THE IDENTITY OF FERULA ASSA-FOETIDA L.

D. F. CHAMBERLAIN

ABSTRACT. The confusion surrounding the application of the name *Ferula assa-foetida* L. (Umbelliferae) is discussed. It is shown that in the past the name has wrongly been used for two further species: *F. foetida* and *F. narthex*. Relevant nomenclature and synonymy is given, along with a summary of distribution, for the three species. A full description is also supplied for *F. assa-foetida*, a species that is restricted to W & SW Persia.

While preparing the account of the genus *Ferula* for *Flora Iranica*, the confusion surrounding the application of the name *Ferula assa-foetida* L. became apparent as this name had been applied to three distinct species occurring within the area covered by the Flora.

Ferula assa-foetida L. dates from the first edition of the *Species Plantarum* (1753) and is based on Kaempfer's account (1712) of plants from W Persia, from which the gum 'Assa-foetida' was being collected for commercial exploitation as early as the seventeenth century. Unfortunately the same gum has also been extracted from at least two other species of *Ferula* and these are sufficiently close (at least superficially) not to be separated by Linnaeus's original description.

The gum Assa-foetida has been an important item of trade on account of its supposed medicinal value. Linnaeus (1749) mentions that it was used as a cure for 'hysteria' and both Kaempfer and Aitchison (1890) refer to its use as a vermifuge. Its reputation is doubtless enhanced by the persistent odour, somewhat resembling garlic. For several years after collection, this odour pervades dried material of all three species from which the gum is obtained, making herbarium specimens unpleasant to handle. The gum is also used, especially in India where it is known as 'Hing', as a condiment eaten with Dal.

Kaempfer distinguished two centres from which the trade was conducted. The first was at Disgun in SW Persia (Fars province) and the second at Herat, now in NW Afghanistan. He thought that the same species was being exploited around both centres. It now seems probable that two species were involved and this is the source of some of the confusion surrounding the use of the name.

The method of collection of the gum in the Disgun area is illustrated and described in some detail in Kaempfer's account. Aitchison, almost two centuries later, described essentially the same process based on observations made in Khorasan in NE Persia. In late May or early June the stem was excised and a trench dug around the root. Incisions were made below the cut surface and the whole covered over to prevent undue desiccation. At intervals of three or four days the exuded gum was collected and the process repeated.

The entry under *F. assa-foetida* in the *Species Plantarum* cites a polynomial from the *Materia Medica* (1749) and a different polynomial—'Assa-foetida

Disgunensis umbellifera lingustico affinis'—from Kaempfer's *Amoenitatum* (1712). Linnaeus probably only knew the plant from Kaempfer's description, even though specimens existed in the Sloane Herbarium. The interpretation of these specimens, now in the British Museum, is made more difficult by their fragmentary nature; they are now represented by a few leaf segments and two poor fruits. Fortunately, Kaempfer supplied a full description and a good plate and it is these, rather than the specimens available, that should be used to typify *F. assa-foetida* L.

The second species involved was first described in the genus *Scorodosma* (now considered to be a subgenus of *Ferula*) as *S. foetida* Bunge (1846), from a Lehmann specimen collected in Turkestan. The confusion with *F. assa-foetida* L. dates from Borszczow (1860), who had seen Kaempfer's specimen, which was then in much the same state as it is today, and mistakenly assumed that *F. foetida* was synonymous with *F. assa-foetida* L. Boissier (1872) stated that he was following Borszczow, so obviously contributed nothing original to the problem. Regel (1878) did unravel the two species and made the combination *Ferula foetida* (Bunge) Regel. More recently Korovin (1947) reverted to Borszczow's treatment, maintaining the name *F. assa-foetida* for this taxon without apparently referring back to Kaempfer's specimen or description. This error has been repeated in *Fl. URSS* (1951) and by recent Soviet authors. It is fairly certain that the trade in 'Assa-foetida' centred on Herat was based on *F. foetida* (Bunge) Regel and not *F. assa-foetida* L.

The third species was described from specimens collected near Gilgit in northern Pakistan under the name *Narthex assa-foetida* (L.) Falconer (1851). Falconer did take the trouble to compare his plant with Kaempfer's description and type and can indeed be excused for assuming that his plant was the same as Kaempfer's as there are many similarities. Plants were successfully raised at Edinburgh (see Balfour, 1859) and one was used for an illustration in the *Botanical Magazine* (t. 5168, 1860). Boissier realised that Falconer's plants were distinct from the entity that he considered to be *F. assa-foetida* L. and gave them a new name, *Ferula narthex* Boiss.

Discarding the nomenclatural confusion, the three taxa are sufficiently distinct for Korovin (1947) to have placed each in different subgenera as follows: *F. assa-foetida* L. (as *F. rubricaulis*) in subgen. *Merwia*; *F. foetida* (Bunge) Regel (as *F. assa-foetida*) in subgen. *Scorodosma* and *F. narthex* Boiss. in subgen. *Narthex*. As can be seen from the accompanying map (fig. 1), the three species have essentially allopatric distributions. The following key will serve to differentiate them.

1. Petals 2·5–3·5 mm; styles elongate, stigmas capitate; mericarps with broad inflated wings, villous, dorsal vittae 6–8 per vallecula . . . . . 2. *F. foetida*
+ Petals 1·5–2 mm; styles short, stigmas truncate; mericarps with broad or narrow wings that are not inflated, glabrous, dorsal vittae 1–4 per vallecula 2
2. Upper leaf sheaths c. 9 × 4 cm; mericarps 11–14 × 6·5–9 mm, dorsal vittae 3–4 per vallecula . . . . . 1. *F. assa-foetida*
+ Upper leaf sheaths 12–18 × 7–12 cm; mericarps 17–22 × 9–11 mm, dorsal vittae 1 per vallecula . . . . . 3. *F. narthex*

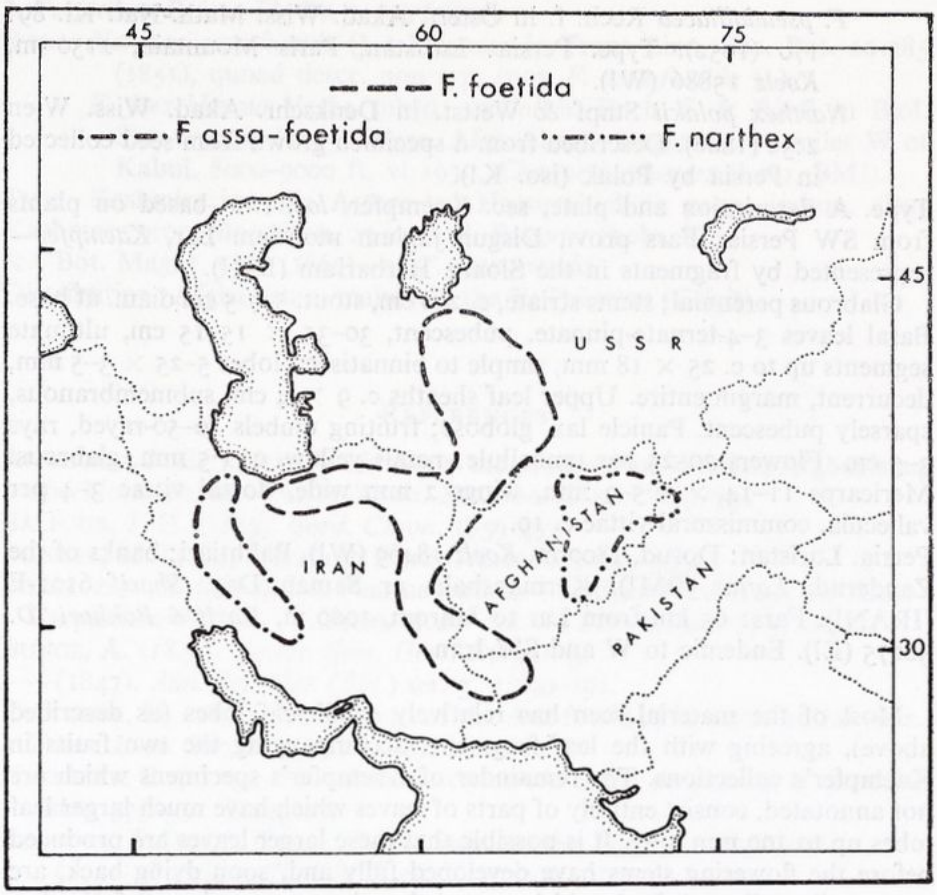

FIG. 1. Distribution of the three species of *Ferula*.

Of the three species concerned, adequate descriptions are available for *F. foetida* and *F. narthex* so for them, only details of synonymy and relevant types are included. However, the description of *F. assa-foetida* L. has depended on an exact interpretation of Kaempfer's account and specimens. I have now seen a plant from near Lar in S Persia collected not far from the type locality of *F. assa-foetida*. This is a close match with Kaempfer's plate and confirms much of his account, allowing a less equivocal description to be drawn up.

1. F. assa-foetida L., Sp. Pl. 248 (1753). [Assa-foetida Disgunensis umbelliferae ligustico affinis. Kaempfer, Amoenitatum 585, t. 536 (1712)].

Syn.: *F. erubescens* Boiss. in Ann Sci. Nat. ser. 1,3:316 (1844) ex parte—*nomen confusum.*

F. rubicaulis Boiss., Diagn. ser. 3,2:92 (1856). Syntypes. Persia: Dalmekou, *Aucher* 4614 (E!); Kuh Daëna (Fars prov.), *Kotschy* 666 (K! W!).

F. pseudalliacea Rech. f. in Österr. Akad. Wiss. Math.-Nat. Kl. 89: 170 (1952). Type. Persia: Luristan, Paris Mountain, 2150 m, *Koelz* 15886 (W!).

Narthex polakii Stapf & Wettst. in Denkschr. Akad. Wiss. Wien 2:56 (1886). Described from a specimen grown from seed collected in Persia by Polak (iso. K!).

Type. A description and plate, sec. Kaempfer, *loc. cit.*—based on plants from SW Persia: Fars prov., Disgun jugium montium Lar, *Kaempfer*—represented by fragments in the Sloane Herbarium (BM!).

Glabrous perennial; stems striate, c. 200 cm, stout, 5–7·5 cm diam. at base. Basal leaves 3–4-ternate-pinnate, pubescent, 30–35 × 15–15 cm, ultimate segments up to c. 25 × 18 mm, simple to pinnatisect, lobes 5–25 × 3–5 mm, decurrent, margin entire. Upper leaf sheaths c. 9 × 4 cm, submembranous, sparsely pubescent. Panicle lax, globose; fruiting umbels 10–50-rayed, rays 3–5 cm. Flowers 20–25 per umbellule; petals yellow, c. 1·5 mm, glabrous. Mericarps 11–14 × 6·5–9 mm, wings 2 mm wide, dorsal vittae 3–4 per vallecula, commissural vittae c. 10.

Persia. Luristan: Dorud, 1800 m, *Koelz* 18469 (W!). Bakhtiari: banks of the Zanderud, *Loftus* (BM!). Kermanshah: nr Saman Dag, *Sharif* 6102-E (IRAN!). Fars: 65 km from Lar to Jahrom, 1000 m, *Davis & Bokhari, D.* 56275 (E!). Endemic to W and SW Iran.

Most of the material seen has relatively small leaf lobes (as described above), agreeing with the leaf fragments accompanying the two fruits in Kaempfer's collections. The remainder of Kaempfer's specimens which are not annotated, consist entirely of parts of leaves which have much larger leaf lobes up to 100 mm long. It is possible that these larger leaves are produced before the flowering stems have developed fully and, soon dying back, are not usually collected. It should be noted that the type specimen of *Narthex polakii* has leaves with large lobes but the remainder of the specimens seen do not.

Both syntypes of *F. rubricaulis* are in fruit and lack leaves. They are however close enough to *F. assa-foetida* to be included under this species.

2. F. foetida (Bunge) Regel in Acta Horti Petrop. 5:592 (1878).

Syn.: *Scorodosma foetidum* Bunge, Delect. Sem. Hort. Dorpat. 3 (1846).

F. assa-foetida sensu Boiss. (1872) & Korovin (1947, 1951) et auct. ross. plur. non L. (1753).

F. koelzii Rech. f. & Riedl in Biol. Skr. 13,4:70 (1963). Type. Afghanistan: [Jowzjan] Sangcherak, Safedsang, N of Qala Shalar, 3050 m, *Koelz* 13997 (W!).

Type. Turkestan: [Uzbek SSR] zwischen Tschakyr-Ata und Nasarbai-Kudak, 12 iv 1842, *Lehmann.*

Ic.: Korovin, Monogr. t. 1. (1947)—as *F. assa-foetida.*

Distribution: Soviet Central Asia (Kara Kum, Kisyl Kum, Turcomania); Afghanistan (Herat, Kandahar, Jowzjan); Pakistan (Baluchistan); Persia (Khorasan, Baluchistan).

3. F. narthex Boiss., Fl. Or. 2:994 (1872).

Syn.: *Narthex assa-foetida* (L.) Falconer in Trans Linn. Soc. Bot. 20:285 (1851), quoad descr. non typ. (non *F. assa-foetida* L.).

F. jaeschkeana Vatke subsp. *taenioloba* Rech. f. & Riedl in Biol. Skr. 13,4:69 (1963). Type. Afghanistan: Paghman, 17 miles W of Kabul, 8000–9000 ft, vi 1939, *Chaworth-Musters* (holo. BM!).

Type. Kashmir: in valle Astore vel Hassorah dicto prope indum, altus Kashmeer prope Boostbon, 23 ix 1838, *Falconer* (holo. K!).

Ic.: Bot. Mag. t. 5168 (1860)—as *F. assa-foetida.*

Distribution: Afghanistan, mainly in the E; Pakistan (Gilgit).

References

AITCHISON, J. E. T. (1890). Notes on the products of Western Afghanistan and North-Eastern Persia. *Trans. Bot. Soc. Edinb.*18:69–73.

BALFOUR, J. H. (1859). *Gard. Chron.* 1859:497.

BOISSIER, M. (1872). Ferula in *Flora Orientalis* 2:994–995.

BORSZCZOW, E. (1860). Die Pharmaceutisch-wichtigen Ferulaceen der Aralo-Caspischen Wüste . . . . *Mém. Acad. Sci. St. Pétersb.* ser. 7, 3, no. 8.

BUNGE, A. (1846). *Delect. Sem. Hort. Dorpat.* 3.

——(1847). *Ann. Sci. Nat.* (*Bot.*) sei. 3, 7:190–191.

FALCONER, H. (1851). Description of the Asa-foetida Plant of Central Asia. *Trans. Linn. Soc. Bot.* 20:285–291.

KAEMPFER, E. (1712). *Amoenitatum exoticarum rerum persicarum et ulterioris Asiae.* 535–552. Lemgovia.

KOROVIN, E. (1947). *Generis Ferula monographia illustrata.* Tashkent.

——(1951). Ferula in *Fl. URSS*, ed. Komarov, 17:73.

LINNAEUS, C. (1749). *Materia medica* ed. 1:49.

——(1753). *Species Plantarum* ed. 1:248.

REGEL, E. (1878). Descriptiones plantarum rariorum et minus cognitarum. *Acta Horti Petrop.* 5:592.