

## ***Sedum erythraeum* Griseb. (Crassulaceae) in the flora of the Republic of North Macedonia**

Zoran Nikolov

Natural History Museum of the Republic of North Macedonia, Blvd. Ilinden 86, 1000, Skopje, Republic of North Macedonia,  
e-mail: [znikolov61@yahoo.com](mailto:znikolov61@yahoo.com)

### **Abstract**

*Sedum erythraeum* is an endemic species, distributed in North Macedonia and Greece. There are also data for the presence of this species in Serbia. Described as a species by Grisebach (Pelister Mt, south-western part of North Macedonia), its status varied, from species rank to subspecies of *Sedum alpestre* or, in some cases, even as synonymic of *Sedum alpestre*. In this study, we keep the species status of *S. erythraeum*. Apart from the Pelister Mt, *S. erythraeum* is found on Šar Planina Mt and Osogovo Mt. The finding on the Jablanica Mt is new record for this rare species, on the territory of North Macedonia. The data of Jurišić, for the Monastery "Treskavec" (Prilep) is evidently overlook because of the low altitude.

**Key words:** *Sedum erythraeum*, endemic, taxonomic rank, protandrous, North Macedonia

### **Introduction**

*Sedum erythraeum* (Crassulaceae) is a tufted perennial that inhabits dump, rocky places and screes. It belongs to the subgenus *Sedum*, Series Alpestris ('t Hurt, 2002, sub nom. *S. alpestre* subsp. *erythraeum*). Its taxonomic rank varies, from species (Grisebach, 1843; Hayek, 1924; Micevski, 1998; Šušlevska, Arsovska, Rusevska & Melovski, 2002), to subspecies of *S. alpestrae* ('t Hart †, 2002) or synonym of *S. alpestre* (Euro+Med PlantBase). The distribution area of *S. erythraeum* includes North Macedonia, Greece and Serbia. There are few localities, on the territory of our country, where the presence of this species was confirmed: Pelister Mt (Locus classicus, Grisebach, 1843), Šar Planina Mt (Degen, 1902; Šušlevska, Arsovska, Rusevska & Melovski, 2002) and Osogovo Mt (Micevski, 1998). The data of Jurišić (1923) for the Treskavec Monastery (Prilep) are probably unreliable due to the more inadequate habitats for this species at low altitudes.

### **Material and methods**

Herbarium material of *Sedum erythraeum*, from the Jablanica Mt, was collected on two occasions: first, in 2021, during the Project "Working together for Conservation of National Endemic Plants in Macedonia" (funded by the Critical Ecosystem Partnership Fund - CEPF), and second, the material for this study, which was collected in 2025. Prepared

and labelled plant material, according to commonly accepted botanical procedures, is stored in the herbarium collection of the Natural History Museum of the Republic of North Macedonia. Relevant literature sources used for material identification are as follows: Grisebach (1843), Hayek (1924), Webb, Akeroyd & 't Hart (1968), Hagemann & 't Hart (1986), Micevski (1998), 't Hart † (2002). The nomenclature followed Grisebach (1843). Photos of the habitat, habitus, different parts of the living plant, as well as of the herbarium specimen, were taken using camera. The contemporary distribution map of *S. erythraeum* in North Macedonia is also presented in the article. Some of the terms, in the part of "Description of the collected plants", were used from the 't Hart' description (2002).

### **Results and discussion**

*Sedum erythraeum* Griseb., Spic. Fl. Rumel. 1: 326 (1843).

### **General distribution:**

*Sedum erythraeum* is distributed in North Macedonia and Greece (POWO, 2025; 't Hart, 2002, sub nom. *S. alpestre* subsp. *erythraeum*). This species is also registered in Serbia (Amidžić & Panjković, 2003; Gajić, M., 1972; Janković, M., 1978-1980, 1982; Nikolić et al., 1986).



### **Distribution in North Macedonia:**

Literature data: Pelister (Grisebach, 1843); Šar Planina Mt (Degen, 1902); Prilep, Monastery "Treskavec" (Jurišić, 1923); Šar planina Mt, Čaušica; Ceripašina (Šušlevska, Arsovska, Rusevska & Melovski, 2002).

New data: Jablanica (vill. Gorna Belica): Krstec, 1845 m a.s.l., 01.08.2021, N: 41°13.909', E: 020°31.614'; Krstec, 1840 m a.s.l., 25.06.2025, 17.07.2025, N: 41°13.901', E: 020°31.621' (Leg./Det.: Z. Nikolov).

*S. erythraeum* (Fig. 1) is a Balkan endemic species described by Grisebach (1843) from the Pelister Mt (Bitola). Degen (1902) and Micevski (1998) recorded this species for Šar Planina Mt and Osogovo Mt, respectively. The data of Degen (1902), for Šar Planina Mt, was later confirmed by Šušlevska, Arsovska, Rusevska & Melovski (2002). The report of Jurišić (1923), for the Monastery "Treskavec" (Prilep), is highly doubtful because it is located in a low altitude zone (Micevski, 1998). The Jablanica Mt is a new spot on the distribution map of *S. erythraeum*, in the territory of North Macedonia (Fig 5).

### **Description of the collected plants:**

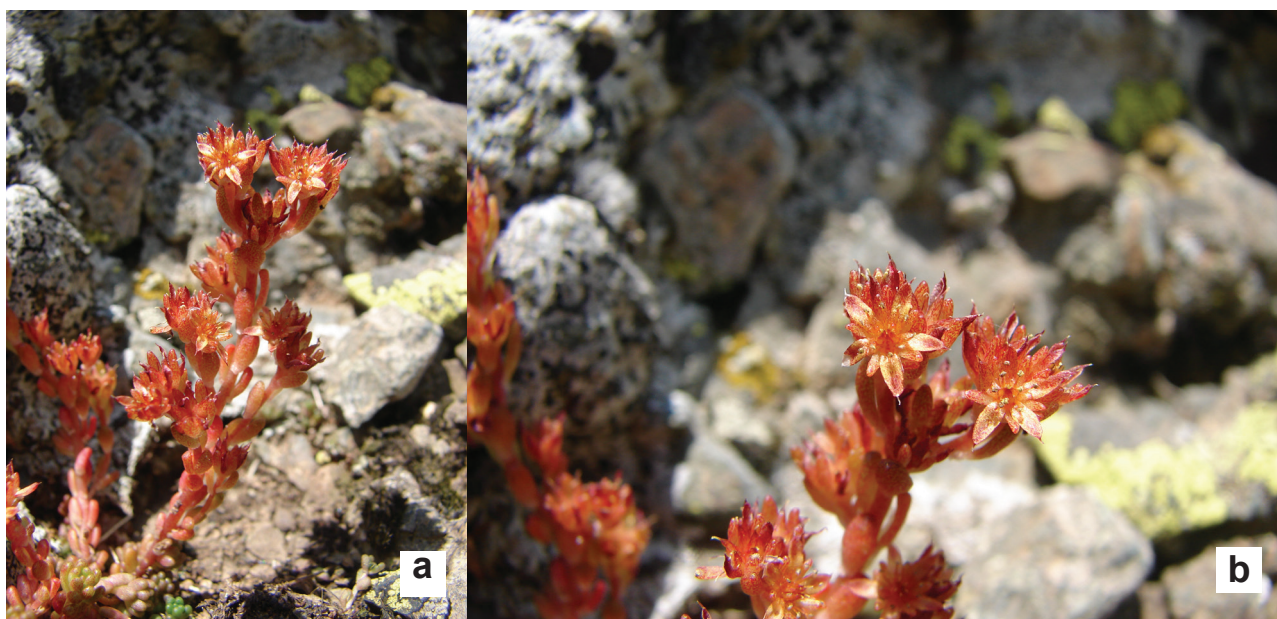
Tufted perennial with numerous short, non-flowering shoots, covered with numerous, green leaves. Flowering shoots also numerous, 3.5-6 cm long, usually simple; leaves succulent, partially overlapping, imbricate, obtuse, reddish; inflorescence consist of 1-2(3) branches, every with 1-3 flowers; flowers pentamerous, sepals c. 3 mm, oblong-obtuse, reddish; petals 3.5-4 mm, reddish, subacute, with  $\pm$  short, pointed tip; stamens 10, anthers pale-yellowish, filaments purplish; style slender, up to 0.5 mm, slightly curved.

The plants, collected from the locality "Krstec", on the Jablanica Mt, match the original description by Grisebach (1843), also the descriptions by Hayek (1924, sub nom. *S. erythraeum*), Micevski (1998, sub nom. *S. erythraeum*) and 't Hart (2002, sub nom. *S. alpestre* subsp. *erythraeum*). The initial specimen, gathered and photographed on 01.08.2021 (Fig. 4), was in the fruiting, while the one from 25.06.2025 - in full, flowering stage. *Sedum erythraeum* is a tufted, reddish perennial, with numerous non-flowering and flowering shoots, with dense, green leaves (Fig. 1). Beside the dominate



**Fig. 1.** *Sedum erythraeum* Griseb.- plant appearance, Krstec locality  
(Photo: Z. Nikolov, 25.06.2025)





**Fig. 2.** *Sedum erythraeum* Griseb. a) branched stem b) upper part of the inflorescence  
(Photo: Z. Nikolov, 25.06.2025)

simple, there are also branched, flowering shoots (Fig. 2, a). The reddish petals are a little bit longer of the sepals, with  $\pm$  short, pointed tip (Fig. 2, b). The inflorescence is with 1-2(3) branches, with 1-3 flowers (Fig. 2, a, b). The style up to 0.5 mm.

#### ***Taxonomic rank***

*Sedum erythraeum* was originally described by Grisebach (1843) as a distinct species, a treatment subsequently followed by Hayek (1924), Micevski (1998), and Šušlevska, Arsovska, Rusevska &



**Fig. 3.** *Sedum erythraeum* Griseb.



Melovski (2002). Webb, Akeroyd & 't Hart (1968) referred to *S. erythraeum* as a species described from western Macedonia, but did not assign it an ordinal number in their list of recognized taxa. Later, 't Hart (2002) reduced its rank to the subspecific level, treating it as *Sedum alpestre* subsp. *erythraeum*. In current major sources, the taxonomic status of *Sedum erythraeum* remains inconsistent: in Euro+Med PlantBase it is listed as a synonym of *S. alpestre* whereas in POWO (2025) it is recognized at subspecies rank as *Sedum alpestre* subsp. *erythraeum*. Compared to *S. alpestre*, *S. erythraeum* is characterized by its distinctly reddish appearance, particularly in fruiting stage (Fig. 4, photo), smaller leaves, and a style length of 0.5-1 mm. Moreover, *S. erythraeum* is strictly allogamous, while *S. alpestre* is predominantly autogamous ('t Hart, 2002). Webb, Akeroyd & 't Hart (1968) emphasized the following diagnostics traits of *S. erythraeum*: "the dwarf habit (c. 2 cm), small leaves (c. 2.5 mm), mucronate, reddish-purple petals, and erecto-patent follicles with a longer style". Hageman & 't Hart (1986) additionally highlighted the morphology of the squamae and the strict protandry as further differentiating characters, while noting that the taxonomic status of the species remained uncertain.

We argue that the combination of the aforementioned morphological and reproductive characteristics provides sufficient evidence for *S. erythraeum* to be retained at the species rank, as originally proposed by Grisebach (1843)

### Habitat

*Sedum erythraeum* populates damp, rocky places, but also damp, grassy places, strict to water. The plants on the Jablanica Mt (locality "Krstec", 2021, 2025) grow on big rocks (Fig. 3, 4), nearby the small river, but also, a small population was found on a damp, grassy place, strict to the water, across the big rock (25.06.2025).

### Conclusion

- On the base of the differential taxonomical characteristics, we keep the species status of *Sedum erythraeum*, following Grisebach (1843) and,

- The discovery of *Sedum erythraeum* on the Jablanica Mt is new data about the distribution of this species in the territory of North Macedonia.



Fig. 4. *Sedum erythraeum* Griseb - Herbarium specimen, with photo of the living plant (01.08.2021)



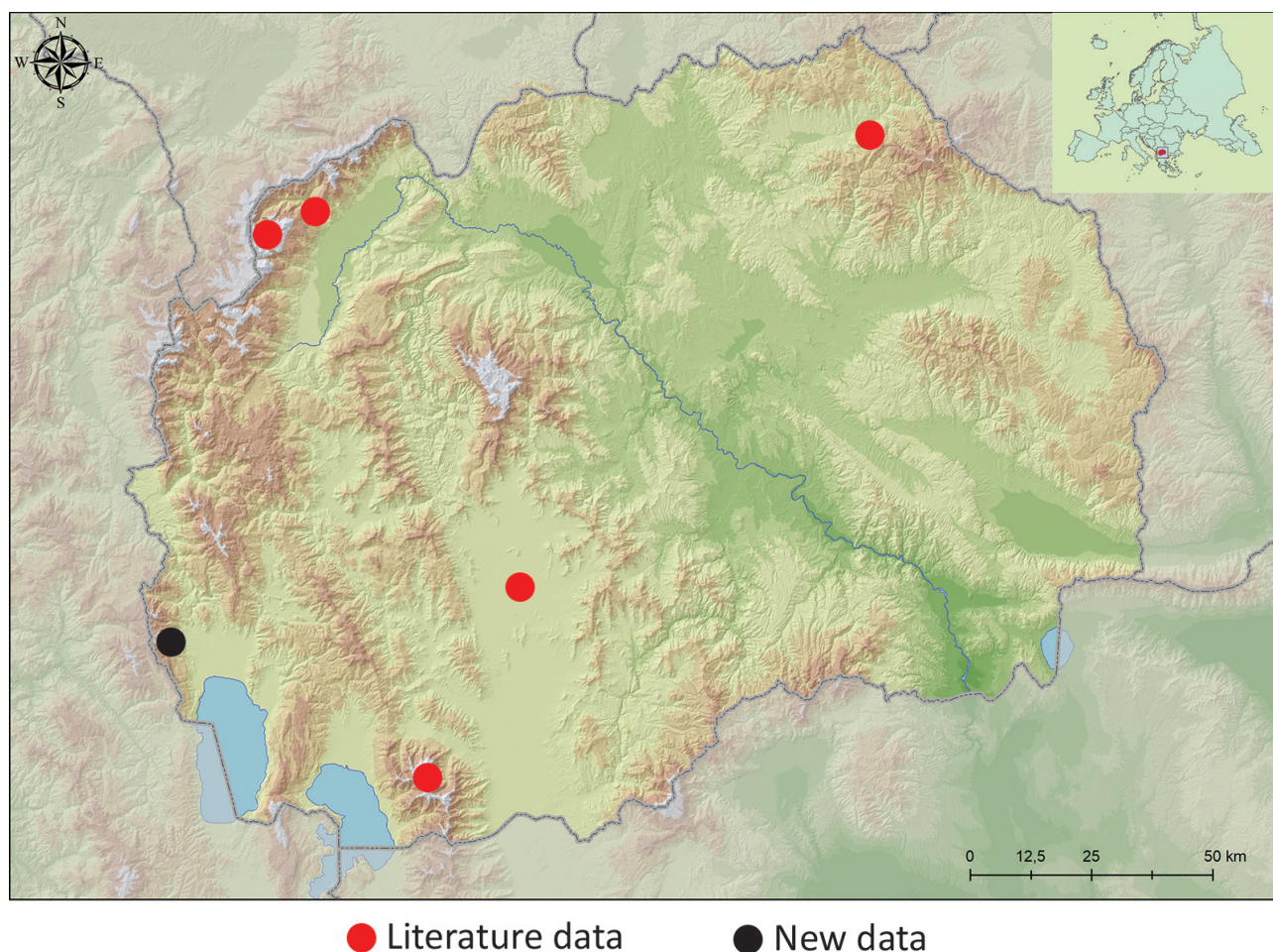


Fig. 5. Distribution of *Sedum erythraeum* in North Macedonia.

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