Allium schoenoprasum subsp. *sibiricum* (L.) Richter in Central and Northern Europe

Crop wild relative case study by Z. Stehno[1], M. Scholten[2], J. Labokas[3], Å. Asdal[4] and I. Chukhina[5]

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The importance of *Allium schoenoprasum* L. as a crop wild relative

***Allium schoenoprasum* L.**, or chive, is the most widespread *Allium* ranging from Europe, northern central and eastern Asia to North America.
Cultivated in many countries of temperate to cool-temperate zones of the Northern hemisphere, mostly in house-gardens, more recently also on commercial scale.
Chives have been cultivated in Europe since the early Middle Ages. Domestication apparently first took place in North Italy but the species has been taken into cultivation several times, in different places and from different wild provenances. It escapes from cultivation and frequently naturalizes.

Biology

Perennial, herb. Early summer flowering, starting from second year. Typical pollinators – bees, bumblebees, wasps and syrphids. On rocky slopes periodically irrigated by defluent water.

Taxonomy of the subtaxon

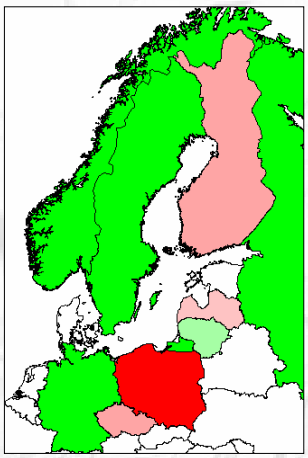
In the Flora Europaea (Tutin *et al*. 1980) *A. schoenoprasum* L. is described as very variable and plastic. Many variants within the species have been described, the most distinct of these a robust, arctic-montane taxon, sometimes distinguished as var. *alpinum* DC., var. *sibiricum* (L.) Gracke or subsp. *sibiricum* (L.) Čelak. It is doubtful if this taxon is identical with *A. sibiricum* L. of Siberia.

Molecular genetic analysis

More recently *A. schoenoprasum* subtaxa have been informally grouped in morphotypes according to growth types (Friesen 1996). Morphotype C, a robust variant which is distributed mainly in mountains within the entire area of *A. schoenoprasum* L. has been named *A. schoenoprasum* subsp. *sibiricum* (L.) Richter, *A. sibiricum* L. or *Allium schoenoprasum* var. *alpinum* (DC.) .

Friesen (2000) raises three main points against distinguishing intraspecific taxa of *A. schoenoprasum*: 1) extensive availability of intermediate forms; 2) morphotypes can not be linked to any geographic locations; 3) all of morphological differences are quantitative.

Random amplified polymorphic DNA (RAPD) analysis was used to study the phylogenetic relationships between species in *Allium* section *Schoenoprasum*. The analysis clearly distinguishes the species of section *Schoenoprasum*. The accessions of *A. schoenoprasum* showed a clear differentiation between an Asian and European subgroup. Within the European accessions, a Scandinavian group and an Eastern European group occur. However, the informally described morphological type C of *A. schoenoprasum* could not be confirmed by RAPD analysis but represent recurrent ecological adaptations (Friesen, 2002).



Red Listing of *Allium schoenoprasum* subsp. *sibiricum*

Green:	Not threatened (LC)
Red:	Threatened (VU)
Salmon:	Near Threatened (NT) or Rare

For Germany *A. schoenoprasum* subsp. *alpinum* DC. is shown.

Regional approaches to taxonomy and threat assessments

Norway: sibirgraslauk

Norwegian botanists distinguish between two subspecies; *A. schoenoprasum* subsp. *schoenoprasum* which is the common chive widely distributed in the southern part of Norway, north to Lofoten (the famous islands pointing westwards in the north) and *A. schoenoprasum*. subsp. *sibiricum* (L.) Čelak. (var. *sibiricum* (L.) Hartm., *A. sibiricum* L.) further north. These two subspecies are clearly different in the Nordic countries, but the differences are not distinct further east in Russia. Because it is quite common, the latter subspecies is not considered threatened.

Siberian chives (*A. schoenoprasum* subsp. *sibiricum)* is frequent in Northern Norway, mainly in the coastal areas. Traditionally, the leaves were collected and used in fish and meat dishes. They were preserved by salting and stored in wooden barrels during the winter, in later years also frozen. The plant has also been used for medical purposes (Alm and Furnes, 1998).

Finland: ruijanruoholaukka, jättegräslök

In Finland *A. schoenoprasum* subsp. *sibiricum* occurs on meadows on lake shores and river banks, stony shores and semi-natural dry grasslands. It is assessed as near-threatened on the Finnish National Red List because of over-growing of meadows following cessation of grazing or hay cutting.

Lithuania: Laiškinis česnakas

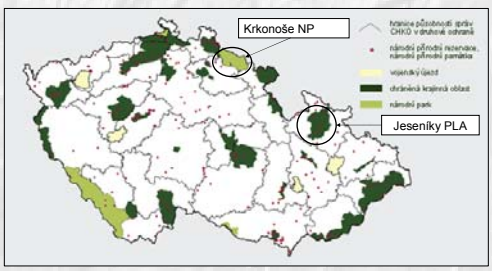
In Lithuania only the typical subspecies of *A. schoenoprasum* are being distinguished. Among the specimen recorded in herbaria only very few are from typical habitats, the others from abandoned homesteads (Karpavičienė, 2004). Mainly due to the symptoms of species invasiveness, it is not included into the Red Data Book of Lithuania and detailed studies are necessary to clarify the situation (Z. Gudžinskas, personal communication).

Russia: Skoroda or Resanets

At VIR, intraspecific taxa or morphological groups within *A. schoenoprasum* L. are not recognized, following Tolmatchev (1963) Friesen (1988). *A. schoenoprasum* is not listed in the Russian Red Book (1988) but it is in regional Red Lists: north-west and north European Russia.

Poland: Czosnek syberyjski

A. sibiricum is a rare and threatened species in Poland, reported exclusively from the Karkonosze Mts. and the Pilsko Massif in the Beskid Zywiecki Mts (Kwiatkowski 1999). It is assessed as Vulnerable on the Polish National Red List of 2000.



Map of the Czech Republic showing protected areas. In the two circled protected areas the main populations of *A. schoenoprasum* subsp. *sibiricum* occur.

Czech Republic: Česnek pažitka sibiřská

In the Czech Republic *A. schoenoprasum* subsp. *sibiricum* is known only from Krkonoše and Jeseniky mountainous areas. Nearly all populations of the taxon are located in protected areas Krkonoše National Park (founded in 1963) and Jeseníky Protected Landscape Area (founded in 1969) as shown in the map on the left. Typical biotopes of the subspecies occurrence are slopes of rock basins no far from water springs. Distribution data for the taxon are available from the Czech National Phytosociological Database. *A. schoenoprasum* subsp. *sibiricum* is frequently accompanied by *Swertia perennis, Bartsia alpine, Epilobium* sp., *Primula minima* and by mountain forms of *Betula, Salix, Pinus, Padus* and *Sorbus.*

It is assessed as Near Threatened on the Czech National Red List 2000 because of its occurrence in two separated areas, limited sizes of its populations and environmental pollution in the second half of 20th century. In *ex situ* conservation at the gene bank (RICP) in Prague are only 4 registered cultivars

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Conserving Euro-Mediterranean plant genetic resources for use now and in the future