

Genus *Campanula* L. (Campanulaceae Juss.) in flora of Altai

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Received: 29.10.2018. Accepted: 03.12.2018

A taxonomic study of the genus *Campanula* L. in the flora of Altai is presented. Based on the data obtained, 14 *Campanula* species, belonging to 3 subgenera and 7 sections, grow in the territory of the Altai Mountain Country. The subgenus *Campanula* includes 4 sections and 8 species and is the most diverse in the flora of Altai. An original key is presented to determine the *Campanula* species in Altai. For each species, nomenclature, ecological and geographical data, as well as information about type material, are provided. New locations of *Campanula* species are indicated for separate botanical and geographical regions of Altai.

Keywords: Altai; *Campanula*; distribution; diversity; ecology; species

A taxonomic study of the genus *Campanula* L. in the flora of Altai is presented. Based on the data obtained, 14 *Campanula* species, belonging to 3 subgenera and 7 sections, grow in the territory of the Altai Mountain Country. The subgenus *Campanula* includes 4 sections and 8 species and is the most diverse in the flora of Altai. An original key is presented to determine the *Campanula* species in Altai. For each species, nomenclature, ecological and geographical data, as well as information about type material, are provided. New locations of *Campanula* species are indicated for separate botanical and geographical regions of Altai.

Materials and methods

In the work on the synopsis we used treatments of the genus for floras of Altai (Krylov, 1949; Fedorov, 1957; Polozhiy, 1979; Li, 1987; Gubanov, 1996; Olonova, 1996; Vibe, 2001; Shmakov, 2003; Krestovskaya, 2006; Ilyin, Fedotkina, 2008; Hong et al., 2011; Maneev, 2012; Silantyeva, 2013), as well as herbarium material of St. Petersburg (LE), Moscow (MW), Tashkent (TASH), Novosibirsk (NS, NSK), Tomsk (TK), Barnaul (ALTB) collections. The latest data on the genus in the territory of Altai were also taken into account (Bekket et al., 2015; German et al., 2012; Shaulo, 2006; Shaulo et al., 2011; Victorov, 2002; Zolotukhin, 2012; Zykova, 2014; etc.). Distribution of the species is given by botanical and geographical regions of the Altai Mountain Country (Flora of Altai, 2005).

Results

Genus *Campanula* L. 1753, Sp. Pl.: 163; id. 1754, Gen. Pl., ed. 5: 77; Krylov, 1949, Flora of Western Siberia, 11: 2629; Terekhova, 1965, Flora of Kazakhstan, 8: 289; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2): 62; Li, 1987, Key to plants of the Middle Asia, 9: 352; Olonova, 1996, Flora of Siberia, 12: 148; Krestovskaya, 2006, Plants of the Central Asia, 15: 101; Hong et al., 2011, Fl. China, 19: 530; Maneev, 2012, Key to plants of the Altai Republic: 401; Silantyeva, 2013, Synopsis of flora of the Altai region: 316.

Lectotype: *C. latifolia* L. Britton a. Brown (1913).

About 400 species distributed in the northern hemisphere. In Altai – 14 species.

Determination key

1. The calyx has folded down appendages in the intervals between the lobes 2
- + The calyx without appendages in the intervals between the lobes 3
2. Flowers single. Stem unbranched, hairless or pubescent with soft hairs at the top *C. dasyantha*
- + Numerous flowers. Stem branched, pubescent with coarse hairs..... *C. sibirica*
3. The flowers sessile, gathered in dense inflorescences at the apex of the stem and in the axils of the upper leaves..... 4
- + Flowers on more or less long pedicles, single, in paniculate or racemose inflorescences..... 5

4. Stem squarrose coarse-haired. Lower leaves narrowed at base, gradually turning into petiole. Calyx lobes obtuse *C. cervicaria*
 + Stem softly short-haired, rarely naked. The lower leaves long-petiolate, with a rounded or heart-shaped blade at the base. Calyx lobes sharpened..... *C. glomerata*
5. Flowers single or gathered in paniculate inflorescence 6
 + Flowers gathered in racemose inflorescence..... 11
6. Basal leaves long petiolate, round or reniform; calyx lobes narrow linear, wide apart at base..... *C. rotundifolia*
 + Basal leaves oblong or oblong-elliptical, narrowed in a short petiole at the base; calyx lobes lanceolate, with acute angle at base..... 7
7. Corolla incised more than half the length 8
 + Corolla incised less than half the length *C. turczaninovii*
8. Flowers in significant number gathered in paniculate inflorescence. Calyx lobes linear-subulate..... *C. patula*
 + Flowers solitary, or few. Calyx lobes lanceolate or linear-lanceolate 9
9. Rhizome branched at the top and densely clad with long remains of dead stalks and petioles; stems numerous and ending in single flowers *C. albertii*
 + Rhizome thin, creeping; few stems, slightly branched at the top and ending with 2-3 (rare – more) flowers 10
10. Calyx lobes rather broad, oblong-lanceolate, obtuse, at the top boat-shaped, thickened and bearing a tuft of short white hairs *C. altaica*
 + Calyx lobes lanceolate or linear-lanceolate, sharp, at the apex flat, bare..... *C. wolgensis*
11. Plant covered with short, velvety hairs; leaves grayish on the lower side *C. bononiensis*
 + Plant covered with short, coarse hairs; leaves not grayish on the lower side 12
12. Flowers gathered in a long one-sided bunch. Calyx lobes bent to pedicel, lanceolate *C. rapunculoides*
 + Flowers gathered in a short bunch. Calyx lobes erect, ovoid or broadly lanceolate 13
13. Lower and middle leaves narrowed at base; calyx bare *C. latifolia*
 + Lower and middle leaves with a heart-shaped base; calyx coarse-haired on the lower side *C. trachelium*

Subgen. *Campanula*.

Type: *C. latifolia* L.

Sect. *Campanula*. – *C. sect. Trachelioideae* (Boiss.) Charadze, 1949, Notes on systematics and geography of plants (Tbilisi), 15: 28. – *C. sect. Medium* A. DC. subsect. *Eucodon* (A. DC.) Fed. 1957, Fl. USSR, 24: 191.

Type: *C. latifolia* L.

C. bononiensis L. 1753, Sp. Pl. : 165; Krylov, 1949, Flora of Western Siberia, 11: 2638; Fedorov, 1957, Fl. USSR, 24: 197; Terekhova, 1965, Flora of Kazakhstan, 8: 290; Li, 1987, Key to plants of the Middle Asia, 9: 353; Olonova, 1996, Flora of Siberia, 12: 149; Vibe, 2001, Key to plants of the Kemerovo region: 301; Shmakov, 2003, Key to plants of the Altai region: 392; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153; Maneev, 2012, Key to plants of the Altai Republic: 403; Silantyeva, 2013, Synopsis of flora of the Altai region: 316.

Described from Europe (“Habitat in Baldi Lefsinensium jugis, Bononiae”).

Lectotype (Viktorov, 2002): “Morison, 1715, Pl. Hist. Univ. Oxon. 2, sect. 5, tab. 4, fig. 38”.

Meadows, sparse deciduous forests, forest edges, bushes, steppes, stony slopes; 250-2000 m.

Altai: A (A1 – vicin. of Gorno-Altai, Belokurikha, settl. Altaiskoe, Srostki, Verkh-Slyudyanka, Vasilyevka, Sarasa, Mayma, Dubrovka, Manzherok, Ust-Muny, Ust-Sema, Anos, Elikmanar, Chermal, Ulalushka, Kyzyl-Ozek, Karasuk, Biryulya, Karasuk, Kamlak, Aleksandrovka, Urlu-Aspak, Paspaul, Choy, Verkh-Pyankovo, Uskuch, Kiska, Karakoksha, Ynyrga, Veselaya Seika, Berezovka, Sibiryachikha, Novosurhayka, valley of Marchela, mouth of Ustyube, lower reaches of Tavdushka, valley of Slydyanka, mt. Babyrgan, A2 – vicin. settl. Kuzedevo, Kureevo Lake, Teletskoye lake, lower reaches of Chulyshman, Achelman, valley of Kondoma; A3 – vicin. of settl. Nijniy Uimon; A4 – lower reaches of Bashkaus, Chebdar); KAD (KAD1 – vicin. of Ust-Kamenogorsk, settl. Kolyvan, Maralikh (on the Charysh river), Charyshskoe, Novonikolaevka, Karbolikh, Uvarovo, Krasny Yar, Verkhubinka, Predgornoe, Ubinka, Krasnoshchekovo, mt. Mokhnatay, vicin. of Lake Kolyvskoye, valley of Charysh below mouth of Inya; KAD3; KAD6 – vicin. of Zyryanovsk, settl. Solonovka, mouth of Cheremshanka, mt. Mramornaya).

General distribution: Europe (central and southern), Russia (European part, W and E Siberia), Caucasus, Middle Asia. Turkey, Iran.

C. latifolia L. 1753, Sp. Pl.: 165; Krylov, 1949, Flora of Western Siberia, 12: 2636; Fedorov, 1957, Fl. USSR, 24: 191; Olonova, 1996, Flora of Siberia, 12: 152; Shmakov, 2003, Key to plants of the Altai region: 392; Silantyeva, 2013, Synopsis of flora of the Altai region: 316. – *Drymocodon latifolium* Fourr. 1869, Ann. Soc. Linn. Lyon, 17: 111.

Described from Europe (“Habitat in Anglia, Suecia monotosis, sepibus”).

Type: “LINN 221.29 *Campanula latifolia*” (LINN).

Dark coniferous and mixed forests, high grass meadows; 250–500 m.

Altai: A (A1 – vicin. of settl. Verkh-Slyudyanka; A2 – shores of Teletskoye lake (cordon Baygazan – a skid); KAD (KAD1 – vicin. of settl. Verkh-Slyudyanka, Bugryshyha, Kamyshehenka, Stenielek, Tigirek, Andreevsky, mts. Chaynaya, Lvyni Kamen, Sinyuha,

Rasrabotnaya, Chrebet, valley of Bolshoi Tigirek, Malyi Tigirek, Malaya Ameliha, Sentelek (upper reaches), Bolshaya Uskuchevka, Loktevkva, Inya, Berezovyi klyuch, upper reaches Lvinyi klyuch).

General distribution: Europe (except northern), Russia (European part, W Siberia) Caucasus, Turkey, Iran.

C. rapunculoides L. 1753, Sp. Pl. : 165; Krylov, 1949, Flora of Western Siberia, 12: 2637; Fedorov, 1957, Fl. USSR, 24: 194; Terekhova, 1965, Flora of Kazakhstan, 8: 290; Li, 1987, Key to plants of the Middle Asia, 9: 353; Olonova, 1996, Flora of Siberia, 12: 154; Shmakov, 2003, Key to plants of the Altai region: 392; Shaulo, 2006, Turczaninowia, 9(1–2): 216; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153; Maneev, 2012, Key to plants of the Altai Republic: 403; Silantyeva, 2013, Synopsis of flora of the Altai region: 317. – *Drymocodon rapunculoides* Fourr. 1869, Ann. Soc. Linn. Lyon, 27: 111.

Described from Europe ("Habitat in Helvetia, Gallia").

Lectotype (Viktorov, 2002): "LINN 221.30 *Campanula rapunculoides*" (LINN).

Forest edges, bushes, abandoned manor; 250–500 m.

Altai: A (A1 – vicin. of settl. Mayma, Dubrovka; A2 – shores of Teletskoye lake (vicin. of settl. Yaylyu, cordon Chiri).

General distribution: Europe (central and southern), Russia (European part, W Siberia), Caucasus, Kazakhstan, Turkey, Iran.

C. trachelium L. 1753, Sp. Pl.: 235; Krylov, 1949, Flora of Western Siberia, 11: 2637; Vibe, 2001, Key to plants of the Kemerovo region: 301; Shmakov, 2003, Key to plants of the Altai region: 392; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 154; Maneev, 2012, Key to plants of the Altai Republic: 403; Silantyeva, 2013, Synopsis of flora of the Altai region: 317. – *C. urticifolia* Schmidt, 1793, Fl. Boem. 1:73.

Described from Europe ("Habitat in Europa sepibus").

Lectotype (Viktorov, 2002): "LINN 221.41 *Campanula trachelium*" (LINN).

Dark coniferous and mixed forests, high grass meadows; 250–600 m.

Altai: A (A1 – vicin. of Belokurikha; A2 – valley of Lebed (between mouths of Tavolka and Salazan), Kondoma (between of settl. Kaltan and Kuzedeevo), between of settl. Kuzedeevo and Kandalep, vicin. of settl. Kuzedeevo, Telbes, Balyksa, valley of Kundel, Mrassu, Tom).

General distribution: Europe, Russia (European part, W Siberia), Turkey, Iran, Syria, N Africa.

Sect. *Heterophylla* (Witasek) Savul. 1916, Teze Prez. Fac. Stiine Bucaresti, 11, 1: 1. – *Campanula cycl. Heterophylla* Witasek 1902, Abh. Zool.-Bot. Ges. Wien, I, 3: 8. – *C. Campanula* sect. *Heterophylla* (Witasek) Tzvel. 2000, Key to vascular plants of North-West Russia: 680, comb. superfl.

Type: *C. rotundifolia* L.

C. rotundifolia L. 1753, Sp. Pl. : 163; Krylov, 1949, Flora of Western Siberia, 11: 2639; Fedorov, 1957, Fl. USSR, 24: 294; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2): 63; Grubov, 1982, Key to plants of the Mongolia: 233; Gubanov, 1996, Synopsis of flora of the Outer Mongolia: 95; Olonova, 1996, Flora of Siberia, 12: 154; Vibe, 2001, Key to plants of the Kemerovo region: 301; Shmakov, 2003, Key to plants of the Altai region: 391; Krestovskaya, 2006, Plants of the Central Asia, 15: 105; Shaulo, 2006, Turczaninowia, 9(1–2): 216; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 448; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153; Maneev, 2012, Key to plants of the Altai Republic: 402; Silantyeva, 2013, Synopsis of flora of the Altai region: 317. – *C. langsdorffiana* Fisch. in Trautv. et C. A. Mey. 1856, in Middendorff, Reise ... Sibir. 1(2): 60 (Fl. Ochot.).

Described from Europe.

Type: "LINN 221.5 *Campanula rotundifolia*" (LINN).

Meadow slopes, forests, rocks, bushes, scree, willows, pebbles, gravelly tundra; 250–2800 m.

Altai: A (A1 – lolgo, Seminsky, Cherginsky ranges, vicin. of Belokurikha, settl. Souzga, valley of Peschanaya, mt. Babyrgan; A2 – shores of Teletskoye lake (vicin. of settl. Yaylyu), mt. Mustag, vicin. of settl. Balyksu, Ust-Bir, Abakansky range; A3 – vicin. of settl. Aktash, Kurai, Korgonsky, Terektinsky (valley of Malaya Katanda), Kholzun, Katunsky (Kucherlinskoe lake), Aigulaksky, Northern-Chuisky (valley of Baksara), Southern-Chuisky ridges, Ukok plateau, valley of Tara; A4 – locality Temir-Tash, Sumultinsky, Shapshalsky, Chulyshmansky, Kuraisky, Chulyshmanskoe plateau; A5 – valley of Bolshoi Ury, Karlygan, Shaman, Hansyn, Monysh, Kokhosh, Dzhebashsky, Dzhoysky, Kantegirsky, Sayansky, Sabinsky, Khemchiksky, Kirska ridges; A6 – valley of Malyi Ak-Khem, Khundurgun pass, Alashskoe plateau, Khemchiksky and Sayansky ranges); KAD (KAD6 – vicin. of settl. Katon-Karagay); ZM (ZM1 – upper reaches of Mugur, Bar-Burgazy, vicin. of Kundyky-Kul lake, valley of Uzun-Tytygem, Barlyk, Kokorya, vicin. of settl. Salchur, Chikhacheva valley of Alty-Himate, Dzhety-Tey, Ustu-Himate), Sailyugem ridges, mts. Kharhira; ZM2 – Sailyugem ridge).

General distribution: Europe, Russia (W and E Siberia), China, Mongolia.

Sect. *Involucratae* (Fomin) Charadze, 1949, Notes on systematics and geography of plants (Tbilisi), 15: 30. – *Campanula* sect. *Medium* A. DC. subsect. *Triloculares* Boiss. ser. *Involucratae* Fomin, 1906, Flora Caucasia critica, 4(6): 100.

Type: *C. glomerata* L.

C. cervicaria L. 1753, Sp. Pl.: 167; Krylov, 1949, Flora of Western Siberia, 11: 2635; Fedorov, 1957, Flora USSR, 24: 210; Terekhova, 1965, Flora of Kazakhstan, 8: 291; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2): 63; Olonova, 1996, Flora of Siberia, 12: 151; Vibe, 2001, Key to plants of the Kemerovo region: 300; Shmakov, 2003, Key to plants of the Altai region: 391; Shaulo, 2006, Turczaninowia, 9(1–2): 216; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 447; Ilyin, Fedotkina, 2008,

Vascular plants of the Altai Republic: 153; Maneev, 2012, Key to plants of the Altai Republic: 402; Silantyeva, 2013, Synopsis of flora of the Altai region: 316. – *Weitenwehera cervicaria* (L.) Opiz, 1852, Seznam: 36. – *Syncodon cervicarium* (L.) Fourr. 1869, Ann. Soc. Linn. Lyon, 17: 111.

Described from Europe ("Habitat in Helvetiae, Sveciae, Germaniae aspens sylvaticis").

Lectotype (Viktorov, 2002): "LINN 221.45 *Campanula cervicaria*" (LINN).

Meadows, mixed forests, edges, bushes; 250–1100 m.

Altai: A (A1 – vicin. of Belokurikha, settl. Anos, Ynyrga, Manzherok, Veselaya Seika, valley of Kuyum, Kayas, Uznezya, Elikmanar, Chermal, Sarakoksha; A2 – vicin. of settl. Kebezen, Troitskoe, Turochak, Sankino, Tondoshka, Ust-Kabyrza, Verkh-Biysk, shore of Teletskoye lake, upper reaches of Chulyshman, etc.; A3 – valley of Akkem, Kucherla, confluence of Malaya Sumulta and Bolshaya Sumulta; A5 – valley of Ona, Joisky range); KAD (KAD1 – vicin. of Ridder, settl. Ust-Pikhtovka, Podpalatsty, Aleksandrovka, Ulbinskoe, Bolshaya Rechka, valley of Bolshaya Maralikha, Malaya Ameliha, mt. Mokhnataya; KAD6 – vicin. of settl. Katon-Karagay, Maiterek, Chingistai).

General distribution: Europe (excluding the south and north), Russia (European part, W and E Siberia). Asia.

C. glomerata L. 1753, Sp. Pl.: 166; DC. 1830, Monogr. Campan.: 253; Krylov, 1949, Flora of Western Siberia, 11: 2633; Fedorov, 1957, Flora USSR, 24: 200; Terekhova, 1965, Flora of Kazakhstan, 8: 291; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2): 62; Grubov, 1982, Key to plants of the Mongolia: 233; Li, 1987, Key to plants of the Middle Asia, 9: 353; Gubanov, 1996, Synopsis of flora of the Outer Mongolia: 95; Olonova, 1996, Flora of Siberia 12: 152; Vibe, 2001, Key to plants of the Kemerovo region: 300; Shmakov, 2003, Key to plants of the Altai region: 391; Krestovskaya, 2006, Plants of the Central Asia, 15: 103; Shaulo, 2006, Turczaninowia, 9(1–2): 216; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 447; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153; Hong et al., 2011, Fl. China, 19: 532; Maneev, 2012, Key to plants of the Altai Republic: 402; Silantyeva, 2013, Synopsis of flora of the Altai region: 316. – *Syncodon glomeratum* Fourr. 1869, Ann. Soc. Linn. Lyon, 17: 111.

Described from Europe ("Habitat in Anglia, Galliae, Sueciae pratis aridis").

Lectotype (Viktorov, 2002): "LINN 221.44 *Campanula cervicaria*" (LINN).

Meadows, steppes, sparse forests, thickets of bushes, edges, elfin woods, subalpine and alpine meadows, banks of rivers and streams, fine-grained debris, rocks; 250–2500 m.

Altai: A (A1; A2; A3 – vicin. of settl. Archaty, Berel; A4 – Chulyshmanskoe plateau Shapshalsky range; A5 – Karlygan, Shaman, Khansyn, Monysh, Kokhosh, Dzhebashsky, Joiysky, Kantegirsky, Sayansky, Sabinsky, Khemchiksky, Kirsra ridges; A6 – Alash plateau, Khemchik and Sayan ranges); KAD (KAD1 – vicin. of settl. Verhubinka, Ivanovsky range; KAD2, KAD3, KAD4, KAD6 – vicin. of settl. Katon-Karagai, valley of Kara-Kaba, mt. Mramornaya, Sarymstakty range, etc.; KAD7 – vicin. of Markakol lake, valley of Kara-Kaba, Karakatay, northern slope of mt. Yamatyn-ula, Jata range, KAD8 – valley of Kairty, Kungeytytau range; KAD9 – valley of Khargaityn-gol, mts. Arshantyn-Nuru, upper reaches of Bayan-gol, Bulgan-Gol, Mongolian Altai range); ZM (ZM1 – mts. Kharhira); UM (valley of Urten-gol).

General distribution: Europe (except the north), Russia (European part, W and E Siberia, Far East), Perneas, Caucasus, Middle. Asia, Mongolia, China, Korea, Japan.

Sect. *Sibiricae* (Fomin) Charadze, 1949, Notes on systematics and geography of plants (Tbilisi), 15:24. – *Campanula* sect. *Medium* A. DC. subsect. *Triloculares* Boiss. ser. *Sibiricae* Fomin, 1904, Flora Caucasia critica, 4(6): 22.

Type: *C. sibirica* L.

C. sibirica L. 1753, Sp. Pl. 1: 236; DC. 1830, Monogr. Campan.: 244; Krylov, 1949 Flora of Western Siberia, 11: 2632; Fedorov, 1957, Fl. USSR, 24: 193; Terekhova, 1965, Flora of Kazakhstan, 8: 289; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2): 62; Li, 1987, Key to plants of the Middle Asia, 9: 353; Olonova, 1996, Flora of Siberia, 12: 155; Vibe, 2001, Key to plants of the Kemerovo region: 299; Krestovskaya, 2006, Plants of the Central Asia, 15: 105; Shmakov, 2003, Key to plants of the Altai region: 390; Shaulo, 2006, Turczaninowia, 9 (1–2): 217; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 447; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 154; Hong et al., 2011, Fl. China, 19: 531; Maneev, 2012, Key to plants of the Altai Republic: 401; Silantyeva, 2013, Synopsis of flora of the Altai region: 317.

Described from Siberia ("Habitat in Sibiria, Gmelin").

Lectotype (Viktorov, 1999): "LINN 221.59 *Campanula sibirica*" (LINN).

Meadows, steppes, deposits, dry forests, grassy mountain slopes, river banks; 250–1800 m.

Altai: A (A1 – vicin. of Gorno-Altaysk, settl. Maima, Kyzyl-Ozek, Ulalushka, Karasuk, Biryulya, Aleksandrovka, Saydys, Urlu-Aspak, Ust-Sema, Anos, Elikmanar, valley of Anuy, Sandy, Sema, Isha, Sarlyk, Kamlak, Cuba, Cherga, Marchela and others; A2 – vicin. of settl. Lake-Kureevo, Dmitrievka, Turochak, Sankino, Tondoshka, Kebezeni, valley of Biya, Ushpa, Ulmen, Lebed, Tondoshka rivers, Tula, Uyymen, Pyzha, shores of Teletskoye lake, lower reaches of Chulyshman, etc.; A3 – valley of Charysh, Elanda, Kaspaa, Ursul, Kurata, Tenga, Akkem, Kucherla, Kuragan, Karagem, Zaychikha, Argut, Shavla, Kulagash, Chuya, Chibit, Kurai, Mena, vicin. of settl. Chindagatuy, Archaty and others; A4 – valley of Bashkaus, Kubadru, Nizhny Ildugem, Verkhny Ildugem, A5 – Dzhebashsky, Joysky, Sayansky, Sabinsky, Kirsra ridges; KAD (KAD1 – Kolyvanskoye lake, vicin. of Ridder, Ust-Kamenogorsk, settl. Shemonaiha, Verhubinka, Sekisovka, Ubinskoe and others; KAD2 – valley of Targyn and others; KAD3; KAD4 – vicin. of Zaisan, valley of Malyi Dzhemenei, etc.; KAD5 – vicin. of settl. Darstvennoe, Kokpekty, Buran, KAD6 – vicin. of settl. Katon-Karagay, Sogornoye, Chernovoye, Chingistai, Gornoye, between of settl. Prirechnoye and Arhipovka, mt. Mramornaya

(between of settl. Nikolaevka and Uspenka), valley of Maimyr and others; KAD7 - vicin. of Altai (Shara-Sume)); ZM (ZM1 – valley of Kuykhtanar, Uzun-Tytygem).

General distribution: Europe, Russia (European part, W Siberia), Caucasus, Middle Asia, China (Altai).

Subgen. *Scapiflorae* (Boiss.) Oganessian, 1993, Bot. Zhurn. 78(3): 146. – *Campanula* sect. *Medium* A. DC. subsect. *Triloculares* Boiss. ser. *Scapiflorae* Boiss. 1875, Fl. Or. 3: 894. – *Campanula* sect. *Scapiflorae* (Boiss.) Charadze, 1949, Notes on systematics and geography of plants (Tbilisi), 15: 25.

Type: *C. ciliata* Stev.

Sect. *Tridentatae* (Charadze) Victorov, 2002, Nov. Syst. Pl. Vasc. 34: 221. – *Campanula* sect. *Scapiflorae* (Boiss.) Charadze ser. *Tridentatae* (Charadze), 1949, Notes on systematics and geography of plants (Tbilisi), 15: 23.

Type: *C. tridentata* Schreb.

C. dasyantha Bieb. 1819, Fl. Taur.-Cauc. 3: 147; Fedorov, 1957, Fl. USSR, 24: 277; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2): 63; Grubov, 1982, Key to plants of the Mongolia: 233; Gubanov, 1996, Synopsis of flora of the Outer Mongolia: 95; Olonova, 1996, Flora of Siberia, 12: 151; Shauro, 2006, Turczaninowia, 9(1–2): 216; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 447; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153. – *C. pallasiana* Vest. ex Roem. et schult. 1819, Syst. Veg. 5: 138; Krylov, 1949, Flora of Western Siberia, 11: 2641.

Described from Siberia.

Type: “Ex Sibiria, Sievers” (LE).

Rocks, stony slopes and placers, gravelly-lichen tundra; 900–2300 m.

Altai: A (A1 – upper reaches of Malaya Sumulta; A2 – upper reaches of Albas, Teletskoye lake, Abakansky range); A3 – vicin. of settl. Belyi Bom, valley of Aigulak, Meny; A4 – upper reaches of Chebdar; A5 – upper reaches of Bolshoi Ury, Abazinsky pass, Karlygan, Shaman, Hansyn, Monysh, Kokosh, Dzhebashsky, Joysky, Kantegirsky, Khemchiksky, Sayansky ranges, mt. Taskyl, valley of Aldy-Uzye; A6 – Alashsky plateau, Khemchiksky, Sayansky (upper reaches of Aldy-Ishkin) ranges).

General distribution: Russia (W Siberia (Altai), E Siberia, Far East), Mongolia, N America.

Subgen. *Rapunculus* (Boiss.) Charadze, 1976, Notes on systematics and geography of plants (Tbilisi), 32: 54. – *Campanula* sect. *Rapunculus* Boiss. 1875, Fl. Or. 3: 895. – *Rapunculus* Fourr. 1869, Ann. Soc. Linn. Lyon, 17: 11, nom. nud. – *Neocodon* Kolak. et Serd. 1984, Notes on systematics and geography of plants (Tbilisi), 40: 27.

Type: *C. rapunculus* L.

Sect. *Rapunculus* Boiss. 1875, Fl. Or. 3: 895, p. p. – *Campanulastrum* Small, 1904, Fl. South.-East. U. St.: 1141, p. p. – *Campanula* sect. *Rapunculus* Boiss. subsect. *Campanulastrum* (Small) Fed. 1957, Flora USSR, 24: 301.

Type: *C. rapunculus* L.

C. patula L. 1753, Sp. Pl.: 163; Krylov, 1949, Flora of Western Siberia, 12: 2643; Fedorov, 1957, Flora USSR, 24: 308; Olonova, 1996, Flora of Siberia, 12: 152; Vibe, 2001, Key to plants of the Kemerovo region: 302; Shmakov, 2003, Key to plants of the Altai region: 392; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153; Maneev, 2012, Key to plants of the Altai Republic: 402; Silantyeva, 2013, Synopsis of flora of the Altai region: 317. – *Rapunculus patulus* (L.) Fourr. 1869, Ann. Soc. Linn. Lyon, 17: 111.

Described from Europe (“Habitat in Anglia, Suecia arvis”).

Lectotype (Victorov, 2002): Dillenius J. J., 1732, “Hort. elthamensis plantarum ...” T. 1, p. 68, t. 58, fig. 68.

Meadows, sparse forests, edges, bushes, river banks, roadsides; 200–400 m.

Altai: A (A1 – vicin. of settl. Cheposh; A2 – vicin. of settl. Artybash, Choya, Verkh-Biysk).

General distribution: Europe (with the exception of the extreme south and north), Russia (European part, W Siberia).

Sect. *Stevenianae* (Fed. ex Charadze) Victorov, 2002, Nov. Syst. Pl. Vasc. 34: 229. – *Campanula* sect. *Rapunculus* Boiss. ser. *Stevenianae* Fed. ex Charadze, 1976, Notes on systematics and geography of plants (Tbilisi), 32: 54. – *Campanula* sect. *Rapunculus* subsect. *Campanulastrum* (Small) Fed. ser. *Stevenianae* Fed. 1957, Flora USSR, 24: 311, sine descr. latin.

Type: *C. stevenii* M. Bieb.

C. albertii Trautv. 1879, Acta Horti Petrop. 4, 1: 83; Li, 1987, Key to plants of the Middle Asia, 9: 354; Fedorov, 1957, Flora USSR, 24: 311; Krestovskaya, 2006, Plants of the Central Asia, 15: 102. – *C. stevenii* subsp. *albertii* (Trautv.) Victorov, 2002, Nov. Syst. Pl. Vasc. 34: 231. – *C. stevenii* Bieb. 1819, Fl. Taur.-Caucas. 3: 138 (“Steueni”), p. p.; Hong et al., 2011, Fl. China, 19: 535.

Described from Med. Asia (Kyrgyzsky Alatau).

Lectotype (Victorov, 2002): “Ad fl. Tschotkae, in montibus Alexandrinis etalaviensibus transiliensibus” (LE!).

Rocks in the subalpine belt; 1100–2500 m.

Altai: KAD (KAD3 – Tarbagatai range; KAD8 – Fuyun; KAD9 – Qinghe).

General distribution: Middle Asia, China.

C. altaica Ledeb. 1824, Index Sem. Horti Acad. Dorpat.: 2; Krylov, 1949, Flora of Western Siberia, 11: 2641; Fedorov, 1957, Flora USSR, 24: 312; Terekhova, 1965, Flora of Kazakhstan, 8: 293; Grubov, 1982, Key to plants of the Mongolia: 233; Gubanov, 1996, Synopsis of flora of the Outer Mongolia: 95; Olonova, 1996, Flora of Siberia, 12: 149; Vibe, 2001, Key to plants of the Kemerovo region: 302; Shmakov, 2003, Key to plants of the Altai region: 392; Krestovskaya, 2006, Plants of the Central Asia, 15: 102; Shauro, 2006, Turczaninowia, 9(1-2): 216; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 153; Maneev, 2012, Key to plants of the Altai Republic: 402; Silantyeva, 2013, Synopsis of flora of the Altai region: 316. – *Campanula stevenii* subsp. *altaica* (Ledeb.) Fed. 1973, Bot. Journ. Linn. Soc. 67(3): 281. – *C. infundibulum* Ledeb. 1829, Fl. Alt. 1: 239, non vest. 1819. – *C. stevenii* M. Bieb. var. *sibirica* DC. 1830, Monogr. Campan.: 321. – *C. stevenii* auct. non M. Bieb.: Ledeb. 1847, Fl. Ross. 2: 886, quoad specim. e Sibir.; Krylov, 1904, Flora of Altai, 3: 778.

Described from the Altai ("Habitat in Sibiria altaica").

Lectotype: "Herb. Ledebour, Campanula altaica mihi" (LE).

Meadows, meadow steppes, edges, sparse forests, bushland, pebbles; 250–2500 m.

Altai: A (A1 – vicin. of Gorno-Altaysk, Belokurikha, settl. Aya, Altaiskoe, Maima, Ulalushka, Kyzyl-Ozek, Karasuk, Biryulya, Aleksandrovka, Beshpeltir, Urlu-Aspak, Saydys, Ust-Sema, Muny, Anos, Chemal, Cherga, Shebalino, Kuyum, Elikmanar, Shergayta, Paspaul, Choya, Uskuch, Karakoksha, Ynyrga, Veselaya Seika, Krasnoselskoye, Verkh-Pyankovo, Kiska, Kuyagan, Soloneshnoe, Tochilnoye, Rybnoye, Solovyikha, Kiska, Antonyevka, Solonovka, valley of Uymen, Pyzha, Shinok, Seminsky pass, mts. Sarlyk, Akaty and others; A2 – valley of Biya, logach, Pyzha, Lebed, Tuloi, Ulmen, Ushpa, Tondoshka, lower reaches of Chulyshman, Teletskoye lake and others; A3 – vicin. of settl. Kaspа, Aktash, Ust-Kan, Sauzar, valley of Sumulta, Edigan, Ursul, Bolshoi Ilgumen, Bolshoi Yaloman, Malyi Yaloman, Argut, Akturu, Shavla, Kulagash, Karagem, Akkem, Turgunda, Kucherla, Tungur, Kuragan, Katanda, Multa, Koksa, Mena, upper reaches of Koksochka, Yabogansky pass, Ukok plateau, Kholzun range, Tenginskoe lake; A4 – lower reaches of Bashkaus; A5 – vicin. of settl. Bogoslovka; A6 – between settl. Shagonar and Khantogoyty, between settl. Khantogoyty and Chadan); KAD (KAD1 – mts. Mayachnaya, Sinyukha, Slyudyanka, Shish, Severny Kamen, Revnyukha, Voskudarnaya Teplukha, Mokhnataya, Bakhareva, Mokhovoy Belok, Gorky Belok, Kamennaya, vicin. of Zmeinogorsk, settl. Palatcy, Tigirek, Kuybyshevo, Ryazanovka, Sosnovka, Baranovka, Ust-Tulatinka, Sentelek, Ust-Monysh, Pokrovka, Mashenka, Savvushka, Ekaterininskoe, valley of Ploskaya, Vostochny Alei, Malaya Belaya, Malaya Tatarka, Otstoyanaya, upper reaches of Belaya rivers (tributary of Tulata), Chagyrka, Tulata, Levaya Chesnokovka, Sentelek, Glukharikha, Bolshaya Batalikha, Lviny Kamen, Bolshoi Tigirek, Malyi Tigirek, mouth of Lugovaya, mouth of Bolshaya Tatarka, between settl. Alekseevka and Yarovskoye, KAD6 – vicin. of settl. Katon-Karagay, KAD7 –valley of Kurty, northern slope of Yamtyun-ula, KAD9 – upper reaches of Bayan-gol); ZM (ZM1 – valley of Bulyukem; ZM2 – upper reaches of Tsagan-gol).

General distribution: Russia (European part, W Siberia), Kazakhstan, China, Mongolia, Ukraina.

C. turczaninovii Fed. 1957, Flora USSR, 24: 304; Polozhiy, 1979, Flora of Krasnoyarsk krai, 9(2) : 64; Grubov, 1982, Key to plants of the Mongolia: 233; Gubanov, 1996, Synopsis of flora of the Outer Mongolia: 95; Olonova, 1996, Flora of Siberia, 12 : 155; Krestovskaya, 2006, Plants of the Central Asia, 15: 105; Shauro, 2006, Turczaninowia, 9(1-2): 217; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 448; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 154; Maneev, 2012, Key to plants of the Altai Republic: 402. – *Campanula stevenii* subsp. *turczaninovii* (Fed.) Victorov, 2002, Nov. Syst. Pl. Vasc. 34: 230. – *C. silenifolia* Fisch. ex DC. 1830, Monogr. Campan.: 320, non Host, 1827; Крыл. 1949, Krylov, 1949, Flora of Western Siberia, 11: 2640. – *C. baicalensis* Pall. 1830, in DC. Monogr. Campan.: 320, nom. nud., pro syn.

Described from Siberia ("Habitat in Dahuria").

Type: "Dahuria, 1828, Fischer" (G).

Alpine and subalpine meadows, larch forests, subalpine light forests, dryad and stony tundras, rocks, turfed stony placers; 1500–2500 m.

Altai: A (A1 – Seminsky pass; A3 – between valleys of Achik and Karakol (tributaries of Shavla); A4 – Tsagan-Shibetu range; A5 – Khemchiksky rahge; A6 – Alashskoe plateau, Chailalyg-Dag range, valley of Barlyk); KAD (KAD8 – the pass lane from Jamata to Kara-Irtysh); ZM (ZM1 – upper reaches of Sagly, mts. Kharkhira).

General distribution: Russia (E Siberia, Far East), Mongolia.

C. wolgensis P. A. Smirn. 1947, Bull. Soc. Nat. Mosc., Biol. n. s. 52(3): 57; Krylov, 1949, Flora of Western Siberia, 11: 2642; Fedorov, 1957, Flora USSR, 24: 317; Terekhova, 1965, Flora of Kazakhstan, 8: 293; Li, 1987, Key to plants of the Middle Asia, 9: 355; Olonova, 1996, Flora of Siberia, 12: 156; Shmakov, 2003, Key to plants of the Altai region: 392; Danilov, Zykova, 2007, Key to plants of the Tyva Republic: 448; Ilyin, Fedotkina, 2008, Vascular plants of the Altai Republic: 154; Maneev, 2012, Key to plants of the Altai Republic: 403; Silantyeva, 2013, Synopsis of flora of the Altai region: 318. – *Campanula stevenii* subsp. *wolgensis* (P. A. Smirn.) Fed. 1973, Bot. Journ. Linn. Soc. 67, 3: 281.

Described from the Volga region.

Type: "Nizhny Novgorod province, Lukyanovsky uезд, between Peley Kasenoi and Kochkari by the north. slope of the log, departing from r. Pelia, 14.06.1926, V. Alekhin, D. Averkiev"(MW 0594935).

Steppes, steppe meadows, sparse forests; 900–2500 m.

Altai: A (A1 – Seminsky pass; A3 – vicin. of settl. Katanda, valley of Akkem, Ebelu, Dzhazator, Zhumaly, Kurai, Kalguty, Ak-Alakha, Yabogansky pass; A4 – valley of Kargy); KAD (KAD1 – vicin. of Ust-Kamenogorsk; KAD2 – Kalbinskiy range, valley of Sartymbet, vicin. of settl. Palatsy and others; KAD3; KAD4; KAD5; KAD6 – vicin. of settl. Katon-Karagai, valley of Kara-Kaba,

Ortathereky, Burkhat pass, KAD7 – vicin. of Markakol lake, Khara-Nur lake, valley of Kara-Kaba, Songinyng-Gol); ZM (ZM1 – valley of Elangash, Kuyakhtanar).

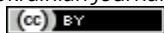
General distribution: Russia (European part, W Siberia), Kazakhstan.

References

- Bekket, U., Kechaykin, A.A., Yevdokimov, I.Yu., Kosachev, P.A., Shmakov, A.I. (2015). New findings about flora of West Mongolia. *Acta Biologica Sibirica*, 1(1–2), 132–139. <http://dx.doi.org/10.14258/abs.v1i1-2.910> (in Russian).
- Fedorov, A.A. (1957). Campanulaceae Juss. In: *Flora USSR*. Vol. 24. Leningrad, 126–450 (in Russian).
- Flora of Altai (2005). Kamelin R.V. (eds.). Vol. 1. Barnaul: Azbuka, 1–340.
- German, D.A., Chen, W.L., Smirnov, S.V., Liu, B., Kutzev, M.G., Wang, J., Shmakov, A.I., Kamelin, R.V. (2012). Plant genera and species new to China recently found in northwest Xinjiang. *Nordic Journal of Botany*, 30, 61–69.
- Gubanov, I.A. (1996). Synopsis of flora of the Outer Mongolia. M.: Valang, 1–135 (in Russian).
- Hong, D., Song, G., Lammers, T.G., Klein L.L. (2011). Campanulaceae. In: Wu, Z. Y., P. H. Raven & Hong D. Y. (eds.). *Flora of China*. Vol. 19. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis, 505–563.
- Ilyin, V.V., Fedotkina, N.V. (2008). Vascular plants of the Altai Republic. Gorno-Altai: RIO GAGU, 1–290 (in Russian).
- Krestovskaya, T.V. (2006). Campanulaceae Juss. In: Grubov V.I. (eds.). *Plants of the Central Asia*. Vol. 15. Moscow, 88–105.
- Krylov, P.N. (1949). *Campanula* L. In: *Flora of Western Siberia*. Vol. 11. Tomsk, 2629–2644 (in Russian).
- Li, A.D. (1987). *Campanula*. In: *Key to plants of the Middle Asia*. Vol. 9. Taschkent: FAN, 352–355 (in Russian).
- Maneev, A.G. (2012). Campanulaceae. In: *Key to plants of the Altai Republic*. Novosibirsk, 401–404 (in Russian).
- Olonova, M.V. (1996). *Campanula* L. In: *Flora of Siberia*. Vol. 12. Novosibirsk, 148–164 (in Russian).
- Polozhiy, A.V. (1979). Campanulaceae. In: *Flora of Krasnoyarsk krai*, 9(2), 62–68 (in Russian).
- Shaulo, D.N. (2006). Flora of the Western Sayan. *Turczaninowia*, 9(1–2), 5–336 (in Russian).
- Shaulo, D.N., Myakshina, T.A., Shaulo, S.P., Erst A.S. (2011). Floristic findings in the upper Yenisei basin. *Turczaninowia*, 14(3), 100–105 (in Russian).
- Shmakov, A.I. (2003). Campanulaceae. In: *Key to plants of the Altai region*. Novosibirsk, 390–393 (in Russian).
- Silantyeva, M.M. (2013). Synopsis of flora of the Altai region. Barnaul: Izd-vo Alt. un-ta, 1–520 (in Russian).
- Victorov, V.P. (2002). Taksonomicheskiy konspekt roda *Campanula* L. (Campanulaceae) Rossii i sopredel'nykh gosudarstv. *Novosti sistematiki vysshikh rasteniy*, 34, 197–234 (in Russian).
- Zolotukhin, N.I. (2012). Floristic findings in the Altai Republic. *Bulletin of Moscow Society of Naturalists*. Biological series, 117(3), 77–80 (in Russian).
- Zykova, E.Yu. (2014). New data on the distribution of alien species in the Altai Republic. *Bulletin of Moscow Society of Naturalists*. Biological series, 119(6), 74–76 (in Russian).

Citation:

Shmakov, A.I., Kechaykin, A.A., Sinitsyna, T.A., Shaulo, D.N., Smirnov, S.V. (2018). Genus *Campanula* L. (Campanulaceae Juss.) in flora of Altai. *Ukrainian Journal of Ecology*, 8(4), 362–369.



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