

Two new species and a new combination in Turkish *Dichoropetalum* (Apiaceae)

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Two new species of *Dichoropetalum* (Apiaceae) are described and illustrated from Turkey. *Dichoropetalum anatolicum* Pimenov & Kljuykov *sp. nova* grows on stony slopes and cliffs in Elmali Dağ (C2 Antalya province) and Honaz Dağ (C2 Denizli province), and is related to *D. platycarpum* and *D. scoparium*. *Dichoropetalum bupleuroides* Pimenov & Kljuykov *sp. nova* is distributed in the Hakkari province (Cilo Dağ). A new combination, *D. longibracteolatum* (Parolly & Nordt) Pimenov & Kljuykov is proposed for a recently described species, *Peucedanum longibracteolatum* from the Taurus Mountains in the Antalya and İçel provinces. After this contribution *Dichoropetalum* contains a total of 29 species, 14 of which occur in Turkey.

Dichoropetalum is a recently restored genus of the Apiaceae (Pimenov *et al.* 2007). It has been included in *Peucedanum s. amplo* and it partly coincides with *Peucedanum* sect. *Palimbioidea* and sect. *Johrenioidea* (Thellung 1926, Shishkin 1951, Frey 1989). The species of *Dichoropetalum* in our circumscription (in total 26 species) are distributed from western Europe (Spain, France) and N Africa (Algeria, Morocco) to N Caucasus, Iran, and Afghanistan (Fig. 1). Turkey has the highest number of *Dichoropetalum* species, followed by Greece and Iran, both with six species. Five of the Turkish species are endemics, these include *D. alpigenum*, *D. graminifolium*, *D. isauricum*, *D. chryseum* and *D. palimboides*. *Dichoropetalum alpinum* is known from Turkey and Lebanon.

During our investigations of the Turkish Apiaceae in the field and in the local herbaria, we found two new species of *Dichoropetalum*. We

also concluded that a further species, recently placed in *Peucedanum*, is to be transferred to *Dichoropetalum*.

***Dichoropetalum anatolicum* Pimenov & Kljuykov, *sp. nova* (Figs. 2 and 3A–C)**

Affinitas: Species haec ad sectionem Scoparia pertinent. E speciebus polycarpicis sectionis huius, D. platycarpo (Boiss.) Pimenov & Kljuykov et D. scopario (Boiss.) Pimenov & Kljuykov, caulibus glabris (non pubescentibus), vittis commissuralibus et vallecularibus mericarporum (non modo vallecularibus) evolutis, parenchymis mesocarpii fere totum lignescentibus (non modo in jugis) differt. A specie turcica habitu simili D. aureo (Boiss. & Balansa) Pimenov & Kljuykov (sect. Dichoropetalum) laminis foliorum ambitu lanceolatis, cum jugis segmentis



Fig. 1. Total distribution area of the genus *Dichoropetalum*.

primariis 4–6 (non 2–3), caulibus erectis, foliis 5–6 (non ascendentibus, foliis 2–3), foliis caulinis superioribus longis, parenchymis mesocarpium lignescentibus, vittis commissuralibus evolutis (non nullis) distinguitur.

TYPE: Turkey. C2 Antalya, near Elmali, SW slope of Elmali Dağ, 36°44'N, 29°54'E, 1760–1800 m, 11 July 2007 M.G. Pimenov & E.V. Kljuykov 108 (holotype MW).

Perennial, glaucescent, entirely glabrous polycarpics. Roots vertical, up to 1.5–2 cm in



Fig. 2. *Dichoropetalum anatolicum* (holotype).

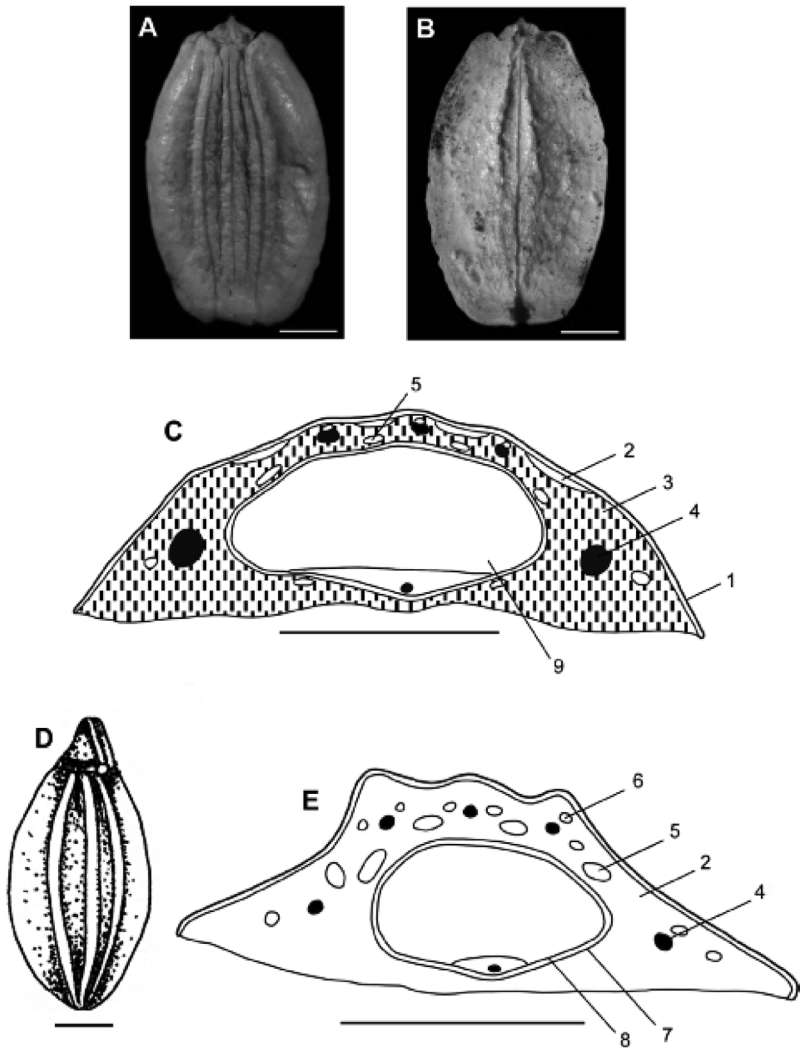


Fig. 3. Fruit structure. — **A–C:** *Dichoropetalum anatolicum* (from Baytop & Tuzlaci 26826, ISTE). — **D and E:** *D. bupleuroides* (from the holotype). — **A and D:** Dorsal view of mericarps. — **B:** Ventral view of mericarp. — **C and E:** Transect of mericarps: 1 = exocarp, 2 = mesocarp of parenchyma cells, 3 = mesocarp of cells with lignified porous walls, 4 = vascular bundles, 5 = vallecular and commissural vittae, 6 = rib secretory ducts, 7 = endocarp, 8 = seed coat, 9 = endosperm. Scale bars = 1 mm.

diameter. Rootstocks intensively branching, densely covered at base by a well-developed collar of fibrous remains of perished leaves and stems of preceding years. Stems few (up to 10), 30–50 cm tall, thin, 1.5–2 mm in diameter at base, terete, solid, minutely striate, slightly curved at nodes, twofold paniculately branched near base. Radical leaves numerous, with petioles up to 2–3 cm long, blades 4–6 cm long, 1–1.5 cm broad, lanceolate in outline, with 4–6 pairs of primary sessile bipinnatisect segments; terminal segments deeply divided (almost to base), ultimate lobes narrowly lanceolate, obtuse, 3–4 mm long (in shady habitats sometimes up to 8 mm long), 0.5–0.7 mm broad. Stem leaves 5–6,

lowermost similar to radical leaves; middle ones with pinnate blades, with a few narrowly linear lobes, 5–7 mm long, up to 0.2 mm broad; upper leaves with entire narrowly lanceolate blades, 1.5–3 cm long. Umbels up to 3 cm in diameter, rays 4–6, scattered at flowering, condensed at fruiting, varying in length from 0.5 to 3 cm long, in fruit up to 5 cm, thin, terete. Involucre absent. Umbellules 5–6 mm in diameter, 10–15-flowered, pedicels terete, unequal, 2–3.5 mm long, bracteoles 4–6, unequal, short, linear-lanceolate, entire, herbaceous or brownish. Calyx teeth obsolete. Petals pale yellow, up to 0.7 mm long, without claw, with solitary secretory duct, with slightly emarginate apex, having a deflexed

lobule. Fruit strongly compressed dorsally, 4.5–5 mm long, ca. 3 mm broad, elliptic, glabrous. Carpophore bifid at base. Stylopods short-conical, styles 0.6–0.7 mm long, reflexed. Marginal ribs of mericarps broad, slightly thickened, dorsal ribs narrow, filiform to filiform-keeled. Exocarp consisting of a layer of small cells, interrupted near ends of marginal ribs; commissure broad. Mesocarp parenchymatic, almost whole consisting of cells with lignescent porous walls. Vittae small, vallecular solitary, commissural two; rib secretory ducts solitary, small. Endosperm plane at commissural side.

ADDITIONAL SPECIMENS EXAMINED (paratypes): — **Turkey**. C2 Denizli, N slope of Honaz Dağ, 37°44'N, 29°17'E, 990–1000 m, 14 July 2007 *M.G. Pimenov & E.V. Kljuykov 122* (MW); C2 Denizli, Paparlik yaylasina, 1300 m, 20 September 1972, *E. Tuzlaçi 23420* (ISTE); C2 Denizli, Paparlik yaylasina, 1400 m, 24 August 1973, *E. Tuzlaçi 26663* (ISTE); C2 Denizli, Paparlik yaylasina, 1200 m, 13 July 1974, *E. Tuzlaçi 30377* (ISTE); Honaz Dağ, Gobecek mevki, 1380 m, 21 September 1972, *E. Tuzlaçi 23462* (ISTE); Honaz Dağ, Arpociga giden, 1240 m, 1 July 1972, *E. Tuzlaçi 22858* (ISTE); Honaz Dağ, Paparlik yaylasina, 1300 m, 14 October 1973, *A. Baytop & E. Tuzlaçi 26826* (ISTE).

***Dichoropetalum bupleuroides* Pimenov & Kljuykov, sp. nova** (Figs. 3D and E, Fig. 4)

Affinitas: A specie *D. depauperato* (Boiss. & Balansa) Pimenov & Kljuykov (sect. *Dichoropetalum*), qui proxima est, radicibus lignescentibus, heterophyllia foliorum radicalium vs. caulinarum, laminis foliorum caulinarum inferiorum dissectis (non integris), lobis terminalibus foliorum latioribus (ad 10 mm, non tantum ad 5 mm latis), stylopodio conico (non depresso), vittis mericarpiorum commissuralibus nullis differt.

TYPE: Turkey. C10 Hakkari, Cilo Dağ, above Diz Deresi, 7500 ft, 7 August 1954 *P.H. Davis & O. Polunin 23945* (holotype ANK).

ETYMOLOGY: The epithet *bupleuroides* refers to the terminal lobes of the lower stem leaves that resemble those of some species in the *Bupleurum falcatum* group, such as *B. polyphyllum*.

Perennial, entirely glabrous, brownish-green polycarpics. Roots vertical, lignescent, up to 1.5 cm in diameter. Rootstocks branching, covered at base with fibrous remains of perished

leaves of preceding years. Stems few, 70–110 cm tall, 2.5–3.5 mm in diameter in base, terete, solid, minutely striate, two- to threefold paniculately branched from middle. Radical leaves with elongate, lanceolate sheaths, up to 3 cm long, blades up to 3–4 cm long, bipinnatisect, with 3–4 pairs of primary sessile segments; terminal lobes lanceolate, 3–4 mm long, ca. 1 mm broad. Lower stem leaves with long lanceolate sheaths, petioles 4–10 cm long, blades pinnatisect, with two pairs of sessile, elongate primary segments, 2–4 cm long, 0.7–1.1 cm broad, completely entire. Middle stem leaves gradually simplified, upper ones with entire narrowly lanceolate blades, up to 2 cm long, frequently fragile. Umbels up to 4 cm in diameter, rays 4–5, at fruiting of very different length, 0.5–3 cm long, thin, terete. Involucre obsolete. Umbellules 6–8 mm in diameter, 6–9-flowered, pedicels terete, thin, slightly unequal, at flowering 0.5–3 mm long, at fruiting up to 6 mm long. Bracteoles 2–3, short, narrowly lanceolate, brownish or herbaceous, entire. Calyx teeth obsolete. Petals pale yellow, up to 0.5 mm long, without claw, with solitary secretory duct, slightly emarginate at apex, with deflexed lobule. Immature fruit strongly compressed dorsally, brownish to brown, glabrous. Mericarps 4.5 mm long, 2–3 mm broad, elliptic. Stylopod conical, styles ca. 1 mm long, reflexed. Marginal ribs of mericarps narrowly winged, dorsal ribs almost inconspicuous, obtuse. Exocarp consisting of a layer of small cells, interrupted near ends of marginal ribs; commissure broad. Mesocarp parenchymatic, with thin vascular bundles. Vittae vallecular solitary (rarely two), commissural obsolete; rib secretory ducts usually two. Endosperm plane at commissural side.

ADDITIONAL SPECIMEN EXAMINED (paratype): — **Turkey**. C10 Hakkari, Cilo Dağ, above Sua, 8000 ft, sheltered earthy slopes, 10 August 1954 *P.H. Davis & O. Polunin 24295* (ANK).

Based on Robert Ulrich's collections, Parolly and Nordt (2005) recently described *Peucedanum longibracteolatum* from the Taurus Mts., Antalya province, near Çayarasi between Mahmutlar and Taşkent (the latter is situated in the Konya province). The authors noted some unusual characters in their new species: it was very tall, but had a thin stem, rays and pedicels

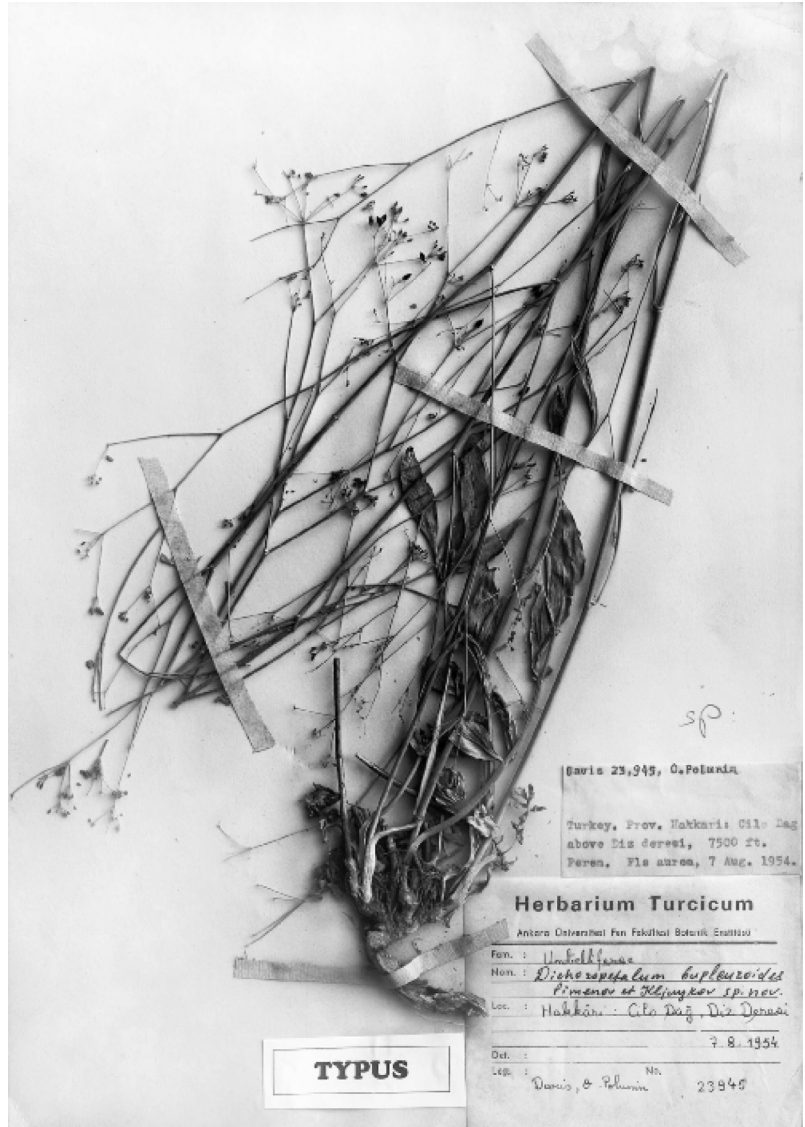


Fig. 4. *Dichoropetalum bupleuroides* (type specimen).

of various lengths, purple petals, a flattened stylopod etc. In addition to the specimens collected in the type locality and nearby over a few years, another Ulrich collection, from the adjacent province of Içel (near Silifke) 130 km from the type locality, was cited in the protologue.

We collected a specimen of the same species in the Karaman province (near Ermenek, Körkuyu Pass) in a pine forest. The species is rare, and only one flowering specimen was found. There is also a further specimen, probably belonging to the same species and considerably extending its known distribution area. It was

collected by H. Pabot in northern Syria (near Latakia, Froulok). The plant is similar to *P. longibracteolatum*, especially in its long-setaceous bracteoles (Pimenov *et al.* 2007). Mouterde (1970) included this specimen in *Johrenia porteri* ("Récolte reconnue conforme à la récolte originale, au Kaputcham Dagh, près de Marache (Post) datée du 17 septembre 1887"). The latter locality is now part of the Turkish Kahramanmaraş province. Mouterde (1970) said nothing about the petal colour or stylopod shape in Pabot's specimen. We have studied Post's collection (G-BOIS, BEI), and noted that long

bracteoles are absent. Thus the specimen from Latakia, different from the type of *J. porteri*, is morphologically close to *P. longibracteolatum*. We cannot, however, identify Pabot's specimen with certainty. The herbarium sheet was collected by Pabot in the summer, but there is one more packet with fruits of an autumn collection attached to it. Are the fruits from the same plant, as Mouterde (1970) believed? This remains unclear. The fruit anatomy is very similar to that of *P. longibracteolatum*, with one deviation: they have no vallecular or commissural vittae.

Peucedanum longibracteolatum, as described by Parolly and Nordt (2005), conforms well with the genus *Dichoropetalum*. Parolly and Nordt (2005) noted that *P. graminifolium* is the closest relative of *P. longibracteolatum*, and Pimenov *et al.* (2007: 481) placed *P. graminifolium* in *Dichoropetalum*. So, we propose the following new combination:

Dichoropetalum longibracteolatum
(Parolly & Nordt) Pimenov & Kljuykov,
comb. nova

Peucedanum longibracteolatum Parolly & Nordt, *Willdenowia* 35: 98. 2005. — TYPE: **Turkey**. C4 Antalya, Alanya, Mahmutlar-Taşkent, etwa 50 km NE Mahmutlar. Tal des Gökdere Çayı nahe Çayarsı, 1130 m, Steilhang. Exp. S. 1 July 2003 *R. Ulrich 3130* (holotype B; isotype herb. Parolly).

ADDITIONAL SPECIMEN: **Turkey**. C4 Karaman, Taurus Mts., Ermenek region, 8 km E Ermenek, Korkuyu Pass, 36° 36'N, 32°58'E, altitude 1100 m, 12 August 2008 *M.G. Pimenov & E.V. Kljuykov 67* (MW).

DISTRIBUTION: Turkey (C4: Antalya, İçel, Karaman); Syria? (Latakia).

The present contribution to the taxonomy of *Dichoropetalum* changes only insignificantly the general pattern of the infrageneric diversity and phytogeography, described earlier by

Pimenov *et al.* (2007). *Dichoropetalum* now includes 29 species, with 14 of them distributed in Turkey. In total, six sections are distinguished in *Dichoropetalum*, four of which (*Holandrea*, *Dichoropetalum*, *Scoparia* — this one earlier not known from Turkey — and *Johreniopsis*) are represented in the country. The section *Dichoropetalum*, to which *D. bupleuroides* belongs, is the only section to have all of its species distributed in Turkey. Within the country, the maximal diversity in *Dichoropetalum* is observed in the southern and southeastern parts, especially in the Taurus Mts. and their eastward extension.

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