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NOTES ON MURETIA AND STEFANOFFIA

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ABSTRACT. The heterogeneous nature of European and W Asiatic *Muretia* (Umbelliferae) is discussed and it is concluded on the evidence of a number of characters, but particularly those of fruit anatomy and histology, that *M. aurea* Boiss. has a natural affinity with *Stefanoffia daucoides* (Boiss.) H. Wolff. The new combination *Stefanoffia aurea* (Boiss.) M. Pimen. & Kluykov is therefore made and the previously monotypic *Stefanoffia* becomes ditypic. Details of nomenclature, typification and distribution of *Stefanoffia* are given.

Investigation of the genus *Muretia* leads to the conclusion that it is a heterogeneous assemblage of species rather than a natural taxon. In studying the most widespread species of *Muretia* in the USSR, *M. lutea, M. transitoria* and *M. fragrantissima,* we reached the conclusion that the last of these differed considerably from the other two and should be placed in Lipsky's previously rejected genus *Galagania*, while *M. lutea* and *M. transitoria* were classified by us as belonging to the genus *Elaeosticta* Fenzl. We believe that the essential diagnostic features of *Elaeosticta*, which should be differentiated from *Scaligeria* DC (Kluykov *et al.*, 1976) are (a) the presence of a very peculiar exocarp consisting of large, radially elongated cells considerably larger than those of the mesocarp, and (b) the structure of the secretory system of the fruit which consists of numerous small oil ducts not containing a separate layer of secretory cells, and almost indistinguisable in ripe fruits. Both these features are well developed in *M. lutea* and *M. transitoria*, which in fact only differ from the other species of *Elaeosticta* in having yellow, not white, petals—a character which shows much intergeneric variation in Umbelliferae and cannot serve as a generic criterion. Accordingly we consider *Muretia s.str.* (i.e. the lectotype species *M. lutea* and its closest relative *M. transitoria*) as subsection *Muretia* in the type section of the genus *Elaeosticta*.

Muretia aurea Boiss. undoubtedly occupies a morphologically and geographically rather isolated position in the genus. It was for this reason that we unhesitatingly chose *M. lutea*, the other of the two species mentioned in the description of *Muretia* by Boissier (1844), to lectotypify the genus (Kluykov, Pimenov & Tikhomirov, 1978). It was therefore of great interest when in studying collections on loan from E, K and LE our attention was drawn to the similarity in many characteristics of *M. aurea* and the only species of the monotypic genus *Stefanoffia* H. Wolff—*S. daucoides* (Boiss.) H. Wolff. These species have the same life-form (geophilic ephemeroids with subterranean root tubers), similar stems and leaves and—what is especially interesting since it is comparatively seldom observed in Umbelliferae—pinnate involucres and petals with inflexed apices (Fig. 1C, 2F).

This similarity points to a taxonomic affinity between *M. aurea* and *S. daucoides* which we have attempted to elucidate by histological study of

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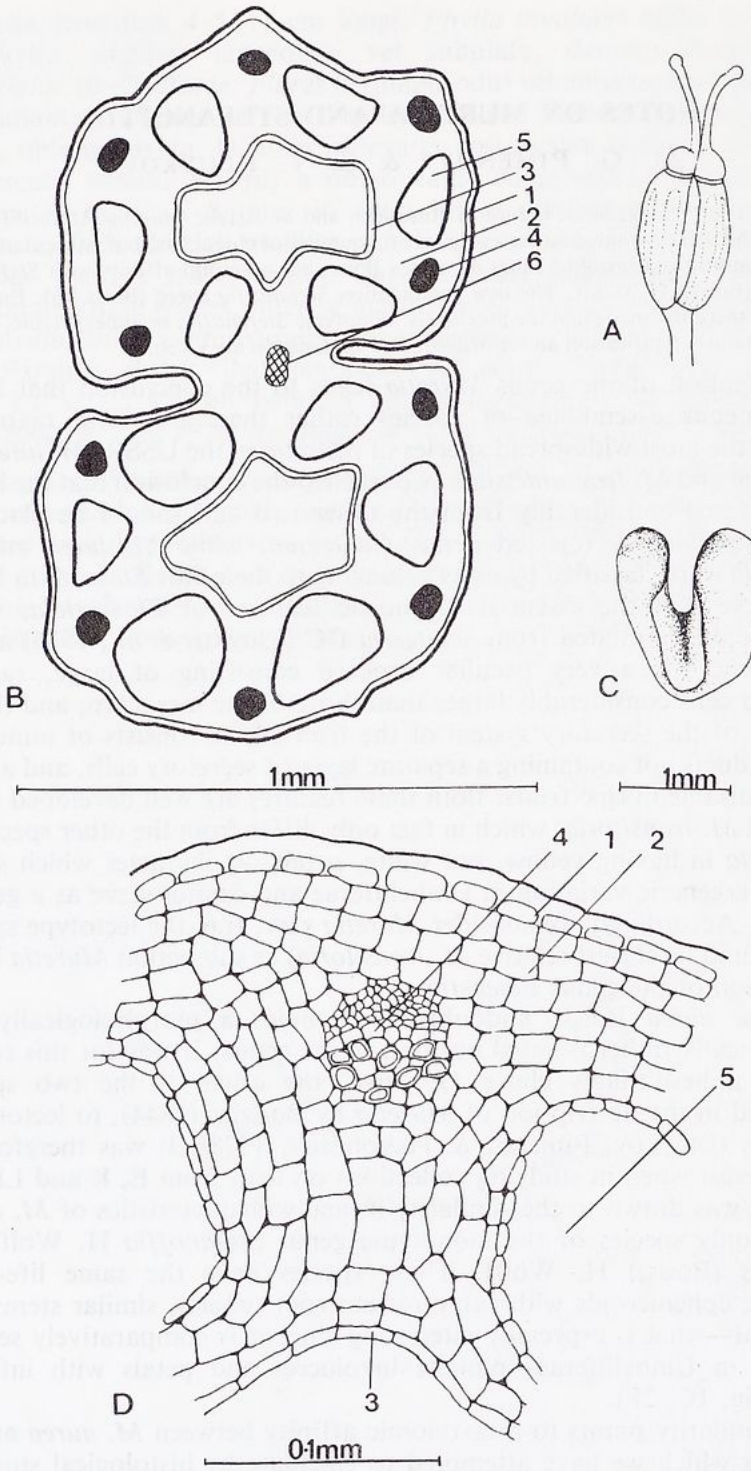

FIG. 1. *Stefanoffia daucoides*. A, young fruit (lateral view); B, T.S. young fruit; C, petal; D, T.S. mericarp in costal region. (1, exocarp; 2, mesocarp; 3, endocarp; 4, vascular bundle; 5, oil duct; 6, carpophore).

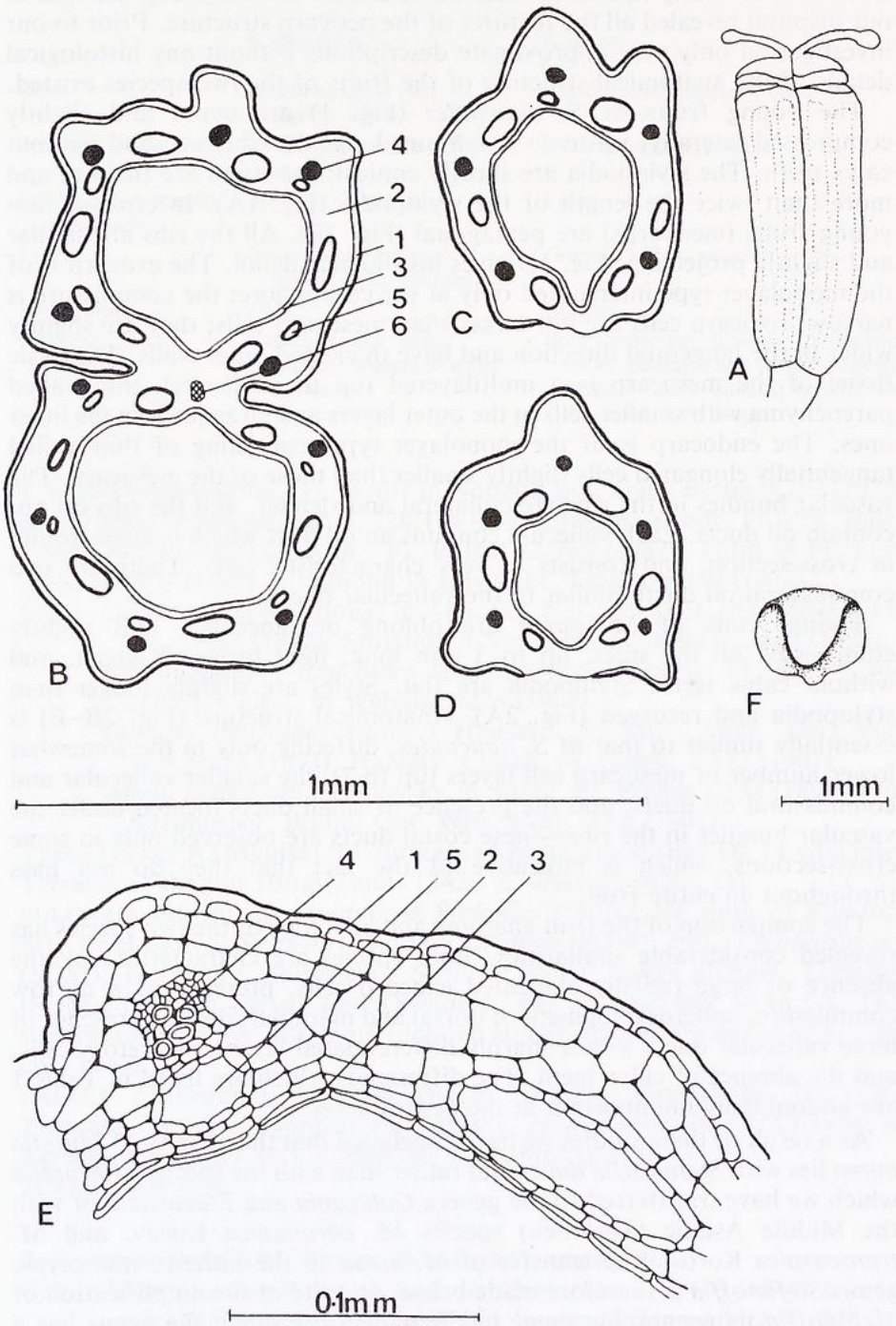

FIG. 2. *Stefanoffia aurea*. A, young fruit (lateral view); B, T.S. young fruit; C & D, T.S. of mericarps; E, T.S. of mericarp through a costa and vallecula; F, petal. (1, 2, 3, 4, 5 & 6 as in Fig. 1).

fruit structure—a powerful taxonomic tool for generic diagnosis in the Umbelliferae. Fully ripe fruits were not available but the young material at our disposal revealed all the features of the pericarp structure. Prior to our investigation only very approximate descriptions without any histological details of the anatomical structure of the fruits of the two species existed.

The young fruits of *S. daucoides* (Fig. 1) are ovoid and slightly compressed laterally, up to 1·5–1·6 mm long, dark-brown, and without calyx teeth. The stylopodia are shortly conical; the styles are filiform and more than twice the length of the stylopodia (Fig. 1A). In cross-section young fruits (mericarps) are pentagonal (Fig. 1B). All the ribs are similar and slightly projecting. Fig. 1D gives histological detail. The exocarp is of the monolayer type interrupted only at the carpophore; the commissure is narrow. Exocarp cells are not larger than mesocarp cells; they are slightly wider in the tangential direction and have thickened outer walls. The basic tissue of the mesocarp is a multilayered (up to 11 layers), thin-walled parenchyma with smaller cells in the outer layers and larger cells in the inner ones. The endocarp is of the monolayer type, consisting of thin-walled tangentially elongated cells slightly smaller than those of the mesocarp. The vascular bundles in the ribs are collateral and slender, and the ribs do not contain oil ducts. Each vallecula contains an oil duct which is large, round in cross-section, and consists of very characteristic cells. There are two commissural oil ducts similar to the vallecular ones.

Young fruits of *M. aurea* are oblong or lanceolate and slightly compressed on the sides, up to 3 mm long, light brownish green, and without calyx teeth. Stylopodia are flat. Styles are slightly longer than stylopodia and recurved (Fig. 2A). Anatomical structure (Fig. 2B–E) is essentially similar to that of *S. daucoides*, differing only in the somewhat lower number of mesocarp cell layers (up to 7), the smaller vallecular and commissural oil ducts, and the presence of small ducts located under the vascular bundles in the ribs—these costal ducts are observed only in some cross-sections, which is indicative of the fact that they do not pass throughout an entire fruit.

The comparison of the fruit anatomy and histology of the two species has revealed considerable similarities. Both species are characterized by the absence of large radially elongated exocarp cells, presence of a narrow commissure, underdevelopment of dorsal and marginal ribs, the presence of large vallecular ducts with a sharply differentiated layer of secretory cells, and the absence of calyx teeth. The differences which are listed in Table 1 are undoubtedly unimportant at the generic level.

As a result of these studies we have concluded that the affinity of *Muretia aurea* lies with *Stefanoffia daucoides* rather than with the species of *Muretia* which we have transferred to the genera *Galagania* and *Elaeosticta* or with the Middle Asiatic (Turkmen) species *M. oeroilanica* Korov. and *M. transcaspica* Korov. The transfer of *M. aurea* to the hitherto monotypic genus *Stefanoffia* is therefore made below. In spite of the amplification of *Stefanoffia* its geographic range has remained the same: the genus has a rather narrow distribution in southern Bulgaria, northern Greece and western Turkey.

Details of nomenclature, typification and distribution (specimen citations) of the species of *Stefanoffia* are given below.

TABLE 1

Diagnostic characters of *Stefanoffia daucoides* and *S. aurea*

	S. daucoides	**S. aurea**
Stem	Round in upper part, slightly ribbed	Almost quadrangular in upper part
Terminal lobe of leaf	Linear or linear-lanceolate, acute	Ovate-lanceolate, pointed
Leaflets of involucells (bracteoles)	Entire or dissected	Entire
Petals	White, deeply inflexed (almost to the middle)	Greenish yellow, entire
Young fruits	Oval	Oblong
Oil ducts (vittae)	Vallecular only, large, passing throughout entire mericarp	Both vallecular (passing throughout entire mericarp) and smaller, shorter, accessory ducts situated between the vallecular ducts present

1. S. daucoides (Boiss.) H. Wolff in Notizbl. Bot. Gart. Berlin 9:282 (1925) & in Engler, Pflanzenreich 4, 228:174 (1927); Hayek, Prodr. Fl. Pen. Balc. 1:992 (1927); Stojanov *et al.*, Fl. Bulgar. 2:785 (1967); Tutin in Fl. Eur. 2:355 (1968); Hedge & Lamond in Davis, Fl. Turkey 4:350 (1973).

Syn.: *Carum daucoides* Boiss. in Ann. Sci. Nat., sér. 3, 1:139 (1884) & Fl. Or. 2:883 (1872); Stojanov & Stefanov, Fl. Bulgar., 822 (1925).
Bulbocastanum daucoides (Boiss.) Nym., Consp. Fl. Eur. 2:304 (1879); Calest. in Webbia 1:276 (1905).
Bunium daucoides (Boiss.) Hausskn. in Mitt. Thür. Bot. Ver. N.F.5:114 (1893); Halácsy, Consp. Fl. Graec. 1:673 (1901).
Ammi thracicum Velenovsky in Suppl. Fl. Bulgar., 132 (1898) & in Sitzungsber. Böhm. Ges. Wiss. Prag. 27:6 (1902).

Type [Turkey B2 Manisa] 'In dumosis ad basin Tmoli (Boz Da.) Lydia inter Terrassa et Berghir [Birgi], ann. 1842', *E. Boissier* (holo. G).

BULGARIA. Ak-Bunar, *Stojanov & Stefanov* 888 (K); NE slope of Rhodopi Mts, nr Haskovo, *Stribrny* (K); ibid., *Urumov* (SOM); ibid., *Vichodtsavsky* (SOM); Hermanly, Skobelevo, *Stribrny* (n.v.); Sakar planina, *Ganchev* (SOM); between Mesok and Devadere, 300 m, *Mattfeld* 58 (n.v.). This species was recorded also from Elchovo and Svilengrad (Stojanov *et al.*, op. cit., 1967).

GREECE. Makedonia, Corthiat Mts nr Saloniki, *Orphanides* 384 (LE); Thessalia, between Tsungeri and Malaxy, *Haussknecht* (n.v.); Chassia, nr Kerasia, *Formànek* (n.v.); Vondas, *Formànek* (n.v.).

TURKEY. See type.

2. S. aurea (Boiss.) M. Pimen. & Kljuykov, **comb. nov.**

Syn.: *Muretia aurea* Boiss. in Ann. Sci. Nat., sér. 3, 1:143 (1844) & in Fl. Or. 2:859 (1872); H. Wolff in Engler, Pflanzenreich 4, 228:213 (1927); Hedge & Lamond in Davis, Fl. Turkey 4:351 (1973).

Type. [Turkey B2/C2 Aydin/Denizli]. 'In dumosis Lydiae ad basin montis Mesogis (Aydin Da.) inter Laodiceam (Denizli) et Philadelphiam (Alaşehir)', *E. Boissier* (holo. G; iso. LE).

TURKEY. B2/C2 Aydin/Denizli: Lydia, vi 1842, *Boissier*; between Sojut (Söğüt) and Lefke, *Wiedemann* (LE); Kütahya, Gediz to Kütahya, 18 km S of Kütahya, 1000 m, limestone gorge, *Davis & Coode* D. 36931 (K); Bilecik, Kütahya to Bozüyük, 8 km above Inönü, 1030 m, *Hub.-Mor.* 16932.

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REFERENCES

BOISSIER, E. (1844). Plantae Aucherianae. *Ann. Sci. Nat.*, sér. 3, 1:139–143.

HEDGE, I. C. & LAMOND, J. M. (1973). Stefanoffia & Muretia in DAVIS, P. H. (ed.) *Flora of Turkey and the East Aegean Islands* 4:351. Edinburgh.

KLUYKOV, E. V., PIMENOV, M. G. & TIKHOMIROV, V. N. (1976). Elaeosticta Fenzl, a self-contained genus of the family Umbelliferae, distinct from Scaligeria DC. *Bull. Soc. Nat. Mosc.* n.s. 81 (6):83–94.

——(1978). Additions to the taxonomy and closer definitions of the genus Elaeosticta Fenzl and near taxa. *Ibid.*, n.s. 83 (6):100–107.

WOLFF, H. (1927). Umbelliferae-Apioideae-Ammineae-Carinae, Ammineae novemjugatae et genuinae. In ENGLER, *Das Pflanzenreich*, Hf. 90 (4, 228):1–398. Leipzig.