

MATERIALS FOR A FLORA OF TURKEY XXIV: FERULA AND FERULAGO

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ABSTRACT. Seven new Turkish species of *Ferula* and *Ferulago* are described. The *Ferula* species are: *F. halophila* Peşmen; *F. tenuissima* Hub.-Mor. & Peşmen; *F. longipedunculata* Peşmen; *F. amanicola* Hub.-Mor. & Peşmen; *F. huber-morathii* Peşmen. Those of *Ferulago* are: *F. isaurica* Peşmen and *F. mughlae* Peşmen.

INTRODUCTION

Both *Ferula* and *Ferulago* are among the largest and taxonomically most difficult genera of Umbelliferae. The most useful character for delimiting the closely related genera is the presence or absence of bracts (involucre) and bracteoles (involucl) which are practically absent in *Ferula* and well-developed and persistent in *Ferulago*. Although not all the species from outside Turkey have been examined, both genera in Turkey seem to be very distinct in the number and position of vittae in their mericarps. In *Ferula* dorsal vittae are always confined to the intercostal area, all equal and usually solitary in each vallecule, while they are usually numerous, unequal and form a continuous row round the seed in *Ferulago*. No other morphological characters distinguish all the species of *Ferula* from *Ferulago*.

The main source on *Ferula* is Korovin's monograph of the genus (*Generis Ferula* (Tourn.) L. *Monographia illustrata*, Taschkent, 1947) in which he recognised 133 species. Since then about 40 new species have been described, mostly from Afghanistan and Iran. The genus has its greatest concentration of species in Central Asia where 97 out of 172 species occur and 88 are endemic. In Anatolia there are about 17 species, of which 8 are endemic.

No monographic study has been done on *Ferulago*, so the main source is still Boissier's account (*Fl. Or.* 996-1008, 1872). The genus, including *Lophosciadium* DC., which is indistinguishable from *Ferulago* except for the broadly winged dorsal ridges of its mericarps, has its centre of distribution in Anatolia; 28 out of 47 known species are found in this area and half are endemic.

Both genera are late-fruitlet and probably undercollected. Apart from the new species described below, there are some incomplete specimens in hand which may well represent additional new species.

NEW SPECIES

***Ferula halophila* Peşmen, sp. nov.** (Subgen. *Peucedanoides* (Boiss.) Korovin Sect. *Xeronarthe* Korovin).

Affinis *F. rigidulae* Boiss. sed vaginis petiolorum maioribus 6.5-7.5 cm longis, laciniis foliorum longioribus (5-15(-20) mm longis), alis mericarporum latioribus (c.2 mm latis) differt. A *F. orientale* L. foliis sparsissime scabridis et alis mericarporum latioribus distinguitur.

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Herba perennis. *Caulis* robustus, teres, striatus, glaber, 60–90 cm altus, superne subverticillatim ramosus. *Folia* basalia sparsissime aculeolato-scabrida, petiolata, basi vaginata; lamina 5–6-pinnata, c. 20 × 20 cm, ambitu triangulari-ovata; laciniae lineari-setaceae, 5–15(–20) × 0.4–0.8 mm, glaucescentes; folia caulina gradatim redacta, summa ad vaginas redacta; vaginae late inflatae, amplexicaules, coriaceae, ovatae 6.5–7.5 cm longae. *Inflorescentia* paniculato-corymbosa; umbellae centrales fertiles, subsessiles; radii 12–15, subaequales, erecto-ascendentes; umbellae laterales steriles pedunculis c. 6 cm longis; umbellulae 12–15-florae in fructu pedicellis 5–9 mm longis; bracteolae inconspicuae. *Sepala* obsoleta. *Petala* flava, c. 2.0 mm longa, glabra. *Mericalpia* obovato-oblonga, 9–11 × 6–7 mm, jugis dorsalibus filiformibus; alae utrinque 2 mm latae; vittae valliculares solitariae, commissurales (2–)4. *Floret* Maio–Jun.; fr. Aug.–Sept.

TURKEY. B4 Konya: distr. Cihanbeyli, Tuz Gölü, nr. Yavşan Memlehesi, with *Artemisia*, nr. the salt lake, 9 ix 1949, Davis 16649 (holo E; iso HJ), fr.; Yavşan Memlehesi, nr. Tuz Gölü, between the lake and the salt factory, Davis 18713 (grazed); Yavşan Tuzlasi, c. 900 m, anon. (ANK 1463), fl.

F. halophila is endemic to the salt lake (Tuz Gölü) area in C. Anatolia. This halophytic species forms, along with the non-halophytic *F. orientalis* L., *F. rigidula* DC. and *F. haussknechtii* Korovin, a complex of closely related species that would well repay further study.

Ferula tenuissima Hub.-Mor. & Peşmen, sp. nov. (Subgen. *Peucedanoides* (Boiss.) Korovin Sect. *Xeronarthex* Korovin). Plate 1A.

Affinis *F. elaeochytridi* Korovin sed foliis glabris, umbellis centralibus plerumque pedunculatis, radiis brevissimis differt. A. *F. hermonis* Boiss. foliis magis dissectis, lacinii angustioribus confertioribus virescentibus, umbellis lateralibus sterilibus, petalis luteis diversa.

Herba perennis. *Caulis* robustus, teres, tenuiter sulcatus, glaber, glaucus, c. 100 cm altus, superne subverticillatim ramosus. *Folia* basalia glabra, longe petiolata; petiolus ad 25 cm longus, basi vaginatus; lamina 6–7-pinnata, ambitu triangulari-ovata, 30–35 × 25 cm; laciniae confertae, tenuiter setaceae, 1.5–3(–4) × 0.2 mm, virescentes; folia caulina gradatim redacta, late vaginata, summa ad vaginas redacta; vaginae late inflatae, amplexicaules, coriaceae, ovatae, 8–14 cm longae, glaucae. *Inflorescentia* paniculato-corymbosa; umbellae centrales fertiles, sessiles vel breviter pedunculatae (pedunculi ad 0.7 cm longi); radii 7–14, subaequales, 10–30 mm longi, erecto-ascendentes; umbellae laterales steriles, longe pedunculatae (pedunculi 4–14.5 cm); umbellulae 7–15-florae, pedicelli 5–8 mm longi; bracteolae minutae inconspicuae. *Sepala* obsoleta. *Petala* lutea, ovato-lanceolata, 2–2.5 mm longa, glabra. *Stylopodium* depresso-conicum, margine incrassato vix undulato-cinctum; styli 2–2.5 mm longi. *Mericalpia* (immatura) obovato-oblonga jugis dorsalibus filiformibus, vittis vallicularibus solitariis, commissuralibus 2–4. *Floret* Jun.–Jul.

TURKEY. C6 Adana: distr. Osmaniye, N Amanus, Yağlipınar ob Yarpuz, *Pinus pallasiana*-*Fagus orientalis*-*Cedrus* Mischwald, 1600–1650 m, i vii 1959, Huber-Morath 15437 (holo Herb. Hub.-Mor., Basel).



PLATE 1: A, holotype of *Ferula tenuissima* Hub.-Mor. & Peşmen. B, holotype of *Ferula amanicola* Hub.-Mor. & Peşmen.

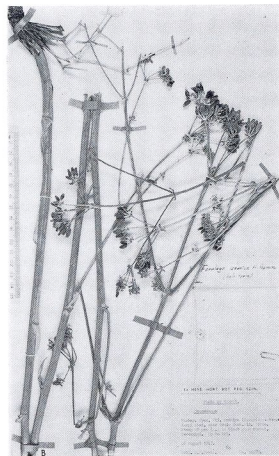


PLATE 2: A, holotype of *Ferula huber-morathii* Peşmen. B, holotype of *Ferulago isaurica* Peşmen.

The new species is related to *F. elaeochytris* Korovin (*F. cassii* Zohary & Davis) from S Anatolia (Hatay), Latakia and Lebanon, but the latter differs in its densely scabrid leaves, central umbels usually sessile, and longer rays. It is also allied to *F. hermonis* Boiss. (Anti-Lebanon (incl. Hermon), S Amanus) which is distinguished by its less dissected leaves (5-pinnate), less conferted and thicker leaf-lobes, lateral umbels almost always fertile, and creamy flowers.

***Ferula longipedunculata* Peşmen, sp. nov.** (Subgen. *Peucedanoides* (Boiss.) Korovin Sect. *Xeronarthex* Korovin).

Species inflorescentia racemosa distincta; a *F. elaeochytridi* Korovin radiis magis numerosis longioribus, laciniae foliorum brevioribus diversa.

Herba perennis. *Caulis* robustus, teres, tenuiter striatus, glaber, c. 100 cm altus, inferne alternatim, superne subopposite et subverticillatim ramosus. *Folia* radicalia longe petiolata; petioli ad 10 cm longi, basi vaginati, sparsim setulosi vel glabrescentes; lamina dense setulosa, 5-6-pinnata, ambitu triangulari-ovata, 25-35 × 20-25 cm, segmentis ultimis 1-2-pinnatisectis; laciniae breviter lineares, 0.5-1.5(-2) mm, acutae, crispatae; folia caulina inferiora ignota, superiora ad vaginas redacta; vaginae valde inflatae, coriaceae, ovatae, c. 8 × 4 cm, amplexicaules. *Inflorescentia* racemosa (i.e. ramis lateralibus uniumbellatis); umbellae terminalis breviter pedunculatis (1.5 cm), fertilis; umbellae laterales longe pedunculatae (8-17 cm), inferiores fertiles, superiores steriles; radii 18-20, subequales, 4-4.5 cm longi, lateralibus ascendentibus; umbellulae 15-22-florae, pedicelli 9-10 mm longi; bracteolae minutae, 0.5-2 mm, cuspidatae, caducae. *Sepala* obsoleta. *Petala* flava, elliptico-ovata, 1.5 mm longa, glabra. *Stylopodium* depresso-conicum, margine valde incrassato undulato cinctum; styli 2-2.5 mm longi. *Mericalpia* (imatura) elliptico-oblonga; vittae ad valleculeas solitariae, commissurales 6. *Floret* Jun.

TURKEY. B6 Maraş: distr. Göksun, Binboğa Da. in ravine on NE side of Işık Da. 1900 m, rocky slopes, 16 vii 1952, *Davis, Dodds & Çetik*, D.20095 (holo E).

This is a remarkable species on account of its simple racemose inflorescence. It is related to *F. elaeochytris* Korovin (*F. cassii* Zohary & Davis) from which it differs in having longer, more numerous rays and smaller leaf-lobes; the latter has a compound inflorescence, rays 10-18 per umbel and 3-4 cm long, and leaf-lobes usually 2-2.5 mm long.

***Ferula amanicola* Hub.-Mor. & Peşmen, sp. nov.** (Subgen. *Peucedanoides* (Boiss.) Korovin Sect. *Xeronarthex* Korovin). Plate 1B.

Species foliis dense setulosis et canescentibus, lacinii angustissime filiformibus elongatis in sectione distincta.

Herba perennis. *Caulis* robustus, erectus, teres, tenuiter striatus, glabro-glauescens ad 100 cm altus, superne subverticillatim ramosus. *Folia* basalia longe petiolata; petioli 20-22 cm longi, evaginati, sparsim setuloso-pubescentes; lamina 5-6-pinnata, ambitu triangulari-rhombiformis, c. 30 × 25 cm, dense setulosa, canescens; laciniae filiformes, (10-)15-20 × 0.2-0.3 mm, supra profunde sulcatae; folia caulina gradatim ad vaginas redacta; vaginae valde turgidae, amplexicaules, coriaceae, glabrae, glaucescentes, ovatae, ad

11 cm longae. *Inflorescentia* paniculato-corymbosus; umbellae centrales fertiles, breviter pedunculatae (2-3(-10) mm) vel sessiles; radii 8-15, subaequales, 2-2.8 cm longi, lateralibus ascendentibus vel horizontalibus; umbellulae 7-12-florae, pedicelli 3-6 mm longi; bracteolae minutae, cuspidatae, 1-1.5 mm longae. *Sepala* obsoleta. *Petala* flava, elliptico-ovata, 2.5 mm longa, glabra. *Stylopodium* depresso-conicum, margine incrassato undulato cinctum; styli 2 mm longi. *Mericarpi* (immatura) obovato-oblonga; juga dorsalia filiformia; vittae vallecules solitariae, commissurales 2-6. *Floret Jun.-Jul.*

TURKEY. C6 Adana: distr. Osmaniye, N Amanus, Yağlipinar ob Yarpuz, *Pinus pallasiana-Fagus orientalis-Cedrus Mischwald*, 1600-1650 m, I vii 1959, *Huber-Morath* 15436 (holo Herb. Hub.-Mor., Basel).

The new species is very distinct in having densely setulose, canescent leaves with elongate filiform lobes.

***Ferula huber-morathii* Peşmen, sp. nov.** (Subgen. *Dorematoides* (Regel & Schmalh.) Korovin). Plate 2A.

Species cortice fructicis deciduo distincta; a *F. caucasica* Korovin foliis pubescentibus, caulibus robustioribus elatioribus, a *F. heuffelii* Griseb. ex Heuffel laciniae foliorum mollibus brevioribus semper pubescentibus recedit.

Herba perennis (vel monocarpica?). *Caulis* robustus, teres, tenuiter striatus, glaber, glaucescens, 100-250 cm altus, inferne alternatim, superne subopposite et subverticillatim ramosus. *Folia* basalia longe petiolata; petioli juniores pubescentes vetustiores glabrescentes ad 15 cm longi, evaginati; lamina 4-5-pinnatisecta, ambitu triangulari-ovata, sparsim albido-pubescentibus; laciniae molles, lineari-oblongae, 2-3(-4) × 0.5 mm, obtusae, margine pubescentibus; folia caulina inferiora breviter petiolata paucisegmenta, superiora sessilia ad vaginas redacta; vaginae submembracaceae inflatae, lineari-lanceolatae, sparsim pubescentes, pallide rubescentes. *Inflorescentia* elongata, paniculato-corymbosa, omnino nuda. *Umbellae* proliferae, fertiles vel steriles, (1-) 2-15-radiatae; radii fructiferorum incrassati, valde inaequales, 1-12 cm longi, ascendentes. *Umbellulae* 8-18-florae, pedicellis 3-10 mm longis. *Sepala* obsoleta. *Petala* lutea, elliptica, c. 1 mm longa, glabra. *Stylopodium* depresso-conicum, margine valde elevato undulato cinctum; styli breviter filiformes, 1.5 mm longi. *Mericarpi* late elliptica, 10-11 × 6 mm, valde plano-compressa, basi truncata, jugis dorsalibus filiformibus, cortice deciduo, vittis vallecularibus solitariis, commissuralibus 2(-4). *Floret Jun.*

TURKEY. B8 Erzurum; 29 km from Hınıs to Pasinler, 1800 m, meadows on chalky slopes, flowers yellow, I m, 12 vii 1966, *Davis* 46387 (holo E); 28 km from Varto to Hınıs, 1700 m, stony slopes, 2-2.5 m, monocarpic? 11 vii 1966, *Davis* 46266; Muş: distr. Bulanik, Bulanik-Muş, c. 20 km from Liz nr. Hasangürgan, 1700 m, 13 vii 1959, *Huber-Morath* 15468.

The new species seems to be fairly distinct in its mericarps with peeling cortex. It may be related to the rare *F. caucasica* Korovin (known to me only from description) from the Caucasus, but the latter also differs in its glabrous leaves, shorter and more slender stem, and fewer (4-6) and shorter (up to 3 cm) rays. Another relative is *F. heuffelii* Griseb. ex Heuffel (W Bulgaria,

NE Yugoslavia, SW Romania) which is distinguished by its leaves glabrous at maturity, and more rigid and larger leaf-lobes. *F. caspica* M. Bieb. a species of salty plains of C Anatolia, S Russia, Caucasus, and N and C Asia, appears to be less closely allied. It differs in its more slender and dwarf stem, smaller mericarps (4-5(-9) mm), and shorter and aggregated leaf-lobes.

***Ferulago isaurica* Peşmen, sp. nov. (Sect. *Ferulago*). Plate 2B.**

Species foliis caulinis omnino ad vaginas redactis a congeneribus diversa. Habitu *F. syriacae* Boiss. similis, sed differt lacinii foliorum plerumque longioribus, bracteis et bracteoleis margine ciliatis, jugis dorsalibus mericarpiorum obsoletis.

Herba perennis. *Caulis* robustus, angulatus, tenuiter striatus, glaber, glaucescens, 140-180 cm altus, omnino subaphyllus. *Folia* basalia breviter petiolata; petioli ad 5 cm longi, anguste vaginati; lamina 5-pinnata, ambitu triangulari-ovata, c. 30 × 30 cm, sparsim scabrida; laciniae lineares, 5-25 × 0.8-1 mm, apiculatae, margine plus minusve revolutae et sparsim scabridae; folia caulina omnino ad vaginas redacta; vaginae submembranaceae, lineari-lanceolatae, 2.5-5 cm longae, acuminatae, glabrae. *Inflorescentia* paniculato-corymbosa. *Umbellae* centrales longe pedunculatae (pedunculi usque ad 9 cm longi) vel sessiles; radii 5-8, inaequales, 3-5 cm longi, robusti, lateralibus ascendentibus; bractae triangulari-lanceolatae, 4-10 mm longae, acutae, vel acuminatae, margine ciliatae; umbellulae 8-14-florae, pedicelli fructiferorum valde accrescentes, 5-8 cm longi; bracteolae triangulari-lanceolatae, 4-7 mm longae, acuminatae vel cuspidatae, margine ciliatae. *Umbellae* laterales longe pedunculatae, minores. *Sepala* minuta, triangulari-ovata, vix 1 mm longa, acuta vel obtusa. *Petala* flava, elliptico-ovata, c. 1.5 mm longa, glabra. *Stylopodium* depresso-conicum vel planum, margine vix incrassato undulato cinctum; styli 2 mm longi. *Mericalpia* elliptica, 12 × 6 mm, basi truncata, jugis dorsalibus obsoletis, lateralibus alatis (alis c. 0.5 mm latis), vittis dorsalibus 12-16, commissuralibus 14-18. *Floret* Jun.-Jul.

TURKEY. C4 Antalya: distr. Alanya, Kargi Çayı nr. Kozlu Dere, 1000 m, steep N slopes in *Pinus nigra* forest, 26 viii 1947, Davis 14277 (holo E).

The new species is distinct in having all its stem leaves reduced to sheaths. It resembles *F. syriaca* Boiss. (S Anatolia, W Syria, Lebanon) in facies, but the latter is distinguished by its usually shorter leaf-lobes (2-13 mm), glabrous bracts and bracteoles, and mericarps with broadly elevated, spongy dorsal ridges.

***Ferulago mughlae* Peşmen, sp. nov. (Sect. *Ferulago*)**

Species habitu *F. pauciradiatae* Boiss. & Heldr. optime similis, sed differt jugis dorsalibus mericarpiorum elevati-spongiosis (nec obsoleti-filiformibus), stylis longioribus et lobis foliorum plerumque longioribus.

Herba perennis. *Caulis* erectus, teres vel angulatus, tenuiter striatus, glaber, glaucus, 60-120 cm altus. *Folia* basalia longe petiolata (petioli ad 15 cm longi); lamina (4-)-5-pinnata, ambitu triangulari-ovata, 20-60 × 15-40 cm, glabra, glaucescens; laciniae lineares, 5-15(-23) × 0.5-1 mm, apiculatae; folia caulina inferiora et media basalius similia sed minora, superiora ad vaginas redacta; vaginae anguste inflatae, lineares, glaucae. *Inflorescentia*

paniculato-corymbosa. *Umbellae* centrales fertiles, sessiles vel longe pedunculatae (pedunculi ad 12 cm longi); radii 7-14, subaequales, 5-7(-10) cm longi, in fructu plus minusve stellatim patentes; bractae ovatae-lanceolatae, 6-10 mm longae, acuminatae, margine membranaceae; umbellulae 5-15-florae, pedicelli fructiferorum valde accrescentes, 9-15 mm longi; bracteolae lanceolatae, 4-15 mm longae, acuminatae-cuspidatae. *Umbellae* laterales omnino steriles, longe pedunculatae. *Sepala* ovata, minuta, 0.5-1 mm longa. *Petala* pallide lutea, ovata, 1.5-2 mm longa. *Stylopodium* depresso-conicum, margine undulato-elevato cinctum; styli 4.5-5.5 mm longi. *Meri-carpia* (vix matura) elliptica, 14-16 $\times$ 5 mm, basi truncata, jugis dorsalibus valde elevato-spongiosis, lateralibus anguste alatis (alis c. 0.5 mm latis), vittis dorsalibus 16-18, commissuralibus 14-16. *Floret Apr.-Mai.*

TURKEY. C1 Muğla: distr. Marmaris, M. Yarimadasi, 300 m, rocky serpentine slopes, 16 iv 1965, *Davis* 41282; 20 km from Emecik to Marmaris, 100 m, serpentine cliffs, 7 vi 1962, *Dudley*, *D.* 35451. C2 Muğla: Muğla-Fethiye, felsige Macchie 120 km südöstlich Muğla, 20 m, 20 vi 1954, *Huber-Morath* 14676 (holo Herb. Hub.-Mor., Basel); 3 km above Muğla, limestone rocks, 800 m, 19 vi 1954, *Huber-Morath* 14675; 30 km from Muğla to Kale, serpentine rocks, 880 m, 28 v 1962, *Huber-Morath* 16861.

The new species is distinct on account of its long styles (less than 4 mm in all other species of the genus). It resembles *F. pauciradiata* Boiss. & Heldr., an Anatolian endemic, in general habit, but the latter differs in its much broader mericarps (8-9 mm) with obsolete-filiform dorsal ridges, and usually shorter leaf-lobes (3-4(-7) mm). The style of *F. pauciradiata* is 2-3 mm long.

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