

A New Variety of *Campanula myrtifolia* (*Campanulaceae*) from South Anatolia, Türkiye

Güney Anadolu Türkiye'den Yeni Bir *Campanula myrtifolia* (*Campanulaceae*) Varyetesi

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ABSTRACT

Türkiye is a key country of the *Campanula* L. diversity in the Mediterranean Basin and also more than half of *Campanula* species in Türkiye are endemic. Sect. *Trachiolepis* mostly consists of perennial polycarpic or perennial monocarpic and chasmophyte species. *Campanula myrtifolia* var. *caerulea* Yıldırım, Deniz & Altıoğlu (*Campanulaceae* Juss.) is described as a new variety from Antalya (Türkiye). Diagnostic characteristics, a full description and comprehensive photographs are given here. According to its morphological features, it belongs to *Campanula* subgen. *Campanula* sect. *Trachiolepis*. It is morphologically closely related to *C. myrtifolia* Boiss. & Heldr. var. *myrtifolia*. It is easily distinguished from *C. myrtifolia* var. *myrtifolia* by its purplish-blue to dark blue corolla. Differences among the those two closely related variety are given in detail. *C. myrtifolia* var. *caerulea* and *C. myrtifolia* var. *myrtifolia*, both are endemic species for Flora of Türkiye. The subject of the article *C. myrtifolia* var. *caerulea* is distributed the in Antalya province.

Keywords: *Campanula* sect. *Trachiolepis*, endemic, taxonomy, Türkiye

Öz

Türkiye, Akdeniz Havzası'ndaki *Campanula* L. çeşitliliğinin en önemli ülkelerinden biridir ve ayrıca birlikte Türkiye'deki *Campanula* türlerinin yarısından fazlasıda endemiktir. Sect. *Trachiolepis* çoğunlukla çok yıllık polikarpik veya çok yıllık monokarpik kazmofit türlerden oluşur. *Campanula myrtifolia* var. *caerulea* Yıldırım, Deniz & Altıoğlu (*Campanulaceae* Juss.), Antalya'dan (Türkiye) yeni bir varyete olarak tanımlanmaktadır. Teşhis karakterleri, tam tanım ve kapsamlı fotoğraflar burada verilmiştir. Morfolojik özelliklerine göre *Campanula* subgen. *Campanula* sect. *Trachiolepis*'e aittir. *Campanula myrtifolia* Boiss & Heldr var. *myrtifolia* ile morfolojik olarak yakından ilişkilidir. Morumsu-mavi ila koyu mavi korolla ile *C. myrtifolia* var. *myrtifolia*'dan kolayca ayırt edilir. Bu iki yakından ilişkili varyete arasındaki farklar ayrıntılı olarak verilmiştir. *C. myrtifolia* var. *caerulea* ve *C. myrtifolia* var. *myrtifolia*'nın her ikisinde Türkiye Florası için endemik türlerdir. Makalenin konusu olan *C. myrtifolia* var. *caerulea*, Antalya ilinde yayılış göstermektedir.

Anahtar Kelimeler: *Campanula* sect. *Trachiolepis*, endemik, taksonomi, Türkiye

Campanula L. is the largest genus of the family Campanulaceae Juss. Its distribution area is mostly in the mountainous areas of the Mediterranean and in Caucasian regions, being represented by approximately 150 species across these regions. Also, it is represented by approximately 420 species worldwide. (Alçitepe, 2011; Contandriopoulos, 1984; Fedorov and Kovanda, 1976; Lammers, 2007; Yıldırım, 2018; Yıldırım

and Özdöl, 2019). Endemism of *Campanula* species is further in the Eastern Mediterranean, the Balkans, the Caucasus and Türkiye. (Borsch et al., 2009; Khansari et al., 2011). *Campanula* is comprised by ca. 128 species (a total of 140 taxa) in Türkiye, of which 68 taxa are endemic and the endemism ratio is 53% (Damboldt 1965, 1976, 1978; Davis et al. 1988; Duman 1999; Güner 2000; Yıldız & Alçitepe 2010; Alçitepe 2011; İkinci 2012;

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Yıldırım 2013; Yıldırım & Şenol 2014; Mutlu & Karakuş 2015; Yıldırım 2018; Yıldırım et. al. 2019). The genus *Campanula* was divided into 6 subgenera (namely, subgen. *Megalocalyx* Damboldt, subgen. *Rapunculus* (Fourr.) Charadze, subgen. *Roucela* (Dumort.) Damboldt, subgen. *Brachycodonia* (Fed.) Damboldt, subgen. *Sicyodon* (Feer) Damboldt, and subgen. *Campanula*) (Damboldt 1976, 1978). In 'Flora of Turkey and the East Aegean Islands' the subgenus *Campanula* is classified into 13 sections, one of which is the *Campanula* sect. *Trachiolepis* has about 9 taxa in Türkiye and 7 of these taxa are endemic (Damboldt, 1978; İkinci, 2012; Yıldırım et al., 2019).

Trachiolepis mostly consists of perennial polycarpic or perennial monocarpic and chasmophyte species. This situation causes to limit the distribution areas of those taxa and indirectly increases their endemism rate. An endemic species, *Campanula myrtifolia* Boiss. & Heldr., was first described by Boissier and Heldreich in 1846 from Konya Ermenek (Boissier, 1849). During field studies in the province of Antalya by third author, a different specimen of *Campanula myrtifolia* was collected from Yunt Mountain (Figure 1). As a result of our detailed studies, we decided that this specimen is a new taxon of *Campanula myrtifolia*.

MATERIALS AND METHODS

The samples of the new variety were compared with herbarium specimens at ANK, G, E, EGE, HUB, W and in the relevant literature (Boissier, 1875; Damboldt, 1976, 1978; Davis, 1988; Fedorov, 1957; Fedorov and Kovanda, 1976; Güner et al., 2000; Rechinger and Schimann-Czeika, 1965). The gross morphology of the new variety was examined under a stereo-binocular microscope and measurements of these specimens were taken with a millimetric ruler. During field studies, photographs of living material of the new species and its related taxa were taken with a digital camera. At the end of the studies, the samples were prepared as herbarium and included in the Ege University Herbarium collection (EGE).

RESULTS

Campanula myrtifolia* var. *caerulea Yıldırım, Deniz & Altıoğlu **var. *nova*** (Figure 2 and 3).

Type: Antalya: Taşeli plateau, Yunt Mountain, 09 viii 2017, 2123 m, İ.G. Deniz 7849 (holo: EGE 43739!).

Diagnosis: *Campanula myrtifolia* var. *caerulea* is similar to *Campanula myrtifolia* var. *myrtifolia*. It is easily distinguishable from var. *myrtifolia* by its purplish-blue to dark blue corolla (not white).

Description: Perennial, hispid to hispidulous hairy, tufted, chasmophyte plants. Stem numerous, erect, crustaceous, 2 – 6 cm long, sulcate to straight, hispid to hispidulous hairy. Leaves small, sessile, elliptic–orbicular to broad ovate–elliptic, 3 – 9 x 2 – 4 mm, both surfaces hispid to hispidulous, entire, hispid to hispidulous hairs on margins. Inflorescence small, corymb, one flowered or raceme 1 – 4 flowered. Pedicel 1 – 6 mm long, antrorsely hispid to hispidulous hairy. Bracts 1 – 2, 1 – 2.5 mm long, elliptic–obovate to linear, antrorsely hispid to hispidulous hairy. Calyx lobes narrow linear to linear–lanceolate, erect, 1 – 2.5 mm long, less than 1 mm wide, antrorsely hispid to hispidulous hairy; appendage absent. Corolla purplish-blue to dark blue, narrow cylindrical to infundibular, 4 – 9 x 1.5 – 6 mm, outer surface hispid hairy, divided in to 1/6 1/5 of length; corolla lobes erect, triangular, 0.7 – 1.7 x 0.4 – 1.5 mm, outer surface hispid hairy, inner surface glabrous to laxly hispid hairy. Stamen 3.5 – 7 mm long; anthers ending with a gibbous mucro at apex, 1.5 – 3.5 mm long; filaments 1.5 – 3.5 mm long, widening at base, ± ciliate on margins. Style 4.5 – 6.5 mm long, shorter or sometimes equal to corolla length, pillate; stigma (2–)3. Capsule turbinate to globose shaped, 2.5 – 4 mm, antrorsely hispid to hispidulous hairy, opening by 3 basal pores. Seed oblong to oblong-elliptic or, 0.3 – 0.5 x 0.15 – 0.25 mm, light brown, surface ornamentation striate.

Phenology: Fruiting and Flowering time from July to August.

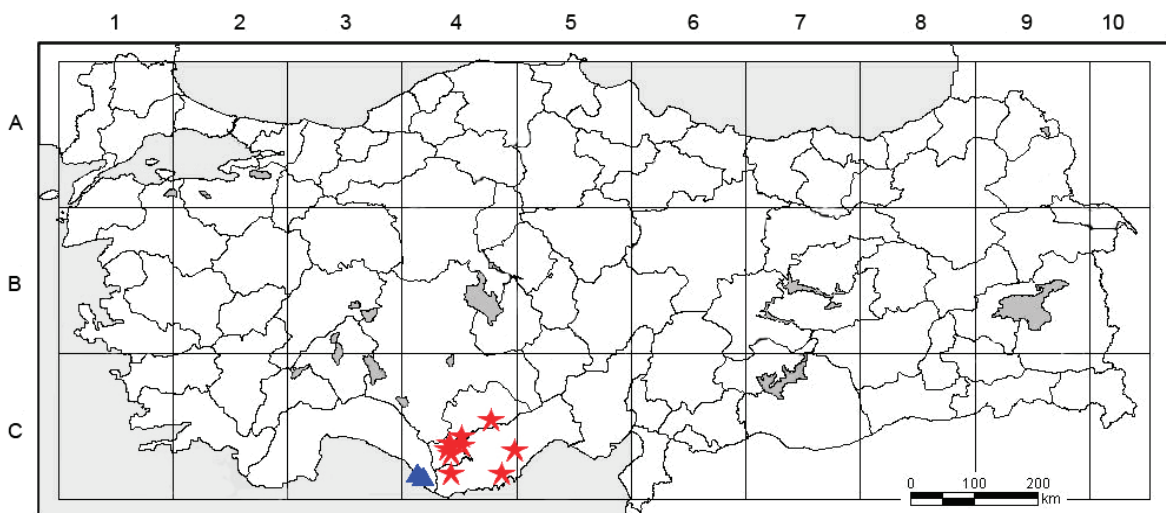


Figure 1. Distribution map of *C. myrtifolia* var. *myrtifolia* (○) and var. *caerulea* (●).

Etymology: The specific epithet indicates that the corollas of the plant are blue. The Turkish name of this species is given as “Taşeliçanı”, according to the guidelines of Menemen et al. (2013).

Ecology, distribution and habitat: The new variety is an endemic chasmophyte plant for Türkiye. It belongs to the Mediterranean floristic region. It grows on calcareous rocky

crevices, at elevations between 1070 to 2100 m (Figure 1).

Additional specimens examined (paratypes): Antalya: Gazipaşa, Çayırakası plateau, 1700 m, 19 vii 1983, H.Sümbül 2326 (HUB!); Gazipaşa, Çobanlar village plateau, Delieğrik, rocky places, 1700-2000 m, 19 vii 1981, H.Sümbül 1075 (HUB 26156!).



Figure 2. Holotypus of *C. myrtifolia* var. *caerulea*.



Figure 3. A, B- Habitus and habitat of *C. myrtifolia* var. *caerulea*.

Identification key for varieties of *Campanula myrtifolia*:

- 1. Corolla whitevar. *myrtifolia*
- 1. Corolla purplish-blue to dark blue var. *caerulea*

DISCUSSION

Campanula myrtifolia is an intermediate species between sect. *Tracheliopsis* and sect. *Saxicole*, with its larger flowers and short style (Damboldt 1978). However, other taxa in sect.



Figure 4. A,B- Habitus and habitat of *C. myrtifolia* var. *myrtifolia*.

Tracheliopsis have small flowers with clearly exerted styles. The type locality of *C. myrtifolia* is the Ermenek district in Karaman province. During field studies around Ermenek, we realized that the populations of *C. myrtifolia* have white flowers (Figure 4). Although Damboldt (1978) stated that *C. myrtifolia* has lavender-blue to sometimes white flowers, we observed only white flowered individuals near the type locality. It is probable that Damboldt examined only dry specimens of *C. myrtifolia*. During field studies, we realized that at the end of flowering periods, the white flowered taxa of sect *Tracheliopsis* turn slightly bluish in color. For this reason, it

is likely that Damboldt (1978) stated that *C. myrtifolia* has mostly lavender-blue flowers. The third author of the present study found a completely purplish-blue to dark blue flowered population of *C. myrtifolia* on the Taşeli plateau in Antalya province. After herbarium studies, we also examined dark blue flowered specimens of *C. myrtifolia* collected from the Gazipaşa district in Antalya. Our conclusion is that the flower color of *C. myrtifolia* is white or purplish-blue to dark blue, but that all populations have stable flower color features; different colored flowers are never seen in the same population. The population of *C. myrtifolia* type locality has completely white flowers. On

account of this, *C. myrtifolia* populations with blue flowers are described in this study as a new variety. However, *C. myrtifolia* is highly variable in terms of both plant height and flower size, as well as calyx lobe shape and size.

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APPENDIX

***Campanula myrtifolia* var. *myrtifolia*:** Türkiye. Karaman: Ermenek, Balkusan Barajı, Balkusan Köprü'sü üzeri kayalıklar, 26 vi 2014, 1553 m, *H.Yıldırım* 2979 (EGE!); Ermenek, Nadire Değirmeni civarı, kaya üzeri, 800 m, 08 vi 1990, *H.Sümbül* 3720 (HUB-26160!). Konya: Ereğli, Mut yolu, Mut'a 23 km kala, Alaoda Kilisesi tabelası yanı yamaçta kayalar, 1087 m, 26 vi 2014, *H.Yıldırım* 2977(EGE!); Ermenek, Kamlı Dere between Ermenek-Oyuklu Dağ, vertical rocks, 1400-1500 m, 14 viii 1949, *Davis* 16173 (E00191080!); Ermenek, Meydan Kebeni Çeşmesi, in sloping or vertical hard limestone rock, 1400 m, 13 viii 1949, *Davis* 16136 (ANK!, W 14542!, E00191081!); Ermenek, Nadire Değirmeni civarı, kaya üzeri, 800 m, 08 vi 1990, *H.Sümbül* 3720 (E!); Ermenek, Tekeçatı-Damlaçal arası, uçurum kayalık, 1400 m, 06 viii 1978, *M.Vural* (ANK!); Ermenek-Mut, senkrechte kalkfelsen 20 km nach Ermenek, 1340 m, 13 vi 1950, *Hub.Mor.* 10210 (G!); in fissuris rupium verticalium inter Ermenek et Tourtchalar, 1067 m, *Heldreich*. Mersin: 10 km from Gülnar to Silifke, limestone rocks cliffs, 800-1000 m, 25 vi 1985, *J.Archibald* 6752 (E00191083!); Anamur, near Çamurlu Yayla between Ermenek-Anamur, 2100 m, 15 viii 1949, *Davis* 16260 (ANK!, E00191082!); Kirobası (Mara)-Silifke, kalkfelsen 17 km nach Kirobası, 1350 m, 15 vi 1950, *Hub.Mor.* 10199 (G!); Kızıldağ, 2400 m, 17 vi 1970, *B.Yıldız* 1380 (HUB-26158!); Mut-Ermenek yolu, Balkusan Hidrotermik 1. Santral, Kanyon içi, 1119 m, 26 vi 2014, *H.Yıldırım* 2978 (EGE!).

