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# A taxonomic and chorological revision of the genus *Allium* L. sect. *Schoenoprasum* Dumort.

NIKOLAI FRIESEN

## ABSTRACT

FRIESEN, N. (1996). A taxonomic and chorological revision of the genus *Allium* L. sect. *Schoenoprasum* Dumort. *Candollea* 51: 461-473. In English, English and French abstracts.

A taxonomic revision of the genus *Allium* L. sect. *Schoenoprasum* Dumort. is presented, including a determination key, complete synonymy, morphological descriptions and distribution maps for all the taxa. A total of 7 species and 2 subspecies are recognized in the section.

## RÉSUMÉ

FRIESEN, N. (1996). Révision taxonomique et chorologique du genre *Allium* L. sect. *Schoenoprasum* Dumort. *Candollea* 51: 461-473. En anglais, résumés français et anglais.

Une révision taxonomique des espèces du genre *Allium* sect. *Schoenoprasum* Dumort. est présentée, comprenant une clé de détermination, la synonymie, les descriptions morphologiques et les cartes de répartition des taxons retenus. Sept espèces et deux sous-espèces sont reconnues dans la section.

**KEY-WORDS:** *Allium* sect. *Schoenoprasum* – Taxonomy – Nomenclature – Distribution – Key for determination – Chromosome numbers

## Introduction

The first taxonomical revision of *Allium* L. sect. *Schoenoprasum* Dumort. is made since its critical survey in REGEL's monograph (1875). Later taxonomical treatments of this section are mainly regional revisions, and often devoted solely to its important species, *A. schoenoprasum* L., widespread naturally in Eurasia and North America. Many more species of section *Schoenoprasum* occur in the area of the former Soviet Union (especially Siberia and Kazakhstan) and Mongolia. An important knowledge about this group is accumulated in the regional revisions made by Russian and Soviet botanists (FRIESEN, 1987). It is impossible to prepare an authentic revision of section *Schoenoprasum* without using these works, as it was done by McDONOUGH (1993).

The taxa of the section *Schoenoprasum* belong to the subgenus *Rhizirideum* (Koch) Wendelbo, forming a closely related group with the sections *Annuloprasum* Egor. and *Cepa* Prokh. characterized by their fistular leaves. Moreover, as the dendrograms of cluster analysis show (EL-GADI & ELKINGTOM, 1977; HANELT & al., 1992), the species from section *Schoenoprasum* are more related to the species of subsection *Phyllodolon* of section *Cepa* (*A. altaicum* and *A. fistulosum*) than with the species of subsection *Cepa*.

Most of the species of section *Schoenoprasum* are mesophilous and inhabit moist localities as river banks, seashore and alpine meadows in mountainous regions.

### Material

Herbarium material, including the majority of types, was studied in the following herbaria: B, BM, GAT, GB, K, LE, LINN, LD, MNA, MW, NS, M. Popov Herbarium in Novosibirsk, TK, TSB, W, WU. My sincere thanks are due to the directors and curators of these institutions. The personally examined type specimens are marked by the symbol !. Otherwise this revision is based on living plants observed in the nature as well as in the collection of the Department of Taxonomy at the Institute of Plant Genetics and Crop Plant Research (Gatersleben, Germany), where more than 50 accessions are maintained (35 of them belong to *A. schoenoprasum*).

### Chromosome numbers

The species of section *Schoenoprasum* are mainly diploids ( $2n = 16$ ) with 14 small meta-centric chromosomes and 2 acrocentric satellite chromosomes with dotlike satellites (LEVAN, 1936; PASTOR, 1982; FRIESEN, 1988). Tetraploids were reported only for *A. schoenoprasum* (TURESSON, 1931, 1966; LEVAN, 1936). These results are based on material collected by TURESSON on the shore of the lake Teletzkoe in 1922, which was widely introduced into European botanical gardens later on. This material however belongs to a local endemic species of Teletzkoe lake and of the middle part of river Tom. As in the meanwhile the exact origin of these tetraploid plants became obscure, it was thought that these were widespread in Siberia (STEARN, 1980; TATLIOGLU, 1993). The chromosome number of *A. schoenoprasum* investigated on many Siberian specimens is always diploid (FRIESEN, 1988; AGAPOVA & al., 1990). With help of the C-banding, additional proof was provided of the allotetraploid nature of *A. altyncolicum* with *A. schoenoprasum* and *A. ledebourianum* as its two parents (FRIESEN, 1994). In Europe (FERNANDES-CASAS & MACHIN-SANTAMARIA, 1978; PASTOR, 1982), in the regions of Far East (GRITZENKO, 1980; GRITZENKO & GURZENKOV, 1983) and Caucasus (POGOSJAN, 1990), the tetraploid chromosome number was found few years ago too. In these marginal parts of the area of *A. schoenoprasum* as well as in the Altai mountain system, besides *A. schoenoprasum*, some other species of section *Schoenoprasum* can be found. Therefore taxa with tetraploid chromosome number are presumably of hybridogenic origin: crossing between *A. schoenoprasum*  $\times$  *A. maximowiczii* could have taken place in the Far East; those between *A. schoenoprasum*  $\times$  *A. schmitzii* in the Iberian Peninsula. In the Caucasus region however only *A. schoenoprasum* is known, but for *A. aucheri* from this area, POGOSJAN (1990) proposed a hybridogenous origin (*A. schoenoprasum*  $\times$  *A. aggr. ampeloprasum*). Therefore, POGOSJAN transferred *A. aucheri* from section *Allium* to section *Schoenoprasum*. This cannot be accepted, because *A. aucheri* has a true bulb and no rhizome.

### Key for the determination of species in section *Schoenoprasum*

- 1a. Pedicels subequal, 1.5-2.5(-4) times longer than tepals. Filaments equalling tepals, slightly shorter or longer ..... 3
- 1b. Pedicels unequal, interior longer than exterior ones, shorter than tepals. Filaments not longer than 2/3 length of tepals, usually only 1/3-1/2 ..... 2
- 2a. Scape, leaves and sheaths smooth, green ..... **A. schoenoprasum**
- 2b. Scape, leaves and sheaths scabrous-dentate along the edges, glaucous ..... **A. karelinii**

- 3a. Pedicels 2-3(-4) times longer than tepals. Tepals 5-6(-8) mm long. Leaves not longer than scape .....4
- 3b. Pedicels 1.5 times longer than tepals. Tepals 10-13(-15) mm long. Filaments 2/3 of tepals length. Leaves equal or slightly longer than scape ..... **A. altynolicum**
- 4a. Umbel hemiglobose or almost fasciculate, many-flowered or rarely few-flowered. Filaments equaling tepals or slightly shorter. Tepals 5-6 mm long .....5
- 4b. Umbel fasciculate, many-flowered. Filaments longer or equalling tepals. Tepals 6-8 mm long .....6
- 5a. Umbel semiglobose, many-flowered, dense. Inner filaments broadened at base. Bulbs cylindrical-conic, bulb tunic greyish, papery. Tepals pink with dark mid-vein . **A. maximowiczii**
- 5b. Umbel almost fasciculate, scanty, lax. Bulbs ovoid, bulb tunic brown, membranaceous ..... **A. oliganthum**
- 6a. Plants tall, stems 70-90(-100) cm long. Pedicels blackish. Style 1.5× longer than tepals ..... **A. ledebourianum**
- 6b. Plants lower, stems 25-60 cm long. Pedicels green. Style shorter than tepals **A. schmitzii**

### Subgenus *Rhizirideum* (Koch) Wendelbo

**Sectio *Schoenoprasum*** Dumort. Fl. Belg.: 140. 1827, p. p. quoad *A. schoenoprasum*.

≡ *Schoenissa* Salisb., Gen. Pl.: 91. 1866.

≡ Sect. *Cepa* subsect. *Schoenoprasa* Traub in Plant Life 24: 162. 1968, nomen nudum.

≡ Sect. *Schoenoprasum* ser. *Schoenoprasa* Omelczuck in Ukr. Bot. J. 19(3): 69. 1962.

≡ Sect. *Schoenoprasum* subsect. *Schoenoprasum* Stearn in Ann. Mus. Goulandris 4: 130. 1978.

**Typus.** – *A. schoenoprasum* L.

**Description.** – Bulbs under-developed, ovoid, narrowly ovoid or conical on the developed rhizome. Leaves cylindrical or semicylindrical, hollow. Stems cylindrical, hollow.

**1. *Allium altynolicum*** Friesen in Bot. Zhurn. (Leningrad) 72: 816. 1987.

= *A. ledebourianum* var. *intermedium* Kryl., Fl. Alt. Tomsk. Gubern. 6: 137. 1912, p. p.

– *A. schoenoprasum* var. *sibiricum* auct. non Garcke: Kasakova, Kultur. Fl. SSSR 10: 53. 1978.

– *A. schoenoprasum* auct. non L.: Levan in Hereditas 22: 1-128. 1936, p. p., only tetraploid plants.

– *A. sibiricum* auct. non L.: Stearn, Fl. Europaea 5: 56. 1980.

**Typus.** – Altai, Lacum Teletskoe, sinus Kamga, ostium fl. Malyj Mionok (holotypus: LE!; isotypi: NS!, GAT!).

**Description.** – Perennial bulbous herb, forming clumps. Bulbs 2.5-4 cm long, 0.75-1 cm in diam., narrowly ovoid, attached to a short rhizome 5 mm diam.; outer bulb tunics membranous, greyish. Leaves 1-3, longer than the stems, hollow, cylindrical, 5-10(-12) mm wide, (25-)40-60 cm long. Stem (30-)40-60 cm high, terete, hollow. Umbel hemispherical or spherical, 4-6 cm in diam., loose to fairly dense; pedicels (1-)1.5-2 cm long, more or less equal. Perianth campanulate; tepals shining, pale-pink with darker mid-veins, (7-)9-12(-13) mm long, 2-2.5 mm wide, narrowly oblanceolate, acute. Stamens one third shorter than the tepals, equal in length or slightly

exserted at anthesis; filaments filiform, connate at the base into an annulus about 1 mm high. Ovary globose, style filiform, equal to the length of stamens. Capsule globose, 3-4.5 mm diam.

*Icon.* – Fig. 1.1.

*Chromosome number.* –  $2n = 32$ .

*Habitat.* – Pebbled and rocky shores, only in littoral zone.

*Distribution.* – Altai (Teletskoe Lake and at the bank along the Tom river between the towns Mysky and Tomsk). Fig 2.

**2. *Allium karelinii*** Poljak. in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 12: 70. 1950.

= *A. schoenoprasum* f. *scaberrimum* Kar. & Kir. in Bull. Soc. Imp. Naturalistes Moscou 15: 507. 1842.

= *A. schoenoprasum* var. *scaberrimum* Regel in Izv. Imp. Obsh. Ljubit. Estestv. Moskovsk. Univ. 21(2): 45. 1876, p. p.

– *A. schoenoprasum* auct. non L.: Ledeb., Fl. Ross. 4: 166. 1852, p. p., quoad pl. Kar. et Kir. soong. – kirgh.; Vvedensky, Fl. SSSR 4: 190. 1935, p. p.

**Typus.** – Kasachstania, Alatau Soongoricus (LE!).

*Description.* – Perennial bulbous herb, forming clumps. Bulb 2-3.5 cm long, 0.8-1.5 cm in diam., narrowly bottle-shaped, attached to a short rhizome; outer bulb tunics membranous, brownish to greyish. Leaves 1-2, shorter than the stems, hollow, cylindrical, on the veins rough, 18-30 cm long, 2-6 mm wide. Stem 20-40 cm in height, hollow, rough. Umbel hemispherical, 2.5-4 cm in diam., dense; pedicels 3-5(-6) mm long, unequal. Perianth campanulate; petals white or pale-pink with darker mid-veins, 8-10 mm long, oblanceolate, acute. Stamens one third to one half of the length of the tepals, 3-5 mm long; filaments triangulate; anthers purplish. Ovary globose, style filiform, 2-2.5 mm long. Capsule globose, 3-4 mm diam; seeds black.

*Icon.* – Fig. 1.2.

*Chromosome number.* –  $2n = 16$ .

*Habitat.* – In damp and steppe meadows along streams and rivers in the alpine belt.

*Distribution.* – Kazakhstan (Saur, Tarbagatai, Kungei Alatau, Terskei Alatau ridges), Mongolia (North-West part of the Mongolian Altai mountains), China (North-West). Fig. 2.

**3. *Allium ledebourianum*** Schult. & Schult. fil., Syst. Veg. 7: 1029. 1830.

= *A. uliginosum* Ledeb., Fl. Alt. 2: 16. 1830 [non G. Don 1827].

**Typus.** – Habitat in paludosis ad fl. Belaja Uba et Koksum (LE!).

*Description.* – Perennial bulbous herb, forming clumps. Bulb 2-4 cm long, 8-20 mm in diam., narrowly bottle-shaped, attached to a short rhizome 4-5 mm diam.; outer bulb tunics membranous. Leaves 1-3, shorter than the stems, hollow, cylindrical, sheathing the lower third to half of the stem, upper leaves sometimes exceeding the umbel. Flower stem 70-90(-100) cm high. Umbel fasciculate or hemispherical, 4-6 cm in diam., fairly dense; spathe 2-valved, persistent, the valves shortly acuminate, unequal; pedicels 1.8-2.5(-3) cm long, more or less equal. Perianth campanulate; tepals lilac with darker mid-veins, 6-7(-8) mm long, 1.5-2 mm wide, narrowly oblanceolate, acute. Stamens slightly longer than the tepals, equal in length; filaments filiform, 6-7 mm long, connate at the base into an annulus about 1 mm high; anthers purplish. Ovary globose; style filiform, 1.5 time longer than tepals, 7-9 mm long. Capsule globose, 3.5-5 mm diam; seeds black.

*Icon.* – Fig. 1.3.

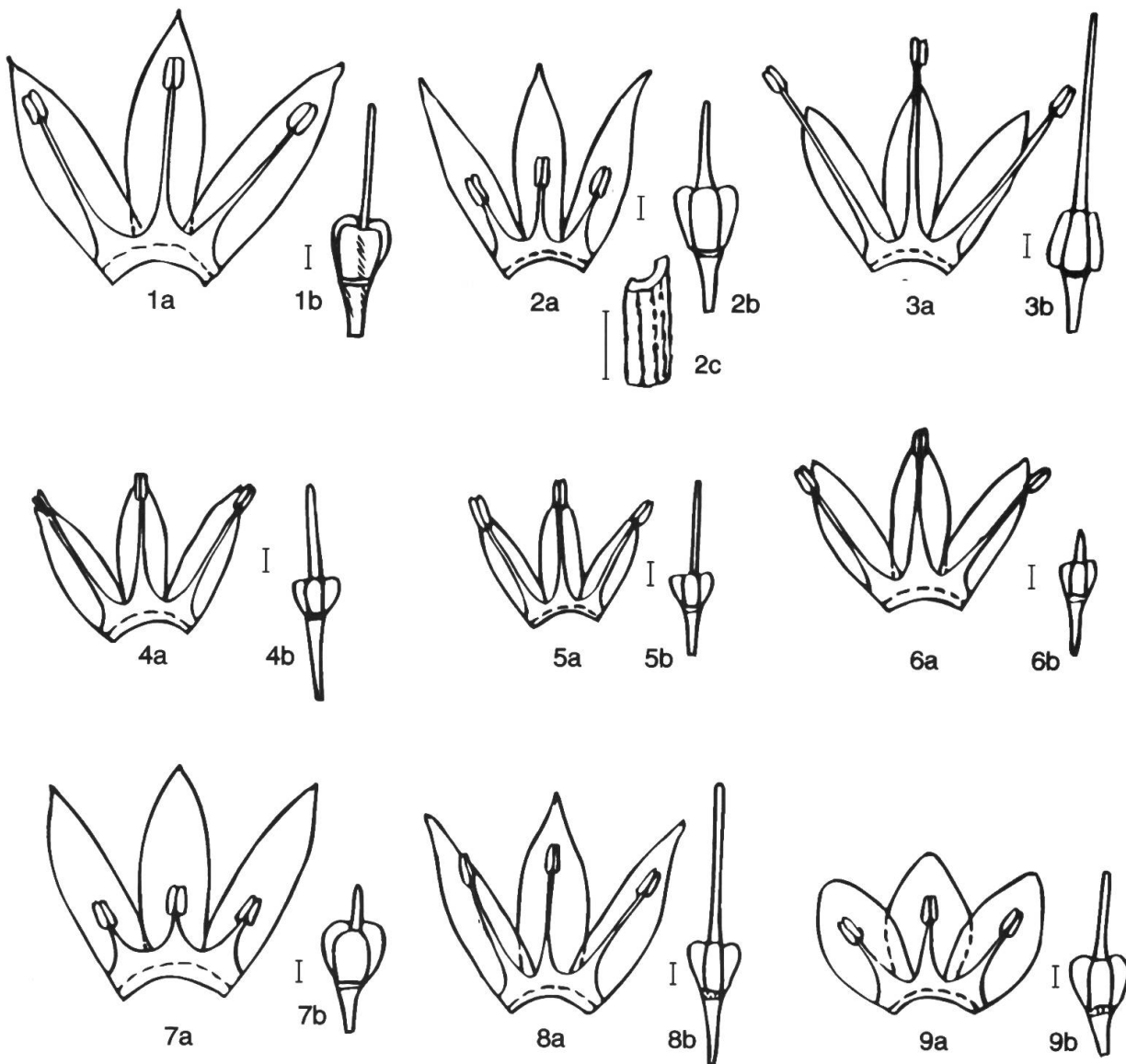


Fig. 1. – 1, *A. altynolicum*; 2, *A. karelinii*; 3, *A. ledebourianum*; 4, *A. maximowiczii*; 5, *A. oliganthum*; 6, *A. schmitzii*; 7, *A. schoenoprasum*; 8, *A. schoenoprasum* subsp. *latiorifolium*; 9, *A. schoenoprasum* subsp. *orosiae*. a, half perianth with stamens; b, ovary and style; c, portion of leaf. Scale 1 mm.

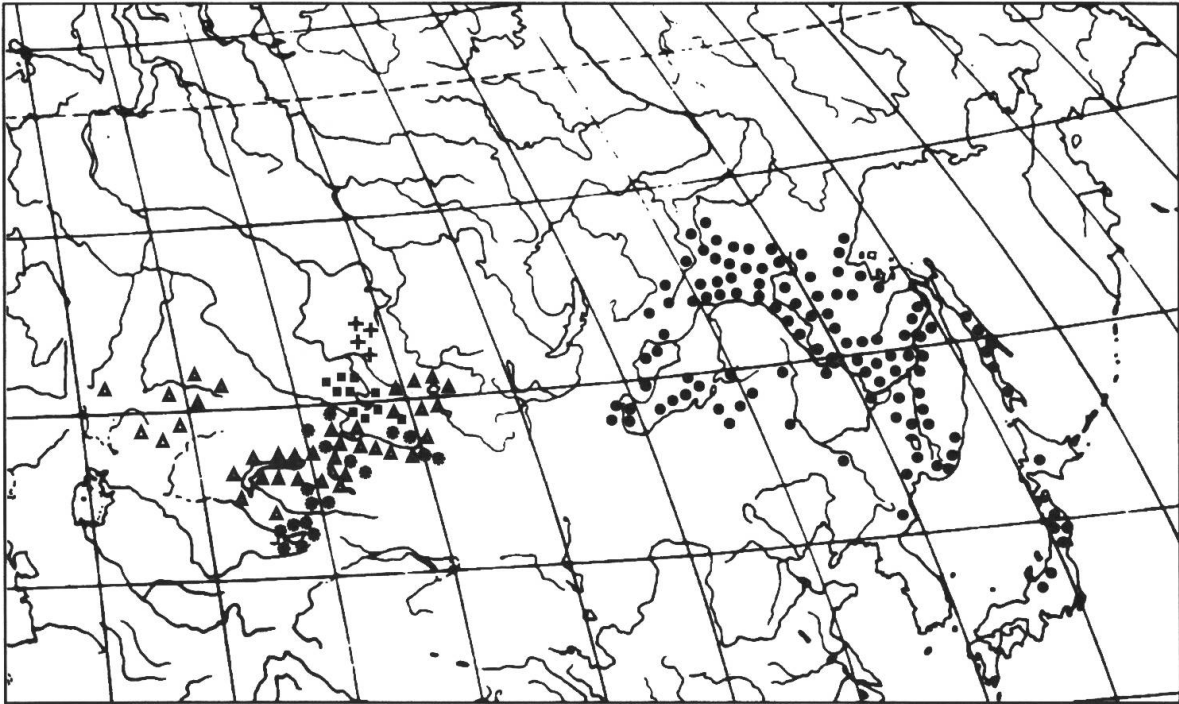


Fig. 2. – Distribution of *A. altynolicum* (+), *A. karelinii* (\*), *A. ledebourianum* (■), *A. maximowiczii* (●), *A. oliganthum* (Δ).

*Chromosome number.* –  $2n = 16$ .

*Habitat.* – In damp and swampy meadows along rivers, in subalpine belt.

*Distribution.* – Russia (West Altai), Kazakhstan (Altai), North-West Mongolia. Fig. 2.

#### 4. *Allium maximowiczii* Regel in Acta Horti Petrop. 3: 153. 1875.

- = *A. schoenoprasum* var. *orientale* Regel in Acta Horti Petrop. 3: 80. 1875.
- = *A. maximowiczii* f. *leucanthum* (Hara) T. Shimizu, New Alp. Fl. Japan in Color 2: 358. 1983.
- ≡ *A. schoenoprasum* var. *leucanthum* Hara.
- = *A. maximowiczii* var. *yezomonticola* (Hara) T. Shimizu, New Alp. Fl. Japan in Color 2: 358. 1983.
- ≡ *A. schoenoprasum* var. *yezomonticola* Hara.
- = *A. maximowiczii* var. *shibutsuense* (Kitam.) Ohwi, Fl. Japan ed. 2: 296. 1965.
- ≡ *A. schoenoprasum* var. *shibutsuense* Kitam.
- = *A. idzuense* Hara in J. Jap. Bot. 49: 1. 1974.
- ≡ *A. schoenoprasum* var. *idzuense* (Hara) Hara in J. Jap. Bot. 55: 214. 1980.
- *A. ledebourianum* auct. non Schult. & Schult. fil.: Karavaev, Kosp. Fl. Jakut.: 76. 1958; Sergievskaja, Fl. Zabaikal'ja 4: 24, p. p.; Andreev, Opred. Vyssh. Rast. Jakut.: 157. 1974; Xu, Fl. Reipubl. Popul. Sinicae 14: 254. 1980.

*Typus.* – Habitat in regione amurense et ussuriense (LE!).

*Description.* – Bulb cylindrical-conical, 1.5-2.5 cm long, 0.75-1 cm in diam., attached to a short rhizome; outer bulb tunic grey, membranous, nearly papery. Leaves 1 or 2 per plant, slightly shorter than the stems, hollow, cylindrical, 20-35 cm long, 1-4 mm wide. Stem 20-60 cm in

height, terete, hollow. Umbel hemispherical, 2.5-4 cm in diam., fairly dense; spathe 2-valved, persistent, the valves shortly acuminate, unequal; pedicels 2-3 times longer than perianth, 1.2-2 cm long, more or less equal; tepals shining, pink with darker mid-veins, 5-6 mm long, 1.5-2 mm wide, narrowly oblanceolate, acute. Stamens slightly shorter or equal to the tepals; inner filaments basis 1.5 times wider than outer ones. Ovary globose, style filiform, slightly longer than the tepals. Capsule globose, 3-4.5 mm in diam.

*Icon.* – Fig. 1.4.

*Chromosome number.* –  $2n = 16$ .

*Habitat.* – In damp meadows along to rivers.

*Distribution.* – Russia (East Siberia and Far East in the basin of the Amur river), China (Manshuria), North Korea, Japan. Fig. 2.

##### 5. *Allium oliganthum* Kar. & Kir. in Bull. Soc. Imp. Naturalistes Moscou 14: 856. 1841.

= *A. stenophyllum* Schrenk in Bull. Phys.-Math. Acad. Sci. Petersb. 3: 210. 1845.

**Typus.** – Habitat in herbosis humidiusculis inter Ajagus et rivulum Donsyk (holotypus LE!, isotypus MW!).

*Description.* – Bulb ovoid, 1-1.5 cm long, 0.8-1 cm in diam., attached to a short rhizome; outer bulb tunics grey membranous. Leaves 1-2, shorter than the stems, hollow, , semicylindrical, 5-10(-13) cm long, 1-1.8 mm wide. Stem 8-25 cm high. Umbel hemispherical, 1.5-2.5 cm in diam., loose (8-20 flowers); spathe 2-valved, persistent, the valves shortly acuminate, 1-1.4 cm long; pedicels 1-1.2 cm long, more or less equal. Perianth campanulate; tepals white or pale pink with darker mid-veins, 5-6 mm long, narrowly lanceolate, acute. Stamens slightly shorter than the tepals, equal in length; filaments filiform, connate at the base into an annulus about 1 mm high. Ovary globose; style filiform, slightly longer than the tepals. Capsule globose, 2.5-3 mm diam.

*Icon.* – Fig. 1.5.

*Chromosome number.* –  $2n = 16$ .

*Habitat.* – In saline meadows along lakeshores and rivers.

*Distribution.* – Central and East Kazakhstan, Russia (South-East Altai and Tuva), North-West Mongolia, North-West China (Dzungaria). Fig. 2.

##### 6. *Allium schoenoprasum* L., Sp. Pl.: 301. 1753.

= *A. sibiricum* L., Mant. Pl.: 562. 1771.

≡ *A. schoenoprasum* var. *sibiricum* (L.) Garcke, Fl. Nord. Mittel-Deutschl.: 322. 1849.

≡ *A. schoenoprasum* subsp. *sibiricum* (L.) Richter, Pl. Eur. 1: 202. 1890.

= *A. foliosum* Clarion ex DC. in Lam. & DC., Fl. Franç. ed. 3, 3: 725. 1805.

≡ *A. schoenoprasum* var. *foliosum* (DC.) Mutel, Fl. Franç. 3: 305. 1834.

= *A. schoenoprasum* var. *alpinum* DC. in Lam. & DC., Fl. Franç. ed. 3, 5: 317. 1815.

≡ *A. alpinum* (DC.) Hegetschw. in Suter, Fl. Helv. ed. 2, 2: 445. 1822.

≡ *A. schoenoprasum* subsp. *alpinum* (DC.) Celak., Prodr. Fl. Böhm. 1: 91. 1867.

= *A. schoenoprasum* var. *pumilum* Bunge, Enum. Pl. Alt.: 19. 1836.

= *A. schoenoprasum* subsp. *riparium* (Opiz) Celak., Prodr. Fl. Böhm. 1: 91. 1867.

= *A. raddeanum* Regel in Acta Horti Petrop. 3: 155. 1875.

= *A. buhseanum* Regel in Acta Horti Petrop. 3: 81. 1875.

≡ *A. schoenoprasum* var. *buhseanum* (Regel) Boiss., Fl. Orient. 5: 250. 1882.

- = *A. schoenoprasum* var. *foliosum* Regel in Acta Horti Petrop. 3: 80. 1875 [non (DC.) Mutel 1834].
- = *A. schmitzii* var. *duriminium* Coutinho in Bol. Soc. Brot. 13: 103, tab. 4. 1896.
- ≡ *A. schoenoprasum* var. *duriminium* (Coutinho) Coutinho, Fl. Portugal: 130. 1913.
- = *A. schoenoprasum* var. *schoenoprasoides* Briquet, Prodr. Fl. Corse 1: 291. 1910.
- = *A. gredense* Rivas Mateos in Bol. Soc. Espan. Hist. Nat. 24: 386. 1924.
- ≡ *A. schoenoprasum* var. *gredense* (Rivas Mateos) Rivas Martinez in Anal. Inst. Bot. Cavanilles 21: 281. 1963.
- ≡ *A. schoenoprasum* subsp. *gredense* (Rivas Mateos) Rivas Martinez & al. in Opusc. Bot. Pharm. Complut. 2: 103. 1986.
- = *A. schoenoprasum* var. *laurentianum* Fernald in Rhodora 28: 167. 1926.
- = *A. udinicum* Antsup. in Nov. Syst. Vyssh. Rast. Leningrad 26: 38. 1989.
- *A. ledebourianum* auct. non Schult. & Schult. fil.: Barkalov in Sosud. Rast. Sov. Daln. Vost. 2: 391. 1987.

**Typus.** – In alpestribus Sibiriae, Oelandia locis rupestribus (LINN 419.37).

**Description.** – Perennial bulbous herb, forming clumps. Bulb (1-)2-3(-4) cm long, (0.5-)1-1.2(-1.5) cm in diam., cylindric-conical or narrowly bottle-shaped, sometimes not developed, attached to a short rhizome; outer bulb tunics membranous, brownish or black. Leaves 1-3, shorter than the stems, hollow, cylindrical, slightly channelled on the upper side or some times with 3-5(-7) ribs, (6-)10-20(-35) cm long, (1-)1.5-3(-5-10) mm wide. Stem 12-35(-50) cm in height, terete, hollow. Umbel fasciculate-hemispherical or nearly spherical, (2-)2.5-4(-6) cm in diam., dense. Spathe 2-valved, persistent, the valves shortly acuminate, unequal, (0.8-)1-1.5 cm long; pedicels (3-)5-8(-10) mm long, unequal. Perianth campanulate; tepals shining, pale-pink, pink or pink-purple with darker mid-veins, 7-12(-15) mm long, 2-3 mm wide, linear-lanceolate, acute. Stamens 2- or 3-times shorter than the tepals, equal in length; filament at base triangulate, (2-)3-5(-7) mm long, basally connate into an annulus about 1 mm high; anthers yellow or brownish. Ovary globose; style filiform, (1.5-)2-3(-3.5) mm long. Capsule globose, 3-4 mm diam.

**Icon.** – Fig. 1.7.

**Chromosome number.** – Mostly  $2n = 16$ , only in some peripheral areas  $2n = 32$ , see text above.

**Habitat.** – In damp meadows, along streamsides, in mountain rocks and rocky pastures.

**Distribution.** – In most regions of Europe, North America and North Asia. Usually in lowlands in the north, but only in mountains on the south, except West-Siberian lowland. Some isolated localities in North Himalaya, North and Central Iran and the Caucasus. The Southern limit of the main area of *A. schoenoprasum* coincides with the southern border of the forest zone. In Far East the southern border is close to the Stanovoj mountain ridge. Fig. 3 and 4.

### Key for determination of subspecies

- 1a. Umbel globose. Tepals broad lanceolate, obtuse . . . . .subsp. **orosiae**
- 1b. Umbel hemispherical, globose or fasciculate. Tepals lanceolate, acute . . . . .2
- 2a. Umbel globose or hemispherical. Pedicels 2 or 3 times shorter than the perianth . . . . .subsp. **schoenoprasum**
- 2b. Umbel fasciculate, 1.5-2 cm in diam. Pedicels equal or shorter than the perianth. Style equal or slightly longer than the tepals. . . . .subsp. **latiorifolium**

**Allium schoenoprasum** L. subsp. **schoenoprasum**

*A. schoenoprasum* is a morphologically very diverse species and the classification into three subspecies may be still insufficient. Three types of *A. schoenoprasum*, were described informally by STEARN (1978). I accept this subdivision and add one additional type.

Type A: Most common, stems usually between 10-30 cm high, includes *A. schoenoprasum* L. sensu stricto, *A. riparium* Opiz, *A. schoenoprasum* subsp. *riparium* (Opiz) Čelak., *A. schoenoprasum* var. *schoenoprasoides* Briquet, *A. buhseanum* Regel, *A. schoenoprasum* var. *buhseanum* (Regel) Boiss.

Type B: Very robust variants with a scape lower than 20 cm, usually in mountains, often in the limestone area (including *A. schoenoprasum* var. *pumilum* Bunge, *A. schoenoprasum* var. *alvarensense* Hylander, *A. schoenoprasum* var. *gredense* (Rivas Mateos) Rivas Martinez, *A. gredense* Rivas Mateos, *A. schoenoprasum* subsp. *gredense* (Rivas Mateos) Rivas Martinez & al., *A. schoenoprasum* f. *kokinjiae* Hay.).

Type C: Variants with a scape up to 50 (70) cm high (including *A. montanum* Schrank, *A. foliosum* Clarion ex DC., *A. schoenoprasum* var. *alpinum* DC., *A. alpinum* (DC.) Hegetschw., *A. raddeanum* Regel, *A. schoenoprasum* var. *laurentianum* Fernald, *A. schoenoprasum* var. *foliosum* Regel). This type has been usually named *A. sibiricum* L., *A. schoenoprasum* var. *sibiricum* (L.) Garcke or *A. schoenoprasum* subsp. *sibiricum* (L.) Richter.

In regard to the epithet “sibiricum” I completely agree with TOLMACHEV (1963), that LINNAEUS (1771) described *A. sibiricum* not as a form of *A. schoenoprasum*, but as a new species. The description of LINNAEUS: “Petala ... alba, carine virescente” indicates that albino forms of *A. schoenoprasum* were described by him as a new species. Type specimens of *A. sibiricum* cannot be found in the Herbarium Linnaeus (LINN). Therefore, *A. sibiricum* simply becomes a synonym of *A. schoenoprasum*.

Type D: Specimens related to type C, but differing by lengthwise ribbed leaves (including *A. udanicum* described by ANTZUPOVA, 1989). This type can be sometimes found in Siberia and probably also in other regions, however, in herbarium material this character disappears. Sometimes this type constitutes homogenous populations, but usually it can be found together with typical *A. schoenoprasum* plants.

**Allium schoenoprasum** subsp. **latiorifolium** (Pau) Rivas Martinez & al. in Opusc. Bot. Pharm. Complut. 2: 103. 1986.

≡ *A. schoenoprasum* var. *latiorifolium* Pau in Bol. Soc. Aragon. Ci. Nat. 2: 42. 1912.

**Typus.** – Spain, Sierra de Guadarrama, Penalara (MAF).

**Description.** – Perennial bulbous herb, 25-35 cm height. Leaves 1-3 per plant, equal to the stems, hollow, cylindrical, 2-3 mm wide. Umbel fasciculate, 1.5-2 cm in diam.; pedicels unequal, 5-9 mm long. Perianth campanulate; tepals pale-red with darker mid-veins, 8-10 mm long, lanceolate, acute. Stamens slightly shorter than the tepals, or equal in length. Ovary globose, style filiform, equal in length with tepals or slightly longer.

**Icon.** – Fig. 1.8.

**Chromosome number.** –  $2n = 32$  (from topotypical material, own count).

**Habitat.** – In alpine meadows.

**Distribution.** – Spain, Sierra de Guadarrama. Fig. 4.

**Allium schoenoprasum** subsp. **orosiae** Montserrat in Soc. Ech. Pl. Vasc. Eur. Occid. Bassin Medit. Bull. 19: 110. 1984.

**Typus.** – Yebra de Basa, Huesca, Spain (Holotypus JACA, Isotypus B!, K!).

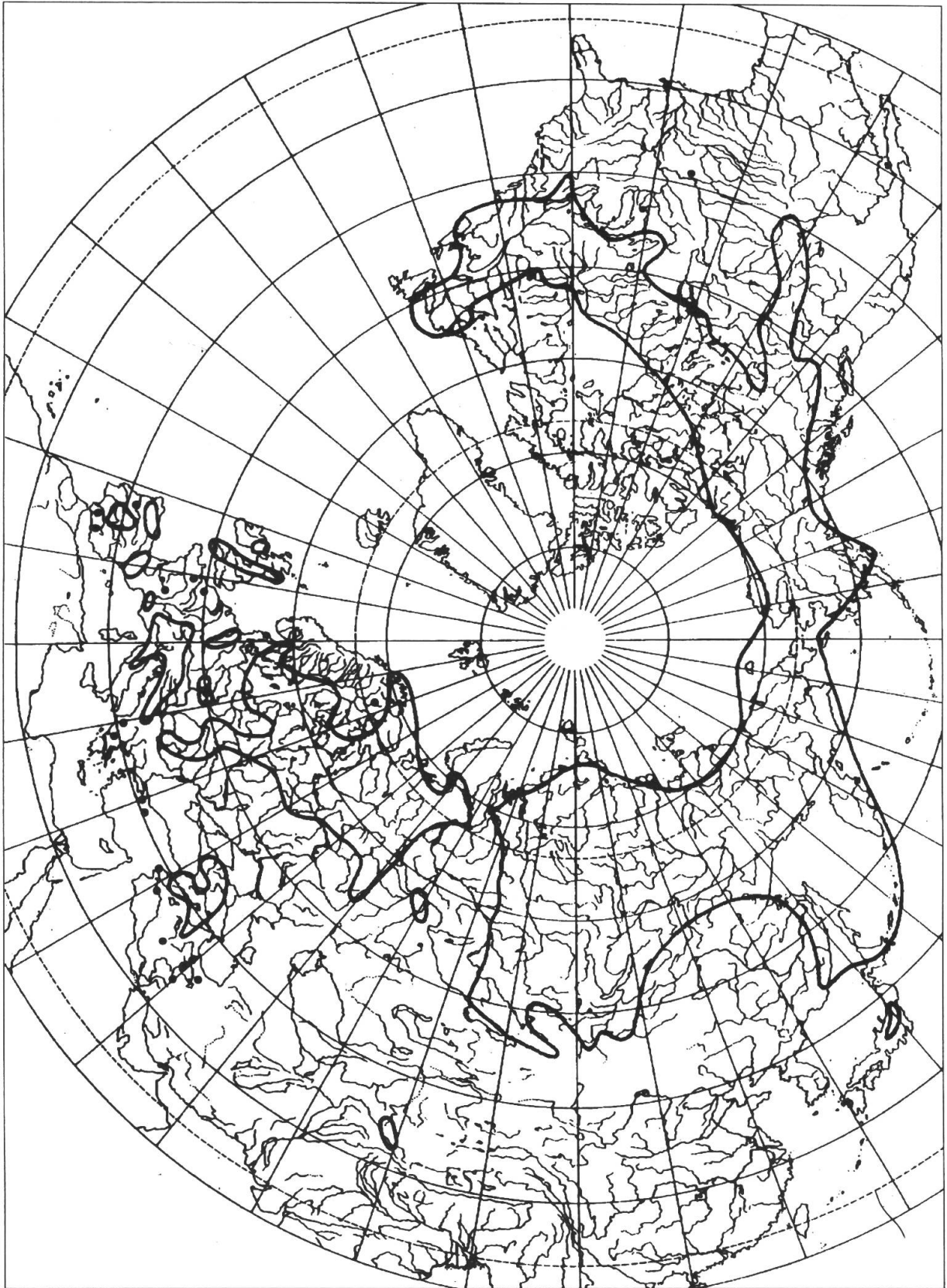


Fig. 3. – Distribution of *A. schoenoprasum* (improved after HULTEN & FRIES, 1986).

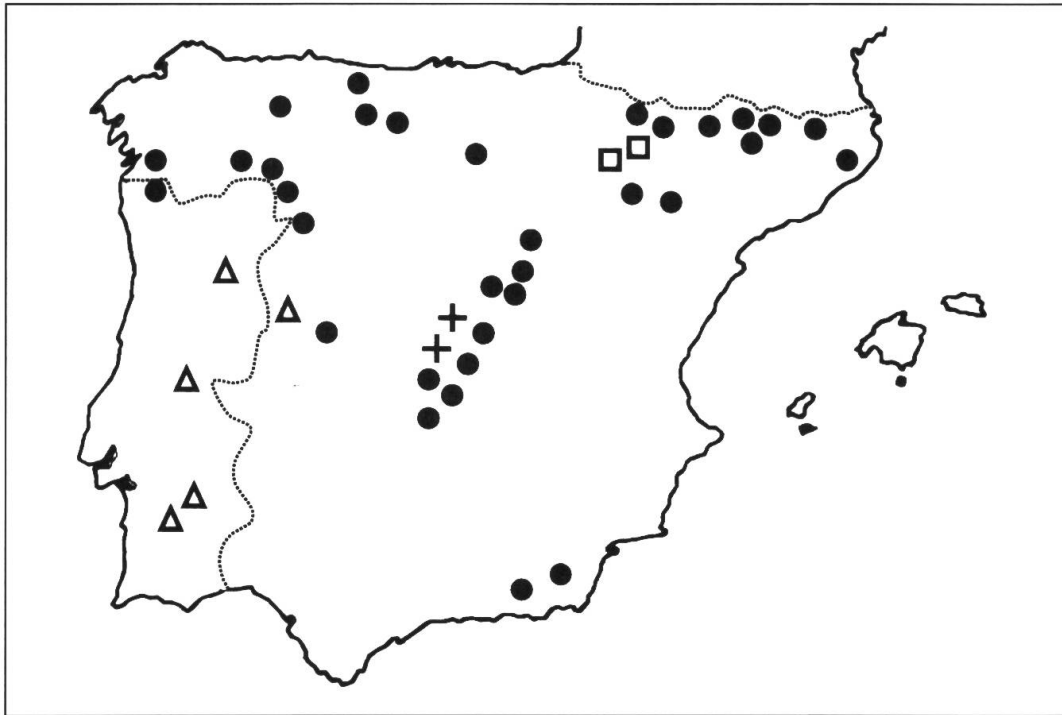


Fig. 4. – Distribution in the Iberian peninsula of *A. schoenoprasum* s.str. (●); *A. schoenoprasum* subsp. *latiorifolium* (+); *A. schoenoprasum* subsp. *orosiae* (□); *A. schmitzii* (Δ).

*Description.* – Perennial bulbous herb, 15-20 cm high. Leaves 1-2 per plant, slightly shorter than the stems, 1.5-2 mm wide. Umbel spherical, dense, pedicels 3-4 mm long, unequal. Tepals pale-red with darker mid-veins, 7-8 mm long, broadly lanceolate, obtuse. Stamens slightly shorter than the tepals. Ovary globose; style filiform, equal in length with tepals.

*Icon.* – Fig. 1.9.

*Chromosome number.* –  $2n = 32$ .

*Habitat.* – In stony dry meadows.

*Distribution.* – Spain, Huesca. Fig. 4.

**7. *Allium schmitzii*** Coutinho in Bol. Soc. Brot. 13: 103, tab. 3. 1896.

**Typus.** – Portugal, Adorigo (Lectotype COI).

*Description.* – Bulbs 3-5 cm long, 1-1.5 cm in diam., narrowly bottle-shaped, attached to a short rhizome; outer bulb tunics membranous. Leaves 1-3 per plant, shorter than the stems, hollow, cylindrical, slightly channelled on the upper side near the base, sheathing the lower quarter to third of the stem, 12-25 cm long, 1.5-3 mm wide. Stem 25-60 cm in height, terete, hollow. Umbel hemispherical to fasciculate, 2.5-5 cm in diam., loose to fairly dense; spathe 2-valved, persistent, the valves acute or shortly acuminate, unequal, 1-1.5 cm long; pedicels 1.2-2.5 cm long, more or less equal. Perianth campanulate; tepals pink or pale purple with darker mid-veins, 5-7 mm long, 1.5-2 mm wide, elliptic or narrowly oblanceolate, acute. Stamens slightly shorter than the tepals, equal in length or slightly exserted at anthesis; filaments filiform, 4.5-7 mm long; connate at the base into an annulus about 1 mm high; anthers brownish or purplish, pollen white. Ovary globose; style filiform, 3.5-5 mm long. Capsule globose, 3-4.5 mm diam.; seeds black, about 3 mm long, 1 mm wide.

*Icon.* – MATHEW (1994), Fig. 1.6.

*Chromosome number.* –  $2n = 16$  (BARROS NEVES, 1973; PASTOR, 1982) indicated  $2n = 32$  for the Plants from Navarra, but it is not the main area of this taxon.

*Habitat.* – Rock crevices and margins of rivers, up to 2000 m altitude.

*Distribution.* – Portugal, Western and North-Eastern Spain. Fig. 4.

#### *Excluded species*

*Allium koenigianum* Grossh. (1928, Fl. Kavk. 1(1): 200) was described from eastern Anatolia (Turkey) and is known only from the description. The type specimen has not been found yet. Grossheim classified it in sect. *Schoenoprasum*. However, this seems very improbable, because according to the description this species has small globose bulbs, acute teeth on the base of the inner filaments, and not fistular leaves. These characters are otherwise unknown in sect. *Schoenoprasum*. Probably it is best to transfer this species to the section *Scorodon* of the subgenus *Allium*.

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