

# What happens to *Allium saxatile* M.Bieb. (Amaryllidaceae)? An unknown story of the well-known name

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**Abstract** The present lectotypification of the Caucasian endemic *Allium saxatile* M.Bieb. is found ineffective and falling outside the current concept of the species. The original collections of *A. saxatile* were destroyed during the Russian Civil War, and conservation of this name is suggested to avoid its lectotypification from remaining illustrations which belong to the Siberian species *A. stellerianum* and *A. rubens*. This conservation would also remove the illegitimacy of *A. saxatile* M.Bieb. caused by homonymy with the overlooked earlier name *A. saxatile* Pall. The original material of *A. caucasicum* is identified and discussed, and the name is typified with an illustration referable to *A. globosum*. Two near-homonyms of *A. caucasicum*, the originally heterotypic *A. caucaseum* and *A. caucasium* are uncovered, and their identity with *A. globosum* is ascertained.

**Keywords** *Allium* sect. *Oreiprason*; Bieberstein; Caucasus; lectotypification

## ■ INTRODUCTION

The ongoing taxonomic revision of the *Allium saxatile* M.Bieb. complex (*A.* sect. *Oreiprason* F.Herm., Amaryllidaceae) revealed that this group consists of no less than 16 closely related species (Seregin & al., 2015) which have been poorly distinguished in the past. This group is represented in the Balkans and Italy (Stearn, 1980) but is especially diverse in the former U.S.S.R. (Czerepanov, 1995) with an extension to northwestern China (Xu & Kamelin, 2000). Among its members, *A. saxatile* s.str., the type of *A.* sect. *Oreiprason*, is endemic to the Caucasus (Kudryashova, 2006). This species, described first in the group, served the basis for subsequent comparisons, and its circumscriptions, in various works, included nearly all the related taxa recognized subsequently (Seregin, 2012). One critical case, the valid publication of *A. savranicum* (Nyman) Oxner, was discussed earlier (Sennikov & Seregin, 2014). The original material and typifications of *A. saxatile* and its synonyms are considered in the present contribution.

## ■ THE EARLY HISTORY OF *ALLIUM SAXATILE* M.BIEB.

*Allium saxatile* was among the first species described by Freiherr (Baron) Friedrich Marschall von Bieberstein after he moved from his native Duchy of Württemberg (now southwestern Germany) to the Russian service and settled permanently in the Russian Empire. This species was discovered when

Bieberstein took part in the Persian expedition of Catherine the Great under the command of Count Valerian Zubov (Lipschitz, 1947). According to the protologue of *A. saxatile*, the species was collected “in abruptis sterilissimus circa Kurt-Bulak”, formerly a mountain pasture on the northern side of the Great Caucasus, located closely to its main watershed. By that time the place belonged to the Shirvan Khanate (Fig. 1), while nowadays it is situated in the Xızı District of Azerbaijan. The Russian troops arrived to Kurt-Bulak on “21” June 1796 (Butkov, 1869), that is 10 June in the Gregorian calendar, and Bieberstein mentioned in his travel diary that he stayed at this place “[second] part of the month of June and almost the whole of July” (Marschall von Bieberstein, 1800: 32), meaning approximately until 20 July in the Gregorian calendar. Petrov (1940), who had done a special effort to study this historical locality in person, speculated that *A. saxatile* was most likely collected from open plateau-like slopes on the southeastern side of Mt. Dübrar (ca. 40.89° N, 48.87° E, alt. 1850–1900 m a.s.l.; Fig. 2). According to Petrov, this pasture area, once an attractive place for large cavalry camping, was destroyed on purpose (to prevent further accommodation of the Russian army) already in the end of 18th century, and then turned into fields.

Marschall von Bieberstein (1798) provided a brief diagnosis of the new *A. saxatile*, which is far from the modern standards of descriptive morphology of *Allium*. Sketchy as it is, Bieberstein’s diagnosis corresponds well to the polynomial *Cepa scapo nudo tereti inani* borrowed from Gmelin (1747) and included in the protologue of *A. saxatile*. Although Gmelin’s plants were collected in Siberia, far outside the area

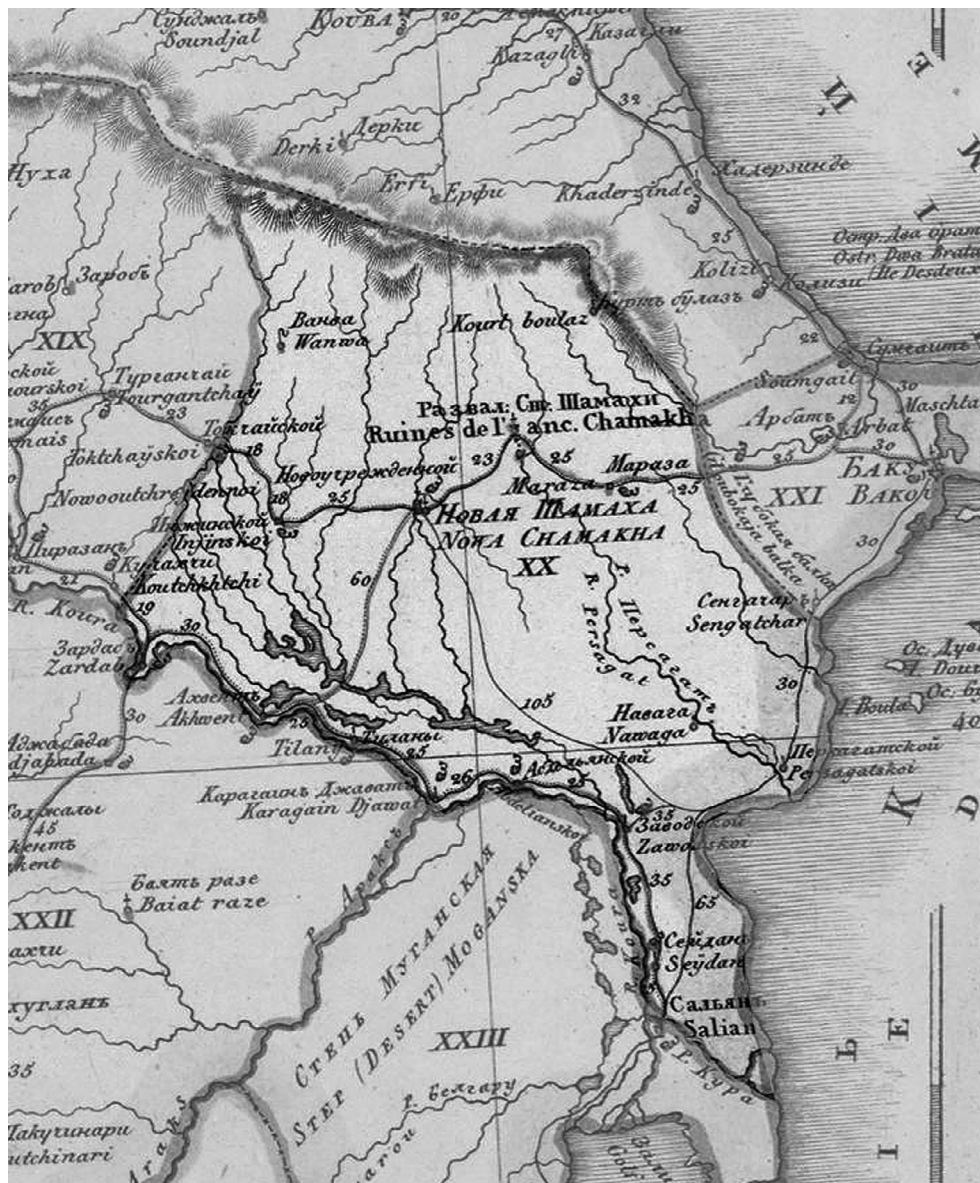
of *A. saxatile* s.str., side-by-side comparison of descriptions in Gmelin (1747) and Marschall von Bieberstein (1798) shows their large congruence (Table 1).

This comparison demonstrates a good match of Gmelin’s description and illustrations, cited by Bieberstein, with the validating diagnosis of *A. saxatile*. According to Art. 9.3 of the ICN (McNeill & al., 2012), the illustrations in Gmelin (1747) should be regarded as part of the original material of *A. saxatile*.

As Gmelin’s *Cepa scapo nudo tereti inani* was collected in Siberia and Bieberstein’s species was described from the Caucasus, one may suspect a taxonomic distinction between the two. Indeed, one year after Bieberstein published *A. saxatile* the illustrations of *Cepa scapo nudo tereti inani* (Fig. 3) became part of the original material of *A. stellerianum* Willd., a Siberian species of *A. sect. Rhizirideum* G.Don ex W.D.J.Koch. This identity was subsequently confirmed by Ledebour (1841). We agree that the plants portrayed by Gmelin definitely belong to

that section because of their deciduous bipartite or tripartite spathe and obtuse tepals, and not to *A. sect. Oreiprason* of which *A. saxatile* is the type.

Gmelin (1747) specified that his species had “whitish” flowers (“floribus e viridi albenibus”), and this feature corresponds to the yellowish-flowered *A. stellerianum* s.str. occurring in central Siberia and Mongolia (Friesen, 1987). Nevertheless, he reported the species also from localities in south-western Siberia and neighbouring Kazakhstan which correspond to the distribution area of the closely related *A. rubens* Schrad. ex Willd. with pink flowers (Friesen, 1987). Among the two drawings in Gmelin (1747), figure 2 with white-looking flowers (“varietas mediocris” of Gmelin) is correctly *A. stellerianum*, whereas figure 1 with dark-looking flowers (“varietas maxima” of Gmelin) is *A. rubens*. Both illustrations belong to the original material of *A. saxatile* because the colour of tepals was not specified in its validating diagnosis.



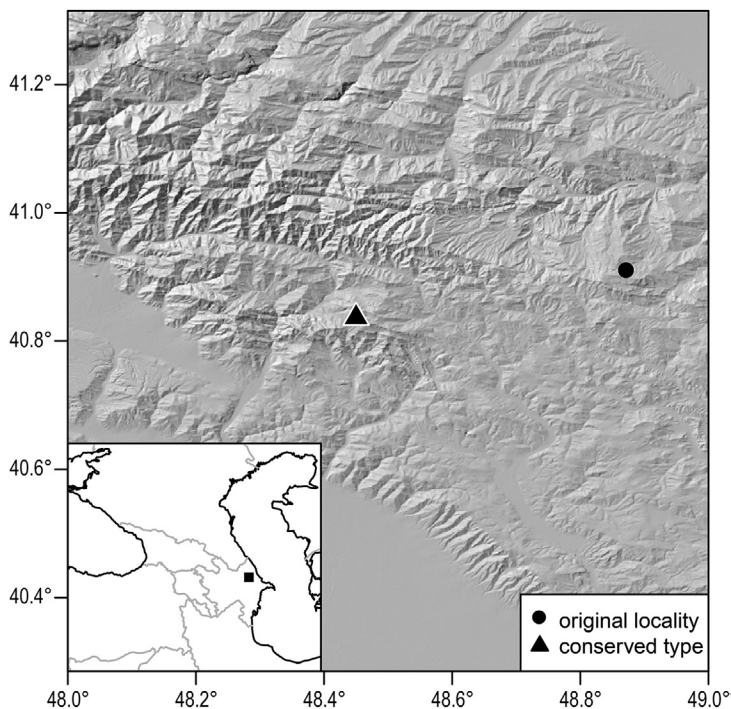
**Fig. 1.** Historical map of the Shirvan khanate, showing the location of Kurt-Bulak (misspelt as “Kourt boulaz”). Source: Pyadyshev (1823: map 45, general map of Georgia).

**Table 1.** Comparison of diagnostic morphological characters of *Allium saxatile* in Marschall von Bieberstein (1798) against those of *Cepa scapo nudo tereti inani* in Gmelin (1747).

	<i>Allium saxatile</i>		<i>Cepa scapo nudo tereti inani</i>
	Diagnosis	Description	Illustrations
Stem	scapo nudo tereti	scapo nudo tereti	stem cylindrical, leafy at the base only
Leaves	foliis semiteretibus	foliis semicylindricis	leaves cylindrical
Spathe	spatha bivalvi brevi	spatha in dias, raro tres partes dehiscente	spathe not visible, apparently deciduous
Stamens	staminibus subulatis corolla longioribus	staminibus ... subulatis	stamens long exerted

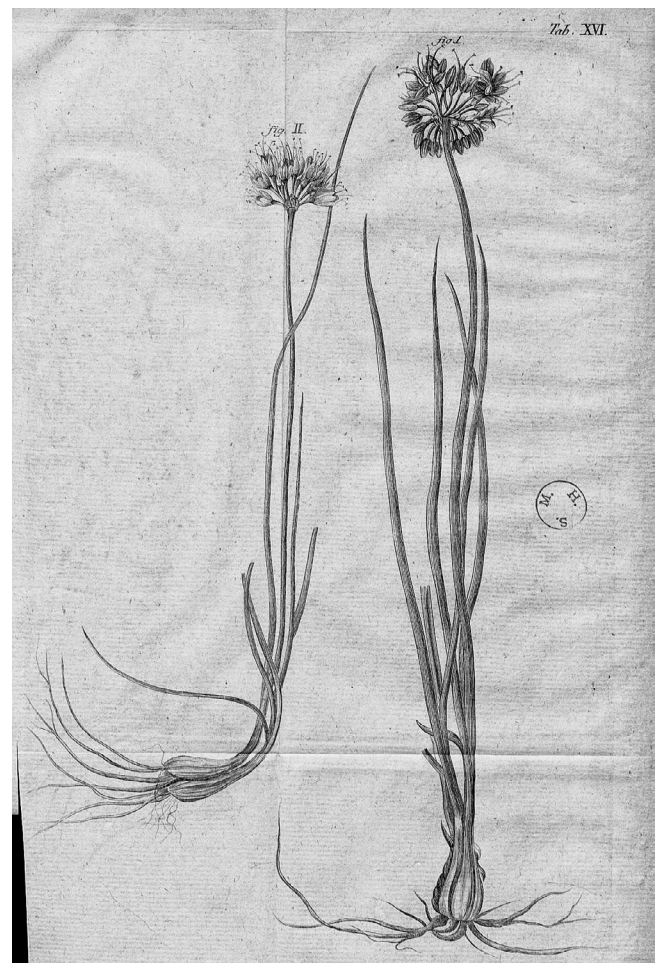
Later Marschall von Bieberstein (1800) reproduced the protologue of *A. saxatile* but added a note that, besides the Caucasian occurrence, this species is also common in the Crimea where it is different in the colour of tepals (constantly white with the green midvein vs. the midvein exclusively purplish in the Caucasian plants). With this range extension he combined two species that are currently accepted: the Caucasian *A. saxatile* and *A. marschallianum* Vved., the latter being a later described species endemic to the Crimea.

In his fundamental *Flora taurico-caucasica* Marschall von Bieberstein (1808) retained this treatment but indicated that he considered the Caucasian plants as a variant of the Crimean species, probably because he was already more familiar with the Crimean plants. At the same time, Bieberstein compared *A. saxatile* with *A. stellerianum*, an obvious hint that he noticed Willdenow's accommodation of Gmelin's illustrations which he stated to differ from *A. saxatile* in a shorter spathe.

**Fig. 2.** Important localities of *Allium saxatile* M.Bieb.: the original locality (Bieberstein, 1798) and the provenance of the new type collection.

## ■ THE SEPARATION OF THE CRIMEAN AND CAUCASIAN SPECIES

Later Marschall von Bieberstein (1819) separated the pinkish-flowered Caucasian plants of the expanded *A. saxatile* to the new species *A. caucasicum* M.Bieb., leaving the white-flowered Crimean plants under the misapplied name *A. saxatile*. As Bieberstein referred in the protologue of *A. caucasicum* to “*A. saxatilis* varietas *caucasica*” in Marschall von Bieberstein (1800), this reference, although congruent with the original

**Fig. 3.** The illustrations of *Cepa scapo nudo tereti inani* from Gmelin (1747: Tab. XVI). Courtesy of the Göttingen State and University Library.

circumscription of *A. saxatile* as the Caucasian species, does not qualify for citation of the name itself or its type as specified in Art. 52.2. In the detailed treatment of *Allium* in *Flora of the USSR* (Vvedensky, 1935) the Crimean species received its current name *A. marschallianum* that was based on the description of *A. saxatile* published in *Flora taurico-caucasica* in 1808.

While separating the pinkish-flowered plants from the whitish-flowered ones, Marschall von Bieberstein (1819) included a few earlier discordant elements into the original concept of *A. caucasicum*. That was two synonyms, *A. paniculatum* auct. (Ker Gawler, 1806) and *A. caucaseum* Ker Gawl. nom. illeg. Because of the deeply purplish acute tepals described in the protologues, both *A. caucasicum* and *A. caucaseum* belong to the same purple-flowered morphotype of the Caucasian species whose name is currently *A. saxatile* (Seregin & al., 2015).

Besides the illustration of “*A. paniculatum*”, at least three gatherings formed the original material of *A. caucasicum*. First, the original collection of *A. saxatile* was included by the reference to “in collibus saxosis Caucasi orientalis” and the citation of the “purplish-flowered variety” of the formerly broadened *A. saxatile*. Two other gatherings, indicated as “postmodum etiam in Iberiâ, pari situ, inter Tiflin et Mtschet lectum”, may have been collected between Tbilisi and Mtskheta in Georgia by Christian Steven in 1805 or 1810 (Shkhiyan, 1967).

### ■ THE IDENTITY OF *ALLIUM CAUCASEUM* KER GAWL.

The protologue of *Allium caucaseum* is composed of three short notes that provided critical comments on the account of *A. paniculatum* L. in Ker Gawler (1806), all placed under a single heading and signed separately by Ker Gawler (1808). The first note introduced the new species with its description and a mention of the only specimen that was sent by Bieberstein to Sir Joseph Banks. Then the discussion about a specimen in Herbarium Banks followed. That specimen was received from Bieberstein under the name *A. globosum* and was supposed to be a true representative of *A. globosum* in the sense of Bieberstein, whereas the species described as *A. globosum* in Redouté (1807) and also based on the material received via Bieberstein was said to be completely different. Ker Gawler identified Bieberstein’s specimen of *A. globosum* as “indistinguishable from *A. sphaerocephalon* L.” The third note provided the provenance of the species, said to be “native of Tartary; found on Mount Caucasus by M. von Bieberstein” and misidentified earlier as *A. paniculatum*.

The specimen sent to Banks (BM barcode BM001125156) and mentioned as a voucher of *A. globosum* sensu Bieberstein (Ker Gawler, 1808) was collected by Johann Friedrich Adams who was a naturalist in expeditions to the Caucasus led by Count Apollon Mussin-Pushkin during the years 1800–1803 (Lipschitz, 1947). Our study of this specimen revealed that it is a mixture of fragments belonging to three different species: the left-hand inflorescence and the bulb belong to *A. atroviolaceum* Boiss., the inflorescence in the middle is *A. rotundum* L. s.l., and the stems lacking leaves and bulbs in the right part of the specimen

could not be identified with confidence. Both identified taxa are from *A.* subg. *Allium*, whereas *A. globosum* is from *A.* subg. *Polyprason* Radić. As evident from the comments of Ker Gawler (1808), he misidentified the fragments of *A. atroviolaceum* and the closely related *A. rotundum* for *A. sphaerocephalon*, and consequently mistook it for the intended *A. globosum* of Bieberstein. This error was the reason for *A. caucaseum* to substitute the “incorrect” *A. globosum* of Candolle.

Ker Gawler (1808) apparently had a broad view on the circumscription of *A. caucaseum* because he mentioned that “we have seen a pale-flowered variety of the present [species]”. Following this observation, he had subsequently synonymized also the pinkish-flowered *A. saxatile* M.Bieb. with his darker-flowered new species (Ker Gawler, 1817), thus anticipating our amended circumscription of the species (Seregin & al., 2015).

Since the protologue of *A. caucaseum* included a citation of the earlier legitimate name *A. globosum* DC., the name *A. caucaseum* is superfluous and illegitimate (Art. 52.1) and is automatically typified by the type of *A. globosum* under Art. 7.5. The only specimen mentioned in the protologue of *A. caucaseum* was said to have been sent by Bieberstein to Banks (Ker Gawler, 1808). Most probably it is a specimen at BM (barcode BM001125155) collected by Musin-Pushkin and labelled “*Allium paniculatum*”. Its identity is uncertain because of the loss of generative parts.

Looking through the old literature, we discovered another relevant name, *A. caucasium* Poir., which was commonly overlooked by recorders and monographers. This name was solely based on the treatment of *A. globosum* in Marschall von Bieberstein (1808) and was introduced because Poirét (1810) followed the idea of Ker Gawler (1808) that the plants described by Augustin Pyrame de Candolle (Redouté, 1807) and Bieberstein were taxonomically different. Unlike Ker Gawler, Poirét correctly recognized the priority of Redouté’s publication.

### ■ THE TYPIFICATION OF *ALLIUM SAXATILE* M.BIEB.

Attempting to lectotypify the name *A. saxatile*, Kudryashova (2006) reported that she discovered no material named *A. saxatile* in Bieberstein’s private herbarium that was purchased by the Russian Academy of Sciences for the Botanical Museum and eventually became part of collections of the Komarov Botanical Institute (LE). However, Bieberstein is known for changing plant names on his labels when he felt the need to (e.g., Sramkó & al., 2012), and the original material of *A. saxatile* should consequently be sought for under the later name accepted by Bieberstein, *A. caucasicum*.

Our search for the material relevant to the typification of *A. saxatile* and *A. caucasicum* uncovered two specimens at LE but none at H where the private herbarium of Christian von Steven (1781–1863), a close collaborator of Bieberstein, is housed. Nothing was found also at B, where a number of specimens sent by Bieberstein to Willdenow are preserved. One specimen at LE was identified as *A. caucasicum* and filed in the separate collection of Bieberstein, but its label, with a mere

note “Caucas[us]” denoting the origin, is not in Bieberstein’s or Steven’s hand and probably came from Christian Wilhelms who actively collected in the North Caucasus in 1809–1826 (Lipsky, 1899). The second specimen at LE, which was labelled “ex herbario Marschall Bieberstein” by curators, has the label saying “*A. caucasicum* Tiflis” but written at the turn of 19th and 20th centuries. This plant, collected in autumn condition, may be part of an unspecified Steven’s gathering but is unlikely of any value to typification of the name because of lacking the floral characters on which the description of *A. caucasicum* was largely based.

Since the specimens on which Bieberstein based his *A. saxatile* were not located, Kudryashova (2006: 141) designated both Gmelin’s illustrations (portraying different plants) as the lectotype of this name. This disruptive choice is not effective as it is contrary to Art. 9.2, which requires the selection of a single illustration. These illustrations are still the only original material of *A. saxatile* known to date, thus being mandatory in lectotypification. However, the empty folder of *A. caucasicum* in the herbarium of Bieberstein at LE, once complete and “intact” (Lipsky, 1899: 146), indicates the former existence of Bieberstein’s specimens. A further examination of Bieberstein’s collection revealed that a number of other specimens of *Allium* are missing, too. The corresponding folders bear pencil annotations saying that the specimens were extracted for preparation of “Flora caucasica critica”, an ambitious project initiated by Prof. Nikolai Kuznetsov (by that time at the University of Yuriev, now Tartu) and started with publishing in 1901 but left unfinished because of the First World War. The treatment of Liliaceae s.l. had to be prepared by Pavel Mischenko, then Keeper of the Herbarium of the University of Yuriev (now TU); printing of this treatment was stopped on the first page of the account of *Allium* (Mischenko, 1912–1913).

Regrettably we do not know the fate of the *Allium* manuscript written by Mischenko, but the bad fortune of the collections once possessed by Kuznetsov and his collaborators is documented. During the year of 1915, when the German army threatened and finally entered the Baltic provinces of the Russian Empire, Imperial Universities and first of all their most valuable property (machinery, devices and collections), as well as mostly the Russian-speaking staff, were hastily evacuated from the present-day Latvia and Estonia eastwards, close to the Urals. The possessions of the University of Yuriev were destined to Perm but finally settled in Voronezh, and have been subsequently used in the foundation of the Voronezh State University in 1918 (Karpachev, 2003). Many university professors hesitated and resisted to move east and change the famous *Alma mater* for the dubious adventure in establishing new teaching and research facilities in the place where proper resources and a demand for high education were presumably lacking (Taranovsky, 1916). Deprived of his collections, Kuznetsov stopped the Caucasian project and accepted the position of the Director of the Nikita Botanical Garden in the Crimea in 1915. No more than a quarter of the collections evacuated from TU were recovered in Voronezh and dispatched to the Komarov Botanical Institute in 1930s, to be partly repatriated to Tartu in the 1950s (Fedotova, 2007). The remaining part, including

Bieberstein’s specimens of *Allium*, have virtually been lost in the turmoil of the Russian Civil War and the following years of the early Soviet administrative chaos.

## ■ THREATS TO THE ESTABLISHED NAMES

Although the intended application of the names *A. saxatile* and *A. caucasicum*, determined by original descriptions and localities, is undoubtedly certain, the loss of the herbarium collections, on which the names were based, makes the discordant illustrations the only option in lectotype designation. Following a strict application of the rules, by lectotypification the name *A. saxatile* should go to the synonymy of *A. stellerianum* or *A. rubens*; and the unused names *A. caucaseum*, *A. caucasium* and *A. caucasicum* should go to the synonymy of *A. globosum*.

Because of rendering *A. saxatile* to the synonymy of the species of *A. sect. Rhizirideum*, the section name *A. sect. Oreiprason* will be replaced by its current synonym *A. sect. Petroprason* F.Herm. (Friesen & al., 2006).

*Allium saxatile* s.str. was described again as *A. ruprechtii* Boiss. from Tsey, the present-day North Ossetian Nature Reserve, Russia. Boissier (1882) originally assigned his new species to the unranked group “*Codonoprasa*” that corresponded to a large part of *A. subg. Allium*, and compared it to the superficially similar but unrelated *A. schoenoprasum* L. It was the absence of the bulb in the only original specimen of *A. ruprechtii* that obscured its correct identity. Furthermore, this name was largely misapplied in the 20th century for a yet undescribed race of *A. saxatile* s.l. from the alpine belt of the West Caucasus (e.g., Grossheim, 1928, 1940; Galushko, 1978) until it was justifiably synonymized with *A. saxatile* s.str. by Kudryashova (1988). Now *A. ruprechtii* becomes correct for the white-flowered morphotype of this species, should it be resurrected again as a species of its own.

Besides the loss of the original collection of *A. saxatile* M.Bieb., this name, though unanimously accepted, is threatened by an obscure earlier homonym, the superfluous and illegitimate *A. saxatile* Pall. The latter name was coined and published by Peter Simon Pallas on the belief that this would have been a more apt substitute for his earlier *A. altaicum* Pall. Pallas introduced this substitute as part of the formula “*Allium altaicum* oder besser *saxatile*” (Pallas, 1776: 293) that leaves room for interpretation whether the new name was accepted by Pallas or proposed provisionally. These doubts notwithstanding, *A. saxatile* Pall. was subsequently accepted in the letters of Johann Sievers (1762–1795) from his ill-fated travels to Siberia, which were posthumously edited and published by Pallas. This work, in which the name is accepted and appears as “*A. saxatile* P.” (Sievers, 1796: 221), still predates Bieberstein’s publication of *A. saxatile*, making the latter name illegitimate as a later homonym. The mention of “P.” after the plant name unambiguously constitutes an indirect reference to Pallas (1776) under Art. 38.14 (with Ex. 21).

In order to protect the established nomenclature, the name *A. saxatile* M.Bieb. is proposed for conservation with

a new type against its earlier homonym *A. saxatile* Pall. (Seregin & Sennikov, 2015). The gathering proposed as the conserved type was collected in 40 km from the original locality of *A. saxatile* at the same altitudes (Fig. 2); the proximity to the original locality was preferred to link this name with East Caucasian populations of the species and to avoid the effect of geographic variation in DNA sequences.

## ■ NOMENCLATURAL SUMMARY

*Allium saxatile* M.Bieb., Tabl. Prov. Mer Casp.: 114. 1798, nom. cons. prop., non Pall. 1776 ≡ *Allium stevenii* var. *saxatile* [M.Bieb.] Regel in Bull. Soc. Imp. Naturalistes Moscou 41: 449. 1868 ≡ *Allium globosum* var. *saxatile* [M.Bieb.] Nyman, Consp. Fl. Eur.: 741. 1882 – Type cons. prop.: Azerbaijan. İsmayılı District: vicinity of Lahic Town, above the forest belt, alt. 1800–2000 m a.s.l., 3 Sep 1982, *E. Nikolaev* 234 (LE!).

= *Allium ruprechtii* Boiss., Fl. Orient. 5: 264. 1882 – Holotype: Russia. Northern Ossetia: “ad moles glaciales Zei”, *F. Ruprecht s.n.* (G-Boiss [photo!]).

*Allium saxatile* var. *globosum* (M.Bieb. ex DC.) Seregin & Sennikov, **comb. & stat. nov.** ≡ *Allium globosum* M.Bieb. ex DC. in Redouté, Liliac.: ad t. 179. 1807; M.Bieb., Fl. Taur.-Caucas. 1: 262. Jan 1808 ≡ *Allium caucaseum* Ker Gawl. in Bot. Mag. 28: ad pl. 1143. Oct 1808, nom. illeg. (Art. 52.1) ≡ *Allium caucasicum* Poir. in Lamarck, Encycl. Suppl. 1: 273. 1810 – Neotype (designated by Kudryashova, 2006: 142 as “lectotype” for *A. globosum*) and **Lectotype (designated here for *A. caucasicum*)**: Russia. “Ex Caucaso rutheno”, s.d., *Bieberstein s.n.* (LE!).

= *Allium caucasicum* M.Bieb., Fl. Taur.-Caucas. 3: 258. 1819 – **Lectotype (designated here)**: [illustration] “*Allium paniculatum*. Rose-Coloured Garlic.” in Bot. Mag. 25: pl. 973. 1806.

= *Allium gmelinianum* Grossh., Fl. Kavkaza 1: 209. 1928 – **Lectotype (designated here)**: Russia. Stavropol Region: Nevinnomyssk Town, 24 Jun 1890, *V. Lipsky s.n.* (LE!).

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