



Lectotypification of *Saxifraga yuparensis* Nosaka (Saxifragaceae)

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We discussed the typification of the name *Saxifraga yuparensis* applicable to an alpine plant described from Hokkaido, northern Japan. The holotype is not found in the cited herbarium and other herbaria related to Nosaka. No isotypes or paratypes were cited in its protologue, and no other uncited specimens are unambiguously deduced to have been used by Nosaka when describing the species and do not comprise the original material (Art. 9.4 of the Botanical Code). Therefore, an illustration (Fig. 11 in Nosaka 1974) published as part of the protologue is the only original material that can be chosen in lectotype designation in conformity with Art. 9.12. The illustration is here designated as the lectotype for the name.

Keywords: illustration, Japan, lectotype, nomenclature, original material, *Saxifraga*, typification

Saxifraga yuparensis Nosaka (1974: 149) (sect. *Bronchiales* DeChaine (2014: 27), Saxifragaceae Jussieu (1789: 308)) is endemic to a scree slope of greenschist debris at Gama-iwa point of Mt. Yubari in Hokkaido, Japan (Shimizu 1983, Sato 2007). The species grows in two extremely small patches (0.3 x 0.2 m and 0.5 x 1.5 m) being located only ca. 5 m away from each other (Tamura *et al.* 2018), and it is designated as a critically endangered species in Japan (Ministry of the environment of Japan 2020). *Saxifraga yuparensis* has undergone several taxonomic treatments based on morphology: namely, a hybrid derived from *S. rebunshirensis* (Engler & Irmscher) Siplivinsky (1971: 155) and *S. nishidae* Miyabe & Kudô (1917: 170) (Toyokuni 1988, Nishikawa *et al.* 1992, Iwatsuki & Kato 1994, Umezawa 2004, Shimizu *et al.* 2014, Takahashi 2015), a synonym or variety of *S. rebunshirensis* (Barkarov 2009, Takahashi 2015) and a variety of *S. bronchialis* Linnaeus (1753, 400) subsp. *funstonii* (Small) Hultén (1929: 12). These taxonomic treatments were reexamined based on molecular, morphological, and cytological evidences and the status as an independent species was supported (Tamura *et al.* 2018).

Nosaka (1974) monographed the flora of Mt. Yubari, where *S. yuparensis* was described, designating the specimen “SAP No. 031075” as the holotype without his own collection number. The specimen, however, is not found at SAP (Graduate School of Science, Hokkaido University). SAP holds mainly algae specimens at present but also held vascular plant specimens until 2004. Currently, vascular plant specimens including types at SAP were transferred to SAPS (Hokkaido University Museum), which specifically stores vascular plant specimens, however, the specimen “SAP No. 031075” was not found at SAPS.

There are two specimens of *S. yuparensis* collected from the type locality by Nosaka in 1973, the previous year from the publication, which are numbered “SAP No. 031584” and “SAP No. 031585” (these are numbered SAPS 061731 and SAPS 061730 respectively this time). These specimens had only fruits but no flowers and were morphologically distinct from the flowering plant of the holotype shown in the illustration of the original description (Fig. 11 in Nosaka 1974; Fig. 1A). The possibility that the illustrated individual was erroneously mounted on the sheet of “SAP No. 031584” or “SAP No. 031585” collected by Nosaka was denied.

Nosaka (1974) noted that “Detailed discussion will be given in the author’s another paper”. Although he published an article on *Saxifraga* of Hokkaido (Nosaka 1980), no information about the holotype was given. We searched the holotype in the other herbarium for vascular plants in the same university SAPT (Hokkaido University Botanic Garden; Note that the acronym SAPT were previously applied to the collection of former Faculty of Agriculture of Hokkaido University, that are now stored in SAPS), and the herbaria Nosaka curated after he described the species (Horie 2015), AICH (Aichi Kyoiku University) and the Rakuno Gakuen University herbarium, but we did not find the specimen there. According to K. Horie, a disciple of Nosaka, Nosaka did not store his specimens in his house (personal communication, 30 April, 2017). We further contacted SHIN (Shinshu University) and KANA (Kanazawa University), considering the possibility of specimen loan to them. When *S. yuparensis* was recombined as *S. bronchialis* Linnaeus subsp. *funstonii* (Small) Hultén var. *yuparensis* (Nosaka) T. Shimizu (1983: 356), the author T. Shimizu, who belonged to Shinshu and Kanazawa University, might have examined the holotype. SHIN and KANA, however, do not hold the haplotype. Therefore, we concluded that the holotype of *S. yuparensis* was lost.

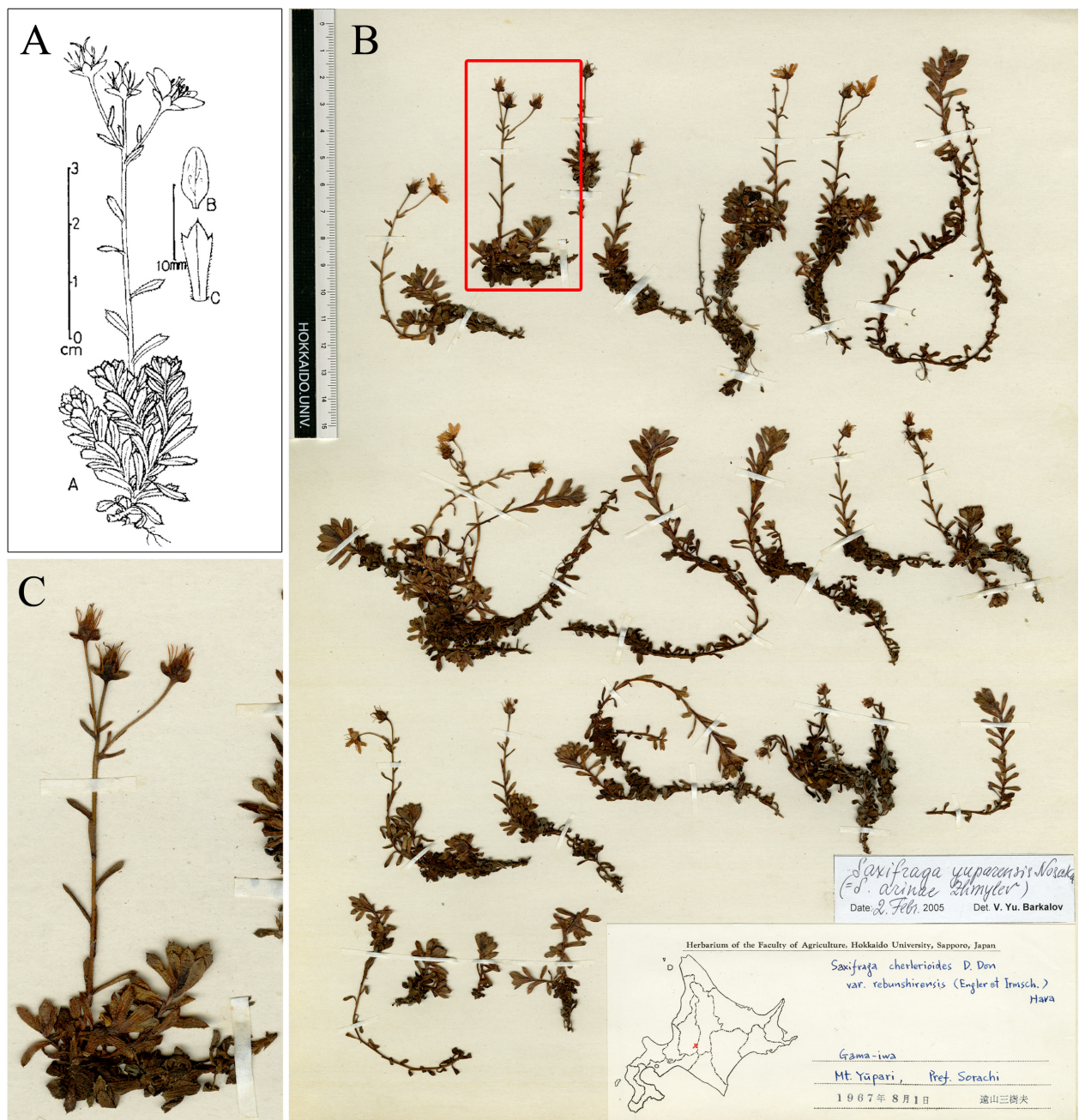


FIGURE 1. The illustration of *Saxifraga yuparensis* in the protologue of Nosaka (A: Fig.11 in 1974), the specimen of Tohyama *s.n.* (SAPS 061729) (B), and a plant on the sheet (C).

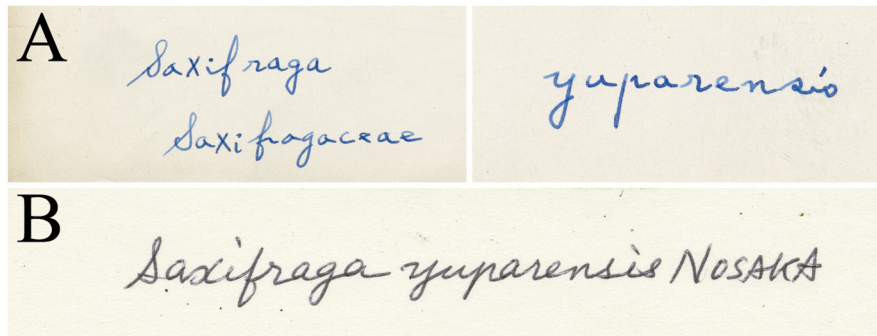


FIGURE 2. Handwritings of “*Saxifraga yuparensis*” on the species cover of Tohyama *s.n.* (SAPS 061729) (A) and the specimen label of Nosaka’s collection (SAP 031585) (B).

In the protologue of Nosaka (1974), no isotypes or paratypes were cited. The above-mentioned two specimens “SAP No. 031584” (SAPS 061731) and “SAP No. 031585” (SAPS 061731) which Nosaka collected in 1973 were probably not used in describing the species, because Nosaka (1974) monographed the flora based on his explorations during the years from 1954 to 1969, as thereto mentioned. Therefore, his collections “SAP No. 031584” and “SAP No. 031585” do not comprise the original materials as defined in Art. 9.4 of the *International Code of Nomenclature for algae, fungi, and plants* (Turland *et al.* 2018).

It is notable that a specimen in SAPS (*M. Tohyama s.n.*, 1 Aug. 1967; Fig. 1B) has a plant looks similar to the illustration of *Saxifraga yuparensis* in the protologue (Nosaka 1974; Fig. 1A). The specimen is labeled “*Saxifraga cherlerioides* D. Don var. *rebunshirensis* (Engler et Irmsch.) Hara” and annotated as “*Saxifraga yuparensis* Nosaka” by V. Yu. Barkalov in 2005. Both the plants in the illustration and the specimen Tohyama *s.n.* have the same numbers of flowers and leaves on the similar positions of the flowering stem; however, the plant of the specimen has no petals (Fig. 1C) while one flower in the illustration has petals (Fig. 1A). Thus it was not proved that the illustration was based on the specimen Tohyama *s.n.* The species cover in which only the specimen Tohyama *s.n.* was placed has handwritings “*Saxifraga yuparensis*, Saxifragaceae” (Fig. 2A). If the handwritings are made by Nosaka, the specimen is considered to have been used in describing the species and considered as the original material. However, it does not match his handwritings on a specimen label (Fig. 2B) in the stroke order of “x” and the stroke direction of superscript dot of “i”. Thus it is not supported that the handwritings on the species cover is made by Nosaka. Last, but very importantly, the specimen Tohyama *s.n.* had no herbarium number while the holotype should be numbered as “SAP No. 031075” (the specimen Tohyama *s.n.* was numbered SAPS 061729 this time). Therefore, there is no proof that the specimen Tohyama *s.n.* was used by Nosaka in describing *S. yuparensis* and it does not comprise the original material.

Accordingly, the illustration with analysis in the protologue of Nosaka (1974; Fig. 1A) is the only original material that can be chosen in lectotypification in conformity with Art. 9.4(b). We hereto designate the illustration as the lectotype for the name.

Typification of names

Saxifraga yuparensis Nosaka (1974: 149–150) = *S. bronchialis* L. subsp. *funstonii* (Small) Hultén var. *yuparensis* (Nosaka) T. Shimizu (1983: 356)

Lectotype (**designated here**): [icon] in Nosaka, J. Fac. Sci. Hokkaido Univ. Ser. 5 Bot. 9 (2) (1974: 150, Fig. 11)

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