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Oxytropis kozhuharovii (Fabaceae), a new species from Bulgaria

Abstract

Pavlova, D., Dimitrov, D. & Nikolova, M.: *Oxytropis kozhuharovii (Fabaceae),* a new species from Bulgaria. – Willdenowia 29: 69-75. 1999. – ISSN 0511-9618.

Oxytropis (sect. *Orobia*) *kozhuharovii* from the Pirin Mts in SW Bulgaria is described as a species new to science and illustrated. Its karyotype has been investigated and a chromosome number of 2n = 4x = 32 found. The morphological differences to *O. prenja* and *O. halleri* are analysed and illustrated.

Oxytropis kozhuharovii D. Pavlova, D. Dimitrov & M. Nikolova, **sp. nova** – Fig. 1, 2, 4A
Holotype: [Bulgaria], North Pirin Mts, Okadenski circus, Yellow Rocks locality, limestone, 2400 m, 41°49'N, 23°22'E, UTM-FM 93, 29.7.1996, *M. Nikolova* (SO 98166; isotypes: B, SOM).

Planta perennis, acaulis. *Stipulae* 10-15(20) mm longae, 4-5(6) mm latae, scariosae, triangulari-lanceolatae, inter se per plus quam didimiam longitudinem connatae, uninerves, pilis longis simplicibus albis subaccumbentibus obsitae et ciliatae. *Folia* (5)7.5-10(13.5) cm longa; *petiolus* (2)2.5-4.5(5) cm longus, circa 1/3 longitudine folii, pilis densis longis albis subaccumbentibus obsitus; *foliola* 7-10-juga, (5)7-12(15) mm longa et (2)3-4(6) mm lata, elongato-elliptica, apice acutata et basi late rotundata, utrimque pilis longis albis simplicibus et accumbentibus dense obtecta. *Inflorescentiae* (4)6-8(10)-florae, pedunculus (5)8-12(14) cm longus, folio longior, ± erectus, pilis atris densis, brevibus accumbentibus et albis longis diffusis simplicibus obsitus. *Bracteae* (5)6-8(10) cm longae, tubo calycis breviores, 1-1.5 mm latae, scariosae, naviculares, pilis albis densis longis arrectis et atris brevibus accumbentibus simplicibus obtectae. *Calyx* 8-10(12) mm longus, 4-5(6) mm latus, tubulosus, pilis albis densis longis arrectis et atris brevibus accumbentibus simplicibus obsitus; dentes 2-3 mm longi, circa 1/4-1/3 calycis longitudinem aequantes, subulati, pilosi ut calyx. *Corolla* cyanoviolacea, calyce circa bis longior; *vexillum* 18-20 mm longum, lamina late rotundata, apice leviter concava, unguis longitudinem subaequans; *alae* vexillo breviores, 14-16 mm longae, lamina lata apice concava, unguis longitudinem aequans; *carina* alis brevior, in apice mucronem circa 1 mm longam desinens, lamina unguem subaequans. *Legumen* (12)15-18(22) mm longum, 4-5(6) mm latum, pilis nigris et albis brevibus accumbentibus obtectum, pseudobiloculare (septum dorsale abest), polyspermum. *Semina* parva, 1-2 mm diametro, reniformia, brunnea, levia.

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Fig. 1. *Oxytropis kozhuharovii* (holotype, SO).

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Karyology

The karyotype was investigated on metaphase plates prepared from root meristem of germinating seeds of the type collection. The root tips were pretreated with 0.01 % solution of colchicin for 5 min, fixed in Clarke for 24 h, then hydrolized in 1N HCl at 60 °C for 10 min and stained in chematoxilin after Gomory (Sharma & Sharma 1965). The karyotype formula of the new species is 2n = 4× = 14m + 14sm + 4sm-SAT (Fig. 2). The satellites are connected with the longer arm, are ball-shaped and different in size in the two pairs. The karyotype shows some asymmetry with the ratio between the length of the longest and the shortest chromosome being 1.44 : 1. No karyological data are available for the closest relatives *O. prenja* (Beck) Beck and *O. halleri* subsp. *korabensis* (Kümmerle & Jáv.) Chrtek & Chrtková.

Distribution and ecology

The single population of *Oxytropis kozhuharovii* known grows in the northern Pirin Mts, in the Okadenski circus (UTM - FM 93), in the protected territory of the Pirin National Park (Fig. 3).

Oxytropis kozhuharovii grows in humus carbonate soil on calcareous basic rock. The compact population with a high number of plants occupies a territory of 1500-2000 m^2. Flowering starts late July or early August. Fruiting lasts from mid August till mid October.

The species is associated with *Bromus lacmonicus* Hausskn., *Festuca paniculata* (L.) Roth, *Sesleria comosa* Vel., *Calamagrostis arundinacea* (L.) Roth, *Carex kitaibeliana* Degen ex Bech., *Onobrychis montana* subsp. *scardica* (Griseb.) P. W. Ball, *Jurinea mollis* (L.) Reichenb. and *Aster alpinus* L. On rocky outcrops *Festuca picturata* Pils, *Saxifraga luteoviridis* Schott & Kotschy, *Saxifraga ferdinandi-coburgi* Kellerer & Sünd., *Leontopodium alpinum* subsp. *nivale* (Ten.) Tutin and *Armeria alpina* Willd. are found.

Relationships

Oxytropis kozhuharovii belongs to the most ancient and largest section *Orobia* with a disjunct main distribution area in Central Asia and most America. The distribution of the section in W Asia and S Europe is insular and the species number not high (Vasilčenko 1965). These species are adapted to the mountainous conditions in the Pyrenees, the Alps and the Carpathians. In the

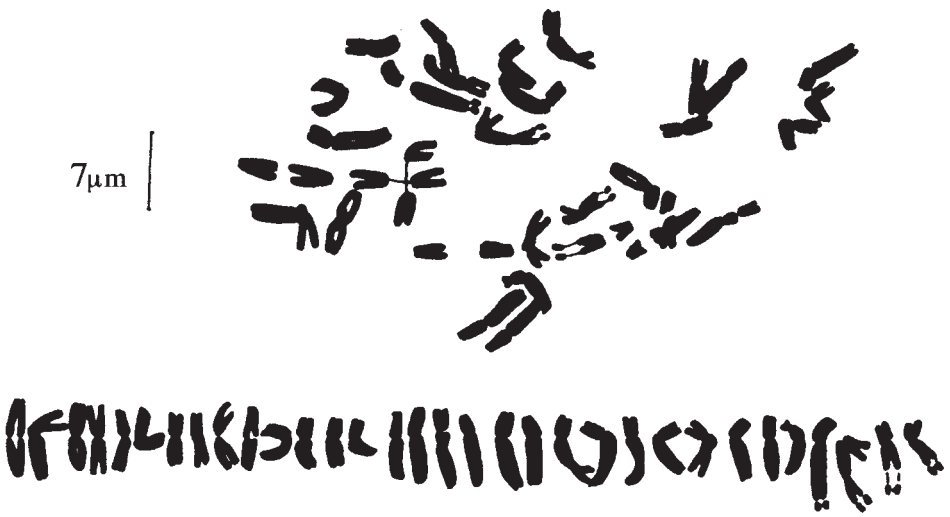


Fig. 2. Karyotype and karyogram of *Oxytropis kozhuharovii* (from the type collection).

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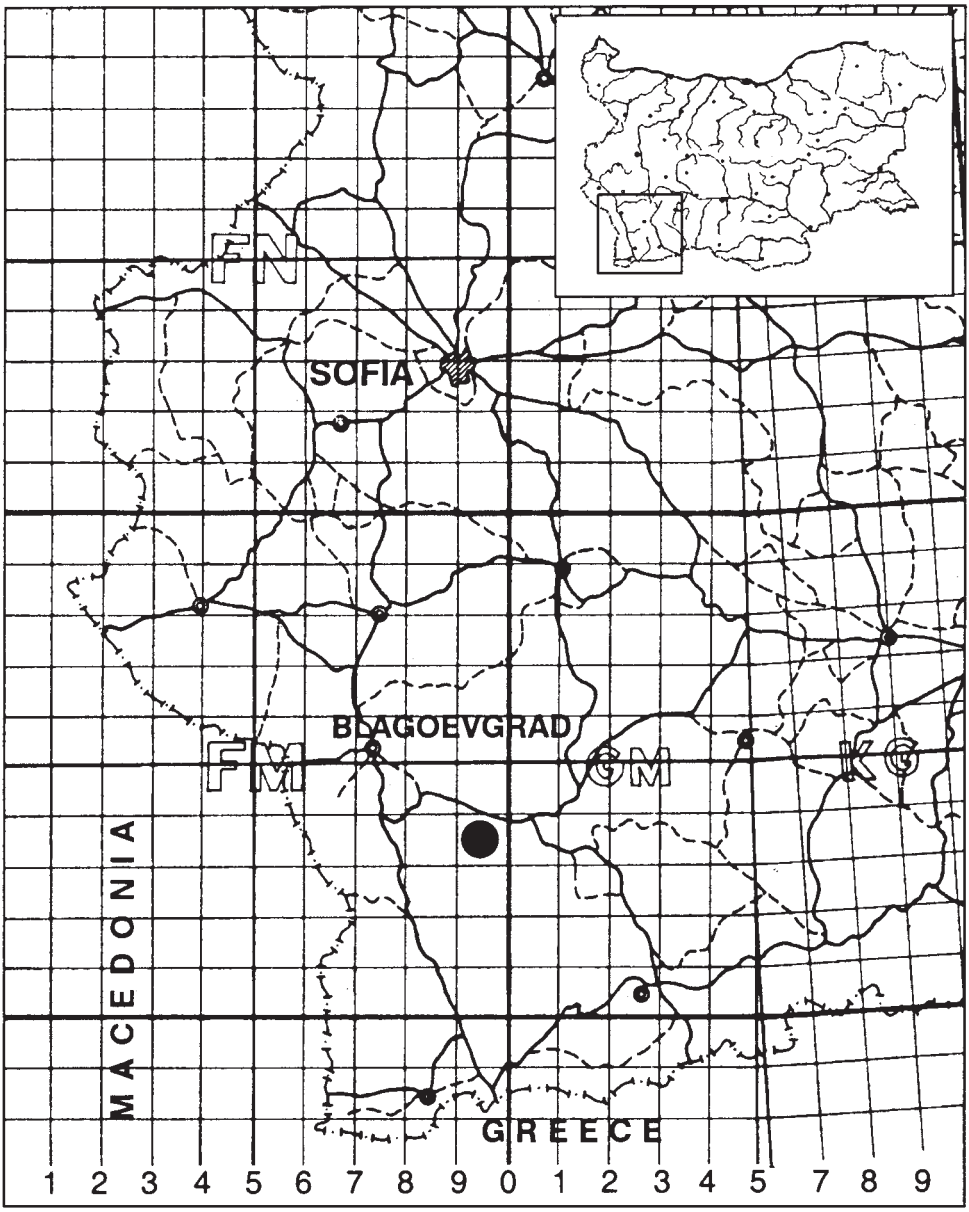


Fig. 3. Distribution of *Oxytropis kozhuharovii* presented on a UTM map. The locus classicus is located in the square FM 93; squares 15 × 15 km.

Bulgarian flora the section is represented by *O. campestris* (L.) DC. and the endemic *O. urumovii* Jáv. (Kožuharov 1976, 1992). The taxonomy of *Oxytropis,* particularly of *O.* sect. *Orobia,* in the Balkan peninsula and the Mediterranean area is difficult due to glacial-postglacial speciation processes in the high mountain populations. The taxonomic status and delimitation of a number of taxa are still inadequately known.

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Tab. 1. Comparison between *Oxytropis kozhuharovii* D. Pavlova, D. Dimitrov & M. Nikolova, the subspecies of *O. halleri* Bunge ex Koch and *O. prenja* (Beck) Beck. Measurements taken from herbarium material.

	O. halleri subsp. *halleri*	*O. halleri* subsp. *velutina*	*O. halleri* subsp. *korabensis*	*O. kozhuharovii*	*O. prenja*
Leaves [length in cm]	(5)7-10(12)	14-18(22)	(3)4-9	(5)7.5-10(13.5)	4-6
Petiole [length in cm]	(1.5)2.5-5	6-8(10)	1.5-2	(2)2.5-4.5(5)	1.5-2
Leaflets [size in mm]	9-16 pairs; (6)7-13(15) × (2)3-5; ovate-lanceolate to lanceolate	6-11 pairs; 14-20(22) × 4-5; ovate-lanceolate	6-12 pairs; 4-9(10) × (2)3-5; elliptical or ovate-lanceolate	7-10 pairs; (5)7-12(15) × (2)3-4(6); elliptical	6-8 pairs; 6-8 × 2-3; ovate-lanceolate
Stipules [size in mm]	lanceolate; (8)10-15 × 4-6	lanceolate; (15)19-20; main vein clearly branched in the upper half, lateral veins indistinct	triangular to lanceolate; 6-7; with 1 or 2 veins	triangular to lanceolate; 10-15(20) × 4-5(6); with 1 vein	triangular to lanceolate; 10-12; with 1 vein
Peduncle	longer than the leaves	longer than the leaves	equalling or shorter than the leaves	longer than the leaves	longer than the leaves
Bract [length in mm]	6-10(12) linear-lanceolate, equalling or longer than calyx tube	8-12(14) linear-lanceolate, equalling or longer than calyx tube	5-6 linear-lanceolate, naviculate, shorter than calyx tube	(5)6-8(10) naviculate, shorter than calyx tube	8-10(12) lanceolate, equalling or longer than calyx tube
Calyx [length in mm]	(6)7-12, teeth 2-3	8-12, teeth 2-3	7-10(12), teeth 1-2	8-10(12), teeth (1)2-3	7-10, teeth (1)2-3
Corolla	blue to purple	pale purple	blue violet	blue violet	purple
Standard	narrowly elliptical, convex at apex	narrowly elliptical, convex at apex	broadly ovate to rhombic, concave at apex	broadly ovate, convex at apex	broadly ovate, convex at apex
Legume	ventral and dorsal septa equal in width, or the ventral wider	ventral and dorsal septa equal in width	with dorsal septum	semi-bilocular without dorsal septum	semi-bilocular, without dorsal septum

Oxytropis kozhuharovii combines morphological features of the *Oxytropis campestris* group (Leins & Merxmüller 1966, 1968) and of *O. halleri* subsp. *korabensis* (Kümmerle & Jáv.) Chrtek & Chrtková. The latter taxon is endemic to the Korab Mts in Albania. It was originally described as a subspecies of *O. sericea* (DC.) Simonkai, nom. illeg. [non Nutt.] = *O. halleri* Bunge ex Koch but this taxonomic position was questioned by Merxmüller & Leins (1968). Despite the differences in the legume morphology, later Chrtek & Chrtková (1983) transferred the subspecies to *O. halleri* Bunge ex Koch, a treatment confirmed by Greuter & al. (1989). The new species resembles subsp. *korabensis* in size, shape and indumentum of the leaves and leaflets, the 1-veined stipules (a fea-

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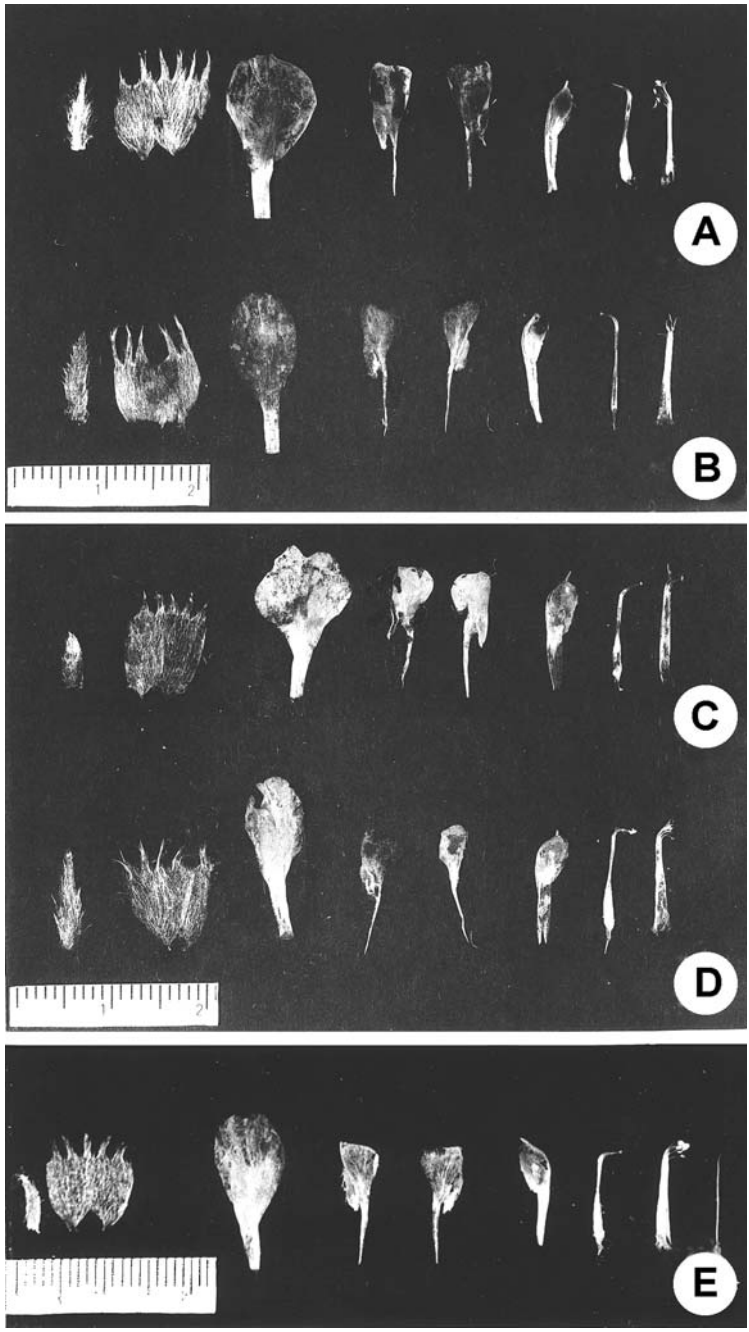


Fig. 4. Bract, calyx and flower parts – A: *Oxytropis kozhuharovii* (from the type collection); B: *O. halleri* subsp. *halleri* (Switzerland, Wallis, 2230 m, 17.7.1974, *Fitz,* W 10046); C: *O. halleri* subsp. *korabensis* (Albania, Mavrovi Hanovi, Korab, 2400 m, 21.7.1934, *Behr,* B); D: *O. halleri* subsp. *velutina* (Austria, Oberinntal, 13.6.1970, *Polatschek,* W 10760); E: *O. prenja* (Hercegovina, Prenja planina, 7.1901, *Curčić & Reiser,* SO 43866).

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ture distinguishing subsp. *korabensis* from the other two subspecies of *O. halleri*), the flower size, the calyx indumentum, calyx teeth and legume. However, the taxonomically most important feature (see Jávorka 1920 and Leins & Merxmüller 1968) is the lack of a dorsal septum of the legume in the new species. Because of this features *O. kozhuharovii* should be considered a representative of the *O. campestris* group. Other differences between *O. halleri* subsp. *korabensis* and *O. kozhuharovii* are the length of the calyx teeth and the length of the bract (Tab. 1).

Amongst all species of the *Oxytropis campestris* group (Leins & Merxmüller 1966, 1968), *O. kozhuharovii* demonstrates the greatest similarity to *O. prenja* (Beck) Beck. This concerns, in particular, the 1-veined stipules (adnate to the petiole for 1/2 their length but free from each other) as well as the shape and colour of the calyx teeth and the bract (more than 1/2 as long as the calyx tube, Fig. 4). Both species show, on the other hand, clear differences in the size of the plant (*O. prenja* is smaller, only up to 10 cm high), in the indumentum of the leaflets, petiole and peduncle (scarcely hairy in *O. prenja*), the bracts (wider in *O. prenja*), and the beak of the keel (only 0.5 mm in *O. prenja* but 1-1.5 mm in *O. kozhuharovii*).

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References

Chrtek, J. & Chrtková, A. 1983: Bemerkungen zu einigen balkanischen *Oxytropis*-Arten. – Folia Geobot. Phytotax. **18:** 309-319.

Greuter, W., Burdet, H. M. & Long, G. 1989: Med-Checklist **4.** – Genève & Berlin.

Jávorka, S. 1920: Uj adatok Albánia flórájához. – Bot. Közlem. **19:** 17-29.

Kožuharov, S. I. 1976: *Oxytropis* DC. – Pp. 177-181 in: Jordanov, D. (ed.), Flora Narodna Republika Balgarija **6.** – Sofija.

— 1992: *Oxytropis* DC. – P. 421 in: Kožuharov, S. I. (ed.), Opredelitel na visšite rastenija v Bălgarija. – Sofija.

Leins, P. & Merxmüller, H. 1966: Zur Gliederung der *Oxytropis campestris*-Gruppe. – Mitt. Bot. Staatssamml. München. **6:** 19-31.

— & — 1968: *Oxytropis* DC. – Pp. 124-126 in: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (ed.), Flora europaea **2.** – Cambridge, etc.

Sharma, A. K. & Sharma, A. 1965: Chromosome techniques, theory and practice. – London.

Vasilčenko, I. T. 1965: K voprosu o genezise roda ostrolodočnik *Oxytropis* DC. – Bot. Žurn. **50:** 313-322.

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