

VOLUME FIVE

FLORA

OF TURKEY

and the East Aegean Islands

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Reader in Taxonomic Botany

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9. Tribus Carduaceae

is difficult, and I have taken a rather different view from that of Aitken. According to that author, *A. major* (Gaertner) Bernh. (syn. *A. lappa* Nutt. non L.) occurs in Turkey and across Asia to China and Japan. I consider that this taxon is best regarded as a subspecies of *A. minor*; it is distinguished from *A. minor* subsp. *pubens* chiefly by its larger involucre and more definitely corymbose inflorescence. I have seen no material of *A. major* from Turkey or Il. Asia, and *A. minor* subsp. *pubens* appears to be much the most widespread subspecies. The petioles of the radical leaves are sometimes stated to be solid in *A. major* and hollow in *A. minor*. However, since this correlation is still uncertain and the character cannot be observed in dried specimens, I have not taken it into account here (vide Aitken, op. cit. 69). Field notes on this character are needed.

60. ONOPORDUM L.

A. DANIN

Stout, spiny, arachnoid biennials, rarely glandular; stems and peduncles usually prickly-winged throughout. Leaves armed, simple, pinnatifid, pinnatifid or pinnatisect, basal leaves mostly larger than cauline ones. Capitula solitary to corymbose. Involucre hemispherical to globose; phyllaries pluriserial, imbricate, $\pm$ lanceolate, coriaceous and spine-tipped, outer ones sometimes triangular, erect to recurved, adpressed to lax. Receptacle with deep, denticulately fringed pits. Flowers tubular, hermaphrodite, limb oblique with linear lobes, usually lilac to purplish. Achenes tetragonal, laterally compressed, rugulose; pappus hairs in several series, scabrous, barbellate or plumose, connate into a ring at base, finally deciduous.

Rouy, M.G. 1896. Révision du Genre *Onopordum*. Bull. Soc. Bot. Fr. 43:577-599. Eig. A. 1942. Revision of the *Onopordum* species of Palestine, Syria and adjacent countries. Pal. J. Bot., Jer. Ser. 2(4):185-199. Dress, W.J. 1966. Notes on the cultivated Compositae 9: *Onopordum*. Baileya 14:75-86.

An under-collected genus.

1. Stems and leaves covered sparsely with small erect glandular hairs; plants bright to dark green 14. *lauricum*
1. Stems and leaves covered to a varying extent with adpressed arachnoid indumentum, glandular hairs rare (if present then only on lower leaf surface); plants grey-green or white
2. All phyllaries erect
3. Capitula solitary on very long peduncles; wings of peduncles often narrowed beneath capitulum
4. Phyllaries glabrous, strongly imbricate, outer ones triangular, 3-8 mm, purple, all phyllaries tapering into a yellow 1-2 mm spine 4. *armenium*
4. Phyllaries arachnoid, larger, inner ones tapering into a 3-5 mm spine 3. *rundifolium*
3. Capitula mostly many, in corymbs or aggregated on short (1-10 cm) peduncles; peduncles $\pm$ equally winged up to capitula or unwinged for 1-3 cm beneath capitula
5. Capitula, each on a 1-2 cm peduncle, aggregated into groups of 2-16 together at end of long branches; involucre 1.5-3 cm broad; outer and median phyllaries 1-2.5 mm broad 1. *polyccephalum*

5. Capitula in corymbs on 2-7(-10) cm peduncles; involucre 3-4 cm broad; outer and median phyllaries 2-3-5 mm broad 2. turkeum
2. Outer and median phyllaries reflexed or patent, inner ones erect
6. All leaves pinnatisect, densely covered beneath with sessile glands; phyllaries glabrous, purple, median ones c. 30 x 5 mm, gradually attenuate towards tip 8. bolssleri
6. Leaves lobed or pinnatifid but rachis always winged; phyllaries mostly arachnoid and green; if glabrous and coloured then broader and shorter or narrower and longer than in *O. bolssleri*
7. Involucre 1-2-2 cm broad (excl. spines)
8. Upper part of phyllaries flat, patent to reflexed with a 2-4 mm acicular spine; pappus hairs with lateral projections 2-3 x as long as rachis width 12. carleum
8. Upper part of phyllaries acicular, patent with a (3-)5-10 mm acicular spine; pappus hairs with lateral projections 4-6 x as long as rachis width 13. davalli
7. Involucre more than (2-)2.5 cm broad (excl. spines)
9. Phyllaries slender, basal part of median ones less than 5 mm broad and spine (above constriction) more than 10 mm; if not constricted, then total length 23-27 mm
10. All phyllaries gradually attenuate, median ones 23-25 mm, 2 mm broad at base 17. acanthium
10. Median phyllaries 30-40 mm, 5 mm broad at base, abruptly tapering to a rigid 20-25 mm spine
11. Pappus hairs shortly plumose, with lateral projections 2-4 x as long as rachis width; phyllaries with basal parts compactly imbricate, glabrous to very sparsely arachnoid 16. anatolicum
11. Pappus hairs scabrous, with lateral projections as long as or shorter than rachis width; phyllaries loosely imbricate, densely arachnoid 15. sibthorplanum
9. Phyllaries broad, basal part of median ones more than 5 mm broad, spines (above constriction) less than 10 mm long, rarely spines 15 mm long then basal part 8-10 mm broad; if not constricted, then total length 40-50 mm
12. All corolla lobes unequal (at base), longest one 1-3 mm longer than rest; median phyllaries abruptly narrowed into a 4-5 mm spine 7. carduchorum
12. Four corolla lobes equal (at base), 3-5 mm shorter than fifth; median phyllaries gradually attenuate into a larger spine
13. Margin of median phyllaries distally serrate with lateral 1-4 mm spine 11. majori
13. Margin of median phyllaries minutely serrulate or smooth
14. Inner phyllaries shorter than flowers; upper cauline leaves subtending involucre, much shorter than phyllaries 5. illyricum
14. Inner phyllaries subequal to flowers; subtending leaves as above or much longer
15. Leaves (mature) glabrescent above, greenish; stem glabrescent with 1-6 wings 6. rhodense
15. Leaves and stems densely arachnoid, whitish; stem wings 6-12

9. Tribus Cardueae

16. Upper cauline leaves subtending involucre, 3-4 cm; basal leaves pinnatilobed (lobes less than $\frac{1}{4}$ width of lamina), lobes triangular
10. bracteatum
16. Subtending leaves small, up to 2 cm; basal leaves pinnatifid (lobes about $\frac{1}{4}$ width of lamina), lobes lanceolate
9. myriacanthum

1. *O. polycephalum* Bolss., Diagn. ser. 2(3):47 (1856).

Biennial, 60-200 cm, adpressed arachnoid-tomentose, whitish. Stem much branched above, leafy throughout; wings 2-4, 2-10 mm wide, sinuate and spinose; spines sparse, 2-12 mm, at tips of small triangular lobes with prominent nerve. Basal leaves oblong-lanceolate, pinnatilobed with triangular lobes tapering into 3-8 mm spines; cauline leaves linear, with large spiny lobes. Capitula many, aggregated (2-16 together) into dense irregular corymbs each on a 1-2 cm peduncle; peduncles with very narrow wings reduced to 2-4 rows of minute spines. Involucre 2-2.5 x 1.5-3 cm, with flat to conical base; phyllaries erect, arachnoid-canescens, with glabrous spiny tips, 4-23 x 1-2.5 mm, gradually tapering into a 2-5 mm glabrous spine, inner slightly shorter than flowers. Flowers 20-25 mm, lobes unequal, longest 1-2 mm longer than shortest. Pappus hairs shortly plumose, lateral projections 2-3 x as long as rachis width. Fl. 6-8. Dry meadows, stony slopes, fallow fields and roadsides, 1400-2130 m.

Type: [Turkey C5] in Tauro Ciliceo, Kotschy (holo. G1).

C. & S. Anatolia. B6 Malatya: Darende, 1400 m, Sorger 71-48-11 Maraş: d. Göksun, Yalak, 1400 m, D. 199141 C5 İçel: Bulgar Maden, 16 ix 1855, Hal. I Konya: Karapınar, Andrasovszky. Niğde: E. of Maden, 1520 m, Darrah 4991 C5/6 Adana/Hatay: Amanus, 11b. Post. C6 Maraş: Berit Da., 1830-2130 m, 7 viii 1865, Hausskn. I

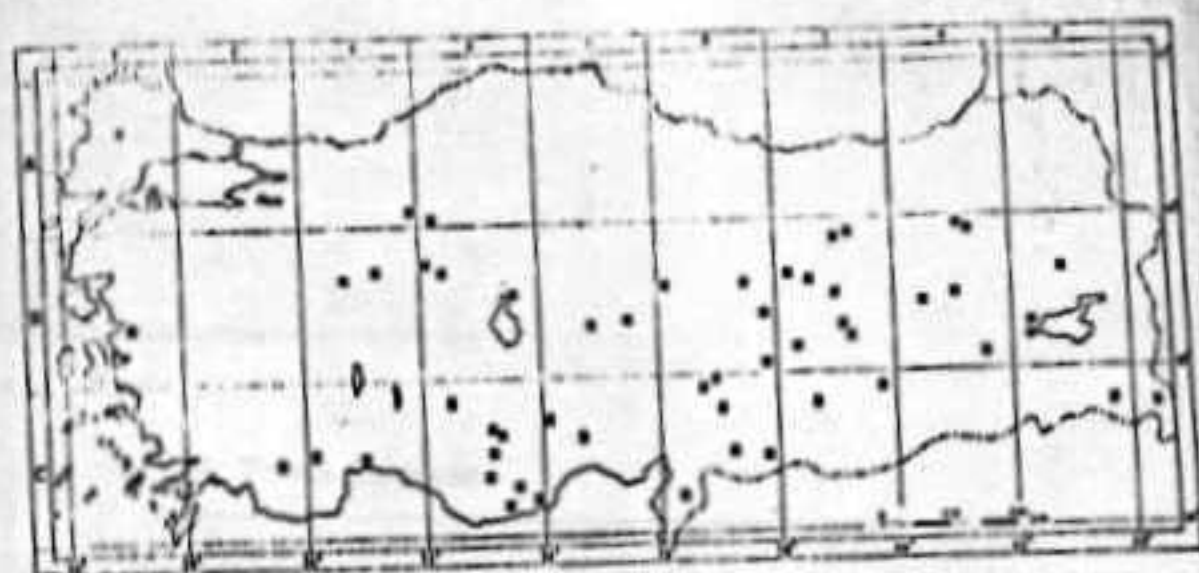
Endemic. Ir.-Tur. element. Related to *O. tureleum*.

2. *O. tureleum* Danin in Notes R.B.G. Edinb. 33:254 (1974). Map 37, p. 359.

Biennial, 50-200 cm, adpressed arachnoid, grey-green. Stem branched above, leafy throughout; wings 2-4, 2-10 mm wide, sinuate and spinose; spines sparse, 2-18 mm, at tips of small triangular lobes with swollen prominent nerve. Basal leaves elliptic, pinnatilobed, with small triangular lobes with distinct prominent median nerve tapering into a 2-7 mm spine; cauline leaves narrower, with 5-15 mm spines. Capitula 1-7, corymbose, on 2-7(-10) cm peduncles; peduncles with wings 2-4 mm broad and subulate spiny leaves; spines 3-10 mm. Involucre 2.5-3 x 3-4 cm, with flat base; phyllaries erect, arachnoid to glabrescent, lanceolate, 15-28 x 2-3.5 mm, inner slightly shorter than flowers. Flowers 23-30 mm; four corolla lobes equal, 2 mm shorter than fifth. Pappus hairs barbellate-subplumose, lateral projections 1-2 x as long as rachis width. Fl. 7-8. Steppe, chalky slopes, river banks, fallow fields, roadsides, 800-2150 m.

Type: Turkey B7 Tunceli: Pülümür to Selepur, 1700 m, roadside at edge of oak scrub, 23 vii 1957, Davis & Hedge, D. 31606 (holo. E1).

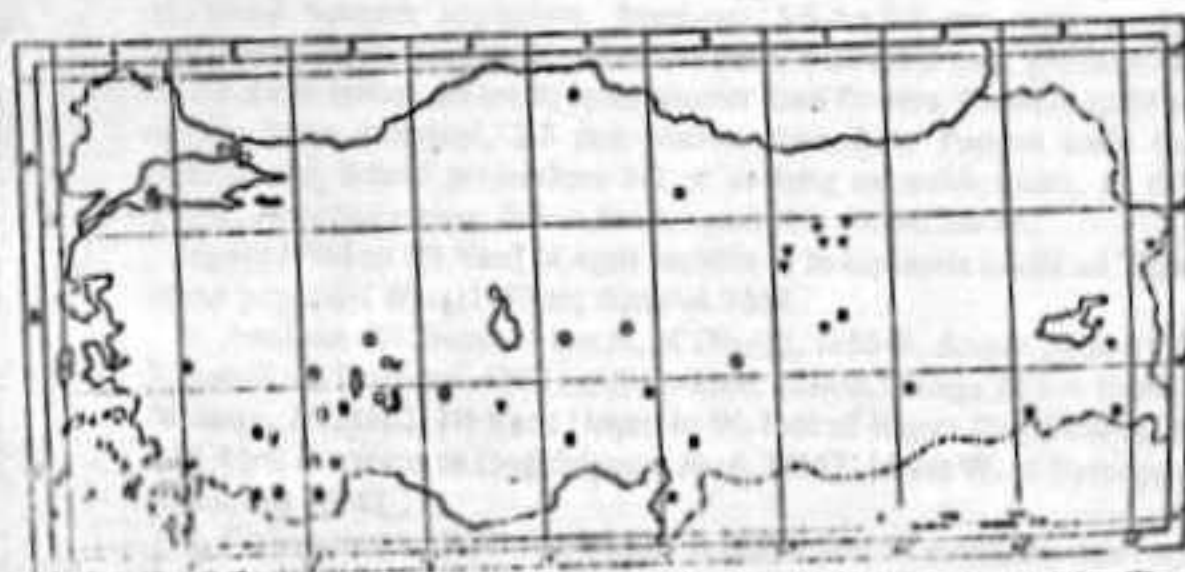
Mainly Inner Anatolia. A4 Ankara: mts. N. of Çetçeren (Keçibren), viii 1906, Frères E.C. I A6/B6 Sivas/Tokat: Çamlıbel Da., between Arhova and Yıldızeli, D. 248671 A8 Erzurum: 27 km from Erzurum to Tortum, 1950 m, D. 475311 Gümüşane: Balburt, Bourgeau (*O. lanigerum* Bolss. ms.) I B3 Eskişehir: Beylikahır to Mihallıçık, 850 m, D. 371961 B4 Ankara: Ankara, D. 132311 B5 Kırşehir: nr Kırşehir, 1120 m, M. Zohary 6111 B6 Sivas: 60 km E.W. of Sivas,



MAP 36 ■ *Gundelia tournefortii* (1) sensu lato.



MAP 37 □ *Onopordum bolzleri* (8) ● *O. densit* (13) ▼ *O. illyricum* (5)
▽ *O. tauricum* (14) ■ *O. turcicum* (2).



MAP 38 ○ *Onopordum anatolicum* (16) ▽ *O. bracteatum* (10) ▼ *O. candidum* (3)
■ *O. carduchicum* (7) ● *O. sibthorpianum* (15).

9. Tribus Cardueae

1620 m, *M. & D. Zohary* 209/31 B7 Erzincan: nr Refahiye, 1570 m, *Hub.-Mor.* 12864! B8 Erzurum: Kandilli, 40 km W. of Erzurum, *Rech.* 32880! B9 Ağrı: Doğubayazıt to Ağrı, c. 53 km E. from Ağrı, 1900 m, *Lamond* 50291.

S. Transcaucasia. Ir.-Tur. element. This species is closest to *O. polyccephalum* but has sometimes been confused in Turkey with the Caucasian *O. heteracanthum* C.A. Meyer and the Persian-Afghan *O. leptolepis* DC. etc. Two specimens from C. Anatolia (B5 Nevşehir: 7 km N.E. of Göreme, 1100 m, *Sorger* 70-38-4! B4 Ankara: Ankara, *D.* 13224!) are probably conspecific with *O. turcicum* but have smaller capitula with laxer, slightly patent phyllaries.

3. *O. candidum* Náb. In *Publ. Fac. Sci. Univ. Masaryk Brno* 52(2):35, t. 6 f. 1, 2 (1925). Map 38, p. 359.

Biennial, 50-100 cm, adpressed tomentose, white. Stem slightly branched above, leafy up to 10-15 cm beneath capitula, sometimes with small scale-like non-decurrent leaves beneath capitula; wings 4-6, 1-4 mm wide, spinose and weakly sinuate; spines 2-8 mm, with hard swollen nerve at the obscure lobe. Basal leaves oblong-lanceolate, pinnatifid with triangular lobes, spines at tips of lobes 3-8 mm, at lobe margins 2-6 mm, all with prominent nerve; upper cauline leaves becoming entire, uppermost small, on peduncles gradually grading into phyllaries. Capitula solitary on 15-35 cm peduncles, wings of peduncles often narrowed beneath capitulum. Involucre 3.5-4 x 3-4 cm, with conical base; phyllaries densely arachnoid, often purplish, 8-30 x 2-5 mm, gradually attenuate into 3-5 mm spines, all erect, inner shorter than flowers. Flowers 30-35 mm; four corolla lobes subequal, 2-3 mm shorter than fifth. Pappus hairs barbellate-subplumose, lateral projections 1-2 x as long as rachis width. *Fl.* 6-8. *Rocky slopes, disturbed steppe, fallow fields, roadsides, 1100-2200 m.*

Type: [Turkey B9 Van] In agris incultis et in lapideis aridis ad Topra Kaleh supra oppidum Wan, 1850 m, *Nábelek* 3554.

E. Anatolia. B7 Sivas: 14 km N. of Divriği, 1150 m, *Sorger* 70-30-1! Erzincan: 37 km E. of Erzincan, 1260 m, *Hub.-Mor.* 12863! Elazığ: 32 km from Elazığ to Malatya, *D.* 24802! B9 Van: Hoşap to W. foot of Keper Da., 2200 m, *D.* 24527! B10 Ağrı: Bazargan to Doğubayazıt, *Rech.* 37657! 15 km W. of Bazargan, 1500 m, *Kukkonen* 79961.

S. Transcaucasia. Ir.-Tur. element. It seems that *O. candidum* was confused by several authors with the Persian *O. leptolepis* DC., which has larger capitula and phyllaries, and pappus hairs with lateral projections 4-6 x as long as rachis width. It was also confused with the Caucasian *O. heteracanthum* C.A. Meyer which is not as white in colour, has inner phyllaries subequal to the flowers, and median phyllaries sometimes patent to reflexed.

4. *O. armenum* Grossh. In *Acta Horti Tiflis* 2(1):40 (1920). Syn: *O. fidekl* Tamamsh. In *Fl. URSS* 28:605 (1963).

Biennial, c. 100 cm, adpressed arachnoid, grey green. Stem branched above, leafy throughout; wings 4-6, 1.8 mm wide, faintly sinuate and spinose; spines sparse, 1-5 mm, at tips of small triangular lobes with prominent nerve. Leaves oblong-lanceolate to linear, scarcely lobed; lobes triangular, tapering into 1-5 mm spines. Capitula on leafless 7-17 cm peduncles with wings narrowed beneath capitulum. Involucre globose, 2-2.5 x 3-3.5 cm; phyllaries erect, glabrous, flat, dark purple at anthesis, strongly imbricate, lanceolate, 3-25 x 2-3 mm, grad-

ally tapering into 1-2 mm spines, 1-2 cm shorter than flowers. Flowers much longer than inner phyllaries. Pappus hairs barbellate-subplumose, lateral projections 1-2 × as long as rachis width. Fl. 7. Mountain steppe and roadsides, c. 1500 m.

Type: [Soviet Armenia] distr. Erevan, prope Dzhrivish, 1220 m, in locis incultis, 17 vii 1919, A. Grossheim.

Easternmost Anatolia. 110 Kar: Pamuk Da., Iğdir to Doğubayazıt, 1500 m, D. 470431

Soviet Armenia, N.W. Iran, Ir.-Tur. element. I am indebted to An. A. Fedorov for matching the Turkish specimen with material from the *locus classicus*.

5. *O. illyricum* L., Sp. Pl. 827 (1753). Ic: Reichb., Ic. Fl. Germ. 15: t. 814, 887 (1853); Rech., Fl. Aeg. t. 27 f. 6 (1943); Beauverd in Bull. Soc. Bot. Genève sér. 2(6): 151, 153 (1914). Map 37, p. 359.

Biennial, 30-80 cm, adpressed tomentose, whitish-green. Stem slightly branched above, leafy throughout; wings 2-12, 2-5 mm wide, spinose and weakly sinuate; spines yellow, 2-7 mm. Basal leaves narrowly oblong-lanceolate, pinnatifid; lobes lanceolate, irregularly dentate with spiny 2-7 mm lobes; uppermost leaves up to 2 cm. Capitula 1-4 on 5-15 cm peduncles. Involucre 3.5 × 3-6 cm (excl. spines), with flat to concave base; phyllaries broadly lanceolate, glabrous except outer ones, mostly pinkish, 10-35 × 3-8 mm, gradually attenuate into a 3-5 mm spine; outer and median phyllaries patent to reflexed, inner erect, shorter than flowers. Flowers 3.5-4 cm; four corolla lobes equal, 4-5 mm shorter than fifth. Pappus hairs shortly plumose, lateral projections 3-4 × as long as rachis width. Fl. 6-7. Roadsides, ruins and other disturbed habitats at low altitudes.

Described from S. Europe. Lectotype designated here: the illustration in Lobel, Plantarum seu Stirpium Icones 2:1 (1581)†.

W. Anatolia, Islands. A1(E) Çanakkale: Dardanelles, Forsskål. B1 Izmir: Yamanlar Da., 1854, Bal. 278! Balıkesir: Assos, Sint. 1883:795! C1 Izmir: Kuşadası, 50 m, Sorger 64-58-12! Ik: Lésvos, Cand.; Kalymnos, Rech. 7866! Leros, Ikonomopoulos; Kos, Rech. 4941! Nisiros, Papadon 1. -

S. Europe, Cyprus. Medit. element. There are several literature records from S. Anatolia (incl. Amanus), but as the species has been much confused in herbaria (in Turkey especially with *O. carduchorum*) these have not been cited here (cf. Elg, op. cit.). *O. illyricum* L. var. *cardunculus* Boiss., Fl. Or. 3:561 (1875), described from the Cataonian Taurus (Haussknecht, holo. G!) differs from the type by its phyllaries being abruptly constricted into a 2-4 mm yellow spine. It differs from *O. carduchorum* by its corolla lobes, and by the central capitula being borne on a peduncle longer than the lateral ones. The relation between these latter two taxa needs further investigation.

6. *O. rhodense* Boiss. ex Rech. fil. in Phytion 1:214 (1949). Syn: *O. tauricum* Willd. var. *mazzocchianum* Pamp. in Nuovo Glor. Bot. Ital. n.s. 34:378 (1927).

Biennial, greenish, glabrescent, with sparse arachnoid indumentum on stems and dense indumentum beneath leaves. Stems slightly branched above, leafy throughout; wings 3-6, often interrupted, 2-6 mm wide, sinuate or forming a series of single triangular lobes with 2-4 mm spines. Basal leaves oblong-

† I am indebted to W. T. Stearn for guidance in the choice of lectotype for this species and *O. acanthium* L.

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lanceolate, pinnatifid into spiny triangular lobes with prominent nerves ending in stout 3-5 mm spines. Cauline leaves linear-lanceolate, less dissected; uppermost leaves not subtending the capitula. Capitula solitary on leafy branches at least 35 cm. Involucre subglobose, 3-4 x 5 cm, with concave base; phyllaries broadly lanceolate, glabrous, green to pink, 15-45 x 3-8 mm, gradually attenuate into 2-4 mm spine; outer and median phyllaries patent to reflexed, inner erect, equal or somewhat longer than flowers. Flowers 25-28 mm, four corolla lobes equal, 3-4 mm shorter than fifth. Pappus hairs scabrous or bulbate, lateral projections 0.5-1 x as long as rachis width. Fl. 4-6. Fields.

Type: [E. Aegean Islands]: Insula Rhodos: Champs près Salakos, 12 vi 1870, Bourgeau (holo. Gf).

Is: Rodhos, Rech. 7260; ibid., Pampanini.

Endemic to Rodhos. E. Medit. element.

7. *O. carduchorum* Bornm. & Beauverd in Bull. Soc. Bot. Genève sér. 2(6):150, f. 4 (1914). Map 38, p. 359.

Biennial, (30-)70-100 cm, sparsely to densely arachnoid. Stem corymbose above middle, leafy throughout; wings 2-4, 3-15 mm wide, spinose and sinuate; spines 3-7 mm at tips of triangular or subulate lobes with prominent nerve. Basal leaves broadly lanceolate, pinnatifid, becoming oblong-lanceolate upwards; primary lobes subulate with triangular secondary lobes, both tapering into 2-7 mm spines with ± prominent nerve. Capitula borne on winged leafy stems. Involucre hemispherical, 2-4 x 3-6 cm (excl. spines), with flat to concave base; phyllaries lanceolate, often violet, glabrous, 10-30 x (3-)5-7 mm; outer and median ones reflexed, abruptly constricted into a 4-5 mm yellow spine; inner erect, gradually attenuate into such a spine. Flowers slightly longer than inner phyllaries, 30-40 mm, all lobes unequal, longest one 1-3 mm longer than others. Pappus hairs plumose, lateral projections 4-6 x as long as rachis width. Fl. 3-7. Steppe, clearings in macchie, river banks, fields, 380-1000 m.

Type: Persia Occidentalis: in monte Schahu (Kuh-i Shahu), mense majo 1909, Strauss (holo. Hb. Haussknecht, JE).

Mainly E. & S. Anatolia. A6 Tokat: 11 km from Turhal to Tokat, 680 m, Hub.-Mor. 12862! B7 Elazığ: nr Elazığ, D. 22012! C3 Isparta: Eğirdir, 1010 m, Güksin (ISTO 9510)! C5 Tauri Cilicici, 1853, Kotschy! Adana: Feke, 600 m, D. 19651! C6 Gaziantep: Osmanlıye to Gaziantep, 770 m, Hub.-Mor. 12051! Hatay: E. of Belen, 500-520 m, Hub.-Mor. 12050! C8 Diyarbakır: Diyarbakır to Çınar, 700 m, D. 28740! C9 Hakkari: Zab gorge, below Çukurea, 700-750 m, D. 44849! Mardin: 10 km E. of Cizre, 380 m, D. 42798!

W. Iran, N. Iraq. Ir.-Tur. element.

8. *O. boissieri* Willk. in Willk. & Lange, Prodr. Fl. Hisp. 2: 179 (1870) non Freyn & Sint. (1895). Syn: *O. corymbosum* Boiss., Fl. Or. 3:560 (1875)! non Willk. (1859). Map 37, p. 359.

Biennial, 40-90 cm, glabrescent, with usually sparse arachnoid indumentum on stems and leaves; leaves glandular beneath, plants green. Stem branched above into a corymb, leafy throughout; wings 2-4, often interrupted, 1-3 mm wide, sinuate or forming series of single triangular lobes with 2-7 mm spines. Basal leaves oblong-lanceolate in outline, pinnatisect; lobes lanceolate, incised into spiny triangular lobules with prominent nerves ending in 3-6 mm spines; cauline

leaves linear-lanceolate, less dissected; uppermost leaves not subtending capitula. Capitula 2-8, corymbose, on leafy 4-20 cm peduncles. Involucre subglobose, 1.1 × 1.5-5 cm, with flat to concave base; phyllaries broadly lanceolate, glabrous, mostly pluk, 8-30 × 3-5 mm, gradually attenuate into 2-4 mm spine; outer and median phyllaries patent to reflexed, inner erect and shorter than flowers. Flowers 25-35 mm; four corolla lobes equal, 4 mm shorter than fifth. Pappus hairs scabrous or barbellate, lateral projections 0.5-1 × as long as rachis width. Fl. 5-7. Forest, meadow, rocky places and ruins, 100-1400 m.

Syntypes: [Turkey C2 Antalya] in Lycia prope Elmalı (Elmalı), Bourgeau 149 (holo, G1 BM, K1); in Cilicia Trachaea, Pironin.

S. Anatolia. C2 Antalya: Ak Da., 1400 m, Sorger 65-26-27; C3 Antalya: Kemer, 900 m, D. 15129; Burdur: Bucak, 910 m, Smith 224; C4 Konya: 6 km S.E. of Elmenek, 1220 m, Hub.-Mor. 17320; İçel: d. Anamur, Geneva, Pironin 441; C5 İçel: Tarsus, Deurer T 1851.

Endemic. E. Medit. element. *O. bolxeri* is easily confused with *O. cardiforme* Boiss., described from Gaza (Palestine), and has been recorded by Rechinger (Ark. Bot. 5(1):455, 1959) from C6 Hatay: Antakya, Dinsmore 15593. *O. bolxeri* differs in its glandular leaf indumentum and its longer phyllaries. In fact it approaches *Carduus nutans* L. sensu lato.

9. *O. myriacanthum* Boiss., Diagn. ser. 2(6):114 (1859). Ic: Rech., Fl. Aeg. t. 24 f. 3 & 7 (1943). Figure 16, p. 365.

Differs from *O. bracteatum* in having indumentum less dense and therefore plant less white; basal leaves pinnatifid with lanceolate lobes; leaves subtending capitula up to 2 cm long; pappus hairs subplumose, lateral projections 1.5-2 × as long as rachis width. Fl. 6-7. Stony slopes, fields and ruins, 100-1000 m.

Syntypes: [Greece] in regione media montis Malevo Laconiae, Orphanides 55 (G1 BM); in regione media Parnassi inter Rachova et Gourni, Heldreich 3203 (G1 K1).

W. Anatolia, Islands. B1 Manisa: 1 km W. of Turgutlu, 100 m, Sorger 68-11-11; C2 Muğla: Baba Da., 610 m, D. 13666; Denizli: Çukur Köy to Kızıllıhisar, D. 13285; I. Lemnos, Kastro to Hag. Paulos, Rech. 1377; Rodhos, iv 1961, Palmer.

Greece & Crete. E. Medit. element.

10. *O. bracteatum* Boiss. & Heldr. in Boiss., Diagn. ser. 1(10):21 (1849). Ic: Bull. Arboricult. Belg. 137 (1903). Map 38, p. 359.

Biennial, 50-80 cm, adpressed-tomentose, snowy-white. Stem slightly branched above, leafy throughout; wings 6-12, 2-8 mm wide, faintly sinuate and spinose; spines yellow, 2-7 mm. Basal leaves oblong-lanceolate, pinnatifid; lobes triangular with a prominent nerve tapering into 3-8 mm yellow spine; uppermost cauline leaves 3-4 cm, subtending capitula. Capitula solitary or 2-4 together on short leafy 1-4 cm peduncles. Involucre 3-4 × 3-6 cm (excl. spines), with flat to convex base; phyllaries broadly lanceolate, glabrous, 30-60 × 5-11 mm, gradually attenuate into 3-8 mm yellow spine; outer and median ones patent to reflexed, inner erect, subequal to flowers. Flowers 4-5 cm; four corolla lobes equal, 1-5 mm shorter than fifth. Pappus hairs plumose, lateral projections 3-4 × as long as rachis width. Fl. 7-8. Open rocky scrub, disturbed steppe and roadsides, 150-1500 m.

9. Tribus Cardueae

Type: [Turkey C3 Burdur] in saxosis prope Aglansoun (Aglasun) ad radices montis Houdroun Piskidae, *Heldreich* (holo. G1).

S.W. & Inner Anatolia, Islands. B3 Konya: d. Beyşehir, Hoyran to Kurucanov, D. 160931 B7 Erzincan: 30 km S. of Kelkit, 1500 m, *M. & D. Zohary* 4231 C2 Mugla: d. Marmaris, Kocekara Da., *Khan et al.* 641 Denizli: Aclpayum to Abbas, D. 134701 C3 Isparta: 31 km S. of Isparta, 900 m, *Sorger* 68-31-11 Antalya: Termessus, D. 154451 C4 Konya: d. Karapinar, Salur to Obektog, *Parsons* 1972: 11 Is: Khios, *Platt* 3251 Rodhos, *Rech.* 85031

Karpathos, Cyprus. E. Medit. element.

11. *O. major* Beauverd in Bull. Soc. Bot. Genève sér. 2(6): 152, f. 5 (1914).

Biennial, c. 100 cm, adpressed-tomentosa, greenish-grey. Stem slightly branched above, leafy throughout, very spiny; wings 6-12, 2-5 mm wide, spinose and weakly sinuate; spines arising from small triangular lobes with swollen median nerve, 2-20 mm, more dense above and then shorter than the sparse longer spines in lower parts. Leaves pinnatisect to pinnatifid, basal ones oblong-lanceolate; lobes of upper cauline leaves mostly as spines, 1-3 cm. Capitula in a shortly branched panicle, the terminal on a peduncle shorter than adjacent younger one; peduncles 3-12 cm, with subtending 2-3 cm leaves. Involucre subglobose, 3-4 x 3-5 cm (excl. spines), with flat to concave base; phyllaries lanceolate, distal half with spiny margins; spinules 1-4 mm, denser in outer phyllaries than in inner ones; outer and median phyllaries patent to reflexed, inner erect, shorter than flowers, glabrous to sparsely arachnoid, 10-40 x 4-10 mm, gradually attenuate into 3-4 mm spine. Flowers 3-4 cm; four corolla lobes equal, 3-4 mm shorter than fifth. Pappus hairs subplumose, with lateral projections 1-5-2 x as long as rachis width. Fl. 7. In hills and mountains, ascending to 1200 m.

Type: [E. Aegean Islands]: Insula Ikaria in monte Atheras, 26 vii 1887, *Forxth-Major* 791 (iso. Et).

Islands. Is: Ikaria, *Rech.* 44621 Samos, 700-1200 m, *Rech.* 39181 Fournol, Thimena Is., *Rech.* 4720; Kos, 800 m, *Rech.* 80471

Karpathos, Crete. E. Medit. element.

12. *O. carleum* Hub.-Mor. in Bauhinia 3(2): 314, t. 15, 16 (1967).

Biennial, 60-100 cm, densely adpressed arachnoid-tomentosa, white. Stem branched above into a compound corymb with 6-15 capitula, leafy throughout; wings spinose and sinuate; lobes broadly triangular, ending in 5-15 mm spine. Basal leaves petiolate, oblong, pinnatifid, 30-40 x 10-15 cm, wings on rachis 5-10 mm wide, spiny; segments ± distant, oblong to broadly oblong, deeply and irregularly incised; leaf margin bearing 10 mm spines. Capitula shortly pedunculate. Involucre ovate to broadly ovate, 2-2.5 x 1-2-2 cm; phyllaries lanceolate,

FIGURE 16 Cardueae achenes: 1 *Cnicus benedictus* var. *benedictus*; a, detail of inner pappus. 2 *Zoegea leptanura*; a, detail of inner pappus. 3 *Crepina eruphastrum*; a, detail of inner pappus. 4 & 5 *Oligochaeta divaricata*; 4 inner achene; 5 marginal achene with deciduous pappus detached. 6 *Tyrimmus leucographus*; mature achene with part of deciduous pappus; a, detail of umbra. 7 *Serratula serratuloides*, deciduous pappus hairs (shortened) shown detached. 8 *S. caryophyllus*. 9 *Jurinea catanica*, inner pappus shortened and partially removed to show umbra. 10 *J. coarctata*; a, detail of umbra. 11 *Onopordum myricanthum*, achene seated in pitted receptacle; deciduous pappus (shortened) shown detached. (1-3, 7-10, 1 x natural size; 1a, 1b, 6, 10a, 6 x natural size; 4, 5, 11 x natural size; 6a, 9 x natural size; 11, 5 x natural size)

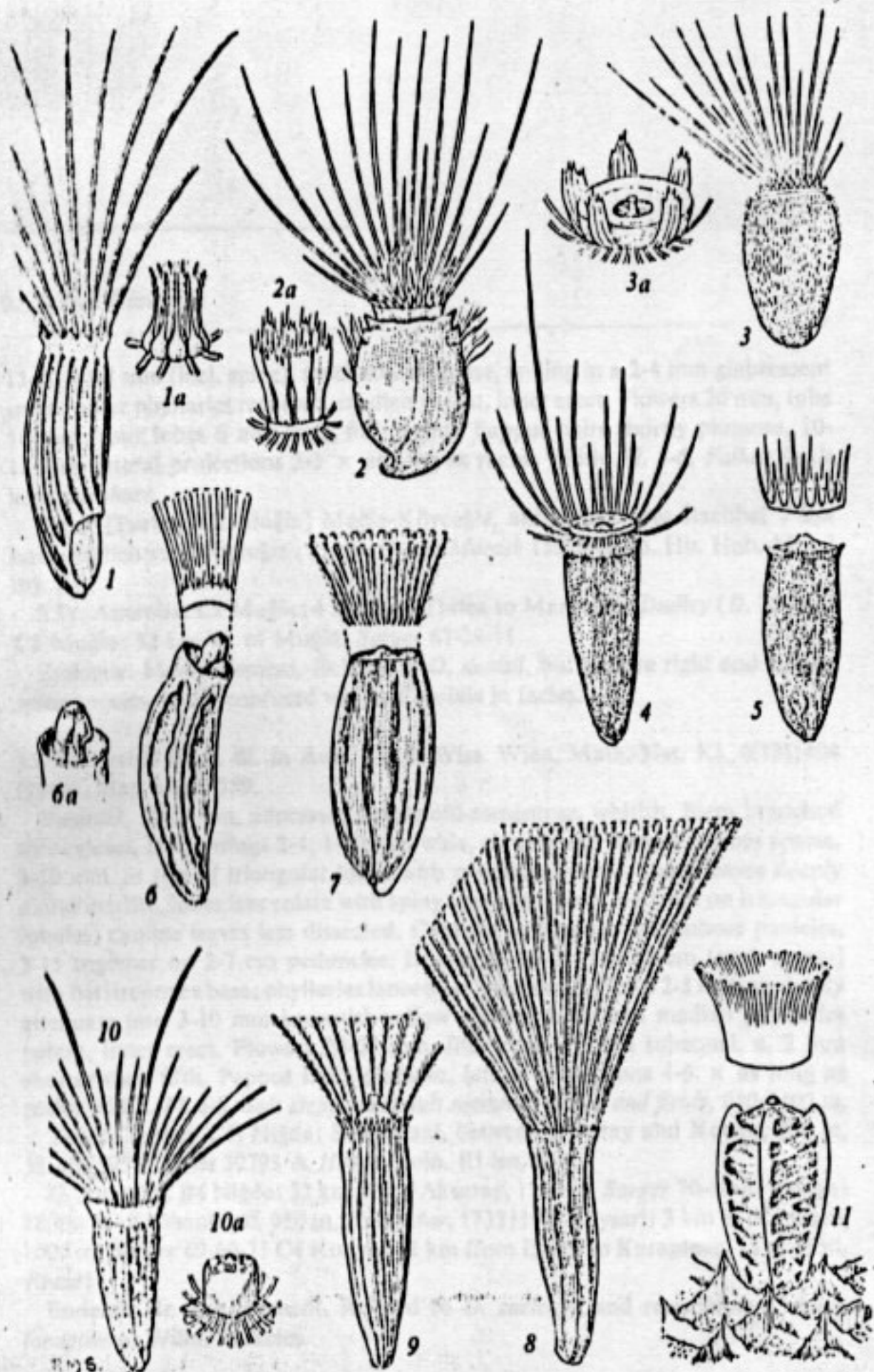


FIGURE 16

9. Tribus Carduene

15-20 × 3-5 mm (incl. spine), arachnoid-floccose, ending in a 2-4 mm glabrescent spine; outer phyllaries recurved, median patent, inner erect. Flowers 20 mm, tube 10 mm; four lobes 6 mm long, fifth 8 mm. Pappus hairs shortly plumose, 10-13 mm, lateral projections 2-3 × as long as rachis width. Fl. 5-6. Fallow fields near sea-shore.

Type: [Turkey C2 Muğla] Muğla-Köyceğiz, ausgetrocknetes Bachbet 7 km nordwestlich von Köyceğiz . . . s.l., Huber-Morath 15974 (holo. hb. Hub.-Mor. iso. E!).

S.W. Anatolia. C1 Muğla: 4 km from Datça to Marmaris, Dudley (D. 35440)! C2 Muğla: 32 km W. of Muğla, Sorger 67-39-11

Endemic. Medit. element. Related to *O. davidsii*, but a more rigid and stoutly spiny species, easily confused with a *Cousinia* in facies.

13. *O. davidsii* Rech. fil. in Ann. Akad. Wiss. Wien, Math.-Nat. Kl. 6(13):404 (1964). Map 37, p. 359.

Biennial, 30-50 cm, adpressed arachnoid-tomentose, whitish. Stem branched throughout, leafy; wings 2-4, 1-10 mm wide, sinuate and spinose; spines sparse, 2-10 mm, at tips of triangular lobes with prominent nerve. Basal leaves deeply pinnatifid, lobes lanceolate with spiny margins, spines 2-10 mm on triangular lobules; cauline leaves less dissected. Capitula in irregular corymbose panicles, 3-15 together on 2-7 cm peduncles. Involucre 1.5-2 × 1.5-2.5 cm (excl. spines) with flat to convex base; phyllaries lanceolate, arachnoid, 5-25 × 2-5 mm, gradually attenuate into 3-10 mm brownish-yellow spines; outer and median phyllaries patent, inner erect. Flowers 20-28 mm, four corolla lobes subequal, c. 2 mm shorter than fifth. Pappus hairs plumose, lateral projections 4-6 × as long as rachis width. Fl. 6-8. Salt steppe near salt marshes, steppe and fields, 950-1100 m.

Type: [Turkey C4] Niğde: Sultanhanı, between Aksaray and Konya, 950 m, 31 viii 1957, Davis 32793 & Hedge (holo. E! iso. K!).

C. Anatolia. B4 Niğde: 32 km W. of Aksaray, 1100 m, Sorger 70-40-61 Konya: 16 km S. of Cihanbeyli, 950 m, Hub.-Mor. 17321! B5 Kayseri: 3 km S. of Incesu, 1000 m, Sorger 69-60-71 C4 Konya: 62 km from Ereğli to Karapınar, 18 vi 1950, Reese!

Endemic. Ir.-Tur. element. Related to *O. caricum*, and resembling *Carduus lanuginosus* Willd. in facies.

14. *O. tauricum* Willd., Sp. Pl. 3(3):1687 (1803). Syn: *O. elatum* Sm. in Sibth. & Sm., Prodr. Fl. Graec. 2:156 (1813); *O. virens* DC., Fl. Fr. 5:456 (1815); *O. viscosum* Hornem. apud Sprengel, Syst. Veg. 3:386 (1826); *O. virens* DC. var. *tauricum* (DC.) DC., Prodr. 6:618 (1838); *O. tauricum* Willd. var. *elatum* (Sm.) Boiss., Fl. Or. 3:559 (1875). Ic: Reichb., Ic. Fl. Germ. 15: t. 814 (1853); Flori, Ic. Fl. Ital. f. 3806 (1904); Hook., Ic. Pl. 32: t. 3156 (1932). Map 37, p. 359.

Biennial, 60-100 cm, sparsely puberulous-viscid with short glandular hairs, green. Stem branched above into compound corymbs with 2-6 capitula, leafy and winged throughout; wings 2-4, spinose and sinuate; spines 3-15 mm at tips of prominently nerved triangular lobes. Leaves oblong-lanceolate becoming linear upwards, pinnatifid, lobes irregularly arranged, triangular, with prominent nerve ending in 3-6(-15) mm spines; uppermost leaves sometimes entire. Capitula borne on winged leafy stems. Involucre globose, 3-4 × 2-5 cm, with flat to concave base; phyllaries lanceolate, (20-)30-40 mm (incl. spine), gradually attenuate from

(2-)3-4(-5) mm broad base to 3-4 mm yellow spine, glandular-scabrous to somewhat arachnoid; outer and median phyllaries slightly patent to reflexed. Flowers as long as or longer than inner phyllaries. Pappus hairs scabrous or barbellate, lateral projections 0.5-1 × as long as rachis width. Fl. 6-7. *Steppe, open scrub and fallow fields, 250-1400 m.*

Type: in Tauria (Crimea). (B-Willd., 14960 B, photol).

N. Turkey and adjacent C. Anatolia, Islands. A1(E) Tekirdağ: Muratlı, J. Buytop (181E 13355)! A2(E) İstanbul: Yediköle, 25 vi 1899, Azn. A2(A) Bursa: nr Bursa, Pichler 341 A3 Bolu: Abant Gl., 1400 m, Sorger 69-4-311 A4 Kastamonu: 76 km W. of Kastamonu, 650 m, Sorger 69-9-21 A5 Amasya: Akdağ, 1200 m, Bornm. 1890:2249. A6 Samsun: nr Samsun, Hand.-Mazz. 130. A7 Trabzon: nr Trabzon, d'Urville. B2 Kütahya: Kütahya to Gediz, 1000 m, M. & D. Zohary 585! B3 Eskişehir: Eskişehir to Bursa, nr Poyra, 800 m, Simon 69-428. Is: Lesbos, Rech. 5746 (var. *elatum* (Sm.) Boiss.)! Psara, Greuter 10769 (var. *elatum* (Sm.) Boiss.); Khios, *Orphanides* (var. *argolicum* Boiss.)!

Balkans, Romania, Cyprus, Crimea; probably naturalized in France, Euro-Sib. element. The island populations have been referred to different varieties (cf. Rech., Fl. Aeg. 656, 1943). Closely related to the Spanish *O. corymbosum* Willk. (*O. tauricum* subsp. *corymbosum* (Willk.) Rouy in Bull. Soc. Bot. Fr. 43:590, 1896), which differs in its more numerous crowded capitula with smaller phyllaries, the inner ones being shorter than the flowers. In hybrid populations of *O. tauricum* × *O. acanthium* near Montpellier (S. France), nothomorphs are intermediate in indumentum and in shape of leaves and phyllaries (Obs. I).

15. *O. sibthorpium* Boiss. & Heldr. in Boiss., Fl. Or. 3:561 (1875). Syn: *O. macracanthum* sensu Sibth. & Sm., Prodr. Fl. Graec. 2:155 (1813), non Schousb. (1800), non Willd. (1803). Ic: Fiori, Ic. Fl. Ital. f. 3807 (1904); Beauverd in Bull. Soc. Bot. Genève sér. 2(6):153 (1914); Sibth. & Sm., Fl. Graeca 9: t. 832 (1837) as *O. macracanthum* Willd. Map 38, p. 359.

Similar to *O. anatolicum* but differing in its fewer, stouter phyllaries that are densely arachnoid at base and loosely imbricate; pappus hairs scabrous or barbellate, lateral projections 0.5-1.5 × as long as rachis width. Fl. 6-7. *Clearings in forest, steppe and fallow fields, 1000-1800 m.*

Type: [Greece] in agris sterilibus circa Athenas, 1847, *Heldreich* (holo. GI iso. BM!).

Mainly W. & S.W. Anatolia; rare in N. and Islands. A5 Sinop: 70 km S.W. of Sinop, 1450 m, Sorger 69-17-12! B2 Izmir: Boz Da., 1100 m, Sorger 68-16-43! C2 Denizli: Boz Da., nr Geyran Y., 1250 m, D. 13327! Antalya: Ak Da., 1700 m, Sorger 68-25-4! Muğla: Baba Da., 1160 m, D. 13700! C3 Antalya: Çamçukuru Y., Bey Da., 1750 m, Khan et al. 313! Is: Rhodes, f. 1540.

Greece, Crete, Malta. E. Medit. element.

16. *O. anatolicum* (Boiss.) Eig in Pal. J. Bot., Jer. ser. 2(4):191, t. 6 f. 7, 8 (1942). Syn: *O. sibthorpium* Boiss. & Heldr. var. *anatolicum* Boiss., Fl. Or. 3:562 (1875)! *O. sibthorpium* subsp. *anatolicum* (Boiss.) Holmboe, Veg. Cyprus 186 (1914)! excl. pl. Cypr. Map 38, p. 359.

Biennial, 25-100 cm, sparsely to densely arachnoid. Stem scarcely branched

9. Tribus Cardueae

above, leafy up to 5-10 cm beneath capitula, winged throughout; wings 2-4, narrow, spinose and sinuate; spines 2-10 mm at tips of triangular lobes with median nerve. Basal leaves oblong-lanceolate, pinnatifid, becoming subulate and pinnatifid upwards, primary lobes distinctly triangular with prominent nerve, lobules with less distinct shape and nerve, all ending in 2-10 mm spines. Capitula on winged peduncles, sometimes wings represented only by spines. Involucre depressed-globose, 1.5-2.5 x 2-4 cm (excl. spines), with flat to concave base; phyllaries slender, 3-5 mm broad near base, abruptly tapering into 1-3 cm spines with 3-10 mm yellow tips, glabrous to slightly arachnoid; outer and median phyllaries reflexed to patent, inner erect. Flowers as long as inner phyllaries. Pappus hairs plumose, lateral projections of pappus setae 2-4 x as long as rachis width. Fl. 6-8. *Steppe (rarely saline) and fallow fields, 100-1400 m.*

Lectotype: [Turkey C3 Konya] Pisidia ad Beycher (Beyşehir), 1845, *Heldreich* 1237 (holo. G! iso. BM! K!).

N.W. Turkey, C. & S.W. Anatolia. A2(E) Istanbul: Dschendere (Cendere), 25 vi 1917, *Azn.* A2(A) Istanbul: Fenerbahçe (Fenerbahçe), 23 vi 1916, *Azn.* B3 Afyon: Karakuyu, D. 13225! B4 Ankara: N. end of Tuz G., 900 m, *Sorger* 70-8-12! B5 Nevşehir: Nevşehir to Acigöl, 1400 m, D. 32784! B6 Marnas: Palaga Ova nr Elbistan, *Hausskn.* (as *O. heteracanthum* C. A. Meyer var. *anisacanthum* (Boiss.) Boiss.), untypical! C3 Burdur: 2 km S.E. of Burdur, 950 m, *Hub.-Mor.* 17318! C4 Konya: 5 km N. of Konya, 1050 m, *Sorger* 66-39-91

Endemic. Ir.-Tur. element. Related to *O. sibthorplianum*.

17. *O. acanthum* L., Sp. Pl. 827 (1753). Ic: Reichb., Ic. Fl. Germ. 15: t. 813 (1853); Fiori, Ic. Fl. Ital. f. 3805 (1904).

Biennial, 30-150 cm, sparsely to densely arachnoid. Stem erect, branched above into compound corymbs with 2-7 capitula, leafy and winged throughout; wings 2-4, spinose and sinuate; spines 2-11 mm. Basal leaves elliptic; cauline leaves becoming linear-lanceolate upwards, pinnatifid, lobes triangular with 2-11 mm spine. Capitula on winged leafy stems. Involucre globose, 2-3 x 2-6 cm (excl. spines), with flat to concave base; phyllaries slender, subulate, 7-25 x 2-3 mm (incl. spine), gradually attenuate from 2-3 mm broad base to 2-6 mm weak yellow spine, glabrous to slightly arachnoid; outer and median phyllaries reflexed to patent, inner erect. Flowers longer than inner phyllaries. Pappus hairs barbellate, lateral projections 0.5-1.5 x as long as rachis width. Fl. 6-8. *Rocky slopes, screes, clearings in forests, roadsides and weed in fields, 600-2600 m.*

Lectotype designated here: [E. Germany] Misnia (nr Dresden), Bohemia, Bavaria, *Burser*, Hortus Siccus 21:44 (UPS photo!).

Widespread in E. Anatolia; local in N. & S.W. Anatolia. A2(A) Istanbul: Kadiköy, 22 xii 1912, *Azn.* A5 Kastamonu: Tosya, *Sint.* 1892:4917! A7 Gümüşane: Taltaban, *Sint.* 1894:6286! A8 Çoruh: Çoruh gorge between Artvin & Borçka, 600 m, D. 29991! B4 Ankara: Kayaş, *Krause*. B7 Diyarbakir: Khan Kezzin to Arghany (Ergani), *B. Post* 424! B8 Erzurum: Erzurum, *Zohrab*! B9 Van: Başkale, Ispiriz Da., 2600 m, D. 23731! B9/10 Ağrı: Bazargan to Doğubayazit, *Rech.* 37654! B10 Kars: Pamuk Da., Iğdır to Doğubayazit, 1500 m, D. 47042! C3 Isparta: Dedepöl Da., 1300 m, *Sorger* 68-43-33! C8 Mardin: Mardin, *Sint.* 1888:1202! C9 Hakkari: Zab gorge, 32-45 km from Çukurca to Hakkari, 900-1000 m, D. 44785!

C. Asia to W. Europe. Introduced in N. America. It seems that *O. acanthum*

has probably been long naturalized in Europe, where it reaches much bigger vegetative dimensions than in Turkey. It occupies secondary habitats in Europe, while in Turkey (and N. Iraq) it has a rather distinctive distribution pattern (predominantly eastern) and grows in primary habitats as well, e.g. screes and rocky slopes. White-flowered populations occur. Hybrid populations with *O. tauricum* (q.v.) occur in S. France.

61. *SILYBUM* Adans.

P. K. KUPICHA

Biennial, with simple or sparingly branched unwinged stems arising from a basal rosette. Leaves spiny. Capitula solitary, homogamous, discoid. Involucre subglobose; phyllaries pluriserial with spiny margins. Receptacle flat, densely setose. Flowers pink to purple. Corolla deeply and obliquely 5-lobed. Filaments glandular, monadelphous. Achenes somewhat compressed, obovate, smooth, bearing a conical umbo at apex surrounded by an entire collar; hilum almost basal. Pappus pluriserial, outer hairs scabrous, inner ones shorter and capillaceous, all connate at base into a deciduous ring.

Dittrich, M. 1970. Morphologische und anatomische Untersuchungen an Früchten der Carduinae (Compositae). I. Morphologischer Teil. *Candollea* 25:45-67.

1. *S. marianum* (L.) Gaertner, *Fruct. et Sem.* 2:378 (1791). Syn: *Carduus marianus* L., *Sp. Pl.* 823 (1753). Ic: Reichb., Ic. Fl. Germ. 15: t. 882 (1853); Fiori, Ic. Fl. Ital. f. 3803 (1904).

Plants (9-)30-100 cm. Stems ribbed, sparsely villous. Leaves glabrous, pale green, mottled white along veins, strongly spiny-dentate; basal leaves obovate, petiolate, 9-26 × 5-12 cm, deeply triangular-lobed; upper ones simple, ovate-lanceolate, auriculate-amplexicaul. Involucre 2.5-4 × 2-4 cm (excl. spreading part of phyllaries); phyllaries with adpressed spiny ovate base widening abruptly to ovate-subulate appendage, reflexed (in outer phyllaries) to erect (in inner ones); innermost phyllaries lanceolate, not appendaged. Achenes brownish streaked with black, c. 7 × 3 mm. Outer pappus hairs c. 15 mm. Fl. 4-5. Roadside banks and ditches, fallow fields, nr s.l.-600 m.

Described from England, France and Italy (Hb. Linn. 966/30!).

Mainly Outer Anatolia, Islands. A2(E) Istanbul: bridge S. of Büyük Çekmece, *Inner, Fitz & Spltz.* 2832! A2(A) Kocaeli: Pendik, 21 v 1937, *B. Post!* A5 Samsun: Çetirli Pinar Köy (Bafra), 100 m, *Tobey* 168! B1 Izmir: Bergama, v 1932, *Guyot.* B2 Manisa: Tayten nr Salihli, *Hub.-Mor.* 5786. C1 Izmir: nr Ephesus (Efes), *Borum.* C2 Denizli: Pamukkale, 400 m, *Sorger* 66-6-12! C5 Adana: 8 km from Adana to Karataş, nr s.l., *Cooile & Jones* 251! C6 Hatay: 8 km from Belen to Antakya, 600 m, *Cooile & Jones* 523a! Is: Lesbos, Ipiros, *Cand.*; Psara, *Greuter* 10765; Khios, *Orphanides* 769! Rhodes, Rodi, *Fiori obs.*

Mediterranean area (and naturalized in parts of C. & N.W. Europe), S. & E. Iraq, Iran, Afghanistan. Medit. element. Specimens in which the stems are very short (2-15 cm) have been distinguished as var. *pygmaeum* (Cuss.) Boiss. (Fl. Or. 3:556, 1875).