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Some Contributions to the Morphological and Anatomical Description of *Anemone coronaria* L. (*Ranunculaceae*) Occuring in Şanlıurfa, Turkey

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Abstract: In this study, some morphological characteristics of *Anemone coronaria* L., which is flowering in spring, were observed. The detailed description of this species is given in this study and the morphological characters are compared with the Flora of Turkey. Some characters that have not been stated previously, like tepal, leaf and fruit, are given for the first time in this study. The specimens are collected from the different parts of Şanlıurfa as a new record for C7 of the grid system. Its habitat, color variations of the flowers and observations on the population are also determined. The anatomical structure of species and its general appearance was also reported.

Key words: *Anemone, Ranunculaceae*, Şanlıurfa, Turkey

INTRODUCTION

Anemone is mainly distributed in Mediterranean and Euro-Siberian area[1-4] and includes about 150 species in the world[5]. The genus *Anemone* L. has 8 species (12 taxa, inc. var. and subsp.) in Turkey. It was not known from South East Anatolia up to now. None of the species of the genus is endemic for Turkey.

In our research area, *Anemone coronaria* L. is flowering in early spring. It is a new record for the C7 square[1,6-10].

This research was carried out to contribute the morphological and anatomical characteristics of *Anemona coronaria* L. Some studies related with *Anemone* on different parts of Turkey were carried out by Demiriz[11,12], Ünal[13,14], Dane[15], Dane and Demiriz[3] and Aktaş and Yıldız[16].

MATERIALS AND METHODS

Specimens were collected during the early spring from different parts of Şanlıurfa which is located in C7 square. A collector number was given and the specimens were dried according to the herbarium methods. The plant samples were kept in the herbarium of Harran University, Şanlıurfa. The Flora of Turkey and the East Aegean Islands[1] was used to identify plant samples.

For the anatomical studies, materials were fixed in 70% alcohol. Transverse sections and surface preparations of root and leaves were made manually. Sartur reactives were applied to the sections for a better understanding of some anatomical structures[17]. Olympus BX50 binocular microscope and a drawing tube were used. Photographs were taken by Olympus Camedia.

Findings

Morphological characteristics: *Anemone coronaria* L., Sp. Pl. 539 (1753) Ic.: Bot. Mag., t.841 (1805) (Fig. 1). Plant 6-35 cm, perennial, rootstock tuberous with adventatif roots. Basal leaves biternately compound, 2-12.5 cm long, petiol 1.5-12 cm, stalked segments deeply divided into numerous, oblong, dentate laciniae, sparsely at base but dense hairy upper. Involucral leaves sessile, densely hairy. Stem 3.7-30 cm long, hairy. Flowers borne singly, perianth actinomorphic, uniseriate, 3-6 cm in diameter; peduncle 1-9 cm. Tepals usually 5(- 6), 1.4-3.1x0.6-1.5 cm, obovate, dense hairy outer. Tepal colour variable, scarlet (var. *coccinea* (Jord.) Burn.), pink (var. *rosea* (Hanry) Batt.), violet-blue (var. *cyanea*) or white (var. *alba* Goaty and Pens.). Stamens and pistils in numerous, stamens 3-8 mm long, anters 0.9-2 mm long, grey-blue, pollens purple; filaments 1-7 mm, usually claret red, rarely mixed; pistil 3-7 mm. Achenes densely villose, 2n=16.

Fl.: Feb-April
Habitat: Rocky slopes, scrub, meadows, sea level-900 m.
Vernacular name: Anemon, Manisa lalesi, şakayık, yoğurt çiçeği.
Phytogeographic region: Medit. element
Distribution in the world: Throughout the Mediterranean area.

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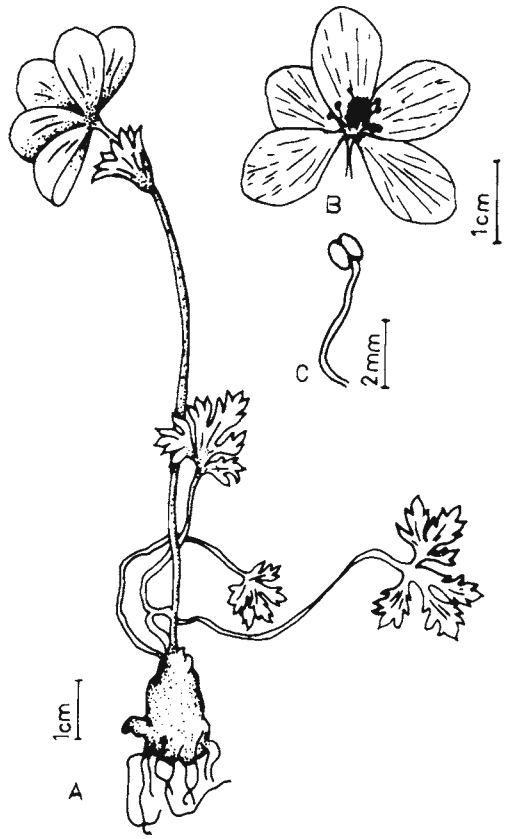

Fig. 1: *Anemone coronaria* L. (İ. Eker 48). A. Habit B. Perianth C. Stamen

Distribution in Turkey: A2(E)Istanbul, A2 Bursa, A6 Samsun, B1 İzmir, C2 Muğla, C3 Antalya, C5 Içel and C6 Hatay, C7 Şanlıurfa, C8 Diyarbakır.

Type: Orient near Constantinople (Istanbul) (Hb. Linn. 710/9).

Examined specimens: (Turkey): C6 Şanlıurfa: Birecik, around Çiftlik village, meadows, 600-800 m, 21.03.2002, Akan and İ. Eker 68; Birecik, around Mezra village, steppe, 600-650 m, 23.03.2002, Akan and İ. Eker 92. C7 Şanlıurfa: Şanlıurfa to Gaziantep 15 km, around Çalışkanlar village, rocky slopes, 550-600 m, 10.03.2002, İ. Eker 48.

Anatomical characteristics

Leaf: In transverse section upper and lower epidermis comprise uniseriate square and rectangular cells. The upper epidermis cells are longer than lower epidermis cells. Both epidermal surfaces are covered with thick cuticle. Stomata is anomocytic type and located on slightly higher from the epidermal cell level and it is more abundant on the lower surface. Leaf is bifacial. Palisade parenchyma cells are usually 1-layered, but sometimes 2-layered. Spongy parenchymatic cells are 3-5-layered. Vascular bundles lie between the palisade and the spongy

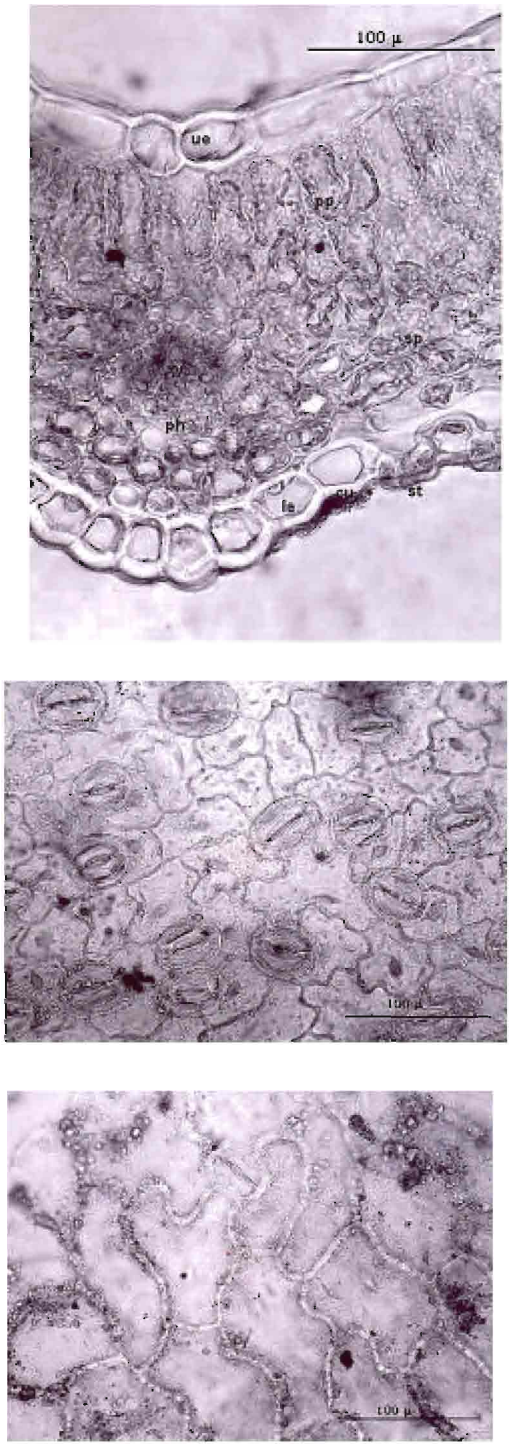

Fig. 2: *Anemone coronaria* L. (İ. Eker 48). A) Cross-section of leaf, B) Lower epidermis of leaf, C) Upper epidermis of leaf;
cu-Cuticula, ue-Upper epidermis, le-Lower epidermis, st-Stomata, pp-Palisade parenchyma, sp-Spongy parenchyma, xy-Xylem, ph-Phloem

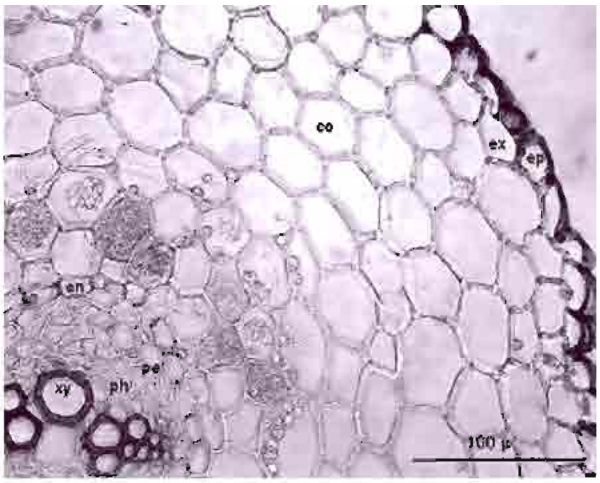

Fig. 3: *Anemone coronaria* L. (İ. Eker 48), Cross-section of root
ep-Epidermis, ex: Exodermis, co-Cortex, en-Endodermis, pe-Pericycle, xy-Xylem, ph-Phloem

tissue and are surrounded by parenchymatous bundle sheathings. They are collateral type. The xylem is towards the upper surface, and the phloem is towards the lower surface (Fig. 2).

Root: The epidermis is composed of a single layer and isodiametric cells. There is usually 1-layered exodermis tissue below the epidermis. Cortex is 6-8-layered. The cortex tissue consists of large hexagonal or polyhedral parenchymatous cells. Single layered endodermis consists of rectangular cells. The walls of the endodermis cells have a casparian strip. Pericycle, parenchyma cells are just inside of the endodermis. Xylem is usually diarch but sometimes triarch. Phloem is found in patches between the xylem arms (Fig. 3).

Palynological characteristics: The pollen morphology of the species was determined as tectate, sferoidal, periporate and microechinate, by Aktaş and Yıldız[16].

Observation on population: *Anemone coronaria* is distributed in Şanlıurfa around 550-800 m at rocky slopes, meadows and steppe with *Adonis flammea* Jacq., *Asphodelus aestivus* Brot., *Geranium tuberosum* L., *Holosteum umbellatum* L. var. *umbellatum*, *Ranunculus argyreus* Boiss., *Eminium rauwolffii* (Blume) Schott. var. *rauwolffii*, *Gagea fibrosa* (Desf) Schultes, *G. reticulata* (Pallas) Schultes, *G. chlorantha* (Bieb.) Schultes and *Muscari longipes* Boiss.

It is observed that the population in the field is local and not widespread. The population of species has been reducing because of the grazing, construction of channels and dams around Şanlıurfa and being collected by the citizens for ornamental pecularity. It has been threatened by anthropogenic effects and tries to survive under unsuitable conditions.

RESULTS AND DISCUSSION

In this study, the morphological characters of *Anemone coronaria* L. were observed. The findings were compared with the Flora of Turkey and it was determined that there are some differences between this study and the Flora of Turkey. These are given in Table 1.

Table 1 The comparison of morphological characteristics between this study and the Flora of Turkey, related with *Anemone coronaria* L

	Anemone coronaria L	
Morphological characters	Flora of Turkey (Davis *et al* [1])	The findings of this study
Plant height	not indicated	6-35 cm
Basal leaves length	not indicated	2-12 5 cm
Petiol length	not indicated	1 5-12 cm
Stem length	not indicated	3 7-30 cm
Involucral leaves	not indicated	densely hairy
Perianth diam	not indicated	3-6 cm
Peduncle length	not indicated	1-9 cm
Tepals	not indicated	1 4-3 1 x 0 6-1 5 cm, obovate, densely hairy outer
Stamens length	not indicated	stamens 3-8 mm long
Pistil length	not indicated	pistil 3-7 mm

Some morphological characters of this species weren't given in Flora of Turkey, such as the height of the plant and stem, peduncle, petiol, pistils and stamens. The unknown characters are given and enlightened with this study. With the knowledge brought out with this study, the description of species is widened and findings are generally contributed to the Flora of Turkey.

In this research, the morphological and anatomical features of *Anemone coronaria* L. were studied in order to provide a more detailed description for the future studies. Moreover, with this study, the determination of the anatomical characteristics present the first data available in the literature.

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