

A new species of *Bupleurum* L. (Umbelliferae–Apiaceae) from the Teberda Nature Reserve (North Caucasus)

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Summary: The new species *Bupleurum teberdensis* (Umbelliferae–Apiaceae) is described from the North Caucasus. It is related to *B. polyphyllum* and *B. nordmannianum*, but differs from them in a number of features: monocarpic life form, details of caudex, root, stems, leaves, sheath morphology, form and size of involucre bractlets and some others. The new species differs well from two other monocarpic endemic *Bupleurum* species of this region, *B. woronowii* and *B. rischawii* in stem thickness, basal and stem leaf form, details of sheath developing, branching, number and form of involucre bracts, form and size of involucre bractlets, umbel structure and petal colour.

Keywords: Umbelliferae, Apiaceae, new species, *Bupleurum*, flora of North Caucasus, morphological characters

Bupleurum L. is a polymorphic genus of the family Umbelliferae comprising 185–195 species (PIMENOV & OSTROUMOVA 2012). In the North Caucasus, there are 14 species of *Bupleurum*, eight of which are annual, four perennial polycarpics and two are perennial monocarpics.

During field research of Umbelliferae in the Teberda Nature Reserve (North Caucasus) in 2005, herbarium specimens belonging to the genus *Bupleurum*, a group of species related to *B. nordmannianum* Ledeb. and *B. polyphyllum* Ledeb. & B. Manden. were collected. Plants in this particular habitat grew in the upper forest zone in large numbers on a steep north-western slope with rock outcropping. They had a perennial monocarpic life form and are described below as a new species of the genus *Bupleurum*.

Materials and methods

The material collected in the Teberda Nature Reserve as well as herbarium collections of LE, MW, MHA, including the type specimens of *Bupleurum nordmannianum*, *B. polyphyllum* and *B. woronowii*, were studied.

Results

Bupleurum teberdensis Kljuykov sp. nov. (Fig. 1)

Diagnosis. The new species has similarities in habitus, structure of the inflorescence and flowers with the highly variable species *B. nordmannianum* and *B. polyphyllum*. However, it differs well from them in monocarpic life form (vs polycarpic), entire caudex (vs branched), thin taproot (vs thicker, usually branching), the absence of vegetative lateral rosettes (vs presence), single stems (vs 1–6), basal leaves early dying off (vs persisting for a long time), leaves with unexpressed narrow sheaths (vs stem enclosing bases). From *B. polyphyllum* the new species differs as well in leaves narrowly linear, almost filiform (vs from lanceolate to linear), leaves with three veins



Figure 1: Holotype of *Bupleurum teberdensis* Kljuykov sp. nov. [MW].

Table 1. Comparative morphological characters of *Bupleurum teberdensis* and related species.

Characters	<i>B. teberdensis</i>	<i>B. polyphyllum</i>	<i>B. woronowii</i>	<i>B. rischawii</i>	<i>B. nordmannianum</i>
Life form	monocarpic	polycarpic	monocarpic	monocarpic	polycarpic
Caudex	entire	branched, sometimes entire	entire	entire	branched, sometimes entire
Stem number	single	1–6	single	single	1–6
Stem thickness (diameter in mm)	2	1.5–4	4–6	4–7	0.5–2
Stem length in cm	18–50	50–100	80–100	50–100	5–30
Vegetative lateral rosettes	absent	present	absent	absent	present
Basal leaves	dying off early	persistent	dying off early	dying off early	persistent
Basal leaf form	lanceolate-linear	from lanceolate to linear	narrowly linear	elliptic or oblong-lanceolate	from narrow-lanceolate to linear
Stem leaf form	narrowly linear, filiform or lanceolate-linear	lanceolate (narrowly-spatulate) to linear-lanceolate or linear	narrowly linear	ovate to rounded-ovate	from lanceolate to ovate
Sheath	unexpressed narrow	stem-enclosing bases	stem-enclosing bases	stem-enclosing bases	stem-enclosing bases
Number of basal leaf veins	3	5–7	5–7	7–9	5–7
Branching	alternate	alternate	alternate	alternate and opposite	alternate
Bract number	1–3	1–5	4–5	2–8	1–5
Bract form	narrowly linear	lanceolate	lanceolate or oblong-lanceolate	ovate	from lanceolate to ovate
Bractlet number	4–6	6–12	5	4–6	6–8
Bractlet form	lanceolate-linear or lanceolate	linear-lanceolate	widely ovate	ovate or ovate-lanceolate	broadly lanceolate or obovate
Bractlet size	equal or slightly exceeding umbellules	slightly exceeding umbellules	shorter than umbellules	shorter than umbellules	slightly exceeding umbellules
Umbel position	all the umbels are terminal, central umbel slightly exceeds the lateral ones	central umbel exceeds the lateral ones, on short pedicles	terminal and lateral umbels are equal, on short pedicles	all umbels are equal, on long pedicles	central umbel exceeds the lateral ones, on long pedicles
Umbel ray number	5–9	8–12	6–8	10–18	6–9
Petal colour	light yellow	light yellow	bright yellow	light yellow	golden yellow

(vs with 5–7 veins), involucrel consisting of 4–6 bractlets (vs 6–12). From *B. nordmannianum* the new species differs in lanceolate-linear or lanceolate involucrel bractlets, slightly longer than the umbellules (vs broadly lanceolate or obovate, noticeably longer than the umbellules), petals light yellow (vs golden yellow) (Table 1).

Types. Russia. North Caucasus Ridge, prov. Karachaevo-Cherkessia, National Park Teberda, Baduk River valley, above the second lake, on rocks, 2200 m s.m., 08 August 2005, *E.V. Kljuykov, U.A. Ukrainskaja* 35 [holotype MW 0595770 (Fig. 1), isotype MW 0595769].

Description. Plant glabrous, perennial, monocarpic. Taproot thin, vertical, cylindrical, slightly branching at the apex, approx. 2 mm in diameter. Caudex unbranched, covered with soft narrow remains of dead leaf petioles. Stems erect, single (rarely 2), thin, about 2 mm in diameter at the

base, solid, 18–50 cm long, round, clearly thin-ribbed throughout their length, with 3–5 leaves, corymbose branching. First order branches are long; second order branches are rarely formed or small. The branches are alternate. Basal leaves few, early dying off, entire, narrowed at the base into a petiole; leaf blade 3–5 cm long, up to 0.5 cm wide, narrowly linear or lanceolate-linear, acute at the apex, with 3 veins. Stem leaves gradually simplified, narrowly linear: the lower ones are similar to the basal ones, with a long petiole and an unexpressed sheath, 3–6 cm long, 2–5 mm wide; the upper leaves with a narrow blade 2–3 cm long, sessile, without a pronounced petiole. Involucre of 1–3 bracts, herbaceous, entire, green, unequal, narrowly linear, at the apex drawn out, 4–15 mm long. All umbels are terminal. Central umbel pronounced, slightly exceeds the lateral ones, 3–6 cm in diameter, with 5–9 rays, 3–5 cm long, slightly unequal, thin, slightly ribbed. Involucel of 4–6 bractlets, herbaceous, green, with 2–3 veins, lanceolate-linear or lanceolate, unequal, equal or 2 times exceeding the peduncles, slightly exceeding the umbellules. Umbellules with 15–20 short pedicles, 2–3 mm long, thin, slightly unequal. Calyx teeth absent. The petals light yellow, small, about 0.5 mm long, wedge-shaped at the base, obovate, with incurved apex and solitary secretory duct. Young fruits approx. 2 mm long, elliptical. Stylopodia flat, light brown. Styles 0.5 mm long, thin, recurved to the dorsal side of mericarps.

Additional specimens examined. Russia, North Caucasus, Karachay-Cherkessia, Teberdinsky Zap., Baduk, 1995, *V.G. Onipchenko* 59 [paratype MW 0595767!]; Jamagat, 2850 m.s.m., 1994, *V.G. Onipchenko* 29 [paratype MW 0595768!]; Teberdinsky Zap., Z slope of the Moussa-Agitara ridge, on the ridge, 2800 m.s.m., 15 July 1972, *Chubatova* [MW 06988483!].

Etymology. The specific epithet was selected after Teberda Nature Reserve, where the new species grows.

Phenology. Flowering in July–August; fruiting in August–September.

Distribution area. Russia, prov. Karachaevo-Cherkessia, North Caucasus. Endemic.

Habitat. The species grows on steep western slopes of the mountains, on the ridges, on loose soil among stones.

Discussion

The western slopes of the North Caucasus Ridge are the local center of Apiaceae endemism. There are six narrowly endemic species from four genera. Three of them were identified in *Cnidiocarpa* Pimenov, *Laserpitium* L. and *Mutellina* N.M. Wolf (PIMENOV & OSTROUMOVA 2012). *Cnidiocarpa rhodopetala* Pimenov & Kljuykov is known from Karachay-Cherkessia, Adygea and neighboring districts of Krasnodar Krai (PIMENOV & KLJUYKOV 2010; OSTROUMOVA et al. 2019), *Laserpitium stevenii* Fisch. & Trautv. from Karachay-Cherkessia and neighboring districts of Krasnodar Krai and *Mutellina caucasica* (Sommier & Levier) Lavrova from Karachay-Cherkessia and neighboring districts of Georgia (ONIPCHENKO & LAVROVA 1991; LAVROVA 1993). Three endemic species belong to *Bupleurum* L.: *B. rischawii* Albov grows at the Black Sea coast in Georgia and in Krasnodar territory, *B. woronowii* Manden. at the Black Sea coast of the Western Caucasus and in the Crimea. The described new species is known only from Karachay-Cherkessia. All endemic species of *Bupleurum* are perennial monocarpics. The genus *Bupleurum* does not include many species with such a life form compared to perennial polycarpics (PIMENOV & KLJUYKOV 2002; PIMENOV & OSTROUMOVA 2012; PIMENOV 2017). LINCZEWSKI (1950) pointed out the importance of the life form (monocarpic or polycarpic) in the taxonomy of *Bupleurum*.

The new species differs well from other monocarpic endemic species.

From *B. woronowii* it differs in stem thickness (2 mm in diameter vs 4–6 mm), stem leaves with a long petiole and an unexpressed sheath (vs stem enclosing at the base), involucre of 1–3 bracts (vs 4–5), involucre bractlets lanceolate-linear or lanceolate (vs widely ovate). Involucre bractlets equal or slightly exceeding umbellules (vs shorter than umbellules); all the umbels are only terminal (vs terminal and lateral on short pedicles). Petals light yellow (vs bright yellow).

From *B. rischawii* the new species differs in stem length (18–50 cm vs 50–100 cm), stem thickness at the base (approx. 2 mm in diameter vs 4–7 mm), basal leaves with lanceolate-linear blade (vs elliptic or oblong-lanceolate); basal leaves with three veins (vs 7–9). Stem leaves with a narrowly linear blade and an unexpressed sheath (vs ovate to rounded-ovate, with a stem-enclosing sheath); branching is alternate (vs alternate and opposite). Central umbel is pronounced, slightly larger than the lateral ones (vs all the terminal umbels are equal); 5–9 rays of the umbel (vs 10–18); involucre of 1–3 bracts, narrowly linear (vs 2–8, ovate).

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