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**TYPIFICATION OF SELECTED NAMES OF CRUCIFERAE TAXA FROM SIBERIA AND  
SOME NEIGHBORING REGIONS**

**ТИПИФИКАЦИЯ НЕКОТОРЫХ НАЗВАНИЙ ТАКСОНОВ КРЕСТОЦВЕТНЫХ  
(CRUCIFERAE) СИБИРИ И РЯДА СМЕЖНЫХ РЕГИОНОВ**

**Summary.** The detailed data on type specimens of 25 Cruciferae taxa distributed predominantly in Siberia and to less degree in neighboring regions (Kazakhstan, Middle and Central Asia) are reported. Mostly taxa of P.S. Pal-las, C.F. Stephan, C.L. Willdenow, C.F. Ledebour, and N.S. Turczaninow are treated. In two cases, holotypes are recognized, otherwise the names are lectotypified (incl. 2 second-step lectotypes).

**Key words:** Cruciferae, typification, Siberia.

**Аннотация.** Приведена подробная информация о типовых образцах 25 таксонов крестоцветных (Cruciferae), распространённых в основном в Сибири, а также в некоторых соседних (Казахстан, Средняя и Центральная Азия) регионах. Рассмотрены преимущественно таксоны П.С. Палласа, Х.Ф. Стефана, К.Л. Вильденова, К.Ф. Ледбура и Н.С. Турчанинова. Все названия, кроме двух, имеющих голотип, лектотипифицированы (для двух таксонов выбор лектотипа уточнён).

**Ключевые слова:** крестоцветные, типификация, Сибирь.

While preparing the treatment of Cruciferae for the “Flora of Altai” and “Flora of Tuva” projects, the need of typification of numerous names has arose. Partly such work has been performed during last years (German, 2005; German et al., 2006; German & Cherneva, 2008). In continuation of this work, some other names of relevant Cruciferae taxa are typified herein. In the present study, the material of AA, B, BP, BRNU, HAL, KW, LE, M, MHA, MW, P, PRC, TK, and W was used, and JSTOR plant project (<http://plants.jstor.org>) was also consulted for specimens from BM and K. For each taxon, detailed data on all available parts of original material are reported and commented when needed.

*Alyssum fedtschenkoanum* N. Busch, 1923, Notul. Syst. Herb. Hort. Bot. Petrop., 4, 19–20 : 145. – *Odontarrhena fedtschenkoana* (N. Busch) D. German, 2009, Komarovia, 6, 2 : 85.

Described from the eastern part of Zaissan depression: “Prov. Semipalatinsk, a Bogdanow receptum. Fedtschenko! Distr. Saissan, in arenis Ak-kum ad ripam fluvii Alkabek prope pag. Terek Inferiorem. 11/24. VII. 1908. fl. fr. imm. Ssedelnikow! Soongaria chinensis, Alkabek, in arenis contra Alexeewskoje. 6/19. VIII. 08. ster. Fedtschenko! Altai merid., inter Nikolajewka et

Uspenka. 6. VIII. 1914. fr. fere omnib. apertis. Saposhnikow!”.

Lectotype (hic designatus): “Semipalatinsk prov., Zaissan district, South Altai. Nikolaevka – Uspenka, 6 Aug. 1914. V. Sapozhnikov” (LE!, iso – BRNU!, LE! (3), TK!).

Syntypes: “Zaissan district, sands Ak-Kum, on the bank of Alkabek near Nizh. Terek.[ty]. 11 VII 1908. A.N. Sedelnikov” (2); “Received from A.N. Bogdanov from Semipalatinsk(?) prov. 16 I 1913. B. Fedtschenko” (2 samples, only one labeled); “Soongaria Chinensis, Alkabek, sands on the opposite of Alexeewskoe. 6 VIII 1908. № 2321. B.A. Fedtschenko”; “A.N. Sedelnikow: Plantae terr. Semipalatinsk, Zaissan district [fl., fr.]” (3) (all – LE!).

The latter three specimens have no indication on the collection place and date but they all are identified by N.A. Busch and apparently represent the cited above gathering of Sedelnikov; thus they are also treated as syntypes.

*Alyssum spathulatum* Steph. ex Willd. 1800, Sp. Pl. 3 : 465. – *Galitzkya spathulata* (Steph. ex Willd.) V. Bocz. 1979, Bot. Zhurn. 64, 10 : 1442.

Described from NE Kazakhstan: “in montibus Altaicis Sibiriae”.

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Lectotype (Dudley et Cullen, 1965, Feddes Repert. 71, 1–3 : 226; second-step lectotype hic designatus): “*Alyssum spathulatum* mihi [Stephan]. Montes altaici” (B-W 11903.4!).

Other original material: “Mussin-Puschkin [A.A. missit] W.” (B-W 11903.1-3!); “*Alyssum spathulatum* e Sibiria Willdenow dedit” (HAL!).

Possible original material: “*Alyssum spathulatum* Willd. Sp. Pl. Cor. pallide flava. Hab. in montosis Altaicis. Ibidem lectum Dn. de Lindenthal misit 1789. Pott” (LE!).

Original material can represent any of the collections of either P.I. Schangin, or J. Sievers, or their mixture as both collectors gathered the species and even invalidly named it as *Clypeola altaica* Schangin and *C. shanginii* Sievers (Ledebour, 1841 : 135). While Sievers collected the species during his trip to Tarbagatai in 1793 (Sievers, 1796), the origin of Schangin’s collection is unclear because the only mentioning of “schöne graue *Clypeola*” in the description of his trip in 1786 (Schangin, 1793: 76) refers to any plant collected in Yabagan (“Jabagan”) where *G. spathulata* does not occur. According to Litwinow (1909 : 344), Schangin sent seeds (and probably specimens) to Pallas prior to that trip and *G. spathulata* could be among them. Otherwise, the locus is given incorrectly which sometimes happened in that work (Litwinow, l.c.). Unfortunately, the present author had no opportunity to check Shangin’s letters to Pallas where the name *Clypeola altaica* first appeared.

Dudley and Cullen (l.c. : 226) cited the type as follows: “Siberia. In montibus altaicis sibiriae, Stephan, B!” without specification among 4 specimens in B-W which necessitated the second step of typification (McNeill et al., 2006, Art. 9.15 ICBN). Boczantzeva (1979 : 1441) mentioned “type in B and isotype in LE” but there is no specimen in LE marked as such. Obviously, she ment the specimen from Pott’s herbarium which most likely represents Shangin’s gathering.

***Alyssum tenuifolium*** Steph. ex Willd. 1800, Sp. Pl. 3 : 460. – *Ptilotrichum tenuifolium* (Steph. ex Willd.) C.A. Mey. 1831, in Ledeb. Fl. Alt. 3 : 67. – *Stevenia tenuifolia* (Steph. ex Willd.) D. German, 2009, Komarovia, 6, 2 : 84.

Described from SE Siberia (Baikal region): “in Sibiria”.

Lectotype (hic designatus): “Habitat in Sibiria. Saxosis ad Selengam et Baikal” (B-W 11889.4!).

Other original material: B-W 11889.2!; “*Alyssum tenuifolium*. E Sibiria. Willdenow dedit” (HAL!).

There are five specimens in Willdenow herbarium under the common label cited above. Only two of them taxonomically correspond to the generally accepted concept of this taxon. The rest of specimens are: *Alyssum lenense* Adams (11889.1), *Ptilotrichum dahuricum* Peschkova (11889.3), and a mixture of *A. lenense* and *Stevenia cheiranthiodes* DC. s. str. (11889.5).

***Brassica polymorpha*** Murr. 1776, Novi Comment. Götting. 7 : 35, tab. VI. – *Sisymbrium polymorphum* (Murr.) Roth, 1830, Mant. Bot. 2 : 946.

Described based on the material grown in Hortus Göttingensis from seeds of E Siberian (most likely, Baikal) origin obtained from Pallas: “... Sibiricis plantis destinavi”.

Lectotype (German et Berkutenko, hic designatus): fig. (Novi Comment. Götting. 7 : tab. VI).

Other original material: “*Brassica polymorpha* Murr. H.[ortus] Gött.[ingensis]”; “*Arabis nova*. Pro *Brassica* nova Murray descripsit in Nov. Com. Goet.” (LE!).

No authentic material has been found in LINN, K, and GOET (Berkutenko, 1983 : 24) but the two cited specimens in LE (both with labels by Pallas) apparently represent the plants grown by Murray. However, both specimens are quite poor (these are only upper parts of stem with buds and few incompletely opened flowers); therefore, the picture in the validating publication better illustrating the species morphology is designated as the lectotype as not cited specimens do not have priority over the cited figure under the Art. 9.10 (McNeill et al., 2006).

***Braya siliquosa*** Bunge, 1839, Del. Sem. Hort. Dorpat. : 7.

Described from South-East Altai: “in alpinis ad Tschujam crescens”.

Lectotype (hic designatus): “*Braya siliquosa* m. Tschuja; in lapidosis alpium ad fl. Tobogosch. Politow 1839 [fr.; det. Bunge]” (P!).

Isolectotype: «Herbar. Bung. Flor. orient. altaica. 1839. *Braya siliquosa*» (LE!).

Lectotype consists of seven plants with ripe fruits mounted in the upper portion of the herbarium sheet. Two plants which just started flowering mounted in the right lower corner of the sheet and labeled “*Platypetalum. Braya siliquosa* mihi. H[ortus] D[orpatensis]. 1841. [Bunge]” do not belong to the original material.

It is almost undoubtedly that the following two specimens: “*Braya siliquosa* Bge. Altai» (two upper plants) and «*Braya siliquosa* Bunge. Altai, leg. Bunge. Herb. J. Klinge” (both LE!) also represent isolectotypes; habitually, the plants are very similar to those constituting the lectotype. Mentioning Bunge’s name does not point him as a collector and should be only attributed to the origin of these specimens from Bunge’s private herbarium: the species was first collected not earlier than in 1837 while Bunge conducted field studies in Altai himself for the last time in 1832.

***Cardamine macrophylla*** Willd. 1800, Sp. Pl. 3 : 484.

Described from East and probably West Siberia: “in Sibiria”.

Lectotype (Khatri, 1990, Folia Geobot. Phytotax., 25, 2 : 208, “holotype”; second-step lectotype hic designatus): B-W 11970.1!

Other original material: B-W 11970.2-4!; “*Cardamine macrophylla*. E Sibiriae. Pallas” (HAL!); fig. [Sisymbrium foliis pinnatis, pinnis ovatis serratis] (Gmelin, 1768, Fl. Sib. : tab. 62).

Khatri (l.c. : 208) cited the type as follows: “Hab. in Sibiriae, 1772, Pallas (B-W, holotype, examined)”. However, he did not specify which of four specimens was meant, and it is barely possible to associate certain specimen with the separately attached labels: “*Cardamine chelidonium* [added by Willdenow] figura Gmelinii bona”; *Cardamine chelidonia* Linn., ad fontes. Lect. Junio 1772 (Hb. Pall.) [by Georgi except the species epithet by Pallas]; “In boreal. Ad Jeniseam [et] circa Baikalem (Pallas) [manus Pallasii]”; “In Kumeskie [?] goltzy along rivers and in moist places in pine forests [in Russian – N. Sokolov?] (Herb. Pallas)”; “[From Sievers?] Stephan. W.”.

Possible original material: “*Cardamine macrophylla*. 799. Sievers. Sibir[ia] (Hb. Stephan)” (LE!).

***Cardamine nivalis*** Pall. 1773, Reise, 2 : 740, ahn. 113, tab. U. – *Macropodium nivale* (Pall.) W.T. Aiton, 1812, Hort. Kew. ed. 2, 4 : 108.

Described from SW Siberia (Altai): “circa nives in summis montium Altaicorum”.

Lectotype (hic designatus): “*Cleome altaica*. *Cardamine nivalis* Pall. it. II. [late July 1771, Pallas] Herb. Pallas [manus Pallasii]” (BM, right plant).

Other original material: fig. “*Cardamine nivalis*” (Pall. 1773, Reise, 2 : tab. U).

Among three plants on the lectotype sheet, only the right one (with mature fruits) represents

the collection of 1771 fully corresponding both the description and the figure. The other two plants being in full bloom and with first immature fruits were not used by Pallas while preparing the description as he only mentioned few withering flowers at the top of the stem (Pallas, 1773 : 740) which apparently fell down soon, and mature fruits. The central and the left plants pictured (along with the right one) in the unpublished Pallas’s “*Plantae selectae Rossicae*” under the name *Catharinea sublimis* Pall. (nom. nud.) (Sytn, 1997 : 220) were grown later in St. Petersburg from seeds obtained by Pallas from I.P. Shangin (Sytn, l.c. : 219). As follows from the letter of Pallas to Shangin from 10 XII 1793, it was the first opportunity for Pallas to study flowers of this species enabled him concluding that it cannot belong to *Cardamine* L. and should appear in Flora Rossica as *Schanginia alpina* Pall. (nom. nud.) (modified from: Sytn, l.c. : 324). Thus, it is obvious that the original material is restricted to the fruiting plant and its picture.

***Draba eriopoda*** Turcz. ex Ledeb. 1841, Fl. Ross. 1, 1 : 154.

Described from SE Siberia (E Sayan and Transbaicalia): “in subalpinis baikalensibus ad torrentem Urgudei et ad rivulum Korolla in subalpinis Davuricae! (Turcz.)”.

Lectotype (German et Dorofeyev, hic designatus): “*Draba eriopoda* Turcz. In glareosis humidis Dahuriae 1832 (Herb. Ledeb. 70.39.)” (LE!).

Isolectotypes: “*Draba eriopoda* Turcz. In glareosis humidis Dahuriae, 1832” (B!); “*Draba eriopoda* Turcz. In glareosis Dahuriae, 1832”; “*Draba eriopoda* Turcz. Dahuria, 1832”; “*Draba eriopoda* Turcz. In subalpinis Dahuriae ad rivulum Korolla”; “*Draba eriopoda* Turcz. In glareosis Dahuriae” (KW!); “*Draba eriopoda* m. In humidis lapidosis ad fl. Korolla. Dahuria 1832. Turcz.[aninow] (Ex herb. Turcz.)”; “*Draba eriopoda* Turcz. Dahuria leg. 1832”; “*Draba eriopoda* Turcz. Dahuria. Exi. Fischer. [misit] 1839”; “*Draba eriopoda* Tcz. Dahuria. Hb. Bagd. [misit] 1840”; “*Draba eriopoda* Turcz. In glareosis humidis Dahuriae 1832. Mis. D. Turczaninow 1833 (Hb. Meyer)”; “*Draba eriopoda* Turcz. In glareosis humidis Dahuriae 1832”; “*Draba eriopoda* Turcz. Dahuria 1832. Ded. Turczan. 1838 (Herb. Trautv.)”; “*Draba eriopoda* m. Ad rivulum Korolla, Dahuriae 1832”; “*Draba eriopoda* Turcz. In glareosis humidis Dahuriae 1832” (LE!); “*Draba eriopoda* Turcz. Dahuria 1832. Turczaninow” (M!); “*Draba eriopoda* Turcz. In glareosis Dahuriae 1832” (MW); “*Draba eriopoda* Turcz. Dahuria,

leg. Turcz.”; “*Draba eriopoda* T. In humidis Dahur. (Hb. Bunge)”; “*Draba eriopoda* Turcz. Dahuria. 1832 (Hb. Bunge)”; “*Draba eriopoda* Turcz. Ad rivulum Korolla, Dahur. (Hb. Fischer)”; “*Draba eriopoda* Turcz. In subalpinis Dahuriae. Turcz.”; “*Draba eriopoda* Turcz. Dah.[uria] (Hb. Fischer)”; “*Draba eriopoda* Turcz. In Dahuria. Coll. et examin. N. Turcz. Ed. R.F. Hohenacker. 1844” (P!); “*Draba eriopoda* Turcz. Dahuria”; “*Draba eriopoda* Turcz. Dahuria 1832 [mis.] Turczaninow 1839” (PRC!); “*Draba eriopoda* Turcz. Dahuria 1832 leg. celeberr. Turczaninow” (TK!); “*Draba eriopoda* Turcz. Dahuria. leg. Turcz.”; “*Draba eriopoda* Turcz. Dahuria. [misit Turcz.] XI 1837”; “*Draba eriopoda* Dahuria. Turczaninow” (W!).

Syntypes: “*Draba eriopoda* mihi. Ad pedem alpis Urgudei 1830 (Ex herb. Turcz.)”; “*Draba eriopoda* mihi. Distincte a *D. lute[a]e* pedicellis que pubescentibus Ad pedem alpis Urgudei 1830 Turcz.” (LE!).

The single specimen from Ledebour’s private collection which is the only one definitely studied by him prior to the species name validation, is chosen as the lectotype. Specimens representing the third Turczaninow’s collection from Hovsgol lake (“*Draba eriopoda* Turcz. In glareosis ad lacum Kossogol. 1836” (KW!, LE!, W!); Turczaninow, 1842 : 261) seem to be unknown to C.F. Ledebour and thus are not a part of the original material.

***Draba mongolica*** Turcz. 1842, Bull. Soc. Nat. Mosc. 15, 2 : 256.

Described from SE Siberia (E Sayan) and adjacent Mongolia: “In alpe Nuchu-Daban, nec non in glareosis ad lacum Kossogol in confini Mongolia Chinensi”.

Lectotype (Buzunova, in sched.; German et Buzunova, hic designatus): “*Draba mongolica* m. In alpe Nuchu-Daban legit celeb. Kirilof 1836 [defl., fr.]” (LE!).

Syntypes: “*Draba mongolica* Turcz. Ad lacum Kossogol [added later:] et in alpe Nuchudaban. 1836 [fl., fr.]” (LE! (3), P!, PRC!).

Some specimens from Nuchu-Daban were reported as isosyntypes (Buzunova, 2000 : 69) but because the species name was validated by Turczaninow himself all of them are syntypes. Two syntypes in LE are represented by plants in fruits, similar to the lectotype specimen, and probably can be treated as isolectotypes.

***Draba pygmaea*** Turcz. ex N. Busch 1918, Bull. Acad. Sci. Russ., 6 ser., 12, 2 : 1633, 1635, 1639.

Described from SE Siberia (E Sayan and Transbaikalia): “*D. pygmaea* Turcz. Cat. 1838, No 136, nomen nudum, *D. lapponica* Turcz. Fl. Baic.-Dah. I 1842, p. 135, non Willd., *D. Wahlenbergii*  $\beta$  *heterotracha* Led. Fl. Ross. I 1842, p. 150 part.). Transbaik!”

Lectotype (hic designatus): “*Draba pygmaea*  $\beta$ . In alpe Nuchu-Daban legit Kuznetsoff 1834 / In alpe Nuchu-Daban 1834” (LE!).

Isolectotypes: “*Draba pygmaea* Turcz.:  $\beta$ . In alpe Nuchu-Daban 1834” (K); “*Draba lapponica*  $\beta$  (*Draba pygmaea* Turcz.). In alpinis occident. Baicalensibus”; “*Draba pygmaea* Turcz.:  $\beta$ . In alpe Nuchu-Daban 1834” (2); “*D. Wahlenbergii* Hartm. *Draba pygmaea* Turcz. In alpe Nuchu-Daban” (KW!); “*Draba pygmaea* Turcz.:  $\beta$ . In alpe Nuchu-Daban 1834” (2, one from herb. Meyer); “*Draba pygmaea*. Nuchu-Daban” (LE!); “*Draba lapponica* W. *Draba pygmaea* Turcz.  $\beta$ . In alpe Nuchu-Daban 1834” (MW!).

Syntypes: “*Draba pygmaea* Turcz.:  $\gamma$ . In alpinis ad fl. Tessa 1834” (3, one with “legit Kuznetsoff”); “*D. Wahlenbergii* Hartm. In alpinis ad fl. Tessa 1834”; “*Draba Wahlenbergii* Hartm. In alpinis ad fl. Tessa legit Kuznetsoff 1834 (Herb. Ledeb. 70.25.  $\beta$ )”; “*Draba stellata* Jacq. In alpe ad fl. Oka legit Kuznetsoff 1834”; “*Draba pygmaea* Turcz.:  $\alpha$ . In alpe Tsagan-Gol. 1834” (4, one from herb. Meyer); “*Draba pygmaea* m.:  $\alpha$  In alpe Tsagan-Gol legit Kuznetsoff. 1834”; “*Draba pygmaea* Turcz.  $\alpha$  In alpinis Tsahan-gol. 1834. Ded. Turcz. 1838 (Herb. Trautv.)”; “*Draba pygmaea*  $\alpha$  In alpinis Zagan-gol. 1834. Ded. Turcz. 1838 (Herb. Trautv.)”; “*Draba pygmaea* Tcz. Alp. Tschagan-Gol. (Hb. Bo[n]g[ar]d. 1840)”; “*Draba lapponica* W. Fl. Dah. Baic. I, p. 135 [manus Turczaninowii]”; “*Draba glacialis* Adams  $\gamma$  *Raddeana* Regel. In Dahuriae alpinis. Legit Radde” (2); “*Draba glacialis* Adams  $\gamma$  *Raddeana* Regel. ... Munku Sardyk bei 8000’ legit Radde”; “*Draba glacialis* Adams  $\gamma$  *Raddeana* Regel. In monte Munku-Sardyk. 1859. G. Radde”; “Alpe Munku-Sardyk. 14 Aug. 1871. № 102. A. Czekanovsky”; “Mt. Munku-Sardyk, south slope, between stones rather common; on goltzy. 14. VI 1912. Meyer” (LE!).

Isosyntypes: “*Draba pygmaea* Turcz.:  $\alpha$ . In alpe Tsagan-Gol. 1834”; “*Draba pygmaea* Turcz.:  $\gamma$ . In alpinis ad fl. Tessa 1834” (K); “*Draba pygmaea* Turcz. In alpe Tsahangol. 1836”; “*Draba pygmaea* Turcz.:  $\gamma$ . In alpinis ad fl. Tessa 1834”; “*Draba pygmaea* Turcz.:  $\alpha$  In alpinis Zaganhol. 1834”; “*Draba pygmaea* Turcz.:  $\alpha$  In alpe Tsagan-Gol. 1834” (KW!); “*Draba pygmaea* Turcz.

Alpes Baicalenses [misit] Kareline 1840”; “*Draba pygmaea* Turcz. Alpes Baicalenses” (PRC!); “*Draba pygmaea* Turcz. Alpes Baicalenses [misit Turcz.] XI 1837” (W!).

As the work of Busch (1918) represent the shortened version of his treatment of *Draba* L. for the “Flora Sibiriae et Orientis Extrimi” (Busch, 1919), which was totally ready by that time (Busch, 1918 : 1631), the complete citation of the original material can be presented as: “Irk.[utsk province] Mt. Munku-Sardy, sources of Irkut. 8000’. R[adde]! Alps of Munku-Sardy 14 VIII [1871]. Opened fruits. Czok.[anovsky]; Ibid., south slope, between stones. 14. VI. [19]12. fl. Meyer! Alps of the Nuchu-Daban pass. Kuzn.[etzov]! Alps along Tess (Tissa). T[urczaninow]! Alps along Oka. Kuzn.[etzov]! Transbaik[alia]. Alps of Dahuria. R[adde]! Alps of Tsagan-gol. Kuzn.[etzov]!” (Busch, 1919 : 340). Therefore, the type material is not confined to just Turczaninow’s gatherings but also includes other specimens cited above.

Turczaninow’s initial division onto three varieties was not followed by Busch and they stood unnamed.

***Erysimum altaicum*** C.A. Mey. var. ***baicalense*** M. Pop., 1955, Herb. Fl. URSS 13: 18.

Lectotype (German, hic designatus): “[Exicc. №] 3820. Lac. Baical, ripa austro-occidentalis, prope pag. B. Koty, in abruptis lapidosis ad lac. Baical. Leg. E. Sabutite et S. Popova. 24 VIII 1952” (LE!; isolectotypes – AA!, BP!, KW!, LE!, MHA!, MW!).

The specimens also represent the isotypes of *E. baicalense* Polatschek (2008, Ann. Naturhist. Mus. Wien, B, 109 : 154; type – W!). Here, only duplicates not mentioned by Polatschek (l.c.) are enumerated.

***Erysimum czernjajevii*** N. Busch, 1939, Fl. USSR, 8 : 115. – *E. divaricatum* Czern. ex Turcz. 1855 (“1854”), Bull. Soc. Nat. Mosc. 27, 4 : 304, non Wallr., 1840. – *E. virgatum* auct non Roth, p. p., quoad var. “?”: Kar. et Kir. 1842, Bull. Soc. Nat. Mosc. 15, 1 : 155.

Described from E Kazakhstan: “*Cheiroopsis E. virgatum* Kar. et Kir. enum. var.? [In arenosis Songoriae ad radicem montium Arganaty. Karelin et Kirilow, 1841]”.

Holotype: “1243 [1244]. *Erysimum virgatum* Roth var. ? [*Erysimum*] *divaricatum* Czern. In arenosis Songoriae ad radicem montium Arganaty

medio Junio 1841. Kar[elin] et Kir[iloff] (Ex herbario Scegleewi) [Ex herb. Turcz.]” (KW!).

Isotypes: “*Erysimum virgatum* Roth var.? Habitu sat distinctus et stigmatibus brevissima. Altai. Kar. et Kir. N 1244 (Ex herb. Turcz.)”; “Kar. et Kir. Altai № 1244 (Ex herb. Turcz.)” (2); “*Erys. virg.* K. K. 1244 (Herb. Fisch.)” (LE!); “№ 1244. leg. Karelin et Kiriloff a. 1841” (MW!).

The name was validated based on the specimen from Turczaninow’s herbarium (Turczaninow, 1855). At the moment, there is no specimen(s) of *E. czernjajevii* in Turczaninow’s herbarium but only the empty folder with handwriting “*Erysimum divaricatum* Czern.” by Turczaninow. The single specimen of Karelin and Kirilow in KW, cited above, was found in the department “Flora of USSR”. Because similar situation is observed with other species collected by Karelin and Kirilow, it is likely that they were first taken from Turczaninow’s private herbarium by S. Stschegleew during his treatment of Karelin’s collections and later were incorporated into the herbarium of flora of USSR. Therefore, it is clear that the cited specimen was the single one of *E. czernjajevii* in Turczaninow’s herbarium on which the name could be validated and thus represents the holotype.

The number 1243 (not 1244) is obviously a mistake by Stschegleew (the whole label is written by him) as soon as the species was collected in 1841 only in one locality (mts. Arganaty) and the gathering was not separated by collectors (Karelin, Kirilow, 1842); all other specimens collected that year have a number 1244.

The species was collected in mts. Arganaty again in 1842 by G.S. Karelin along (Stschegleew, 1854). That gathering is represented by two specimens in LE which are not a part of original material.

***Erysimum quadricorne*** Steph. ex Willd. 1800, Sp. Pl. 3 : 514. – *Tetracme quadricornis* (Steph.) Bunge, 1836, Del. Sem. Horti Dorpat. : 8.

Described from NW shore of Caspian sea: “in Sibiria inter Volgam et Kumam fluvium”.

Lectotype (hic designatus): “in Sibiria inter Volgam et Kumam fluvium. Stephan” (B-W 12071.2!)”.

Other original material (probably isolectotypes): B-W 12071.1!; “795. Taur. et ad Kumam fl. (Herbarium Stephanianum)” (LE!).

***Eutrema cordifolium*** Turcz. ex Ledeb. 1841, Fl. Ross. 1, 1 : 198.

Described from SE Siberia (E Sayan): “In subalpinis baikalensibus ad torrentem Zemczug! (Turcz.)”.

Holotype: “*Cochlearia cordifolia* m. *Eutrema* [cordifolium] Turcz. In lapidosis umbrosis torrentem Zemczig 1830” / “*Eutrema* [cordifolium] Turcz. Herb. Ledeb. 95.3.” (LE!).

Isotypes: “*Smelowskia cordifolia* Turcz. In pratis montosis sylvaticis ad torrentem Zemczug 1830”; “*Cochlearia cordifolia* mihi. In sylvis ad torrentem Zemczig 1830” (KW!); “*Cochlearia cordifolia* mihi. In sylvis ad torrentem Zemczig 1830” (4; one specimen, in addition, bears Turczaninow’s note: “An genus proprium?”); “*Cochlearia cordifolia* mihi. In sylvis ... ad torrentem Zemczig 1830”; “*Smelowskia cordifolia* Turcz. In pratis montosis sylvaticis ad torrentem Zemczig 1830” (2, one from herb. Meyer); “In sylvis ad torrentem Zemczig 1830. Turczaninow” (2); “[In sylvis ad torrentem Zemczig 1830. Turczaninow]. Herb. Fischer” (3); “*Eutrema cordifolia* Turcz. Fl. Dah. Baical. 1. p. 165 [Turczaninow]” (LE!).

As soon as just one collection was cited and the single specimen from Ledebour’s private herbarium is available, it is obviously that the name is based on this specimen which should be recognized as holotype.

***Eutrema intermedium*** Turcz. 1842, Bull. Soc. Nat. Mosc. 15, 2 : 283. – *E. edwardsii* R. Br. var. *intermedium* (Turcz.) A.L. Ebel, 2000, Turczaninowia, 3, 3 : 30.

Described from N Mongolia: “In glareosis ad lacum Kossogol”.

Lectotype (hic designatus): “*Eutrema parviflorum* Turcz. var. foliis caulinis longioribus. In glar. ad lacum Kossogol 1836 [I. Kirilow] (Hb. Meyer)” (LE!).

Isolectotype: “*Eutrema parviflorum* Turcz. var. foliis caulinis longioribus. Ad lacum Kossogol 1836 ... specim. intermedia inter *E. Edwardsii* et *parviflorum* (Hb. Bunge)” / “*Eutrema parviflora* Turcz. Ad lacum Kossogol. Turcz.” (only left and right plants, not 3 *Draba ochroleuca* Bunge specimens in between) (P!).

***Eutrema parviflorum*** Turcz. ex Ledeb. 1841, Fl. Ross. 1, 1 : 198. – *E. edwardsii* R. Br. f. *parviflorum* (Turcz. ex Ledeb.) N. Busch, 1913, Fl. Sib et Or. Extrim. 1 : 129.

Described from SE Siberia (E Sayan) and neighboring Mongolia: “In alpinis baikalensib. ad fl. [Maloi Irkut] Monda! et ad lacum Kossogol (Turcz.)”.

Lectotype (hic designatus): “*Eutrema parviflorum* Turcz. In alpe ad fl. Maloi Irkut 1834 [I. Kuznetsow] (Herb. Ledeb. 95.2.)” (LE!).

Isolectotypes: “*Eutrema parviflorum* m. In alpe ad fl. Maloi Irkut legit Kuznetsoff 1834 (2 – ex herb. Turcz. et Fisch.)”; “*Eutrema parviflorum* Turcz. In alpe ad fl. Maloi Irkut 1834 (Hb. Meyer)”; “*Eutrema parviflorum* Turcz. In alpe ad fl. [Maloi] Irkut 1834”; “*Eutrema parviflorum* Turcz. Sibiria, in alpe ad fl. Maloi Irkut” (LE); “*Eutrema parviflorum* Turcz. In alpe ad fl. Irkut 1834” (MW).

Syntypes: the above cited lecto- and isolectotypes of *E. intermedium*.

Apparently, Ledebour occasionally changed “Maloi Irkut” to “Monda”: the single specimen from his herbarium designated here as lectotype, originates from Maloi Irkut, which completely agrees with Turczaninow (1842 : 283) who mentioned “maloi Irkut” for *E. parviflorum* and Monda for *E. edwardsii* R. Br. [s. str.].

There is a number of *E. parviflorum* specimens collected in Nuchu-Daban in 1834 and 1836 signed by Turczaninow (B!, KW!, LE!, M!, P!), but he did not mention them in his “Flora...” (only *E. edwardsii* is reported from there; KW!, LE!), nor did Ledebour. For the latter reason, they are not treated as the original material on *E. parviflorum*.

Turczaninow had validated the name *E. intermedium* under synonymy of *E. parviflorum* (= *E. parviflorum* var.  $\beta$ ), while Ledebour earlier validated *E. parviflorum* based on both collections. The present typification keeps the current understanding of both taxa.

***Holargidium kuznetsowii*** Turcz. ex Ledeb. 1841, Fl. Ross. 1 : 156. – *Draba kuznetsowii* (Turcz. ex Ledeb.) Hayek, 1911, Beih. Bot. Centralbl. 27, 1 : 172.

Described from SE and SW Siberia (E Sayan and Altai): “in alp. altaicis (Bunge in litt., qui unicum specimen legit), in alpe Nuchu-Daban regionis baikalensis! (Turcz.)”.

Lectotype (German et Dorofeyev, hic designatus): “*Holargidium kuznetsowii* Turcz. Ad ripas (alpis) torrentium prope alpem Nuchu-Daban legit Kuznetsoff 1834 (Herb. Ledeb. 71.1.)” (LE!).

Isolectotypes: “*Holargidium kuznetsowii* Gen. et sp. Turcz. Circa alpem Nuchu-Daban. 1834” (KW!); “*Holargidium kuznetsowii* m. Ad ripis torrentem pr. alpem Nuchu-Daban legit Kuznetsoff 1834” (4; in two cases “Turcz. instead of “m.”); “*Holargidium kuznetsowii* Turcz. Circa alpis Nuchu-Daban 1834” (LE!); “*Holargidium kuznetsowii* G. et sp. Turcz. Circa alpem Nuchu-Daban. 1834” (M!);

“*Holargidium kuznetsowii* m. Genus 4 valvae, 4 loculare, septis completis. In alpe Nuchu-Daban detexit Kuznetsoff 1834”; “*Holargidium kuznetsowii* Turcz. Ad ripis torrentem pr. alpem Nuchu-Daban [legit Kuznetsoff 1834] mis. Fischer 1836” (P!).

Syntype: “*Holargidium kuznetsowii* Turcz. In alpis ad Tschujam, leg. Politow unicum hoc specimen inter specimini *Parryae exc. [apae]*” (P!).

Probable isoelectotypes: “In subalpinis Baicalensibus” (GOET); “*Holargidium kuznetsowii* Turcz. In alpe Nuchu-Daban” (KW!); “Baicalia. Turcz. legit” (LE!); “*Holargidium kuznetsowii* Turcz. In alpe Nuchudaban coll ex examin. N. Turcz. Ed. R.F. Hohenacker. 1844” (2); (P!); “*Holargidium kuznetsowii* Turcz. Regio Baicalensis occid.”; “*Holargidium kuznetsowii* Turcz.! In subalpinis Baicalensibus [mis.] Kareline 1840” (PRC!); “*Holargidium kuznetsowii* Turcz. In subalpinis Baicalensibus”; “*Holargidium kuznetsowii* Turcz. Regio Baicalensis occid. [mis.] XI 1837” (W!).

Ledebour did not cite other collections (“Kossogol, ... Tessa et in aliis locis vicinis”) mentioned by Turczaninow (1842 : 266) thus excluding them from the original material. Among two collections from Nuchu-Daban, only the first (1834) was used by Ledebour; therefore, specimens representing the second collection (1836 – LE!) are also not treated as syntypes. Because both gatherings can hardly be separated from each other habitually, the status of collections from Nuchu-Daban without date is determined as possible isoelectotypes along with specimens with unspecified locality which can also represent the first Nuchu-Daban collection.

As previously mentioned, the specimen collected in Altai was not found in LE (German, 2005) but is deposited in P as a part of Bunge’s private herbarium (mounted on one sheet with an isoelectotype). Similarly, another taxon from Altai, *Braya limosella* Bunge, is represented by the single authentic specimen: “*Platypetalum limoselloides* m. alp. Ad Tschujam” (holotype, P!).

***Hutschinsia bifurcata*** Turcz. ex Ledeb. 1841, Fl. Ross. 1, 1 : 201. – *Smelowskia bifurcata* (Turcz. ex Ledeb.) Botsch. 1968, Novit. Syst. Pl. Vasc. 5 : 140.

Described from SE Siberia (E Sayan): “in alp. baical. Nuchu-Daban! (Turcz.)”.

Lectotype (Botschantzev, in sched., “typus”; hic designatus [also for *Smelowskia asplenifolia* Turcz., see below]): “*Smelowskia asplenifolia* Turcz. In alpe Nuchu-Daban ad torrentem Dschochoi legit Kuznetsoff. 1834. Turcz.” (LE!).

Isoelectotypes: “*Smelowskia bifurcata* Turcz. In alpe Nuchu-Daban ad torrentem Dschochoi legit Kuznetsoff. 1834” (KW! (2), LE! (6), M!, PRC!). Some labels are shortened to “In alpe Nuchu-Daban. 1834”; one specimen in KW holds both names: “*Smelowskia bifurcata* m. / *Smelowskia asplenifolia* m.” (Turczaninow’s hand).

Like in the above case of *Eutrema cordifolium*, the specimen cited by Ledebour should have been treated as holotype. However, no specimen from Ledebour’s collection was found, and a lectotype is proposed following Botschantzev’s choice (on the label).

As Turczaninow’s intention to apply both names (*bifurcata* and *asplenifolia*) to exactly the same taxon (known to him from the single gathering) is explicitly clear, the same specimen is also chosen as the lectotype for *Smelowskia asplenifolia* to keep both names attached to the same specimen.

***Lepidium calycinum*** Steph. ex Willd. 1800, Sp. Pl. 3 : 433. – *Smelowskia calycina* (Steph.) C.A. Mey. 1831, in Ledeb. Fl. Alt. 3 : 170.

Described from W Siberia (Altai): “in alpinibus Altaicis Sibiriae”.

Lectotype (hic designatus): “[Altai. Salesow?]” B-W 11809.1!

Other original material: “in alpinibus cor-gonensibus [s] [manus Pallasii?]”; “in monte Serbasiere Sabandie” [Shangin?]” (B-W 11809.2-3!); “*Lepidium calycinum*. 804. Sales[ow]. Sibi.[iria] (Herbarium Stephanianum)”; “*Bunias altaica* Schangin. Salesow. Altai”; “*Lepidium calycinum*. Ex Sibiria. Salesow. Remitt. M. Bieb.” (LE!).

Possible original material: “*Lepidium calycinum* Willd. Sp. Pl. Hab. in alpinibus Altaicis. Ibidem lectum [P.I. Shangin, 1786?] Dn. de Lindenthal misit 1787. Pott” (LE!).

Original material is suspected to include several gatherings. Among the two specimens from herbarium of Pallas in B-W, at least the first collection (and most likely the second as well) is that of P.I. Shangin (elder) who’s material Pallas has at his disposition (Borodin, 1908 : 139; Litwinow, 1909 : 344). The specimen from Pott’s herbarium most likely has the same origin. It is marked as “isotypus” but cannot be accepted as isoelectotype according to the present choice because it definitely could not be gathered by Zalesov (Salesow) who conducted collections in Altai after 1794 (Borodin, 1908 : 39) and from whom the rest of material originates. Although it is difficult to associate any of three labels in B-W with the certain specimen,

it is assumed that the first one designated as the lectotype is a part of Zalesov's collection because of considerable habitual similarity with at least two specimens in LE (the third Zalesov's specimen in LE [returned by Bieberstein] is too much damaged for the sound comparison). If this assumption is correct, relevant samples in LE should be treated as isolectotypes. The specimen from Stephan's herbarium was marked by Botschantzev as "typus" (in sched.), but material in B-W should have priority as being treated by the validating author. The plant 11809.4 represent *L. coronopifolium* Fisch. (correctly re-identified by Ledebour).

***Lepidium ceratocarpum*** Pall. 1773, Reise, 2 : 740, ahn. 112, tab. U. – *Thlaspi ceratocarpum* (Pall.) Murr. 1774, Novi Comment. Götting. 5 : 26.

Described from NE Kazakhstan: "in campis salsuginosis, inter stationem Belokamenskoi et fortalitiu Septempalatorum".

Lectotype (hic designatus): "*Thlaspi ceratocarpum* Nova species. [late June 1771, Pallas] Herb. Pallas" (BM, three plants in fruit).

Isolectotypes: "Sibiria. Pallas" (BM); "*Thlaspi ceratocarpum*. Pallas" (LE!).

Other original material: fig. "*Lepidium ceratocarpon*" (Pall. 1773, Reise, 2 : tab. U).

Meyer (2001, Hausknechtia, 8 : 24) has cited the "holotypus" as follows: "*Thlaspi ceratocarpum* Nova Species. Sibiria (BM)", combining the labels of both specimens in BM.

The plants from the specimen "*Lepidium Ceratocarpon*. Ex hortulo krasnojarensi" / "*Lepidium Ceratocarpon*. Itinerar. Vol. II. Culta krasnojari in hortulo e seminibus, lectis ad Irтин 1771 [manus Pallasii]" (LE!) most likely were grown in summer 1772 and obtained by Pallas upon his second visit to Krasnoyarsk in winter 1772/73. If so, the specimen is not a part of the original material as the 2<sup>nd</sup> volume of "Reise ..." was completed by Pallas during his first stay in Krasnoyarsk one year before. Because one of four plants on the lectotype sheet sharply differ from others by being in bloom (like the grown plants), it might represent not the type collection and thus is not treated as a part of the lectotype. This suspicion agrees with the protologue: "Semina sub finem Junii maximam partem jam matura, flores paucissimi superstites" (Pallas, l.c. : 740).

***Lepidium obtusum*** Basin. 1844, Bull. Acad. Sci. Pétersb. 2 : 203.

Described from Middle Asia: "in locis argilloso-salsis terrae Chivensium".

Lectotype (hic designatus) et 3 isolectotypes: "In locis argilloso-salsis terrae Chivensium leg. Basser d. 9 Sptmbr. 1842" (LE!).

***Raphanus strictus*** Fisch. ex Bieb. 1819, Fl. Taur.-Cauc. 3 : 452, in nota. – *Diptychocarpus strictus* (Fisch. ex Bieb.) Trautv. 1860, Bull. Soc. Nat. Mosc. 33, 1 : 108.

Described from NW Kazakhstan: "circa lacum Inderiensem, Tauscher".

Lectotype (hic designatus): "*Raphanus strictus* m. ad lac. Inderiensem [manus Fischeri] *Chorispermum Aitonianum* spectat. Remitte! [manus Biebersteinii]" (LE!).

Isolectotypes: "*Raphanus strictus* mihi. Inderskoie ozero" (KW!); "Lac. Inder. Tauscher"; "Tauscher. 20 ... [Apr.?] 1812"; "Inderskoe lake. Herb. Fisch." (LE!); "*Raphanus strictus* mihi. Ad lac. sals. Inderiensem desertum kirghisorum" (P!).

***Sisymbrium junceum*** (Willd.) Bieb. var. ***latifolium*** Korsh. 1898, Bull. Acad. Sci. Pétersb. 5 ser., 9, 5 : 412. – *S. polymorphum* (Murr.) Roth subsp. *latifolium* (Korsh.) D. German et Vesselova, 2009, Komarovia, 6, 2 : 82.

Described from Middle Asia: "Alaj: ad ostium fl. Katta-Karamuk, 25 Jun. (7 Jul.) 1895 fl.".

Lectotype (hic designatus): "310. *Sisymbrium junceum* MB. v. *latifolium* m. Alai, Katta-Karamuk mouth, weedy near the fields. 29/VI [18]95. Legit S. Korshinsky" (LE!, cum iso!).

***Sisymbrium salsugineum*** Pall. 1773, Reise, 2 : 740, 466, ahn. 114, tab. V. – *Thellungiella salsuginea* (Pall.) O.E. Schulz, 1924, in Engler, Pflanzenreich, 86 (4, 105) : 252. – *Eutrema salsugineum* (Pall.) Al-Shehbaz et S.I. Warwick, 2005, Harvard Pap. Bot. 10, 2 : 134.

Described from NE Kazakhstan (saline area along Irtysh): "circa lacus et lacunas sale praesertim amaro abundantes ad Irтин inter fortalitia Shelesenka et Jamyschewa".

Lectotype (hic designatus): "*Sisymbrium salsuginosum*. [Pallas, 29 May 1771]. Herb. Pallas. Herb. Fischer [manus Fischeri]" (LE!).

Other original material: fig. "*Sisymbrium salsuginosum*" (Pall. 1773, Reise, 2 : tab. V).

Since rather long time, it is considered that *S. salsugineum* is described "from saline lakeshores along Irtysh and from Baikal region" (Busch, 1939 : 76) which assumes that material collected not only by Pallas in 1771 but also by him or his co-travellers in 1772 was used for the description. Following this information, relevant gatherings from Baikal region



are often accepted as original material. For example, the specimen “in region Bargusinensis, Jul. 1772. Georgi and Lebedev” (MW) is being repeatedly cited as a syntype during last two decades (e. g., Al-Shehbaz & Warwick, 2005 : 134; Dorofeyev, 2002 : 111; German, 2002 : 36; Gubanov, 1993 : 61). However, the 2<sup>nd</sup> volume of “Reise ...” includes results of 1770–1771 years and not of East Siberian part of the trip (1772) which have been completed only in 1774 and published in 1776. Thus, East Siberian gatherings must be excluded from the original material on *S. salsugineum*.

Despite lacking the data on collection year/locality, the above specimen is chosen as the lectotype because it perfectly fits each detail of the figure (stems branched from the middle, distinctly acute leaves (including lower), stage of end of blooming/fruitletting, etc.). Besides, both image and lectotype label bear epithet “*salsuginosum*” which apparently was the initial intention of Pallas soon changed to “*salsugineum*”. To be noted, no Pallas’s *S. salsugineum* specimens were found in BM (Al-Shehbaz, pers. comm.).

There is one more specimen: “Herb. Pallas. Herb. Fischer” (LE!) which also was suspected to be collected in 1771 but because of having predominantly rounded leaves (except uppermost) and stems branched from the base (like in plants collected around Baikal in 1772 – M!, MW!), it obviously does not represent the type collection. The latter

collection was first cited by Georgi (1775 : 224) as “*Sisymbrium salsum* Pall.”.

***Smelowskia asplenifolia*** Turcz. 1842, Bull. Soc. Nat. Mosc. 15, 2 : 285.

Described from SE Siberia (E Sayan): “In alpe Nuchu-Daban ad torrentem Dschochoi satis rara”.

Lectotype (Botschantzev, in sched., “typus”; hic designatus [also for *Hutschinsia bifurcata* Turcz. ex Ledeb.]): “*Smelowskia asplenifolia* Turcz. In alpe Nuchu-Daban ad torrentem Dschochoi legit Kuznetsoff. 1834. Turcz.” (LE!).

The homotypic synonym of *Hutschinsia bifurcata* is lectotypified here by the same specimen as *H. bifurcata* (see above).

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