

Sempervivum ekimii nom. et stat. nov. for *S. minus* var. *glabrum* (Crassulaceae), with an amplified description

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The name *Sempervivum ekimii* F. Karaer nom. et stat. nov. is proposed for *S. minus* var. *glabrum* (Crassulaceae) from Turkey based on examination of type material and other specimens. An amplified description of the taxon is provided.

Key words: Crassulaceae, nomenclature, *Sempervivum*

The genus *Sempervivum* comprises about 50 species and 17 hybrids throughout the world. It is mainly distributed in mountainous regions of central and southern Europe, southwestern Asia, Caucasia and the Mediterranean (Topalov *et al.* 2006). Its centre of diversity lies in the Euro–Siberian, Mediterranean and Irano–Turanian phytogeographic regions (Konop 1987).

The first revision of *Sempervivum* in Turkey was done by Muirhead (1972) for *The Flora of Turkey*, in which she recognized 13 taxa. Since the publication of the flora, three more species, one subspecies and one hybrid have been described from Turkey (Davis *et al.* 1988, Neeff 2005).

Since 1999, as a part of revisional study of the genus *Sempervivum* in Turkey, the authors have carried out extensive field studies and collected a large number of specimens. These specimens were pressed carefully and dried. In addition, population size and phenological and ecological properties were observed in the field. During the revisionary work on the *Sempervi-*

vum specimens, in herbaria GAZI, HUB, ANK, OMU, ISTE, KNYA, K and E, we concluded that *S. minus* var. *glabrum* has considerable differences from *S. minus* var. *minus*. Therefore, in this study, *S. minus* var. *glabrum* is raised to species level.

Sempervivum ekimii F. Karaer, nom. et stat. nov.

Sempervivum minus Turrill var. *glabrum* Wale, Bull. Alp. Gard. Soc. 10: 240. 1942. — TYPE: Turkey. A cultivated specimen from A8 Trabzon, Haldizan Da., near Bayburt, 1934, *Balls* (holotype K!).

ETYMOLOGY: The species is named in honour of the eminent Turkish botanist Prof. Dr. Tuna Ekim (Department of Biology, Istanbul University) who is an expert on the Flora of Turkey.

Perennial, flowering stem (5)10–13(15) cm high. Rosettes 2–3(4) cm diam.; offsets 5–8 per rosette. Rosette leaves elliptic-oblong-lan-

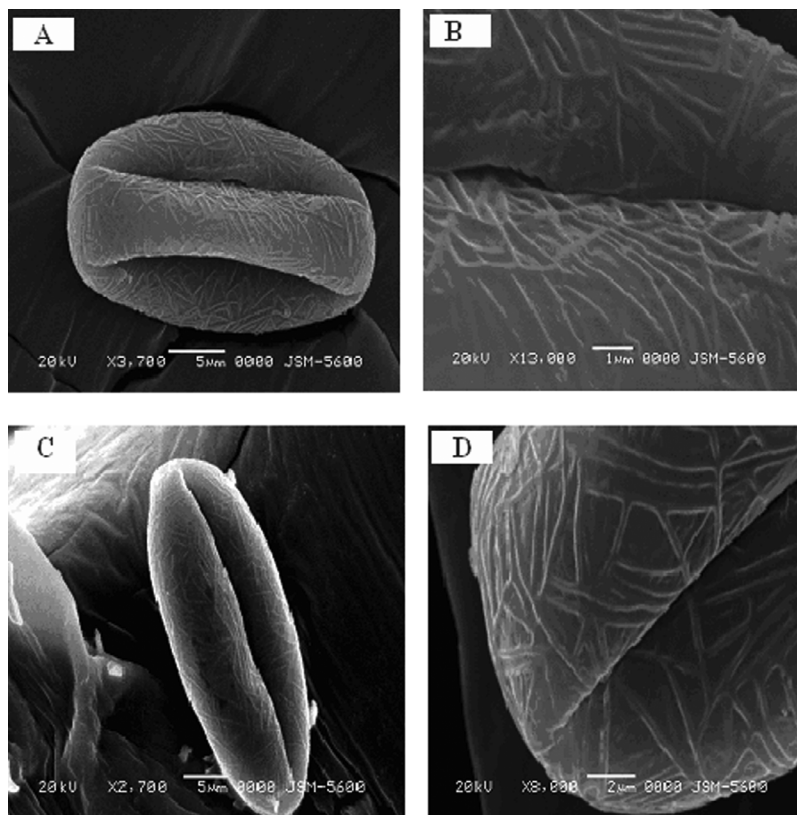


Fig. 1. SEM micrographs of the pollen grains. — *Sempervivum ekimii*. **A:** General view. **B:** Ornamentation. — *S. minus*. **C:** General view. **D:** Ornamentation.

ceolate, mucronate, ca. $10\text{--}15 \times 4\text{--}6$ mm, 1.5–2 mm thick, young rosettes leaves somewhat hairy but when mature glabrous, outer leaves bent back, green-bronze, base purple. Cauline leaves ovate-lanceolate to oblong, mucronate, $12\text{--}15 \times 5\text{--}7$ mm, 1.7–2 mm thick, densely and imbricate. Inflorescence (3)4.6–5.8(6.6) cm, 20–30 flowered, pedicels 1–1.5 cm, flowers ca. 15–18 mm diam., 9–11-merous; calyx lobes oblong-lanceolate, $2.1\text{--}3.5 \times 1\text{--}1.2$ mm, 0.5 mm thick, outside hairy, inside glabrous; petals pale greenish-yellow, ca. $8\text{--}9 \times 1.5\text{--}2.5$ mm, lanceolate, narrow at base, acuminate, strongly keeled, outside slightly hairy; bracts deltoid-lanceolate; filaments 18–22, pale yellow, 4–5 mm long, at base slightly widened and hairy; anthers bright yellow, oblong-ovoid; carpels 4–5 mm long, scales subquadrate-rotund, $0.5\text{--}0.8 \times 0.3$ mm, erect; seed surface grooved.

Sempervivum ekimii has 2–3(4) cm leaf rosettes in diameter, the rosette leaves being glabrous when mature, and an elongate inflorescence with 20–30 flowers. *Sempervivum minus*

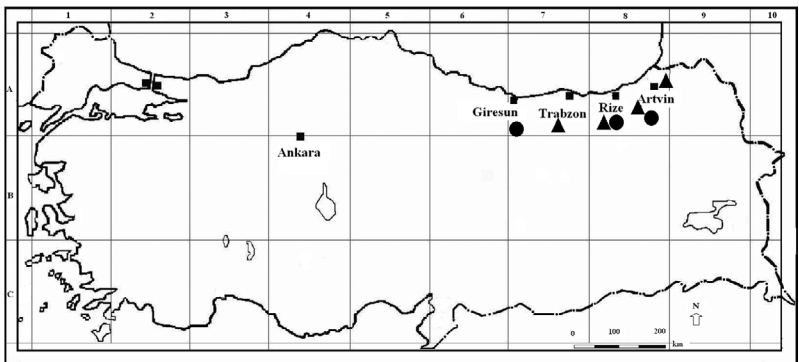
has 0.8–2(2.5) cm leaf rosettes in diameter, the rosette leaves are glandular when mature, and the inflorescence is globose and has 5–12 flowers. Other morphological differences are given in Table 1.

In addition, *S. ekimii* has suboblate pollen shape, while that in *S. minus* is sphaeroidal. General appearance and surface photographs of the pollen grains were taken with a scanning electron microscope (Fig. 1). The details are provided in Table 2.

Sempervivum ekimii appears to be quite a distinct endemic species, growing on granite rocks in northeastern Turkey. It was possibly formed by sympatric speciation from a common ancestor, from which *S. minus* also evolved (Doğan & Akaydin 2002).

Sempervivum ekimii grows on granite rocks in moist alpine steppe and is restricted to altitudes between 1100 and 3010 m. The flowering time is from July to August and the fruits mature from September to October. The vegetation in these places is mainly herbaceous with *Sedum*

Fig. 2. Distribution map of *Sempervivum ekimii* (●) and *S. minus* (▲) in Turkey.



spp., *Rosularia* spp., *Centaurea* spp., *Festuca* spp., *Alyssum* spp., *Trifolium* spp., *Alchemilla* spp., *Cirsium* spp., *Potentilla* spp., *Anthemis* spp. and *Ranunculus* spp. It is endemic to Turkey (Giresun, Trabzon and Artvin provinces). The collection sites are within the Euro–Siberian phytogeographic region and the locality has a relatively humid climate (Fig. 2).

SELECTED SPECIMENS EXAMINED. — *Sempervivum ekimii*. **Turkey.** A7 Giresun: Dereli, Tamdere to İksu, around tunnel, granite rocks, 1100–1250 m, *F. Karaer 10125-10126* (OMUB). A8 Rize: Cimil Da., 1934, *Balls* (K!). A8 Rize: Çamlıhemşin, between Yukarı Kavrın plateau and Mezevit, alpine meadows, granite area, 2150–2750 m, *A. Güner 2897*, (HUB!). A8 Rize: Çamlıhemşin, Yukarı Kavrın plateau, between Pornag and Kaçkar M., alpine steppe, granite area, 2750–3010 m, *A. Güner 2859* (HUB!). A8 Rize: İkizdere, between Gölyayla and Telfeniş, alpine meadows, 2400 m, *A.*

Güner 6646 (HUB!). A8 Rize: İkizdere, between Gölyayla and Cihantepe, stony place, 2500–2800 m, *A. Güner 6578* (HUB!). A8 Rize: Çamlıhemşin, Amlakit plateau, Kaygut to Çovinovit, granite area, alpine steppe, 2200–2750 m, *A. Güner 1062* (HUB!). A8 Rize: Çamlıhemşin, above Ayder plateau, Yukarı Kavrın, *F. Karaer 9614-9615* (OMUB). — *Sempervivum minus*. **Turkey.** A7 Trabzon: Haldızan mountain, near Bayburt, 1934, *Balls* (holotype K!). A7 Trabzon: Above Maçka, 609 m, *Balls 484a* (K!). A7 Trabzon: Çaykara, above Uzungöl, 1100–1200 m, *F. Karaer 9560-9568* (OMUB). A8 Rize: Çamlıhemşin, above Ayder plateau, Yukarı Kavrın, *F. Karaer 9613* (OMUB). A8 Artvin: Şavşat to Ardahan, Yavuz village, vicinity çayırlar, south side, *F. Karaer 9589* (OMUB).

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Table 1. Main morphological differences between *Sempervivum minus* and *S. ekimii*.

	<i>S. ekimii</i>	<i>S. minus</i>
Mature rosettes indumentum	glabrous	glandular hairy
Rosette diameter (cm)	2–3(4)	0.8–2(2.5)
Rosette leaf shape	oblong-elliptic	oblanceolate or oblong
Rosette leaf base	purple	not purple
Inflorescence length (cm)	4.6–6.6	2.5–4.5
Inflorescence shape	elongate	globose
Number of flowers	20–30	5–12
Pediceal length (mm)	10–15	2–9
Pollen shape	suboblate	sphaeroidal

Table 2. Pollen morphology of *Sempervivum ekimii* and *S. minus* (values in µm).

Species	Polar axis	Equatorial axis	Pollen shape	Ornamentation
<i>S. ekimii</i>	17.2–27.1(22.5)	21.8–27(27)	suboblate	striate rugulate
<i>S. minus</i>	17.7–25(20.8)	17.7–27.1(20.2)	sphaeroidal	striate rugulate

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