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Taxonomic corrections and new records in vascular plants of Kyrgyzstan, 2

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A series of notes on distribution, taxonomy, morphology and nomenclature of some vascular plants in Kyrgyzstan is presented. One transfer in Lamiaceae, *Betonica betoniciflora* is proposed because of priority under the current phylogeny; a white-flowered form is described within this species. *Youngia serawschanica* (*Crepidifolium serawschanicum*) is moved to *Crepidiastrum*, following the phylogenetic studies in Cichorieae. The only species of the former genus *Modestia*, *M. darwasica* is transferred to *Jurinea* because of its nested position in the molecular phylogeny. *Jurinea* sect. *Anacantha* is proposed for the placement of this species in the system of *Jurinea*. *Modestia jucunda*, *M. mira* and *M. pteroclada* are established as new synonyms of *Jurinea darwasica*. New substitute names *Phlomoides codonantha* and *P. deserticola*, new combinations *P. dshungarica* and *P. karatavica*, and three new sectional names are proposed in connection with the synonymization of *Eremostachys* and *Paraeremostachys* with *Phlomoides*. *Fritillaria ferganensis* is resurrected from the synonymy of *F. walujewii*; an identification key is provided, and the distributions of both species in Kyrgyzstan are mapped. Lectotypes are designated for *Crepis distincta* and *Fritillaria walujewii*. *Allium setifolium* is new to Ili Ala-Too, *Arctium echinopifolium* (*Hypacanthium echinopifolium*) to Kyrgyz Range, *Saussurea vvedenskyi* to Talas Ala-Too, *Hypopitys hypophegea* to Chatkal Range. *Rhaponticum namanganicum* is recorded on the S side of Chatkal Range, extending the distribution area southwards.

Introduction

The present series of notes is the second to complement the checklist of the flora of vascular plants of Kyrgyzstan (Lazkov & Sultanova 2011). Besides new records, 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).

Matherials and methods

Records of vascular plants from Kyrgyzstan were screened and checked against published information. The collections of the Institute of Biology and Soil Science, Kyrgyz Academy of Sciences, Bishkek (FRU), authors' collections and field observations were taken into account. The records were mapped using a GPS navigator with WGS84 datum (specimens collected by A.S. & G.L., re-

corded positions) and Russian printed maps with Pulkovo-1942 datum (other collections and observations, estimated positions). Specimen information is deposited in the database of records in vascular plants of Kyrgyzstan (Sennikov and Lazkov 2012) that is published also through the Global Biodiversity Information Facility (GBIF).

The BGN (United States Board on Geographic Names) / PCGN (Permanent Committee on Geographical Names for British Official Use) romanisation of the Kyrgyz and Kazakh language is employed to transliterate collection labels originally in Cyrillic. The romanisation of toponyms in Kyrgyzstan is based on the official standard of the Cyrillic spelling (Ömürzakov *et al.* 1988). The toponyms expressed by composite words are hyphenized by tradition. Delimitation of mountain ranges and depressions is given according to Ömürzakov *et al.* (1988).

References to the International Code of Nomenclature for algae, fungi and plants are provided according to its Melbourne edition (McNeill et al. 2012).

Amaryllidaceae (incl. Alliaceae)

Allium setifolium Schrenk

Specimens examined: Kyrgyzstan. Kyrgyz Range: Ala-Archa Valley, 12.07.1978, *anonymous* (FRU). Küngöy Ala-Too: S foothills, right side of Chüy River, 21.07.1980, *N. Gorbunova* (FRU); right side of Chüy River near the bridge Krasny most, 23.06.1986, *R. Aidarova* (FRU). Ili Ala-Too: Kök-Too Mts., SE-facing side, steppe grassland with *Botryochloa* and *Bromus*, 1440 m, 31.07.2013, *A. Sennikov & G. Lazkov 39* (FRU, H 1760561). Suuk-Döbö Mts.: 4–5 km of Kökömeren River, 15.06.1979, *R. Aidarova, A. Ubukeeva & N. Ledovskaya* (FRU). Naryn-Too Mts.: left side of Naryn River opposite to the airfield, 06.07.1965, *R. Aidarova* (FRU).

Allium setifolium Schrenk is distributed in north-eastern parts of Central Asia: Kazakhstan, Kyrgyzstan, China and Mongolia (Vvedensky 1971; Xu & Kamelin 2000). Its typical habitats are deserts and semideserts on steep gravelly slopes in foothills and mountains at elevations up to 2000 m. The species was first reported from Kyrgyzstan (probably on the basis of the only specimen from Naryn-Too Mts.) by Nikitina (1967) who, however, failed to provide any information about the occurrence of this species. Lazkov & Sultanova (2011) reported the species from Central Tian-Shan as new to the country, but the basis of this record was not presented again. The specimens of *A. setifolium* kept at FRU are listed and mapped here to provide the background for the species distribution in the country.

In 2013 we discovered the species also in Kök-Too Mts., the isolated easternmost outlier of Ili Ala-Too, Northern Tian-Shan. This record fills the gap between the localities previously known in Kyrgyzstan, and those in Kazakhstan (Pavlov & Poliakov 1958).

Asteraceae

Arctium echinopifolium (Bornm.) S.López, Romasch., Susanna & N.Garcia

Taxon 60(2): 550. 2011 — *Cousinia echinopifolia* Bornm., Beih. Bot. Centralbl. 34(2): 192. 1917 — *Hypacanthium echinopifolium* (Bornm.) Juz., Trudy Bot. Inst. Akad. Nauk SSSR (ser. 1) 3: 324. 1937. — Type: Kyrgyzstan. Chatkal Range: S side, upper course of Chanach River, 06.07.1912, *O. von Knorring 67* (LE, holotype).

Alfredia talassica Iljin, Izv. Glavn. Bot. Sada RSFSR 23(2): 136. 1924. — Type: Kyrgyzstan. Talas Ala-Too: upper course of Taldy-Bulak River, xerophytic steppe zone, 09.08.1922, *E. Korovin 2196* (TASH, holotype).

Specimen examined: Kyrgyzstan. Kyrgyz Range: N side, ravine of Ak-Suu River, 19.06.2013, *G. Lazkov* (FRU).

This species, widely distributed in western Kyrgyzstan (Tscherneva 1983), is new to Kyrgyz Range. This record (Fig. 1) makes a considerable extension of the distribution area northwards.

Crepidiastrum serawschanicum (B.Fedtsch.) Sennikov, comb. nova

Crepis serawschanica B.Fedtsch., Beih. Bot. Centralbl. 40(2): 203. 1924 — *Youngia serawschanica* (B.Fedtsch.) Babc. & Stebb., Univ. Calif. Publ. Bot. 484: 231. 1943 — *Crepidifolium serawschanicum* (B.Fedtsch.) Sennikov, Komarovia 5(2): 96. 2008 ("2007"). — Type: Tajikistan. Fann Mts.: Voru Village, 10.06.1892, *V. Komarov* (LE, lectotype, designated by Babcock & Stebbins 1943: 231).

Crepis distincta Popov & Vved., Bull. Moscow Soc. Naturalists, ser. biol., n. s. 42(2): 147. 1933 — *Youngia distincta* (Popov & Vved.) Babc. & Stebb., Univ. Calif. Publ. Bot. 484: 233. 1943. — Type: Kazakhstan. Talas Ala-Too: rocky slopes in the lower course of Topşak-Suu River, 20.07.1931, *N. Pavlov 658* (MW, lectotype, designated here; isolectotype LE, not seen).

Fig. 1. Habit of *Arctium echinopifolium* in Kyrgyz Range. Photo: Georgy Lazkov.

The similarity of *Youngia tenuifolia* (Willd.) Babc. & Stebb. and related species to the genus *Crepidiastrum* Nakai was noted by Sennikov (1997) who effected transfers of names for two most widespread species. This group formerly classified as *Youngia* sect. *Crepidopsis* Babc. & Stebb. is strikingly dissimilar from the type section of *Youngia* Cass. in the less compressed (not flattened) achenes with 10 unequal but very broad ribs and caducous pappus. Later Sennikov (Sennikov & Illarionova 2008) abandoned this decision in favour of establishing a new genus *Crepidifolium* Sennikov that was deemed different from the type species of *Crepidiastrum* in achenes with broad unequal ribs (vs. achenes with narrow equal ribs). The phylogenetic studies (yet unpublished, see Shih & Kilian 2011) have proven that the position of this group in *Crepidiastrum* is correct, and some more transfers were effected in connection with the *Flora of China* (Shih & Kilian 2011). For this reason the new combination *Crepidiastrum serawschanicum* is proposed here to accommodate *Youngia serawschanica* (B.Fedtsch.) Babc. & Stebb., endemic to Central Asia with a coloured pappus, which is presumably related to *Crepidiastrum tenuifolium* (Willd.) Sennikov (Sennikov & Illarionova 2008).

Sennikov & Illarionova (2008) erroneously cited the type locality of *C. serawschanicum* as situated in Uzbekistan. The locality is actually in Fann Mts. of Tajikistan according to the itinerary of V. Komarov (Lipsky 1905).

Two gatherings were indicated as types in the protologue of *Crepis distincta* Popov & Vved. (Pavlov 1933), of which *Pavlov 658* was cited as ”type” by Babcock & Stebbins (1943: 233) who thereby attempted to designate the lectotype. Their citation of the lectotype at LE is contrary

to the requirements of Art. 9.12 which defined the priority of original material in type designations, because the relevant syntype was indicated at MW and only an isosyntype (not indicated in the protologue) was located at LE. According to Art. 9.19, the lectotype designation of Babcock & Stebbins may not be followed and is superseded here in favour of the specimen at MW.

Jurinea darwasica (C.Winkl.) Sennikov, **comb. nova**

Cnicus darwasicus C.Winkl., Acta Horti Petrop. 9(2): 427. 1886 — *Saussurea darwasica* (C.Winkl.) Lipsky, Acta Horti Petrop. 26(2): 437. 1910 — *Cirsium darwasicum* (C.Winkl.) Iljin, Not. Syst. Herb. Horti Bot. Petrop. 3(15–17): 59. 1922 — *Modestia darwasica* (C.Winkl.) Charadze & Tamamsch., Not. Syst. Geogr. Inst. Bot. Thbiliss. 19: 41. 1956 — *Anacantha darwasica* (C.Winkl.) Soják, Sborn. Nár. Muz. Praze 1982(1–2): 108. 1982. — Type: Tajikistan. Darvoz Range: "prope Tevildara [Tavildara Village] ad fluvii Chingou [Obikhingou River], alt. 6000', 1881, *A. Regel*" (LE, lectotype, designated by Charadze & Tamamschian 1956: 41, not seen).

Cnicus jucundus C.Winkl., Acta Horti Petrop. 9(2): 427. 1886 — *Saussurea jucunda* (C.Winkl.) O.Fedtsch. & B.Fedtsch., Izv. Turkest. Otd. Imp. Russk. Geogr. Obsch. 6(Suppl. 4): 234. 1911 — *Cirsium jucundum* (C.Winkl.) Iljin, Not. Syst. Herb. Horti Bot. Petrop. 3(15–17): 58. 1922 — *Modestia jucunda* (C.Winkl.) Charadze & Tamamsch., Not. Syst. Geogr. Inst. Bot. Thbiliss. 19: 41. 1956 — *Anacantha jucunda* (C.Winkl.) Soják, Sborn. Nár. Muz. Praze 1982(1–2): 108. 1982. — Type (Charadze & Tamamschian 1956: 42): Tajikistan (Badakhshan). Darvoz Range: "inter Sagridascht [Sagirdasht] et Kalaichum, alt. 5–6000', 1881, *A. Regel*" (LE, holotype, not seen).

Cirsium mirum Iljin, Not. Syst. Herb. Horti Bot. Petrop. 3(15–17): 61. 1922 — *Modestia mira* (C.Winkl.) Charadze & Tamamsch., Not. Syst. Geogr. Inst. Bot. Thbiliss. 19: 41. 1956 — *Anacantha mira* (Iljin) Soják, Sborn. Nár. Muz. Praze 1982(1–2): 108. 1982. — Type (Iljin 1922): Tajikistan. Karategin Range: "Ad effusionem fl. Susob in fl. Surchob, 4500', 1896, *W. Lipsky* 844" (LE, holotype, not seen).

Jurinea pteroclada Iljin, Not. Syst. Herb. Inst. Bot. Acad. Sci. URSS 8(10): 195. 1940 — *Modestia pteroclada* (Iljin) Kamelin in Adylov & Zuckerwanik, Consp. Fl. As. Med. 10: 267. 1993. — Type (Iljin 1940, 1962): Tajikistan. Turkestan Range: near the oil springs Kim (Santo), 29.08.1937, *K. Afanasiev* 595 (TAD, holotype, not seen).

The taxonomic position of *Jurinea darwasica* (C.Winkl.) Sennikov has been subject to a long-standing controversy. This species has rigid but unarmed cauline leaves which are wing-like decurrent to the stem, cylindric capitula with numerous phyllaries ended into a long spine, and the suffrutescent habit. Lipsky (1910) acknowledged the plumose, basally connate pappus of this species and moved it to *Saussurea*; later Iljin (1922) noted the misplacement of this species in *Saussurea* but transferred it to *Cirsium* on the basis of the superficially similar structure of filaments, establishing a new section because of the differences from all other species of this genus in the habit and unarmed leaves and stems. Iljin compared his new section also with *Jurinea*, the present position of this group, but stated that the section is different from this genus because its pappus bristles are not as unequal as in *Jurinea*. The conflicting opinions about taxonomic position of this species allowed Charadze & Tamamschian (1956) to separate it and its closest relatives as the oligotypic genus *Modestia* Charadze & Tamamsch., with a note that this group does not fit *Cirsium* because of its achene anatomy and plant habit. In the *Flora of the USSR* (Czerepanov 1963), *Modestia* was keyed out having its receptaculum with membranous scales (vs. setose in *Jurinea*), whereas Kamelin (1993) separated *Modestia* from *Jurinea* on the basis of its coronate achenes. However, the achenes of *Jurinea* have always been considered coronate as well, and the receptacle scales of *Modestia* and *Jurinea* are rather similar. The involucrum and the habit of *Modestia* (Fig. 2) also share the typical appearance of *Jurinea*.

In the recent phylogenetic analysis (Susanna et al. 2006) *Modestia* appeared to be deeply nested in the *Jurinea* clade, and the respective generic synonymy has been proposed (Susanna & Garcia-Jacas 2009). The formal transfer of the species name is effected here to reflect the phylogenetic position and morphological similarity of this species.

Cnicus jucundus C.Winkl. (Winkler 1886) was described simultaneously with *C. darwasicus* C.Winkl. on the basis of its lax tomentum, shorter spines of the phyllaries and ovoid capitula. These differences were treated as modifications by subsequent authors (Tamamschian 1963; Tuljaganova 1993). The priority of *C. darwasicus* over *C. jucundus* (Art. 11.5) was established by Tamamschian (1963).

Iljin (1922) described *Cirsium mirum* Iljin (*Modestia mira* (Iljin) Charadze & Tamamsch.)

Fig. 2. Flowering head of *Jurinea darwasica*. Photo: Georgy Lazkov

on the basis of its non-decurrent leaves and very short spines on the phyllaries; subsequent treatments (Tamamschian 1963; Tuljaganova 1993) found that the leaves of this plant are indeed narrowly decurrent; besides, they recognised that the related *Modestia darwasica* (C.Winkl.) Charadze et Tamamsch. may also have abbreviated spines. We prefer to include this ill-defined taxon into the broad *J. darwasica* as a mere modification of the latter.

Jurinea pteroclada Iljin (Iljin 1940) had been deemed a member of *Jurinea* until Kamelin (Tuljaganova 1993) recognised its close proximity to the other species of *Modestia*. It is said (Tuljaganova 1993) to differ from *M. darwasica* in crispate (vs. flat) margins of its leaves. However, the distribution areas of these morphotypes largely overlap and the diagnostic characters are unreliable; for this reason we recognise *J. darwasica* as the only species of the former genus *Modestia*. Iljin (1962) himself was in doubt concerning the taxonomic position of *J. pteroclada*, described on the basis of a single collection with immature fruits, placing it under *incertae sedis* in *Jurinea* where it properly belongs to.

Jurinea sect. ***Anacantha*** (Iljin) Sennikov, **comb. nova**

Cirsium sect. *Anacantha* Iljin, Not. Syst. Herb. Horti Bot. Petrop. 3: 57. 1922 — *Anacantha* (Iljin) Soják, Sborn. Nár. Muz. Praze 1982(1–2): 108. 1982. — Type: *Jurinea darwasica* (C.Winkl.) Sennikov (lectotype, designated by Charadze & Tamamschian 1956: 41).

Modestia Charadze & Tamamsch., Not. Syst. Geogr. Inst. Bot. Thbiliss. 19: 40. 1956, non *Modesta* Raf. 1840 — Type: *Jurinea darwasica* (C.Winkl.) Sennikov.

Charadze & Tamamschian (1956) stated that they were elevating *Cirsium* sect. *Anacantha* Iljin to the generic rank; at the same time they provided a new Latin description of the genus and designated its type, placing the section name into synonymy. We treat this action as an intention to have the generic and the section names based on the same type, and accept their type citation as the lectotypification of Iljin's section name.

Rhaponticum namanganicum Iljin

Specimen examined: Kyrgyzstan. Chatkal Range (S side): right side of Kök-Serek River, Köldambes, middle part of slopes, very sparse *Juniperus* forest, 23.07.2010, *A. Sennikov & G. Lazkov* 292 (H 1750569).

This species is very similar to *Rhaponticum nanum* Lipsky, being different in dentate (not dissected) primary lobes of its leaves (Fig. 3). According to Makhmedov (1993), the distribution areas of these two species are vicarious: *R. namanganicum* Iljin occurs in the Ögöm and N side of Chatkal Ranges, whereas *R. nanum* grows

Fig. 3. Flowering head and leaves of *Rhaponticum namanganicum*. Photo: Georgy Lazkov

in the Kurama and S side of Chatkal Ranges of Tian-Shan, as well as in the Zarafshan and Hissar Ranges of Pamir Mt. system. Our record from the S side of Chatkal Range shows an overlap in these distribution areas.

Saussurea vvedenskyi Lipsch.

Not. Syst. Herb. Inst. Bot. Acad. Sci. Uzbekistan 15: 16. 1959. — Type: Kazakhstan. Karjan-Tau: "Ak-Bash-Tau" Mts., "Donguz" River by "Trekhsvyatskoe" Village, zone of steppe petrophytes, 12.08.1921, *R. Āboliņš & M. Popov 8255* (TASH, holotype).

Specimen examined: Kyrgyzstan. Talas Ala-Too (N side): shortly below Kara-Buura Pass, open slopes with *Juniperus*, 11.08.2009, *A. Sennikov 446* (H 1748162).

This species was known from two areas: the type locality in Kazakhstan (Karjan-Tau Mts.) and the only place in Kyrgyzstan (N side of Chatkal Range) (Nikitina 1965; Kamelin & Kovalevskaya 1993). The present record is the second from Kyrgyzstan (about 50 km from the previous locality) and the third in total, being a novelty to Talas Ala-Too.

Saussurea vvedenskyi Lipsch. is a humile suffrutex of the subnival zone, forming dense cushions with long-lingified branches of the caudex. Its leaves are narrowly lanceolate, subentire and finely tomentose like in *S. cana* Ledeb.; unlike the latter species, *S. vvedenskyi* has acuminate (not subrounded) apices of phyllaries. The distribution area of *S. vvedenskyi* lies in Western Tian-Schan, whereas the Central Asian part of that of *S. cana* is situated in Altai, Tarbagatai and Dzhungaria (Lipschitz 1979).

This species is very rare and poorly known. Plants from Kyrgyzstan (Fig. 4) differ from those from *locus classicus* (Fig. 5) in their calathidia being narrower, ca. 5 mm in diam. (not 10 mm in diam.), and cylindric (not campanulate), aggregated in dense corymbs of 5–10 (not 1–3) flowering heads. The other characters seem to be identical. The number of flowers in capitula and the number of capitula in synflorescences are often correlated in Asteraceae, and there are at least some related species (e.g. *S. salicifolia* (L.) DC.) reportedly embracing both morphotypes, one with few broader and loose flowering heads and the other with many narrower and dense flowering heads (Lipschitz 1962). For this reason we treat both morphotypes within a single species, in spite of doubts expressed by Kamelin & Kovalevskaya (1993).

Fig. 4. Habit of *Saussurea vvedenskyi* in Kyrgyzstan (from *Sennikov 446*)

Ericaceae (incl. Monotropaceae)

Hypopitys hypophegea (Wallr.) G.Don

Specimens examined: Kyrgyzstan. Kyrgyz Range: S side, along Nyldy River, forest with birches and poplars along the river, under the canopy, together with *Codonopsis*, alt. 1760 m, 04.08.2013, *A. Sennikov & G. Lazkov 107* (FRU, H 1760562). Chatkal Range: Sary-Chelek Nature Reserve, Sary-Chelek Lake, E-facing slopes, spruce-fur forest, 05.08.1955, *A. Matsenko* (LE).

New to Kyrgyz and Chatkal Ranges, and to Sary-Chelek Nature Reserve. *Hypopitys hypophe-*

Fig. 5. Habit of *Saussurea vvedenskyi* in Uzbekistan (from holotype)

gea (Wallr.) G.Don, very recently reported as new to the country (Sennikov et al. 2011), seems to be not so rare but commonly overlooked because of its unusual habit. After specially searched for, now this species is known from 4 localities in Kyrgyzstan, vouchered by old and new collections. It is confined to patches of the boreal flora under the canopy of birch forests along rivers and lake sides, and is clearly a boreal element. Its presence so far southwards in Central Asia is determined by the local conditions of riparian birch and poplar forests which provide enough shade and have humid and cold ground because of immediate proximity to the running waters that remain cold even in the warmest season (Pavlov 1980).

Lamiaceae

Betonica betoniciflora (Rupr. ex O.Fedtsch. & B.Fedtsch.) Sennikov, **comb. nova**

Stachys betoniciflora [Rupr., Mém. Acad. Imp. Sci. St. Pétersbourg (7 sér.) 14(4): 66. 1869, nom. provis.] O.Fedtsch. & B.Fedtsch., Consp. Fl. Turk. 5: 165. 1913 — *Betonica foliosa* Rupr., Mém. Acad. Imp. Sci. St. Pétersbourg (7 sér.) 14(4): 66. 1869, non C.Presl 1826 — *Stachys betonicifolia* Rupr., Acta Horti Petrop. 6: 366. 1879, non Pers. 1806. — Type: Kazakhstan. Ili Ala-Too: "Am Eingange in die Kastek-Schlucht" [= entrance to the Kastek River ravine], 05.07.1867, *R.F. von der Osten-Sacken* (LE, holotype, not seen).

Betonica foliosa var. *latifolia* Rupr., Mém. Acad. Imp. Sci. St. Pétersbourg (7 sér.) 14(4): 67. 1869. — Type: Kyrgyzstan. Kyrgyz Range: N side, "am Eingange in die Schamsi-Schlucht" [= entrance to the Shamshy River ravine], 09.07. 1867, *R.F. von der Osten-Sacken* (LE, holotype).

The genus *Betonica* L. was traditionally recognised in all major Russian publications on the grounds of morphological differences in corollae and anthers from the similar *Stachys* L. (Knorring 1954). This recognition persisted until the late 1980s, when the broad circumscription of *Stachys* s.l. was imported (Tulaganova 1987; Czerepanov 1995). In the molecular phylogeny of Lamiaceae (Bendiksby et al. 2011) *Betonica* appeared sister not to *Stachys* but to *Galeopsis* L., with support to its morphological peculiarity. A new combination is proposed here for the only species of *Betonica* native to and widespread in Central Asia.

Betonica betoniciflora f. ***albiflora*** Sennikov & Lazkov, **f. nova**

Floribus albescentibus a forma typica differt.

Type: Kyrgyzstan. Chatkal Range: Sary-Chelek Nature Reserve, eastern side of Kyla-Köl Lake, upper part of rocky slopes, 41.862° N, 71.981° E, alt. 1850 m, 01.08.2009, *A. Sennikov 199a* (H 1747736, holotype).

In the original description Ruprecht (1869: 66) stated that the colour of flowers in this species is purplish ("corolla purpurascens"). Besides the purple-flowered plants (Fig. 6), whitish-flowered individuals (Fig. 7) were noticed in mixed populations in various parts of the distribution area. Those are given the taxonomic rank of forma and are formally named here.

Fig. 6. Purple-flowered form of *Betonica betoniciflora*. Photo: Georgy Lazkov

Phlomoides brachystegia (Bunge) Adylov & al.

Specimen examined: Kyrgyzstan. Pskem Range: S side, along Kara-Korum River, Kyzyl-Jar, on slopes, 08.08.2009, *A. Sennikov 379* (H 1747752, H 1747753).

This is a new morphotype, resembling *Phlomoides vavilovii* (Popov) Adylov & al. in the very sparse pubescence of its leaves, solely with scattered glandular hairs on both sides of the lamina. Long simple hairs, reportedly typical of *P. brachystegia* (Bunge) Adylov & al. (Lazkov 2011), are totally absent in our specimens.

Phlomoides codonantha Sennikov, **nom. nov.**

Eremostachys codonocalyx Pazij et Vved. in Vvedensky, Fl. Uzbekistana 5: 344. 1961, non *Phlomoides codonocalyx* Kamelin & Makhm. 1990 — *Eremostachys desertorum* subsp. *ferganensis* Popov, Novye Mem. Moskovsk. Obshch. Isp. Prir. 19: 129. 1940. — Type: not traced.

This new name is needed because the former genus *Eremostachys* Bunge has been merged with *Phlomoides* Moench in the molecular phylogeny published by Salmaki et al. (2012).

Fig. 7. White-flowered form of *Betonica betoniciflora*. Photo: Georgy Lazkov

Phlomoides deserticola Sennikov, **nom. nov.**

Eremostachys desertorum Regel, Acta Horti Petrop. 9(2): 563. 1886 — *Phlomoides desertorum* (Regel) Salmaki, Taxon 61(1): 175. 2012, nom. illeg., non (P.A.Smirn.) Mavrodiev & Sukhor. 2003 — *Paraeremostachys desertorum* (Regel) Adylov, Kamelin & Makhm., Novit. Syst. Pl. Vasc. 23: 113. 1986. — Type: Uzbekistan. "Inter Kermine [Navoiy Town] et Bohistan [Bohistan Village]", 26.04.1884, *A. Regel* (LE, lectotype, designated by Salmaki in Salmaki et al. 2012: 175; isolectotype LE).

Phlomoides deserticola has been classified in the genus *Paraeremostachys* Adylov & al. which was described as intermediate between *Eremo-*

stachys and *Phlomoides* (Adylov et al. 1986). The original circumscription of *Eremostachys* (Bunge 1830) was very close to the present-day *Phlomoides*, in spite of the priority of the latter name, because the generic name *Phlomoides* fell into oblivion shortly after its publication (Lazkov 2011). The lectotype of *Eremostachys* was unknowingly designated in the sense of *Phlomoides* s. str., so the recognition of the two genera became practically impossible (Sennikov & Lazkov 2010).

When *Phlomoides* was resurrected by Adylov et al. (1986), *Eremostachys* was stated to differ from *Phlomoides* in the funnelform calyx and thickened roots, and *Paraeremostachys* was defined to have the root system similar to that of *Eremostachys* but its calyx teeth were straight, rarely slightly recurved outwards in fruit (like in some few species of *Phlomoides*). In the phylogeny of the tribe Phlomideae (Lamiaceae) all the three genera were proven to be non-separable, with *Eremostachys* embedded in *Phlomoides* and the polyphyletic *Paraeremostachys* emerging among the species of *Phlomoides* and *Eremostachys* (Salmaki et al. 2012). In order to update the classification, *Eremostachys desertorum* Regel is formally transferred to *Phlomoides* here.

Phlomoides dshungarica (Popov) Lazkov & Sennikov, **comb. nova**

Eremostachys phlomoides f. *dshungarica* Popov, Novye Mem. Moskovsk. Obshch. Isp. Prir. 19: 127. 1940 — *Eremostachys dshungarica* (Popov) Golosk. in Pavlov, Fl. Kazakhst. 7: 382. 1964 — *Paraeremostachys dshungarica* (Popov) Adylov, Kamelin & Makhm., Novit. Syst. Pl. Vasc. 23: 113. 1986. — Type: not traced.

This is another transfer necessitated by the recent advances of molecular phylogeny of the tribe Phlomideae (Salmaki et al. 2012).

Phlomoides karatavica (Pavlov) Lazkov & Sennikov, **comb. nova**

Eremostachys karatavica Pavlov, Vestn. Akad. Nauk Kazakhsk. SSR 8: 20. 1950 — *Paraeremostachys karatavica* (Pavlov) Adylov, Kamelin & Makhm., Novit. Syst. Pl. Vasc. 23: 113. 1986. — Type: Kazakhstan. Among stones on a hill with the steppe vegetation near "Chulak-Tau" [Karatau Town], 29.05.1948, *N. Pavlov 207* (AA, holotype, not seen; isotype MW).

Specimen examined: Kyrgyzstan. Karacha-Too Mts. (E part of Kara-Tau): middle part of slopes, sparse vegetation, 42.673° N, 71.2116° E, alt. 940 m, 07.08.2013, *A. Sennikov & G. Lazkov 171* (FRU, H 1760563).

New to Kyrgyzstan. This species, endemic to Kara-Tau Mts., has been discovered in Karacha-Too Mts. which are the easternmost extension of Kara-Tau into Kyrgyzstan. A number of other species from the Kazakh part of Kara-Tau have been recently found in Kyrgyzstan due to intentional searches, most notably *Rhaphidophyton regelii* (Bunge) Iljin (Lazkov 2007).

Phlomoides sect. ***Eremostachys*** (Bunge) Sennikov, **comb. nova**

Eremostachys Bunge in Ledebour et al., Fl. Alt. 2: 414. 1830. — Type: *Eremostachys laciniata* (L.) Bunge (*Phlomis laciniata* L.) (lectotype, designated by Pfeiffer 1874: 1230).

According to the earliest type designation (see the history of typifications of this name in Sennikov & Lazkov 2010), the name *Eremostachys* falls into the largest clade of *Phlomoides*, "*Eremostachys laciniata* core group" (Salmaki et al. 2012). Among the species occurring in Kyrgyzstan, so far, the phylogenetic position in this clade has been confirmed for *Phlomoides ajdarovae* Lazkov, *P. milkoi* Lazkov, and *P. speciosa* (Rupr.) Adylov et al.

Phlomoides sect. ***Moluccelloides*** (Bunge) Sennikov, **comb. nova**

Eremostachys sect. *Moluccelloides* Bunge, Mém. Acad. Imp. Sci. St. Pétersbourg (sér. 7) 21(1): 78. 1873. — Type (Art. 22.6): *Eremostachys moluccelloides* Bunge.

This section corresponds to the genus *Eremostachys* sensu Adylov et al. (1986).

In Kyrgyzstan this section includes *Phlomoides codonantha* and *P. isochila* (Pazij et Vved.) Salmaki (Lazkov & Sultanova 2011).

Phlomoides sect. ***Paraeremostachys*** (Adylov et al.) Sennikov, **comb. nova**

Paraeremostachys Adylov, Kamelin & Makhm., Novit. Syst. Pl. Vasc. 23: 112. 1986. — Type: *Paraeremostachys phlomoides* (Bunge) Adylov et al. (*Eremostachys phlomoides* Bunge).

Eremostachys sect. *Phlomoides* Bunge, Mém. Acad. Imp. Sci. St. Pétersbourg (sér. 7) 21(1): 78. 1873 — *Eremostachys* sect. *Metaxoides* Briq. in Engler & Prantl, Nat. Pflanzenfam. IV(3a, 134): 247. 1896, nom. illeg. superfl. — Type (Art. 22.6): *Eremostachys phlomoides* Bunge.

The sectional name *Eremostachys* sect. *Phlomoides* Bunge was introduced without an explicit statement of its rank. Bunge used the same system of infraspecific designations as Briquet (1896), denoting sections by uninomials inserted in brackets into species descriptions between generic epithets and definitions; both authors also had a secondary rank below the level of section, which was denoted by the paragraph mark and was seemingly uncertain. "*Phlomoides*" (Bunge 1873) was introduced in the key to the species of *Eremostachys* in Persia, and also mentioned in brackets by new species names, *E. lehmanniana* Bunge and *E. laevigata* Bunge.

Eremostachys sect. *Phlomoides* is the earliest legitimate name at the rank of section for the former genus *Paraeremostachys*; however, its transfer to *Phlomoides* is precluded by Art. 22.4. Its type is necessarily *Eremostachys phlomoides* Bunge according to Art. 22.6. When Briquet (1896) adopted this section name, he explicitly excluded *E. phlomoides* and thereby created a later homonym; this homonym became widely accepted by subsequent authors (e.g. Popov 1940; Rechinger 1982).

In Kyrgyzstan this section includes *Phlomoides deserticola*, *P. dshungarica* (Lazkov & Sultanova 2011), and the newly recorded *P. karatavica*.

Liliaceae

Fritillaria ferganensis Losinsk.

in Komarov, Fl. USSR 4: 740. 1935. — Type: Kyrgyzstan. Alay Range: at the confluence of Kandura and Airy-Tash Rivers, NW-exposed slope, 07.05.1913, *O. von Knorring* 106 (LE, holotype; isotype LE).

Specimens examined: Kyrgyzstan. Ak-Shyyrak-Too: Sary-Küngöy, 11.07.1957, *R. Aidarova & A. Ubukeeva* (FRU). Jumgal-Too: Kara-Gaily, 13.07.1932, *I. Vykhodtsev* (FRU). Kabak-Too: S side, Tabylgyty, 28.05.1959, *N. Gamalitskaya* (FRU). Suusamyr Range: middle course of Chychkan River, Üch-Aral, 13.05.1966, *I. Sudnitsyna* (FRU). Taktalyk Range: near Kara-Suu Lake, 22.05.1979, *anonymous* (FRU). Babash-Ata Mts.: upper course of Shaydan River, 12.07.1955, *L. Lebedeva & N. Faleeva* (FRU). Alay Range: Karagoy, 11.06.1957, *V. Janaeva* (FRU); Kichik, 09.06.1960, *I. Sudnitsyna* (FRU); Chauvay, 13.05.1963, *A. Ubukeeva & N. Gorbunova* (FRU); Peshkaut, 17.05.1963, *A. Ubukeeva & N. Gorbunova* (FRU); Archaty, 08.06.1966, *I. Sudnitsyna & N. Gorbunova* (FRU); Symap, 11.05.1978, *R. Aidarova & A. Ubukeeva* (FRU). Turkestan Range: Kyk near Vorukh Village, 14.07.1960, *I. Sudnitsyna* (FRU).

When originally described (Lozina-Lozinskaya 1935), *Fritillaria ferganensis* Losinsk. was placed to the series of species grouped around *F. verticillata* Willd. and compared with the other species with constantly verticillate leaves. This species was accepted in the monograph of *Fritillaria* (Turrill & Sealy 1980) but mysteriously synonymised with the strikingly dissimilar *F. walujewii* Regel by Pazij (1971). This synonymy has been uncritically incorporated into all the subsequent reference books on the flora of Central Asia (Czerepanov 1995; Lazkov & Sultanova 2011).

Fig. 8. Flower of *Fritillaria ferganensis*. Photo: Georgy Lazkov

The two species differ in many characters (Lozina-Lozinskaya 1935) as summarised in the following key.

1. Perigonium moderately angular. Tepals pinkish-violet on the outer and inner sides (Fig. 8). Capsule valves with prominently elevated ridges, emarginated on the top with acute hoogs ..... *Fritillaria ferganensis*
+ Perigonium strongly angular. Tepals whitish with a pink tint and green midveins on the outer side, purpureous with whitish dots on the inner side (Figs. 9–10). Capsule valves with narrowly elevated ribs, obtuse on the top ..... *Fritillaria walujewii*

Figs. 9–10. Flower of *Fritillaria walujewii*. Photo: Georgy Lazkov

The distribution area of *F. ferganensis* is restricted to Fergana, Alay and Transalay Ranges in Kyrgyzstan and Uzbekistan (Vvedensky 1941; Nikitina 1951). The distribution area of *F. walujewii* covers Central and Northern Tian-Shan in Kazakhstan, Kyrgyzstan and China (Nikitina 1951; Goloskokov 1984; Chen & Mordak 2000).

Fritillaria ferganensis and *F. walujewii* have separate distribution areas, and their limit lies within Kyrgyzstan. To contribute to a better understanding of the species, their distributions in Kyrgyzstan (Fig. 11) are mapped here on the basis of collections kept at FRU and the field work of the second author.

Fritillaria walujewii Regel

Gartenflora 28: 353. 1879. — Original locality: probably Kazakhstan, along Tekes River, close to Tekes Town. Type: [icon] "*Fritillaria Walujewi* Rgl." in Gartenflora 28: Taf. 993. 1879 (lectotype, designated here).

Fritillaria xinyuanensis Y.-K.Yang & J.-K.Wu, Acta Bot. Bor. Occid. Sin. 5(1): 40. 1985.

Fritillaria tianshanica Y.-K.Yang & L.-R.Hsu, J. Wuhan Bot. Res. 5(2): 127. 1987.

Specimens examined: Kyrgyzstan. Teskey Ala-Too: Süttü-Bulak, 30.05.1936, *L. Savich & I. Sokolova* (FRU); tributary of Boz-Uchuk River, 07.07.1949, *anonymous* (FRU); 10 km from Ak-Suu resort, 25.05.1952, *A. Bondarenko & I. Nemets* (FRU); upper course of Jeti-Ögüz River, right side, 01.06.1968, *N. Gorbunova* (FRU); Barskon, 15.05.????, *anonymous* (FRU). Naryn-Too Mts.: Chong-Anchi, 24.08.1966, *V. Tkachenko* (FRU); Salkyn-Tör National Park, 25.05.2013, *G. Lazkov* (FRU); Naryn Nature Reserve, 30.08.2013, *G. Lazkov* (FRU). Kara-Too Mts.: 15 km SE of Kulanak Village, 29.05.1959, *Z. Arbaeva* (FRU). Moldo-Too Mts.: S side, E of Kashka-Suu River, 20.06.1957, *Z. Arbaeva* (FRU).

This species was described on the basis of specimens collected by Albert Regel and said to have originated from the valley of Chirchiq River near Tashkent in Uzbekistan (A. Regel 1879; E. Regel 1879), where the plants were collected as bulbs in the autumn of 1877 (E. Regel 1879). The bulbs were planted in the open ground of the Petersburg Imperial Botanical Garden where they flowered first in July 1879; the new species was recognised, described and illustrated on the basis of these cultivated plants (E. Regel 1879). The species epithet was chosen to honour Peter A. Valuev, then Minister of State Property of

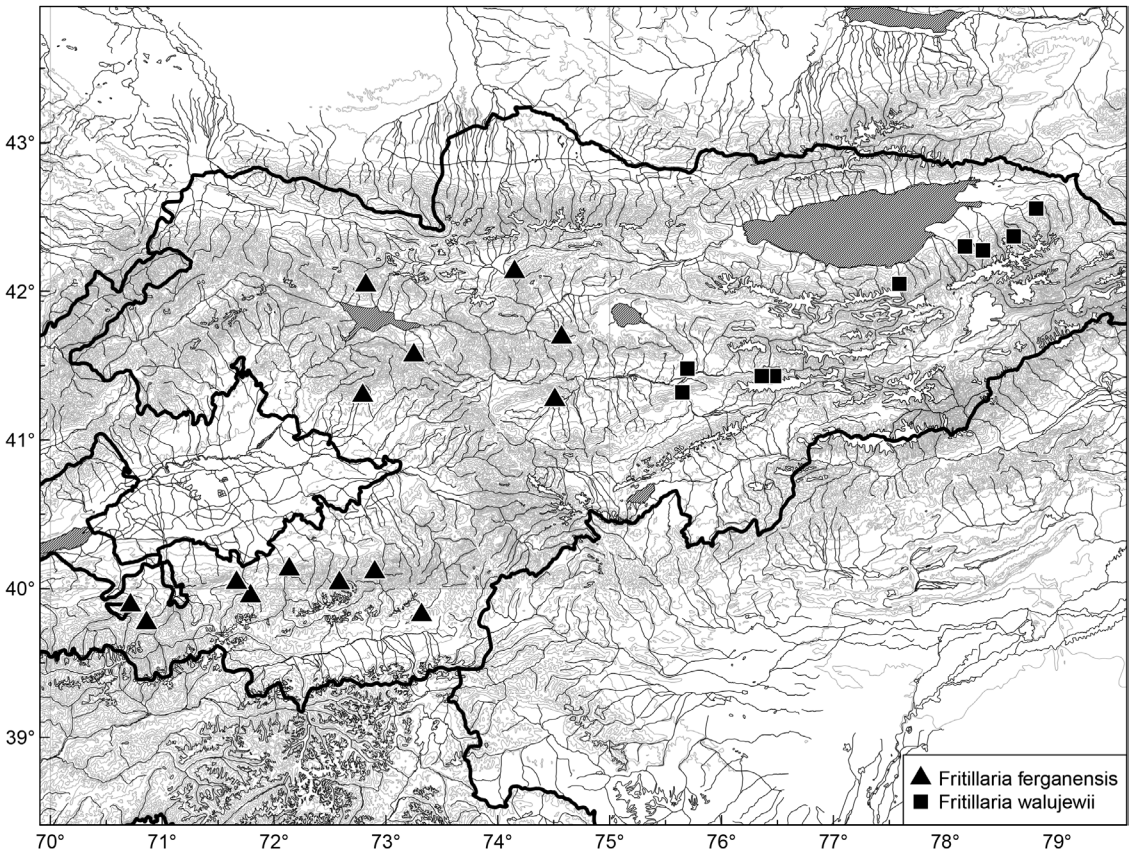

Fig. 11. Distribution of *Fritillaria ferganensis* and *F. walujewii* in Kyrgyzstan

the Russian Empire who superwised the Botanical Garden and was acknowledged by its director E. Regel as protector of science and art.

The protologue records notwithstanding, the plants described and portrayed as *Fritillaria walujewii* do not occur neither at Chirchiq nor in Western Tian-Shan as a whole (Vvedensky 1941). In the autumn of 1877 Albert Regel did not visit the present-day Uzbekistan but travelled in the eastern part of Central Asia, where the species was likely collected along Tekes River (probably close to Tekes Town) in eastern Kazakhstan (Lipsky 1905). The valley of Tekes River was visited by Regel again one year later, and the same species was recollected there with a specimen preserved at LE.

The cultivated plants, on which the original description of *F. walujewii* was based, were not preserved or had not survived in the collections of LE. The illustration published along with the protologue is the only original material available, and is designated as the lectotype here.

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