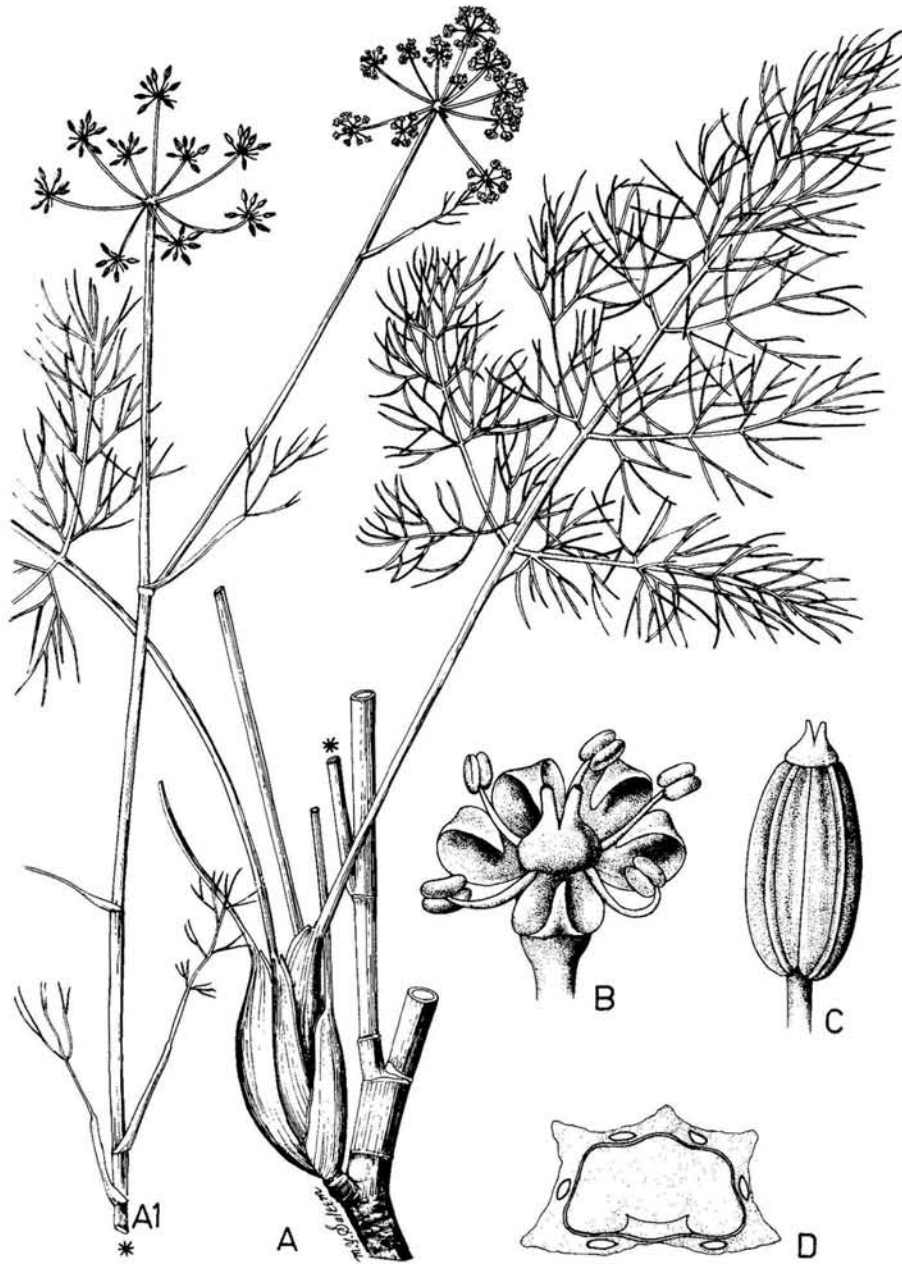


Fig. 17 *Foeniculum vulgare*: A, basal portion of plant $\times 0.5$; A₁, upper portion of the same $\times 0.5$; B, flower $\times 20$; C, fruit $\times 5$; D, t.s. mericarp $\times 20$.

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sold in Libya as vegetable; has white, much expanded leaf base forming a bulb-like structure at the base.

The leaves are used as a vegetable. The root is used as a diuretic and the herb as a condiment in Europe and elsewhere. The fruit is used as an aromatic, emmenagogue, galactagogue, carminative and stomachic. The slightly yellowish oil, obtained by crushing fruit is bitter at first but turns sweet later. The seed is also used for flavouring pickle.

F. scoparium Quezel (in Bull. Soc. Hist. Nat. Afr. Nord. 48: 91. 1957; Mission Bot. Tibesti in Univ. Alg. Inst. Res. Sahara 4: 156, Pl. 8. 1958) described from Tibesti, with up to 20 cm long petioles and 8-12-flowered umbellules, probably do not merit more than a varietal rank of this species.

Fl. May-Nov. *Vern.* Kammun; Bisbas

16. ANETHUM

L., Sp. Pl. 263. 1753; Gen. Pl. ed. 5. 127. 1754.

Annual, glabrous-glaucous, erect aromatic herbs. Leaves petiolate, sheathing at the base, 3-5-pinnatisect into linear or filiform ultimate segments. Umbels long-peduncled with equally long, few to many rays. Bracts mostly absent rarely 1-2; bracteoles present or absent. Flowers bisexual, yellow. Calyx teeth obscure or absent; petals almost orbicular, bilobed with inflexed apices, not radiant. Styles shorter than the depressed-conical, basally fluted stylopodium. Fruit ellipsoid, dorsally much compressed or flattened, glabrous; carpophore filiform, divided to the base; mericarps with 5, filiform ribs, 3 dorsal ribs prominent, lateral \pm winged; each furrow with a single oil-duct; commissural oil-ducts 2-4. Seeds plane to slightly concave on inner face.

Differs from *Foeniculum* by its strongly compressed \pm winged-margined fruits, more slender annual habit. One species widely distributed in Europe, Asia and Africa, but usually as a cultivated plant or an escape from cultivation.

Anethum graveolens L., Sp. Pl. 263. 1753; Durand & Barratte, l.c. 111; Pamp., Pl. Trip. 160. 1914; Keith, l.c. 236; Fiori, l.c. 285, fig. 2322; Ozanda, Fl. Sahara ed. 2. 359, fig. 124. 1977. (Fig. 18)

Peucedanum graveolens (L.) Benth. & Hook. f., Gen. Pl. 1: 919. 1867; Keith, l.c. 744.

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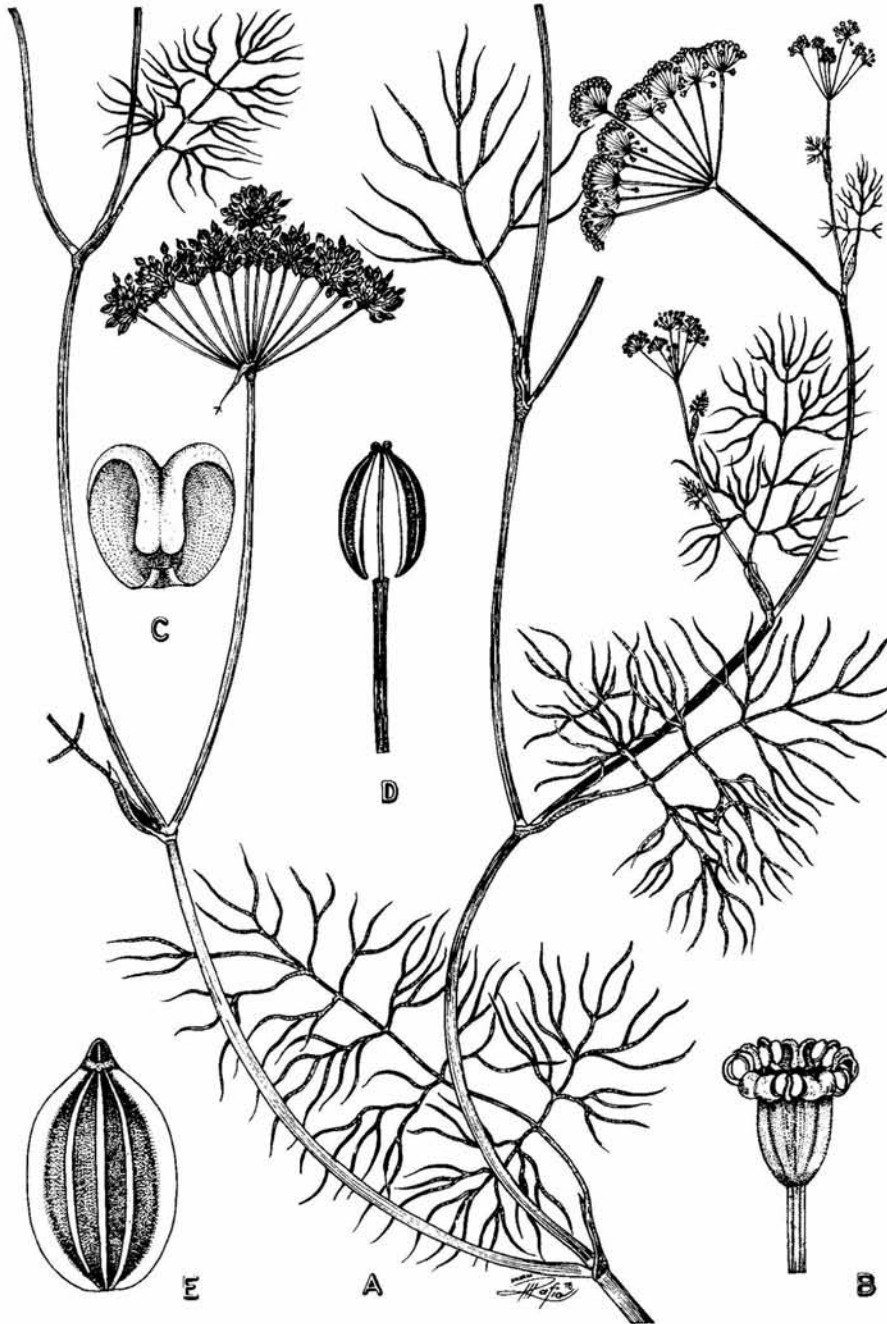


Fig. 18 *Anethum graveolens*: A, upper portion of plant $\times 1$; B, flower $\times 10$; C, petal $\times 40$; D, fruit (mericarps separated) $\times 6$; E, fruit $\times 10$.

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Erect, up to 75 (-100) cm tall strongly odorous herb with very finely ridged or sulcate stems. Leaves triangular in outline, up to 20 x 12 cm, 3-4-pinnate with (8-) 10-30 x 1-2 mm filiform, acute ultimate segments; petiolar sheaths up to 10 cm long, apically auricled with narrow membranous margins. Umbels many, on up to 15 cm long, erect peduncles, subequally 8-40-rayed, rays subpatent, 1-4 cm long; umbellules 15-30-flowered. Bracts and bracteoles absent. Flowers yellow, c. 2.5-3 mm across; pedicels up to c. 8 mm long. Petals oblong with widely emarginate and strongly incurved apices. Stamen filaments c. 1 mm long, anthers suborbicular. Styles in fruit strongly reflexed. fruit ellipsoid dorsally compressed, 3-5 (-6) x 2-3 mm, dark brown when ripe; mericarps with prominent dorsal ribs and narrow marginal wings.

Type: Described from Portugal and Spain, Herb. Linn. 371/1 (LINN).

A-3 Tripoli, Al-Faateh University Campus, erect, up to c. 80 cm tall annual herb, fls. yellow, 28.3.1978, *A. Ghafoor* 322; id. 8.4.1978, *A. Ghafoor* 327; id. *A. El-Gadi* 259; Wadi El-Ramal, c. 65 km E. of Tripoli, annual herb with yellow flowers, 14.4.1977, *M.A. Siddiqi* 211; Jouddiam, 15.3.1974, *G. Faris* 51; Misurata, 5 m, waste ground, aromatic, flowers yellow, escape, 25 March 1970; *P.H. Davis* 49818; *ibid.*, 29.3.1975, *Fauzia* 144; *ibid.*, 30.3.1975, *Zenab Abu Raya* 115; gasr Khair, E. of Tripoli, on way to Khoms, waste fields, soil clayey, fls. yellow, 2.5.1978, *A. El-Gadi* 1178; **A-6** Benghazi, c. 10 km to east, in cultivated field, erect herb, c. 50 cm tall, flowers yellow, fruits winged on margins, 21.4.1978, *A. Ghafoor* 339; Dariana, c. 40 km from Benghazi, cult. field, 16.6.1972, *S.I. Ali* 448; Benghazi, Gar Younis University (New Campus), sandy loam soil, erect, c. 15 cm tall, fls. yellow, *A. Ghafoor* 334; **A-7** c. 79 km from Baida, roadside, flowers yellow, 23.6.1972, *S.I. Ali* 890; c. 5 km from Shahat (on way from Baida) stony roadside, c. 1 m tall, fls. yellow, 18.6.1972, *S.I. Ali* 611; Shahat area, 5.5.1978, *Salawi* 28; **B-4** Gulf of Sirte, between Misrata and Bugren poor sandy barley fields in Sebkha, annual aromatic, flowers yellow, 23.3.1970, *P.H. Davis* 49867.

Distribution: Originally a S.W. Asian species now widely distributed in Europe, Asia and Africa but usually as a cultivated plant or as an escape from cultivation.

Cultivated in Libya for its fruit and vegetative parts, particularly leaves which are used as pot herb and for flavouring. the fruit is used in medicine as an aromatic stimulant and carminative in addition to pickling.

Fl. Feb.-June *Vern.* Shibt

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17. CONIUM

L., Sp. Pl. 243. 1753; Gen. Pl. ed. 5. 114. 1754.

Biennial to perennial herbs, erect, glabrous with stout tap root and fistulose, usually spotted, striate stems branched above. Leaves petiolate, sheathing at the base, basal 2-4-pinnatisect with oblong-elliptic to oblanceolate ultimate segments, upper cauline leaves opposite and ternate. Umbels compound, terminal and axillary, numerous-rayed. Bracts and bracteoles 3-6, small. Flowers bisexual or some staminate in the same umbel, white. Calyx teeth absent. Petals obcordate, notched and inflexed at the apices. Stylopodium conical; styles filiform, deflexed in fruit. Fruit laterally compressed, subglobose or broadly ovoid-suborbicular, glabrous; carpophore 2-partite; mericarps with 5, often subundulate-crispate prominent ribs and numerous striate furrows; oil ducts obsolete or minute. Seeds with grooved or sulcate inner face.

c. 4 species, distributed in N. temperate regions and S. Africa; represented in Libya by the following species.

Conium maculatum L., Sp. Pl. 243. 1753; Pamp., Prodr. Fl. Cir. 341. 1931; Quezel & Santa, l.c. 674; Keith, l.c. 381; Fiori, l.c. 293. fig. 2387. 1933; Zohary, l.c. 405, fig. 585. (Fig. 19)

Cicuta officinalis Crantz, Umb. 98. 1767; *Coriandrum maculatum* (L.) Roth., Fl. Germ. 1: 130. 1788; *C. cicuta* Crantz, Stirp. Aust. 3: 100. 1767.

Erect, almost glabrous, 0.5-2.5 m tall, fusiform rooted, biennial or perennial herb, with unpleasant mousy smell when bruised. basal leaves on 15-60 cm long petioles, broadly triangular, usually 30-50 x 15-25 (-30) cm, (2-) 3 (-4)-pinnatisect into ovate or oblong lobes with oblong-elliptic to oblanceolate, 5-20 x 2-7 mm, pinnatifid or pinnatipartite, acute, ultimate segments; upper leaves similar but subsessile or nearly sessile with linear ultimate segments. Umbels 8-20-rayed, \pm flat or convex, on leaf-opposed and terminal, 4-8 cm long peduncles; rays patent or erect, 1-2.5 cm long, unequal. Bracts mostly 4-5, leafy, lanceolate-ovate, 2-3 x 1-1.5 mm, scarious margined, deflexed, caducous. Umbellules 12-20-flowered. Pedicels c. 3 mm long at flowering stage, elongated up to c. 1 cm or more in fruit. Bracteoles 3-6, akin to bracts, 2-6 x 1-3 mm, connate at the base, shorter than the fruiting pedicels. Petals broadly obovate, 1-1.5 mm long and broad, emarginate at apices. Anthers ovoid-oblong, yellow. Fruit broadly ovoid to subglobose, 2.5-4 x 2-3 mm, greyish-brown; mericarps \pm arcuate when ripe, dorsally rounded, with 5, prominent, pallid ribs.

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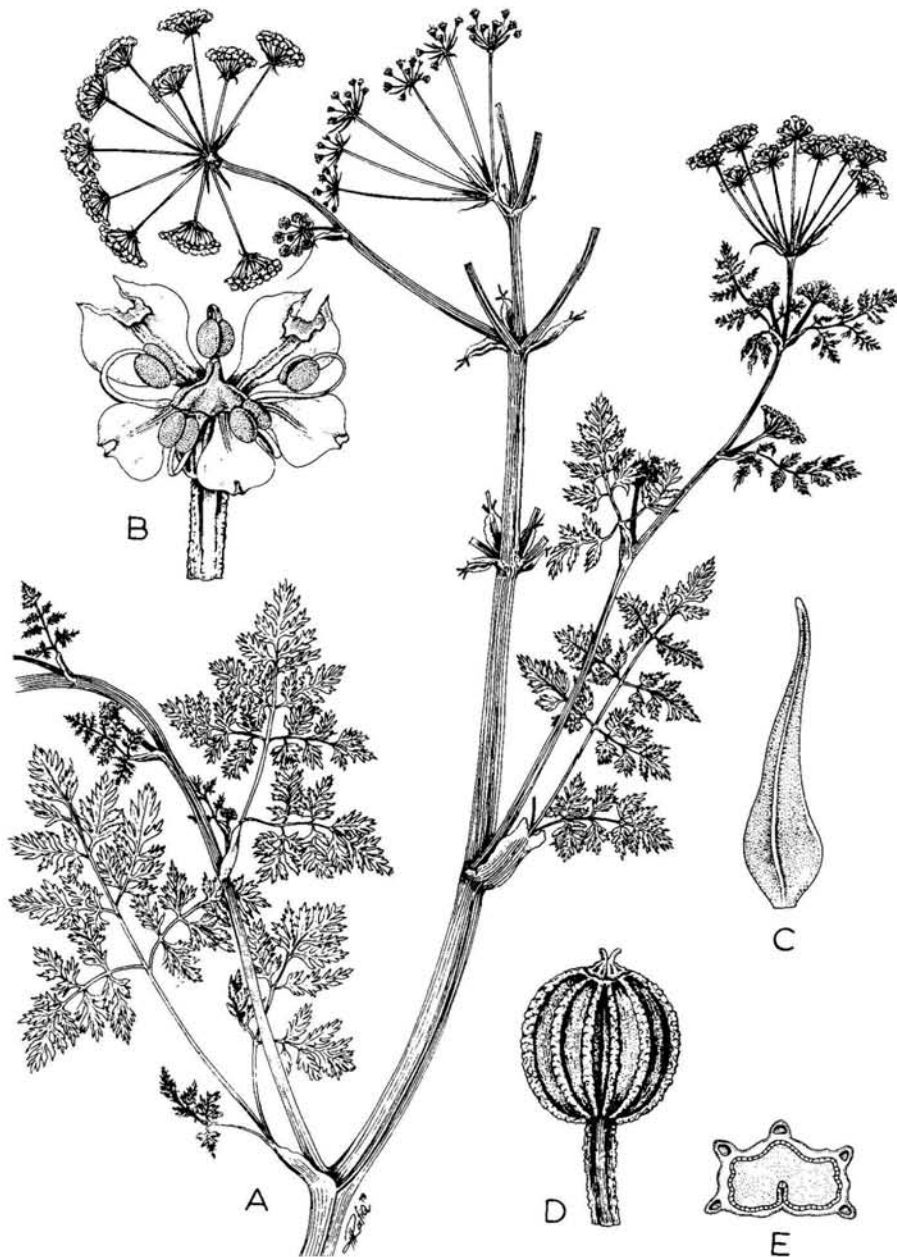


Fig. 19 *Conium maculatum*: A, a flowering branch $\times 0.5$; B, flower $\times 10$; C, bracteole $\times 8$; D, fruit $\times 10$; E, t.s. mericarp $\times 20$.

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Type: Described from Europe, Herb. Linn. 343/1 (LINN).

A-7 El-Merj. 22.4.1978, *Siddiqi, Fathi & Ramadan* 1061; Gebel Akhdar, . *Boulos* 3989.

Distribution: Europe (except extreme north) eastwards to Russia (Caucasus, W. Siberia, Central Russia), W. Asia and N. Africa; introduced in the New World.

All parts of the plant, *Hemlock*, especially fruits, are highly poisonous and contain an alcohol soluble principal alkaloid called coniine which has been used medicinally as an antispasmodic and sedative. The crushed plant parts impart a mousy unpleasant odour. A decoction of the young fruits was administered to persons condemned to death and is believed to have been the poison given to the famous philosopher Socrates.

Fl. Apr.-July *Vern.* Shawkaran

18. CACHRYS

L., *Sp. Pl.* 246. 1753; *Gen. Pl.* ed. 5: 117. 1754.

Hippomarathrum Hoffmagg. et Link, *Fl. Port.* 2: 411. 1820; non Gaertn., *Mey et Scherb.* (1799).

Robust, perennial herbs, much branched, with usually 3-4-pinnate leaves and filiform or subulate ultimate segments. Umbels compound, many rayed; bracts and bracteoles present, usually simple, linear or subulate, sepals distinct; petals greenish-yellow, incurved-emarginate; stylopodium shortly conical with crenulate-crispate basal margin; styles usually long with capitate stigmas. fruit usually rather large, oblong to subobovate, didymous, \pm laterally compressed, densely verruculose-crustaceous with broad, rounded, conspicuous or obscure dorsal ridges; carpophore bipartite; vittae numerous, slender.

c. 8 species in S. Europe, Mediterranean region and W. Asia; represented by 1 species in Libya.

Cachrys sicula L., *Sp. Pl.* ed. 2: 355. 1762; Tutin in Tutin et al., *Fl. Europ.* 2: 343. 1968.

Hippomarathrum siculum (L.) Hoffmagg. et Link, *Fl. Port.* 2: 411. 1820; Pamp., *Pl. Trip.* 165. 1914; *H. libanotis* var. *siculum* (Hoffmagg. & Link) Fiori, *Nouv. Fl. Ital.* 2: 97. 1926; *Fl. Ital. Illust.* 294, fig. 2392. 1933; *H.*

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pterochlaenum Boiss. in Ann. Sc. Nat. Ser. III (2): 74. 1844.

Perennial herb, 30-150 cm tall, erect, slightly scabrid, glaucescent; stem solid, striate; branches opposite or whorled. Leaves 2-3-pinnates, broadly rhombic or triangular-ovate in outline; ultimate segments linear, often flaccid, 15-50 x 1-1.5 mm, mucronate, scabrid on the margins. Rays 20-30; bracts of central umbel (1-) 2-pinnatifid; bracteoles subulate, entire. Fruits 10-15 mm long; ridges prominent, wide and rounded, \pm cristate-dentate.

Type: Described from Sicily

Reported from Tarhuna and Misrata by Pampanini (l.c.) and Keith (l.c.)

Distribution: Mediterranean region.

Easily distinguished by its linear, elongated ultimate leaf-segments and narrow, 10-15 mm long fruits.

19. BUPLEURUM

L., Sp. Pl. 236. 1753; Gen. Pl. ed. 5: 110. 1754.

Herbs or rarely subshrubs, with alternate, simple, glabrous, usually entire and flattened leaves, lower generally petiolate, the upper often sessile or perfoliate. Umbels terminal, compound, usually compact, with 1-many, erect to divaricate rays; bracts present, foliaceous or absent; bracteoles few to many, leafy or sometimes lacking. Flowers bisexual, yellowish, yellowish-green, whitish or dark purple to almost black. Sepals obscure or absent. Petals orbicular or ovate, mostly equal, entire or occasionally serrulate, inflexed at the apices, keeled along the nerve at upper face. Stylopodium flat or depressed to conical, light brown to black, entire; styles very short, divergent. Fruit mostly ovoid or elliptic to oblong, \pm laterally compressed; carpophore generally bipartite; mericarps with 5, filiform, thickened, unwinged or winged, rarely obscure ribs, smooth or ornamented; each furrow with 1-4 oil ducts; commissural oil ducts 2-10, these sometime obscure in fruit. Seeds semicylindrical, plane to \pm concave on inner face.

c. 150 species, mostly in temperate regions and Africa; represented in Libya by 7 species.

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- | | | |
|----|---|---|
| 1. | <ul style="list-style-type: none"> + Upper leaves broad, perfoliate. Bracts absent. Bracteoles broadly ovate or suborbiculate — Upper leaves linear-lanceolate or subulate, not perfoliate. Bracts present. Bracteoles lanceolate-subulate or narrowly ovate | <p style="margin: 0;">2</p> <p style="margin: 0;">3</p> |
| 2. | <ul style="list-style-type: none"> + Leaves usually with a tapering acumen. Umbellules 6-16-flowered. Styles much shorter than the stylopodium. Fruit 2-3 x 1.5-2 mm — Leaves without a tapering acumen. Umbellules 15-25-flowered. Styles equalling or exceeding the stylopodium. Fruit 3.5-4.5 x 3-3.5 mm | <p style="margin: 0;">1. B. lancifolium</p> <p style="margin: 0;">2. B. subovatum</p> |
| 3. | <ul style="list-style-type: none"> + Umbels subsessile or very shortly pedunculate; peduncle generally less than 0.3 mm long. Bracteoles ovate — Umbels usually on more than 5 mm long peduncles. Bracteoles not ovate | <p style="margin: 0;">3. B. nodiflorum</p> <p style="margin: 0;">4</p> |
| 4. | <ul style="list-style-type: none"> + Bracteoles lanceolate, membranous or translucent between the lateral veinlets and the nerves, erect and enveloping the fruit — Bracteoles linear-subulate, entirely herbaceous and opaque, not enveloping the fruit | <p style="margin: 0;">4. B. odontites</p> <p style="margin: 0;">5</p> |
| 5. | <ul style="list-style-type: none"> + Bracteoles mostly (1-) 2-3. Umbellules generally 2-3-flowered — Bracteoles mostly 5. Umbellules 4-7-flowered | <p style="margin: 0;">6. B. trichopodium</p> <p style="margin: 0;">6</p> |
| 6. | <ul style="list-style-type: none"> + Fruit ovoid-subglobose, 1-1.5 mm long and nearly as broad; mericarps with white-pallid papillae — Fruit oblong-prismatic, 2-2.5 mm long, c. 1.5 mm broad; mericarps glabrous. | <p style="margin: 0;">7. B. semicompositum</p> <p style="margin: 0;">5. B. gerardii</p> |
| 1. | <p>Bupleurum lancifolium Hornem., Hort. Hafn. 1: 267. 1813; Quezel & Santa, Nouv. Fl. Alger 1: 653. 1963 p.p.; Keith, l.c. 306; Meikle, Fl. Cyp. 1: 729. 1977. (Fig. 20, A-F).</p> | |

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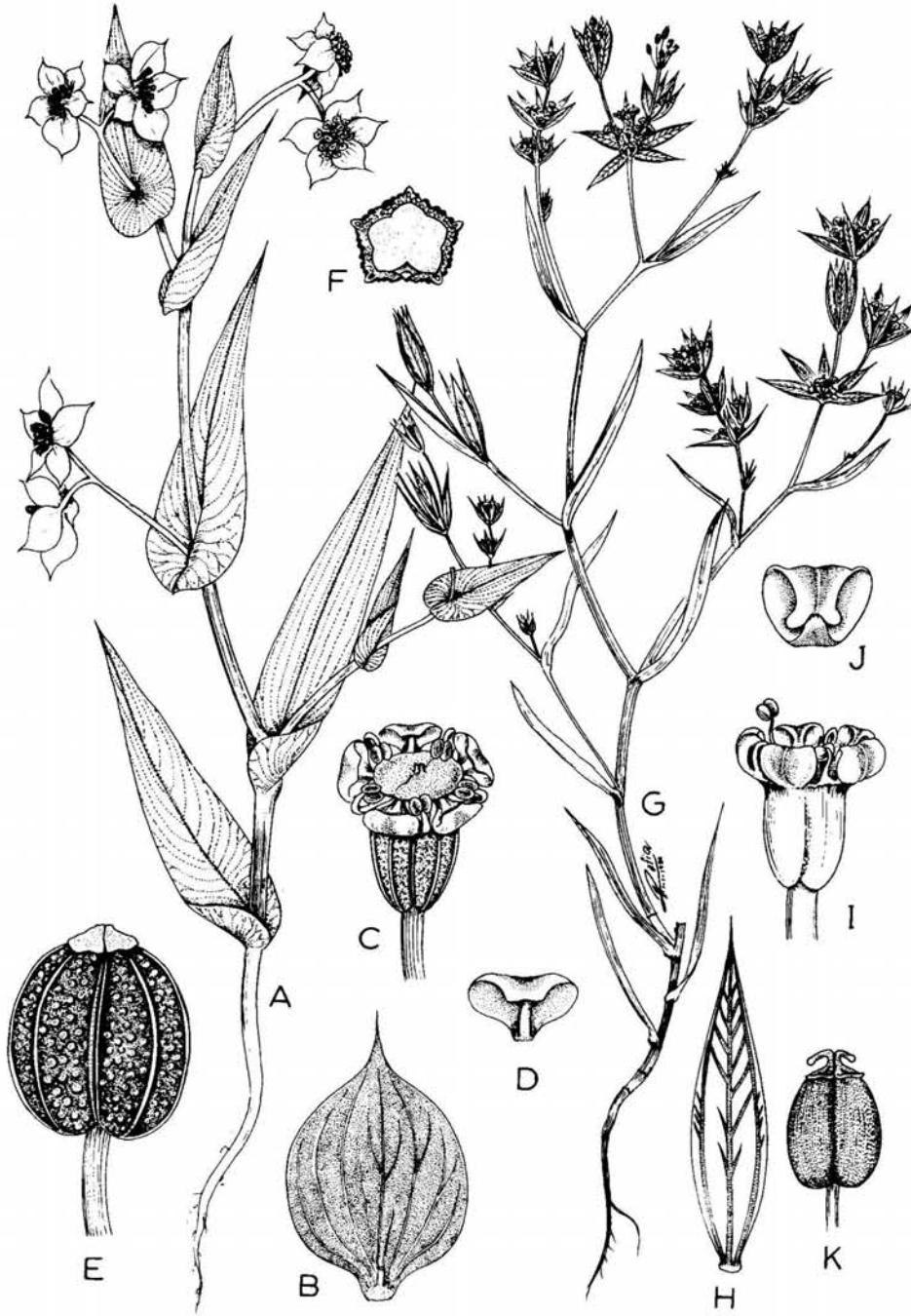


Fig. 20 **Bupleurum lancifolium**: A, habit $\times 1$; B, bracteole $\times 4$; C, flower $\times 10$; D, petal $\times 15$; E, fruit $\times 10$; F, t.s. mericarp $\times 10$. **B. odontites**: G, habit $\times 1$; H, bracteole $\times 4$; I, flower $\times 15$; J, petal $\times 20$; K, fruit $\times 10$.

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B. heterophyllum Link, Enum. Hort. Berol. 1: 262. 1821; *B. protractum* Hoffm. et Link. var. *heterophyllum* (Link.) Boiss. Fl. Orient. 2: 836. 1872; Durand & Barratte, l.c. 106; Keith, l.c. 306; *B. subovatum* Link ex Spreng. var. *heterophyllum* (link) H. Wolff. in Engl., Pflanzenr. 43 (IV. 228): 48. 1910; Pamp., Prodr. Fl. Cir. 341. 1931; Keith, l.c.

Erect, (5-) 10-40 (-60) cm tall, divaricately branched, annual herb with terete, striate erect-patent to ascending shoots. leaves dimorphic; basal sessile, oblong-lanceolate to linear-lanceolate, 3-8 x 0.3-1 cm, long acuminate, 5-9-nerved, narrowed at base, withering before flowering; upper cauline leaves perfoliate, narrowly ovate to ovate-oblong or broadly lanceolate, (1.5-) 2.5-10 x (0.5-) 1-2.5 cm, gradually acuminate. Umbels (1-) 2-3 (-5)-rayed, on terminal and axillary, 1-3 cm long peduncles; rays unequal, 4-10 (-15) mm long. Bracts absent; umbellules 6-16-flowered. Pedicels c. 1 mm long, thickened in fruit. Bractlets 5, rarely 6-9, pale-green broadly ovate to orbiculate, 2.5-10 (-13) x 2-8 mm, shortly connate at the base, 5-7-nerved, mucronate, patent. Petals ovate-oblong, c. 0.4 mm long and nearly as broad, truncate or shallowly notched at apex. Anthers suborbiculate, yellow. Styles minute, patent, shorter than the flattish stylopodium. Fruit ovoid-oblong, 2-3 x 1.5-2 mm, dark brown; mericarps prominently 5-ribbed with sharp rib edges, irregularly tuberculate in furrows.

Type: Described from plant grown from seeds received from Egypt in Botanic Garden, Copenhagen (C).

A-3 El-Sharshara, yellow flowers, 30.3.1975, *K. Sifaw* 204; **A-7** Gebel Akhdar, Gasr Libya, c. 150 m, from sea level, clay loam soil, erect herb, c. 25 cm tall, fls. yellow, 5.5.1978, *A. Ghafoor* 384; *ibid*, c. 30 cm tall with pale-green flowers, 5.5.1978, *A. Ghafoor & El-Makahal* 401; Wadi Kouf, 8.5.1978, *A. El-Gadi & others* 1812; 16 km from Al-Fidia on way to Taknes, 22.4.1978, *Ramdan, Fathi & Siddiqi* 1051; Wadi Derna, 14.3.1968, *L. Boulos* 2418.

Distribution: N. Africa, S. W. Asia, Transcaucasia and S. Spain.

Common in the Gebel Akhdar area in Libya.

Fl. Mar.-May

2. ***Bupleurum subovatum*** Link. ex Spreng., Sp. Umb. 19. 1818; Pamp., Prodr. Fl. Cir. 341. 1931 (p.p.); Keith, l.c. 307; Meikle, l.c. 730.

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B. protractum Hoffmanns. & Link., Fl. Portugaise 2: 387. 1820; Durand & Barratte, l.c. 106 (p.p.); *B. intermedium* (Lois. ex DC.) Steud., Nom. Bot. ed. 1. 128. 1821; Snogerup in Davis, Fl. Turk. 4: 399. 1972; *B. rotundifolium* L. var. *intermedium* Lois ex DC. in Lam. & DC., Fl. France 6:514. 1815; Poiret in Lam., Encycl. Method. Suppl. 5: 585. 1817.

Erect, up to 1 m tall, glabrous-glaucous, annual, stout herb with conspicuously furrowed, \pm angular stems. Basal and lower leaves oblong-narrowly ovate, oblanceolate or elliptical, 3-8 x 1-2.5 cm, acute but not long acuminate; upper leaves broadly ovate, 2-8 x 1.5-3 cm, acute-apiculate, perfoliate. Umbels 3-5-rayed, on terminal and axillary peduncles; rays subequal, 1-2.5 cm long, glabrous. Bracts absent. Umbellules 15-25-flowered, pedicels up to 2 mm long, unequal. Bractlets mostly 5, broadly ovate, 4-15 x 3-10 mm, subequal, pale-green, basally \pm connate, apiculate at the apex. Petals broadly oblong, 0.5-0.7 x 0.8 mm, much inflexed. Anthers suborbicular, yellow. Styles shorter than stylopodium. Fruit oblong-ovoid, 3.5-4.5 (-5) x 3-3.5 mm, dark brown; mericarps conspicuously 5-ribbed with sharp rib margins, \pm pruinose, irregularly tuberculate in furrows.

Type: "In Lusitania, Aegyptio et Lenam Sibiriae" (B).

A-3 Garabolly area, 11.5.1977, *A. El-Gadi* 256; Agricultural Farm, c. 18 km from Tripoli, 13.4.1977, *Fathi B. Ratib* s.n.; **A-7** 15 km W. of Baida, 8.5.1978, *A. El-Gadi & others* 1784; c. 5 km from Baida, towards Shahat, near cult. field, branches ascending, c. 20-35 cm, fls. yellow, 20.6.1972, *S.I. Ali* 749; Al-Gubbah, 5.5.1978, *Khawla H. Masoud* 78; Shahat area, 5.5.1978, *O. Shetwiy* 24; Shahat Motel, 1 km N.E. of city, *N.M. Faris* 25; **B-2** Wadi Kabau, steep valley slope, sandy soil, 5.5.1972, *S.I. Ali & M.M. Khalifa* 334; **B-6** 79 km from Ajdabia on way to Benghazi, with broad ovate leaves, 3.5.1978, *A. El-Gadi & others* 1329.

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

Common in N.E. Libya (gebel Akhdar area).

Very similar to and often treated under the preceding species but flowers 15-25 in each umbellule and leaves acute (but not acuminate). It seems to hybridize with *B. lancifolium* as some intermediate forms are met with but need confirmation by experimental studies.

Fl. Jan.-July

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Bupleurum nodiflorum Sibth. et Smith, Fl. Graec. Prodr. 1: 177. 1806; Fl. Graec. 3: 54, t. 260. 1821; Zohary, Fl. Palest. 2: 413. 1972; Meikle, l.c. 731.

Annual herb, suberect or ascending to procumbent, glabrous, 5-20 cm long, di- or trichotomously branched from the base with unequal, divaricate branches. Leaves 20-70 (-90) x 2-5 (-20) mm linear-lanceolate, acute, membranous at margin, 3-5-veined. Umbels axillary along the branches and terminal, head-like. Rays (3-) 5-12, unequal, mostly shorter than the bracts. Bracts 3-5, unequal, oblong-lanceolate, acute, mucronate, scarious-margined, prominently 3-nerved; bracteoles 3-5 (-6), ovate-lanceolate, long-acuminate, cuspidate, with 3, thick prominent nerves, middle one keeled; interspace between nerves generally translucent to semitransparent. Flowers unequally, very short-pedicelled or subsessile. Petals ovate-oblong, c. 0.8 mm, with incurved, truncate apices. Fruiting umbellules become hidden within indurated, ± conical bracteoles. Fruit 1.5-2 mm, oblong, brown, with prominently ribbed mericarps.

A variable species, primarily of eastern Mediterranean region, often treated to include *B. nanum* Poir. (*B. proliferum* Del.) as its synonym, but recently Snogerup (in Pub. Cairo Univ. Herb. 7 & 8: 57. 1977) has given some reasons to justify separate identity of the latter species also. However, we need more material for a final decision from our area. Snogerup (l.c.) while showing the distribution of *B. nodiflorum* includes Palestine also, while for *B. nanum* he gives the distribution in Egypt and Libya only, but the illustration given by Zohary (Fl. Palest. 2: fig. 594. 1977) distinctly shows 5 bracteoles per umbel (like our material), showing the presence of *B. nanum* in Palestine also. Therefore, for the present it seems more reasonable to treat *B. nanum* as a subspecies of *B. nodiflorum* till more information is available. The type subspecies probably do not occur in our area.

+ Bracteoles per umbellule 3 (-4)	3 (a) subsp. nodiflorum
— Bracteoles per umbellule 5 (-6)	3 (b) subsp. nanum

3(a) subsp. **nodiflorum**

Erect to ascending plant with usually 10-30 umbels; spaces between the veins of bracteoles herbaceous (vide Snogerup, l. c.).

Type: Described from Cyprus.

Distribution: Cyprus, N. Egypt, Palestine, Syria and Turkey.

APIACEAE

- 3(b) subsp. **nanum** (Poir.) Jafri, *stat. nov.* (Fig. 21).

Bupleurum nanum Poir., *Encyl. Suppl.* 1:750. 1811; Snogerup in *Pub. Cairo Univ. Herb.* 7& 8: 57. fig. 1. 1977; *B. proliferum* Delile, *Fl. Egypt* 205. t. 22. fig. 2. 1814.

Very similar to the type subspecies but plants prostrate to ascending, usually with 3-8 umbels; spaces between the veins of bracteoles semitransparent.

Type: Described from N. Egypt.

A-8 Tamini to Omm Rezem, 5-50 m, sandy wadies (flooded last autumn), annual. 30.3.1970, *P. H. Davis* 50286 (K).

Distribution: Palestine, N. Egypt and N. E. Libya.

4. ***Bupleurum odontites*** L., *Sp. Pl.* 237. 1753 (p.p.); Zohary, *Fl. Palest.* 2:412. fig. 593. 1972; Snogerup, in *Davis, Fl. Turk.* 4:400. 1972; Meikle, *l. c.* 732. (Fig. 20, G-J).

B. fontanesii Guss., *Fl. Sic. Prodr.* 313. 1827; Pamp., *Prodr. Fl. Cir.* 343. 1931; Kieth, *l. c.* 343.

Erect or spreading, up to 50 cm tall, dichotomously branched annual herb with finely sulcate stem. Leaves linear-lanceolate, 2-10 (-17) x 0.3 -1 cm, acuminate, (3-) 5-7-veined, glabrous, upper leaves amplexicaule. Umbels 4-7-rayed, on terminal and axillary, 3-15 mm long peduncles; rays very unequal, up to 35 mm long, glabrous. Bracts (4-) 5 (-6), nearly free, lanceolate, 1-4.5 x 0.2-0.5 cm, acute, acute-acuminate, usually 3-nerved with ascending transverse veinlets, translucent between the veinlets at fruiting stage, narrowly membranous margined. Umbellules 8-13-flowered. Pedicels filiform, up to 8 mm long, unequal. Bractlets usually 5, narrowly lanceolate, 5-20 x 1.5-4 mm, acuminate, enlarged and erect in fruit. Petals narrowly oblong, 0.6-0.8 mm long, with a strongly incurved, truncate emarginate apex, yellowish-green. Anthers oblong-suborbicular, yellow. Styles shorter than the stylopodium. Fruit oblong-ellipsoid, 1.5-1.8 x c. 1 mm, dark brown, enveloped by indurated bractlets; mericarps smooth with inconspicuous ribs and oil ducts.

Type: Europe, *Herb. Linn.* 335/11 & 12 (LINN).

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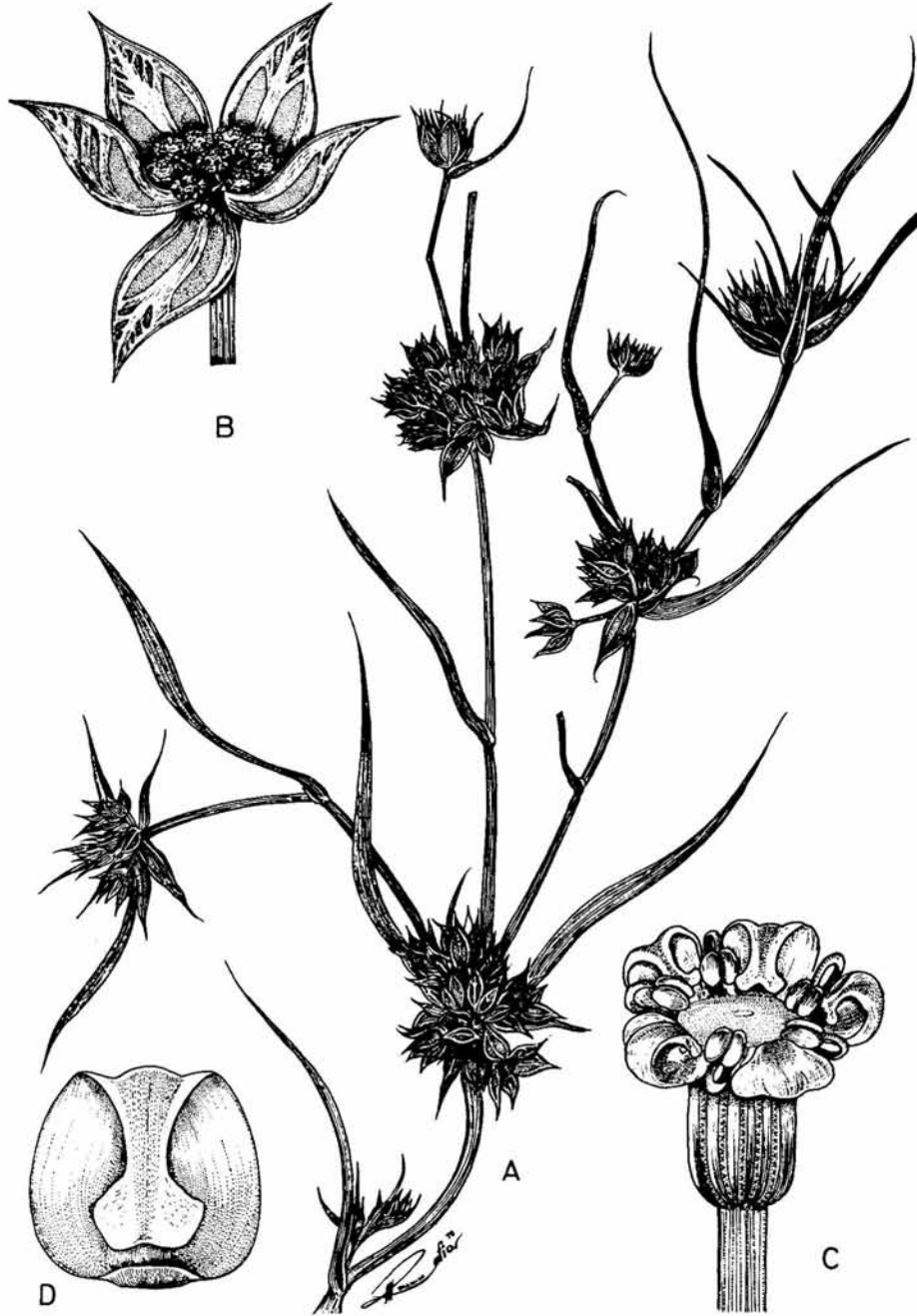


Fig. 21 *Bupleurum nodiflorum* ssp. *nanum*: A, habit $\times 1$; B, umbellule $\times 4$; C, flower $\times 30$; D, petal $\times 60$.

APIACEAE

A-7 c. 5 km from Shahat (on way from Baida), stony roadside, prostrate, fls. yellowish, 18.6.1972, *S. I. Ali* 604.

Distribution: W., C. & S. Europe, N. Africa, Turkey, Palestine, Syria; introduced elsewhere.

Not common and confined to N. E. Libya (Gebel Akhdar area).

Fl. April-July

5. ***Bupleurum gerardii*** All., Auct. Syn. Meth. Stirp. Hort. Taur. 81. 1774; Pamp., Prodr Fl. Cicer. 343. 1931; Keith, l. c. 306; Zohary, l. c. 412. fig. 593; Meikle, l. c. 735. (Fig. 22, A-B).

Annual herb, erect, up to 50 cm tall, dichotomously or corymbosely branched from c. the middle, glabrous with patent-suberect, angular, sulcate branches. Leaves linear, (10-) 20-100 (-110) x 1-4 mm, amplexicaul but not sheathing at base, acute-acuminate at the apex, conspicuously 3-veined. Umbels (3-) 5-6 (-7)-rayed, on terminal and antiphylloous, 8-30 mm long, slender, erect peduncles; rays filiform, unequal, 3-25 mm long, angular, glabrous. Bracts 3-5, linear-subulate, 3-15 x 0.5-1 mm, unequal minutely scabridulous on margins, cuspidate, 1-3-nerved, entirely herbaceous and opaque between veinlets. Umbellules mostly 6-flowered. Pedicels up to 2 mm long. Bracteoles 5, akin to bracts, mostly less than 6 mm long. Petals broadly oblong, c. 0.3-0.4 mm long, strongly incurved emarginate at apex, occasionally ± papillate dorsally. Anthers yellow, suborbicular; styles shorter than the flattish stylopodium. Fruit oblong-prismatic c. 2-2.5 mm long, dark brown; mericarps glabrous with 5 conspicuous filiform ribs.

Type: France: "In Gallopr. australis sterilibus, campestribus", figured in Gerard, *Flora Gallo-Provincialis*, Figure 9 (1761).

A-7 Al-Ghareeb, Gebel El-Akhdar, c. 150 m from sea level, soil clay loam, erect, annual herb, c. 30 cm tall, common, 5.5.1978, *A. Ghafoor* 346 and 357; Gasr Libya; c. 150 m from sea level, clay loam soil, erect, annual herb with pale-yellow fls., 5.5.1978, *A. Ghafoor* 377.

Distribution: S. Europe, eastwards to Turkey, Palestine, Syria, W. Iran and Libya.

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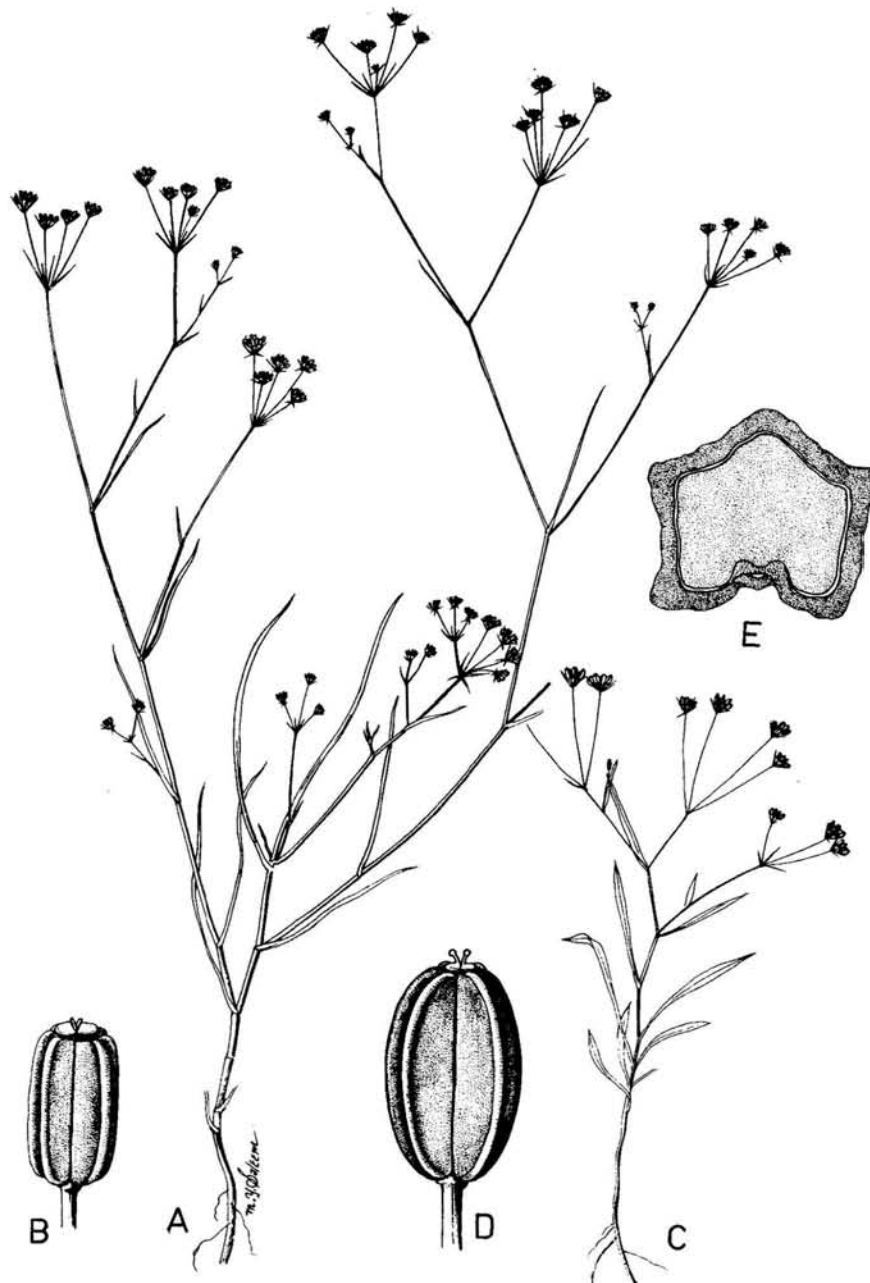


Fig. 22 *Bupleurum gerardii*: A, habit $\times 0.5$; B, fruit $\times 10$. *B. trichopodum*: C, habit $\times 0.5$; D, fruit $\times 10$; E, t.s. mericarp $\times 25$.

APIACEAE

Confined to Gebel Akhdar area in Libya.

Fl. May-June.

6. ***Bupleurum trichopodum*** Boiss. & Spruner in Ann. Sc. Nat. Ser. 3, 1:145. fig. 9.1844; Durand & Barratte, l. c. 107; Pamp., Prodr. Fl. Cir. 343. 1931; Keith, l. c. 307; Meikle, l. c. 736. (Fig. 22, C-E).

B. trichopodum var. *depauperatim* Boiss., Fl. Orient. 2:846. 1872 & Suppl. 252. 1888; Durand & Barratte, l. c.; Keith, l. c. 308.

Erect, up to 40 (-50) cm tall, glabrous annual, dichotomously branched herb with \pm terete or inconspicuously sulcate stem. Leaves linear or linear-oblong to \pm spatulate, 10-60 (-80) x 1.5-6 mm, shortly acuminate or obtuse, narrowed at the base, lower petiolate, upper occasionally subulate, sessile, subcordate and amplexicaul at base. Umbels (2-) 3-6 (-7)-rayed, on terminal and antiphyllous, 8-40 mm long, filiform peduncles; rays subequal, slender, 6-50 mm long, spreading. Bracts 1-3, rarely absent, linear-subulate to lanceolate, (3-) 5-15 (-20) x c. 1.5 mm, obscurely 1-3-nerved, cuspidate at tips; bracteoles usually 2-3. Umbellules (1-) 2-3 (-5)-flowered. Pedicels 1-2 mm long. Petals broadly oblong, c. 0.5 mm long and broad, with a inflexed emarginate tip, yellowish. Styles strongly reflexed. Fruit oblong-prismatic to \pm rounded, 2.5-3 x 1.5 mm, dark brown; mericarps smooth or faintly rugulose, with 5 filiform ribs.

Syntypes: Greece: In dumosis Atticae, *Spruner* (G); Beotiae prope Oropo, *Boissier* (G); Peloponnesi, *Fauche* (G); Syria: Circa *Aleppum Aucher* 3634 partly (G.).

A-7 Ras-el-Hilal, near coastal road, 6.5.1978, *A. El-Gadi & Jafri* 1634 and 1625.

Also reported from Wadi Derna (Gebel Akhdar) by Durand & Barratte (l. c.) and Pampanini (l. c.)

Distribution: East Mediterranean area, mainly Greece, Balkans, Aegean and Libya.

Like *B. gerardii* in having smooth fruits, without papillae, but umbellules 2-3-flowered, bracts or bracteoles usually 2-3 only.

Fl. Apr.-May

APIACEAE

7. **Bupleurum semicompositum** L., *Demonst. Pl. Hort. Upsal.* 7. 1753; *Amoen. Acad.* 3:405. 1756; Durand & Barratte, l. c. 106; Pamp., *Prodr.* l. c. 342; Keith, l. c. 306; Ozenda, *Fl. Sahara* ed. 2. 359. fig. 124. B₁-B₂. 1977; Zohary, l. c. 415, fig. 599; Meikle, l. c. 733. (Fig. 23).

B. glaucum Robill. et Cast. in Lam. & DC., *Fl. Franc.* 5:515. 1815; Post, *Fl. Palest. Syria & Sinai* ed. 2. 1:511. 1932; *B. semicompositum* var. *glaucum* (Robill. et Cast.) Paol. in Fiori et Paol., *Fl. Anal. Ital.* 2: 155. 1900; H. Wolff in Engler, *Pflanzen.* 43 (IV. 288):106. 1910.

Erect or ascending, up to 30 (40) cm tall. glabrous-glaucous, dichotomously branched from base. loose tuft forming annual herb with angular or inconspicuously ridged stems. Leaves linear-lanceolate or narrowly oblong-ob lanceolate, 10-30 (-60) x 1-6 mm, acute or acuminate, 3 (-5)-nerved, lower shortly petiolate, upper sessile and semi-amplexicaule. Umbels (3-) 4-5 (-6)-rayed, on slender, angular, 0.5-1.5 cm long, unequal peduncles; rays filiform, very unequal, 0.5-15 mm long, angled. Bracts 4, linear-lanceolate, 3-12 x 0.5-1.5 mm, concave, prominently 3-nerved, opaque and herbaceous between the veinlets, scabridulous. Umbellules 4-7-flowered. Pedicels very unequal, up to c. 2 mm long. Bractlets mostly 5 narrowly linear-lanceolate, longer than umbellules, 2.5-8 x 1-1.5 mm, green, scabrid on veins and veinlets, aristate, suberect or patent in fruit. Petals oblong, yellowish or brownish-green, c. 0.3-0.4 mm long and broad, incurved at tip, inconspicuously papillose or not. Anthers suborbicular, yellow. Styles shorter than stylopodium. Fruit ovoid-subglobose, 1-1.5 mm long and nearly as broad, dark brown; mericarps inconspicuously ribbed, irregularly white-pallid papillate.

Type: In Hispania, *Loefling*, *Herb. Linn.* 335/13 (LINN).

A-3 Tripoli, Ministry of Agriculture Farms, Sidi El-Masri, 2.4.1967, *L. Boulos* 1640; Mallaha coastal road, 5 km east of Tripoli, 15.4.1967, *L. Boulos* 1647; Sharshara, 30.3.1975, *K. Sifaw* 118; *ibid*, 30.4.1975, *Fauzia* 279; **A-4** Tawargha, 14.5.1975, *Zenab Abou Raya* 414; **A-7** Wadi Derna, 14.3.1968, *L. Boulos* 2414; **A-8** Omm Rezum, S. E. Derna, 13.3.1968, *L. Boulos* 2355; **B-4** Near Al-Kararim, 8.3.1968, *L. Boulos* 1925; **B-6** 79 km from Ajdabia on way to Benghazi, 3.5.1978, *A. El-Gdi & M. A. Siddiqi* 1324.

Distribution: S. Europe, N. Africa, Mediterranean Islands, Balkans, Turkey, Palestine, Russia (Azerbaijan) and S.W. Iran.

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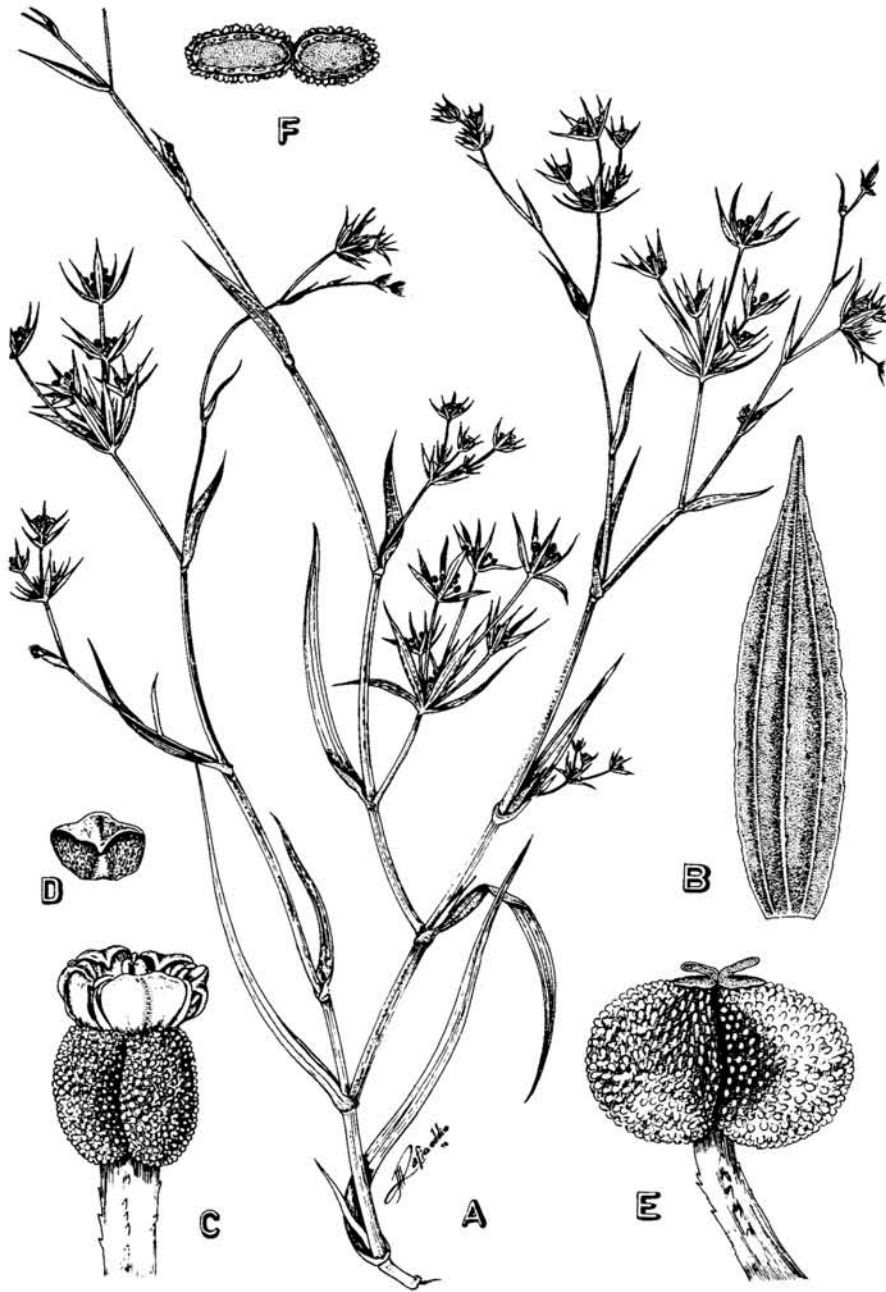


Fig. 23 *Bupleurum semicompositum*: A, habit $\times 1$; B, bracteole $\times 15$; C, flower $\times 25$; D, petal $\times 25$; E, fruit $\times 25$; F, t.s. mericarps $\times 20$.

APIACEAE

Common in the maritime zone in Libya.

Fl. Mar.-May

20. CUMINUM*

L., *Sp. Pl.* 254. 1753; *Gen. Pl. ed. 5.* 121. 1754.

Annual, glabrous herbs. Leaves petioled, biternate with filiform ultimate segments. Umbels terminal, few-rayed. Bracts and bracteoles present, linear or ternate. Flowers bisexual, white or pinkish. Calyx teeth conspicuous, subulate, unequal. Petals oblong-obovate, emarginate with inflexed apices. Stylopodium depressed, shorter than styles. Fruit dorsally compressed, ovoid-oblong, setulose or villose; carpophore bipartite; mericarps with the secondary ribs more prominent than primary filiform ribs and clothed with bristles; furrows with single oil ducts. Seeds with grooved inner face.

c. 5 species, distributed from Mediterranean area to S. W. & C. Asia and Sudan. Represented here by a single cultivated species.

***Cuminum cyminum** L., *Sp. Pl.* 254. 1753; Durand & Barratte l. c. 112; Pamp., *Prodr. Fl. Cir.* 343. 1931; Corti, *Fl. Veg. Fezzan* 480. 1942; Keith, l. c. 403; Nasir in Nasir & Ali, *Fl. W. Pak.* no. 20 (Umbelliferae); 97, fig. 29. A-C. 1972.

Slender up to 50 cm tall, annual herb, with stem furcately branched from base. Leaves pinnately much dissected into 20-59 x c. 2-3 mm, filiform lobes. Umbels (2-) 3-5 (-6)-rayed, on terminal, glabrous peduncles; rays stout, 5-10 mm long, glabrous usually shorter than the filiform or 3-fid, 2-4 bracts. Umbellules 3-5-folwered, pedicels short, stout, glabrous. Bracteoles usually 3, linear, unequal 5-10 mm long, white margined. Calyx teeth promineent, subulate, acute, persistent. Petals oblong, unequal, rosy or pinkish-white, deeply emarginate with incurved tips. Styles erect, becoming recurved in fruit, longer than conical stylopodium. Fruit oblong, 5-6 x c. 1.5 mm, whitish-brown; mericarps setulose or glabrous on primary ridges, oil ducts solitary below secondary ribs; commissural ducts 2.

Type: Described from Egypt & Ethiopia. *Her. Linn.* 358. 1 (LINN.).

Reported to be an exotic and cultivated in Fezzan (Corti, l.c.). Benghazi by Pamp. (l.c.) and Keith (l.c.).

APIACEAE

Distribution: North Africa, S. W. & C. Asia, Europe, India, Pakistan and as an adventive in N. America.

A species probably indigenous to the Nile valley in Egypt and now cultivated in many countries for its fruit which is used medicinally for digestive ailments and as a spice.

Fl. Mar.-May *Vern.* Kammoon

21. APIUM

L., *Sp. Pl.* 264. 1753; *Gen. Pl.* ed. 5. 128. 1754.

Helosciadium Koch in *Nov. Act. Nat. Cur.* 12: 125. 1824.

Herbs, mostly biennial or perennial, glabrous, erect. Leaves petiolate, sheathing at the base, basal and lower cauline ones oblong in outline, unipinnate, upper ones sometimes ternately divided, leaflets variously lobed. Umbels terminal or antiphylous, peduncles short or occasionally lacking, rays few. Bracts present or absent. Bracteoles absent or fairly conspicuous. Flowers bisexual, white to greenish-white. Calyx teeth minute or absent. Petals mostly entire, rarely with inflexed apices, those of outermost flowers not much enlarged or radiant. Stylopodium short, conical. Fruit laterally compressed, broadly ovoid or ellipsoid to almost globular, glabrous; carpophore entire or \pm bifid at the apex; mericarps with filiform prominent ridges, lateral \pm marginal; each furrow with 1 (-3) oil ducts; commissural oil ducts paired. Seeds plane on inner face.

c. 20 species, distributed in both the hemispheres in aquatic and paludial habitats: represented by 3 species in Libya.

- | | | |
|----|---|---------------------------|
| 1. | + Annual; ultimate segments linear or filiform | 3. A. leptophyllum |
| | — Perennial or biennial; ultimate segments or leaflets ovate to \pm orbicular | 2 |
| 2. | + Plants erect; cauline leaves ternately compound with usually 3-lobed, deltate-rhombic, long petioluled leaflets. Bracteoles absent | 1. A. graveolens |
| | — Plants creeping and rooting at the basal nodes. All leaves pinnately compound with unlobed (except the terminal) lanceolate-ovate, sessile leaflets. Bracteoles present | 2. A. nodiflorum |

APIACEAE

1. **Apium graveolens** L., Sp. Pl. 264. 1753; Durand & Barratte, l.c. 105; Pamp., Prodr. Fl. Cir. 344. 1931; Corti, l.c. 480; Keith, l.c. 243. (Fig. 24).

Seseli graveolens (L.) Scop., Fl. Carn. ed. 2. 1: 215. 1772; *Sium graveolens* (L.) Vest. Man. Bot. 517. 1805; *Selinum graveolens* (L.) Krause in Sturm, Fl. Deutsch. 12: 38. 1904; *Carum graveolens* (L.) K. Pol. in Bull. Soc. Nat. Mosc. 29. 199. 1916.

Erect, up to 1 m tall, biennial to perennating herb with strongly aromatic smell when crushed, and fusiform roots. Stem divaricately branched, especially in upper half, deeply sulcate, glabrous and often hollow. Basal leaves on canaliculate, broadly sheathing, up to 25 cm long petioles, 1-pinnatisect into 5-7 deltate-rhombic, 1-3 × 0.7-3.5 cm, petiolulate, usually lobed and incised-dentate to crenate segments or leaflets; upper leaves shortly petiolate to sessile, ternately compound and upper-most often with 3-lobed single leaflet. Umbels 3-12-rayed, on up to 1 cm long, leaf-opposed and terminal peduncles; rays 1-2.5 (-3) cm long, subequal, patent, slightly enlarged in fruit. Bracts and bracteoles absent. Umbellules 10-15 (-20) -flowered, pedicels 2-3 mm long, glabrous. Petals greenish, broadly ovate-elliptic, nearly as long as broad. Anthers suborbicular, yellow. Styles arcuate-patent in fruit and longer than the flattish stylopodium. Fruit broadly ovoid or subglobose, 1.5-2 × 1-1.5 mm, glabrous, dark brown; mericarp with 5, prominent pallid ribs, semicircular in outline.

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

A-2 Sharshara, erect, white flowers, 25.3.1976, *Fathi B.R.* 20; *Ibid.*, 25.3.1976, *Mohiba Shuehdi* 19; *Ibid.*, 25.3.1978, *Amina Abdel Aziz* 38; Garian, Jandouba, 22.4.1976. *Fatin Ahmed* s.n.; *Ibid.*, 28.4.1978, *Salwa H. Hammad* s.n.; **A-3** Tripoli, Al-Faateh University Campus, 15.5.1978, *Halima N.* s.n.; University Farms, 15.5.1978. *N. Shetawi* 31; *Ibid.*, 14.5.1978, *K. Zaglam* s.n.

Distribution: Most of Europe, Africa, Asia and N. & S. America, both in cultivation and wild states.

'Wild celery' is cultivated for its leaves and roots which are eaten as salad. The root, leaf, as well as the fruit, have been used in folk medicine as a diuretic, aphrodisiac, carminative and tonic. A decoction of the fruit and seed is said to relieve lumbago and rheumatism. The herb contains the *glucoside apiin* and *glycolic acid* which, sometimes, produce gastric irritation.

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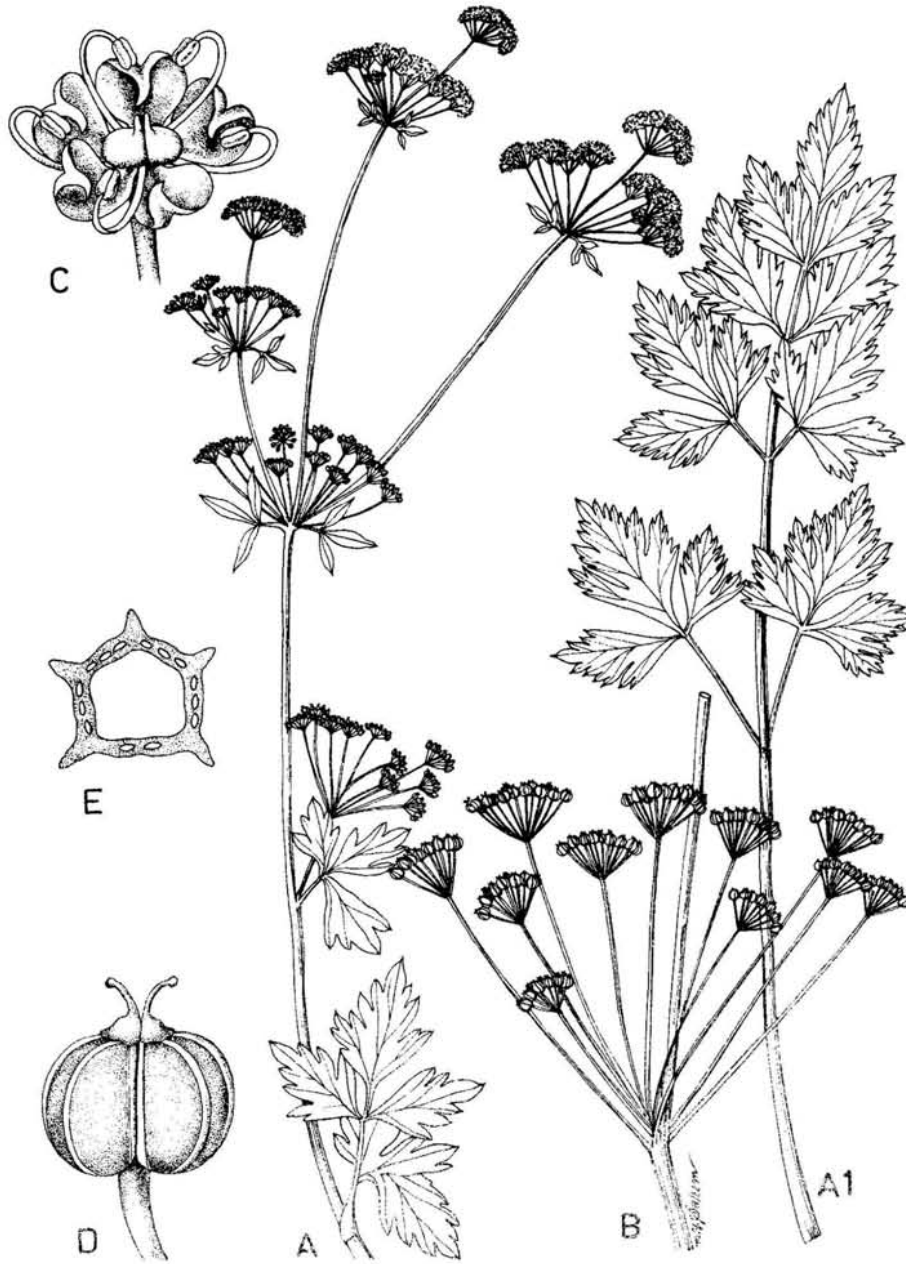


Fig. 24 *Apium graveolens*: A, flowering stem $\times 1$; A1, lower leaf $\times 0.5$; B, infructescence $\times 3.5$; C, flower $\times 25$; D, fruit $\times 20$; E, t.s. mericarp $\times 30$.

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Fl. Mar.-June. Vern. Chrafes, Krafs

2. **Apium nodiflorum** (L.) Lag., Amen. Nat. Espan. 1,2: 101. 1821; Reichb. f., Ic. Fl. Germ. & Helv. 21: 10. t. 1856. 1863; Tutin in Tutin et al. Fl. Europ. 2: 351. 1968; Pesman in Davis, Fl. Turk. 4: 422. 1972; Zohary, FL. Palaest. 2: 416. t. 601. 1972. (Fig. 25).

Sium nodiflorum L., Sp. Pl. 251. 1753; *Helosciadium nodiflorum* (L.) W. Koch in Nova Acta Acad. Leop.-Carol. 12 (1): 126. 1824; Durand & Barratte, l.c. 105; Pamp., Prodr. Fl. Cir. 344. 1931; Ozenda, Fl. Sahara ed. 2. 359. fig. 124. 1972; *Sium radiatum* Viv., Fl. Lib. Spec. 16. Tab. 9, fig. 2. 1824.

Ascending or procumbent-creeping, glabrous herb, with up to 1 m tall, upright flowering shoots, and fusiform roots. Stem sulcate, hollow, rooting at the basal nodes. Leaves oblong, 2-20 × 1-8 cm, imparipinnately 1-pinnate; petiole up to 15 cm long, broadened at the base to a membranous margined sheath, canaliculate on upper side; leaflets sessile, glabrous lateral ones opposite, lanceolate to narrowly ovate, 1-6 × 0.5-3 cm, oblique at the base, serrate, acute or subobtuse, terminal leaflet usually 3-lobed. Umbels 3-12-rayed, leaf-opposed, sessile or on up to 2 cm long peduncles; rays c. 0.5-2.5 cm long, unequal, patent or recurved, glabrous. Bracts usually absent, rarely 1-2, subulate, acute, umbellules 10-12-flowered. Pedicels 1-2 mm long, unequal. Bracteoles 5-7, oblong-lanceolate, 2.5-5 mm long, membranous margined, acute. Petals white, suborbicular to broadly ovate, c. 0.5-0.7 mm in diam. Anthers ovoid, purplish. Styles longer than stylopodium, reflexed in fruit. Fruit ovoid-oblong, 2-2.5 × 1-1.5 mm, dark brown; mericarps with 5 prominent, pallid, thick ribs.

Type: Described from Europe, Herb. Cliff.

A-3 Tripoli, university campus, aromatic herb, *Sakina Mahgoub* s.n.; **A-7** Wadi Derna, 14.3.1968, L. Boulos 2403; c. Wadi Derna, 100-200 m, bystream, flowers white, 31 March, 1970, P.H. Davis 50358; Ain Mara, stem hollow, flower white, at every node, 5.5.1978, El-Gadi & Jafri 1562.

Distribution: Europe, N. Africa, Atlantic Islands, W. Asia, Iran, Afghanistan, Russia and naturalized in the New World.

Commonly grows near water channels, ditches and wet ground in the maritime

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Fig. 25 *Apium nodiflorum*: A, flowering and fruiting stem $\times 1$; B, flower $\times 15$; C, petal $\times 25$; D, fruit $\times 15$; E, t.s. mericarp $\times 20$.

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zone in Libya.

Fl. Mar.-June

3. ***Apium leptophyllum*** (Pers.) Muell. in Benth & Muell, Fl. Austr. 3: 372. 1866; Tack., St. Fl. Egypt ed. 2: 187. 1974; Tutin in Tutin et al., l.c. 352; Fiori, Icon. Fl. Ital. 278, fig. 2265. 1933; Nasir in Nasir & Ali, l.c. 34, fig. 10. A-C (Fig. 26).

Pimpinella leptopylla Pers., Syn. Pl. 1: 324. 1805; *Apium ammi* (Jacq.) Urb. in Mart., Fl. Bras. 11: 341. 1879; *Sison ammi* Jacq., Hort. Vindob. 2: 95. 1773, non L. (1753). *A. tenuifolium* (Moench) Thell. in Hegi, Ill. fl. Mittel-Europ. 7 (2): 1140. 1926 (in obs.); *Cnidium tenuifolium* Moench, Meth. 98. 1794 (excl. syn. *P. dioica* L. (1771) *nom. conf.*

Annual herb, 20-50 cm tall, erect to prostrate, glabrous. Leaves 3-4-pinnate, with filiform to linear ultimate segments, having sheathing leaf-bases. Bracts and bracteoles lacking. Umbels sessile to shortly pedunculate; rays (1-) 2 (-5). Fruits ovoid to suborbicular, 1.5 × 1.2 mm, glabrous, with prominent ridges; furrows 1-vittae.

Type: Described from St. Dominica, W. Indies.

A-3 Tripoli, Faculty of Agriculture garden, Al-Faateh University, an annual weed, common in grassy plot near picnic spot, 9.4.1982, *M.A. Siddiqi* 476; **A-6** Benghazi, Shara Jamal Abd Ennasir, weed in the lawn, 30.4.1978, *A. Ghafoor* 345.

Distribution: Cosmopolitan.

A new world species, introduced and naturalized at many places elsewhere. This is a new record for our area.

22. PETROSELINUM

Hill, Brit. Herb. 424. 1756

Biennial to perennating herb with thick rootstock, without fibrous collar. Leaves (1-) 2 (-3)-pinnate, with somewhat large, concave, usually lobed segments. Bracts (0-) few; bracteoles present, few, linear. Sepals minute. Petals white or yellowish, obovate, emarginate. Stylopodium shortly conical; styles short, erect or reflexed. Fruits

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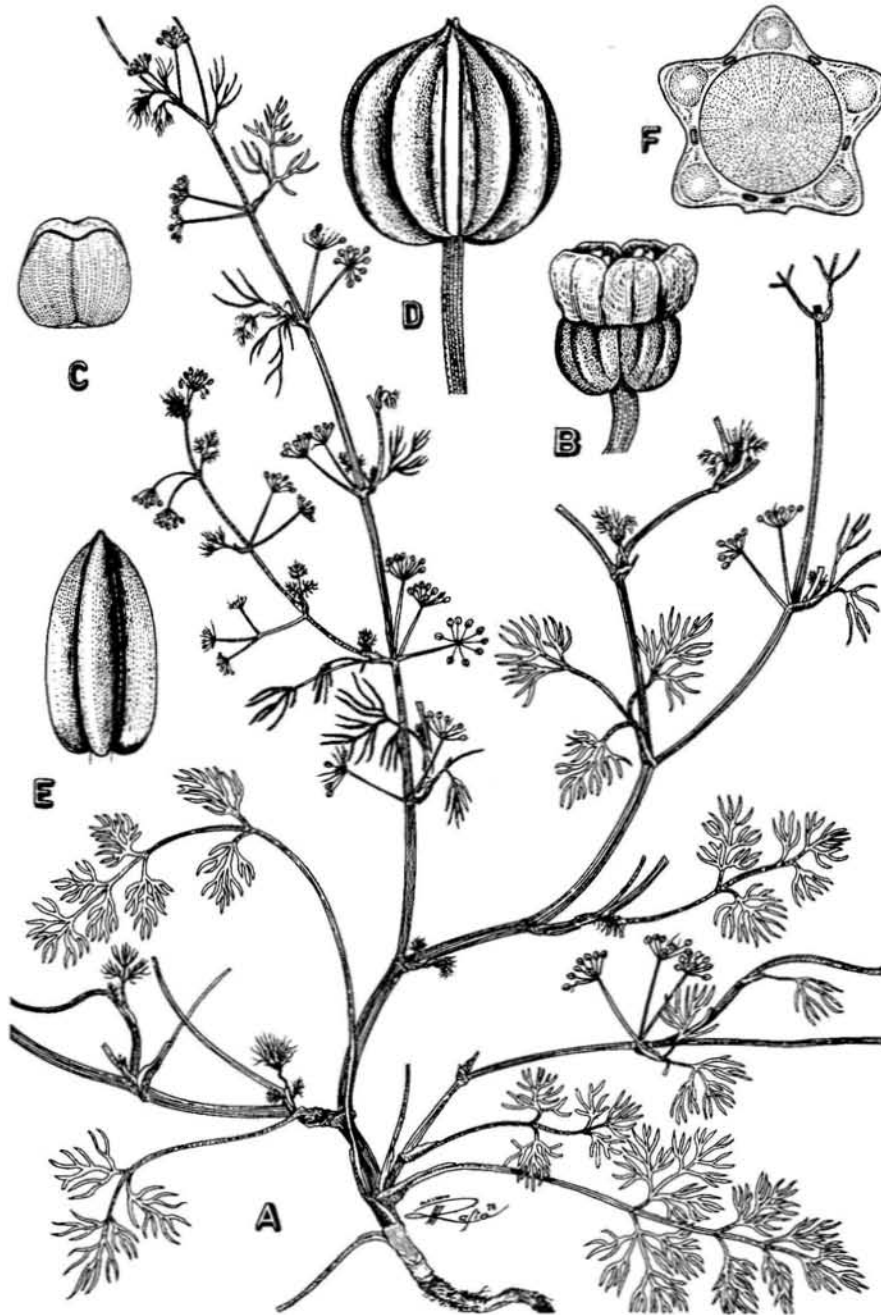


Fig. 26 *Apium leptophyllum*: A, habit $\times 1$; B, flower $\times 20$; C, petal $\times 40$; D, fruit $\times 15$; E, mericarp $\times 15$; F, t.s. mericarp $\times 30$.

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ovoid, glabrous; ridges filiform, furrows 1-vittate, commissure 2-vittate; inner seed face plane.

3 species with a wide distribution in N. & S. America, Europe and Asia; represented by the following species in Libya.

Petroselinum crispum (Mill.) A. W. Hill in Hand-List Herb. Pl. Kew ed. 3: 122. 1925; Tutin in Tutin et al, l.c. 352; Pesmen in Davis, Fl. Turk. 4: 423. 1972. (Fig. 27).

Apium petroselinum L., Sp. Pl. 246. 1753; *A. crispum* Mill, Gard. Dict. ed. 8, no. 2. 1768; *P. hortense* Hoffm., Gen. Umb. 163. 1 a f 7. 1814; Keith, l.c. 744; Fiori, l.c. 277, fig. 2261; *P. sativum* Hoffm., l.c. 177; *Ibid.* ed. 2: 219. 1816; Durand & Barratte, l.c. 106; Pamp., Pl. Trip. 160 1914; *Carum petroselinum* (L.) Benth.; Butcher, New Illust. Fl. Brit. Isles, 1: 846, fig. 744. 1961.

Biennial, erect, glabrous, up to 60 (-74) cm tall; stem terete, ribbed, solid, branches ascending. Leaves triangular in outline, 3-10 × 2-7 cm, 2-3-pinnate, lobes 1-2 (-3) cm long, cuneate, obovate to lanceolate linear, lobed, with irregular crenate lobes, often crispate. Umbels flat-topped; long-peduncled; rays (7-) 10-20, subequal, 1.5-4 cm; bract (0-) 1-3, entire to 3-fid, ± subulate; bracteoles 5-8, linear oblong or subulate, smaller. Petals greenish-yellow or yellowish. Fruits 2.5-3 × 1 mm, broadly ovoid, glabrous.

Type: Described from Sardinia, Herb. Cliff.

A-3 Ain Zara, near Tripoli. 5.5.1977, A. *El-Gadi* 258; without locality and collector's name 104.

Distribution: Europe, W. Asia, Libya.

'Parsley' is cultivated almost all over the world for its edible foliage. A variable species of horticultural importance.

Fl. Mar.-Apr. *Vern.* Baqdunis, Madnous, Maadanous.

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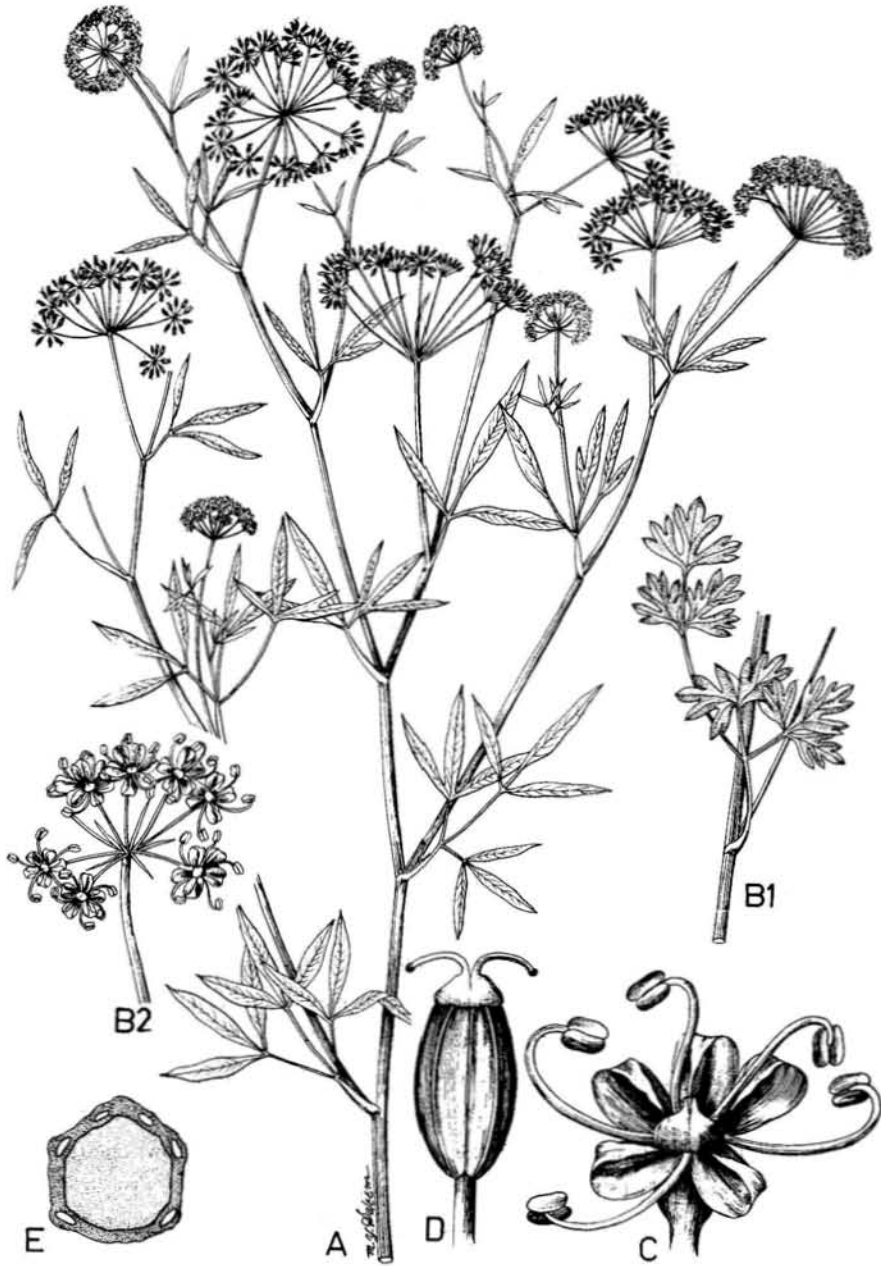


Fig. 27 *Petroselinum crispum*: A, flowering stem $\times 0.5$; B₁, lower leaf $\times 0.5$; B₂, umbellule $\times 6$; C, flower $\times 20$; D, fruit (immature) $\times 10$; E, t.s. mericarp $\times 30$.

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23. RIDOLFIA

Moris, Enum. Sem. Hort. Taur. 43. 1841.

Erect, glabrous, annual herbs. Leaves petiolate, sheathing at the base. 4-5-pinnatisect into linear-filiform ultimate segments. Umbels peduncled, mostly terminal, many-rayed. Bracts and bracteoles absent. Flowers bisexual, yellow calyx teeth absent. Petals ovate, truncate or subemarginate with inflexed apices. Stylopodium depressed, discoid, shorter than the patent-recurved styles. Fruit laterally \pm compressed, oblong-cylindrical, glabrous; carpophore bipartite; mericarps with 5, filiform, almost obscure inconspicuous ribs; each furrow with single oil duct; commissural oil ducts 2. Seeds with \pm concave inner face.

A monotypic genus of Mediterranean region. Differs from *Foeniculum* by being annual winter weed, fruits 1.5-2 mm long on 3-4 times longer pedicels as in *Anethum* but fruits smaller, oblong, without marginal wings.

Ridolfia segetum (Guss.) Moris, Enum. Sem. Hort. Reg. Taur. 43. 1841; Quezel & Santa, Nouv. Fl. Alger. 2: 672. 1962; Negre, Fl. Arid. Maroc. 2: 106. fig. 514. 1962; Keith, l.c. 837; Zohary, l.c. 419. fig. 605.

Meum segetum Guss., Fl. Sic. Prodr. 1: 346. 1827 (non *Anethum segetum* L. (1767)); *Carum ridolfia* Benth. in Benth. & Hook. f., Gen. Pl. 1 (3): 891. 1867.

Annual, erect, 25-80 (-100) cm tall, glabrous-glaucous, dichotomously branched herb with terete, obscurely sulcate stems. Leaves triangular-ovate, 5-25 (-30) \times 4-20 cm, deeply pinnatisect into filiform setose, 5-30 \times 0.5-1 mm, acute ultimate segments; lower leaf petioles 10-15 cm or more long; upper leaves sessile, ternately divided into filiform segments or reduced to the inflated petioles. Umbels (10-) 25-50 (-60)-rayed, on up to 2 cm long peduncles; rays slender, subequal 2-8 cm long, upcurved from a patent base. Umbellules 30 or more-flowered. Pedicels 1.5-5 mm long at anthesis, lengthening up to 10 mm in fruit. Petals oblong, 0.8 mm long, yellow, emarginate-truncate at the strongly inflexed apices. Anthers suborbicular, yellow. Fruit narrowly oblong to prismatic, 1.5-2 \times c. 1.2 mm, dark greenish-brown; mericarps glabrous, ribs filiform, obscure.

Type: Sicily, "Inter segetes, et in arvis argillosis" Gussone (NAP).

Reported from Gebel Akhdar (Zorda, near El-Merj) by Keith (l.c.) as a common

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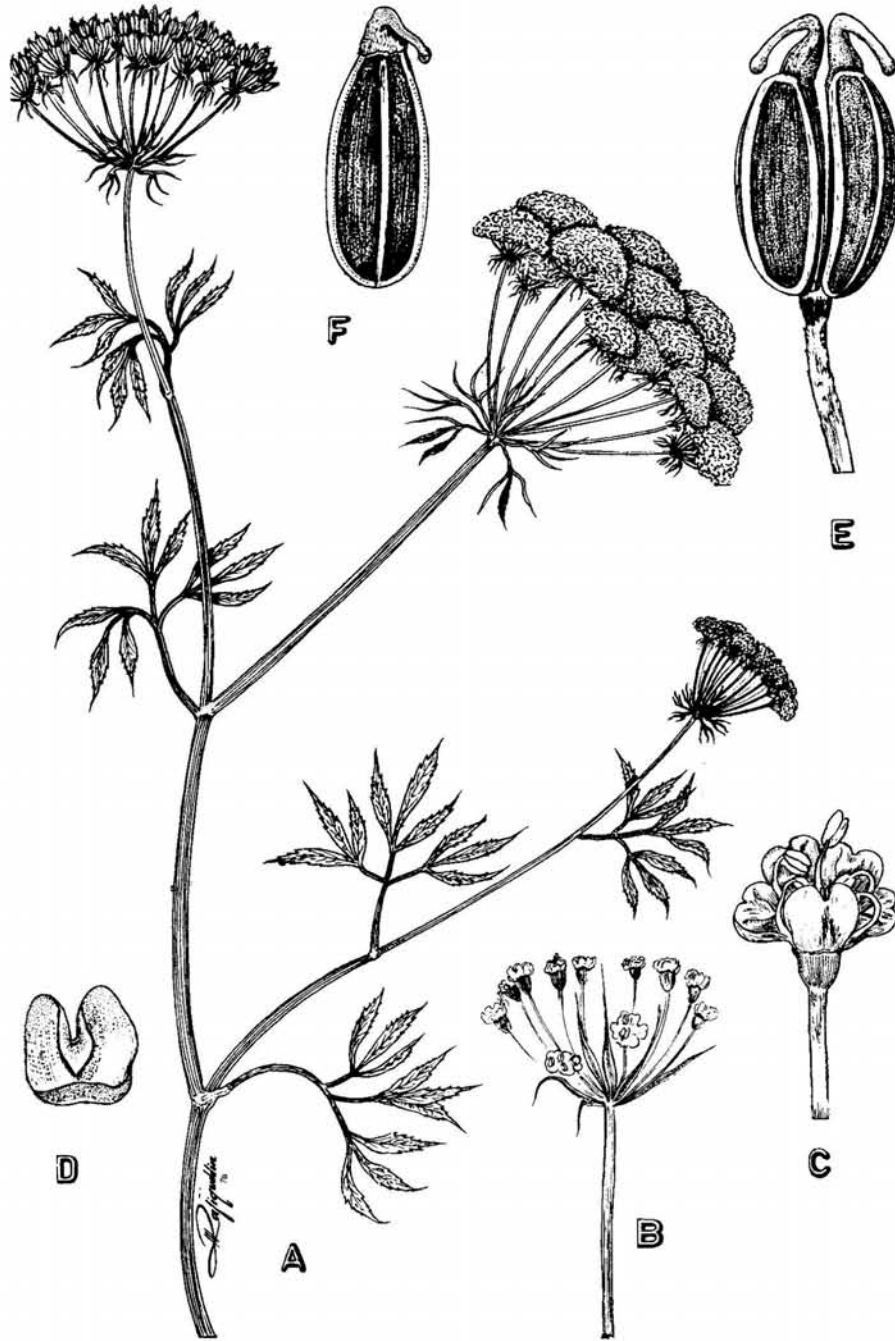


Fig. 28 *Ammi majus*: A, flowering branch $\times 1$; B, umbellule $\times 5$; C, flower $\times 10$; D, petal $\times 15$; E, fruit $\times 15$; F, mericarp $\times 15$.

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weed. Some of the specimens cited under *Anethum graveolens* with young fruits especially from Shahat (Gebel Akhdar) area, probably belong here. We need mature fruits to confirm the occurrence of this species in our area.

Distribution: Circum-Mediterranean with slight extension into S.Euro-Siberian border lands.

Fl. Apr.-July

24. AMMI

L., Sp. Pl. 243, 1753; Gen. Pl. ed. 5. 113, 1754.

Much branched, annual or biennial glabrous herbs. Leaves petiolate, sheathing at the base, uni- to tripinnatisect into obovate, elliptic to linear-filiform or lanceolate lobes or ultimate segments. Umbels pedunculate, terminal and axillary, compound, usually with numerous rays. Bracts numerous, conspicuous, mostly pinnate or pinnatisect, or undivided, persistent. Bracteoles numerous, generally entire, shorter or longer than the pedicels. Flowers bisexual, mostly all fertile, white or yellowish. Calyx teeth minute, rudimentary. Petals short-clawed, obcordate or deeply unequally 2-lobed with inflexed apices, the outer larger. Styles slender, longer than the depressed or slightly conical, entire or crenulate margined stylopodium. Fruit ovoid-oblong, c. 2 mm long, glabrous, laterally \pm compressed; carpophore free, entire or bipartite; mericarps with 5, filiform ribs; each furrow with a single oil-duct; commissural oil-ducts 2. Seeds with convex back and concave or plane inner face.

6 species, distributed in Azores, Madeira, Mediterranean area, temperate W. Asia and New World as an adventive; represented by 2 species in Libya.

+ Ultimate segments of at least basal leaves, usually more than 4 mm wide, acutely serrate to finely serrulate. Rays slender, patent-suberect, forming an open umbel, not thickened at the base

1. **A. majus**

— Ultimate segments of all the leaves less than 1 (-1.5) mm wide entire. Rays stout, somewhat convergent forming a nest-like umbel, thickened at the base

2. **A. visnaga**

1. **Ammi majus** L., Sp. Pl. 243, 1753; Durand & Barratte, l.c. 102; Pamp. Pl.

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Trip. 160. 1914; Prodr. Fl. Cir. 345. 1931; Corti. l.c. 480; Keith, l.c. 221. (Fig. 28).

Apium ammi Crantz. Stirp. Austr. 3: 109. 1767.

Annual to biennial herb, up to 1 m tall, erect with stiff, sulcate and much branched stem, especially in the upper half. Leaves triangular-ovate or ovate-oblong, up to 15 × 10 cm; basal with up to 20 cm long petioles, ternately 1-2-pinnatisect with up to 6 × 2 cm, oblong-lanceolate to elliptic or obovate, acutely serrate segments; upper leaves with linear-lanceolate, sharply serrate or serrulate segments. Umbels 8-50-rayed, on up to 15 cm long, sulcate, terminal peduncles; rays up to 6 cm long, subequal, patent-suberect both at flowering and fruiting, often sparsely papillate at the base. Bracts 1-3-pinnatisect, up to 5 cm long, segments filiform or narrowly linear. Umbellules many-flowered. Pedicels c. 1 cm long, unequal. Bracteoles linear or filiform, 2-6 mm long, entire, shortly aristate at the apex. Petals white, c. 1.5 × 1.3 mm. Anthers oblong, pink tinged or whitish. Styles reflexed in fruit, longer than the flattish or ± convex stylopodium. Fruits oblong, ± compressed laterally, 1.5-2 × c. 1.2 mm, dark brown; mericarps with 5, prominent, slender, pale ribs; furrows sometimes pale-papillate.

Type: Described from Europe, Herb. Linn. 341/2 (LINN).

A-3 Msallata, Gurmat, area, c. 4 Km S.W. of Gusbat, sandy soil, 14.4.1978, *A. El-Gadi* 1043; **A-6** Libya: Around El-Abiar, 50-60 km East of Benghazi, 300 m. edge of wheat fields on low plateau, annual?, flowers white, 24 March 1970, *P.H. Davis* 49886; **A-7** 10 km from Baida on way to Derna, 23.5.1972, *S.A. Faruqi* 1367; Susa, 28.2.1973, *S.I. Ali & S.A. Faruqi* 1055; c. 87 km from Baida, in barley field, branches ascending, c. 60-70 cm, flowers white, 23.6.1972, *S.I. Ali* 900; El-Gaigab, waste ground, roadside, c. 50 cm tall, fls. white, 21.6.1972, *S.I. Ali* 815; *id.*, c. 5-10 cm tall, *S.I. Ali* 816; Shahat, roadside, waste ground, c. 10-25 cm, ascending, flowers white, 20.6.1972, *S.I. Ali* 766; *id.* 18.6.1972, *S.I. Ali* 636.

Distribution: S. Europe, N. Africa, East Mediterranean countries, Iran, Pakistan, Atlantic Islands and introduced in the New World.

Found mainly in cultivated and fallow fields in N.E. mountains (Gebel Akhdar) of Libya.

The seeds are used as a carminative and antispasmodic and are said to contain thymol.

Fl. Mar.-Sept.

Vern. Sfinnari-hmeer, Khalla, Sfinnari el ma'iz.

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2. ***Ammi visnaga*** (L.) Lamk., Fl. Franc. ed. 1.3.:462. 1778; Quezel & Santa, l.c. 677; Meikle, Fl. Cyp. 740. 1977. (Fig. 29).

Daucus visnaga L., Sp. Pl. 242. 1753; *Apium visnaga* (L.) Crantz, l.c. 104.

Annual or biennial, erect, up to 1 m tall, glabrous herb with \pm terete, furrowed, divaricately branched stems. Leaves ovate, up to 20 \times 15 cm, basal unipinnatisect, often withering at anthesis, upper ones sessile to subsessile, 3-4-pinnatisect ultimate segments narrowly linear or filiform, usually up to 1 (-1.5) mm wide, divaricate, entire, cuspidate. Umbels many-rayed, flattish or \pm convex, on up to .15 cm long, sulcate, stout terminal peduncles; rays thick 3-5 (-7) cm long, arising from a conspicuously thickened tip of peduncle, subequal, \pm contracted in fruit to form nest-like structure. Bracts many, shorter to longer than rays, 3-5-partite into long, filiform segments. Umbellules many-flowered, pedicels unequal up to 7 mm long. Bracteoles setose-filiform, shorter to longer than pedicels, entire, patent. Petals white, nearly as long as wide, deeply 2-lobed, not radiating. Anthers orbicular, pinkish. Styles reflexed in fruit. Fruit ovoid-oblong, 1.5-2 \times c. 1 mm, blackish-brown, glabrous; mericarps with 5, prominent, rather thick ribs, flattish on inner face.

Type: Described from S. Europe, Herb. Cliff.

A-6 Benghazi, c. 10 km to the East of Town, in cultivated fields, erect annual herb, c. 35 cm tall, flowers white, 21.4.1978, *A. Ghafoor* 343; **A-7** Shahat, c. 30 cm tall, 18.6.1972, *S.I. Ali* 637; c. 55 km from Baida towards El-Marj (northern road), roadside, branches erect, c. 50-70 cm tall, 23.6.1972, *S.I. Ali* 882; c. 87 km from Baida, barley field, flowers white, 23.6.1972, *S.I. Ali* 890; Labrag, c. 15 km from Lamluda, c. 30 cm tall, fls. white, 19.6.1972, *S.I. Ali* 742; 10 km from Baida on way to Derna, 23.5.1972, *S.A. Faruqi* 1367; Shahat, soil gravelly, fls. white, 7.5.1978, *El-Gadi & Jafri* 1696; Shahat towards Ras-Hilal, fls. white, *Ramadan et al* 850.

Distribution: N. Africa, Ethiopia, Europe, Asia, Atlantic Islands and introduced in the New World.

Recorded for the first time from Libya and seems to be confined to the N.E. parts in cultivated and fallow fields.

The fruit contains *Khellin* and *Visnagin* and are used in preparing medicines for treating asthma and heart diseases. The seeds are diuretic and emmenagogic.

Fl. Apr.-Aug.

Vern. Sfinnari-hmeer

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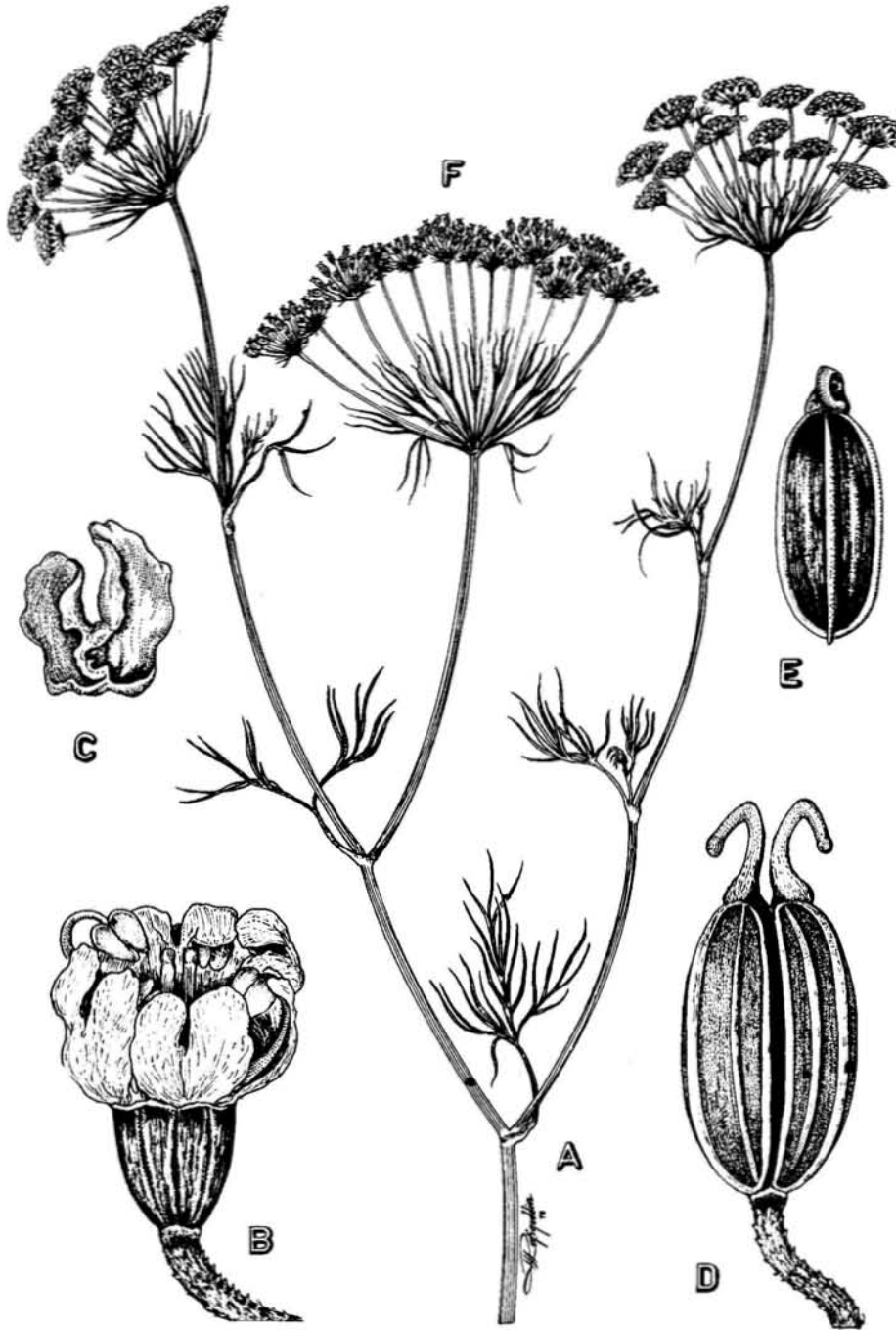


Fig. 29 *Ammi visnaga*: A, flowering branch $\times 1$; B, flower $\times 20$; C, petal $\times 20$; D, fruit $\times 20$; E, mericarp $\times 15$.

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25. AMMOIDES

Adanson, Fam. 2: 96. 1763.

Annual, glabrous herbs. Lower leaves at least 2-pinnate with linear ultimate segments. Umbels compound, pedunculate. Bracts absent or if present much less than 0.5 as long as rays and early caducous. Bracteoles dimorphic, some spatulate and often inflated. Flowers bisexual, white. Calyx teeth absent. Petals with a suborbicular lobe projecting on either side of the inflexed oblong apices. Fruit laterally compressed, narrowly to broadly ovoid, glabrous; carpophore 2-fid to partite, mericarp ribs 5, prominent and filiform; each furrow with a single oil duct; commissural oil ducts 2-4. Seeds with plane inner face.

2 Mediterranean species, represented by the following one in Libya.

Ammoides pusilla (Brot.) Breistr., Bull. Soc. Sci. Dauph. 61: 628. 1947; Tutin in Tutin et al Fl. Europ. 2: 353. 1965; Tack Stud. Fl. Egypt. ed. 2. 391. 1974. (Fig. 30).

Seseli pusillum Brot. Phyt. Lusit. 1: 89. t. 39. 1816; *Ptychotis ammoides* Koch. in Nov. Act. Nat. Cur. 12 (1): 125. 1824; Durand & Barratte, l.c. 102; *P. verticillata* Duby, Bot. Gall. ed. 2. 1: 235. 1830; *Ammoides verticillata* (Duby) Briq. in Compte rendu Sceances Soc. Phys. & Hist. Nat. Geneve 30: 59. 1913-14; Pamp., Prodr. Fl. Cir. 346. 1931; Keith, l.c. 222; *Petroselinum ammoides* (Koch) Rchb. Icon. 21: t. 17. fig. 1. 1863; Fiori, Icon. Fl. Ital. 278. fig. 2263. 1933.

Erect, slender. 10-50 cm tall, glabrous, well branched herb with obscurely angled stems. Leaves dimorphic, glaucescent, the lowest and the oldest ones oblong, 20-30 × 3-5 mm, bipinnatisect into 7-11 pairs of pseudo-verticillate oblong primary lobes with filiform, mucronate ultimate segments; the middle with 3-5 and uppermost with 2-3, filiform, up to 1 cm long, mucronate ultimate segment. Umbels 5-15 (-20)-rayed, on 2-5 cm long, glabrous, angular, leaf-opposed peduncles; rays unequal, slender, 1-2.5 cm long. Bracts absent or few and caducous. Umbellules 10-20-flowered. Pedicels filiform, unequal, 1-2 mm long at anthesis, slightly elongated in fruit. Bracteoles dimorphic, some linear-lanceolate, others narrowly spatulate, 4-6 mm long, acuminate at the tip. Petals broadly oblong, c. 0.4-0.5 mm long and broad, strongly inflexed with emarginate apex, white. Styles reflexed, as long as or shorter than the conical stylopodium. Fruit ovoid, c. 1 × 0.8 mm, blackish-brown; mericarps with conspicuous, filiform ribs.

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Fig. 30 *Ammoides pusilla*: A, habit $\times 1.5$; B, a portion of basal leaf $\times 3$; C, umbellule with dimorphic bracteoles $\times 5$; D, linear and spatulate bracteoles $\times 10$; E, flower $\times 20$; F, petal $\times 25$; G, fruit $\times 15$.

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Type: Described from Portugal.

A-6 El-Ghareeb. Gebel El-Akhdar, c. 100 m from seal level, soil clay-loam, erect, c. 15-20 cm tall, much branched herb, fls. white, 5.5.1978, *A. Ghafoor* 353; Gebel Akhdar, Wadi El-Agar, between Benghazi & El-Marj, c. 100 m from sea level, erect, annual herb, common, fls. white, 5.5.1978, *A. Ghafoor* 410; Dariana, c. 40 km from Benghazi, c. 0.5 km from sea, near cultivated field, 16.6.1972, *S.I. Ali* 482; Zawia-tal-Gasur (between El-Marj & Taknes), c. 20-25 cm, fls. white, 17.6.1972, *S.I. Ali* 516; **A-7** 16 km from Al-Fidia on way to Taknes, 22.4.1976, *Ramdan, Fathi & Siddiqui* 1043; c. 20 km from Taknes, c. 5-15 cm tall, flowers white, 17.6.1972, *S.I. Ali* 571; Ras El-Hilal, near coastal road, 6.5.1978, *El-Gadi & Jafri* 1641; Shahat (Cyrene) to Fidia, S. of Baida cross roads, 700 m, low Pistacia scrub, annual, 1 April, 1970 *P.H. Davis* 50507; Slonta to Marwa (S. road from Derna to El-Marj (Barce) 750 m, cupressus & Pistacia macchie/forest, annual, flowers white, 1 April 1970, *P.H. Davis* 50554; *Ibid.*, 500 m, grassy depression in Artemisia herba-alba steppe, annual, 1 April 1970, *P.H. Davis* 50571; 4 km from Ras-Hilal, towards Derna, rocky place, 13.4.1979, *Nadia S. 3; id.*, *Esamuddin*; **B-6** Gaminis-Benghazi road, 9.3.1968, *L. Boulos* 1987; 79 km from Ajdabia on way to Benghazi, 3.5.1978, *A. El-Gadi, Jafri & others* 1347.

Distribution: S. Europe and N. Africa.

Easily recognized by its dimorphic bracteoles among the narrow-leaved taxa, umbels with white flowers. Common and confined to Gebel Akhdar area in Libya.

Fl. Apr.-July

26. **CARUM***

L., *Sp. Pl.* 263. 1753; *Gen. Pl.* ed. 5. 127. 1754.

Hellenocarum Wolff. in *Engl.*, *Pflanzenr.* 90 (IV. 228): 167. 1927.

Perennial, glabrous herbs with elongated fusiform tap roots, without a fibrous collar. Leaves petioled, (1-) 2-4-pinnatisect with linear to oval ultimate segments. Umbels terminal or axillary, few-many rayed, occasionally irregular. Bracts present or absent. Bracteoles few to several or absent. Flowers usually hermaphrodite, white rarely pinkish or yellowish. Calyx teeth minute or absent. Petals obovate, outer ones \pm radiant, emarginate with inflexed apices. Stylopodium conical, short, entire or obscurely crenate. Fruit laterally compressed, oblong-ellipsoid or elliptical, glabrous;

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carpophore 2-fid to 2-partite; mericarps with filiform, prominent or almost winged ribs; each furrow with a single and wide, or 2-3 narrow oil ducts, commissural oil ducts 2-4. Seeds with plane or \pm concave inner face.

c. 30 species, found in temperate and subtropical areas; represented by 1 cultivated species in Libya.

***Carum carvi** L., Sp. Pl. 263. 1753; Durand & Barratte, l.c. 102; Keith, l.c. 332; E. Nasir in Nasir & Ali, Fl. W. Pak. 20: 87. fig. 24. 1972.

Bunium carvi (L.) M. Bieb., Fl. Taur.-Cauc. 1: 211. 1808.

Erect, up to 1.5 m tall, glabrous, divaricately branched biennial or perennial with a fusiform or cylindrical fleshy root. Leaves narrowly triangular to oblong, 6-20 \times 2-8 cm, 2- to 3-pinnatisect into linear-lanceolate to narrowly ovate, up to 3-25 \times 2-6 mm ultimate lobes; petioles shorter than rachis. Umbels 5-16-rayed, 4-8 cm across, on short, terminal peduncles; rays very unequal, glabrous, 2-40 mm long, erecto-patent in fruit. Bracts absent or 1-5 (-8), narrowly linear or filiform. Umbellules 6-18-flowered, c. 1 cm across. Pedicels unequal, very short, glabrous. Bracteoles usually absent. Petals broadly obovate, c. 1.5 mm long, white or pinkish-white. Styles recurved, as long as stylopodium. Fruit ovoid-oblong, 2.5-4 (-6) \times 2-3 mm, distinctly didymous, pale-brown, strong smelling when crushed; mericarps with prominent, obtuse glabrous ribs; oil ducts solitary in furrows; commissural oil ducts 2.

Type: Described from meadows in N. Europe. Herb. Linn. 372. 1. (LINN).

Reported to be introduced and cultivated in Libya by Durand & Barratte, (l.c.) and Keith (l.c.).

Distribution: Europe. W. Asia, introduced and naturalized elsewhere.

Cultivated for its fruit and occasionally found as an escape from cultivation. The fruit is aromatic and used as a condiment for flavouring confectionary and as a carminative.

Fl. May-July Vern. Karawiya, Kerwiya.

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27. BRACHYAPIUM

(Baillon) Maire in Bull. Soc. Hist. Nat. Afr. Nord. 23: 186. 1932.

Carum sect. *Brachyapium* Baill.

Small, annual herbs, \pm dichotomously branched above. Leaves 2-3-pinnatisect, with usually narrow lobes. Bracts and bracteoles usually absent. Sepals absent. Petals white to pinkish, suborbicular, with inflexed apices. Umbels compound, like the preceding genus. Fruits small, broadly cordate-ovoid, subdidymous, distinctly laterally compressed, hispid to glabrous, with prominent, filiform ridges and solitary vittae.

About 4 species in Mediterranean region; represented by 1 species in Libya.

Brachyapium dichotomum (L.) Maire in Bull. Soc. Hist. Nat. Afr. Nord 23: 186. 1932; Quezel & Santa, *Nouv. Fl. Alg.* 2: 675. plate 65, fig. 1982. 1963; Tutin in Tutin et al., l.c. 355. (Fig. 31).

Pimpinella dichotoma L., *Mant.* 58. 1767; Durand & Barratte, l.c. 102; Pamp., *Pl. Trip.* 166. 1914; *Tragiopsis dichotoma* (L.) Pomel. *Nouv. Mat. Fl. Atl.* 139. 1874; Pamp., *Prodr. Fl. Cir.* 345. 1931; *B. pomelianum* (Maire) Maire, l.c.; Quezel & Santa, l.c.; *T. scabriuscula* Pomel, l.c.; *Trachyspermum pomelianum* Maire in Bull. Soc. Hist. Nat. Afr. Nord. 17: 113. 1926.

Annual herb, up to 15 cm tall, slender, with or without odour of celery, \pm dichotomously branched. Lower leaves 2-3-pinnatisect, with 3-10 mm long, linear-lanceolate to linear, acute lobes; petioles of upper leaves with wide membranous margins. Rays 4-8, filiform, minutely scabrid to glabrous. Bracts and bracteoles absent. Flowers white to pinkish. Fruit c. 1 mm, broadly cordate or reniform, densely papillose-scabrid to almost glabrous.

Type: 'Habitat in Hispania'

A-7 Wadi Derna. 14.3.1968, L. Boulos 2441; Marawa, flowers white, 2.3.1973, A. El-Taife 127.

Also reported from Benghazi by Durand & Barratte (l. c.).

Distributions: Spain, N. Africa (Morocco eastwards to Egypt).

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Fig. 31 *Brachypodium dichotomum*: A, habit $\times 0.5$; B, flower $\times 20$; C, petal $\times 30$; D, fruit $\times 20$.

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A variable species and the status of *B. pomelianum* (Maire) Maire which is said to be without odour, is doubtful.

28. FERULA

L., Sp. Pl. 246. 1753; Gen. Pl. ed. 5:117. 1754.

Ferulago Koch in Nov. Act. Nat. Cur. 12 (1):97. 1824; Davis, l.c. 453.

Perennial, erect often very large herbs with a fibrous collar on the rootstock. Leaves 2-5-pinnately or ternately dissected, with narrow lobes and mostly prominently sheathing bases. Umbels compound, terminal (central ones of the whorl) often sessile or short-peduncled, the laterals usually long-peduncled. Bracts and bracteoles 0-3 (or more). Flowers of the central umbel bisexual, fertile, those of the lateral ones mostly staminate. Sepals mostly obsolete. Petals yellow, whitish- or yellowish-green, oblong or obovate, entire with inflexed apices. Stylopodium depressed-conical with lobed margin. Fruit large, dorsally compressed, flat, ovate or elliptical; carpophore tripartite; ribs of mericarp 5, the 3 dorsal ones filiform, sometimes carinate, the lateral ones confluent, with the mostly inflated wing-like margin of the mericarp; oil ducts superficial 1-many in each furrow, sometimes obscure; seeds plane on either face.

c. 150 species, mainly in C. and S. W. Asia and Mediterranean region; represented by 6 species in Libya. Further study is needed in our area with thorough collection. Plant collectors usually neglect it because of tall habit and larger leaves.

- | | | |
|----|---|--------------------------------|
| 1. | + Bracts several; fruit with narrowly winged dorsal ridges
— Bracts 0 (-3); dorsal ridges usually filiform | 6. F. lutea
2 |
| 2. | + Petals whitish, persistent; fruit vittae inconspicuous
— Petals yellow, usually caducous; fruit vittae conspicuous | 1. F. assa-foetida
3 |
| 3. | + Leaves scabrous or minutely hispid
— Leaves glabrous or glabrimous | 2. F. cossoniana
4 |
| 4. | + Ultimate leaf-segments linear, more than 1 cm (1.5-5 cm) long, filiform or narrowly linear (rarely up to 3 mm wide in var. <i>glauca</i>), flat, | |

APIACEAE

- | | |
|---|--|
| without revolute margins
— Ultimate leaf-segments less than 1 cm long, distinctly revolute at margins | 3. F. communis

5 |
| 5. + Leaves shiny-green on both surfaces; ultimate segments oblong, 2-4 x 1.5-2mm, obtuse or acutish
— Leaves green above, pale beneath; ultimate-segments similar but acutish-mucronate | 4. F. tingitana

5. F. marmarica |

1. **Ferula assa-foetida** L., Sp. Pl. 248. 1753; Pamp., Prodr. Fl. Cir. 349. 1931; Keith, l. c. 495; Nasir in Nasir & Ali, Fl. W. Pak. no. 20 (Umbelliferae): 157. 1972.

F. foetida (Bunge) Regel in Act. Hort. Petrop. 5:592. 1878; *F. scorodosma* Bent. & Trim, Med. Pl. t. 31. 1880; *Scorodosma foetidum* Bunge, Ind. Sem. Hort. Dorpat. 3. 1846.

Tall, perennial herb, up to 3 m, with thick tap root. Leaves large, bipinnate, pubescent; ultimate segments oblong, entire, obtuse. Inflorescence densely pubescent; umbels compact. Petals whitish-yellow, persistent. Fruits broadly oblong to suborbicular, c. 10 x 8 mm; vittae numerous, minute; wings nearly as broad as the seeds.

Type: Described from Persia.

Reported from arid and sandy areas of Libya in Cyrenaica by Pampanini (l. c.) but needs confirmation and probably known from cultivation only.

Distribution: Iran, Afghanistan, URSS and W. Pakistan.

An exotic species, native of W. Asia, whose occurrence here is very doubtful. 'Asafoetida' of commerce is extracted from the cut end of the root below the stem region of this and other related species in the late spring. It is used medicinally and as a flavouring agent.

Vern.: Haltit (oleo-gum resin obtained from the plant).

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2. **Ferula communis** L., Sp. Pl. 246. 1753; Durand & Barratte, l. c. 109; Pamp., Prodr. Fl. Cir. 348. 1931; Keith, l. c. 495; Quezel & Santa, l. c. fig. 1954; Zohary, Fl. Palest. 2:437, fig. 633. 1972; Pesmen in Davis, Fl. Turk. 4:444, fig. 10, nos. 3 & 4. 1972.

F. glauca L., l. c. 247; *F. nodiflora* L., l. c. 247; *F. communis* ssp. *glauca* (L.) Rouy & Camus, Fl. Fr. 7:398. 1901; Cannon in Tutin et al, Fl. Europ. 2:359. 1968.

Robust, 1-2 m tall perennial, glabrous herb, stem single, 2-3 cm thick, 2-5 m tall, corymbosely or verticillately branched above, hollow, terete, striate. Leaves with conspicuous sheathing bases; lamina finely divided, with linear lobes up to 50 x 0.5-3 mm; upper leaves progressively reduced to conspicuous sheathing bases only. Bracts 0-2, oblong, 2-3 cm long, caducous. Terminal umbel ± sessile, surrounded by smaller lateral umbels on long peduncles, which may themselves have secondary lateral umbels; bracteoles 0-few, linear-lanceolate, deciduous. Terminal umbel with 20-40 rays; rays 3-10 cm long. Petals yellow. Fruiting pedicels about as long as the fruit. Fruits (1-) 1.2-2 x 0.8-1 cm, obovate or elliptical, rarely ovate-orbicular, brown; dorsal ribs of mericarp filiform, prominent; lateral ribs contiguous with the margin; margin 2 mm broad or more, wing-like; oil ducts 3 (2 or 1) in each furrow; commissural ducts 2-6.

Type: Described from S. Europe, Herb. Cliff.

Reported from Gebel Akhdar area by Durand & Barratte (l. c.) and Pampanini (l. c.) etc.

Distribution: Mediterranean region.

A species confined to the Gebel Akhdar area in Libya. *F. glauca* L., often treated as an infraspecific taxon of this has broader leaf lobes (up to 3 mm wide), green above and glaucous beneath (green on both surfaces on the type).

3. **Ferula tingitana** L., Sp. Pl. 247. 1753; Durand & Barratte, l. c. 109; Pamp., Prodr. Fl. Cir. 348. 1931; Keith, l. c. 496; Cannon in Tutin et al, l. c. 359; Zohary, l. c. 438, fig. 634; Pesmen in Davis, l. c. 444 fig. 10, no. 7. (Fig. 32).

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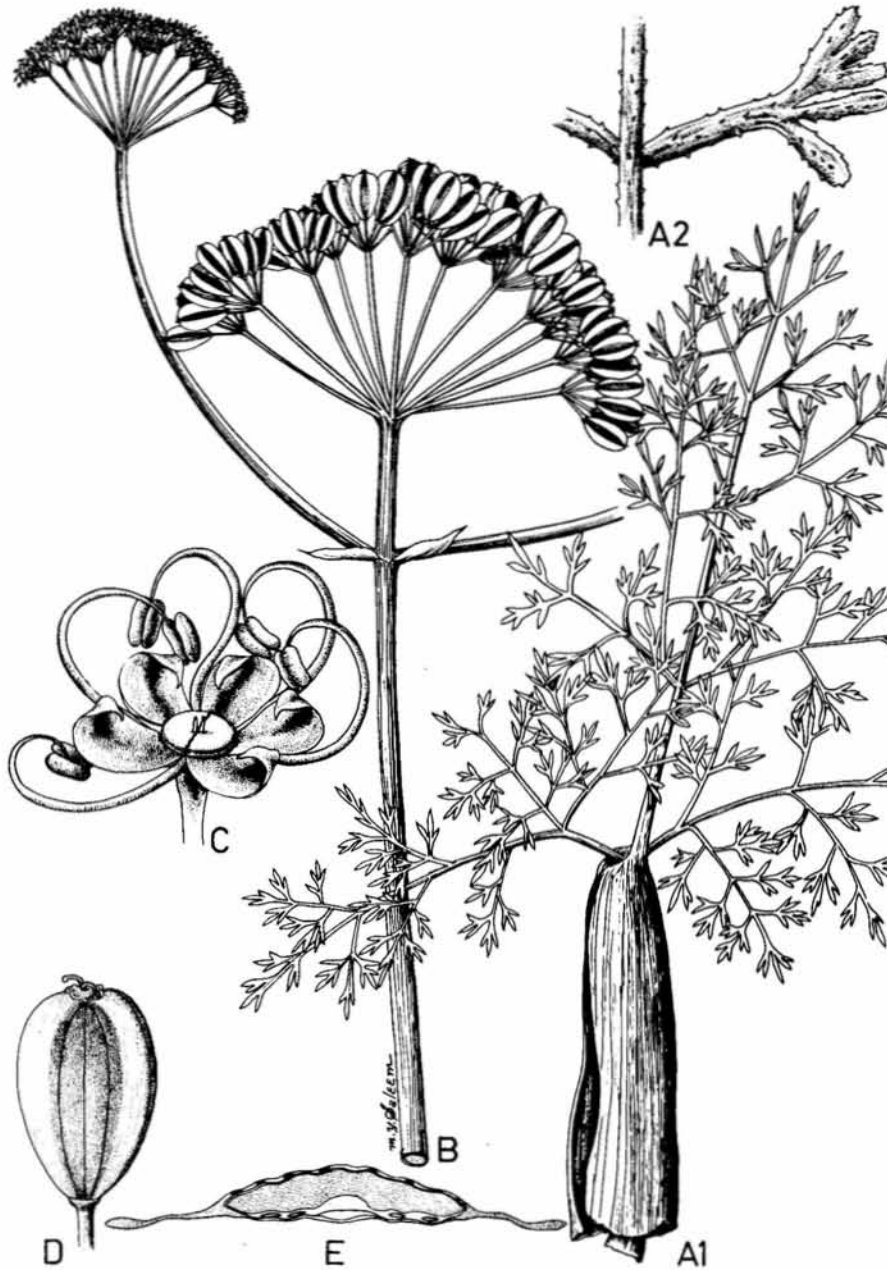


Fig. 32 *Ferula tingitana*: A₁, lower leaf $\times 0.5$; A₂, a portion of leaf $\times 5$; B₁, inflorescence $\times 0.5$; C, flower $\times 10$; D, fruit $\times 2$; E, t.s. mericarp $\times 8$.

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Glabrous, glaucescent tall perennial herb, similar to the preceding species but leaf lobes not more than 1 cm long with the margins distinctly revolute, the ultimate leaf-lobes partly united below to one another.

Type: Described from Spain & N. W. Africa, Her. Linn. (BM).

A-1 c. 28 km from N. E. of Wazen on way to Nalut, perennial, erect herb, flowers yellow, sheathed leaves, 26.2.1978, *A. El-Gadi* 827; **A-3** Wadi Kaam, 18.4.1978, *A. El-Gadi* 1124; Misallata, Shabeyeen area, c. 8 km S. of Gussbat, mountainous, with sandy-clayey soil, very common, c. 1-2 m high, fl. yellow, 14.4.1978, *A. El-Gadi* 1099; Misallata, Gurmat area, c. 4 km S. W. of Gusbat, sandy soil, very common, robust, c. 1-1.5 m high, fls. yellow, bad smell, 14.4.1978, *A. El-Gadi* 1032.

Distribution: S. W. Europe, N. W. Africa, Libya, Palestine & W. Syria.

A very variable species, which needs intraspecific variational studies in the area.

Fl. Feb.-Mar. *Vern.* Kalakh, Kalkh.

F. vesceritensis Coss et Dur. (= *F. tingitana* var. *vesceritensis* (Coss. et Dur.) Batt., reported in Ozenda (l. c. 359. fig. 126) and Pampanini (Pl. Trip. 164. 1914) needs study. It has been reported from Garian by Pampanini. *F. vesceritensis* seems to be intermediate between this species and *F. communis*, but specimens are needed for study.

4. ***Ferula cossoniana*** Batt. et Traub. ex Batt. in Bull. Soc. Bot. Fr. 35:340 et 388. 1888; Quezel & Santa, Nouv. Fl. Alg. 2:670. 1963; Ozenda, Fl. Sahara ed. 2:359. fig. 126.1977.

F. longipes Coss. ex Bonn. & Maury in Moret, Journ. de Bot. 2:314. 1888; et ex Batt., l. c.

Similar to *F. tingitana* but leaves with short ultimate segments, shortly hispid, fruits smaller, ± orbicular on pedicels about as long as the fruit.

Type: Described from Algeria, "steppe desertique du Sudouest de la province d'O-ran".

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Distribution: Sahara desert areas of Libya, Algeria and Tunisia.

Probably only a desert form of the preceding species, or *F. tenetana* Pomel, which needs further studies with material and field observations.

5. ***Ferula marmarica*** Aschers. et Taubert ex Aschers. & Schweinf., Primit Fl. Marm. in Bull. Herb. Boiss. 1:649. 1893; Durand & Barratte, l. c. 109; Pamp., Prodr. Fl. Cir. 349. 1931; Tack., St. Fl. Egypt ed. 2:393. 1974. (Fig. 33).

Rootstock thick, often with fibres of dead leaves; stem erect, thickened, glabrous, narrowly striated. Leaves 4-pinnatisect, below pale-green with entire or 3-fid obtuse, mucronate ultimate segments. Umbels of one large terminal and (3-) 8-10 small, lateral ones. Bracts and bracteoles usually absent. Petals yellow; fruits rounded-ovate with narrow margin, vittae 3 (-4), commissurals \pm 6.

Type: Described from Marmarica (Egypt-Libya, Northern bordering area).

A-7 Gebel Akhdar c. 11 km from Ras el Hilal on way to Derna, 21.4.1978, *Ramadan & Siddiqi* 960; Gasr Libya, clay loam soil, c. 1 m tall, flowers yellow, 5.5.1978, *A. Ghafoor* 368.

Distribution: Endemic

Fl. Mar.-June Vern. Derias

It needs a collective study of *F. longipes*, *F. sinaica*, *F. tunetana* Pomel etc. with this and the preceding species for their more definite taxonomic treatments. They all differ from *F. communis* by their shorter ultimate segments of leaves and *F. vesceritensis* Coss. et Dur., sometimes treated as a variety of *F. tingitana*, seems intermediate with somewhat longer leaf-segments.

6. ***Ferula lutea*** (Poir.) Maire in Bull. Soc. Hist. Nat. Afr. Nord. 27: 227. 1936; Quezel & Santa, Nouv. FL. Alg. 2: 668. t. 64. fig. 1952. 1963.

Ligusticum luteum Poir., Voy Bar. 2: 136. 1786; *F. sulcata* Desf., Fl. Atl. 1: 252. 1798; Durand & Barratte, l. c. 110; Pamp., Prodr. Fl. Cir. 348. 1931; *F. nodiflora* auct. non. L (1762); Viv., Fl. Lib. Spec. 16. 1824; *Ferulago lutea* (Por.) Grande in Bull. Orto Bot. Napoli 4: 366. 1914; Cannon in Tutin et al., Fl. Europ. 2: 360. 1968.

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Fig. 33 *Ferula marmarica*: A, basal part of the plant $\times 0.1$; B, inflorescence $\times 0.5$; C, portion of leaf $\times 1$; D, flower $\times 7.5$; E, an umbellule from the central capitulum $\times 1$; F, fruit (immature) $\times 5$; G, t.s. of the same $\times 10$.

APIACEAE

Tall, dark-green perennial herb, up to 2 m; stem angled, strongly sulcate. Leaves up to 60 cm long, triangular-ovate in outline, with short, linear lobes. Bracts and bracteoles usually lanceolate, conspicuous; flowers yellow. Fruits 10-12 mm long, elliptic-oblong to narrowly obovate; dorsal ridges of fruit narrowly winged.

Type: Described from N. E. Algeria, "Elle croit dans le lieux de la Numidie".

Reported from the mountains of Cyrenaica (*Della-Cella* 1817) by Durand & Barratte (l. c.) etc.

Distribution: Spain, Portugal, Algeria, Tunisia and Libya.

Sometimes treated in a separate genus *Ferulago* and differs from ***Ferulago campestris*** (Besser) Grec. (= *Ferula ferulago* L. figured in Fiori, l. c. 284, fig. 2316) by its short leaf-lobes and dorsal ridges of fruit narrowly winged (not filiform, unwinged), vide Cannon in Tutin et al (l. c.).

29. OPOPANAX

Koch, Nov. Act. Nat. Cur. 12 (1): 96. 1824.

Robust perennial herbs with rootstock crowned by fibrous collar and pinnate leaves usually stellately glochidiately hairy beneath; ultimate segments oblong-lanceolate, entire to deeply lobed. Bracts 2-5, linear. Sepals absent. Petals yellow, ovate-oblong, in volute. Umbels all fertile, terminal or lateral, 5-15-rayed. Fruit obovate to orbicular, strongly compressed dorsally. Lateral ridges united to form a border surrounding the fruit before dehiscence; dorsal ridges slender, low; vittae 2-3.

3 species in S. Europe, Mediterranean region and W. Asia; reported to be represented by the following species in Libya.

Opopanax chironum (L.) Koch, Nouv. Act. Nat. Cur. 12 (1): 96. 1824; Durand & Barratte, l. c. 110; Pamp., Prodr. Fl. Cir. 349. 1931; Keith, l. c. 707; Tutin in Tutin et al, Fl. Europ. 2: 360. 1968; Coste, Fl. Fr. 2: 179 (with figure) 1903.

Laserpetium chironum L., Sp. Pl 249. 1753; *Ferula opopanax* auct. non Spreng.: Viv., Fl. Lib. Spe. 16. 1824; *Pastinaca opopanax* auct. non L.: Fiori, Icon. Fl. Ital. 284, fig. 2818. 1933.

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Stout, erect perennial, up to 3 m tall; stem solid, terete smooth. Basal leaves large, 2-pinnate, lobes 4-25 cm long, obliquely cordate to cuneate at base, crenate-serrate, stellate-hairy beneath and on the petioles. Umbels compound, upper leaves simple, or reduced to inflated petioles; bracts and bracteoles few, setaceous. Flowers yellow. Fruits 6-7 mm long, elliptical with narrow (1 mm), thickened, whitish border. $2n=22$

Type: Described from Montpellier.

Doubtfully reported by Viviani (l. c.) from Cyrenaica (*Della-Cella*)

Distribution: S. Europe to Balkan area & European part of Turkey.

Occurrence of this species needs confirmation from our area. **O. hispidus** (Friv.) Gris., with 7-9 mm long fruits having 2-3 mm wide thin wings; may occur in our area also. However, *Pastinaca opopanax* L., given as a synonym of *F. Opopanax* L. by Viviani (l. c.) may refer to this species. Both the species have stellate hairs and in young stages may be confused with each other.

30. MALABAILA

Hoffm., Gen. Umb. 125. 1814.

Biennial or perennial, hairy, erect herbs with rootstock crowned by a fibrous collar, hairs simple. Leaves petioled, basal ones 1-3-pinnatisect with entire to pinnatisect ovate to obovate-cuneate ultimate segments, upper stem leaves reduced to a sheath or petiole. Umbels terminal or lateral, long-peduncled, all fertile, 4-20-rayed. Bracts present or absent; bracteoles present or absent. Flowers bisexual or male, yellow. Calyx teeth absent or obscure. Petals ovate or obcordate, emarginate with inflexed apices. Stylopodium depressed-conical with undulate margins. Fruit orbicular-obcordate, dorsally compressed, glabrous or hairy, winged, wing translucent in its inner part and thickened at the margins; carpophore bipartite; mericarp with filiform ribs; each furrow with a single conspicuous oil duct; commissural oil ducts 2.

Distinguished from *Pastinaca* by its \pm inflated margins of fruits and simple hairs. c. 10 species, chiefly in E. Mediterranean region, C. Asia and Iran; represented by the following species in Libya.

APIACEAE

Malabaila suaveolens (Delile) Coss., in Bull. Soc. Bot. Fr. 19: 82. 1872; Durand & Barratte, l. c. 110; Pamp., Prodr. Fl. Cir. 349. 1931; Keith, l. c. 636. (Fig. 34).

Tordylium suaveolens Delile, Fl. Egypt t. 63. f. 13. 1812; *M. numidica* Coss. in Bull. Soc. Bot. Fr. 9: 297. 1862; Pamp., Pl. Trip. 165. 1914; *M. pumila* Boiss., Fl. Or. 2: 1058. 1872; Keith, l. c.; *M. suaveolens* var. *numidica* (Coss.) Maire; Quezel & Santa, Nouv. Fl. Alger. 2: 668. plate 64, fig. 1950. 1963.

Biennial or perennial, erect, 10-60 cm tall, simple or thinly branched, patent hairy herb with sulcate, subangular stem; hairs \pm prickly on stems and leaves. Leaves broadly oblong or triangular-ovate, 8-20 (-25) x 5-12 (-15) cm shallowly to deeply bipinnatisect into ovate to obovate, cuneate, pinnatifid lobes with incised-dentate ultimate segments; upper leaves reduced to sheaths or petioles. Umbels 4-20-rayed, on terminal, 4-10 cm long, rays subequal, filiform, 4-10 cm long; rays subequal, filiform, 1.5-2 cm long, lengthening up to c. 7 cm in fruit. Bracts absent. Umbellules 10-15-flowered. Pedicels filiform, 2-4 mm long, greenish-yellow, subequal, elongating to 5-8 mm in fruit. Bracteoles 2-5, linear-setaceous, 0.5-2 mm long, much shorter than the pedicels, marcescent-deciduous to persistent. Petals obovate, c. 0.75 mm long, dorsally lanate to glabrescent, yellow. Styles longer than undulate margined, yellow stylopodium, erect in fruit. Fruit almost orbicular to obovate-suborbicular, 8-10 mm long and broad, emarginate at apex, straw yellow with brownish tinge; mericarps glabrous, flattened dorsally, ribs filiform, furrows with visible brown oil ducts, lateral ribs extended to c. 1 mm broad wings.

Type: Described from near Alexandria (Egypt).

A-6 Al-Bakur, near Tobra, Gebel Akhdar, 10.3.1968, *L. Boulos* 2075; **A-7** 20 km S. of Baida on way to Derna, rocky area, 4.5.1978, *A. El-Gadi & Jafri* 1454; Al-Ghareeba, soil clay loam, erect, perennial, c. 60 cm tall herb with fibrous collar, fls. yellow, 5.5.1978, *A. Ghafoor* 365; 6 km E. of Labrag on way to Derna, fls. yellow, 5.5.1978, *A. El-Gadi & Jafri* 1488; Wadi Mahbool, Beida coastal road, fls. yellow, 1.3.1973, *S.I. Ali & S.A. Faruqi* 1104, 1148 and 1159; c. 11 km from Ras El-Hilal on old way to Derna, fls. yellow, 21.4.1978, *Ramdan, Fathi & Siddiqi* 951; Ras el-Hilal, near coastal road, fls. yellow, 6.5.1978, *A. EL-Gadi & Jafri* 1606; Below ruins of Cyrene (Shahat), 500-600 m, rocky limestone gully (dominated by phrygana), perennial, flowers gold, 26 March 1970, *P.H. Davis* 50020; **B-6** Gaminis-Benghazi Road, 9.3.1968, *L. Boulos* 1978; 4 km from Ras-el Hilal towards Derna, 13.4.1979, *Karima Z.* 23; id., *Fauzi O.*

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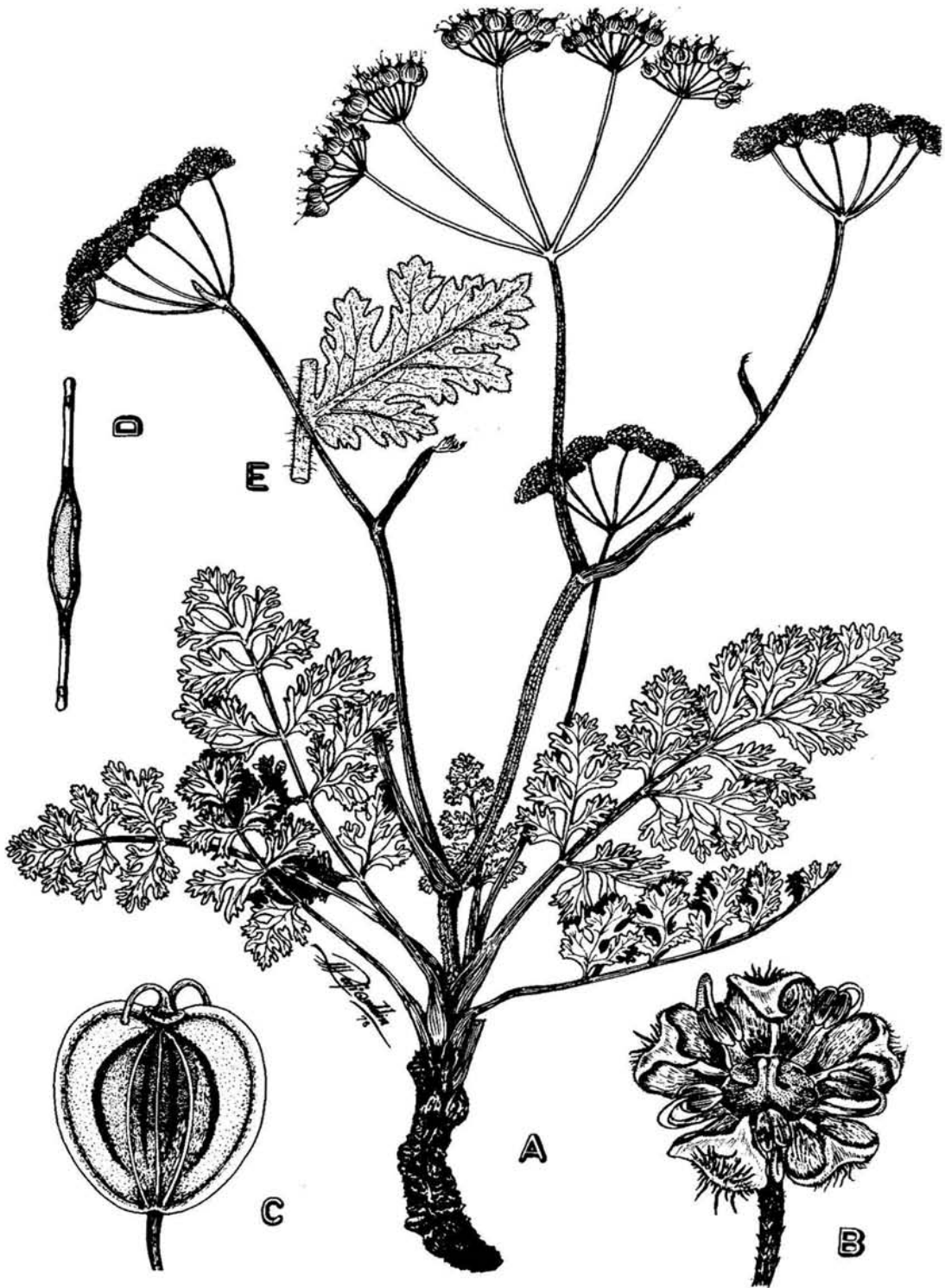


Fig. 34 *Malabaila suaveolens*: A, habit $\times 0.5$; B, flower $\times 15$; C, fruit $\times 3$; D, t.s. of mericarp $\times 5$.

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23; id., *Sakina M.* 48.

Distribution: N. Africa (Algeria eastwards to Egypt).

Confined to Gebel Akhdar area in Libya.

Fl. Mar.-June.

Vern. Teludi

31. **TORDYLIUM**

L., *Sp. Pl.* 239. 1753; *Gen. Pl.* ed. 5. 111. 1754.

Annual or biennial, scabrous to villose or strigose, branched herbs. Leaves petioled, basal and lower ones mostly simple, ovate, basally cordate or 2-3-pinnatisect, with simple or lobed broadly ovate or suborbicular ultimate segments, upper cauline leaves simple or lobed. Umbels compound terminal or antiphyllous, 5-40-rayed. Bracts lanceolate to linear or absent. Bracteoles present or absent. Flowers bisexual and unisexual in the same umbellule, white to yellowish with purplish-tinge. Calyx teeth unequal in size, triangular. Petals obovate, cuneate or clawed, those of outermost flowers often enlarged radiant, bipartite into 2, equal or unequal lobed, involute at the apices. Stylopodium shorter than the styles, conical with undulate margins. Fruit usually dimorphic, ovate-elliptic to \pm orbiculate, all with 2 mericarps and strongly compressed or those in the centre of umbellule with a single \pm hemispherical mericarp; 3 ribs of mericarps thin, inconspicuous, lateral 2 ribs often confluent with thickened or winged, inflated moniliformly wrinkled or tuberculate pithy margins; each furrow with 1 (-3) oil ducts; commissural oil ducts 2-many. Seeds with plane inner face.

c. 15 species, distributed in Europe, N. Africa and S.W. Asia; represented here by the following species:

Tordylium apulum L., *Sp. Pl.* 239. 1753; *Pamp.*, *Fl. Cir.* 349. 1931; *Quezel & Santa*, *Nuov. Fl. Alger.* 2: 659. 1963; *Keith*, l.c. 967. (Fig. 35).

Annual, erect or ascending, 10-60 cm tall, softly and sparsely pubescent, stout much branched herb with striate or subangular, densely hairy at the base, solid stem. Basal and lower cauline leaves unipinnate into broadly ovate or suborbicular, 1-2.5 x 0.8-1.5 cm, truncate or widely cuneate obtuse, deeply crenate or obtusely lobed ultimate segments; upper cauline leaves divided into oblanceolate or linear-obcuneate, sparsely pilose segments. Umbels (2-) 5-8 (-20)-rayed, on scabrous, terminal, 3-12 cm long peduncles; rays \pm equal, 1-4 cm long, subscabrous, patent-suberect.

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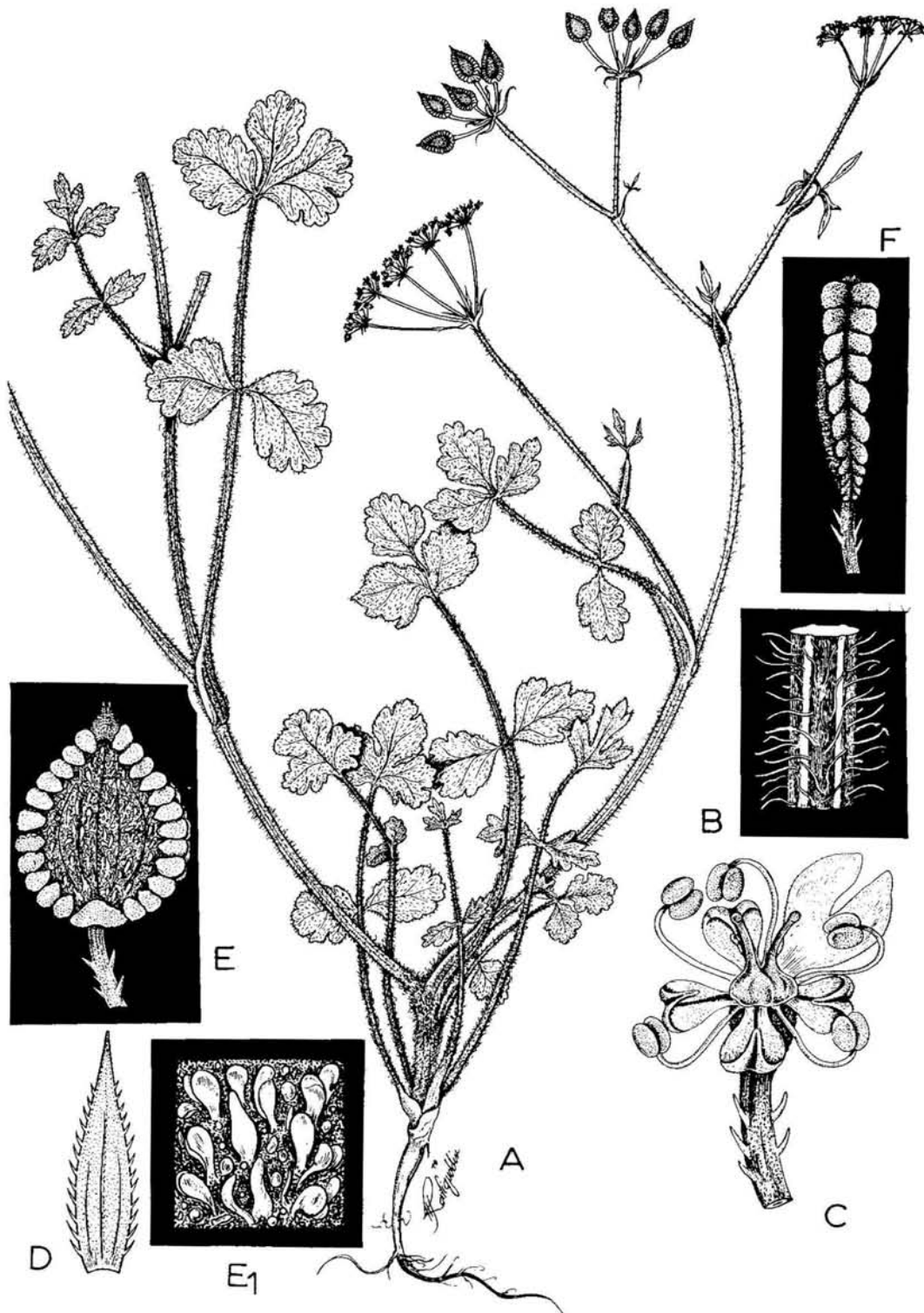


Fig. 35 *Tordylium apulum*: A, habit $\times 0.75$; B, portion of stem $\times 5$; C, flower $\times 15$; D, bracteole $\times 10$; E, fruit $\times 5$; E₁, papillae on the fruit $\times 20$; F, fruit (marginal view) $\times 5$.

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bracts 4-6, subulate, 2-10 x 0.5-0.8 mm, patent, sparsely hispid, persistent. Umbellules 10-15-flowered. Pedicels thin, 3-4 (-5) mm long, hispidulous. Bracteoles akin to bracts but smaller in size. Petals white, obovate, one petal of outer flowers radiant, much enlarged, deeply and equally bilobed, 5-9 x 4-7 mm, appearing like 2 large petals, the other petals broadly oblong-obovate, as wide as long, entire or shallowly emarginate and incurved at tips. Anthers greenish. Stylopodium absent. Fruit broadly elliptic or suborbicular, 5-10 x 5-8 mm, pale brown, narrowly notched at tips; mericarps with vesicular hairs on dorsal sides, strongly thickened and moniliform on pallid margins; ribs obscure; commissural oil ducts 8-10.

Type: Described from Italy.

A-3 13 km from Ras el Hilal, on way to Derna, fls. white, 14.4.1979, *Fauzi Ouheda* 104; *id. Hamida el Borai* 104.

Distribution: S. Europe, Turkey, N. Africa (Libya westwards).

Fl. Apr.-May

32. ELAEOSELINUM

Koch ex DC., Prodr. 4: 215. 1830.

Erect perennial herb with thick rootstock crowned with fibrous collar. Leaves (2-) 3-5-pinnatisect with very small ultimate leaf segments; upper ones reduced to inflated petioles. Bracts and bracteoles present, inconspicuous. Sepals usually small. Petals yellowish or whitish, oblong, slightly emarginate to shallowly bifid with inflexed apices. Fruits oblong to orbicular, glabrous, somewhat compressed dorsally with 4 wide lateral wings and unwinged or narrowly winged dorsal ridges; vittae solitary in the grooves and in the ridges.

c. 10 species, mostly in W. Mediterranean region; represented by the following species in Libya.

Elaeoselinum asclepium (L.) Bertol, Fl. Ital. 3:383. 1838; Tutin in Tutin et al., l.c. 368; Fiori, Icon. Fl. Ital. 290, fig. 2357. 1933.

Thapsia asclepium L., Sp. Pl. 261. 1753; *Laserpetium meoides* Desf., Fl. Atl.

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1:53, tab. 69, 1798; *E. meoides* (Desf.) Koch ex DC., l.c.; Durand & Barratte, l.c. 111; Pamp., Pl. Trip. 164. 1914; Keith, l.c. 450; *E. asclepium* ssp. *meoides* (Desf.) Fiori, Nouv. Fl. Anal. Ital. 2:84. 1925; Quezel & Santa, Nouv. Fl. Alg. 2: 657, plate 63, fig. 1905. 1963; *E. millefolium* Boiss., Elench. 50. 1838.

Erect, almost glabrous perennial herb, up to 130 cm tall, with solid, terete smooth stem, branched above. Basal leaves 3-5-pinnate, horizontal to ascending, divisions often whorled; ultimate leaf-segments short, filiform, 2-3 mm long; petiole and rachis \pm pubescent; cauline leaves reduced to inflated petioles. Rays 8-25, \pm equal, somewhat indurated at base; pedicels 8-28, \pm equal, 5-8 mm long. Sepals inconspicuous. Petals yellow. Fruits (5-) 8-15 mm long, orbicular or ovate-oblong, \pm cordate below with wide, whitish, shiny lateral wings; dorsal ridges obsolete to distinct but with narrow wings.

Type: Described from Italy, Apulia.

Reported from Tripolitania (Sur le littoral sans designation de localite (Hoffmann Mission de ghadames p. 330) by Durand & Barratte, (l.c.) and Pampanini (l.c.).

Distribution: N. Africa (Morocco to Libya) and S. Europe.

Fruit winged like those in *Thapsia garganica* but smaller, and leaf-segments very small.

Our plants probably fall under the subspecies *meoides* (Desf.) Fiori, which is said to differ from the type subspecies by its erect basal leaves (not horizontal), bracts and bracteoles linear-lanceolate (not setaceous) and dorsal ridges of fruit distinctly but narrowly winged (unwinged in the type subspecies). However, specimens from our area are needed for further studies regarding the status of *E. meoides* (Desf.) Koch.

33. THAPSIA

L., Sp. Pl. 261. 1753; Gen. Pl. ed. 5. 126. 1754.

Perennial, erect herbs, with tuberous roots bearing a fibrous collar. Leaves petiolate, sheathing at the base, basal (1-) 2-3-pinnatisect with lobed ultimate segments; upper leaves reduced to broad, entire sheath. Umbels compound, peduncled, 5-many-rayed. Bracts absent or if present early caducous. Bracteoles absent. Flowers

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bisexual, yellow calyx teeth small. Petals obovate-oblong, base narrow or long-clawed, inflexed at the apices. Stylopodium depressed-conical, shorter than styles. Fruit broadly oblong to ovate, dorsally compressed, winged; carpophore bipartite; primary mericarp ribs, thin, inconspicuous, all secondary ribs or only marginal 2 with broad wings; each furrow with single oil duct; commissural oil ducts 2. Seeds with plane inner face.

c. 6 species, mainly in Mediterranean region; represented by the following species in Libya.

Thapsia garganica L., Mantissa 57. 1767; Durand & Barratte, l.c. 111; Pamp., Pl. Trip. 167. 1914; Prodr. Fl. Ciren. 350. 1931; Keith, l.c. 960; Fiori, Icon. Fl. Ital. 289, fig. 2355. (Fig. 36)

T. decussata Lag., Gen. et Sp. Nov. 12. 1816; *T. praealta* d'Urv., Enum. Pl. Ins. Pont. Eux. 288. 1822; *T. sylphium* Viv., Fl. Lib. Spec. 17. 1824; *T. garganica* var. *sylphium* (Viv.) Aschers.; Keith, l.c. 961; *Sylphium cyrenaicum* Laval; Keith, l.c. 944; *T. garganica* var. *decussata* (Lag.) Maire.

Erect, 0.3-2.5 m tall, glabrous or sparsely hairy herb with terete, striate, solid glaucous stem. Leaves deltoid-ovate in outline, 10-50 x 5-20 cm, hispid beneath, 2-3-pinnatisect into 2-5-whorled, linear-oblong lobes with linear, 10-40 (-60) x 2-5 (-15) mm, involute margined, entire or 1-2-toothed, acute or obtuse ultimate segments, usually whitish beneath. Umbels paniculate, 5-35-rayed, on long, glabrous peduncles; rays subequal, stout, 4-14 cm long, glabrous. Bracts trinagular-lanceolate, 5-25 mm long, early withering and evidently absent. Umbellules 30-100-flowered. Pedicels 5-15 mm long, subequal, slightly indurated at the base. Bracteoles absent. Petals oblong obovate, radiate, yellow. Styles erect, as long as conical stylopodium. Fruit oblong-elliptic, 10-25 x 9-20 mm (incl. mericarp wings), straw coloured, basally cordate, deeply emarginate at apex; mericarps with unwinged or narrowly winged central secondary rib, lateral ribs with 3-6 mm broad, thin, transversely striate wings, membranous (when young), thickish and white, shiny when mature, with integrating intermediate forms.

Type: in Barbaria and Italy, Gargeno, Apuliae, *Gouan*, Herb. Linn. 368. 2 (LINN).

A-7 Shahat, common, c. 1 m tall, 18.6.1962, *S.I. Ali* 659; Shahat, gebel Akhdar, near the museum, more than 1 m tall, common on rocks, 26.10.1975, *S.M.H. Jafri* 6121; 5 km before Derna on way to Shahat, stony soil, fls. yellow, 20.4.1978, *Ramadan &*

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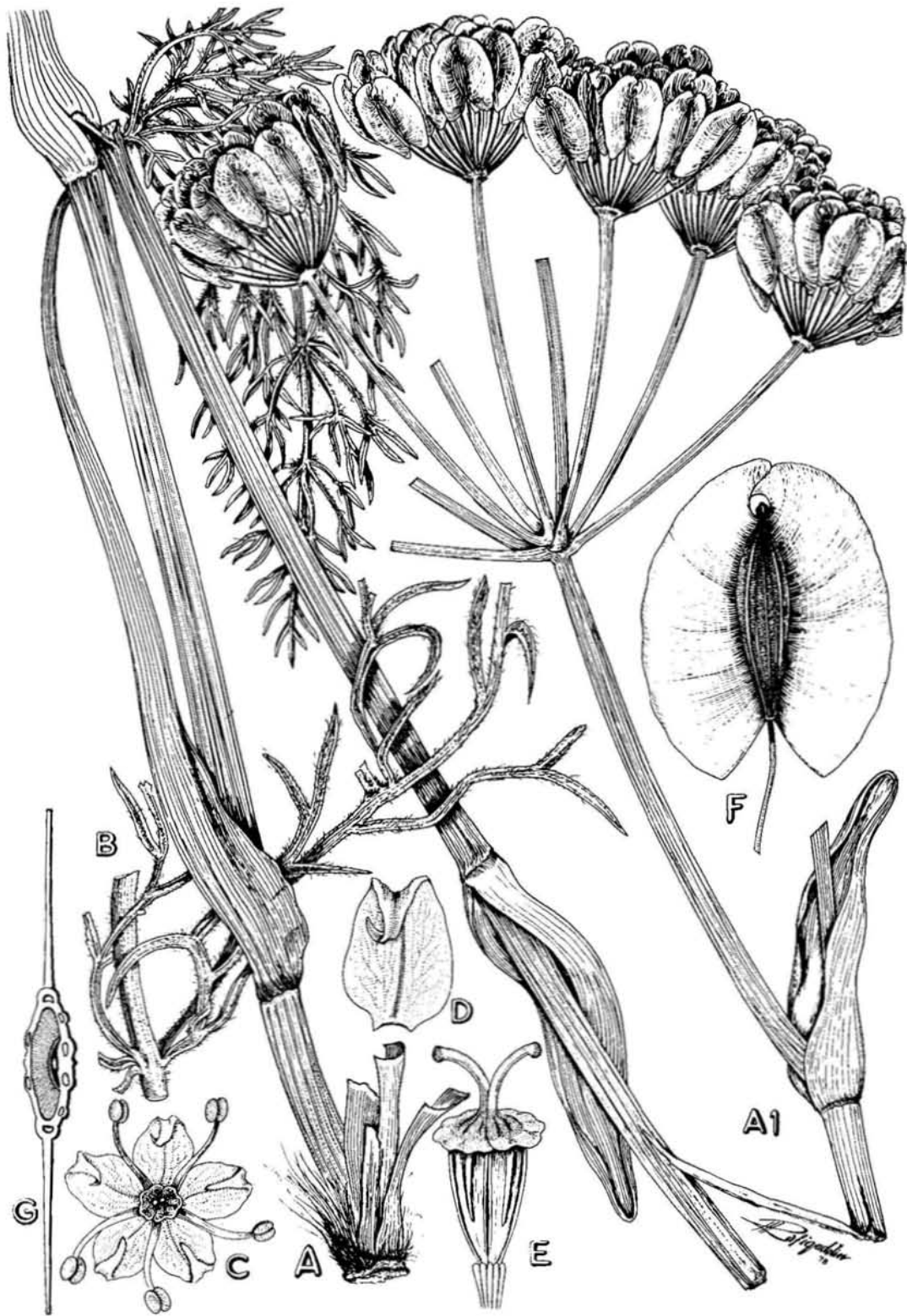


Fig. 36 *Thapsia garganica*: A, basal and lower part of the plant $\times 0.5$; A₁, infructescence $\times 0.5$; B, a portion of lamina $\times 1$; C, flower (dorsal view) $\times 4$; D, petal $\times 15$; E, gynoecium $\times 10$; F, fruit with shiny wings $\times 2$; G, t.s. mericarp $\times 5$.

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Siddiqi 756; Wadi Kuf, 16.4.1979, *Karima Z.* 157; c. 55 km from Ras el Hilal, on way to Tobruk, stony ground, 25.10.1975, *S.M.H. Jafri* 6030; 21 km from Al-Gubba to Ras el Hilal, 14.4.1979, flowers yellow, *Ramadan* 2502; Wadi el Kuf, flowers yellow, very common, 16.4.1979, *Ramadan & Siddiqi* 2686; Shahat, 4.5.1978, *A. Ali* 4; *id. Howaidy* 51; Gebel Akhdar, Ain mara, 5.5.1978, *A. El-Gadi & S.M.H. Jafri* 1549.

Distribution: N. Africa (Libya westwards), S. & S.W. Europe and Turkey.

Common and confined to Gebel Akhdar area in Libya.

“A fennel-like plant with dark green very much succulent central shoot and poisonous to livestock especially camels. This is most likely the ‘Sylphium’ or ‘Silphium’ plant of Cyrenaica” (Keith, l.c. 901)

var. *decussata* (Lag.) Maire has decussate, broader leaf-segment (up to c. 2 cm broad) and occur here also but its status as a variety is uncertain.

Fl. Apr.-May *Vern.* Deryas, diryas, drias.

34. TORILIS

Adans., *Fam. Pl.* 2: 99. 1763.

Herbs, usually annual, erect, retrose appressed-setose or scabrous, with terete or obscurely ribbed stems. Leaves with basally sheathing petioles, 1-3-pinnatisect with oval or linear to lanceolate, entire or toothed ultimate segments. Umbels terminal or antiphyllous, subsessile to long-peduncled, 2-many-rayed. Bracts 0-many. Bracteoles several, usually subulate. Flowers bisexual and male, white or pinkish. Calyx teeth small, persistent. Petals obovate, often radiating, shallowly emarginate with inflexed apices. Ovary with hooked or barbed bristles. Stylopodium short, thick; styles persistent, varying in length. fruit usually monomorphic, linear-oblong to ovoid, laterally \pm compressed, narrowed at the commissure; carpophore \pm 2-fid; mericarps with ciliate, thin, 5 primary ribs, these hidden by spines or pickles or rarely by tubercles borne on secondary ribs and in furrows, prickles or spines of 2 mericarps sometimes unequal in size; each secondary ribs with solitary oil duct beneath. Seeds flattened, with concave inner face.

c. 15 species, distributed from Canaries eastwards to Japan and Europe; represented by 5 species in Libya.

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- | | | |
|----|---|--|
| 1. | + Umbels long-peduncled, often terminal; uppermost leaves simple or almost so
— Umbels subsessile or short-peduncled, usually axillary or opposite the leaves; all leaves pinnatisect | 2. T. arvensis

2 |
| 2. | + Umbels on 0-2 cm long peduncles, opposite the leaves. Mericarps clearly heteromorphic, the outer prickly, the inner tubercled
— Umbels on mostly more than 2 cm long peduncles, often terminal. Mericarps homomorphic, or almost so | 1. T. nodosa

3 |
| 3. | + Umbel rays (4-) 5-12 (or more). Petals white
— Umbel rays 2-3 (-4)-rayed. Petals usually pink or purple or tinged with these colours | 6. T. tenella

4 |
| 4. | + Upper leaves with elongated terminal lobe. Basal and lower cauline leaves with toothed or lobed, more than 1 mm broad ultimate segments. Mericarps 3-5 mm long. Umbellules 3-4-flowered.
— Upper leaves not as above. Basal and lower cauline leaves with entire, less than 1 mm broad ultimate segments. Mericarps 6-8 (-10) mm long. Umbellules 4-8-flowered | 3. T. heterophylla

5 |
| 5. | + Secondary peduncles short, stout, unequal in length; fruits 7-10 mm long
— Secondary peduncles equally, elongated not as stout; fruits 5-6 mm long. | 4. T. leptophylla
5. T. bifrons |

1. **Torilis nodosa** (L.) Gaertn., Fruct. et Sem. 1: 82. 1788; Durand & Barratte, l.c. 112; Pamp., Pl. Trip. 165. 1967; Prodr. Fl. Cir. 339. 1931; Keith, l.c. 967; Zohary, l.c. 397. fig. 573. (Fig. 37).

Tordylium nodosum L., Sp. Pl. 240. 1753; *Caucalis nodosa* (L.) Scop., Fl. Carniol. ed. 2. 192. 1772; *C. nodiflora* Lam., Fl. Fr. 3: 424. 1778.

Procumbent to ± erect, 10-50 cm tall, much branched annual herb with sparsely retrorse-hispid, subterete, striate stem. Leaves triangular-ovate or oblong, 5-15 x 3-8

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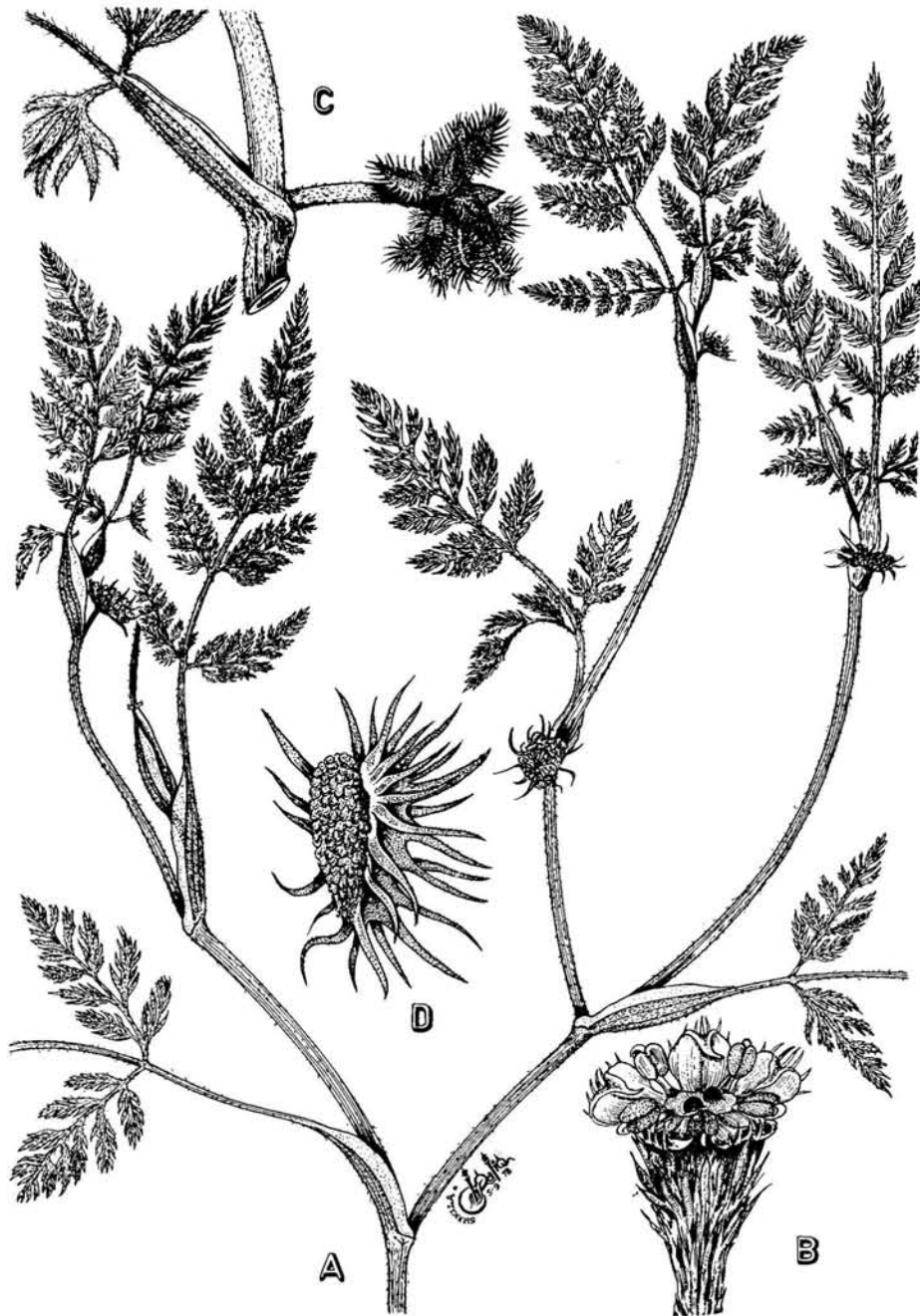


Fig. 37 *Torilis nodosa*: A, flowering stem $\times 1$; B, flower $\times 20$; C, infructescence $\times 2$; D, fruit with dimorphic mericarps $\times 20$.

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cm, (1-) 2-pinnatisect into 1-3 cm long, deeply pinnatipartite or-sect segments with narrowly oblong-linear, 2-10 x 1-2.5 mm, acute, subglabrous or thinly hispid lobules; lower leaf petioles canaliculate, antrorsely hairy and up to 10 cm long, upper leaves sessile. Leaf sheath oblong, membranous margined. Umbels 2-3-rayed, mostly less than 2 cm long, on spuriously leaf-opposed, 0-2 cm long peduncles (generally seemingly \pm sessile on stems); rays hidden by flowers and fruits, rarely up to 1 cm long, adpressed hairy. Bracts absent. Umbellules 5-10-flowered. Pedicels very short or almost absent. Bracteoles subulate, 2-5 x 0.5-1 mm, sometimes longer hispid. Petals white, obovate, less than 1 mm long, hardly radiating, strongly involute at tips. Styles erect, as long as or \pm longer than stylopodium. Fruit ovoid-oblong, 2-4 x 2-2.5 mm, greenish; mericarps heteromorphic, the outer bearing patent, scabrous, apically glochidiate prickles, the inner obtusely papillose tuberculate.

Type: Described from France and Italy, Herb. Linn. 337/6 (LINN).

A-2 Ain Erumia, 10.2.1974, *G. Faris* 357; Rumia, 15 km from Yefren, limestone hill, fls. white 9.4.1974, *S.I. Ali* 1819; **A-3** Tripoli, university campus, near football field, erect, c. 35 cm tall herb, fls. white in leaf-opposed umbels, 28.3.1978, *A. Ghafoor* 323; **A-6** Benghazi, Garyounus University Campus (New), sandy loam soil, spreading herb with ascending branches, fls. white, fruit spiny, 16.4.1978, *A. Ghafoor* 335; **A-7** c. 4 km from Ras al Tin, near cultivated field, prostrate to ascending branches, c. 10-15 cm, fls. white, 21.6.1972, *S.I. Ali* 862; Shahat, near Tourist Motel, soil reddish, flowers white, 4.5.1978, *A. El-Gadi & Jafri* 1402; Gasr Libya, clay loam soil, straggling herb, under shade, flowers white, fruits spinose, 5.5.1978, *A. Ghafoor* 380; 20 km E. of Baida on way to Derna, rocky area, 4.5.1978, *A. El-Gadi & Jafri* 1455; c. 5 km from Baida, towards Shahat, near cult. field, prostrate, fls. white, 20.6.1972, *S.I. Ali* 753; Shahat, 1 km N.E. of city, fruit spinose, *N.H. Faris* 39; **A-8** c. 10 km from Tobruk on way to Derna, prostrate, white flowers, 19.4.1978, *Ramdan, Fathi & Siddiqi* 657; Timimi to Omm Rezem, 5-50 m, sandy Wadis (flooded last autumn), prostrate annual, fls. white, 30 March 1970, *P.H. Davis* 50313; 4 km from Ras el Hilal, barley fields, 14.6.1979, *Sakina M.* 80. **B-6** Gaminis-Benghazi road, 9.3.1968, *L. Boulos* 1969.

Distribution: Europe, N. Africa, S.W. Asia to Turkistan.

A variable species in vegetative and fruit characters and extraordinarily different from other species in having heteromorphic mericarps (one setaceous and the other tubercular) and usually seemingly sessile umbels. A common species in the coastal

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areas of Libya, especially N.E. parts.

2. **Torilis arvensis** (Huds.) Link, Enum. Hort. Berol. Alt. 1: 265, 1821; Zohary, l.c. 395, fig. 371, excl. ssp. *heterophylla* (Guss.) Thell. (Fig. 38).

Caucalis arvensis Huds., Fl. Angl. 98. 1762.

Annual herb, up to 40-80 (-100) cm tall, erect, sparingly branched, usually sparingly hispid with appressed, simple, short hairs; stems furrowed, glabrous to sparingly hairy, especially above with short, retrorse, setaceous hairs. Leaves sparsely appressed-hairy with forward pointing hairs, 2-3-pinnatisect, \pm homomorphic, gradually decreasing in size above; the lower ones with 2-3 pairs of pinnatisect or-partite or-fid segments; the upper leaves ternatisect (to simple); segments broadly lanceolate, 1-4 cm long, broadly lanceolate or linear-subulate, serrate, incised or lobed. Umbels long-peduncled, (3-) 4-12-rayed; rays 1-3 (-3.5) cm long. Bracts 0 (-1); bracteoles 3-several, nearly as long as the pedicels, hispid. Flowers 2 mm; petals pink or white, radiant; styles longer than stylopodium. Fruit 3-5 mm long, ovoid to ellipsoid, prickly with prickles white, usually unequal in size on the 2 mericarps, and directed somewhat upwards.

Type: Described from England.

A-7 Shahat, ruins, flowers pink, 4.5.1978, *A. El-Gadi & S.M.H. Jafri* 1429; 13 km from Ras-el-Hilal on way to Derna, 15.4.1979, *Karima Z.* 133.

Distribution: W. & C. Europe, Mediterranean region, Caucasia to N. Iran.

This is a new record for our area.

3. **Torilis heterophylla** Guss., Fl. Sic. Prodr. 1: 326. 1827; Durand & Barratte, l.c. 112; Pamp., Prodr. Fl. Cir. 340. 1931; Keith, l.c. 967; Meikle, Fl. Cyp. 1: 702. 1977. (Fig. 39, H-I).

T. arvensis ssp. *heterophylla* (Guss.) Thell. in Hegi, Ill. Fl. Mitteleur. 5 (2): 1057. 1926; Zohary, l.c. 395 (p.p.); *T. arvensis* ssp. *purpurea* Cannon in Tutin, et al., l.c. 371 (p.p.)-non (Ten.) Hay.

Annual, erect, 20-50 cm tall herb with basally branched, sparsely retrorsely-

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Fig. 38 *Torilis arvensis*: A, habit $\times 0.5$; B, portion of stem $\times 5$; C, a portion of lamina $\times 5$; D, umbellule $\times 10$; E, flower $\times 15$; F, hairs on ovary $\times 30$; G, fruit $\times 15$; H, t.s. mericarp $\times 25$.

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hairy, thinly sulcate stem. Leaves heteromorphic, basal and lower cauline leaves deltoid. 2-3-pinnatisect into narrowly oblong or ovate, lobed or sharply serrate ultimate segments, upper and terminal leaves ternatisect into linear, sharply serrate, long acuminate 2-10 mm broad, ultimate segments or undivided. Umbels 2-3 (-4) rayed, on 4-10 cm long, terminal and leaf-opposed appressed bristly peduncles; rays unequal, 5-30 mm long. Bracts absent or single. Umbellules 5-8-flowered. Pedicels 2-5 (-8) mm long, appressed bristly. Bracteoles 3-5, linear-subulate, as long as pedicels, acuminate, appressed hairy. Petals obovate, unequal, mostly pink, hardly radiating, deeply emarginate. Styles as long as the stylopodium. Fruit ovoid-oblong, 3-5 mm long; mericarps \pm heteromorphic, the outer being densely covered with long, patent scabrid-glochidiate prickles, the inner with scabrous, very short bristles or spines.

Type: Sicily: "In dumetis glareosis montosis; Monti di Mistretta, e di Cannatta, Nocelle de Polizzi" *Gussone*

A-7 Half way between Cyrene (Shahat) and Apollonia (Mursa Susa), Wadi Roseyt, 350 m, rocky limestone gorge, in macchia, among rocks in shade, annual, 27.3.1970, *P.H. Davis* 50123.

Distribution: S.W. Europe eastwards to Russia (Crimea), Turkey, Syria, Palestine and Libya.

Fl. Mar.-June

A very variable species which needs further study in the area. Both Cannon (in Tutin et al., l.c.) and Zohary (l.c.) have treated this taxon as a subspecies of *T. arvensis* (Huds.) Link; the former adopting the subspecific name *purpurea* (Ten.) Hayek and the latter subspecific name *heterophylla* (Guss.) Thell. The correct name of this taxon, if treated as one species, should be *T. purpurea* (Ten.) Guss. However, Meikle (*Fl. Cyprus* 1: 701 and 702, 1977) treated *T. purpurea* (Ten.) Guss. (*Caucalis purpurea* Ten) and *T. heterophylla* Guss. as 2 different species, the former confined to the N. Mediterranean region to Caucasia and Iran, and the latter widespread in the Mediterranean region (not extending to Iran). The latter is distinguished by its dissimilar basal and cauline leaves, the upper leave caudate or long-acuminate in their middle segments.

4. ***Torilis leptophylla*** (L.) Reichb., *Icones Fl. Germ.* 21: 83. t. 169 figs. 1-9.

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1866; Keith, l.c. 967; Cannon in Tutin et al., l.c. 371; Zohary, l.c. 396, fig. 572; (Fig. 39, A-G).

Caucalis leptophylla L., Sp. Pl. 242. 1753; Durand & Barratte, l.c. 113; Pamp., Prodr. Fl. Cir. 340. 1931; Keith, l.c. 339; *C. erythrotricha* (Reichb.) Boiss. & Hausskn. in Boiss., Fl. Orient. 2: 1085. 1872; *C. xanthotricha* Stev. in Bull. Soc. Nat. Mosc. 29: 353. 1856; *T. xanthotricha* (Stev.) Schischkin in Fl. URSS 16: 164. 1950.

Erect or sometimes ascending or spreading, 10-30 (-40) cm tall, dichotomously branched herb, with retrorsely appressed-setulose to subglabrous stem. Leaves narrowly triangular-oblong, 2-6 x 0.5-3 cm, 2-3-pinnatisect, with oblong or linear, 1-3 x 0.5-1 mm, acute, entire or toothed, sparsely adpressed hairy ultimate lobules; lower leaf petioles long, uppermost leaves nearly sessile on narrow oblong sheaths. Umbels 2-3 (-5)-rayed, on (1-) 2-4 (-5) cm long, antiphyllous and terminal peduncles; rays 1-2 (-2.5) cm long, patent, thick and stout. Bracts absent. Umbellules 5-8-flowered. Pedicels unequal, 2-6 mm long. Bracteoles 3 or more, lanceolate, c. 3 x 1 mm, setose, broadly membranous margined. Petals obovate, unequal 1-2 mm long, deeply notched, white to pale pink. Stamens pinkish. Styles shorter than the conical stylopodium. Fruit linear-oblong, 6-8 x 3-4 mm (incl. prickles), yellowish-grey; mericarps prominently ribbed, primary ribs sparsely adpressed hairy, the 4 secondary ribs beset with 2-3 rows of glochidiate-scarious, patent prickles.

Syntypes: Described from France and Italy.

A-3 Tripoli, University Campus, sandy soil, 1.4.1977, *A. Ghafoor* 301; **A-7** Gebel Akhdar, Gasr Libya, c. 150 m from sea level, clay loam soil, annual herb, c. 15-20 cm tall, fls. white, fruits spiny, 5.5.1978, *A. Ghafoor* 370; 4 km from Susa to Ras-el-Hilal, barley field, 14.4.1979, *Sakina M.* 50; Gebel Akhdar, *Khawla H.M.* 60; id. *O. Shetwy* 19.

Distribution: W. & S. Europe, Turkey, Russia (Caucasia, Turkestan), and Pakistan westwards to Libya.

Fl. Mar.-June.

5. **Torilis bifrons** (Pomel) Jafri, **comb. nov.** (Fig. 40).

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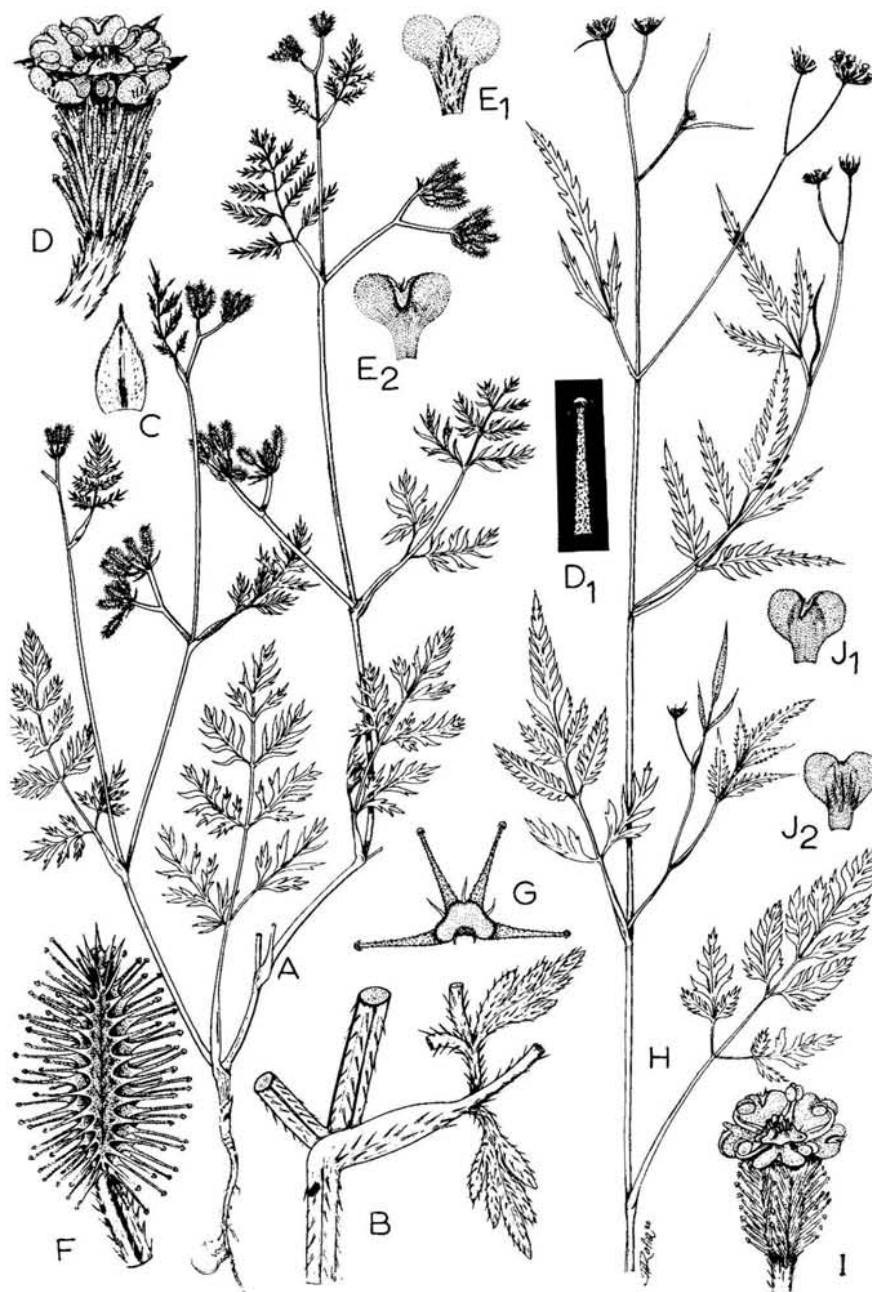


Fig. 39 *Torilis leptophylla*: A, habit $\times 0.5$; B, a portion of stem and leaf $\times 2.5$; C, bracteole $\times 5$; D, flower $\times 10$; D₁, hair on ovary $\times 15$; E₁, petal (back view) $\times 10$; E₂, the same (front view) $\times 10$; F, fruit $\times 4$; G, t.s. mericarp $\times 10$. *T. heterophylla*: H, flowering stem $\times 0.5$; I, flower $\times 7.5$; J₁, petal (front view) $\times 10$; J₂, the same (back view) $\times 10$.

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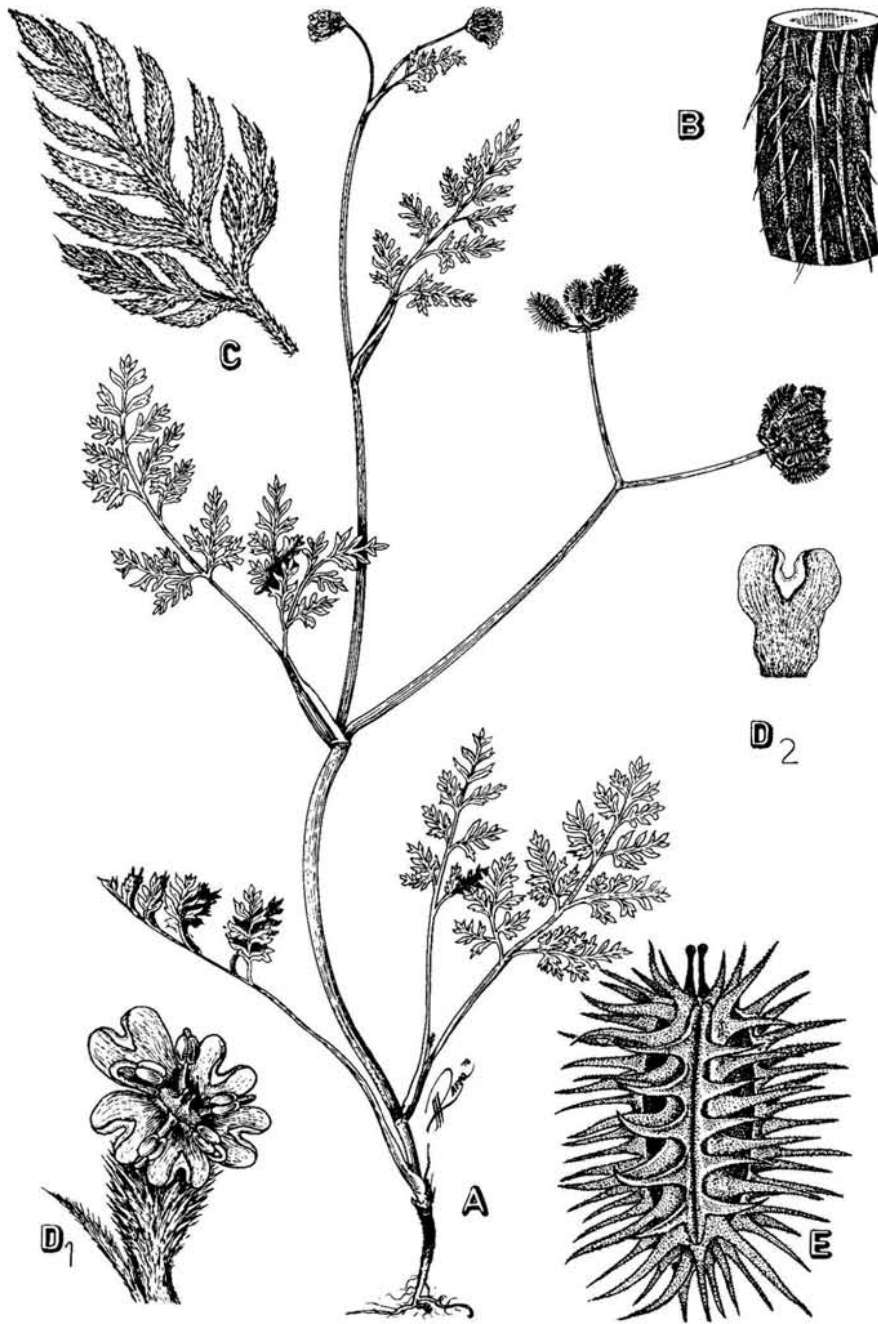


Fig. 40 *Torilis bifrons*: A, habit $\times 1$; B, portion of stem $\times 10$; C, portion of leaf $\times 2$; D₁, flower $\times 10$; D₂, petal (front view) $\times 10$; E, fruit $\times 8$.

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Lappularia bifrons Pomel, Nouv. Mat. Fl. Atl. 149. 1874; *Caucalis bifrons* (Pomel) Maire in Bull. Soc. Hist. Nat. Fr. Nord. 13: 216. 1922 (non Coss. et Dur. 1878), *nom. illegit*; Quezel & Santa, Nouv. Fl. Alg. 2: 665, Pl. 67, fig. 1937. 1963; Negre, Pet. Fl. Reg. Arid. Maroc. Occ. 2: 99, Pl. 82, fig. 505. 1962;

C. homaephylla de Coincy in Bull. Herb. Boiss. 4: 571. 1896;

Similar to *T. leptophylla* but plant somewhat weaker and more slender, with thin stem and leaves, peduncle longer usually with forked, almost equally long secondary peduncles, the 2 secondary peduncles sometimes without the primary peduncle but with a single leaf-like bract at base, much longer than the umbellules. Fruits smaller, with thinner and dense spines.

Type: Described from Algeria, "Aux pieds des rochers des gres: de Tiaret a Bogher".

A-22 km before Garian, limestone hill, stony slope, up to 40 cm, fls. white, 17.4.1973, *S.I. Ali* 1625.

Distribution: N. Africa (Libya, Tunisia, Algeria, Morocco), probably extending to Spain.

Easily recognized by its 2, \pm equally long secondary peduncles arising from the same point (either on the primary peduncle or from the branch without the primary peduncle), bearing single umbellules each.

Fl. Mar.-Apr.

6. ***Torilis tenella*** (Del.) Reichb. Icon. Fl. Germ. 21: 84. 1867; Cannon in Tutin et al., l.c. 371; Cullen in Davis, Fl. Turk. 4: 523. 1972; Tack., Stud. Fl. Egypt ed. 2. 397. 1974. (Fig. 41).

Caucalis tenella Del., Fl. Egypt. 58. t. 21. fig. 3. 1813; Durand & Barratte, l.c. 112; Pamp., Prodr. Fl. Cir. 340. 1931; Keith, l.c. 340; Zohary, l.c. 398. fig. 574.

Erect, slender, 10-35 (-50) cm tall, sparsely branched or unbranched annual herb with thinly retrorse-hispid, obscurely sulcate stem. Leaves oblong or narrowly

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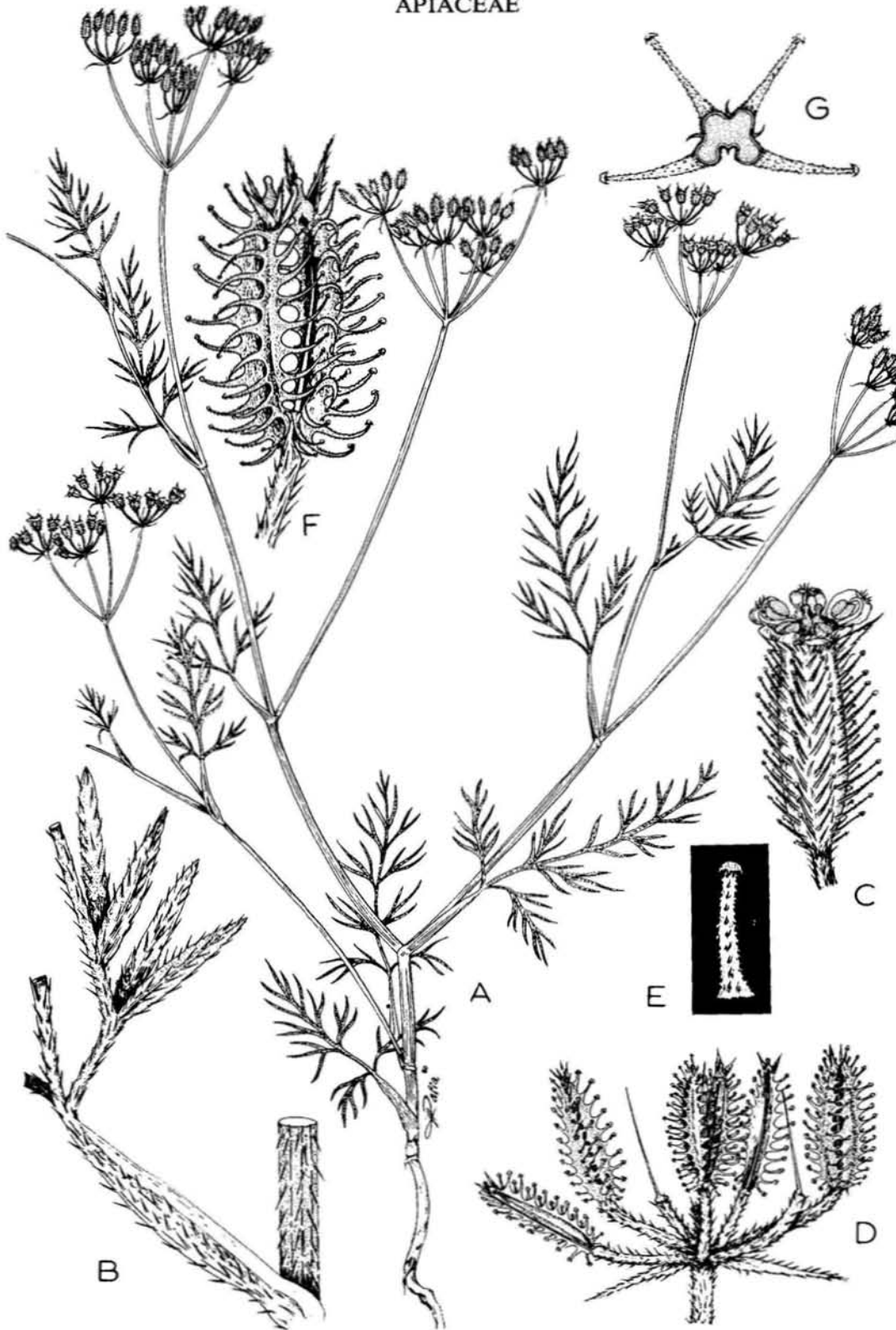


Fig. 41 *Torilis tenella*: A, habit $\times 1$; B, a portion of stem and leaf $\times 5$; C, flower (late stage with immature fruit) $\times 15$; D, umbellule with fruits $\times 5$; E, a seta (prickle) from fruit $\times 20$; F, fruit $\times 10$; G, t.s. mericarp $\times 15$.

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triangular-oblong, 2-8 x 1-4 cm, bipinnatisect, with linear or narrowly oblong, 2-4 mm long and less than 1 mm broad, acute, sparsely retrorsely appressed-hispid entire ultimate segments. Umbels (4-) 5-10 (-15)-rayed, on terminal or leaf-opposed, (2-) 4-8 cm long peduncles; rays very unequal especially at fruiting, 5-40 cm long, retrorsely hairy. Bracts wanting or solitary and caducous. Umbellules 6-10-flowered. Pedicels 1-2 mm long in flower, enlarged up to 7 or more mm in fruit. Bracteoles 3-5, lanceolate-subulate, 4-8 x 0.5-1.5 mm, membranous on margins, thinly whitish hairy. Speals conspicuous. Petals broadly obovate, c. 0.6-1 x 0.6 mm, subequal, white, slightly emarginate at apices. Ovary narrowly oblong, densely hispid. Styles shorter than the conical stylopodium. Fruit narrowly linear-oblong, 4-5 (-7) x 2-3 mm (incl. prickles), greenish; mericarps with appressed-hairy primary ribs and single row of patent, 2-3 mm long, papillose-scabrid prickles.

Type: Described from Alexandria, Egypt (P).

A-7 Gebel Akhdar, Gasr Libya, clay loam soil, erect, c. 3fl cm tall herb with spinose fruits, 5.5.1978, A. *Ghafoor* 372.

Distribution: Libya eastwards to W. Iran, Turkey, Greece and Cyprus.

Fl. Mar.-June

35. TURGENIA

Hoffm., Gen. Umb. 59. 1814.

Annual, hispid-strigulose, herb, Leaves 1-pinnatisect, with oblong-lanceolate to ovate-oblong usually serrate segments. Umbels 3-5-rayed, pedunculate, terminal. Bracts and bracteoles present, usually lanceolate or elliptic, whitish, \pm membranous, pubescent. Flowers hermaphrodite and staminate, white to purple with outer petals radiant, 2-lobed, all petals notched with inflexed apices. Stylopodium conical with short conical styles. Fruit ovoid, laterally \pm compressed; both primary and secondary ridges bearing \pm equally long spines in 1-2 series, rarely some of these reduced to tubercles; oil ducts solitary under each secondary rib, commissural ducts 2; inner face of seed involute-grooved.

A monotypic genus.

Turgenia latifolia (L.) Hoffm., Gen. Umb. 59. 1814; Quezel & Santa, Nouv.

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Fl. Alg. 2: 664, Pl. 64, fig. 1933. 1963; Zohary, Fl. Palest. 2: 398, fig. 575. 1972; Cullen in Davis, Fl. Turk. 4: 527, fig. 13, no. 7. 1972. (Fig. 42).

Tordylium latifolium L., Sp. Pl. 240. 1753; *Caucalis latifolia* (L.) L., Syst. ed. 12: 1205. 1768; *Turgenia tuberculata* Boiss., Ann. Sc. Nat. Bot. Ser. 3, 2: 52. 1844; *T. latifolia* var. *tuberculata* (Boiss.) Godr. in Gren. et Godr., Fl. Fr. 1: 673. 1849; Zohary, l.c. 399.

Annual, hispid or setose-scabrous herbs, 15-30 (-50) cm tall, erect to procumbent, dichotomously branched. Leaves 1-pinnate, setose on both surfaces, 5-10 cm long, sheathing at abase, lower withering early; segments (1-) 2-5 (-6) cm, oblong-lanceolate, serrate to incised-lobed. Bracts and bracteoles usually 3-5, ovate-lanceolate or-oblong, obtuse, scarious-margined, white, pubescent. Flowers c. 5 mm, across, pedicelled. Calyx-teeth evident. Petals white to rose-coloured or purplish; Fruit 8-15 x 5-8 mm (including spines), papillose, usually ovoid, with scabrous spines 1.5-2 mm long, broadened at base and glochidiate at apices.

Syntypes: "Habitat in Gallia, Italia

A-7 c. 31 km from Baida on way to El-Merj, flowers deep purple, 24.4.1978, *Ramadan & Siddiqi* 184.

Distribution: W.S. & C. Europe, N. Africa (Algeria-Libya), S.W. Asia (Palestine, Turkey), Turkestan and Pakistan.

A new record for our area, with beautiful purple (-white)-flowered umbels, worth introducing in our gardens.

Fl. Mar.-April.

36. PACHYCTENIUM

Maire & Pamp. in Archiv. Bot. Forli 12 (n.s.ii): 176. 1936

Small, diffuse, hispid-hirtellous, perennial herb, with elongated, up to c. 10 mm thick rootstock; branches many, basal usually simple, ending in a terminal umbel, sometimes smaller lateral umbels also present above. Similar to *Daucus* but with conspicuous triangular-sublanceolate glabrous, calyx-lobes enlarging in fruit and

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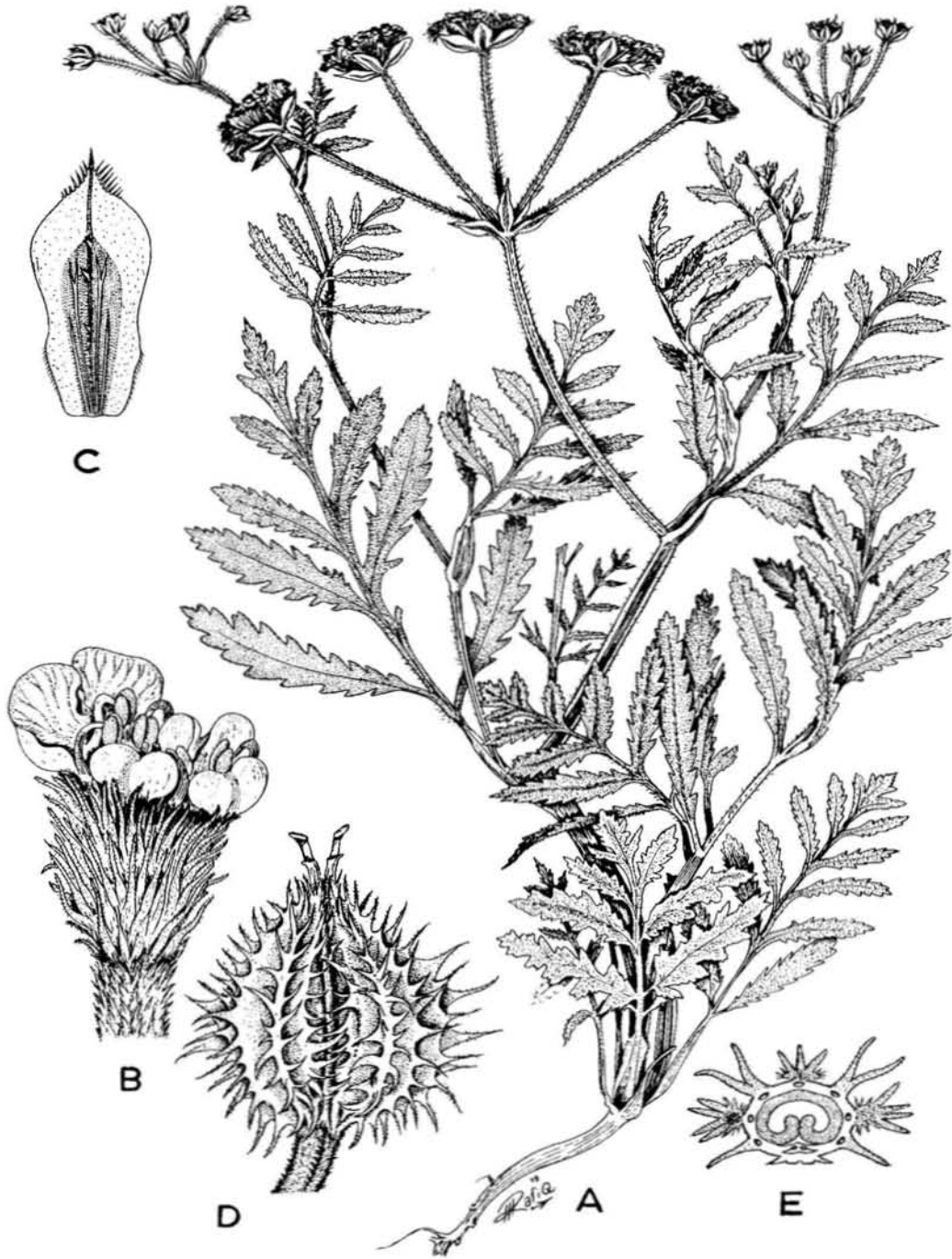


Fig. 42 *Turgenia latifolia*: A, habit $\times 0.5$; B, flower $\times 7.5$; C, bracteole $\times 5$; D, fruit $\times 4$; E, t.s. mericarp $\times 4$.

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remaining spineless; corolla purple-rose to whitish; fruits persistent or hardly deciduous, ovate \pm laterally compressed; secondary ridges spiny-winged with spines short, conspicuously confluent below forming dentate wings, and the mature fruits seemingly spiny-winged in the lower half only and naked above (\pm broad beak-like).

A monotypic genus.

Pachyctenium mirabilis Maire & Pamp. in *Archiv. Bot. Forli* 12 (n.s. ii): 176. 1936. (fig. 43).

Perennial herb, 10-15 (-20) cm long) branches, prostrate, sometimes ascending, hispid-hirtellous; rootstock up to 10 mm thick, elongated, branched above. Leaves rosulate, (3-) 6-7 (-9) cm long, oblong-lanceolate in outline, pinnatisect; segments 2-3-jugate, pinnati-partite to linear-lanceolate, mucronate, petiole \pm equal to lamina, sheathing at base. Flowering branches about twice as long as leaves; hairs short retrorse; cauline leaves (0-) 1-2. Umbels generally terminal, c. 5 cm across at flowering (up to 10 cm in fruit), rarely axillary in the upper leaves but smaller. Rays unequal, outer longer, much exceeding the involucre bracts, thickened, hirtellous and purplish in colour in fruit; involucre bracts several, unequal, usually entire, linear or linear-lanceolate, acute, hirtellous; umbellules 6-10 mm wide. Flowers 2.5 mm across, pinkish or purplish, almost actinomorphic; calyx 5-toothed with conspicuous triangular teeth, glabrous; petals obcordate, inflexed, apiculate. Styles 2, erect, filiform elongating; stylopodium disc flat, rounded. Fruit 2.5 (-3) x 1.6 mm (excluding styles), ovate below with dentate wing and oblong, naked above like a beak, terminating into 5 dentate calyx teeth and 2, filiform elongated styles, more than half the length of fruit; mericarp with secondary ridges dentate-winged in primary ridges short, hairy.

Type: Libya: "Habitat haud rarum in saxosis aridissimis oropedii Cyrenaici Centralis nec non circa Berenicem hodie: Benghazi", *Maire & Weiller*

A-7 Gebel Akhdar, Shahat, perennial, prostrate, fls. purplish-white, 7.5.1978, *M.A. Siddiqi* 1745; Roman aqueduct near Labrag, E. of Shahat (Cyrene), 700 m, limestone pavement in Roman cart-track, flowers pinkish, 29.3.1970, *P.H. Davis* 50249; Shahat, rocky places, *Hania A.Z.* 156.

Distribution: Endemic to Libya (Gebel Akhdar area).

Fl. Mar.-Apr.

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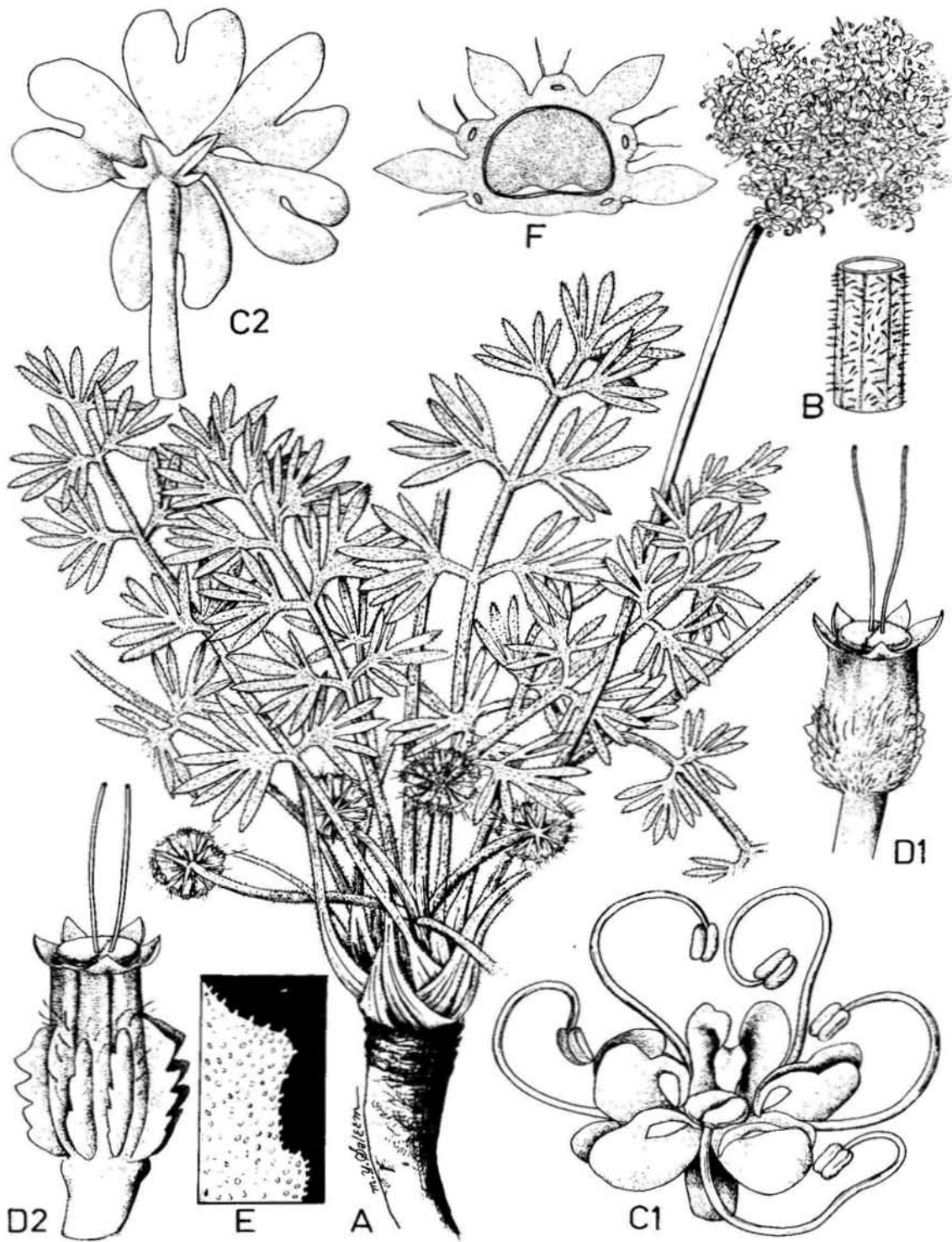


Fig. 43 *Pachyctenium mirabilis*: A, habit $\times 2$; B, portion of stem $\times 10$; C₁, flower $\times 8$; C₂, the same (ventral view showing calyx) $\times 18$; D₁, early stage of fruit $\times 12$; D₂, late stage of fruit $\times 12$; F, t.s. mericarp $\times 30$.

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37. DAUCUS

L., Sp. Pl. 242. 1753; Gen. Pl. ed. 5: 113. 1754.

Durieua Boiss. et Reut., Diagn. Pl. Nov. Hisp. 14. 1842.

Herbs, annual or biennial, mostly hispid or bristly, erect or suberect, branched. Leaves (1-) 2-3 (-4)-pinnate. Umbels compound, often showy. Bracts and bracteoles mostly pinnatisect or 3-fid. Flowers white, reddish or yellowish-white, hermaphrodite or staminate (central ones); calyx obsolete or minute; petals usually unequal, often radiating, obovate, notched with inflexed apices. Fruit ovoid, oblong or cylindrical, dorsally subcompressed, bristly; carpophore undivided; primary ridges usually 5, filiform, short-setulose, the secondary ridges 4, stout and more prominent, usually with longer, patent spines in a single series; oil ducts 1 under each secondary ribs; commissural ducts 2.

About 60 species, mostly in Europe, Africa and W. Asia; represented by 10 species in Libya.

- | | | |
|----|---|-------------------------|
| 1. | + Umbels usually subsessile, leaf-opposed; styles short, erect | 1. D. durieua |
| | — Umbels pedunculate, terminal, axillary, rarely leaf-opposed; styles medium or long | 2 |
| 2. | + Plants fleshy, short; bracts undivided or 3-fid | 8. D. littoralis |
| | — Plants not fleshy; bracts mostly dissected (rarely entire) | 3 |
| 3. | + Bracts deflexed in fruits | 4 |
| | — Bracts usually not deflexed in fruit | 5 |
| 4. | + Rays subequal; spines on fruits yellowish, slightly dilated but not confluent at the base; petals becoming yellowish after anthesis | 3. D. aureus |
| | — Rays markedly unequal; spines on fruits silvery white, widely confluent at the base; petals remaining white after anthesis | 2. D. muricatus |
| 5. | + Plants usually erect and tall, seemingly glabrous (coastal areas) | 6 |
| | — Plants usually ascending and shorter; pubescent | 9 |

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- 6 + Spines on the secondary ridges of mericarps not or slightly longer than the width of mericarps 4. **D. carota**
 — Spines on fruits longer than the width of mericarps 7
7. + Rays many (more than 12); bracteoles divided (mostly pinnatisect) 6
 — Rays 6-12 only; bracteoles entire, flowers whitish; spines on fruits white or brownish; (bracts entire to 3-fid above) 7. **D. jordanicus**
8. + Flowers yellowish after anthesis; plants slender; spines on fruit yellowish to whitish 6. **D. capillifolius**
 — Flowers remaining white after anthesis; plants stout; spines on fruit brown, bracteoles pinnatisect 5. **D. guttatus**
9. + Leaf-segments acute. Flowers mostly reddish or pinkish (plant of coastal areas, common) 9. **D. syrticus**
 — Leaf segments obtuse; flowers white or yellowish; (plant of desert areas) 10. **D. sahariensis**
1. **Daucus durieua** Lange in Willk. & Lange, Prodr. Fl. Hisp. 3: 23. 1874; Pamp., Pl. Trip. 163. 1914; Keith, l.c. 429; Quezel & Santa, Nouv. Fl. Alg. 2:660, plate 63, fig. 1921; Heywood in Tutin et al, Fl. Europ. 2: 373. 1968; Meikle, Fl. Cyp. 1: 715. 1977.

Dureiua hispanica Boiss. et Reut., Diagn. Pl. Nov. Hisp. 15. 1842; *Caucalis hispanica* sensu Samp. non Lam., (1785); nec *Daucus hispanicus* Gouan (1773); *D. subsessilis* Boiss. Fl. Or. Suppl. 272. 1888. Zohary, Fl. Palaest. 2: 451, fig. 653. 1972.

Erect or ascending annual herb, up to 20 (-30) cm tall; stem flexuose, branched from the base, shortly hispidulous. Leaves petiolate oblong, 2-3-pinnate, usually 1-2 x 1-1.5 cm in outline; lobes lanceolate-linear, 1-2 (-3) x 0.5-1 mm, shortly hispid, umbels subsessile, leaf-opposed. Rays 3-5, markedly unequal, inconspicuous to conspicuous, thickened. Bracts foliaceous, resembling the cauline leaves, several, unequal exceeding the umbellule, bracteoles 3-5, linear-lanceolate, entire or pinnatifid smaller. Flowers few (up to 5) in each umbellule; pedicels short unequal, thickened, up to 5

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mm long. Petals very small, yellowish white. Fruits 4-6 x 1.5-2 mm, oblong-elliptical; primary ridges of mericarps with several rows of whitish short bristles; secondary ridges with conspicuous, often golden-yellow hispidulous-papillose, glochidiate spines, c. 2 mm long, confluent with each other at the bases, forming a narrow wing.

Type: Described from Spain, "dans l'Herbier d'Isnard, croit vraisemblablement en Espagne" (P-JU).

A-2 Bougheilan, stony hill, 18.3.1955, *K.M. Guichard* 608 (BM)

Distribution: Spain, Portugal and N. Africa (Algeria, Tunisia & Libya), Mauritania.

Easily recognized by its subsessile, leaf-opposed umbels with 3-5, unequal rays.

2. ***Daucus muricatus*** L., Sp. Pl. ed. 2: 349. 1762; Pamp., Pl. Trip. 163. 1914; Keith, l.c. 429; Quezel & Santa, l.c. 663, fig., plate 64, fig. 1929; Heywood in Tutin et al., l.c. 373; Fiori, Icon. Fl. Ital. 287, fig. 2341. 1933.

Annual herb, up to 60 cm tall, branched above, very hispid. Leaves 3-pinnate; lobes linear-lanceolate, mucronate, sparsely hairy. Rays numerous, markedly unequal, contracted in fruit. Bracts pinnatisect, the segments linear-setaceous, later deflexed; bracteoles linear-setaceous, entire or 3-fid. Petals white, the outer strongly radiate. Fruits 5-10 mm long; spines on secondary ridges silvery-white, 1-2 times as long as the width of the mericarp, strongly dilated and confluent at the base.

Type: Described from the Mediterranean region.

Reported from Tarhuna by Pampanini (l.c.) and Keith (l.c.).

Distribution: W. & C. Mediterranean region, Portugal.

A species of dry, open habitats, especially near the sea. It is very conspicuously hairy (almost lanate) and stoutly spiny on fruits.

3. ***Daucus aureus*** Desf., Fl. Atlant. 1: 242. t. 61. 1798; Keith, l.c. 428; Heywood in Tutin et al, l.c. 373; Zohary, l.c. 451. fig. 654; Fiori, l.c. fig. 2340; Meikle, l.c. 711.

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Annual or biennial stout herb, 30-60 (-80) cm tall, sparingly hairy or subglabrous, frequently branched above, and golden yellowish upwards. Leaves (5-) 10-25 cm long 2-3-pinnatisect, with narrowly linear-acuminate or filiform ultimate segments, 2-25 x 0.5-2 mm, glabrescent. Umbels terminal, long-peduncled, many rayed; rays rigid, (2-) 3-8 cm long subequal, contracted in fruit like a nest. Bracts many, deflexed and shorter than the fruiting umbels, pinnatisect into linear or filiform segment, 1 cm or more long. Bracteoles shorter than the umbellules, partly 3-5-fid, partly undivided. Petals slightly radiating, whitish, turning yellow when dried. Fruits (4-) 5-6 (-8) x 3-6 mm (including prickles), oblong; bristles of primary ribs thickened-bulbose at base; those of secondary ribs numerous, c. 2-3 mm long, very narrow, connate at base, lanceolate, white or yellowish when dried, sometimes reduced to protuberances (var. *subinermis* Zohary); glochidia well-developed; central fruit of umbellules and sometimes inner mericarps of fruit with very short prickles.

Type: Algeria, "inter segetes circa Mascar" (P).

Reported from Hescian (T) (Forest Nursery) by Keith (l.c.).

Distribution: Mediterranean region: Spain, Italy, Sicily, N. Africa (Morocco to Egypt) & Palestine.

A species of cultivated fields and waste places. leaves with fish-like odour; used by Arabs as a flavouring in cooking fish, hence the vernacular name (Keith, l.c.).

Vern. Kamun el hout.

4. ***Daucus carota** L., Sp. Pl. 242. 1753; Durand & Barratte, l.c. 113; Heywood in Tutin et al., l.c. 374; Fiori l.c. 287, fig. 2339.

D. maximus Desf., Fl. Atl. 1: 241. 1798.

A biennial, hispid erect to suberect herb, up to 1 m (or more) tall, with a thickened usually reddish tap root. Leaves up to 30 cm long, oblong in outline, 2-3-pinnate; ultimate segments variable, linear-lanceolate to oblong or broadly obovate-cuneate, \pm glabrous. Umbels pedunculate, terminal and leaf-opposed, usually flat, 5-25 cm in diam, usually many rayed; rays up to 5 cm long, unequal, contracted in fruit. Bracts 1-2-pinnatisect, shorter to as long as the umbel; deflexed in fruit; bracteoles as long as or exceeding the umbellules, usually 3-fid to pinnatisect.

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Flowers white or pinkish, central ones sterile and often dark-blackish-crimson; petals radiating. Fruit oblong, 1.5-3 (-4) x 2-3 mm (including prickles); prickles on secondary ribs numerous, hardly exceeding the width of mericarps, free at the base, glochidiate.

Type: Described from Europe, in Europae campis exaridis'.

A very polymorphic species, usually split into a number of infraspecific taxa (some of these also treated as separate species). This (ssp. *carota*) is usually cultivated in our area, but the following 2 subspecies occur spontaneously.

- (a) ssp. ***gummifer*** (Lam.) Hook. f., St. Fl. Brit. Isles, ed. 3: 185. 1884; Heywood, in Tutin et al., l.c. 374.

D. gummifer Lam. Ency. 1: 634. 1783, non All.; Durand & Barratte, l.c. 113; Pamp., Pl. Trip. 163. 1914; Prodr. Fl. Cir. 351; Keith, l.c. 429.

Similar but umbels convex or only slightly contracted in fruit, plants smaller, often procumbent or ascending, glabrous, or sparsely hairy, leaves ± fleshy.

Type: Described from Britain.

A-3 El-Magharba, 25.5.1978, *M. El-Meghirbi* 42; Tripoli, 12.5.1978, *Hamida B.*

Also reported from various coastal areas in Libya by Durand & Barratte (l.c.) and Pampanini (l.c.)

Vern. Jazr, Sfinnari, Sefrania.

- (b) ssp. ***maritimus*** (Lam.) Batt. in Batt. & Trab., Fl. Alger. (Dicot.): 382. 1889; Heywood in Tutin et al., l.c. 374. 1783.

D. maritimus Lam., Encyc. 1: 634 1783; *D. carota* ssp. *parviflorus* (Desf.) Fiori, Quezel & Santa, l.c. 662; *D. parviflorus* Desf., Fl. Atl. 1: 241, t. 60. 1798.

Fruit spines short, like the type subspecies, but ultimate leaf segment smaller, linear, flowers yellowish, smaller.

Type: Habitat ad maris littora prope Arzean (N.W. Africa)

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A-3 Tripoli, University Campus, soil sandy, common, 10.4.1978, *A. Ghafoor* 332; **B-2** Mizda, 116 km from Mizda towards Algariat, a perennial undershrub, flowers yellow, very common, 13.2.1977, *M.A. Siddiqi* 56.

The above cited specimens have fruits (probably immature) with shorter hairs (spines) like those in the type subspecies but flowers yellowish and leaf-segments narrower as in *D. capillifolius* Gilli. This seems intermediate between the 2 species.

Fl. Feb.-Apr.

5. ***Daucus guttatus*** Sibth. et Sm., *Fl. Graec. Prodr.* 1: 184. 1806; *Fl. Graec.* 3.t. 269. 1819; Durand & Barratte, l.c. 114; Pamp., *Prodr. Fl. Cir.* 352; Keith, l.c. 429; Heywood in Tutin et al., l.c. 373; Zohary, l.c. 451, fig. 642; Meikle, l.c. 713.

D. setulosus Guss. in DC., *Prodr.* 4. 211. 1830; *D. setulosus* var. *branchylaenus* Boiss., *Fl. Or.* 2: 1075. 1872; *D. guttatus* var. *Brachylaenus* (Boiss.) Hayek, *Prodr. Fl. Pen. Balc.* 1: 1051. 1927; *D. bicolor* Sibth. & Sm., *Fl. Graec.*, l.c. 64, t. 270.1819.

Erect to spreading annual herb, 20-30 (-60) cm long, rather flexuose, slender, subglabrous or retrorse-hispid, obscurely sulcate. Leaves usually few, 3-pinnate, 1.5-8 cm long, lower long-petiolate, upper sessile; ultimate segments lanceolate or linear-lanceolate, acute, 2-8 x 1-2 mm, generally entire. Umbels leaf-opposed and terminal, flattish, 6-12-rayed, long-peduncled, peduncles lengthening in fruit. Bracts usually longer than the rays, pinnatisect with many filiform, setaceous or narrowly linear segments, hispidulous, 10-25 (-30) mm long; rays numerous, 5-20 mm long in flowers, increasing and becoming suberect in fruit; bracteoles various, 3-4 outer setaceous, up to c. 15 x 1-1.5 mm, herbaceous, hispidulous, 2-3 inner linear-acuminate, c. 5 x 1-1.5 mm, ± keeled and membranous-ciliate except for the mid-nerve. Flowers white, bisexual, staminate or sterile, those at the centre of umbel and umbellules mostly sterile and dark blackish-crimson; pedicels up to 8 mm in flowers, lengthening in fruit; petals very small, unequal, outer slightly radiant, c. 1-1.5 mm in diam. Fruit narrowly oblong-ellipsoid, 3-5 x 1.5 mm; primary ridges shortly setose with 2 rows of spreading bristles; secondary ridges conspicuously spinose, with 4-5 mm long, single row of glochidiate spines flattened and inconspicuously confluent at the base.

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Type: Italy, 'in collibus argillosis Aprutii: Turri valignano presso Chieti' (NAP).

A-7 Wadi el Naga, W. of Derna, *Sandwyth* 2495 (K); Cyrenaica, *B.C. Park* 553 (K).

Distribution: S. Europe, Turkey, N. Africa

Like *D. syrticus* but smaller, with smaller leaf segments and elongated bracts and bracteoles.

A very similar species, **D. broteri** Ten, with inconspicuous bracts (shorter than to c. as long as the rays) and spines of mature fruits distinctly confluent-winged at the base, may also be found in our area.

6. **Daucus capillifolius** Gilli in Osterr. Bot. Zeitschr. 104: 574. 1958; (Fig. 44).

D. parviflorus auct. non Desf. (1798): Pamp., Pl. Trip. 163. 1914; Keith, l.c. 429.

Similar in habit with *D. parviflorus* Desf. but tall (up to 2 m), leaf-segments distant, very variable in length (up to 5 cm long), linear, capillary; spines on fruit much longer than the width of the mericarps; flowers turning yellowish; fruit with whitish spines, much longer than those in *D. parviflorus*.

Type: Described from Tripolitania

A-2 c. 25 km from Al-Assa, on road to Ragdalin Zwara, flowers greenish-yellow, 2.11.1976, A. Ghafoor 154; 8 km after Zoara, A. K. *El-Rubi* 5; **A-3** Tripoli, university campus, near hostel, sandy soil, common, erect, 1-1.5 m tall; 4.6.1972, S.I. Ali 440; *id.* 8.7.1974, S.I. Ali 2120, 2122 and 2123; Garabouli, small yellow flowers, 29.4.1978, Naima B. Y. 24; University campus, sandy soil, common, flowers yellow or pale, erect perennial, c. 1.5 m tall, 10.4.1978, A. Ghafoor 333.

Distribution: N. Africa.

This species was probably always confused with *D. parviflorus* Desf. by the previous workers on the Libyan Flora. *D. parviflorus* has smaller spines, not longer than the width of the mericarps, like those in *D. carota* and often treated as an infraspecific taxon of this species. However, intermediate forms do occur in our area between this species and var. *maritima* (incl. *D. parviflorus*) of *D. carota*.

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Fig. 44 *Daucus capillifolius*: A, habit $\times 1/6$; B, a portion of stem with leaf base $\times 0.5$; C, umbel $\times 0.5$; D, flower $\times 15$; E, petal (front view) $\times 25$; F, fruit $\times 3.5$; G, mericarp (inner view) $\times 3.5$

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Like *D. areus* Desf. but bracts not deflexed in fruit. Probably only a form of the following species, *D. jordanicus*, which need further studies.

Fl. Mar.-June Vern. Onsale

7. ***Daucus jordanicus*** Post in J. Linn. Soc. Lond. (Bot.) 24: 431. 1888; Zohary, Fl. Palest. 2: 453. fig. 656. 1972. (Fig. 45).

D. libycus Beg. et Vacc. (in ed.)-nom. nud.

Annual, slender herb, glabrous or sparingly papillose, 15-30 (-50) cm tall, erect, dichotomously branched. Leaves 2-3-pinnatisect, with linear to filiform ultimate segments; setulose at the apices. Umbels 6-12-rayed, long-peduncled, terminal; rays somewhat unequal, up to 8 cm long in fruit. Bracts unequal, linear-subulate, entire (very rarely 3-fid or pinnatisect), about half as long as the rays, not deflexed in fruit; bracteoles shorter to about as long as the pedicels, ovate to oblong-lanceolate, acuminate. Petals shortly radiating, white. Fruit oblong-ellipsoidal, 5-7 x 4-5 mm (including prickles), shorter than pedicels; prickles on secondary ribs numerous, much longer than the width of the mericarps, free to the base, weak, setaceous, whitish with minute glochidia at apex.

Type: "Hab. in herbidiis ditionis el ghor, Jordani vallis"

A-2 c. 25 km from Al-Assa on road to Ragdalin-Zwara, *Ghafoor, Alavi & Fathi* 150; **A-3** 8 km from Tripoli University, roadside, 5.12.1975, *Fathi B.R.* 40; University Campus, waste ground, flowers yellowish, 3.12.1979, *S.M.H. Jafri* 10833; c. 25 km from Al-Assa on road to Ragdalin-Zwara, 26.11.1976, *A. Ghafoor* 153; Tripoli, Bir Acara, 1914, *A. Vaccari* 129 (BM).

Distribution: Mediterranean and Saharo-Arabian.

A new record for our area. It seems closely related to *D. muricatus* in its white fruit spines, but capitulum 6-12-rayed only and bracts and bracteole shorter, mostly entire (or 3-fid above), not deflexed in fruit.

Fl. Dec.-Apr.

8. ***Daucus littoralis*** Sibth. & Sm., Fl. Graec. Prodr. 1: 185. 1806; Fl. Graec. 3:

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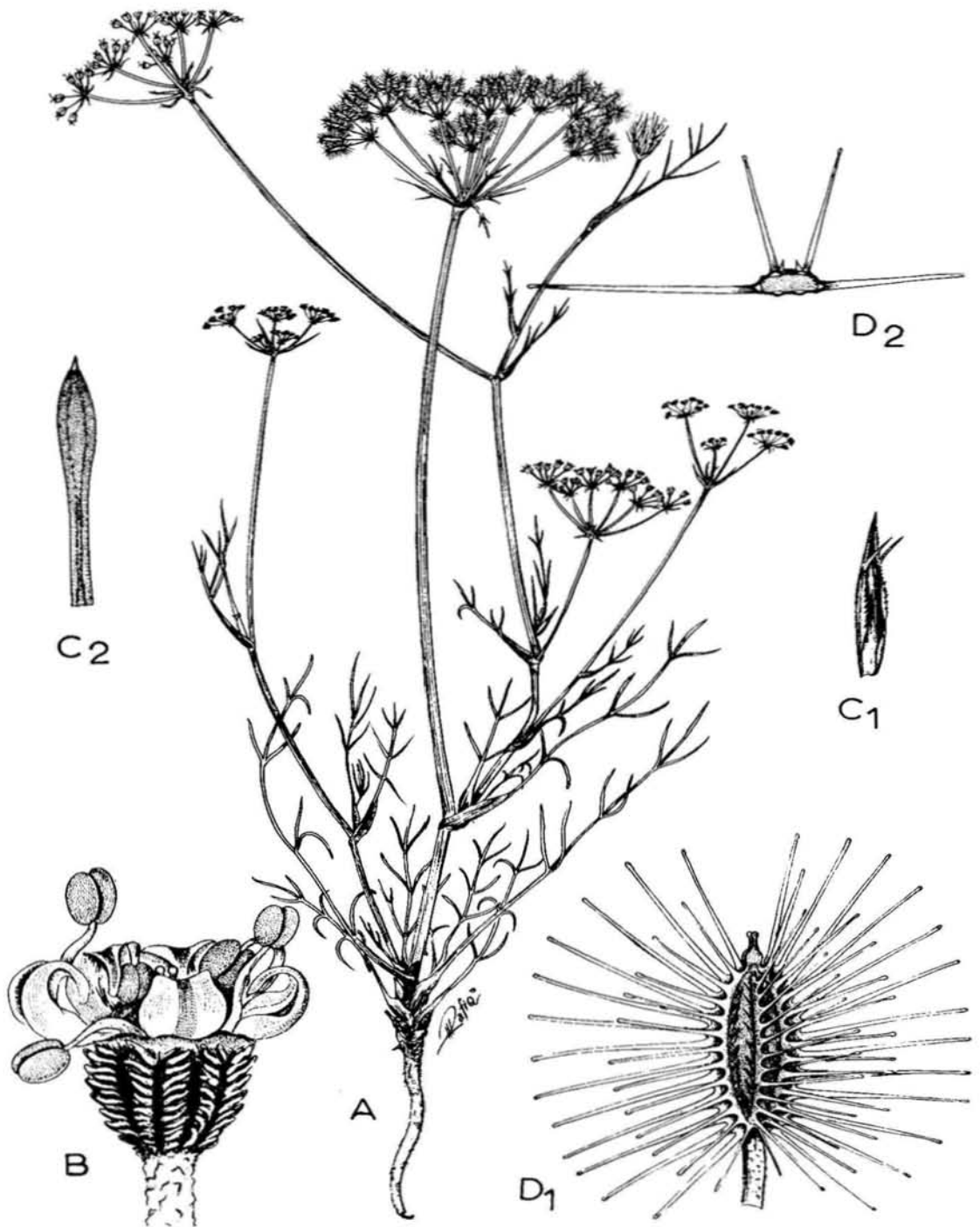


Fig. 45 *Daucus jordanicus*: A, habit $\times 0.5$; B, flower $\times 20$; C₁-C₂, bracteoles $\times 5$; D₁, fruit $\times 5$; D₂, t.s. mericarp $\times 5$.

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65. t. 272. 1821; Cullen in Davis, Fl. Turk. 4: 334, fig. 14. no. 6. 1972; Zohary, l.c. 449, fig. 651; Tack., l.c. 396. (Fig. 46).

Caucalis glaber Forsk., Fl. Aegypt-Arab. 206. 1775; *D. glaber* (Forsk.) Thell. in Mem. Soc. Nat. Cherb. 38: 407. 1912-(non Opiz ex Celak. in Arch. Nat. Land. Bohm. 3 (Bot. Abth.): 582. 1875); Meikle, Fl. Cyp. 1: 713. 1977; *D. muricatus* var. *littoralis* (Sibth & Sm.) H.S. Thompson in J. Bot. 44: 308. 1906. Fig. 58.

Procumbent to suberect annual or biennial herb, 10-40 (-50) cm. often much branched from the base, glabrous to \pm densely retrorse-hispid, rather fleshy. Leaves usually 2-pinnate, 1-6 cm long, subglabrous or scabridulous, rather fleshy and glaucous, petiolate, becoming sessile above; ultimate segments obovate-cuneate, up to 5 x 3 mm, rather bluntly lobed or toothed; Umbels terminal and leaf-opposed, flattish, 5-7 (-15)-rayed, usually long-peduncled; rays very unequal, rigid. Bracts small, 3-6, simple, oblanceolate-acute, or shortly 3-fid, 2-10 mm long, fleshy, spreading, setulose; bracteoles shorter than the umbellules, oblong-lanceolate entire, setulose-ciliate, broadly scarious-margined. Flowers perfect, some male or sterile. Petals \pm radiating, white or yellowish, tinged pink. Fruits oblong or ellipsoidal c. 7 x 2 mm; primary ridges rather prominent, densely and irregularly hispid with shorter, whitish bristles; secondary ridges conspicuously spinose with a single row of rather stout, straight, glochidiate spines, 0-1.5 mm long, usually shortly connate at the bases.

Type: Described from Greece.

A-3 N. Misrata, seashore, 26.4.1967, *L. Boulos* 1830; **A-7** Tokra, 3.3.1973, *S.I. Ali & S.A. Faruqi* 1273; Gebel Akhdar, 26.2.1973, *Samira T.* 50.

Distribution: Mediterranean region.

A very variable maritime species of sandy seashores and dunes, with fruit spines shorter to much longer than the mericarps. A new record for our area, easily recognized by its somewhat fleshy habit, with \pm thickened, yellow roots buried in sand.

9. ***Daucus syrticus*** Murb., Contr. Fl. Nord-Ouest Afr. 1: 87, fig. 1-3. 1897; Durand & Barratte, l.c. 114; Pamp., Pl. Trip. 164, 1914; Prodr. Fl. Cir. 352 1931; Keith, l.c. 429; Tack., l.c. 396, Pl. 136. (Fig. 47).

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Fig. 46 *Daucus litoralis*: A, habit $\times 1$; B, flower $\times 20$; C, fruit $\times 7.5$; D, t.s. mericarp $\times 10$.

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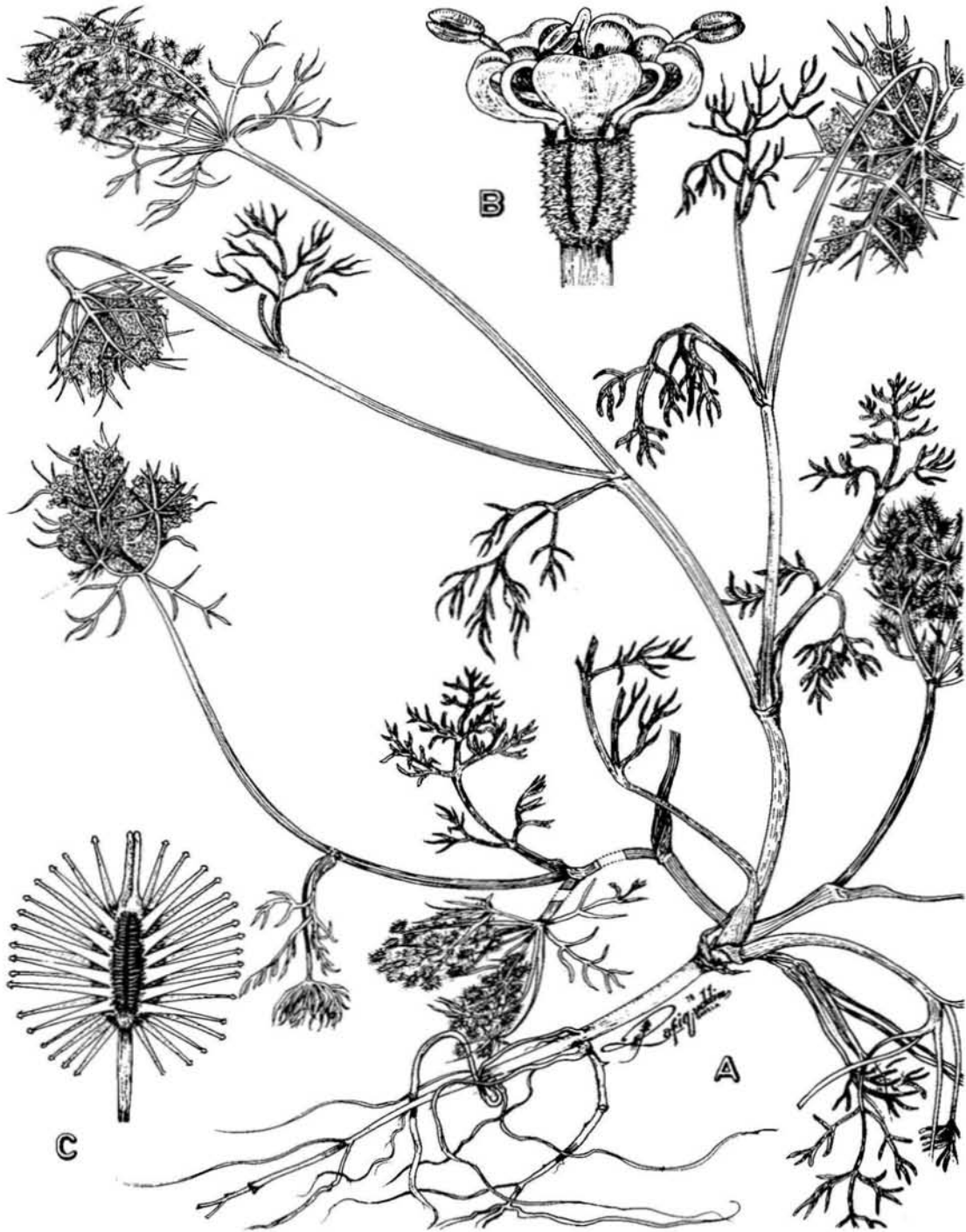


Fig. 47 *Daucus syrticus*: A, habit $\times 1$; B, flower $\times 15$; C, fruit $\times 5$.

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Small, diffuse or ascending annual herb, 10-25 (-30) cm long, hairy, branched from the base, with narrow, almost filiform, acute ultimate-segments. Bracts pinnatisect, c. as long as or exceeding the rays in flowers, not deflexed in fruit; bracteoles divided, at least some of them. Umbels 5-12-rayed; \pm contracted in fruit; umbellules small. Flowers reddish, white or turning yellow with age or when dried; petals slightly or not radiating. Fruits ellipsoid, spiny with regularly arranged spines, much longer than the mericarps width, spreading, yellowish, or with slightly confluent bases; prickles on secondary ridges elongated, much exceeding the mericarps, confluent at base.

Type: Described from Tunisia, Gabes, 24.4.1854, *Kralik* (K, BM, isotypes).

A-1 Wadi Aital, 10.4.1975, *Amina G.* 372; **A-2** c. 18 km from Zawia (towards Ghonem), stabilized sand dune, fls. white, 7.4.1975, *S.I. Ali* 2734; Kolaba, c. 15 km from Garian, sandy soil, cult. field, fls. light violet, 10.4.1975, *S.I. Ali* 2734; Kolaba, c. 15 km from Garian, sandy soil, cult. field, fls. light violet, 10.4.1975, *S.I. Ali* 2720; **A-3** Wadi al Kharwa, 19.5.1978, *Naima A.* 48; Tripoli, University campus, sandy soil, barley field, 18.4.1967, *L. Boulos* 1670; *ibid.*, flowers pinkish-white, 10.4.1978, *A. Ghafoor* 331; Al Kusbat, c. 10 km, violet flowers, 29.3.1975, *K. Sifaw* 214; Msallata, Gurmat area, c. 4 km S.W. of Gusbat, sandy soil, flowers white, 14.4.1978, *A. El-Gadi* 1028; Tripoli, near university, low sandy hill, annual, flowers white, 12.3.1970, *P.H. Davis* 49478; 20-30 km east Tripoli, along the coastal road to Khoms, 8.3.1967, *L. Boulos* 1574; 22 km West Khoms, on calcareous slopes, 25.4.1967, *L. Boulos* 1799; Wadi el Hira, white flowers, 29.4.1976, *Muftah M.Z.* 86; c. 5 km from the coastal road to Tarhuna, going from Khoms, fls. white 30.3.1975, *S.I. Ali* 2606; c. 16 km from Misrata going to Khoms, fls. white, tinged with pink, 29.3.1975, *S.I. Ali* 2540; **A-7** 4 km from Ras Hilal towards Derna, 13.4.1979, *Bashir A.M.* 2; *ibid.*, flowers white, *Hinia N.* 3; **B-4** 25 km W. Syrte, 8.3.1968, *L. Boulos* 1939; Talmina, c. 79 km from Bugrain going towards Misrata, 28.3.1975, *S.I. Ali* 2498; **B-5** near Es Sidra, 9.3.1968, *L. Boulos* 1958.

Distribution: N. Africa.

It seems very similar to *D. broteri* Ten. but fruit spines hardly or not confluent at the bases, bracts usually conspicuous.

10. ***Daucus sahariensis*** Murb., *Contr. Fl. Tunisie etc.* 1: 88, pl. 5. 1897; Jehand. & Maire, *Cat. Pl. Maroc.* 2: 551. 1932; Ozenda, *Fl. Sahara ed.* 2: 362, fig.

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127. (51-52) 1977; Quezel & Santa, l.c. 66, pl. 64, fig. 1926; Keith, l.c. 329. Tack., St. Fl. Egypt, ed. 2: 396. 1974. (Fig. 48).

Platyspermum pubescens Pomel, Nouv. Mat. Fl. Atl. 148. 1874, non *D. pubescens* Koch (1824).

Short annual green herb, c. 15 (-20) cm, branched from the base ascending to erect; stem sulcate, minutely but densely retrorse-hispid. Leaves 2 (-3)-pinnatisect, with linear-oblong, narrow ultimate segments, up to c. 10 (-15) x 1 mm, obtuse, sometimes very shortly bristle-tipped. Umbels compound, central one usually largest, long-peduncled, arising from the base or a little above the base of the plant, unequally many-rayed. Bracts pinnatisect to almost entire, about as long as the rays in flower; spreading or subdeflexed in fruit. Bracteoles similar to bracts but smaller, often exceeding the umbellules. Umbellules many-flowered; pedicels unequal, outer exceeding the flowers and fruits. Petals white, hardly radiate, almost equal, notched at apices. Fruits (almost mature) up to c. 6 x 4 mm; spines on secondary ridges longer than the mericarps width, yellowish when dried, broader at base but not confluent; fruit shortly pubescent between the spiny ridges; styles much longer than the stylopodium, erect, spreading like a fork.

Type: Described from Algeria, Greviers de Oued-Biskra, pres Biskra, 10.5.1853, *B. Balansa* n. 936. (BM - isotype).

A-1 Nalut, Ejwabia, soil rocky corolla white, 8.56.1974, *B. Faris* 539; **C-4** c. 50 km from Hun, c. 30 km from Wadan, towards Tripoli, flowers white, 2.4.1973, with *Ammodaucus leucotrichus*, *S.I. Ali* 1554 (a).

Distribution: N. Africa (Algeria, Tunisia, Libya, Egypt).

A species confined to the N.W. arid regions of Libya.

Fl. April-June

38. PSEUDORLAYA

Murb. in Act. Univ. Lund. 33 (12): 86. 1897.

Annual or rarely biennial, branched, densely hispid or pilose, maritime herbs.

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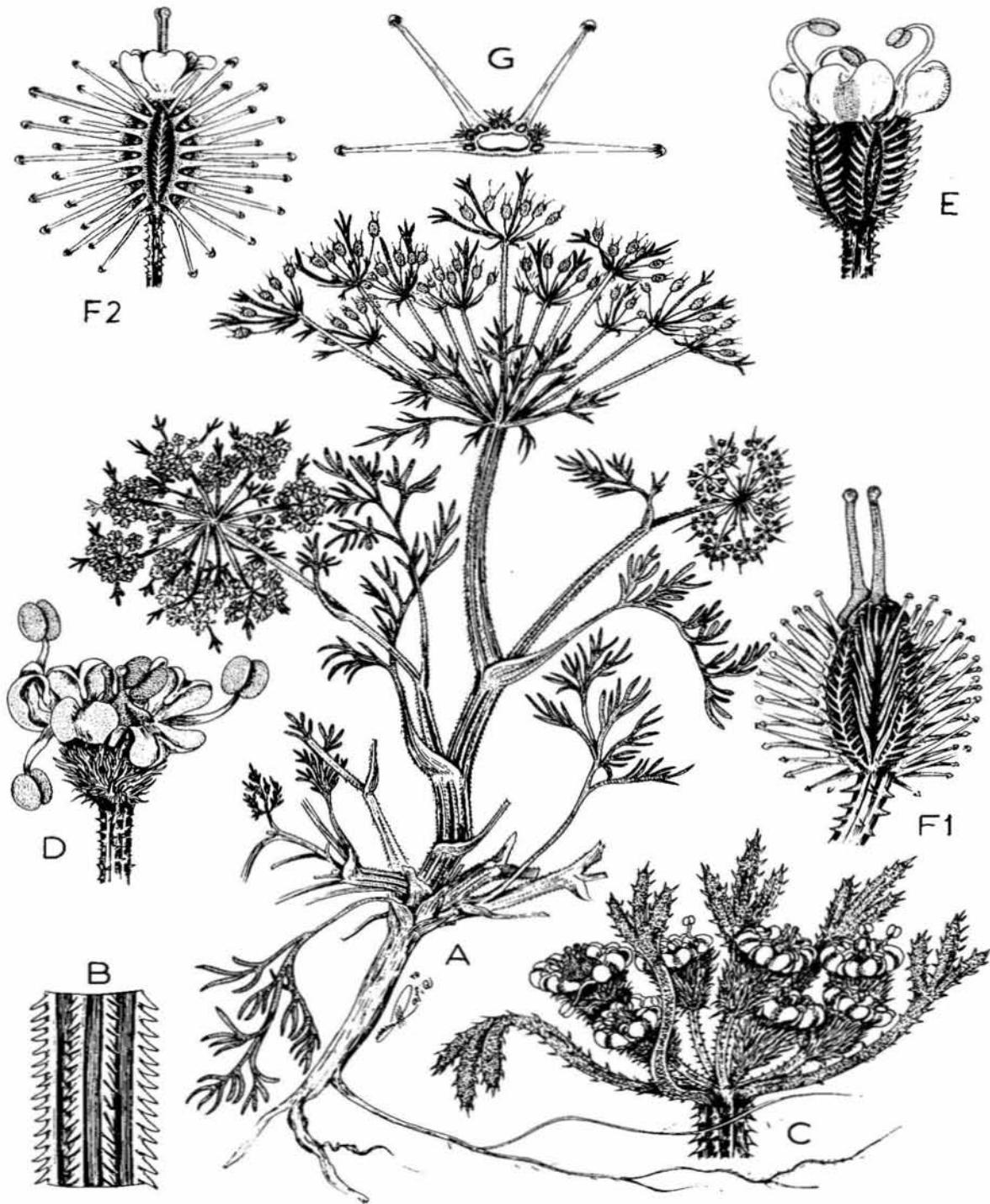


Fig. 48 *Daucus sahariensis*: A, habit $\times 1$; B, portion of stem $\times 5$; C, umbellule $\times 5$; D, flower (early stage) $\times 7.5$; E, the same (late stage with immature fruit) $\times 10$; F₁, fruit $\times 15$; F₂, the same, with persistent petals $\times 5$; G, t.s. mericarp $\times 7.5$

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Leaves short petioled, mostly basal, 2-3-pinnatisect with narrow, pinnatifid or dentate, linear-oblong ultimate segments. Umbels terminal and antiphyllous, peduncled, 2-5-rayed. Bracts and bracteoles present, conspicuous, several, linear-lanceolate, simple or trisect near the tips. Flowers bisexual, small, white with pinkish or purplish tinge. Calyx teeth inconspicuous. Petals obovate, hardly radiating with inflexed apices. Stylopodium hemispherical or conical, shorter than the thick styles. Fruit ellipsoid, dorsally almost flattened; primary mericarp ribs filiform, hispid; secondary ribs with 2-3-rows of straight, glochidiate, spines; carpophore terete, entire. Seeds with plane inner face.

A small genus of 2 Mediterranean species; represented by the following species in Libya.

Pseudorlaya pumila (L.) Grande in *Nouv. Giorn. Bot. ital. nov. ser.* 32, 86. 1925; Heywood in *Tutin et al., Fl. Europ.* 2: 375. 1968; Cullen in *Davis, Fl. Turk.* 4: 536. 1973; Tack., l.c. 394; Zohary, *Fl. Palest.* 2: 400, fig. 577. 1972; Meikle, *Fl. Cyp.* 1: 708. 1977. (Fig. 49)

Caucalis pumila L., *Syst. Nat.* ed. 10. 955. 1759; *C. maritima* Gouan, *Hort. Reg. Monsp.* 135. 1762; *Orlaya maritima* (Gouan) Koch in *Nov. Act. Nat. Cur.* 12 (1): 79. 1824; Durand & Barratte, l.c. 113; Pamp., *Pl. Trip.* 165. 1914; *Prodr. Fl. Cir.* 351. 1931; Keith, l.c. 715; *Daucus pumilus* (Gouan) Bax. in *J. Linn. Soc. (Bot.)* 16: 477. 1978. *Pseudorlaya maritima* (Gouan) Murb. in *Act. Univ. Lund* 33 (12): 86. 1897; *O. pumila* (L.) Hal., *Conspe Fl. Grae.* 1: 622. 1901. *Daucus biseriatus* Murb., *Contrib. Fl. Tunis.* 2: 51. pl. 11. 1905; Jehand. & Maire, *Cat. Pl. Maroc.* 2: 551. 1932; Quezel & Santa, l.c. fig. 64, no. 1927.

Small, densely hairy, 5-20 (-30) cm tall, spreading basally much branched herb with distinctly ribbed stem. Leaves oblong to deltoid-ovate, 1.5-6 x 1-3.5 cm, pilose, 2-3-pinnatisect into ovate lobes with linear-oblong, 2-5 x 0.8-2 mm, obtuse ultimate segments; lower leaf petioles usually buried in sand, stout, up to 6 cm long. Umbels 3-7-rayed, on leaf-opposed and terminal, 1-8 cm long, stout, conspicuously sulcate, patent hairy peduncles; rays very unequal, 5-10 mm at anthesis, elongating up to 4 cm in fruit. Bracts 2-5, lanceolate-linear to subulate, 5-15 x 1-10 mm, entire or sometimes 3-fid, acuminate. Umbellules densely 8-12-flowered, c. half of flowers functionally male or sterile. Pedicels 1-5 mm long. Bractlets similar to bracts, patent to reflexed. petals broadly obovate, equal, c. 1.5 mm long and broad, pink or purplish, emarginate at tips. Anthers broadly ovate-suborbicular, pinkish or purplish. Ovary of fertile

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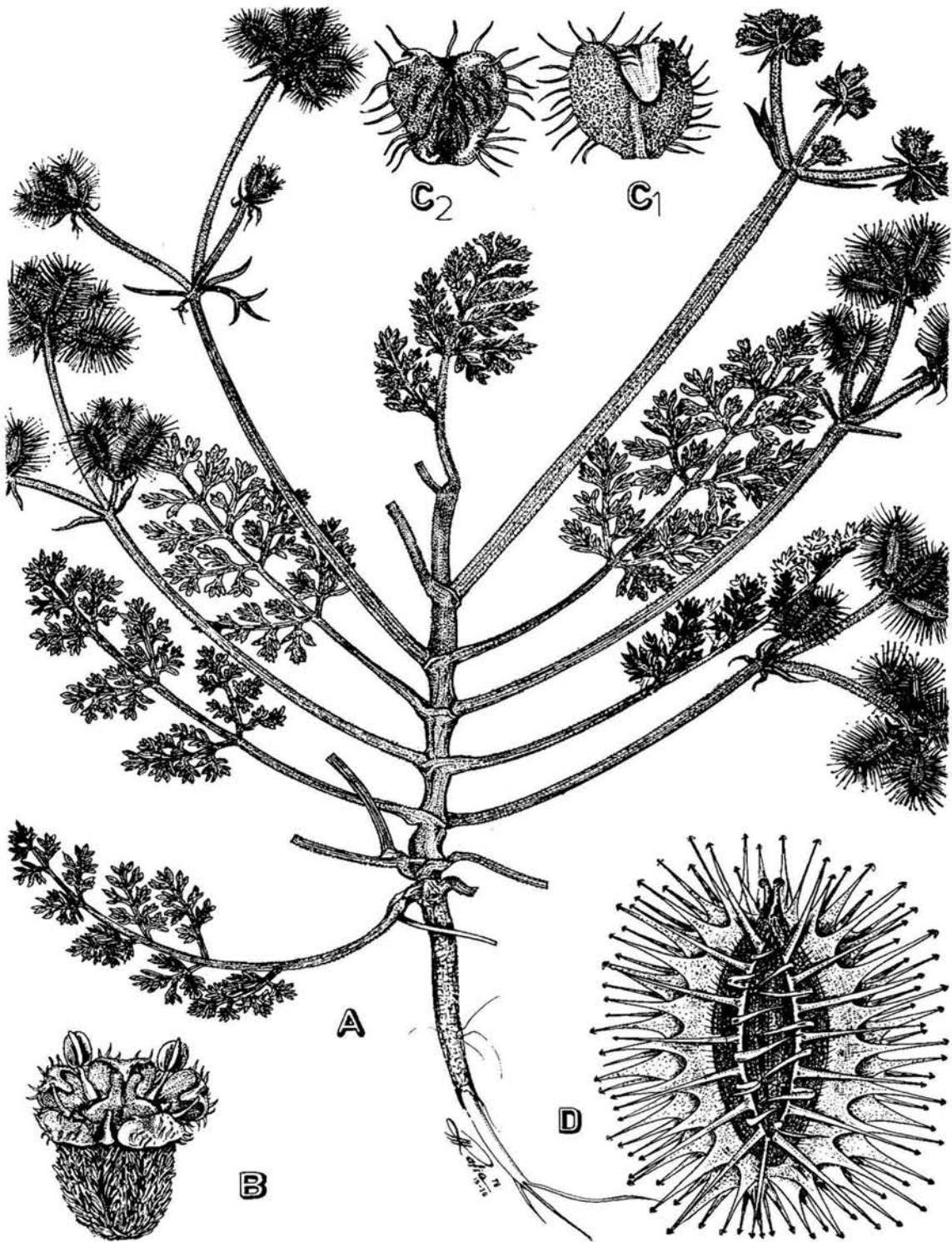


Fig. 49 *Pseudorlaya pumila*: A, habit $\times 1$; B, flower $\times 15$; C₁, petal (front view) $\times 15$; C₂, the same (back view) $\times 15$; D, fruit $\times 5$.

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flowers densely hispid; fruit oblong-ellipsoid, (4-) 6-10 x 4-6 mm, brownish; mericarps patent hairy on primary ribs, secondary ribs with 1 or 2 rows of 2.5-3.5 mm long, stout, basally widened spines.

Type: Probably collected in Spain by Alstromer.

A-3 *Leptis Magna*, fls. light, violet, 29.3.1975, *S.I. Ali* 2564; Tripoli, Al-Faateh University Campus, soil sandy, annual herb, c. 10 cm tall with suberect floral shoots, fruit spiny, 10.4.1978, *A. Ghafoor* 329; Tajora, near Tourist hotel, sea coast, fls. pinkish, 12.3.1977, *A. Ghafoor & Mohammad Ahmed* 269; Wadi El-Raml, c. 55 km east of Tripoli, sandy soil, an annual herb, fruits spinose, 14.4.1977, *M.A. Siddiqi* 208; Labda, 29.3.1975, *Fauzia* 176; Misurata, 29.3.1975, *Fauzia* 163; barley fields facing Faculty of Science, Sidi El-Masri, Tripoli, in sandy soil. 18.4.1967, *L. Boulos* 1672; Tarhouna-Beni Walid (new road), 2.5.1978, *Saleh* 9; **A-6** Mersa El-Brega-Ajdabia road, *L. Boulos* 1968; **A-7** Derna, sandy terrain near sea, 20.4.1954, *K.M. Guichard* KG/CYR/135 (BM).

Distribution: S. Europe, N. Africa, W. Syria, Turkey and Cyprus.

Common in the maritime sands throughout Libya.

Fl. Feb.-Apr.

D. biseriatus Murb. is described having yellow flowers which seems to be a mistake. It seems a form of this species with smaller fruits, 4-5 mm, but short obtuse ultimate leaf-segments and stout stylopodium with shorter styles are exactly like in this species.

39. AMMODAUCUS

Coss. & Dur. in Bull. Soc. Bot. France 6: 393. 1859.

Annual, glabrous, not much branched herb with long, mostly unbranched tap root. Leaves petiolate, 2 (3-)-pinnatisect with fleshy, linear-oblong ultimate segments. Umbels leaf-opposed, few-rayed. Bracts and bracteoles 3-partite and with broad membranous margins. Flowers bisexual, white or purplish-white. Calyx teeth short. Petals obovate, unequal, the outer radiant, emarginate with inflexed apices. Ovary hairy; styles longer than the stylopodium. Fruit ovoid-oblong, compressed

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dorsally; carpophore stout, entire; mericarps with 5, hispidulous ribs and conspicuous, densely long soft-setose hairy 4 secondary ribs; each secondary rib with a single oil duct below it; commissural oil ducts 2. Seeds with \pm flat inner face.

A monotypic genus distributed throughout N. and W. Africa in the Saharan and subsaharan countries.

Ammodaucus leucotrichus Coss. & Dur., in Bull. Soc. Bot. France 6: 393. 1859; Durand & Barratte, l.c. 113; Pamp., Pl. Trip. 160. 1914; Quezel & Santa, l.c. 659; Keith, l.c. 222; Ozenda, l.c. 360. fig. 127. (Fig. 50).

Annual, erect, up to 25 cm tall, glabrous herb, with striate, short stems from base. Leaves with basally sheathing petioles, dark green, 2-3-pinnatisect into narrowly linear-oblong, less than 1 mm broad, fleshy ultimate segments. Umbels 2-4-rayed, on 1-5 cm long, leaf-opposed peduncles; rays 1-4 cm long, unequal, suberect at flowering and fruiting. Bracts as many as rays, 1-3.5 cm long, \pm sheathing at the base, unipinnatisect in the upper half, with broad \pm setulose membranous margins and setulose lobes. Flowers white, 5-10 in each umbellule, on 5-10 mm long, setose, pedicels; bractlets tripartite, shorter to as long as pedicels, membranous margined, acuminate tipped. Petals white, c. 1 mm long, shallowly 2-lobed. Ovary oblong, c. 1 mm long, hairy. Fruit ovoid, 10-12 x 5-6 mm, densely beset with soft pale brown, 2-5 mm long hairs; mericarps compressed dorsally, with 4, hairless secondary ribs between the 5 prominent primary ribs, flattish on innerside.

Type: Algeria, in prov. Cirtensis ditone Biskra prope Saada, *Blansa*

A-3 Misurata, 30.3.1975, *Zenab Abou Raya* 174; **B-1** Wazen, Libyan-Tunisian boundary & Dheba edges, corolla white, 10-12 cm, 9.6.1974, *B. Faris* 596; Wadi near Bohairat Mjazzam on Derj-Ghadames road, an annual herb with light purple flowers like coriander, 29.1.1977, *M.A. Siddiqi & F.B. Ratib* 421; **A-4** c. 50 km from Twarga towards Bugrain, 16.4.1978, *Ramadan* 235; **B-4** 52 km from Bugrain on way to Hun, roadside, stony ground, erect, fruits woolly, fls. white, common, 17.2.1978, *S.A. Alavi*, 1731; c. 4 km from Bugrain (going towards Misrata) sandy ground with pebbles, fls. white, fruit woolly, 28.3.1975, *S.I. Ali* 2471; 18 km W. of Bugrain, clayey soil, 2.5.1978, *A. El-Gadi & M.A. Siddiqi* 1236; **C-4** c. 80 km from Hun towards Besalt hillock, 1.4.1973, *S.I. Ali* 1510; c. 50 km from Hun, c. 30 km from Wadan towards Tripoli, fls. white, 2.4.1973, *S.I. Ali* 1554; Weshka, c. 27 km from Hon, 25.3.1975, *Amina Gammudi* 35; Weshka, 26.3.1975, *Fauzia*, 68.

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Fig. 50 *Ammodaucus leucotrichus*: A, habit $\times 1.5$; B, flower $\times 10$; C, gynoecium $\times 5$; D, fruit $\times 2.5$; E, mericarp (inner view) $\times 2.5$

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Distribution: N. Africa, Mauritania, and Mali.

A species of subdesert regions of Libya, common in alluvial soil in sandy wadis of Western and Central parts.

Fl. Jan.-June *Vern.* Tagreftah.

The following taxa are reported to be cultivated in our area for their edible tuberous roots by Keith (l.c.) etc.

1. **Chaerophyllum bulbosum** L. (white flowered with narrowly oblong, 5-7 mm long fruits); Fiori, *Icon. Fl. Ital.* 291, fig. 2372. 1933.
2. **Pastinaca sativa** L. Parsnip' (yellow flowered with somewhat winged, elliptic, 8 x 4 mm fruits); Fiori, l.c. 284, fig. 2320.
3. **Sium sisarum** L. (white flowered with ovoid fruits, 2-3.5 mm long); Fiori, l.c. 278, fig. 2270.

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