

## *Campanula hacerae* (Campanulaceae), a new species from Turkey

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*Campanula hacerae* A. İlçim *sp. nova* (Campanulaceae) from Turkey is described and illustrated. It grows on the slopes of gypsum hills located between Kayseri and Sivas in central Anatolia and flowers in the middle of July. Its diagnostic morphological characters relative to some closely related species are discussed.

The Campanulaceae are widespread on most continents, comprising up to 90 genera and 2200 species (Judd *et al.* 2002, Kovacic 2004). *Campanula* consists of approximately 400–600 species existing almost exclusively in the temperate zones of the northern hemisphere. The highest species diversity in the genus is found in the mountain ranges of the eastern Mediterranean and the Caucasus area (Fedorov & Kovanda 1978). Within the European Alps, there are 42 *Campanula* species, 20 of which are endemic or subendemic (Aeschimann *et al.* 2005).

Since *Campanula* was revised by Damboldt (1968) for the *Flora of Turkey*, 16 new species and four subspecies have been found in the country; a further subspecies was also recorded as new for Turkey (Davis *et al.* 1988, Güner *et al.* 2001, Behçet & Karabacak 2003, Ocak 2003, Akçiçek *et al.* 2005, Kandemir 2007). *Campanula* has 132 species in the subgenera *Campanula*, *Megalocalyx*, *Roucela*, *Brachycodonia*, *Sicyodon* and *Rapunculus* in Turkey; 68 of them are

endemic (Damboldt 1978, Ocak 2003, Akcicek *et al.* 2005, Kandemir 2007).

The species described here belongs to the section *Rupestres* in the subgenus *Campanula*. In that section, the plants are usually perennial, suffruticose-caespitose, with numerous and fragile stems and few flowers. The basal leaves are usually in dense rosettes. The calyx appendages are distinct or inconspicuous. The capsule opens by three basal pores, rarely dehisces irregularly between the ribs (Damboldt 1978).

The specimens reported here were cross-checked with the materials stored at various herbaria in Turkey (GAZI, ANK, VANF, KSUH).

***Campanula hacerae* A. İlçim, *sp. nova***  
(Figs. 1–4)

*Ab affine specie Campanulae ledebourianae differt foliis inferioribus lineatis et ad apicem laciniatis, hirsutis utrimque, 3–8 × 0.8–1 mm (nec*



Fig. 1. Habit of *Campanula hacerae* (holotype).



Fig. 2. Flowers of *Campanula hacerae* (holotype).

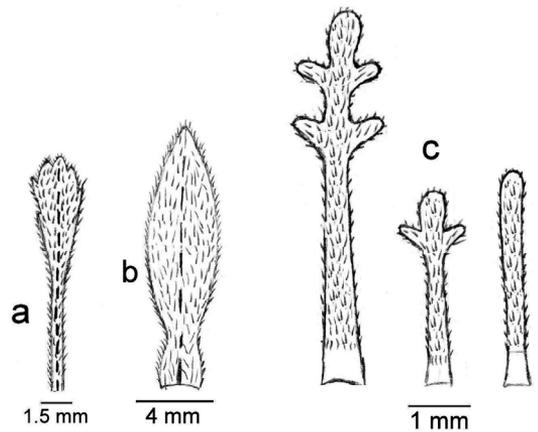
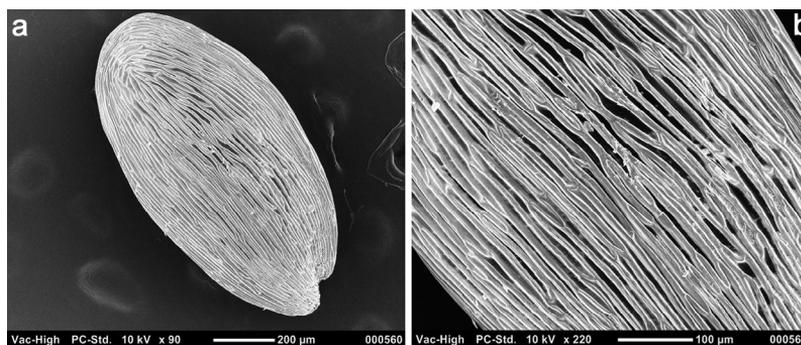


Fig. 3. Basal leaves of (a) *Campanula ledebouriana*, (b) *C. pulvinaris* and (c) *C. hacerae* (holotype).

*lineatis-lanceolatis*, *circa crenulatis*, *hirsutis tantum supra*, 10–20 × 1–3 mm); calicis lobis *cuneatis*, 1.5–2 × 0.5–0.7 mm (*nec lanceolatis*, 2–4 × 1 mm); corolla *intra extraque hirtella*, 6–8 × 4–5 mm (*nec glabra*, 7–14 × 7–9 mm).

TYPE: Turkey. B6 Kayseri: Uzunyayla, around Örenşehir village, on slope of gypsum hills at 1640–1670 m, 10 July 2009 A. İlçim 1763 (holotype KSUH; isotype VANF). —

**Fig. 4.** SEM image of *Campanula hacerae* (a) seed general view, and (b) seed coat.



**Table 1.** Diagnostic morphological characters of *Campanula hacerae*, *C. ledebouriana*, and *C. pulvinaris*.

Characters	<i>C. hacerae</i>	<i>C. ledebouriana</i>	<i>C. pulvinaris</i>
Basal leaves	linear with 1–2 pairs of lateral segments	linear–lanceolate, ± dentate	linear–spathulate, entire
Basal leaves	hairy on both surfaces, 3–8 × 0.8–1 mm	hairy only on upper surface, 10–20 × 1–3 mm	hairy only upper surface, 8–10 × 1–2 mm
Calyx lobes	cuneate, 1.5–2 × 0.5–0.7 mm	lanceolate, 2–4 × 1 mm	lanceolate, 2.5–4 × 1–1.5 mm
Corolla	hairy outside and inside, 6–8 × 4–5 mm	glabrous outside, 7–14 × 7–9 mm	ciliate on middle nerves, 10–12 × 7–10 mm

PARATYPE: Turkey. B6 Kayseri: Uzunyayla, near Örenşehir village, on slope of gypsum hills at 1640–1670 m, 25 July 2010 A. İlçim 1817 (KSUH).

ETYMOLOGY: The specific epithet is in honour of the first author's wife Hacer İlçim.

Perennial with sterile rosettes. Stems suffruticose-caespitose, rarely erect, 4–14 cm long, densely adpressed-hirsute with dense and adpressed hairs below (hairs ca. 0.2 mm long), loosely hirsute above. Basal leaves in dense rosette, petiolate, 3–8 × 0.8–1 mm, linear or with 1–2 pairs of lateral segments, lateral segments 0.5–1 × 0.2–0.5 mm. Cauline leaves few, lower cauline leaves usually with 2 lobes, upper leaves 1–4 × 0.2–0.5 mm, linear-cuneate. Flowers erect, shortly pedicellate (ca. 2 mm) axillary, solitary; bracts absent. Calyx hirsute, 3 mm long, lobes cuneate, 1.5–2 mm, appendages between adjacent lobes, ca. 1.3 mm. Corolla deep blue, clearly campanulate, 6–8 mm long and 4–5 mm wide at apex, 1.5 mm wide at base, divided to 1/3, hairy outside and loosely so inside, lobes slightly deflexed, 2–2.3 mm, cuneate-ovate. Sta-

mens yellow, 4–4.5 mm long, filiform part of filaments ca. 1 mm, base cuneate, 1 mm, ciliate, anthers 3–3.2 mm long, shorter than style. Style papillate, 5–6 mm long, included, stigmas 3, short. Capsule semiglobose, slightly adpressed, opening by 3 basal pores. Seeds oblong-elliptic, 1.3–1.4 × 0.4–0.5 mm, light brown, shiny. Flowering in July, fruiting in August.

*Campanula hacerae* is known from the type locality only, where it grows on gypsum hills at 1640–1670 m, between Pınarbaşı and Darende. The vegetation is formed by herbaceous plants such as *Gypsophila festucifolia*, *Aethionema armenum*, *Hedysarum varium*, *Euphorbia cardiophylla*, *Ebenus depressa*, *Dianthus crinitus* var. *crinitus*, *Cousinia sivasica* and *Scabiosa graminifolia*.

*Campanula hacerae* is included in the section *Rupestres*, which has 20 taxa, 14 of which are endemic to Turkey. It resembles *C. ledebouriana* and *C. pulvinaris*, but can be morphologically distinguished from both (Table 1).

The seed surfaces of *C. hacerae* have a striate testa. The cells are elongate, fibriform, with

relatively thick radial walls and often a narrow lumen, which is essentially linear (Fig. 4). This structure was reported also for *Campanula lyrata* subsp. *lyrata* (sect. *Quinqueloculares*), *C. rapunculoides* subsp. *rapunculoides* (sect. *Campanula*), and *C. glomerata* (sect. *Involucratae*; Akcin 2009).

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