

Genus *Hylotelephium* (*Crassulaceae*) in Bulgaria

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Abstract. *Hylotelephium*, a segregate genus of *Sedum*, has been studied for the first time in the Bulgarian flora. In Bulgaria, this genus is represented by two wild species – *H. maximum* and *H. ruprechtii*, and two grown in culture species – *H. spectabile* and *H. sieboldii*. The new for the Bulgarian flora *H. ruprechtii* (Jalas) Tzvelev (*Sedum telephium* L. subsp. *ruprechtii* Jalas) is still under discussion. The species *H. telephium* and *H. vulgare* already reported for the country have not been confirmed.

Key words: *Crassulaceae*, *Hylotelephium*, *Sedum*, taxonomy, *Telephium*

Introduction

The species of genus *Hylotelephium* H. Ohba are usually considered a section (sect. *Telephium* S. F. Gray) (Gray 1821), or subgenus (subgen. *Telephium* (S. F. Gray) Clausen) (Clausen 1975) of the genus *Sedum* L. Genus *Hylotelephium* has been described by the Japanese botanist Hideaki Ohba (1977) and includes 28 species from the *Telephium* group of genus *Sedum* (*Crassulaceae*) spread in the temperate parts of the Northern Hemisphere.

In the Bulgarian flora, the genus *Sedum* (including sect. *Telephium*) is represented by 23 wild and five grown in culture species (Cheshmedzhiev 2011). The so far known one wild species (*S. maximum*) and two introduced species (*S. sieboldii* and *S. spectabile*) have been referred to *S. sect. Telephium* of genus *Hylotelephium*. *Hylotelephium ruprechtii*, the second wild species, is reported here as new to Bulgaria.

The species *Sedum maximum* Suter and *Sedum purpurascens* W.D.J.Koch of the *Telephium* group were reported for the first time for Bulgaria by Velenovský (1891). Subsequently, Velenovský (1898) reported

only *S. maximum*. Urumov (1905, 1906, 1909) also recorded *S. maximum* and *S. purpurascens* as present in the Bulgarian flora: Cherepishki Monastery in the Iskar Gorge (Urumov 1905), Bunovo and Pancharevo (Urumov 1906), Katino and Vladaya villages (Urumov 1909). In another publication (Urumov 1908), he listed the major distinctive features between *S. maximum* and *S. telephium* (*S. purpurascens*). On the basis of these data, Stoyanov & Stefanov (1924) reported *S. purpurascens* for the region of Sofia. Hayek (1925) and Stoyanov & Stefanov (1933, 1948) mentioned *S. fabaria* W.D.J.Koch (sub *S. purpurascens*) for the country. The subsequently published *Bulgarian Flora* reported only *S. maximum* (Stoyanov & al. 1966; Valev 1970; Andreev 1992 and Cheshmedzhiev 2011), while the species *S. fabaria* and *S. purpurascens* were excluded from it. This is what Stoyanov & Kitanov (1960) wrote about *S. fabaria*: "...it is referred to the western parts of the country" and "...is a decorative plant suitable for gardening". In the Herbarium of Vascular Plants of the Institute of Biodiversity and Ecosystem Research (IBER) at the Bulgarian Academy of Sciences (SOM), there is a herbarium specimen

(SOM 34890) from Bachkovo (leg. Stribrny) labelled “*Sedum purpurascens* (*S. telephium*)”. However, it is incomplete and insufficient for a taxonomic decision.

According to The Euro+ Med Plantbase (Marhold 2011), genus *Hylotelephium* in Bulgaria is represented by three naturally occurring species (*H. maximum*, *H. telephium*, *H. vulgare*).

The purpose of this study is to clarify the species structure of the *Telephium* group in the Bulgarian flora and to join it with the modern taxonomic decisions in genus *Sedum*.

Material and methods

The present study of species of the *Telephium* group in Bulgaria is based on the analysis of relevant literature and herbarium specimens of the *Telephium* group from the following herbaria: SOM, SOA and SO.

Description of the morphological characteristics of *Hylotelephium ruprechtii* followed the literature data (Jalas 1954; Omelczuk-Myakushko 1977), as well as living material and herbarium specimens collected by the authors. The studied specimens are deposited in the Herbarium of Vascular Plants of the Institute of Biodiversity and Ecosystem Research (IBER) at the Bulgarian Academy of Sciences (SOM), Sofia, and the Herbarium of the Agricultural University (SOA), Plovdiv.



Fig. 1. *Hylotelephium ruprechtii* – habit (photo Zhivko Barzov).

Results and discussion

Genus *Hylotelephium* H. Ohba. Bot. Mag. Tokyo 99: 41-56 (1977).

A large perennial glabrous plant, without sterile shoots and with tuberous thickened roots. Flat, car-nose leaves without a spur, alternate, opposite or whorled; the pistil is apocarpous with erect multi-seminal follicles; flowers are hermaphrodite 5-sided, stamens 10; inflorescences thick, paniculato-corimbose, terminal.

Hylotelephium ruprechtii (Jalas) Tzvelev, Novosti Sist. Vyssh. Rast. 29: 136. (1993).

Sedum telephium subsp. *ruprechtii* Jalas, Ann. Bot. Soc. Zool. Bot. Fenn. Vanamo 26 (3): 33 (1954); D. A. Webb. Fl. Europ. 1: 358 (1964). *Sedum maximum* subsp. *ruprechtii* (Jalas) Soó, Acta Bot. Acad. Sci. Hung. 9: 425 (1963); *Sedum ruprechtii* (Jalas) Omelcz., Novosti Sist. Vyssh. et Nyssh. Rast. pp. 122-125. (1977); *Hylotelephium telephium* subsp. *ruprechtii* (Jalas) H. Ohba, Bot. Mag. Tokyo 90: 53 (1977); *Hylotelephium maximum* subsp. *ruprechtii* (Jalas) Dostál, Folia Mus. Rer. Nat. Bohem. Occid., Bot. 21: 7. (1984).

Perennial herbaceous plant (Fig. 1). The roots are spindly and thickened, in groups or single in a relatively well-developed rhizome (Fig. 2). The stem 20–35 cm tall, ascending at the base, upright, after flowering drooping to leaning (subprostrate) (Fig. 3). Leaves elliptical or ovate, ± amplexicaul, oppositely arranged, seldom in whorls of three, or single below inflorescence, all-round entire, seldom indistinctly dentate, gray-green, reddish after blossoming, (2) 3–6 × (1) 2–4 cm. Inflorescence a peltate panicle, 3–6 cm in diameter (Fig. 4). Sepals about 2 mm. Petals creamy-white, elliptical to



Fig. 2. *Hylotelephium ruprechtii* – roots (photo Zhivko Barzov).

lanceolate, pointed, spread out. Stamens 10, \pm as long as the corolla and the pistil, anthers yellow (Fig. 5). Nectar scales 0.5 mm, at the top \pm concave. Follicles erected, 3.5–4 mm long. Seeds elongated-ovate with longitudinal grooves, brown, about 1 mm long. Flowers July–September.

Distribution in Bulgaria: Vegetative plants were collected 15 years ago in the rock crevices close to the seashore, in the Yailata Protected Site at the Northern Black Sea Coast (N43.434687; E28.543064) and grown in Plovdiv (SOM 176437; 176438 and SOA 062348–062354 sub *Sedum ruprechtii*). The species is new for the Bulgarian flora (Fig. 6).



Fig. 3. *Hylotelephium ruprechtii* – stems (photo Zhivko Barzov).



Fig. 4. *Hylotelephium ruprechtii* – inflorescence (photo Zhivko Barzov).



Fig. 5. *Hylotelephium ruprechtii* – flowers (photo Zhivko Barzov).

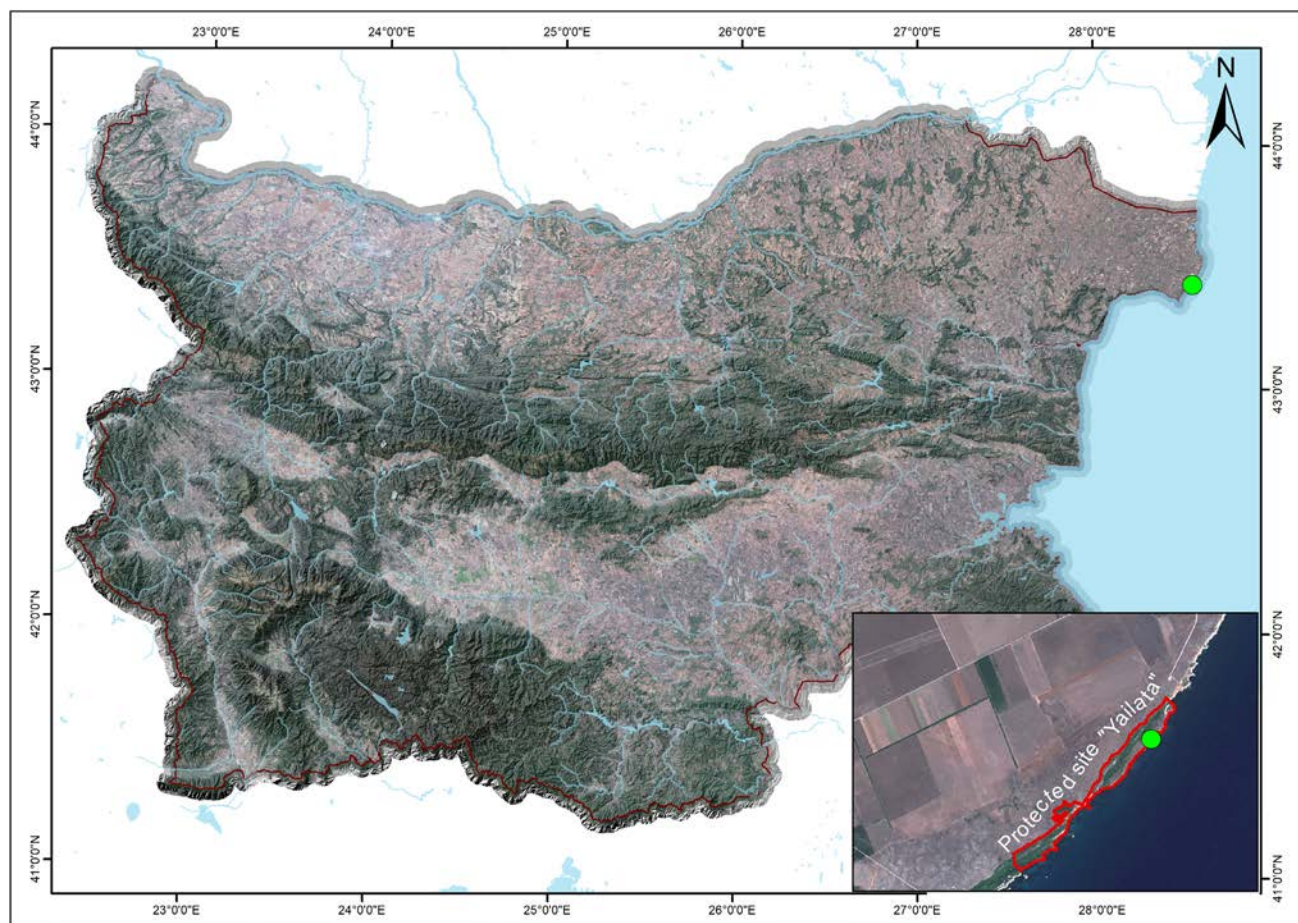


Fig. 6. Distribution map of *Hylotelephium ruprechtii* in Bulgaria.

General distribution: North, Northeast and partly Central Europe. Armenia, Belarus, Estonia, Finland, Hungary, Norway, the Russian Federation, Romania?, Sweden, Transcaucasia (Azerbaijan, Armenia, Georgia), Ukraine.

Habitat and population: *Hylotelephium ruprechtii* grows in calcareous dry grasslands belonging to the habitat type 62C0 *Ponto-Sarmatic steppes of EU Habitats Directive, 92/43/EEC (1992). According to EUNIS classification, the habitat is E1.2D1 Western Pontic steppes (EUNIS 2017). The co-occurring species are: *Artemisia pedemontana*, *Bellevalia ciliata*, *Convolvulus cantabrica*, *Euphorbia myrsinites*, *Festuca valesiaca*, *Goniolimon collinum*, *Gypsophila glomerata*, *Iris pumila*, *Kochia prostrata*, *Koeleria brevis*, *Limonium latifolium*, *Potentilla bornmuelleri*, *Scandix australis*, *Sedum urvillei*, *Thymus zygioides*, *Trigonella gladiata*, etc.

The population of *H. ruprechtii* at the seashore is located in the northern and central part of the Yailata Protected Site and is of high density. It occupies an ar-

ea of about 3 ha and numbers approximately 1000 individuals.

Economic importance: Decorative, soil-covering plant suitable for curbs and rock gardens.

Similar species in Bulgaria are *Hylotelephium maximum* (L.) Holub, and the introduced *H. spectabile* (Boreau) H. Ohba and *H. sieboldii* (Regel) H. Ohba. The decorative species of this genus are not mentioned in the Bulgarian botanical literature, with the exception of *Key to the Plants in Bulgaria* (Cheshmedzhiev 2011). In the Bulgarian floristic literature, Papazova (1961) and other authors mention *H. spectabile* and *H. sieboldii*, as widespread decorative species grown across the country.

The species *Hylotelephium vulgare* (Haw.) Holub (syn. *Sedum fabaria* W.D.J. Koch) and *Hylotelephium telephium* (L.) H. Ohba (syn. *Sedum telephium* L.; *Sedum purpurascens* W.D.J. Koch) are included in The Euro+Med Plant Base (Marhold 2011) as distributed in Bulgaria. This study does not confirm them for the country. In the identification key, they are marked with a question mark (?).

Identification key

1. Wild plants 2
- + Cultivated plants 5
2. Flowers whitish, greenish to creamy-white 3
- + Flowers purple or lilac 4
3. Stems erect, 30–70 cm tall
. *H. maximum* (L.) Holub
- + Stems ascending, after flowering drooping,
20–40 cm tall *H. ruprechtii* (Jalas) Tzvelev
4. Upper leaves truncate at the base, sessile
. (?) *H. telephium* (L.) H. Ohba
- + Upper leaves wedge-shaped at the base, occasion-
ally sessile (?) *H. vulgare* (Haw.) Holub
5. Stems erect *H. spectabile* (Boreau) H. Ohba
- + Stems procumbent or hanging
. *H. sieboldii* (Regel) H. Ohba

Conclusion

The species from sect. *Telephium* of genus *Sedum* in Bulgaria are treated within the genus *Hylotelephium*. *Hylotelephium ruprechtii* is reported as new to the Bulgarian flora. The species *H. vulgare* and *H. telephium* are not confirmed for the country.

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