GONGYLOTAXIS, A NEW GENUS OF THE UMBELLIFERAE, ENDEMIC TO AFGHANISTAN

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On morphological and anatomical evidence the Afghan endemic *Scaligeria gongylotaxis* Rech.f. is shown to be distinct from *Scaligeria* sens. str. and related geophytic genera. The taxon is considered to be best treated as a separate monotypic genus, here named *Gongylotaxis* Pimenov & Kljuykov, and the species renamed as *Gongylotaxis rechingeri* Pimenov & Kljuykov *nom. nov.*

Keywords. Middle Asiatic flora, *Scaligeria*, Umbelliferous geophytes.

INTRODUCTION

The generic delimitation of arid Umbelliferous geophytes is beset with considerable difficulties (Pimenov et al., 1981). Although rather similar in habit and life-form (tuber-like underground parts, single stem, ephemeroid rhythm of season development, etc.), these plants are only partly connected in their evolutionary origin; their similarity also appears to be due to convergence, reflecting an adaptation to life under very peculiar ecological conditions. To distinguish those taxa truly related from those only similar through convergence, we have investigated a large set of characters, including fruit (Pimenov et al., 1981) and rootstock anatomy (Sdobnina & Pimenov, 1991).

There are many such umbels in the Middle Asiatic flora with geophytic life-form. A small number of them obviously belong to rather distant infra-familiar taxa (e.g. *Krasnovia* and *Kozlovia*, as well as some *Chaerophyllum* species, in the Scandiceae; *Seselopsis* from the Apieae-Foeniculinae; and *Korshinskya* in the Smyrnieae sens. lat.), but the majority belong to the large and, until now, poorly classified tribe Apieae. In our opinion *Bunium*, *Elaeosticta*, *Galagania*, *Hyalolaena*, *Korovinia*, *Mogoltavia*, *Oedibasis* and *Ormopterum* are also members of the Apieae; having dorsally compressed fruits *Korovinia*, *Mogoltavia* and *Oedibasis* have in the past been formally referred to the Peucedaneae.

Many Umbelliferous geophytes are known from the territory of *Flora Iranica*. Some of them have been placed in the traditional genus *Scaligeria* (Rechinger, 1987) on the basis of similarity in life-form, the structure of the tuber-like underground parts, etc. Most of them have been formerly transferred to the old, but forgotten, genus *Elaeosticta* Fenzl (Kljuykov et al., 1976; Kljuykov, 1983). After all these transfers only one species of Iranian-Afghan *Scaligeria* remains unregarded, namely *S. gongylotaxis*, a species described by Rechinger (1987) in the treatment of the genus for *Flora Iranica*. We consider that this species cannot rightfully be referred

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to either *Scaligeria* sens. str., to *Elaeosticta*, to *Korshinskya*, or to any other known genus of local geophilic Umbelliferae. The main differences between *S. gongylotaxis* and *Elaeosticta* are the following: the structure of the underground part (their 'tubers' are only superficially homologous as in *Elaeosticta* they are derived from a thickening of the hypocotyl, and in *S. gongylotaxis* from the lateral roots); the absence (*Elaeosticta*) vs presence (*S. gongylotaxis*) of general pubescence; and fruit structure (the peculiar exocarp consisting of large cells found in all *Elaeosticta* species — the 'stratum pellucidum' of Korovin (1928) — is absent in *S. gongylotaxis*). The differences between *S. gongylotaxis* and the genera *Korshinskya*, *Hyalolaena* and *Galagania* are also considerable; they are summarized in Table 1 along with *Scaligeria*. Thus we consider that *S. gongylotaxis* is a rather peculiar taxon which should be separated from *Scaligeria* into a new monotypic genus with a narrow area of distribution in Afghanistan.

In naming this new genus we have used the specific epithet 'gongylotaxis' given by K.H. Rechinger, regarding it as the substantive because it emphasizes one of the clearest diagnostic characters of the taxon: the knob-like roots. The specific name we dedicate to the prominent Austrian botanist Karl Heinz Rechinger, initiator, organizer and principal author of *Flora Iranica*, who first described this taxon.

Gongylotaxis Pimenov & Kljuykov, **gen. nov.**
Hyalolaena Bunge, *Elaeosticta* Fenzl et *Scaligeria* (Willd. ex Spreng.) Grande affinitas sed radices divisae, tuberiformiter incrassatae et plantae pilis albis brevibus mollibus tenuibus tectae et exocarpium cellulis minutis notabilis.

Affinities with *Hyalolaena* Bunge, *Elaeosticta* Fenzl and *Scaligeria* (Willd. ex Spreng.) Grande but notable for tuberous roots, general pubescence and minute exocarp cells.

Perennial monocarpic ephemeroid geophytes, covered with soft fine white hairs. *Roots* divided, thickened like a tuber, lateral roots with many conspicuous tubers. *Leaves* 3 × pinnatisect, basal segments sessile to subsessile, with linear terminal lobes. *Bracts* and bracteoles shortly pubescent, mainly entire, herbaceous to membranous. *Calyx teeth* obsolete. *Petals* white, shortly hairy on the dorsal surface, unclawed, apex acuminate and incurved. *Ovary* and developing fruits shortly white papillate. *Fruits* ovate, barely dorsally flattened, constricted below the stylopodium, ribs inconspicuous; stylopodium flat-conical, carpophore bifid to the base, commissure narrow. *Mericarps* ovate to suborbicular in cross-section. *Exocarp* single-layered with minute cells, *mesocarp* composed of minute parenchymatous cells. *Vittae* scarcely distinguishable, the vallecular canals with a single broad and a minute pair, the commissure with two broad and 2–4 minute. *Endocarp* and spermoderm unistriate and formed of minute cells. *Endosperm* scarcely emarginate on the ventral side, provided with a shallow double groove (Fig. 1A–C).

Type species: *G. rechingeri* Pimenov & Kljuykov *nom. nov.*
Syn.: *Scaligeria gongylotaxis* Rech.f., Flora Iranica 162: 226, tab. 167 (1987).

TABLE 1. The taxonomic characters of *Scaligeria gongylotaxis* and the genera *Elaeosticta*, *Korshinskya*, *Galagania*, *Hyalolaena* and *Scaligeria*.

Character	*Scaligeria gongylotaxis*	*Elaeosticta*	*Korshinskya*	*Galagania*, *Hyalolaena*	*Scaligeria*
Roots	Branched, with chain-like tubers on lateral branches	Tuber-like, tubers solitary, globose, ovoid or cylindrical	Branched (finger-like), their branches short	Tuber-like, tubers solitary or branched, globose or cylindrical	Tuber-like, globose
Stems	Hairy	Glabrous	Glabrous	Glabrous or slightly pubescent	Glabrous
Primary leaf segments	Sessile, pubescent	Sessile, glabrous	Petiolulate, glabrous	Petiolulate or sessile, glabrous	Petiolulate, glabrous
Involucre	Developed	Developed	Developed	Developed	Absent
Sepals	Absent	Absent	Absent	Absent	Present
Petals	Pubescent, having free apex	Glabrous, having free apex	Glabrous, having apex adnate to lamina	Glabrous, having free apex	Glabrous, having free apex
Fruits	Pubescent, ovate without ribs	Glabrous or papillate, ovate, elongated or ovoid without ribs or with filiform ribs	Glabrous, ovate, didymous with thin ribs	Glabrous, elongated or obconical with thin ribs	Glabrous, ovoid, didymous, with thin ribs
Exocarp cells	Small	Large, radially enlarged	Small	Small	Small
Commissure	Narrow	Narrow	Narrow	Broad	Narrow
Commissural seed face	Flat	Flat or emarginate	Emarginate	Flat	Emarginate
Endosperm cells	Without calcium oxalate crystals	Without calcium oxalate crystals	Without calcium oxalate crystals	Without calcium oxalate crystals	With calcium oxalate crystals

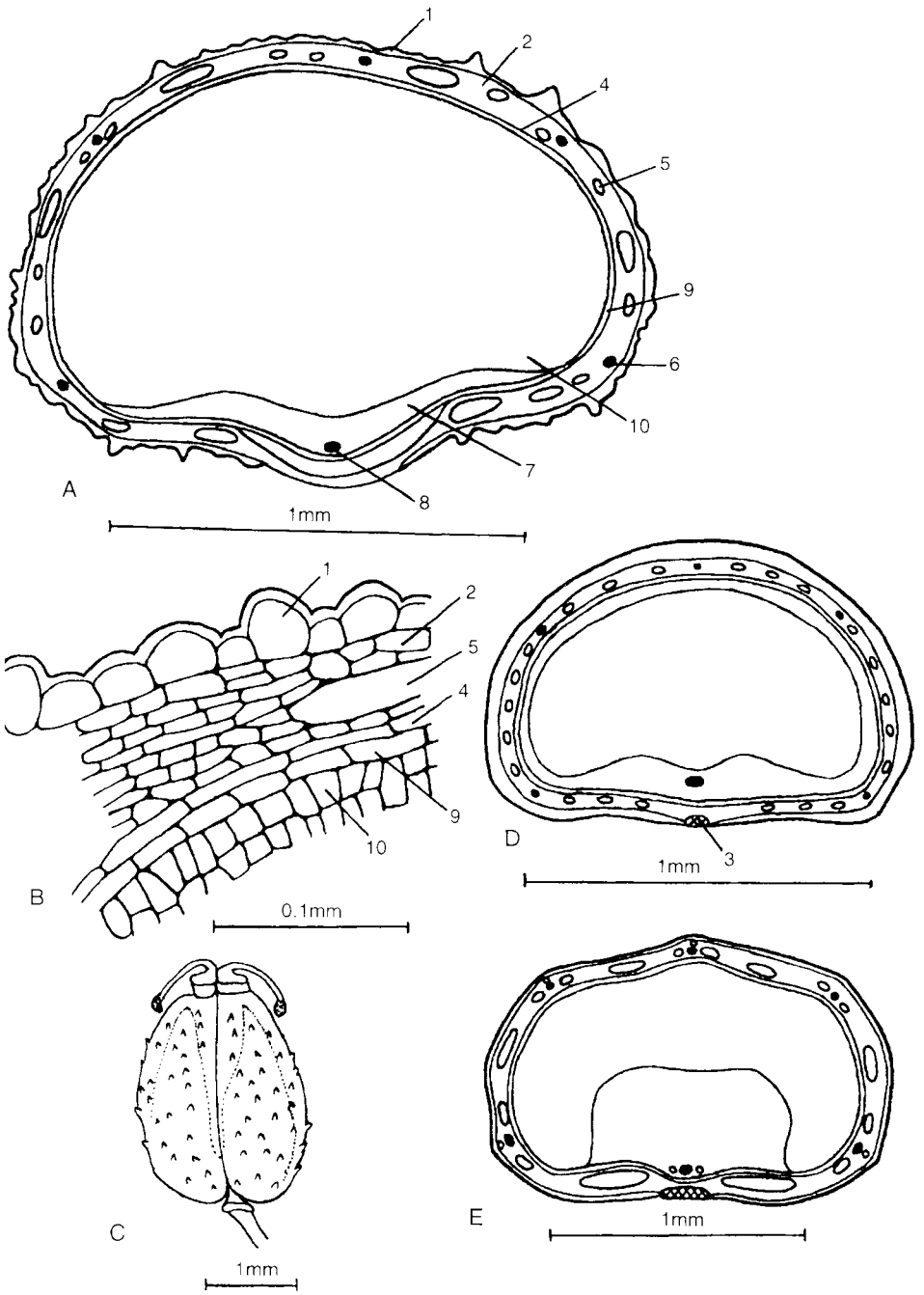

FIG. 1. A–C, *Gongylotaxis rechingeri* Pimenov & Kljuykov. A, TS of mericarp; B, TS of mericarp through vallecula; C, fruit. D, *Elaeosticta meifolia* Fenzl. TS of mericarp. E, *Scaligeria napiformis* (Willd. ex Spreng.) Grande. TS of mericarp. 1, exocarp; 2, mesocarp; 3, layer of sclerenchymous cells; 4, endocarp; 5, oil duct; 6, costal vascular bundle; 7, funicle; 8, funicular vascular bundle; 9, spermoderma; 10, endosperm.

Holotype: Afghanistan, prov. Orozgan (Ghorat), prope pagum Dorahi Tarbulak inter Panjao et Lal, 2700m, 25 vii 1962, *K.H. Rechinger* 18799 (W, n.v.; iso. E). Distribution: Endemic to C Afghanistan.

Gongylotaxis is easily distinguished from the related *Hyalolaena* Bunge and *Elaeosticta* Fenzl (Fig. 1D) by the following: it has lateral roots with many conspicuous tubers; before the petals fall, the ovary and developing fruit are shortly pubescent, the ribs of mericarps are indistinct, and commissure narrow; later the parts are truly pubescent, surface and exocarp cells minute. This new genus is distinguished from the species of *Scaligeria* (Willd. ex Spreng.) Grande sens. str. by the following: lateral roots with many conspicuous tubers, above-ground parts pubescent, basal segments of primary leaves sessile, bracts developed (never absent), calyx teeth obsolete (never present), stylopodium shortly conical, ribs of mericarps indistinct, endosperm next to the commissure scarcely (not deeply) emarginate (Fig. 1E).

Additional specimens examined. C Afghanistan, Deh Kundi: inter juga Waras et Khonak, 65km SW Panjao, substr. granit., 2600m, 30 vi 1967, *K.H. Rechinger* N 36642 (E); Afghanistan, prov. Bamian: inter jugum Kotal Deraz Kol et Panjao, prope pagum Mandigak, c.34°20′N 67°10′E, c.2800–3200m, 23 vii 1962, *K.H. Rechinger* N 18664 (E); Afghanistan, prov. Kabul: west of Panjao, Godar, steep soil slopes, 2750m, 2 vii 1962, *I. Hedge & P. Wendelbo* N W-4971 (E).

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