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ALI KANDEMIR & IAN C. HEDGE

An anomalous new *Ferulago (Apiaceae)* from eastern Turkey

Abstract

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A distinctive new species, *Ferulago glareosa,* is described as a species new to science and illustrated from a localised area of Erzincan province. It differs from all other species in the genus on account of its scree-like habit, scarcely developed fibrous collar, slender stems, loose inflorescence, few-rayed umbels and the scarcely winged lateral ridges on the mericarps. Despite its anomalous facies in the genus, molecular evidence indicates affinities with *Ferulago* and there are no apparent reasons for not including it in this genus.

Key words: *Umbelliferae,* taxonomy, *Ferulago glareosa,* Erzincan.

Ferulago glareosa Kandemir & Hedge, **sp. nov.** – Fig. 1
Holotype: Turkey, B7 Erzincan, Erzincan – Kemah, Sürek, 39°38.95'N, 39°20.16'E, 1212 m, in scree, 3.6.2005, *Kandemir 6901* (E ; isotypes: ANK, GAZI).

Combinatione characterum sequentium a speciebus omnibus huius generis differt: habitu planta glareosa, collo vaginis emarcidis foliorum infirme evoluto vel nullo, tenuicaulibus, foliis paucis plerumque basalibus, segmentiis terminalibus foliorum longis filiformibus, inflorescentiis laxis, umbellis pauciradiatis, mericarpiis vix alatis.

Perennial, entirely glabrous; *rootstock* oblique, solitary, woody, c. 1.3 cm broad, apically with, or without, a few petiolar remains. *Stems* c. 30-50 cm high, terete, finely ridged, solid, purplish, c. 1.5 mm in diameter at soil level. *Leaves* triangular in outline, mostly basal, 2-3-pinnate with few distant filiform ultimate segments, c. 4-5 cm long and regularly 0.5 mm wide; petiole with an inconspicuous basal sheath. *Inflorescence* loose, paniculate-corymbose with few branches; umbels compound, few; rays 4-7, subequal, 30-40 mm long; secondary rays 7-10. *Bracts* 2-4, c. 2 mm long; *bracteoles* 3-5, 1.5-2 mm long; bracts and bracteoles persistent, without veins. *Flowers* polygamous, innermost flowers of an umbellule usually male, outer ones hermaphrodite or female; sepals minute; petals yellow, 0.6 mm long. *Mericarps* broad-elliptic, glabrous, dorsally somewhat compressed, c. 6.5-7 × 3-4 mm, retuse at base; primary ridges relatively well-developed; lateral ridges scarcely different but with an indistinct membranous, not undulate wing; vittae not superficially visible; dorsal vittae 18-24; commissural vittae 12-14. *Endosperm* flat.

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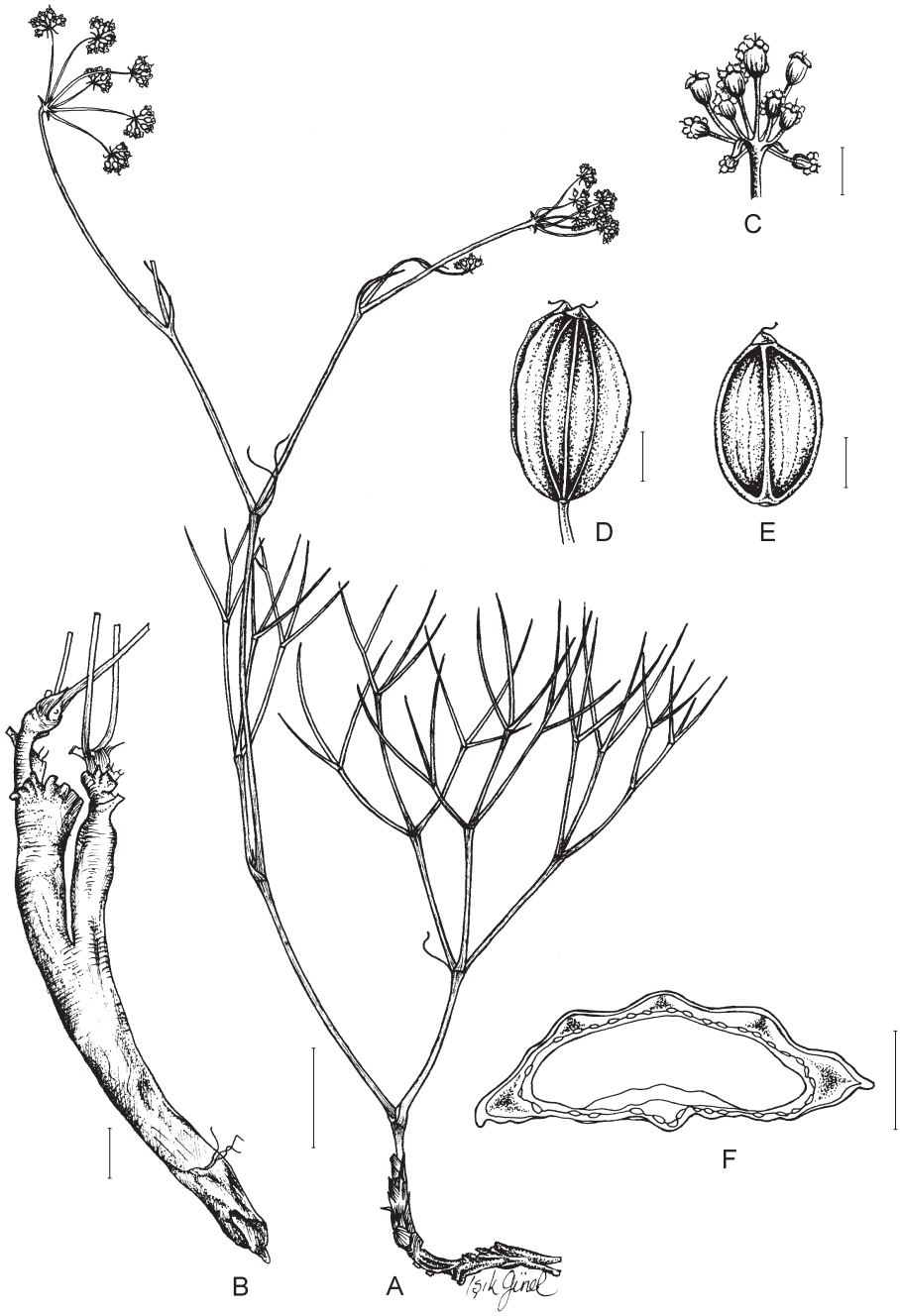

Fig. 1. *Ferulago glareosa* – A: habit; B: root; C: umbellule; D: dorsal surface of fruit; E: commissural surface of mericarps; F: transverse section of mericarp. – Scale bar: A = 3 cm, B = 1 cm, C-E = 2 mm, F = 1 mm; drawn from the type collection.

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Distribution. – The species is only known from the type locality. The habitat of *Ferulago glareosa* is a bare scree with few other plants including the rare distinctive endemic *Salvia divaricata* Benth., *Hedysarum candidissima* Freyn, *Oxytropis lupinoides* Grossh., *Jurinea cataonica* Boiss. & Hausskn., *Serratula serratuloides* (DC.) Takht. and *Onosma microcarpum* DC.

Other specimen examined. – TURKEY: B7 Erzincan: Erzincan – Kemah, Sürek, Steppenhügel, 1200 m, 16.7.1988, *Nydegger 43800* (E).

Relationships. – This distinctive species was first collected in 1988 and although it was subsequently examined by several botanists with a good knowledge of the family in SW Asia, it eluded generic identification, though generally considered to be within the *Ferula, Ferulago, Peucedanum* group of genera and possibly a new taxon. The original Nydegger material was less than ideal, though in mature fruit, and it was only when more complete specimens were collected in 2005 by one of us (A. K.) that its status could be more thoroughly investigated. It soon became clear that it was indeed a new species, but a bigger problem remained: which genus to place it in, or, does it merit being described as a new genus?

Using the dichotomous and the multi-access keys in the Flora of Turkey and relevant descriptions (Davis 1972, Peşmen 1972), the characters of perennial habit, yellow flowers, 2-3-pinnate leaves, the presence of both bracts and bracteoles, and the short, scarcely winged, compressed mericarps, brought *Peucedanum* and *Ferulago* into first consideration and eliminated *Ferula*. There were two features of the fruit that threw doubt on it belonging to the multiform *Peucedanum:* firstly, the scarcely winged lateral ridges on the fruit; secondly, and more important, the high number of both dorsal and commissural vittae. In *Peucedanum,* the usual number in European/SW Asian species is 2-3 dorsal and, usually, 2 commissural vittae. *Ferulago* has an overall range from (4-)10-36 commissural vittae and 12-50(-60) dorsal ones. The Erzincan plant has 12-14 commissural and 18-24 dorsal vittae. This gave support for describing it in *Ferulago* rather than *Peucedanum* (or any of its related SW Asian genera such as *Leutea* Pimenov, *Demavendia* Pimenov, *Cervaria* Gaertn., *Johreniopsis* Pimenov and *Zeravschania* Pimenov, see Pimenov 1987) all of which have many fewer vittae.

The arrangement and number of vittae are certainly important features in the family where reliable characters are so few. Throughout *Apiaceae,* most genera have relatively small numbers of dorsal and commissural vittae; those with many, at least in SW Asia, are in the minority. Burtt & Davis (1949) in their description of their new Turkish/Cyprus genus *Glaucosciadium* placed major emphasis on the complete absence of commissural vittae and used it as a strong reason for isolating it from *Peucedanum*. Bernardi (1979), in his somewhat idiosyncratic, but detailed, revision of *Ferulago,* discussed their vittae in detail. He concluded that, in it and related genera, vittae were a valuable taxonomic character and independent of ecological factors. The three sections that he recognised, viz. *F.* sect. *Anisotaenia* Boiss., sect. *Eutaenia* Bernardi and sect. *Ferulago,* were defined solely on the respective numbers of the vittae on the commissure and dorsal surfaces. Subsequently, Tomkovich & Pimenov (1982) provided useful fruit cross-sections drawings of c. 30 species; they clearly illustrate the wide range of variation in both dorsal and ventral ridges and in vittae numbers. In 1983, Tomkovich published a key, entirely in Russian, to the 43 species then known. The most recent infrageneric classification of *Ferulago* is that of Tomkovich & Pimenov (1987). It differs appreciably from Bernardi's. They recognised 2 subgenera (one new) and 9 sections (6 new) with most emphasis on leaf characters and very little on vittae. The geographical distribution of all the species in the genus is dealt with in a further paper by Tomkovich & Pimenov (1989). With c. 30 species out of a genus total of c. 45, Turkey has both the largest number of species and the most morphological diversity. But despite these above-cited informative references, including their keys, we were unable to find an ally for the new species.

Unlike the Eurasian/African *Peucedanum,* at least as currently recognised, which has a multiplicity of variation in facies, leaves and fruit structure, the c. 45 species of the SW Asiatic/Mediterranean *Ferulago* are all relatively similar in facies with the readily observable features of sturdy erect stems, a prominent fibrous collar of withered petiolar remains, prominent bracts and bracteoles and yellow petals. The facies of *F. glareosa* is markedly different from all known *Fe-*

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rulago species because of its slender stems with an absent or poorly developed fibrous collar. But we decided to describe it there because other than its habit, there seemed to be no good reasons why it did not belong there. Within the genus, it would be placed within sect. *Anisotaenia* as defined by Bernardi (1979: 54) because of the numbers of vittae; though very different from the five Turkish species recognized in that section (Peşmen 1972). If it were to be described as a new genus, it would, with present knowledge, be based solely on its distinctive habit.

While attempting to assess the placement of the new species, we were fortunate in having a preliminary analysis carried out of nrDNA sequence data from ITS1 and ITS2 sampling. This revealed (J. H. Paik, unpubl. data) that, comparing the result with known accessions in Genbank, the Erzincan plant showed a 95 % similarity with *Ferulago galbanifera* Koch (= *F. campestris* (Besser) Grech) and a 92 % similarity with *Peucedanum terebinthaceum* Rchb. Although this molecular evidence does suggest a closer relationship with *Ferulago* than *Peucedanum,* relatively few species of *Ferulago* have been sampled and it would be unwise to over-emphasise it.

Recommended IUCN threat category. – The single population of *Ferulago glareosa* known grows in a restricted open area, which has been included in an afforestation programme. Tree planting is in progress. We estimate that the species may face a population size reduction of over 80 % within the next few years and thus an extremely high risk of extinction in the wild if no precautions are taken. We therefore recommend the classification of *Ferulago glareosa* as "Critically Endangered (CR)" according to criteria A3 and B2 (IUCN 2001).

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