

## Taxonomic corrections and new records in vascular plants of Kyrgyzstan

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A series of notes on distribution, taxonomy and nomenclature of some vascular plants in Kyrgyzstan is presented. Two new hybrids (*Delphinium* × *pskemense* Sennikov & Lazkov, *Perovskia* × *intermedia* Lazkov) are described. The variety *Rhinactinidia limoniifolia* var. *brachyglossa* Lazkov & Sennikov and forma *Rubus praecox* Bertol. f. *rutiliflorus* H.E.Weber & Sennikov are described for unusual morphotypes of these species. Five transfers from *Pyrethrum* to *Richteria* (*R. brachanthemoides* (Kamelin & Lazkov) Sennikov, *R. neglecta* (Tzvelev) Sennikov, *R. sovetkinae* (Kovalevsk.) Sennikov, *R. sussamyrensis* (Lazkov) Sennikov, *R. sect. Trichanthemopsis* (Tzvelev) Sennikov) are proposed in conformity with the phylogeny of Anthemideae. Nomenclature is discussed and lectotype is designated for *Achillea biebersteinii* Afan. Three transfers (*Arctium nidulans* (Regel) Sennikov, *A. sect. Plagioccephalum* (Rupr.) Sennikov, *Harmsiella olgae* (Regel) Sennikov) are proposed because of priority under the current phylogeny of Asteraceae and Lamiaceae. Ten native species (*Centaurea chartolepis* Greuter, *Cousinia hamadae* Juz., *Hypopitys hypophegea* (Wallr.) G.Don, *Lemna turionifera* Landolt, *Lycopus exaltatus* L. f., *Portulaca granulatostellulata* (Poelln.) C.Ricceri & P.V.Arrigoni, *P. nitida* (Danin & H.G.Baker) C.Ricceri & P.V.Arrigoni, *Ranunculus acris* L., *Rubia laevissima* Tschern., *Zygophyllum miniatum* Cham.) and two aliens (*Calystegia spectabilis* (Brummitt) Tzvelev, *Rubus praecox* Bertol.) are new to Kyrgyzstan. Ten species are new to certain mountain ranges. The presence of *Sorbus turkestanica* (Franch.) Hedl. in Kyrgyzstan is confirmed; this species and *S. persica* Hedl. are mapped anew for conservation purposes. *Otostegia nikitinae* Scharasch. and *O. schennikovii* Scharasch. are synonyms of *Harmsiella olgae* and therefore need no protection in Kyrgyzstan.

### Introduction

During the years 2009–2011 botanists of the Botanical Museum of the University of Helsinki (A. Sennikov, 2009–2011; L. Junikka, M. Koistinen, S. Lommi, P. Uotila, H. Väre, 2009; V. Salo, 2011) made three expeditions to collect plants in

Kyrgyzstan. G. Lazkov participated in all these expeditions, representing the Institute of Biology and Soil Science of the Kyrgyz Academy of Sciences.

The expeditions visited Western Tian-Shan (Kyrgyz, Suusamyr, Chatkal, Pskem, Chanda-

lash and Fergana Ranges, Babash-Ata and At-Oinok Mts.) and Pamir – Alay (Alay and Turkestan Ranges) mountain systems. Approx. 4000 specimens of vascular plants were collected (kept in H, partly in FRU and LE). The diary of the 2009 travel has been published separately (Uotila 2010).

Some new taxa and several new records emerged when these collections were treated, some of these novelties are published here. A few other records are added by G. Lazkov. An entry on *Cousinia* Cass. resulted from the preparation of a new checklist of vascular plants of Kyrgyzstan (Lazkov & Sultanova, in press). The novelties were checked against major published sources on Kyrgyz flora (*Flora of the Kirghiz SSR*, vols. 1–11, 1952–1965; *Manual of Vascular Plants of Central Asia*, vols. 1–10, 1968–1993), complemented with separate treatments when available.

Taxonomic or nomenclatural adjustments are provided when new names are required because of new synonymy or phylogenetic placement. The circumscription of families follows APG III (Chase & Reveal 2009).

## Araceae (incl. Lemnaceae)

### *Lemna turionifera* Landolt

Kyrgyzstan. Ketmen-Döbö Depression: along Nichke River, 41.849° N, 73.057° E, alt. c. 950 m, shore of 1–2 m wide rather slowly running small river in valley bottom, with open grassy shores, at mouth of a brook, in shallow water and on wet soil, several sq-m wide fairly sparse colony, 28.07.2009, P. Uotila 47484 (H 1746620).

New to Kyrgyzstan. Members of *Lemna* were kept on eye during the excursion in 2009, and they seem to be uncommon, because they were found in this single locality only. *Lemna turionifera* Landolt was suspected in the field, and the final determination of the specimen was made in 2011 by Lasse Pihlajaniemi (Helsinki).

*Lemna turionifera* may be difficult to distinguish from *L. minor*, especially in summer. Fronds of *L. turionifera* are somewhat smaller, rounder and thicker than those of *L. minor*. Papulae on the upper surface of the frond along the midvein are ± similar in size, whereas in *L. minor* the papula nearest to the apex is usually bigger than the others. *Lemna turionifera* usually has

some red colour on the lower surface of the frond (always more expressed than on the upper surface), especially near the root base. *Lemna minor* may only seldom have a weak red colour on the lower surface (always less expressed than on the upper surface). Under unfavourable conditions *L. turionifera* forms small, dark, rootless turions, which sink to the bottom and grow after dormancy. *Lemna minor* does not form any distinct turions, even though its autumn-borne fronds may be smaller than those developed in summer.

In Asia *L. turionifera* was known from Kazakhstan, further east it grows in Siberia and Russian Far East, and southward its area extends to China (Heilunkiang) and Northern India (Landolt 1986). According to Landolt (1986), the total area of *L. turionifera* is more northern than that of *L. minor*, which is known in Asia only from the Southwest, India and Tibet. Consequently the earlier records of *L. minor* reported from Kyrgyzstan may also belong to *L. turionifera*.

## Aspleniaceae

### *Asplenium septentrionale* (L.) Hoffm.

Kyrgyzstan. Fergana Range: Kara-Alma River basin, on rocks, 09.06.2003, G. Lazkov & N. Kenjebaeva (FRU, LE).

New to Fergana Range. Nikitina (1952) reported this species from Kyrgyz Range only. Later it was also found in Chatkal (Cheremnykh 1985) and Suusamyr (Lazkov & Ganybaeva 2008) Ranges.

## Asteraceae

### *Achillea arabica* Kotschy

Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 52: 251. 1866. — Type: Saudi Arabia. Asyr [Asir], 1838, *medicus ignotus legit* (W, holotype).

*Achillea biebersteinii* Afan., Bot. Mat. Herb. Bot. Inst. Acad. Sci. USSR 19: 361. 1959 — *Achillea micrantha* Willd. var. *sulfurea* DC., Prodr. 6: 29. 1837. — Type: Azerbaijan. "Talüsch" [Talış Mts.], [June 1830,] C.A. Meyer [part of Meyer's *Enumeratio plantarum Caucasicum* 633, distributed as *A. pubescens* in 1832] (G-DC, lectotype, designated here by Sennikov; isolecotype LE).

This species is one of the most widespread taxa of *Achillea* with yellow flowers. Its distribution area ranges from Near East to Central Asia (Afanasiev 1961; Greuter 2006–2009).

This species has been known as *A. micrantha* Willd. until Afanasiev (1959) discovered that this use of the name is referable to a misapplication allowed by Willdenow (1803). Willdenow (1789) originally described *A. micrantha* as a psammophilous species endemic to the southern part of East Europe, Western Siberia and the western part of Central Asia (Afanasiev 1961). Afanasiev transferred the name *A. micrantha* Willd. 1789 to the species earlier known as *A. gerberi* Willd., as proposed the substitute (*nomen novum*) *A. biebersteinii* Afan. for what he believed to be the illegitimate later homonym "*A. micrantha* Willd. 1803".

As correctly pointed out by Valant-Vetschera (1999), Willdenow (1803) had not created a later homonym of the original *A. micrantha* but only changed the circumscription of this taxon, because its type had not been excluded (Art. 48.1). For this reason *A. biebersteinii* cannot be technically a replacement name for a later homonym. At the same time, it cannot be a name of new species based on the description of "*A. micrantha* Willd. 1803" because the type designation is missing (Valant-Vetschera 1999). Valant-Vetschera (1999) concluded that the name *A. biebersteinii* was validly published not by Afanasiev (1959, 1961) but by Huber-Morath (1975) who indicated its type ("*Millefolium cappadocicum rectum luteum*", *Tournefort* in Hb. Willdenow B-W16356/5).

This conclusion was erroneous because Afanasiev (1959) included in the synonymy of *A. biebersteinii* a full and direct reference to the earlier legitimate name *A. micrantha* var. *sulfurea* DC., which may serve as replaced synonym. The type designation by Huber-Morath is not acceptable under Art. 7.7, and the new type is designated here.

Regrettably the name *A. biebersteinii*, already long-established in Russian literature since its appearance in the *Flora of the USSR* in 1961, was replaced by the obscure and long-forgotten but earlier and legitimate name *A. arabica* Kotschy (Valant-Vetschera 1999; Greuter 2006–2009).

### *Arctium nidulans* (Regel) Sennikov, **comb. nova**

*Cirsium nidulans* Regel, Bull. Soc. Imp. Naturalistes Moscou 40(3): 160. 1867 — *Cnicus nidulans* (Regel) Krasn., Zap. Russk. Geogr. Obsch. 19: 346. 1888 — *Schmalhausenia nidulans* (Regel) Tschern. in Schischkin & Bobrov, Fl. USSR 27: 361. 1962, non (Rupr.) Petr., Allg. Bot. Zeitschr. 20: 117. 1914. — Type: Kyrgyzstan. Teskey Range: "Kök-Jar" [Kashka-Tor] Pass, 1857, P.P. Semenov [Tian-Schan-ski] (LE, not seen).

*Jurinea horrida* Rupr., Mém. Acad. Imp. Sci. St. Pétersbourg, 7 sér., 14(4): 57. 1869 — *Carduus horridus* (Rupr.) B.Fedtsch., Izv. Turkest. Otd. Imp. Russk. Geogr. Obsch. 6(Suppl. 4): 278. 1911. — Type: Kyrgyzstan. Kyrgyz Range: Shamsy Pass, 10.07.1867, R.F. von der Osten-Sacken (LE, not seen).

*Cousinia eriophora* Regel & Schmalh., Acta Horti Petrop. 6: 313. 1880 — *Arctium eriophorum* (Regel & Schmalh.) Kuntze, Revis. Gen. Pl. 1: 307. 1891 — *Schmalhausenia eriophora* (Regel & Schmalh.) C.Winkl., Acta Horti Petrop. 12: 281. 1892. — Type: Kyrgyzstan. Teskey Range: [Kapka-Tash Mts.], Sary-Küngöy [River, tributary of Kichi-Naryn River], *A. Regel* (LE, not seen).

This spectacular spiny species of alpine meadows of Tian-Shan (within Uzbekistan, Kazakhstan, but first of all Kyrgyzstan) (Zuckerwanik 1993) is peculiar of its compact head-looking synflorescence of nearly sessile capitula. It has been independently described three times by different researchers of Central Asian plants. No wonder that its correct species name appeared to be tricky.

The plant was originally described by Regel (1867) as a species of *Cirsium* Mill. When Ruprecht (1869) and Regel & Schmalhausen (Regel 1880) redescribed this species, they stated its isolated position in the respective genera, *Jurinea* Cass. and *Cousinia* Cass. For this species Winkler (1892) established a monotypic genus *Schmalhausenia* C.Winkl., presumably related to *Carduus* L. Since then, this genus became universally accepted (Hoffmann 1897; Tscherneva 1962; Zuckerwanik 1993).

Being unaware of Winkler (1892), Petrak (1910) described a new monotypic genus *Wettsteinia* Petr. for the same species, which he received among Turkestan plants (from Küngöy Range, the present-day Kyrgyzstan), collected by V.F. Brotherus and distributed from the Botanical Museum in Helsinki. The specimen was identified as *Cnicus nidulans* by C.Winkler; a quick search in available literature brought Petrak to the proto-

logue of *C. nidulans* Regel (1867) but at the same time to the record of *Carduus nidulans* Rupr. in *Index Kewensis* (Jackson 1893). The protologue of *Carduus nidulans* Rupr. (1869) was not available to Petrak, who was confused with the similarity of epithets in related genera and for this reason assumed that the same plant may have appeared under *Carduus* and *Cirsium*. Petrak (1910) indicated *Carduus nidulans* Rupr. as the basionym of *Wettsteinia nidulans* (Rupr.) Petr., adding *Cirsium nidulans* Regel to synonymy.

Meanwhile the full and correct synonymy of this species was established by Fedtschenko & Fedtschenko (1911). Petrak (1914) received the German version of Fedtschenko & Fedtschenko (1914) and consequently updated the nomenclature of this species, transferring *Carduus nidulans* Rupr. (sic!) to *Schmalhausenia*. Even though Petrak declared that he was uncertain about the identity of *Carduus nidulans* Rupr., he still maintained this name as the first synonym of *S. nidulans*, and this synonym has been consequently interpreted as the basionym of *S. nidulans* in *Index Kewensis* (Hill 1926).

Later *Carduus nidulans* Rupr. was found to belong to a different group of plants, which was separated as the genus *Olgaea* Iljin (Iljin 1924b).

Tscherneva (1962) was probably first to cite *Cirsium nidulans* Regel as the basionym of *S. nidulans*. By doing so, she created a later homonym to be ascribed to her. Because of a nomenclatural mistake the epithet "nidulans" became unavailable in *Schmalhausenia*; the correct name of this species in this genus might have been "*S. horrida*" (Rupr.) ined.

The supraspecific nomenclature related to this species is summarised below.

***Arctium* sect. *Plagiocephalum* (Rupr.) Sennikov, comb. nova**

*Jurinea* sect. *Plagiocephalum* Rupr., Mém. Acad. Imp. Sci. St. Pétersbourg, 7 sér., 14(4): 58. 1869. — Type: *Jurinea horrida* Rupr. (= *Arctium nidulans* (Regel) Sennikov)

*Cousinia* ser. *Renardia* Regel, Acta Horti Petrop. 6: 313. 1880 — *Schmalhausenia* C.Winkl., Acta Horti Petrop. 12: 281. 1892 — *Cousinia* [unranked] *Renardia* (Regel) O.Hoffm. in Engler & Prantl, Nat. Pflanzenfam. 4(5): 319. 1894 — *Arctium* sect. *Schmalhausenia*

(C.Winkl.) S.López, Romaschenko, Susanna & N.García, Taxon 60: 552. 2011. — Type: *Cousinia eriophora* Regel & Schmalh. (= *Arctium nidulans* (Regel) Sennikov)

*Wettsteinia* Petr., Bull. Soc. Bot. Genève, 2 sér., 2(6): 167. 1910. — Type: *Cirsium nidulans* Regel (= *Arctium nidulans* (Regel) Sennikov) (lectotype, designated in Farr et al. 1979: 1864).

The molecular phylogeny of *Arctium* – *Cousinia* group (López-Vinyallonga et al. 2011) has convincingly shown that *Schmalhausenia* is not related to *Cousinia* but is part of *Arctium* s.l. The genus *Arctium* has been phylogenetically circumscribed to include all taxa with a chromosome number of  $x = 18$ , orbicular and spiny pollen grains and a glabrous and cylindrical style with a ring of sweeping hairs at the thickened articulation, as opposite to chromosome numbers of  $x = 9, 10, 11, 12$  and  $13$ , oblong and smooth pollen grains and long hairs covering the apical part of the style and stylar branches (Kuprianova & Tscherneva 1982; López-Vinyallonga et al. 2011).

In the phylogenetic analysis *Schmalhausenia* was found sister to *Hypacanthium* Juz. (in conformity with the original assumption of Juzepczuk (1936) that was based on morphology). A separate section was established to accommodate this species in the newly circumscribed *Arctium* (López-Vinyallonga et al. 2011).

But already Ruprecht (1869), when describing this species in *Jurinea*, stated that its "spicate" synflorescence and spiny leaves never occur in *Jurinea*. For this reason he placed his new species *J. horrida* Rupr. into the new section *J. sect. Plagiocephalum* Rupr. This sectional name was accompanied by a brief diagnosis and thus is validly published. It clearly predates the sectional name created by López-Vinyallonga et al. (2011). A new transfer is proposed here according to priority.

*Wettsteinia* Petr. is another synonym of *A. sect. Plagiocephalum* (Rupr.) Sennikov, even though this genus was originally monospecific and its only species name, *W. nidulans* (Rupr.) Petr., is a synonym of *Olgaea nidulans* (Rupr.) Iljin. Petrak (1910) added *Cirsium nidulans* Regel to the synonymy of his only accepted species name; this means that two previously published species names and thus two elements eligible as generic type (nowadays referable to different genera)



were included (Art. 10.2). Farr et al. (1979) indicated "*W. nidulans* (Regel) Petrak (*Cirsium nidulans* Regel)" as the type of *Wettsteinia*; by doing so one of the two elements (a synonym!) was designated as lectotype and *Wettsteinia* has been rendered to the synonymy of *Arctium*.

### *Centaurea chartolepis* Greuter

Synonym: *Chartolepis intermedia* Boiss.

Kyrgyzstan. Chüy Valley: N of Kamyshanovka Village, along the road at Chüy River, 11.07.2011, *G. Lazkov* & *I. Illarionova* (FRU, LE).

New to Kyrgyzstan. This species has a wide distribution in Kazakhstan, recorded in west and east up to the border of Kyrgyzstan but formally never from its limits (Makhmedov 1993). It prefers rather humid saline meadows, river valleys and lake sides.

The genus *Chartolepis* Cass. is phylogenetically nested in *Centaurea* L. s.str. (the former *Jacea* group of *Centaurea* s.l.) and has to be merged with the latter (Greuter 2003; Garcia-Jacas et al. 2006).

### *Cousinia hamadae* Juz.

Kyrgyzstan. Turkestan Range: Left side of Isfana River in 6–7 km SW of Sülükütü Town, varicoloured denudations, ephemeroïd vegetation, 05.05.1964, *R. Aydarova* & *N. Gorbunova* (FRU); near Shaldy-Baldy Village, varicoloured denudations, NW-exposed slope, species-rich grassland, 07.07.1964, *R. Aydarova* & *N. Gorbunova* (FRU); left side of Aksu River, clayey denudations, 21.08.1969, *R. Tambovtseva* (FRU); Belesnyk Mts., near Kyzym-Bayrak Village, 08.05.2005, *G. Lazkov* (FRU).

New to Kyrgyzstan. This species occurs in Pamir–Alay Mt. System and neighbouring areas and readily differs from the similar *C. talassica* (Kult.) Juz. ex Tschern. in loosely tomentose (not densely villous) flowering heads. The presence of this species in Kyrgyzstan might have been reported by Tscherneva (1993) on the basis of a single specimen [“Turkestan Range: from Aksu River to Zambar Village, *Balabaev*” (TASH, formerly TAK, n.v.)] but doubted because of the immature stage of the specimen. The record of *C. talassica* from the southern Kyrgyzstan (Aydarova et al. 1985) is erroneous and belongs here.

Besides of the morphological difference, *C. talassica* has a separate distribution area, occurring in the northern parts of Western Tian-Shan (Talas and Kyrgyz Ranges) (Tscherneva 1993).

### *Olgaea pectinata* Iljin

Kyrgyzstan. Chatkal Range (S side): nameless left-side tributary of Kasan-Say River, upper part of gravelly slopes, 41.49° N, 71.04° E, alt. 1700 m, 04.08.2009, *A. Sennikov* 199 (H 1748152) & *G. Lazkov* (FRU, LE).

New to Chatkal Range. Previously Nikitina (1965) reported this species from Kabak-Too Mts. only. Outside Kyrgyzstan this species is known from Kazakhstan (Talas and Ugam Ranges, Karatau) (Tuljaganova 1993). It is a tall, very spiny plant with all outer and middle phyllaries being pectinate (Fig. 1). Its wider distribution in the Kyrgyz part of Western Tian-Shan is expected.



Fig. 1. Flowering head of *Olgaea pectinata*. Photo: Georgy Lazkov

*Rhinactinidia limoniifolia* (Less.) Novopokr. ex Botsch. var. *brachyglossa* Lazkov & Sennikov, var. nova

*Florum ligulatorum ligulis reductis* (0.5–1(3) mm lg., nec 5–7 mm lg.) *decoloratis* (*pallidis roseolis*, nec *violaceis*), *involucris phyllis brevioribus* (5 mm lg., nec 5–6 mm lg.) *decoloratis* (nec *marginis violaceis*), nec non *caulibus longioribus ad 50 cm lg.* (nec ad 30 cm lg.) *a varietate typica differt.*

Type: Kyrgyzstan. Fergana Range: Isfan-Jayloo Mts., middle part of the N slope along Kara-Suu River, on rocks, alt. ca. 1150 m a.s.l., 41.66° N, 72.66° E, 12.07.2010, A. Sennikov & G. Lazkov 85a (H 1750542, holotype; isotypes B, BC, FRU, K, LE, MO, MW, S). — Other specimens examined (paratypes): Kyrgyzstan. Fergana Range: along Kara-Suu River and the lowermost part of the slopes on the left riverside, lower part of rocky slopes, 41.53° N, 72.68° E, alt. 1550 m a.s.l., 08.07.2005, G. Lazkov (FRU, LE) & 28.07.2009, A. Sennikov 110 (H 1748146) & 14.07.2010, A. Sennikov & G. Lazkov 113 (H 1750544) & 125 (H 1750543). Chatkal Range (S side), left side of K k-Serek River, middle part of the slope, N slope, sparse *Juniperus* trees, 41.3° N, 71.07° E, alt. 2250 m a.s.l., 24.07.2010, A. Sennikov & G. Lazkov 315 (H 1750539).

The unusual plants of *Rhinactinidia limoniifolia* s.l. have been originally discovered in the course of floristic inventories of rare and endemic plants of Kyrgyzstan by G. Lazkov in 2005. The population in the Isfan-Jayloo Mts. was uniform in morphology and rich in mature individuals, all in abundant flower with a good seed set. In subsequent years, more populations of similar plants were observed within the same small mountain range. The plants inhabited open or sparsely shaded cliff sides at the altitudes of 1150–1600 m.

The plants were strikingly different from the common *R. limoniifolia* s.str. in possessing a few (1–5) abbreviated (usually with ligules 0.5–1 mm long) and discoloured (pale pinkish) ligulate florets per flowering head (Fig. 2), or the ligules are completely reduced (Fig. 3), whereas the typical form of *R. limoniifolia* had 6–10 ligulate florets per flowering head with well-developed deeply blue to violet ligules 5–7 mm long. The flowering heads looked smaller not only because of the "lack" of the ligulate florets but also because of slightly shorter involucre with the inner phyllaries ca. 5 (not 5–6) mm long. The involucre phyl-



Fig. 2. Abbreviated ligules of *Rhinactinidia limoniifolia* var. *brachyglossa*. Photo: Alexander Sennikov



Fig. 3. Reduced ligules of *Rhinactinidia limoniifolia* var. *brachyglossa*. Photo: Alexander Sennikov

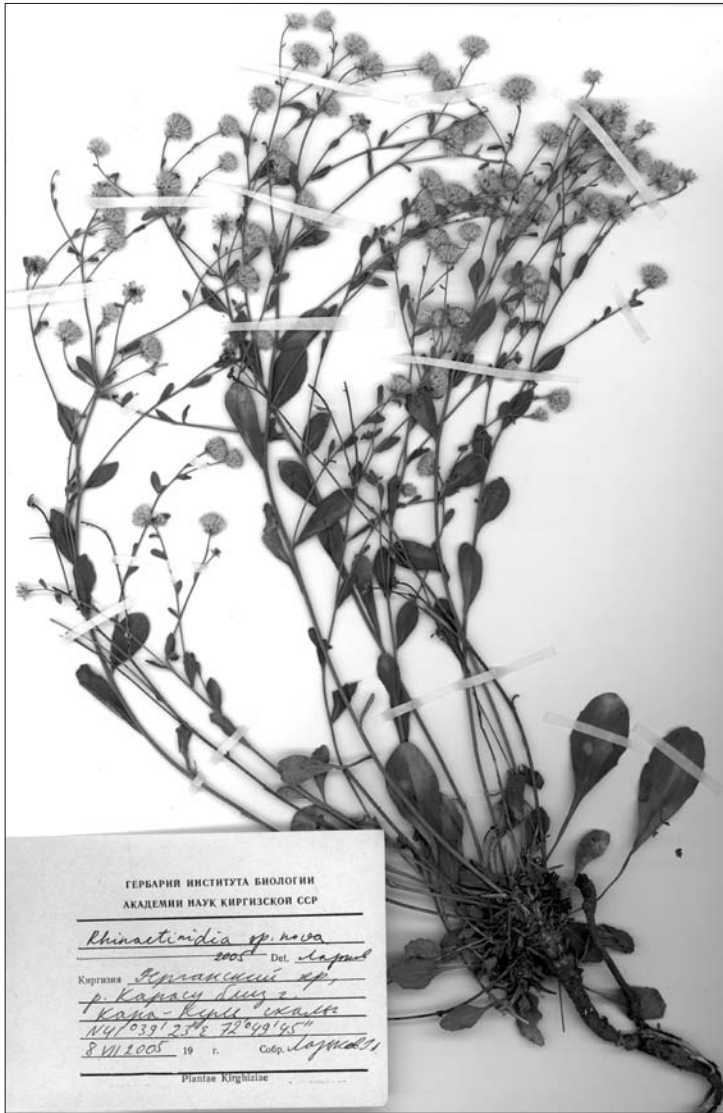


Fig. 4. Habit of *Rhinactinidia limonii-fo lia* var. *brachyglossa*

laries of that local variant of *R. limonii-fo lia* s.l. were green, whereas those in *R. limonii-fo lia* s.str. had the violet coloration along the margin. The habit of those plants was also deviating from the typical form, with stems longer (usually up to 50 cm long) and much branched (Fig. 4), whereas the typical form had shorter (usually up to 30 cm long) and less branched stems.

During the field work in 2010 we observed a remote locality of *R. limonii-fo lia* s.l. in the Chatkal Range where both variants, with normal and abbreviated ligules, were present side by side. This observation convinced us that these variants

belong to the infraspecific, though inherited, variability of *R. limonii-fo lia* and should be treated at the rank of variety. We assume that the abbreviation and discolouration of the ligules and phyllaries are controlled by a few (or a single) genes, and the differences in the habit are largely overlapping.

Two species of *Rhinactinidia*, *R. limonii-fo lia* and *R. popovii* (Botsch.) Botsch., are known from Kyrgyzstan. The record of *R. eremophila* (Bunge) Novopokr. ex Botsch. from Naryn River basin (Tuljaganova 1993) is erroneous and belongs to *R. limonii-fo lia*. These two species are said to dif-

fer in long ligules and entire leaves in *R. limoniifolia* vs. short (slightly overtopping the involucre) ligules and dentate leaves in *R. popovii* (Tamamschian 1959; Tuljaganova 1993). Our observations show that this opposition is not correct not only because of the present discovery of abbreviated ligules in *R. limoniifolia*, but also because the radical leaves of *R. limoniifolia* often have inconspicuous dentation at the apex, less prominent than in *R. popovii* but very similar to. The corrected diagnostic characters are presented below.

1. Calathidia on elongated pedicels 2–3 cm long. All plant surfaces are covered with hairs 0.1–0.25 mm long. Radical leaves with inconspicuous irregular dentation. Ligules usually blue, much overtopping the involucre, 5–7 mm long (rarely pinkish, not overtopping the involucre, ca. 1 mm long, or completely reduced) ..... *R. limoniifolia*
- + Calathidia on shorter pedicels 0.5–1 (1.5) cm long. All plant surfaces are covered with hairs 0.2–0.4 mm long. Radical leaves usually with conspicuous regular dentation. Ligules violet, slightly overtopping the involucre, ca. 2 mm long ..... *R. popovii*

***Richteria brachanthemoides* (Kamelin & Lazkov)  
Sennikov, comb. nova**

*Pyrethrum brachanthemoides* Kamelin & Lazkov, Bot. J. (St. Petersburg) 82(7): 123. 1997. — Type: Kyrgyzstan, Fergana Range: the valley of Bekechal River at its mouth, clay & sandstone denudations, 11.06.1996, M. Pimenov, E. Kluykov & G. Lazkov 124 (LE, holotype; isotypes FRU, MW).

Very narrow endemic of NW projections of Fergana Range, described from Bekechal River valley. Recommended for legal protection in Kyrgyzstan (Sultanova et al. 1998). Photographed and mapped in Umralina & Lazkov (2008).

The genus *Richteria* Kar. & Kir. was merged with *Pyrethrum* Zinn in the most influential Russian classifications (Tzvelev 1961; Poliakov 1967), otherwise supporting very narrow generic concept in Anthemideae Cass. Tzvelev (1961) observed that the type species of *Richteria*, *R. pyrethroides* Kar. & Kir. has a peculiar pappus of long scales, which are separated (nearly) to their base, and phyllaries with broad brown margins. Tzvelev noted very similar characters for *Pyrethrum tianschanicum* Krasch. that was considered to differ from *P. pyrethroides* (Kar. & Kir.)

B.Fedtsch. ex Krasch. (= *Richteria pyrethroides*) mostly in more extensive lignification of its stem bases. The heterogeneity of *Pyrethrum* s.l. was obvious and noted also by Tzvelev (1961) who did not dare for its further dismembering in spite of many new genera which he otherwise established in this tribe.

Bremer & Humphries (1993) restored the genus *Richteria* and placed it to the new subtribe Cancriniinae Bremer & Humphries of Anthemideae altogether with *Allardia* Decne. (*Waldheimia* Kar. & Kir.), *Cancrinia* Kar. & Kir. and *Trichanthemis* Regel & Schmalh. All these genera are presumably closely related and share the scaphoid habit and involucre phyllaries with broad brown margins. The status and phylogenetic position of *Richteria* was subsequently confirmed within the broader subtribe Handeliinae Bremer & Humphries (incl. Cancriniinae) (Oberprieler et al. 2007, 2009).

The marginal position of *P. tianschanicum* within *Pyrethrum* resulted in its transfer to *Pseudoglossanthis* Poljak. (Kamelin & Kovalevskaya 1993). *Pseudoglossanthis* is a variant of *Trichanthemis* that is characterised by white (vs. yellow, if present) radiate flowers; this difference is analogous to the variability found within *Tanacetum* L. (incl. *Pyrethrum*) and does not qualify for generic distinction (Bremer & Humphries 1993; Oberprieler et al. 2006). *Trichanthemis* is characterised by densely hairy receptacles and achenes, whereas *P. tianschanicum* has glabrous receptacles and achenes and thus cannot be placed to that genus. The phylogenetic position of *P. tianschanicum* in *Richteria*, suggested already by Tzvelev (1961), was recently confirmed in the analysis of nrDNA ITS data (Sonboli & Oberprieler 2010).

As currently circumscribed, *Richteria* embraces small subshrubs with glabrous receptacles and achenes, apically brownish pappus scales that are split to the base (rarely to the middle) and are shorter than the achene body, as well as phyllaries with broad brown margins (Sonboli & Oberprieler 2010).

When originally described (Kamelin & Lazkov 1997), *P. brachanthemoides* Kamelin & Lazkov was classified as a member of *Pyrethrum* Zinn and compared with the species of "*Richteria* group of *Pyrethrum*" and with the "superficially similar" *P. tianschanicum*. *Pyrethrum brachan-*



*themoides* fits the diagnosis of *Richteria* and differs from *P. tianschanicum* in the outer phyllaries with the narrow (vs. broad) brown margin, pinnatisect (vs. bipinnatisect) leaves with fewer pairs of lateral lobes (2–3 vs. 3–5), and a much greater lignification of stems. The formal transfer of *P. brachanthemoides* to *Richteria* is consequently proposed here.

***Richteria neglecta* (Tzvelev) Sennikov, comb. nova**

*Pyrethrum neglectum* Tzvelev in Schischkin & Bobrov, Fl. USSR 26: 874. 1961. — Type: Kyrgyzstan. Chatkal Range: Kuldambes Mt. at Sary-Chelek Lake, 17.07.1908, V. Rovinski (LE, holotype; isotype LE).

This race of *R. pyrethroides* s. l. is confined to mountains surrounding the eastern part of Fergana Valley and differs from *R. pyrethroides* s. str. mostly in a greater density of pubescence (Tzvelev 1961).

***Richteria sovetkinae* (Kovalevsk.) Sennikov, comb. nova**

*Pyrethrum sovetkinae* Kovalevsk., Novit. Syst. Pl. Vasc. 23: 241. 1986. — Type: Kyrgyzstan. Suusamyrgorge Range: Suusamyrgorge river valley, S slope, 05.07.1926, M. Sovetkina 998 (TASH, formerly kept in TAK).

Endemic of Western Tian-Shan (Kabak-Too, Moldo-Too, Suusamyrgorge, Talas, Kyrgyz & Chatkal Ranges) (Kovalevskaya 1986; Kamelin & Kovalevskaya 1993; Lazkov 2007). Recommended for legal protection in Kyrgyzstan (Sultanova et al. 1998). Photographed and mapped in Umralina & Lazkov (2008).

This species differs from *R. leontopodium* C.Winkl. in a less developed pubescence and longer stems, which are sometimes branched (Lazkov 2007).

***Richteria sussamyrensis* (Lazkov) Sennikov, comb. nova**

*Pyrethrum sussamyrense* Lazkov, Bot. J. (St. Petersburg) 84(5): 125. 1999. — Type: Kyrgyzstan. Sary-Kamysh-Too Mts.: clay and sandstone denudations with shrubs, 14.06.1977, R. Aydarova, A. Ubukeeva & Ledovskaya (LE, holotype; isotypes FRU, MW, TASH).

This species is a narrow endemic of Suusamyrgorge Range, Sary-Kamysh-Too Mts. and Shamshykal Mts., situated north and east of Ketmen-Döbö Depression (Lazkov 1999). Its closest relative is *R. brachanthemoides*, from which it differs in bipinnate leaves. The presence or absence of ligulate flowers in this species is variable.

*Richteria tianschanica* (Krasch.) Sonboli & Oberpr., *R. brachanthemoides* (Kamelin & Lazkov) Sennikov and *R. sussamyrensis* (Lazkov) Sennikov are to be placed in a separate section, which can be distinguished from *R. sect. Richteria* in longer and narrower lobes of leaves, a lesser number of ligulate flowers and a much greater lignification of stems: *Richteria* sect. ***Trichanthemopsis*** (Tzvelev) Sennikov, **comb. nova** (basionym: *Pyrethrum* sect. *Trichanthemopsis* Tzvelev in Schischkin & Bobrov, Fl. URSS 26: 872. 1961).

## Brassicaceae

***Draba melanopus* Kom.**

Kyrgyzstan. Fergana Range: headstream of Tar River, upper reaches of Chong-Kulun River, tributary of Terek River, near pass to Kulun Lake, 27.09.2009, G. Lazkov (FRU).

This species is broadly distributed in Central Asia (Kovalevskaya 1974) but has not been so far recorded from Fergana Range, being a novelty for that area.

## Caryophyllaceae

***Minuartia hybrida* (Vill.) Schischk.**

Synonym: *Minuartia turcomanica* Schischk.

Kyrgyzstan. Chatkal Range (S side): right side of Kök-Serek River, lower part of the slope, savannoid vegetation with *Artemisia* sp. on clayey soils, 2100 m, 41.295° N, 72.089° E, 25.07.2010, A. Sennikov & G. Lazkov 132 (FRU).

New to Western Tian-Shan in the limits of Kyrgyzstan. Rare species, possibly overlooked because of its tiny habit.

In Kyrgyzstan this species has been earlier known from Turkestan Range (Lazkov 2006). In Western Tian-Shan it was reported from Mogol-Tau in northern Tajikistan only (Adylov 1971).

## Convolvulaceae

### *Calystegia spectabilis* (Brummitt) Tzvelev

Synonym: *Calystegia sepium* (L.) R.Br. subsp. *spectabilis* Brummitt

Kyrgyzstan. Ketmen-Döbö Depression: along Nichke River, tall grassland along the riverside, water margin, 41.849° N, 73.057° E, alt. c. 950 m a.s.l., 28.07.2009, A. Sennikov 107 (H 1748362).

Established alien, new to Kyrgyzstan. A single large patch of *C. spectabilis* (Brummitt) Tzvelev was found along a side of Nichke River, apparently being a remnant of cultivation (some houses and cultivated lands were situated nearby).

This taxon was described from cultivation in Northern Europe; no provenance was known at that time. Likely it was originated from interspecific hybridisation in cultivation (Brummitt 1971), and therefore should be recognised at species level. In *Flora of China* (Fang & Brummitt 1995) this name was provisionally assigned to the plants from north-eastern China (Jilin and Liaoning Counties), Japan and the Russian Far East.

*Calystegia spectabilis* has been previously confused with *C. inflata* Sweet or included in *C. sepium* (L.) R.Br. It differs from the latter, which is common in Kyrgyzstan (Nikitina 1959b), in pinkish (not white) petals, ciliate sepals, and hairy veins of leaves (Tzvelev 2000).

## Ericaceae (incl. Monotropaceae)

### *Hypopitys hypophegea* (Wallr.) G.Don

Synonyms: *Monotropa hypophegea* Wallr.; *M. hypopitys* L. subsp. *hypophegea* (Wallr.) Holmboe; *Hypopitys monotropa* Crantz subsp. *hypophegea* (Wallr.) Tzvelev; *M. hypopitys* var. *glabra* Roth

Kyrgyzstan. Ysyk-Köl Lake Depression: Ysyk-Köl State Nature Reserve (Sary-Bulak part), along Tüp bay near Sary-Bulak Village, 42.75° N, 78.29° E, alt. ca 1600 m a.s.l., 25.07.2008, G. Lazkov (FRU). Suusamyр Range: left side of Chyckan River, rather dense birch forest rich in herbs and shrubs, in shade, 42.10° N, 72.80° E, alt. 1650 m a.s.l., 09.07.2010, A. Sennikov & G. Lazkov 12 (H 1750369).

*Hypopitys monotropa* Crantz s.l. is a boreal taxon widely distributed in Eurasia. *Hypopitys hypophegea* (Wallr.) G.Don is considered either a separate species (Tzvelev 2000; Bässler 2005),

or a subspecies (Hämet-Ahti 1998; Stace 2010), or a variety of *H. monotropa* (*Monotropa hypopitys* L.) (Roldugin 1964), being different in glabrous (vs. densely pilose) flower parts, campanulate (vs. tubulate) flowers, and lax and usually smaller inflorescence. *Hypopitys hypophegea* is also much more thermophilous than *H. monotropa*, with its distribution area stretching much farther to the north (Hämet-Ahti 1998; Tzvelev 2000). It is diploid with  $2n = 16$ , whereas *H. monotropa* is hexaploid with  $2n = 48$  (Hämet-Ahti 1998; Stace 2010).

These records make a generic (or family in the narrow sense) novelty for Kyrgyzstan and a species record for Central Asia. The record from the Ysyk-Köl Lake Depression is situated immediately southwards off the southern side of Kungöy Range, and the nearest localities of *H. monotropa* s.l. were known from the northern side of Kungöy Range in Kazakhstan (Vinogradova 1986). The locality on the Chatkal Range is the second of *H. monotropa* s.l. found in Western Tian-Shan, whereas the first was recorded from Oygaing River Basin in Kazakhstan (Roldugin 1964).

Along the Chyckan River, *H. hypophegea* was discovered under a dense birch forest canopy, accompanied with other boreal species, e.g. *Cotoneaster melanocarpus* (Bunge) Loudon, *Rubus saxatilis* L. and *Solidago dahurica* Kitag.

The type species of *Monotropa* L. is *M. uniflora* L. (lectotype designated by Pfeiffer 1874: 351), occurring in East Asia and North and Central America. The genus *Hypopitys* Hill is often included in *Monotropa*; its separation is justified in the molecular phylogeny of Monotropeae Dumort. (Cullings 1994; Neyland & Hennigan 2004; Tsukaya et al. 2008).

## Lamiaceae

### *Harmsiella olgae* (Regel) Sennikov, **comb. nova**

*Chartocalyx olgae* Regel, Acta Horti Petrop. 6: 368. 1880 — *Otostegia olgae* (Regel) Korsh., Zap. Imp. Akad. Nauk, Fiz.-Mat. Otd., ser. 8, 4(4): 96. 1896 — *Moluccella olgae* (Regel) Ryding, Taxon 60(2): 482. 2011. — Type: Kyrgyzstan. Alay Range: foothills of Kichi-Alay Mts., along the valley of Isfayram River at Üch-Korgon village, alt. 6000–8000 ft., *O. Fetschenko* (LE, not seen).

*Otostegia nikitinae* Scharasch., Trudy Inst. Bot. Akad. Nauk Kirgizsk. S.S.R. 3: 76. 1958. — Type: Kyr-

gyzstan. Alay Range: Kichi-Alay Mts., S slope of Tegirman [in protologue erroneously "Tehermag"] river valley, 23.06.1954, Jordan [in protologue erroneously "V. Scharaschova"] (FRU, holotype).

*Otostegia schennikovii* Scharasch., Trudy Inst. Bot. Akad. Nauk Kirgizsk. S.S.R. 3: 75. 1958. — Type: Kyrgyzstan. Ak-Shyirak Mts.: Karagaty-Say, 05.07.1946, L.I. Popova (FRU, holotype).

Bendiksby et al. (2011) provided the grounds for the dismemberment of *Otostegia* Benth., as currently accepted in all major publications (e.g. Czerepanov 1995; Harley et al. 2004). In the updated molecular phylogeny of Lamiaceae subfam. Lamioideae (Bendiksby et al. 2011) *Otostegia* s.l. appeared diphyletic, with one clade (*O.* sect. *Otostegia*) corresponding to African plants and the other (*O.* sect. *Chartocalyx* (Regel) Chiov.) to Central Asian plants. The type of *Otostegia* belongs to the tribe Leucadeae Scheen & Ryding, whereas the Central Asian species *O. olgae* (Regel) Korsh. (= *Chartocalyx olgae* Regel) is placed to Marrubieae Endl. as sister to *Moluccella* L.

Bendiksby et al. (2011) decided to combine *Moluccella* and *Chartocalyx* Regel into a single genus on the basis of similarities in nutlets, corolla and calyx shape. Otherwise, these two genera are strictly different in several characters of vegetative organs (the species of *Moluccella* are annuals or short-lived herbs with toothed or incised thin leaves, and those of *Chartocalyx* are semishrubs with entire coriaceous leaves). We consider these differences strong enough to justify acceptance of separate genera, in accord with a long-established tradition of their classification in Central Asia.

Unfortunately the generic name *Chartocalyx* (Regel 1880) is not acceptable because of the existence of an earlier homonym (Art. 45.3). *Chartocalyx* Maingay ex Mast. (Masters 1875) is grammatically erroneous and nomenclaturally contrary to Art. 60.8. This Article prescribes to use the rule of compound formation (as formulated in Rec. 60G), and deviations from this rule are treated as correctable errors, not as separate validly published names. The first part of the compound epithet "*Chartocalyx*" is derived from the Greek χαρτης (chartēs), meaning "paper". The genitive singular of χαρτης is χαρτου (chartou). According to Rec. 60G, the case ending (that

is -ou) is to be removed and replaced by a connecting vowel before a consonant, that is -o- for Greek words. The resulting epithet is obligatorily *Chartocalyx*, to which "*Chartocalyx*" is to be automatically corrected.

Then *Chartocalyx* Regel 1880, a correctly formed name, is to be treated as a later homonym of *Chartocalyx* Maing. ex Mast. 1875 ("*Chartocalyx*"). Its conservation under Art. 14.1 is unlikely, because *Chartocalyx* Regel had not been in use for a long time, being universally placed into the synonymy of *Otostegia*.

The next name available for this genus is *Harmsiella* Briq. 1897, a replacement for the illegitimate *Chartocalyx* Regel. No species transfers are provided to this generic name yet, in spite of the statement in *Index Kewensis*. Schumann (1900) recorded the combination *Harmsiella olgae* ascribed to Briquet (1897), although Briquet had not published any species name in connection with his treatment. However, Schumann had not accepted this combination but instead treated it as a synonym of *O. olgae*. This combination was not validly published in *Index Kewensis* either (Prain 1908), and for the same reason. This name transfer for the only species of *Harmsiella* occurring in Kyrgyzstan is validly published here.

Two more species of *Otostegia* s.l. were described from Kyrgyzstan (Scharaschova 1958, 1960). They represent aberrant forms of *H. olgae* with partly reduced inflorescences (*O. schennikovii* Scharasch.) or partly reduced calyces (*O. nikitinae* Scharasch.). Such variants can be often found in populations of the common *H. olgae*. *Otostegia schennikovii* is currently listed as legally protected in Kyrgyzstan with the status of Vulnerable species (Mosolova 2006); this taxon has to be excluded from the Red Data Book of Kyrgyzstan for taxonomic reasons as a variant of the common species.

#### *Lycopus exaltatus* L. f.

Kyrgyzstan. Chüy Valley: N of Kamyshanovka Village, close to Chüy River, half-drained wetland, 11.07.2011, G. Lazkov & I. Illarionova (FRU).

New to Kyrgyzstan. This species is widely distributed in lowlands and up to the middle mountain belt in Kazakhstan and Turkmenistan,

where it can be found along waterstreams (Tuljaganova 1987). It has never been recorded from Kyrgyzstan, although is known to occur along its border with Kazakhstan.

### *Nepeta lipskyi* Kudr.

Kyrgyzstan. Fergana Range: headstream of Tar River, upper reaches of Chong-Kulun River, tributary of Terek River, near pass to Kulun Lake, 27.09.2009, G. Lazkov (FRU).

New to Fergana Range. This species was known from the Pamir – Alay mountain system only (Zuckerwanik 1987).

### *Perovskia* × *intermedia* Lazkov, hybr. nova

*Perovskia angustifolia* Kudr. × *P. abrotanoides* Kar.

*Suffrutex* 70–100 cm alt. *Rami hornotini* 50–70 cm lg., *supra virides, basi brunnei, glandulis sessilibus et pilis stellatis tecti. Folia caulina utrinque glandulis sessilibus et pilis stellatis sparsis vestita, lamina 3–5 cm lg., 1.5–2.5 cm lt., lato-lanceolata, oblongo-lanceolata vel ovata, basi cuneata, in petiolis 0.5–1 cm lg. angustata, ad media vel magis pinnato-dissecta. Inflorescentia paniculata, ramis verticillis 2–8 ad 0.3–0.8 cm dissitis. Verticilli 2–6-flori. Bractea ca 1 mm lg., triangulares. Pedicelli 0.1–1.0 mm lg., breviter pubescentes. Calyx tubuloso-campanulatus, 5–6 mm lg., 1.5–2.5 mm lt., violaceus, bilabiatus, labio supero indistincte tridentato, dente medio magis brevior, labio infero bidentato, glandulis sessilibus obsito, pilis multicellularibus longis ad 2/3 (supra brevioribus) furcatis tectus. Corolla violacea, bilabiata, labio supero quadrifido, infero integro, tubo exserto, intus pubescente. Stamina 4, duo exserto. Pistillum stigmatibus bipartito partibus inaequilongis. A *P. angustifolia* Kudr. foliis pinnatisectis (nec dentatis), a *P. abrotanoides* Kar. foliis minus dissectis differt.*

Type: Kyrgyzstan. Fergana Range: Isfan-Jayloo Mts., Kara-Suu River valley, 15 km NE from Kara-Köl Town, N-exposed rocks, alt. 1100 m, 28.07.2009, G. Lazkov (LE, holotype; isotypes MW, FRU). — Other specimens examined (paratypes): Kyrgyzstan. Fergana Range: Isfan-Jayloo Mts., Kara-Suu River valley, 15 km NE from Kara-Köl Town, N-exposed rocks, alt. 1100 m, 28.07.2009,

A. Sennikov 111 (H 1747743) & P. Uotila 47496b (H 1746632); Choket Mts., Kara-Köl River valley, left side, lower part of gravelly slopes, alt. 1250 m, 41.56° N, 72.68° E, 14.07.2010, A. Sennikov & G. Lazkov 107 (LE, FRU).

The distribution areas of *Perovskia angustifolia* Kudr. and *P. abrotanoides* Kar. are mostly separate and overlap at the northernmost end of Fergana Range only (Kudriaschov 1936; Kovalevskaya 1987). The plants intermediate between these two species were observed among the parents in Isfan-Jayloo Mts. and small neighbouring ranges situated northwest of the main Babash-Ata Range. Unlike in *P. angustifolia*, the leaves of this hybrid are pinnatifid (not dentate), whereas the leaves of *P. abrotanoides* are pinnatisect (Fig. 5).

## Malvaceae

### *Alcea litwinowii* Iljin

Kyrgyzstan. Chatkal Range (N side): Besh-Aral Nature Reserve, confluence of Ters and Kichi-Kyzyl-Jar Rivers, lowermost parts of slopes, 41.61° N, 70.69° E, alt. c. 1600 m a.s.l., 06.08.2009, A. Sennikov 280 (H 1748366 & H 1748367).

This taxon has been originally described as a hybrid between the white-flowering *A. nudiflora* and the violet-flowering *A. rhyticarpa* (Trautv.) Iljin (Iljin 1924a). However, the distribution area of *A. litwinowii* is very large, covering nearly the whole Tian-Shan from Mogoltau to Trans-Ili Alatau, Alay and Western Pamir, whereas that of *A. rhyticarpa* is much more limited (Abdullaeva 1983).

New to Besh-Aral Nature Reserve. Several individuals of *Alcea litwinowii* were found imixed with a large population of the common *A. nudiflora* (Lindl.) Boiss., situated on the lowermost part of an open sun-exposed slope covered by forb savannoid vegetation. The plants of *A. litwinowii* had the flowers pale-lilac (violet in dry collections) and the leaves crenately lobate, whereas *A. nudiflora* had the petals white and greenish yellow at the claw and the leaves distinctly lobate. No intermediates between *A. litwinowii* and *A. nudiflora* were observed, neither plants of *A. rhyticarpa* had been recorded from this nature reserve and even from the Chatkal Range as a whole (Abdullaeva 1983).



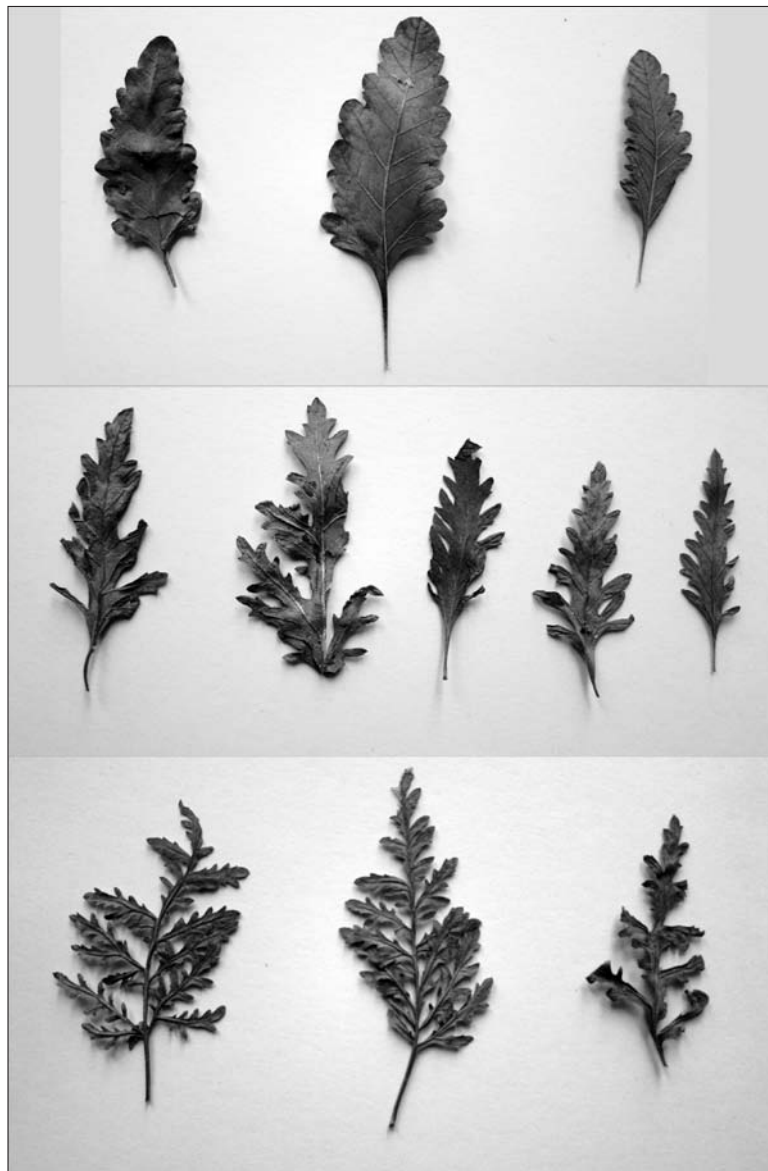


Fig. 5. Lower cauline leaves of *Perovskia angustifolia* (upper row), *P. x intermedia* (middle row) and *P. abrotanoides* (lower row)

## Plumbaginaceae (incl. Limoniaceae)

### *Acantholimon linczevskianum* Lazkov

Kyrgyzstan. Fergana Range: Isfan-Jayloo Mts., middle part of the N slope along Kara-Suu River, on rocks, alt. 1650 m, 41.66° N, 72.83° E, 12.07.2010, A. Sennikov & G. Lazkov 95 (FRU).

New to Fergana Range. This species was recently described as endemic to At-Oinok Mts. (Lazkov 2004a).

### *Limonium drepanostachyum* Ik.-Gal.

Synonym: *Eremolimon drepanostachyum* (Ik.-Gal.) Lincz.  
Kyrgyzstan. Chatkal Range (S side): foothills, 4 km SW of Sumsar (Shakaftar) Village, an isolated hill E of the road, N gravelly slope, sparse vegetation with *Caragana*, *Artemisia*, *Perovskia*, *Convolvulus fruticosus* etc., red clay soils, 41.2° N, 71.3° E, alt. 1100 m a.s.l., 21.07.2010, A. Sennikov & G. Lazkov 204 (FRU, H1750371).

This species is known from many places in Uzbekistan and Tajikistan, situated in the foot-

hills around Fergana Valley (Linczevsky 1993). Our observation makes a record new to Chatkal Range, being the second known from Kyrgyzstan. The only previous record comes from the foothills of Fergana Range, Mayly-Say River Basin (Nikitina 1959a), and is the easternmost locality of this species.

## Portulacaceae

### *Portulaca granulostellulata* (Poelln.) C.Ricceri & P.V.Arrigoni

Kyrgyzstan. Bishkek City: city center, Manaschy Sagymbay Street, 42.8725° N, 74.5733° E, alt. c. 700 m, side of a little used pavement, 14.08.2009, *P. Uotila* 48201 (H 1748906).

New to Kyrgyzstan.

The widespread *Portulaca oleracea* L. s.lat. has been divided into several microspecies on the basis of seed characters, such as seed size and surface morphology (e.g. Danin & al. 1978, 2008). The seed size has a strong correlation with the ploidy level: hexaploid species have larger seeds than tetraploids and diploids. Epidermal cells are starry with longer or shorter arms or only with bendy walls, and the cell surface is smooth to variously papillate. The *Portulaca* floras of Europe, North Africa and Near East have been studied recently (e.g. Danin 2011), but the Asiatic material has been determined quite sporadically from the southern and south-western parts of the continent (Danin & al. 1978). So far no Central Asiatic material has been revised according to the present-day taxonomy.

The five specimens collected in 2009 and 2011 belong to two different microspecies, *P. nitida* (Danin & H.G.Baker) C.Ricceri & P.V.Arrigoni and *P. granulostellulata* (Poelln.) C.Ricceri & P.V.Arrigoni. Both are diploid species with a small seed size (length less than 0.85 mm). *Portulaca nitida* has the smooth seed surface and the walls of starry epidermal cells are well visible, whereas *P. granulostellulata* has a great number of minute papillae on the seed surface, giving a faintly granulose appearance with less clearly visible walls of epidermal cells. Both species belong to the most widespread and common taxa of *P. oleracea* aggr.

### *Portulaca nitida* (Danin & H.G.Baker) C.Ricceri & P.V.Arrigoni

Kyrgyzstan. Fergana Range: Isfan-Jayloo Mts., on the road between K k-Bel and Kara-K l, 41.534° N, 72.496° E, alt. 1020 m, in the yard of a local restaurant (est. a few years before), 06.08.2011, *A. Sennikov* & *G. Lazkov* 8 (H 1753102). Tash-K m r Town: centre of the town, 41.346° N, 72.217° E, alt. c. 600 m, street side, 30.07.2009, *P. Uotila* 47563 (H 1747496). Chatkal Range: Arkyt Village, center, W side of the Padsha-Ata River, 41.791° N, 71.959° E, alt. c. 1250 m, densely built village, very nitrofiled surroundings of barn, 31.07.2009, *P. Uotila* 47580 (H 1747515); Arkyt Village, center, yard of the hotel and Deputy Director's residence on the main street, 41.792° N, 71.961° E, alt. c. 1250 m, potato patch, 31.07.2009, *P. Uotila* 47627 (H 1746642).

New to Kyrgyzstan.

## Potamogetonaceae

### *Stuckenia filiformis* (Pers.) B rner

Synonym: *Potamogeton filiformis* Pers.

Kyrgyzstan. Suusamyr Valley: 0.5 km NW of Suusamyr Village, near the road bridge of the river, 42.191° N, 73.950° E, alt. c. 2090 m, small pond in pastured meadow with some shrubs, during flood time pond connected to the river, very abundant, 24.07.2009, *P. Uotila* 47318 (H 1746778).

Vvedensky (1968) reported this species for Central Asia as common on plains but rare in mountains. Kaplan (2008) was first to report *S. filiformis* from Kyrgyzstan (Teskey and Transalay Ranges). Our record makes a novelty for Western Tian-Shan in the limits of Kyrgyzstan.

## Ranunculaceae

### *Delphinium knorringianum* B.Fedtsch.

Kyrgyzstan. Fergana Range: Isfan-Jayloo Mts., middle part of the N slope along Kara-Suu River, on rocks, alt. 1650 m, 41.66° N, 72.83° E, 12.07.2010, *A. Sennikov* & *G. Lazkov* 91 (FRU, H1750413).

New to Fergana Range. Originally believed to be endemic to Alay Range (Pakhomova 1972), this species has been recently found in Turkestan Range (Lazkov & Ganybaeva 2008) and At-Oinok Mts. (Lazkov 2004b).

*Delphinium knorringianum* B.Fedtsch. has a high ornamental value because of its large flow-



Fig. 6. Flowers of *Delphinium knorringianum*. Photo: Georgy Lazkov



Fig. 7. Flowers of *Delphinium x pskemense*. Photo: Georgy Lazkov

ers (with sepals ca. 2–2.5 cm long) of blue colour with a violet tint (Fig. 6). Legally protected in Kyrgyzstan as Vulnerable species (Mosolova 2006).

***Delphinium x pskemense*** Sennikov & Lazkov,  
**hybr. nova** (*D. albomarginatum* Simonova  $\times$  *D. biternatum* Huth)

*A specie parentali simillima D. albomarginato sepalis caeruleis in latere abaxiali centro luteomaculatis, apice puberulis (nec atrocaeruleis, concoloribus, glabris), petalis pallide caeruleis (nec atrocaeruleis, albomarginatis), staminodis pallide caeruleis pilis brevioribus rigidioribus flavescentibus (nec atrocaeruleis pilis longioribus tenuioribus caerulescentibus apice atrocaeruleis), nec non antheris flavis apice caerulescentibus (nec caeruleis) differt.*

Type: Kyrgyzstan. Pskem Range (S side): dry slopes along Kara-Korum River, Kyzyl-Jar, 41.77° N, 70.72° E, alt. ca 1850 m a.s.l., 07.08.2009, *A. Sennikov* 321 (H 1747789, holotype).

This hybrid was sporadically found immixed to sympatric populations of its parental species. The number of individuals was very low, and the plants were seemingly sterile.

The hybrid differs from the most similar *Delphinium albomarginatum* Simonova in the sepals of blue colour with a faint yellow spot on the abaxial side which are puberulent along the top margin (vs. usually deeply blue to violet without a yellow spot, totally glabrous), petals white-bluish (vs. deep blue with a brightly white margin), staminode limb white-bluish with shorter straight coarse yellowish hairs (vs. deep-blue with long curved slender hairs of blue colour with deeply blue tips), and anthers almost totally yellow (vs. blue) (Fig. 7). The carpels of the hybrid may have solitary hairs, whereas *D. albomarginatum* has regularly glabrous carpels. The second parental species, *D. biternatum* Huth clearly differs in its yellow flowers with the sepals totally puberulent and the staminode limb with straight coarse yellowish hairs. The upper part of the stem in *D. biternatum* is totally puberulent vs. glabrous in *D. albomarginatum* and the hybrid.

The hybrid may be confused with a rare colour form of *D. albomarginatum* having blue (vs. deeply blue to violet) sepals. In this case the hybrid differs in the colour of petals and the pubescence of the staminode limb. The hybrid may be also keyed out as the blue-flowering species *D. bucharicum* Popov, which differs in the glabrous sepals and usually glandular stem.

***Ranunculus acris* L. subsp. *borealis* (Regel)**

Nyman

Synonyms: *Ranunculus borealis* Trautv., nom. illeg.; *R. subborealis* Tzvelev.

Kyrgyzstan. Chatkal Range: Sary-Chelek Nature Reserve, eastern side of Kyla-Köl Lake, grassland on pasture, 41.86° N, 71.98° E, alt. c. 1900 m a.s.l., 02.08.2009, A. Sennikov 188 (H 1747778, H 1747780, H 1747791); Besh-Aral Nature Reserve, confluence of Ters and Kichi-Kyzyl-Jar Rivers, along a brook, 41.61° N, 70.69° E, alt. ca 1600 m a.s.l., 06.08.2009, A. Sennikov 294 (H 1747781, H 1747792).

This species was found in a few places in the Chatkal Range, on fertilised pastures and along watercourses. The plants were tall (0.5–1 m high), multicaulous, with short rhizomes and large radical leaves dissected up to the petiole, with narrow lateral segments and the middle segment being divided up to  $\frac{3}{4}$ . Petioles of the radical leaves and the basal stem internode glabrous in the basal part and sparsely pilose with somewhat patent hairs in the upper part.

In the former Soviet Central Asia this taxon was reported from Dzhungarian Alatau and Tian-Shan "excluding Western Tian-Shan, scattered" (Kovalevskaya 1972). No certain record of *R. acris* L. has been known from Kyrgyzstan (Spota 1955). Our observations belong to Western Tian-Shan and make a novelty to the Sary-Chelek Nature Reserve, Besh-Aral Nature Reserve, Chatkal Range, Western Tian-Shan and Kyrgyzstan.

This subspecies name was typified by a specimen from eastern Kazakhstan (Tzvelev 1994). Plants from Fennoscandia differ in the radical leaves with usually broader and less dissected segments (Nurmi 2001).

**Rosaceae*****Comarum salesovianum* (Steph.) Aschers. et Graebn.**

Kyrgyzstan. Fergana Range: headstream of Tar River, upper reaches of Chong-Kulun River, tributary of Terek River, near pass to Kulun Lake, 27.09.2009, G. Lazkov (FRU).

New to Fergana Range. Kaschenko (1957) and Nabiev (1976) reported this species from Central Tian-Shan (Sususamy-Too, Jungal-Too, Kabak-Too) and the mountains surrounding the

Ysyk-Köl Lake Depression (Küngöy and Teskey Ranges).

***Rubus praecox* Bertol. f. *rutiliflorus* H.E. Weber & Sennikov f. *nova***

*Petalis filamentisque rosaceis a forma typica differt.*

Type: Kyrgyzstan. Fergana Range (NW projections): Choket Mts., Kara-Köl River valley, left side, small village in mountains, planted along the fence, 41.53° N, 72.70° E, 14.07.2010, A. Sennikov & G. Lazkov 133 (HBG, holotype; isotype Hb. Weber).

This plant is widely cultivated in Kyrgyzstan to form live fences, because it is tall-growing and enormously spiny. It frequently runs wild being dispersed by birds, and is getting established in some places.

This species differs from the closely related *R. armeniacus* Focke in the green to wine-red colour of the primocanes (not green with red angles



Fig. 8. Inflorescence of *Rubus praecox* f. *rutiliflorus*. Photo: Georgy Lazkov



and bases of prickles), shorter petals and distinctly curved (not straight to only slightly curved) spines on the rachis of the inflorescences (Fig. 8) (Weber 1995). Unlike *R. armeniacus*, *R. praecox* is not commonly cultivated, and our record makes a novelty for Kyrgyzstan. Its native distribution area stretches from Portugal to the Crimea (Kurtto et al. 2010). In the former Soviet Central Asia, this species was rarely found in ruderal habitats and among shrubs in Tajikistan (Nowak et al. 2008), apparently also as an escape.

The specimen which we collected in 2010 is characterised by red-pink petals and pink anther filaments, whereas the European *R. praecox* has constantly white to slightly pinkish petals (Weber 1995). The other diagnostic characters match the typical *R. praecox* quite well. Since the colour forms are known in *R. vestitus* f. *vestitus* (deep-pink) vs. f. *albiflorus* (purely white), both being recorded from the same distribution area, and a form with exceptionally white flowers is known in the otherwise pink-flowered *R. ulmifolius*, there is no reason to suspect taxonomic difference of higher rank here. Hereby a new form is established to accommodate hitherto unrecorded red-pink-flowered plants of *R. praecox*.

### *Sorbus persica* Hedl.

Kyrgyzstan. Kyrgyz Range: S side, Kara-Archa, 20.06.1962, 16.08.1967, *I. Sudnitsyna* & *N. Gorbunova* (FRU, LE). Chatkal Range: Shabrez River, 15.07.1884, *V. Lisnevsky* 77a (LE); Ters River valley, 06.07.1912, *O. von Knorring* 516 (LE); Sary-Chelek Nature Reserve, 17.08.1952, *L. Kaschenko* (FRU); N side of Sary-Chelek Lake, 27.07.1955, *N. Vykhodtsev*, *L. Lebedeva* & *N. Faleeva* (FRU); N side of Sary-Chelek Lake, alt. 1950 m, 08.08.1955, *A. Kaschenko* (LE); S side of Sary-Chelek Lake, 03.06.1956, 04.06.1956, 05.06.1956, *L. Lebedeva* (FRU); N side, along Kanysh-Kyya River, 14.08.1961, *A. Ubukeeva* (FRU); vicinities of Sary-Chelek Lake, 10.09.1979, *R. Aydarova* & *I. Sudnitsyna* (FRU); NW side, left side of Chatkal River near Besh-Aral Village, 11.06.1980, *N. Gorbunova* (FRU); N side of Sary-Chelek Lake, 22.08.1983, *R. Aydarova* (FRU); Sary-Chelek Lake, Bakaly, 24.08.1983, *R. Aydarova* (FRU). Chandalash Range: S side, Kayyng-Suu, 06.08.1961, *A. Ubukeeva* (FRU); right side of Chatkal River, Ak-Köl, 05.09.1964, *I. Sudnitsyna* & *N. Gorbunova* (FRU). Suusamy Range: S side, between Torkent and Toluk Villages, *G. Lazkov* (observation). At-Oynok Mts.: Mart pass, on the way to Ketmen-Döbö depression, 20.07.1912, *O. von Knorring* 589

(LE); middle course of Turduk River, 12.08.1930, *M. Iljin* 605 (LE); Malkaldy River, Kara-Gayly ravine, 1945, *L. Popova* & *V. Tkatschenko* (FRU); N slopes of Ak-Bulak ravine by Uzun-Akmat River, 17.06.1946, *V. Tkatschenko* (FRU); N side, Kara-Kulja River at Almaluu, 16.07.2005, *G. Lazkov* (FRU). Babash-Ata Range: Urak-Suu River (tributary of Kara-Üngkür), 30.05.1899, *D. Litvinov* (LE); Arstanbap, 09.06.1899, *D. Litvinov* (LE); Sere-Suu River valley, 29.07.1911, *O. von Knorring* & *Z. von Minkwitz* 1626 (LE); Arstanbap, 21.05.1916, *V. Lipsky* 475a (LE); Arstanbap walnut farm, 31.10.1933, *S. Sokolov* (LE); Sharap-Say (right tributary of Kara-Ünkür River), 25.09.1953, *V. Tkatschenko* (FRU); S side, Tamchy-Bulak, 10.05.1956, 15.05.1956, *L. Lebedeva* (FRU); Arstanbap, 04.09.1995, *G. Lazkov* (FRU). Fergana Range: Kök-Art River, alt. 7000', *S. Korshinsky* 609 (LE); Upper reaches of Kök-Art River, 18–24.07.1900, *W. Niedzwetzky* 192 (LE); Kök-Art River valley the mouth of Kyzyl-Suu River and Katyn-Akchek, forest, 02.06.1911, *O. von Knorring* & *Z. von Minkwitz* 338 (LE); Kypchalma ravine along Jasy River, 27.09.1931, *Titov* 70 (LE); Zyndan, 02.08.1945, *Akalishin et al.* (LE); Kara-Alma walnut farm, 21.08.1945, *I. Vasilchenko* 278 (LE); Isfan-Jayloo Mts. by Chaar Plateau, 23.08.1946, *V. Tkatschenko* (FRU); Kara-Kulja River at Besh-Moynok, 13.09.1947, *V. Tkatschenko* (FRU); Tar River basin, Terek-Suu, 18.06.1964, *R. Aydarova* & *N. Gorbunova* (FRU, LE); middle course of Jasy River, 05.06.1965, *M. Pryakhin* (LE); by Oy-Kayyng Pass on the way to Kazarman, below Ak-Moynok, 06.09.1966, *V. Tkatschenko* (FRU); upper reaches of Kök-Art River, 09.09.1966, *V. Tkatschenko* (FRU); left side of Kara-Tash River (Tar River basin), 15.07.1974, *R. Aydarova*, *B. Sultanova* & *A. Mursaliyev* (FRU). Moldo-Too Range: SW slopes of Chemyndy Pass, 22.07.1915, *M. Spiridonov* (LE). Alay Range: upper reaches of Kul-Mambet River, 30.08.1947, *A. Gusarova* & *Khizhnyakova* (FRU); S side of Kurban-Köl Lake, 07.06.1959, *Ismatova* & *Xarimov* 140 (LE); N side, near Kurban-Köl Lake, 15.06.2006, *G. Lazkov* (observation); S of Langar Village on the way to Ay-Köl Pass, W-exposed slope with sparse shrubs and *Juniperus* trees, middle part, alt. ca. 1800 m, 08.08.2011, *A. Sennikov* & *G. Lazkov* 26 (FRU, H). Turkestan Range: Birk-Suu (right tributary of Leylek River), 16.09.1956, *V. Janaeva* (FRU); Kichik by Shohimardon, 08.06.1960, *I. Sudnitsyna* (FRU); right side of Leylek River valley, N-facing slope, alt. ca. 1800 m, 20.08.2011, *A. Sennikov* & *G. Lazkov* 167 (FRU, H).

Legally protected in Kyrgyzstan (conservation status: vulnerable) because of occurrence in scattered individuals, very poor reproduction in nature, and local use for handicrafts (Koblitskaya 2006). Originally assessed and recommended for protection by Tkachenko & Assorina (1978). Protected in Besh-Aral Nature Reserve (Lazkov et al. 2002) and Sary-Chelek Nature Reserve (Borlakov 1966).

Distribution in Kyrgyzstan. Kyrgyz, Chatkal, Chandalash, Suusamy, Fergana (incl. At-Oinok Mts. & Babash-Ata Range), Moldo-Too, Alay and Turkestan Ranges. The background for the records from Talas Range (Tkachenko & Assorina 1978) is not traced. The records from Uzun-Akmat Mts., Kök-Irim-Too Mts. and Ak-Shyirak Mts. (Tkachenko & Assorina 1978) are probably referable to the adjoining ranges At-Oinok, Fergana and Moldo-Too, respectively. The map in Koblietskaya (2006) was compiled with significant distortions (its records from N side of Kyrgyz Range are not confirmed here; the record situated N of Chatyr-Köl Lake is considered impossible). A new corrected map is provided here (Fig. 9) on the basis of herbarium specimens examined.

***Sorbus turkestanica* (Franch.) Hedl.**

Kyrgyzstan. Chatkal Range: middle course of Chatkal River, 04.07.1899, *D. Litvinov* (LE). Fergana Range: Kök-Art River valley, 18–24.07.1900, *W. Niedzwetzky* (LE); between Tuuratal-Say and Kök-Art River, 07.09.1966, *V. Tkatschenko* 226 (FRU). Alay Range: N side, near Kurban-Köl Lake, 15.06.2006, *G. Lazkov* (FRU). Turkestan Range: Kosh-Bulak Village, 10.05.2006, *M. Ganybaeva* (FRU); right side of Leylek River valley, N-facing slope, alt. ca. 1800 m, 20.08.2011, *A. Sennikov* & *G. Lazkov* 168 (FRU, H).

The locality in Chatkal Range is uncertain because of very general information on Litvinov's label. According to Litvinov's itinerary published in Lipsky (1905), in the morning of 4<sup>th</sup> of July 1899 Litvinov started from "Aral" (now Besh-

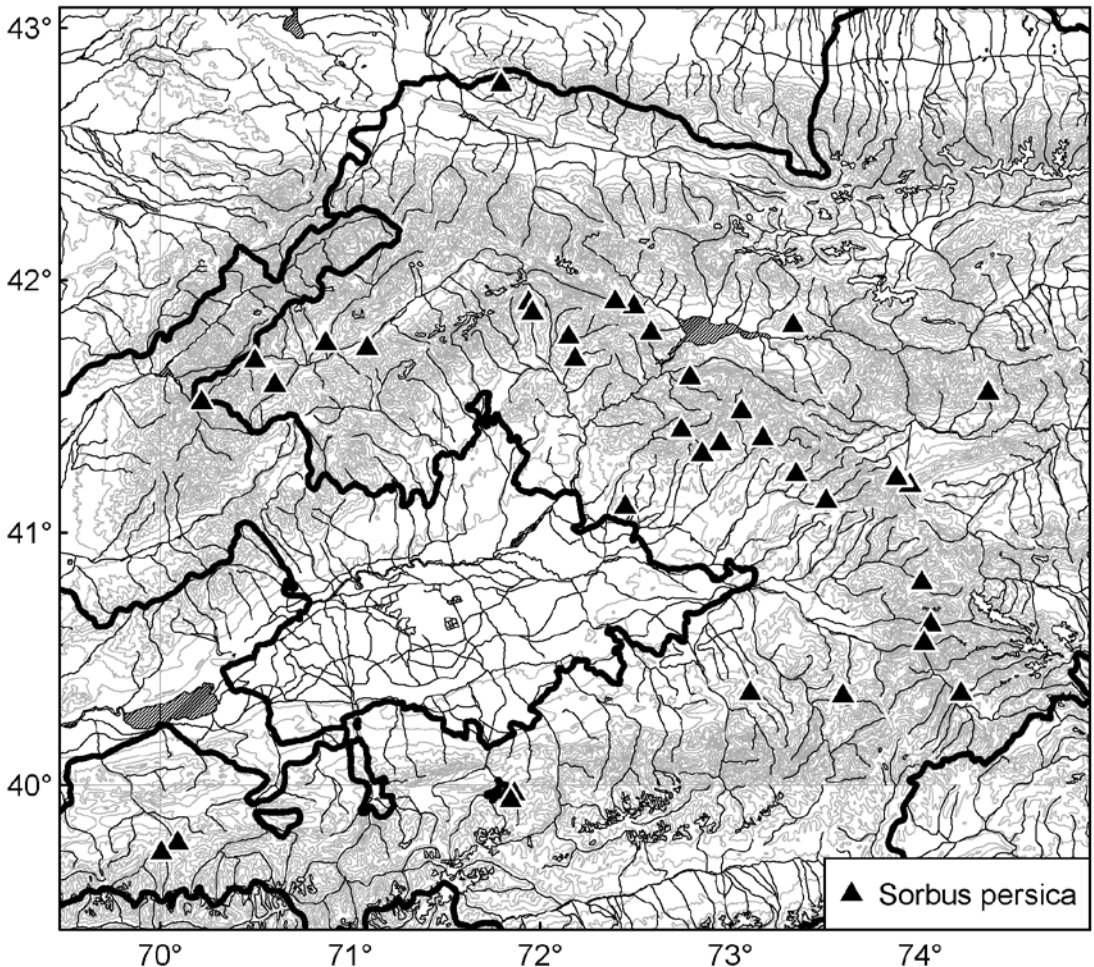


Fig. 9. Distribution map of *Sorbus persica* in Kyrgyzstan, based on verified herbarium records



Aral village) in the present-day Kyrgyzstan and arrived next day to Hojikent via Burch-Mulla in the present-day Uzbekistan. Most of this way is within Kyrgyzstan, and the middle course of Chatkal (if understood literally) is certainly within Kyrgyzstan. Therefore this collection came from the territory of Besh-Aral Nature Reserve, making novelty for its flora.

*Sorbus turkestanica* was excluded from the second edition of the Red Data Book of Kyrgyzstan as erroneously recorded (Shukurov 2006) on the basis of the earlier proposals (Takhtajan 1975), in spite of the positive assessment by Tkachenko & Assorina (1978) and the inclusion in the first edition of the Red Data Book of Kyrgyzstan (Tkachenko 1985). Plants from Iskander-

Köl (Tajikistan), one of the two original localities of *Pyrus turkestanica* Franch. (Franchet 1883), which we had seen in the Herbarium LE, were found taxonomically identical with those collected in Kyrgyzstan. The identity of plants from Kyrgyzstan and Iskander-Köl was proven also by Tkachenko in cultivation in Bishkek Botanical Garden (Tkachenko & Assorina 1978). For this reason, the presence of *S. turkestanica* in Kyrgyzstan is reconfirmed here.

*Sorbus turkestanica* has its leaves partly pinnatifid (the lowermost pair of the lobes being often cut up to the midrib), with acute lobes, their lower surface with thin indumentum (greyish-tomentose). *Sorbus persica* can be easily distinguished by lobate leaves with obtuse lobes, their

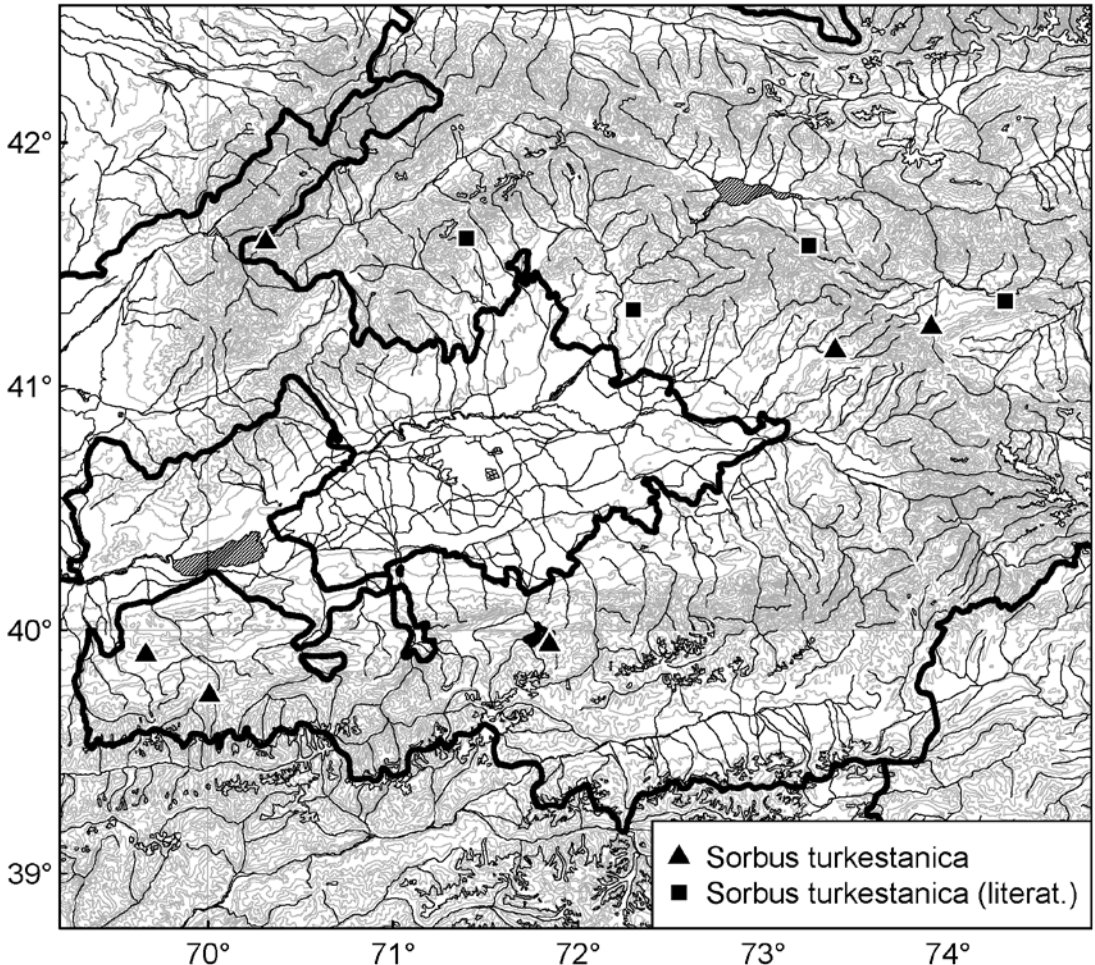


Fig. 10. Distribution map of *Sorbus turkestanica* in Kyrgyzstan, based on verified herbarium records (triangles) and reliable literature data (Tkachenko 1985) (squares)

lower surface with thick indumentum (white-tomentose). The distribution areas of these species largely overlap, also in Kyrgyzstan, and in some areas they can be found growing side by side in the same locality.

*Sorbus turkestanica* is under threat in Kyrgyzstan, sharing the same features with *S. persica*. We propose this species to be included in the new edition of Red Data Book of Kyrgyzstan as vulnerable species.

Distribution in Kyrgyzstan. Chatkal, Fergana, Alay and Turkestan Ranges; unconfirmed records from Ak-Shyirak and Babash-Ata Range. Tkachenko (Tkachenko & Assorina 1978) reported this species also from K ok-Irim-Too Mts. (Kara-K ol Lake) and S side of Chatkal Range (Ala-Buka), but the relevant specimens are missing. Later Tkachenko (1985) added more localities which we were unable to confirm: east side of Kara-Suu Lake (Taktalyk Mts., Fergana Range), Shyng-Say (west of Mayly-Say, Babash-Ata Range), and N side of Ak-Shyirak Mts.; at the same time, the record from K ok-Irim-Too was not listed. A new distribution map (Fig. 10) is provided here, with records from specimens and published observations (Tkachenko 1985) mapped separately.

## Rubiaceae

### *Rubia laevissima* Tschern.

Kyrgyzstan. Pskem Range (S side): slopes along Kara-Korum River, Kyzyl-Jar, in gypsaceis, sheltered under a rock, 47.77° N, 70.72° E, alt. 1850 m, 08.08.2009, A. Sennikov 333 (H 1747375, H 1747376) & G. Lazkov (FRU, LE).

This species replaces *Rubia laxiflora* Gontsch. (confined to Pamir–Alay mountain system) in Western Tian-Shan, being different mostly in the oligoflorous inflorescence (not separated from the leafy part of the stem) and bent (not only slightly contorted) anthers. *Rubia laevissima* Tschern. has been originally described (Tscherneva 1961) as a local endemic from Pskem Range within Uzbekistan (southernmost end of Pskem Range, right side of Chatkal River between Aurakmat and Hudaydod). Our locality makes the first record in Kyrgyzstan and is situated in ca 50 km from the *locus classicus*.

The protologue of *R. laevissima* describes its leaves as almost totally glabrous on the lateral sides (as opposite to the scabrous leaves which are typical of *R. laxiflora*), hence the epithet; whereas the latest treatment (Pakhomova 1987) says that the leaves can rarely be scabrous on the lateral sides. Our plants also have the leaves scabrous on the sides, but the inflorescence and anthers match *R. laevissima* perfectly well.

## Zygophyllaceae

### *Zygophyllum miniatum* Cham.

Kyrgyzstan. Zagyra Mts. (westernmost edge): 3.5 km SE from Torkent Village, lower part of the slope, on clay slope, alt. 1110 m, 41.818° N, 73.191° E, 27.07.2010, A. Sennikov & G. Lazkov (FRU).

New to Kyrgyzstan. Discovered on a low mountain range situated S of Sususmyr Range along the northern side of Ketmen-D ob  Depression. This is the easternmost, isolated locality of this species, widely distributed in the lowlands adjacent to Kyzylkum, Karakum and Muyunkum Deserts, Zarafshan and Fergana Valleys (Adylov 1983).

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