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New state records and deletions of Cruciferae in the Middle Asian region and surroundings

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Summary. Based on the revision of collections of AA, K, LD, LE, MW, P, PE, TASH, W, XJA, XJBI, XJFA, XJNM and XJU, information on occurrence or absence of some Cruciferae (Brassicaceae) species in the Middle Asian and some neighbouring countries is updated. Among native species, *Draba sarycheleki* is newly recorded from Kazakhstan, *Nasturtium microphyllum* – from Turkmenistan, *Nasturtium officinale* and *Neotorularia brevipes* – from Kyrgyzstan (along with the second finding of the latter in Tajikistan), *Smelowskia sisymbrioides* – from Afghanistan and *Strigosella latifolia* – from Uzbekistan; occurrence of *Barbarea plantaginea* in Turkmenistan is confirmed after more than 120 years since the first and highly neglected record; finally, presence of *Strigosella stenopetala* in China (Xinjiang) is stressed with a special reference on its species rank and distinctness from *S. africana*. Among alien species, *Neslia paniculata* is first reported for Tajikistan as ephemerophyte; in Uzbekistan, *Sisymbrium officinale* is found for the first time, presence of *Camelina sativa* is confirmed, and first reliable records of *Cardamine occulta* from this country and Middle Asia as a whole are presented. In contrast, occurrence of the following species in the countries given in parentheses after relevant names is not confirmed: *Barbarea vulgaris* and *Isatis lusitanica* (Turkmenistan), *Braya humilis* (Kazakhstan), *Erysimum aksaricum* (Kyrgyzstan), *Matthiola flavida* (Tajikistan), *Parrya khorasanica* (China and Kazakhstan) and *Smelowskia annua* (Uzbekistan), of which *Isatis lusitanica* and *Matthiola flavida* do not occur in Middle Asia in general.

К видовому составу крестоцветных (Cruciferae) стран Средней Азии и некоторых сопредельных регионов

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Аннотация. В сообщении приводятся полученные в результате обработки коллекций гербариев AA, K, LD, LE, MW, P, PE, TASH, W, XJA, XJBI, XJFA, XJNM и XJU новые данные о нахождении (или, наоборот, отсутствии) некоторых видов крестоцветных (Cruciferae, или Brassicaceae) в республиках Средней Азии и ряде граничащих с регионом стран. *Draba sarycheleki* пополняет информацию о естественной фракции флоры Казахстана, *Nasturtium microphyllum* – Туркменистана, *Nasturtium officinale* и *Neotorularia brevipes* – Кыргызстана (для последнего также приводится вторая находка в Таджикистане), *Smelowskia sisymbrioides* – Афганистана и *Strigosella latifolia* – Узбекистана. Спустя более чем 120 лет после первого сообщения, не учитываемого в современной литературе, подтверждён факт произрастания в Туркменистане *Barbarea plantaginea*, а для *Strigosella*

stenopetala, никогда не принимавшегося в китайской литературе в качестве самостоятельного вида, приведены сборы из Синьцзяна и отличия от *S. africana*. В качестве заносного вида для Таджикистана отмечен эфемерофит *Neslia paniculata*, а адвентивную флору Узбекистана пополняют *Sisymbrium officinale*, впервые найденный здесь, *Camelina sativa*, присутствие которого в стране подтверждено, а также *Cardamine occulta*, для которого приводятся первые конкретные данные, документирующие его наличие во флоре Узбекистана и Средней Азии в целом. В то же время произрастание *Barbarea vulgaris* и *Isatis lusitanica* в Туркменистане, *Braya humilis* – в Казахстане, *Erysimum aksaricum* – в Кыргызстане, *Matthiola flavida* – в Таджикистане, *Parrya khorasanica* – в Казахстане и Китае, а *Smelowskia annua* – в Узбекистане (при этом *Isatis lusitanica* и *Matthiola flavida* – также во всем среднеазиатском регионе) не получило подтверждения.

Another communication on state records and deletions of Cruciferae (Brassicaceae) is focused on the Middle Asian region (Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and southern Kazakhstan) as well as neighbouring Afghanistan and Xinjiang Uygur Autonomous Region of China. Results are based on the treatment of material in several herbaria, first of all LE and TASH. In few cases, the specimens were studied online via the resources JACQ (2004+) and MNHN [2024]; information on one species is based on the author's collections.

1. Records

Barbarea plantaginea DC.

Turkmenistan: “Копет Даг, Ай-дре-су gorge, 1100 m a. s. l. 27 VII 1925. № 410. В. А. Федтшенко, Р. С. Массажетов, Е. Г. Бобров / Копет-даг. Ущелье Ай-дре-су. Б. А. Федченко, П. С. Массажетов, Е. Г. Бобров”; “Ad scaturiqines pr. m. Ludscha, ca. 6000 ft. 6 VI 1898. № 513. D. Litwinow”; “Turkmen SSR, central Kopet-Dag, pass Arvaz. VIII 1947. К. В. Блиновский / Туркменская ССР. Центральный Копет-Даг, перевал Арваз. К. В. Блиновский”; “TSSR, Karmok Distr., on the pebble along the stream in Khodzha-fil-ata. 25 VII 1935. N. Androsov / ТССР, Кармоковский р-н, на гальках по речке, в ауле Ходжа-филь-ата. Н. Андросов” (all – LE); “On the pebble alongside the stream near Nukhur [Nokhur]. 5 VI [19]25. N. Androsov, V. Kutieva / На гальках у ручья бл. Нухура. Н. Андросов, В. Кутьева” (MW [MW 0834729]); “Turkestan, Bukhara, Kelif: near Khodzha-fil-ata, streamside. 15 V 1915. № Кут 695. М. Г. Попов / Туркестан. Бухарские владения. Келифское бекство: у сел. Ходжа-филь-ата, по берегу ручья. М. Г. Попов” (TASH [TASH 00186776]).

While some early treatments (Busch, 1939; Vasilschenko, 1948) mentioned two species of *Barbarea* W. T. Aiton for Turkmenistan, *B. vulgaris* W. T. Aiton s. l. [incl. *B. arcuata* (Opiz ex J. Persl et C. Presl) Reichenb.] and *B. minor* K. Koch (presence of which outside SW Asia/Caucasus is doubtful), all

sources of the last half a century agree in reporting only the prior species for the country (e. g., Nikitin, 1965; Hedge, 1968; Shermatov, 1974; Gudkova, 1985; Nikitin, Geldikhanov, 1988; Kamakhina, 2005; POWO [2024]). However, I failed to find a single typical specimen of this species from Turkmenistan. Instead, relevant plants fit *B. plantaginea* which differs from *B. vulgaris* by generally less divided leaves, relatively longer [(2.5)3–4.5(5) vs. (1)1.5–3(3.5) cm] and narrower [1–1.4(2) vs. (1.2)1.5–2(2.5) mm], tereete or slightly quadrangular-terete (vs. usually distinctly 4-angled to compressed-4-angled) fruits with more prominent, capitate stigma, often more compact infructescence, etc. Only gatherings consisting of plants with mature to submature fruits are cited above and all of them can be determined with certainty. There are other specimens stored in LE and identified as *B. vulgaris* s. l., with flowers only or at best with young fruits that are not cited here; their identification is not that certain, but habitually they also fit *B. plantaginea* rather than *B. vulgaris*, presence of which in the flora of the country needs confirmation. As for *B. plantaginea*, the present conclusion fully confirms the first record of this species by Freyn (1903: 570) from “Suluklu-Dagh” (southern Turkmenistan) based on the gathering of P. Sintenis: “Regio transcaspica; Aschabad; Suluklü (Saratowka); ad fines Persiae; ad rivulum in mt. Sulukludagh. 10 VIII 1900. № 834. P. Sintenis” (LD).

***Camelina sativa* (L.) Crantz [C. glabrata (DC.) Fritsch]**

Uzbekistan: “[Bukhara Province] Bukhara oasis. Peshkun district. Wheat field. № 73. 4 V 2006. Kh. K. Esanov / Бухарский оазис. Пешкунский район. Пшеничное поле. Х. К. Эсанов” (TASH [TASH 00189366], sub nom. *C. microcarpa* Andr. ex DC.); “Tashkent. Along Bossu and Salar. № 78. 7 V 1920. М. Г. Попов / Ташкент. По Боссу и Салару. М. Г. Попов” (TASH [TASH 00189483]).

Studies of last decades revealed somewhat wider distribution of *C. sativa* in the Middle Asian region compared to that given in *Conspectus Florae Asiae*

Mediae (CFAM) (Vinogradova, 1974). In particular, the species was recorded from Kyrgyzstan (German et al., 2013) and Turkmenistan (German, 2022), though based on rather old (middle of the last century) and single collections. As for Uzbekistan, it was recorded from Tashkent by Popov (1924) as common, but was not reported for the country by subsequent authors (Botschantzev, Vvedensky, 1955; Vinogradova, 1974), probably because of Popov's (l. c.: 153) comment "may be treated as a large-fruited form of *C. microcarpa* Andr.". As evidenced by the above specimen from Bukhara oasis, occurrence of alien *C. sativa* in Uzbekistan is confirmed by relatively recent collection.

***Cardamine occulta* Hornem.**

Uzbekistan: "Tashkent, Durmon Yuli Str., 30, front garden of the Institute of Microbiology, under bushes of *Laurocerasus*, weedy. 22 II 2023. D. A. German / Ташкент, ул. Дурмон Йули, 30, палисадник Института микробиологии АН РУз, под кустами лавровишни. Д. А. Герман" (ALTB; TASH [TASH 00189045]); "Taskhent, Academic town, crossroad Durmon Yuli Str. × Mirzo Ulugbek Ave., front garden, weedy. 10 I 2024. D. A. German / Ташкент, Академгородок, перекрёсток ул. Дурмон Йули и просп. Мирзо Улугбека, сорное в палисаднике" (ALTB; LE [LE 01267770], TASH [TASH 00244171]); same locality and collector, 14 I 2024 (ALTB).

This annual bittercress of East Asian origin is presently a cosmopolitan weed due to its introduction elsewhere predominantly with ornamental planting material (Marhold et al., 2016; Šlenker et al., 2018; Leostrin, Mayorov, 2019). Geographically closest secondary locality is hitherto registered in SW Siberia (Bolbotov et al., 2024). *Cardamine occulta* was included in the checklist of plants of Tian Shan (Sennikov, Tojibaev, 2021), but no localities were given and neither relevant specimens were found in TASH, nor correctly identified observations were revealed in online resources (Plantarium [2007+]; iNaturalist [2008+]; GBIF [2024]). Hence, this is the first reliable record of the species from Uzbekistan and Middle Asian region in general. According to author's observations during 2023 and early 2024 made along Durmon Yuli Str. (from Ziyolilar Str. to the Tashkent filial of the Russian State University of Oil and Gas named after I. M. Gubkin), *C. occulta* can be found here in irrigated places (mainly flower beds and plantings of ornamental bushes) nearly throughout the year [contrary to another alien annual bittercress, *C. hirsuta* L. appearing exclusively

in spring], despite intensive continuous weeding and apparently can be treated as successfully introduced element; its finding in similar conditions in other places of the region is quite likely.

***Draba sarycheleki* Vesselova**

Kazakhstan: "Kopal distr. Valley of Kora. Gorge Tentek-bulak. 10 VII 1916. № 746. V. S. Titov / Копальский уезд. Дол. Р. Кора. Ущелье Тентекбулак. В. С. Титов" (TASH [TASH 00190266]); "Dzhungarian Alatau, Koxsu basin, watershed between Arasan and upper reaches of Tenteksai, gravelly places between rocks, 3200 m. 14 VIII 1948. V. P. Goloskokov / Джунгарский Алатау, басс. р. Кок-су, водораздел рр. Арасан и верховьев Тентекская, мелкозёмистые места, среди скал, 3200 м. В. П. Голоскоков" (AA, LE); "Dzhungarian Alatau: Semirechye Prov., Kopal Distr., glacier gorge Aselbai-sai. № 3570. 23 VI 1909. V. I. Lipsky / Джунгарский Алатау: Семиреченская обл., Копальский у.: ледниковое ущелье Асельбай-сай. В. И. Липский" (LE); "Kazakhstan, gub. Dschetytsu, distr. Taldy-Kurgan. Mountains in the upper reaches of Karatal, Soldatskaya shchel [gorge], southern tributary of Chizhi [Chizhe], western slope, rock. Alt. ca. 1750 m. 29 VII 1928. № 1152. N. W. Schipczinsky / Казахстан, Семиречье, Талды-Курганский уезд. Горы в истоках Каратала. Солдатская щель. Юж. приток р. Чижи. Зап. склон, утёс. Выс. ± 1750 м. Н. В. Шипчинский" (LE); "Dzhungarian Alatau. Region of upper reaches and sources of Karatal. Upper reaches of Chin-bulak, Medvezhya shchel [gorge]. Rocky precipice. 24 VII 1930. № 540. N. W. Schipczinsky / Джунгарский Алатау. Район верховьев и истоков Каратала. Верховья р. Чинбулака. Медвежья щель. Скалистый обрыв. Н. В. Шипчинский" (LE); "Dzhungarian Alatau. Region of upper reaches and sources of Karatal. Gorge of Kora. Rocks. 31 VII 1930. № 320-R. L. E. Rodin / Джунгарский Алатау. Район верховьев и истоков Каратала. Ущелье р. Кору. Скалы. Л. Е. Родин" (LE).

Among miscellaneous, predominantly quite predictable findings reported herein, this one is really surprising. The specimens were variously identified and eventually stored among the material of *D. subamplexicaulis* C. A. Mey. in TASH, *D. tibetica* [sub]var. *leiocarpa* (Lipsky) O. E. Schulz in AA and *D. lasiophylla* Royle in LE. All of them were gathered in central part of Dzhungarian Alatau in eastern Kazakhstan but morphologically they sharply differ from all *Draba* L. species distributed both in this country and adjacent Xinjiang. Instead, with loosely

cespitose habit, uniform indumentum of predominantly small many-branched trichomes, numerous stems with 2–4 ovate to narrowly ovate leaves, relatively big, to 6×3 mm, broadly obovate white petals, divaricate pedicels subequaling lanceolate to broadly so, usually twisted fruits with a style to 1 mm, etc. [broadly dilated and sometimes toothed filaments of median stamens can be additionally mentioned], they perfectly fit the morphology of *D. sarycheleki* described from vicinities of Sary-Chelek Lake in eastern part of Chatkal Range (Vesselova, 1997), subsequently found somewhat eastwards, in the valley of Chichkan (German et al., 2013), and hitherto known exclusively from western part of Kyrgyzstan (Tojibaev et al., 2020) with closest localities situated ca. 600 km apart from Dzhungarian findings, in totally different biogeographic circumstances. Molecular studies are desirable for confirming identification of Kazakhstani specimens, verifying potential case of cryptic speciation and revealing the phylogeographic scenario underlying the observed distribution pattern.

Nasturtium microphyllum (Boenn.) Reichenb.

Turkmenistan: “Kishlak Kuhitang [Koyten], Karasu spring. 16 VI 1931. № 268. S. A. Nevski / Кишл. Кугитанг [Койтен]. Источник Кара-су. С. А. Невский” (LE [LE 01245232], sub nom. *N. officinale* W. T. Aiton).

Information on the number of species of *Nasturtium* W. T. Aiton occurring in Middle Asia and their distribution in the region has long been a matter of controversy. Based on the revision of herbarium collections in LE, Jonsell (1973) was the first to found out that, unlike previously reported, not one but two species, *N. microphyllum* and *N. officinale* [as *Rorippa microphylla* (Boenn.) Hyl. and *R. nasturtium-aquaticum* (L.) Hayek, respectively] occur in the region, the prior in Kazakhstan (southern part), Kyrgyzstan and Tajikistan; the latter in Turkmenistan; and both in Uzbekistan (*N. microphyllum* in Samarkand region and Amu Darya basin, *N. officinale* – in Tashkent region). Unfortunately, by that time the preparation of relevant, 4th volume of CFAM was nearly completed and relevant information was not counted in the treatment of *Nasturtium* (Shermatov, 1974) and, with an exception of Yunussov (1978), in most of subsequent regional treatments and compendiums (e. g., Abdulina, 1999; Tojibaev, 2010; Lazkov, Sultanova, 2014; Sennikov, Tojibaev, 2021). In the present communication, information of Jonsell (1973) is taken as a starting point.

In general agreement with the latter author, nearly all revised gatherings from Turkmenistan correspond *N. officinale*. However, one specimen, cited above, have fruits to 27 mm long and semibiseriate seeds with 12 or more depressions across on each side and thus clearly belongs to *N. microphyllum*. Apparently, this species within Turkmenistan is restricted to Kuhitang which is in line with its occurrence in adjacent southern Uzbekistan (Jonsell, 1973; LE, TASH).

Nasturtium officinale W. T. Aiton

Kyrgyzstan: “Northern foothills of Alai Range, along watercourse of Shurak. 13 V 1938. T. G. Glybin / Сев. предгорья Алайского хр. По руслу сая Шурак. Т. Г. Глыбин” (TASH [TASH 00186928]); “Northern foothills of Alai Range, between the rivers Sokh and Shakhimardan, along the watercourse of the stream. 9 V 1938. T. G. Glybin / Сев. предгорья Алайского хр. Между р. Сох и Шахимардан, по водному руслу сая. Т. Г. Глыбин” (TASH [TASH 00186927]); “Northern foothills of Alai Range, between the rivers Sokh and Shakhimardan, along the watercourse of Shurak and other streams. 9 V 1938. T. G. Glybin / Сев. предгорья Алайского хр. Между р. Сох и Шахимардан, по водным руслу саёв Шурак и др. Т. Г. Глыбин” (TASH [TASH 00186926]).

In accordance with Jonsell (1973), all reliably identifiable *Nasturtium* specimens from Kyrgyzstan in LE represent *N. microphyllum*. However, several gatherings from Alai Range in TASH possess fruits not exceeding 13 mm and clearly biseriate seeds with less than 12 depressions across them on each side and therefore undoubtedly belong to *N. officinale*. Thus, both *N. microphyllum* and *N. officinale* are registered in the flora of three countries of the region: Kyrgyzstan, Turkmenistan and Uzbekistan. Further studies, including collecting new material, are needed in order to clarify the details of ranges of both species in Middle Asia which is somewhat hampered by the fact that a number of available herbarium specimens are lacking mature fruits.

Neotorularia brevipes (Kar. et Kir.) Hedge et J. Léonard

Kyrgyzstan: “Central Tian Shan. Akche-tash Range, southern slopes. The tract Urus-bulak on the way to Shargo. № 40. 7 VI 1934. E. Korotkova / Центральный Тянь-Шань. Хребет Акче-таш; южные склоны. Уроч. Урус-булак по дороге в ур. Шарго. Е. Короткова” (TASH [TASH 00191180]).

Details of distribution of this ephemeral species were discussed recently in relation to its first finding in Tajikistan (German, 2021). The present finding is the first confirmed record of *N. brevipes* in Kyrgyzstan. In addition, the second gathering from Tajikistan is worth mentioning: “Pamir. Basin of Shakh-dara. Vicinities of Dzhou-shangoz. Sovkhoz Pamir. Stony slope (lower part). № 175. 15 VI 1934. [S. Kh.] Chevrenidi / Памир. Бассейн р. Шах-дара. Район ур. Джоу-шангоз. Совхоз Памир. Каменистый склон (внизу). [С. Х.] Чеврениди” (TASH [TASH 00191179]). Both specimens were found among the material of *Drabopsis nuda* (Bélang.) Stapf [*Draba nuda* (Bélang.) Al-Shehbaz et M. Koch], a species superficially reminding *N. brevipes* due to tiny habit, leafless stems, indumentum of forked stalked trichomes, similar flower size and, *in sicco*, petal colour (white in *N. brevipes* both in nature and in herbarium and turning so from yellow upon drying in *D. nuda*), etc. Among others, the most evident distinguishing character is the size of trichomes which is more or less uniform in *D. nuda* while in *N. brevipes* leaf trichomes are considerably larger than hairs of stem and, if present, on siliquae. The newly revealed localities demonstrate that knowledge on the distribution of *N. brevipes* is still much incomplete.

***Neslia paniculata* (L.) Desv.**

Tajikistan: “East Pamir. Murgab district, Chechekty. Pamir biostation. Weed on the planting plot. Late VIII 1947. I. A. Raikova / Вост. Памир. Мургабский р-н. Урочище Чечекты. Памирская биостанция. Сорное на участке. И. А. Райкова” (TASH).

Both species of *Neslia* Desv. occur in Middle Asia being to a large extent allopatric, with *N. apiculata* Fisch. et C. A. Mey. completely substituting more northern *N. paniculata* in Tajikistan, Turkmenistan and Uzbekistan (Vinogradova, 1974; POWO [2024]). Undoubtedly, the cited specimen is just an occasional introduction, apparently with seed material, not resulted in establishment of the species in local flora. Hence, the status of *N. paniculata* in Tajikistan is ephemerophyte. The single collected plant has only first flowers and no even unripe fruits, but morphology of ovaries (rounded at both ends) enable its undoubtful identification.

***Sisymbrium officinale* (L.) Scop.**

Uzbekistan: “Chatkal Range, right bank of Akhangaran, Akcha. 12 V 2000. K. Tajjanov / Чат-

кальский хр. Правая сторона р. Ахангаран. Село Акча. К. Тайжанов” (TASH [TASH 00194660, 00194661], sub nom. *Lepidium aucheri* Boiss.).

This presently cosmopolitan species of W Palaeo-arctic origin is not yet common in the Middle Asia, though known here for quite long time from a few findings in the northern part (Bondarenko, 1974). Nevertheless, it appears to gradually spread within the region, in particular, southwards, as proven by the recent record from Tajikistan (Ebel et al., 2020) along with the present finding.

***Smelowskia sisymbrioides* (Regel et Herd.) Lipsky (*Sophiopsis sisymbrioides* (Regel et Herd.) O. E. Schulz)**

Afghanistan: “Badakhshan, above Khumbuke-Bala, h = 3000 m, grassland near stream. № 568. 15 VIII [19]69. B. Carter” (K, sub nom. *Smelowskia calycina* (Steph. ex Willd.) C. A. Mey. and *Sophiopsis* [sp.]).

This is south-westernmost finding of the species somewhat remote from closest known localities in Tajikistan (Yunusov, 1978). *Smelowskia sisymbrioides* is the third species of relevant genus found in Afghanistan, along with *S. annua* Rupr. [*S. flavissima* sensu Podlech, Anders (1977) and Podlech (2012), non (Kar. et Kir.) Kar. et Kir.] and *S. calycina* s. l., all confined to the north-east of the country.

***Strigosella latifolia* Bondar. et Botsch.**

Uzbekistan: “Surkhandarya province, near Omonkhana. Multicoloured soil in lower mountain belt. 28 IV 2009. M. Matvafayeva / Сурхандарьинская обл. Вблизи [кишлака] Омонхана. Пестроцветные породы в нижнем поясе гор. М. Матвафаева” (TASH [TASH 00201636], sub nom. *S. spryginoides* (Botsch. et Vved.) Botsch.).

This definitely native element of the flora of Uzbekistan has hitherto been known as endemic to adjacent southern Tajikistan (Botschantzev, 1972; Bondarenko, Botschantzev, 1974; Botschantzev, Bondarenko, 1978; Al-Shehbaz et al., 2014; POWO [2024]). Gathering from Omonkhana situated quite far (over 50 km) from the border with Tajikistan considerably extends the compact range of the species to the north-west implying wider distribution of *S. latifolia* in SE Uzbekistan and possibility of its further findings first of all in Babatag and its surroundings. From all Uzbekistanian congeners, the species is readily distinguished by a combination of wide, generally ovate leaves with few big and acute

teeth, presence of rough patent simple trichomes in the lower part of the plant and compressed and strongly torulose siliquae.

Strigosella stenopetala (Fisch. et C. A. Mey.) Botsch. (*Malcolmia stenopetala* (Fisch. et C. A. Mey.) Ledeb.)

China: “Shawan County, from Sandao Hezi to Sineshu. 10/11 [given differently on field and printed labels] VI 1957, Chinese-Soviet Xinjiang expedition, № 32” (LE, sub nom. *Malcolmia*); “Manas County [actually Karamai], Hongshanzui, in desert. 6 VI 1957, Chinese-Soviet Xinjiang expedition, № 621” (LE, indet.).

Although *S. stenopetala* has been recorded from Xinjiang (An, 1983, 1995, as *Malcolmia africana* var. *stenopetala* Fisch. et C. A. Mey.), specifically from “Manas, Hutubi and other counties” (An, 1995: 179) and subsequently was mentioned in Chinese sources (Zhou et al., 2001; Species 2000... [2006+]) among the synonyms of *S. africana* (L.) Botsch. (*Malcolmia africana* (L.) W. T. Aiton), I found it worthy to include this taxon in the present communication because it has never been recognized in China as a distinct species (at best just as a variety), contrary to the viewpoint more or less generally accepted since the revision of Botschantzev (1972) and reflected in basic present-day databases (e. g., COL (Bánki et al., 2024); GBIF [2024]; POWO [2024]; WFO (2024)). Indeed, with sepals persisting to (vs. usually shed by) fruit submaturity, filaments of median stamens connate per pairs (vs. free), approximately twice shorter and narrower petals, generally shorter (3–4(5) vs. (3)4–8 cm) fruits, etc., *S. stenopetala*, confined to dry saline habitats, should not be merged with more eurytopic *S. africana*. At the same time, *S. stenopetala* was never reported for China in monographic studies (Botschantzev, 1972; Al-Shehbaz et al., 2014) and above-mentioned databases.

Meanwhile, this species is one of the most widely distributed members of *Strigosella* Boiss.: its range covers the whole Middle Asia, considerable part of Kazakhstan, and Transcaucasia (Botschantzev, 1972; Al-Shehbaz et al., 2014). Therefore, its occurrence in the desert area of western Xinjiang (Chinese Dzhungaria or Junggar) is well-expected; apparently, relevant gatherings indicate eastern limit of the natural distribution of *S. stenopetala*.

Noteworthy, similar situation is observed around *S. trichocarpa* (Boiss. et Buhse) Botsch. with the only differing detail – it is recorded from China in relevant works (Botschantzev, 1972; Al-Shehbaz et al., 2014). With addition of these two species to another four currently reported for the country (Zhou

et al., 2001; Species 2000... [2006+]), the number of *Strigosella* species known to occur in China reaches six.

2. Deletions

Barbarea vulgaris W. T. Aiton s. l.: occurrence in **Turkmenistan** needs confirmation because of the lack of reliable gatherings from this country (see discussion under *B. plantaginea* above).

Braya humilis (C. A. Mey.) B. L. Rob. [*Neotorularia humilis* (C. A. Mey.) Hedge et J. Léonard]

Kazakhstan: attention was paid previously (German, 2003) to the fact that occurrence of the species in north-eastern part of the country (Altai Mts.) is not supported by herbarium material and that reports for the south of the country are not confirmed by subsequent publications. Nonetheless, some uncertainty remained and *B. humilis* continued to be mentioned for Kazakhstan till now (e. g., Al-Shehbaz, German, 2014; Al-Shehbaz, 2015; POWO [2024]). Revision of collections in relevant herbaria demonstrated lack of any gatherings of this species from Kazakhstan; the single collection misplaced into the folder “Ili-Balkhash” (LE), implying this country, is that of V. I. Lipsky from Arabel, i. e. from Kyrgyzstan. It should therefore be stated that, despite the possibility of finding in Altai Mts. at the border with Russia, according to the currently available data, *B. humilis* is absent in the flora of Kazakhstan.

Erysimum aksaricum N. Pavl.

Kyrgyzstan: “Čyčkan-Tal: ca. 10 km E Torkent, ca. 60 km SW vom Paß Ötmek. 4 VII 1994. № 10262. Fr. Speta” (W [W 2012-08114]); “Kult. [e sem. № 10262] Alpengarten Belvedere/Wien 1995/96. 2n = 14. A. Polatschek” (W [W 1997-08600]).

Based on this material, *E. aksaricum* has been reported by Polatschek (2010) for the first time for Kyrgyzstan along with the first chromosome count for the species. By leaves covered predominantly with 2-fid (vs. 3–5-fid) trichomes, divaricate (vs. erect-ascending to subappressed) pedicels with 2-fid (vs. 2–4-fid) trichomes, quadrangular (vs. terete-quadrangular) siliques, etc., the cited specimens immediately differ from any member of *E. hieracifolium* sens. trad. group to which *E. aksaricum* unambiguously belongs. Instead, they fit *E. gypsaceum* Botsch. et Vved. s. l. (incl. *E. ferganicum* Botsch. et Vved.) known from relevant region of Kyrgyzstan (Lazkov, Sultanova, 2014). Chromosome number 2n = 14 also better agrees with 2n = 28 counted for

E. gypsaceum instead of $2n = 48$ known for representatives of *E. hieraciifolium* affinity complex, e. g., *E. marschallianum* Andr. ex M. Bieb. and *E. virgatum* Roth (Polatschek, l. c.).

Besides Kyrgyzstan, Polatschek reported *E. aksaricum* for Kazakhstan based on its type collection from Bostandyk [now Bostanlyk] region transferred in 1956 to Uzbekistan, and respective distribution (Kazakhstan and Kyrgyzstan) is currently given by POWO. In fact, the species is so far not found outside Uzbekistan, as correctly mentioned in Tojibaev et al. (2020); however, Polatschek's record is not considered in the latter publication. Taxonomic status of *E. aksaricum* itself is a matter of further elucidation; most likely it will turn out to be conspecific with either of the two above-mentioned species of *E. hieraciifolium* group, especially *E. marschallianum*.

***Isatis lusitanica* L. (*I. aleppica* Scop.)**

This S Mediterranean / SW Asian species is included in nearly all basic treatments on **Turkmenistan** (e. g., Busch, 1939; Vassilczenko, 1948; Nabiev, 1974; Nikitin, Geldikhanov, 1988; reported for Gaudan and Ioldere, where specified) and currently mentioned for the country in POWO [2024]. Meanwhile, yet Hedge (1968: 85) noted that *I. lusitanica* "recorded from Turcomania but this is a doubtful determination", and the species is absent in the "Key ..." (Gudkova, 1985). Presently, Middle Asian department of LE has no folder "*I. lusitanica*" and all specimens ever determined as such (usually as *I. aleppica* Scop.), including those from Gaudan and Ioldere, are stored among numerous collections of *I. leuconeura* Boiss. et Buhse; relevant placement implying revision has most likely been done by V. P. Botschantzev during his work on *Isatis* L. in 1970–80ths. There are only two gatherings still kept under the name *I. aleppica* in TASH, both collected 29 IV 1916 by V. P. Drobow from vicinities of Kurt-su of Gaudan district, №№ 948 and 949, and, despite lacking developed fruits, they are undoubtedly identifiable as *I. leuconeura* (perennial with entire leaves) and not *I. lusitanica* (annual with often dentate leaves). Thus, occurrence of the latter in Turkmenistan cannot be confirmed. Besides, the species should be excluded from the flora of Middle Asia as a whole since it was not recorded in the region from outside southern Turkmenistan (Kopet Dagh Mts.).

***Matthiola flavida* Boiss.**

In a recent paper focusing on the Middle Asian collections of G. Capus, Turdiboev et al. (2022), among several state records, reported, based on two

specimens (G. Capus, № 92 [P 05431756] and A. Regel s. n. [P 05431754]), *M. flavida* as a novelty for the flora of **Tajikistan**. This species has been reported in some early publications on the flora of the region (e. g., Franchet, 1883; Lipsky, 1904; Fedtschenko O. A., Fedtschenko B. A., 1906; Fedtschenko, 1915) but since the treatment in the "Flora of USSR" (Czeraniakowskaya, 1939), this binomial is only mentioned in relevant publications as a name misapplied to *M. integrifolia* Kom. (Botschantzev, Vvedensky, 1955; Nikitina, 1955; Sarkisova, 1974; Yunusov, 1978), the most common *Matthiola* W. T. Aiton species in the southern Middle Asia. Subsequently (Zhou et al., 2001; Al-Shehbaz, 2015), *M. integrifolia* was recognized synonymous with *M. chorassanica* Bunge ex Boiss. and finally, both were merged into *M. revoluta* Bunge ex Boiss. (Kaffash, Assadi, 2017; Zeraatkar et al., 2022).

In accordance with this, all Middle Asian specimens from LE and TASH previously identified as *M. flavida*, are stored under the name *M. integrifolia*, i. e. represent *M. revoluta*, and identity of the above gatherings by Capus and Regel in P is the same. Distinctness of these two closely related species is discussed in detail by Zeraatkar et al. (l. c.), the most obvious character is flat petals of *M. flavida* vs. circinate involute ones in *M. revoluta*. This case demonstrates that uncritical acceptance of old determinations contrasting with subsequently published data is a wrong way that leads to mistakes.

***Parrya khorasanica* (Rech. fil. et Aellen) D. A.**

German et Al-Shehbaz (*Parrya lipskyi* D. A. German et Al-Shehbaz, *Pseudoclausia turkestanica* (Lipsky) A. Vassil.)

Yet from the time of discovery of *P. khorasanica* and its first description as *Clausia turkestanica* Lipsky (Lipsky, 1904) and by the present time, it is reported to occur in Tian Shan (e. g., Vassilczenko, 1939; Botschantzev, Vvedensky, 1955; Nikitina, 1955; Vasilyeva, 1961; Kamelin, 1973, 1990; Pachomova, 1974; Yunusov, 1978; Tojibaev, 2010; Lazkov, Sultanova, 2014; Sennikov, Tojibaev, 2021) and believed to be a common species in the western part of this mountain system. Revision of available material led me to an unexpected conclusion that it is not so. Indeed, I failed to find a single specimen from Tian Shan that undoubtedly belongs to this species. The vast majority of misidentifications represent *P. gracillima* (Botsch et Vved.) D. A. German et Al-Shehbaz [*Pseudoclausia gracillima* (Botsch et Vved.) A. Vassil.], the most widespread member of *P.* sect. *Pseudoclausia* (M. Pop.) Madaminov in western

Tian Shan and endemic to this region (Tojibaev et al., 2020). The two species are quite similar in terms of morphology and ecology, but, given that the specimens are adequate, can be reliably discerned at any stage of ontogenesis by a set of characters (e. g., Al-Shehbaz, German, 2013), especially in fruits that are generally broader (at least 1.5, but usually more than 2 mm wide) and distinctly compressed in *P. khorasanica* and narrower (usually up to 1.6 mm) and not compressed (tetragonal to terete-tetragonal) in *P. gracillima*. With regards to the occurrence of *P. khorasanica* in particular country, this finding means that the species is to be excluded from the list of the flora of **Kazakhstan**.

One more country where occurrence of *P. khorasanica* cannot be confirmed, is **China**. The species is recorded from Xinjiang in basic treatments (Kuan, 1987; Zhou et al., 2001) and in the online database Species 2000... [2006+]. However, An (1995) stressed that, despite such a mention in “Flora RPS”, he did not manage to find any specimens of the species from Xinjiang, and I have the same experience, at least based on the work in PE, XJA, XJBI, XJFA, XJNM and XJU. In accordance with these facts, Chinese Virtual Herbarium database (CVH, 2004+) also does not contain a single collection of *P. khorasanica* from China. Such a picture fits well the known distribution of the species which, as shown above, does not occur in Kazakhstan at all and also absent in adjacent to China regions of Kyrgyzstan and Tajikistan. The same could be said with regards to Afghanistan based on the information of “Flora Iranica” (Dvořák, 1968), but subsequent authors (Podlech, 2012; Breckle et al., 2013) report it for Vakhān (Wakhan) bordering with China. Apparently, this range extension is based on the gathering of O. Anders (№ 8117) from the upper reaches of Istmochno reported by Podlech and Anders (1977). Relevant specimen “Badakhshan: Wakhan, oestl. Oberlauf des Daryae Istmochno (Toli Bay Tal, 72/57-37/08). Alt. 3900–4000 m. 6. 8. 1971. O. Anders. No. 8117” (KU [KU 000150]; http://jacq.nhm-wien.ac.at/djatoka/jacq-viewer/viewer.html?rft_id=kufs_000150&identifier_s=kufs_000150) includes the single perennial plant ca. 17 cm tall with leafless stem which cannot be *P. khorasanica* characterized by biennial to short-lived perennial life span and leafy stems 30–120 cm alt. Besides, it does not occur at elevations more than 3000 m a. s. l. (Yunusov, 1978; Zhou et al., 2001). The plant collected by O. Anders can only be identified as *P. minjanensis* Rech. fil., a species growing at extreme elevations of NE Afghanistan and adjacent Pakistan (Breckle et al., 2013; Al-Shehbaz, 2015). Hence, occurrence of *P. khorasanica* in Vakhān is

not confirmed and its presence in adjacent region of Xinjiang is also impossible. In sum, evidences proving that the latter species was recorded from China in mistake appear exhausting.

Smelowskia annua Rupr. (*Sophiopsis annua* (Rupr.) O. E. Schulz)

Recently (German, Vesselova, 2022), it was shown that *Smelowskia annua* does not occur in Kazakhstan. Further studies demonstrate that the same is true for **Uzbekistan** because all seen collections from western Tian Shan with such determination belong to *Smelowskia sisymbrioides* (Regel et Herd.) Lipsky (*Sophiopsis sisymbrioides* (Regel et Herd.) O. E. Schulz) and *S. annua* was never found in and recorded from Pamir-Alai of Uzbekistan. The two species are very close and ranges of variation of many characters treated as diagnostic partly interfere which often leads to confusions. According to the best key for these species provided by Zhou et al. (2001), *S. annua* is characterized by fruiting pedicels erect or ascending, often subappressed to rachis, densely pubescent; racemes bracteate at least basally; stems prostrate or rarely ascending; uppermost leaves 1-pinnatisect or pinnatifid; fruit terete and ovules 10–16 per ovary while *S. sisymbrioides* is peculiar for having fruiting pedicels divaricate, not appressed to rachis, glabrous or glabrescent; racemes ebracteate; stems erect or rarely ascending; uppermost leaves 2-pinnatisect; fruit slightly 4-angled and ovules 4–8 per ovary. Being identified with this key, the mentioned specimens mostly fall between the two species having either glabrescent or quite densely pubescent and either divaricate or ascending pedicels, either 1- or 2-pinnatisect upper leaves, and ovules 6–12 per ovary. A version of their hybrid origin might be worthy to check; however, there are two arguments in favour of treating them as *S. sisymbrioides* and not as *S. annua* or interspecies hybrids. First, they all possess slightly 4-angled fruits and no or just one bract; and second, there is a continuous range of intermediates between them and typical plants of *S. sisymbrioides* fully matching the above set of characters and there is no such a range to *S. annua*. Most likely, the discussed specimens from western Tian Shan represent ecological form of *S. sisymbrioides* occurring in harsh open habitats of higher belt contrasting with typical plants of this species from milder conditions of *Picea* or *Juniper* forests of middle mountain belt. Noteworthy, the above record of *S. sisymbrioides* from Afghanistan is based on the same ‘untypical’ specimen which correlates well with its habit.

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