

## *Sedum caucasicum* – a new species for Turkey

*Sedum caucasicum* – nový druh pro Turecko

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Sádlo J. & Štěpánková J. (1999): *Sedum caucasicum* – a new species for Turkey. – Preslia, Praha, 71: 37–40.

*Sedum caucasicum* (Grossg.) Boris. is reported from two localities of North East Turkey, as a new taxon for the flora of Turkey. Its morphological characters, chromosome number, differences from some other taxa of *Sedum* sect. *Telephium* and comments on its ecology are given.

**Key words:** *Sedum* sect. *Telephium*, chromosome number, distribution, East Turkey

### Introduction

The present paper is based on the research of rock vegetation in Turkey and Iran carried out by the first author during two expeditions in May 1996 and 1997. Plants under study were found in two localities in the easternmost part of Turkey. From each locality, about 8 specimens were taken into culture, and cultivated in the Institute of Botany at Průhonice. These plants were later determined as *Sedum caucasicum*.

*Sedum caucasicum* (Grossgejm) Borisova 1939, Fl. SSSR 9: 57 et 480 (Bas.: *Sedum maximum* Suter var. *caucasicum* Grossgejm 1930, Fl. Cauc. 2: 226, non vidimus) belongs to sect. *Telephium* S. F. Gray (Chamberlein 1972). It is distributed mainly in the area of Caucasus. So far it has been reported e. g. from Georgia, Dagestan, Karabach and Armenia (Grossgejm 1949, Kolakovskij 1958). Its distribution in Armenia includes regions adjacent to Turkey.

### Localities

1. North East Anatolia – Arpa Cay River valley, near ruins of a medieval town Ani, ca 42 km E of Kars, 40°31'N, 43°34'E, 1500 m a. s. l., 20 May 1997.
2. North East Anatolia – Aras Nehri River valley, near Bog'akale village ca 24 km E of the town of Horásán, 40°07'N, 42°30'E, 1510 m a. s. l., 20–21 May 1997.

### Morphology

The plants are perennial, blue-green in the spring, and deep green and deep red tinged in the summer, forming clusters of 4–6 stems. The roots are fusiform. A short, woody rhizome bears cylindrical buds. Their imbricate scales with dentate margins are intensively coloured by blue-green, violaceous and crimson. Stems are erect, 20–50 cm high, unbranched, lignifying, with 9–20 pairs of opposite leaves. Internodes of the lower half of

stem are ca 8–25 mm long. Leaves are rigid, stout, to 8 mm thick, flat or cochleariform, patulous at a right angle from the stem or, partly, deflexed, round or, in some plants, broadly ovate or obovate, ca 3–6 × 3–5.5 cm large, entire or obscurely and irregularly dentate, (semi-) amplexicaul and moderately auriculate at the base. Inflorescence is a dense corymbose panicle with ca 100–200 shortly pedicellate flowers. Sepals are ca 1.2 mm long, lanceolate to triangular. Petals are ovate, 3–4 mm long, white with a fine greenish tinge. Cultivated plants flowered from the end of August to the beginning of October.

The appearance of the plants corresponds to the detailed description of the species (Borisova 1939:480) as well as to other descriptions and pictures (Grossgejm 1949, Grossgejm 1950, Serdjukov 1956, Kolakovskij 1958). Some features given by Kolakovskij (1958) as significant, such as cochleariform and auriculate leaves, were found very variable and exhibit an exceeding range of variation even among particular individuals. Moreover, these characters are influenced by the position of the leaf on the stem, and their development during the year. We also note that the picture given by Grossgejm (1950) is misleading because it does not correspond with the description (leaves triangular vs. obovate, margins coarsely dentate vs. subentire).

## Taxonomy

Grossgejm (1950, map no. 318) was the first who mentioned the occurrence of *S. caucasicum* in Turkey, albeit without giving accurate location. Chamberlein (1972) in the Flora of Turkey, which is the most authoritative and detailed taxonomical work on this country, gives *S. telephium* subsp. *maximum* (L.) Krocker as the only representative of the sect. *Telephium*. He reported this taxon from two separated areas, i. e. NW and NE Turkey, and made only a remark on *S. caucasicum* as being a doubtful species because of its taxonomy and occurrence. According to Chamberlein (1972), plants from North East Anatolia might be referred to *S. caucasicum*, but no material seen matches accurately the type of this species which differs by “cochleariform leaves and large auricles”. In addition, he doubts whether or not these two taxa differ remarkably.

However, it is easy to distinguish *S. caucasicum* from *S. maximum*. The latter species has larger, elliptic to oblong leaves (ca 4–11 × 2–5 cm in size), which are thinner and much more tender. They are round at the base but never auriculate. The plants are higher, with longer internodes. Scales of buds have entire margins. The inflorescence consists of about 50 flowers which are pale yellow coloured. The plants studied cannot be confused with other European taxa of the *S. telephium* group either: *S. purpurascens* and *S. fabaria* differ by purple flowers, cuneate leaf base and spiral foliage; *S. jullianum* and *S. scherfelii* differ by oval leaves which are round at the base and, in most plants, by spiral or verticillate foliage. For these reasons, the plants collected were unambiguously determined as *S. caucasicum*.

It is also probable that the plants reported by Chamberlein (l. c.) from NW Turkey do not belong to *Sedum maximum* either. This taxon has a Central European distribution, ranging from France and Serbia to Central Poland and South Scandinavia (Grulich 1992). Another taxon can be expected in NW Turkey, i. e. *S. scherfelii* (Borbás) Májovský which is widely distributed in southeastern Europe and could be confused with the former taxon. For example, a picture in the Flora of Bulgaria (Jordanov 1970) denoted as *S. maximum* probably shows *S. scherfelii*.

## Chromosome number

Karyological investigations were carried out using the cultivated plants. Root tip meristems were pre-treated with saturated solution of bromnaphthalene, fixed in ethanol-acetic acid (3:1) and macerated in 1N HCl for 15 min. at 60 °C. The squash method and staining by lacto-propionic orceine were used. From each locality (1. Ani, 2. Bog'akale), several plants were tested providing the results  $2n = 24$ .

The diploid chromosome number  $2n = 24$  of *S. caucasicum* is reported here for the first time. The only tetraploid chromosome number reported in the literature up to now is  $2n = 50$  mentioned by Matveeva & Tichonova (Fedorov 1969). Unfortunately, the origin of the plants in which this hypertetraploid chromosome number was observed is unknown. Within sect. *Telephium* both diploid ( $2n = 24$ ) and tetraploid ( $2n = 48$ ) ploidy levels are known (Fedorov 1969, 't Hart 1985).

Unfortunately, the chromosome number recorded in the present study cannot be used to distinguish *S. caucasicum* from *S. maximum* because of identical number in both taxa.

## Remarks on ecology

*S. caucasicum* exceeds into Turkey from the area of Caucasus. Many species of this distribution are restricted in Turkey only to the easternmost Anatolia, e. g. *Arabis caucasica* and *Campanula crispa*.

*S. caucasicum* occurs in both localities as a typical petrophyte, occupying fissures of steep schist rocks. Community with *S. caucasicum* belongs to the *Parietarietea judaicae* Rivas-Martínez ex Rivas-Goday 1964 which comprises nitrophilous rock vegetation. Other dominating and constant species of this community are *Parietaria judaica*, *Campanula crispa*, *Tanacetum parthenifolium*, *Artemisia incana*, *Scrophularia variegata* and *Galium mite*. Rarely, *S. caucasicum* occurs also in stony scree under rocks where it grows with e. g. *Ballota rotundifolia* and some grasses and annuals.

## Souhrn

Bělokvětý okrouhlostý rozchodník *Sedum caucasicum* (Grossgejm) Borisova byl nalezen na dvou východotureckých lokalitách jako nitrofilní rostlina skalních štěrbin. Počet jeho chromozómů byl zjištěn jako  $2n = 24$ . Flóra Turecka z tohoto státu uvádí v rámci skupiny *S. telephium* pouze *S. maximum*. Tento středoevropský druh však pravděpodobně v Turecku vůbec neroste – východoturecké lokality těchto rostlin mají nejspíše jen *S. caucasicum*, kdežto v západoturecké arele lze předpokládat výskyt jihovýchodoevropského druhu *S. scherfelii*.

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Received 2 November 1998

Accepted 11 February 1999