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Research article/Araştırma makalesi

Morphology and anatomy of Potentilla buccoana Clem. (Rosaceae) from Türkiye

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Abstract

In this study, *Potentilla buccoana* Clem.; an endemic for Türkiye, has been investigated morphologically and anatomically. The plant has a compact root anatomy with a full xylem component in pith and herbaceous stem. In the leaf mesophyll, the palisade and spongy parenchyma cells are not a similar shape. Leaves trifoliat; leaflets obovate or oblong obovate, coarsely crenate-dentate. Flowers up to 8 mm, petals longer than sepals. Vascular bundles collateral.

Key words: ***Rosaceae, Potentilla buccoana, Anatomy, Morphology, Flora of Turkey***.

1. Introduction

Monographic study on *Potentilla* L. genus reveals that there is a great variation in the distrubution in Anatolia (Wolf, 1908, Davis, 1972, Panigrahi and Dixit, 1985, Sojak, J. 1987). The genus includes approximately 300 taxa, out of which 60 taxa occur in Türkiye, together with *Potentilla buccoana* an endemic species (Davis, 1972, 1988 and Güner et al., 2000). According to Red Data Book of Türkish Plants (Ekim et al., 2000) *Potentilla buccoana* is placed in the category of **VU** (endangered species).

In this study the morphological and anatomical aspects of *Potentilla buccoana* Clem. have been investigated with that it will prove helpful in the future studies on this genus.

2. Materials and methods

2.1. Plant material

Potentilla buccoana Clem. samples were collected from Kütahya, herbarium samples were prepared and deposited in the Kütahya Dumlupınar University Herbarium (DUP). In this study, the samples we analyzed are indicated by the "**!**" symbol.

2.2. Morphological material

Roots, stems and leaves were fixed in %70 alcohol for anatomical study through cross-sections (by hand). All the sections were stained with Sudan III (Merck), Floroglusin and 1N HCL and lugol (Misirdali et al., 2005) and made permanent by glycerine gelatine. A number of anatomical boks and reviews were consulted (Metcalfe and Chalk, 1950, Esau, 1967, Fahn, 1967, Zhitkov, 1972, Zhang, 1992, Yentür, 2003, Stepanova et al. , 2007).

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3. Results

3.1. Morphology

Plant 25-60 cm, stout erect perennial. Leaves trifoliolate; leaflets obovate or oblong-obovate, 20-50 x 15-40 mm, oblique at base, crenate-dentate, terminal tooth much smaller than laterals, adpressed-pilose, greyish-green. Epicalyx segments elliptic or oblong, shorter than obtuse sepals. Petals yellow, 6-8 mm mm, longer than sepals. Achenes smooth; style conical at base, strongly papillose, as long as achene. Fl.6-8. Meadows, damp shady places, 1200-2000 m *(Fig. 1)*.

Type: (Turkey A2 (A) Bursa: Olympi bithyni (Uludağ), meadows and stony, Clementi (iso.E!).
N.W.Anatolia. Endemic. Mountain euxine element.

A2(A): Bursa: Uludağ, Kirazlı Yaylası, 4.7.1944. Heilbronn,
B2: Kütahya: 45 km from Tavsanlı to Inegöl, 1200-1400 m, high pass, Dudley, D.36156!
Kütahya: Domanic: Domanic to Kocayayla, 5 km, hills, in forest 17.06.2010, 1337 m, Ç.Gidik and K.Ören (DUP!).
Kütahya: Domanic: Domanic to Inegöl, 25-30 km, rocky mountain slopes, 18.06.2008, 1500 m, Y.Bastatlı and S.Güzel (DUP!).

Figure 1. *Potentilla buccoana* Clem.. Plant and flower.

3.2. Anatomy

It shows typical perennial, herbaceous dicotyledonous root characters (Fig.2). Periderm 6-7 rowed forms outermost layer with suberized walls. Parenchymatic cells fill a large part of cortex with evident intercellular spaces and are thin walled. Parenchymatic cortex cells oval or oval-oblong, outer layers large than inners and is having starch grains.

Pericycle lies outside the vascular bundles and endodermis placed above it is not cambium cells are distinguishable. Primary pith extensions are separate from vascular tissue and form parenchyma that is 3-5 rowed and extends up to secondary cortex from pith region, becoming wide. Intervascular spaces is not distinguishable. In seconder root, tracheal elements covers completely the pith ve cambium cells 3-4 rowed.

Stem is possesses a thin cuticle with small-celled epidermis (Fig.3). Epidermis has glandular hairs. Cortex is two-layered collenchyma and five to six-layered parenchymatic tissue. Vascular bundles are colleteral type. There is a sclerenchymatous sheat on the phloem tissue which occupies a small region in bundle. Cambium is not distinguishable and pith parencymatous with thin walled cells and rather large intercellular spaces.

In leaves the upper epidermis consist of flat-ovoidal cells and the lower epidermis is made up smaller cells than uppers (Fig.4). Stoma cells are present in lower epidermis. Palisade parenchyma cells one- and two-layered. There are glandular and eglandular hairs on both upper and lower epidermis. The leaf is hipostomatik. The plant has an amaryllis higromorphic and anomocytic type of stomata on lower surface. In the leaf anatomy, epidermal cells of different sizes can be observed with larger epidermal cells occurring on the upperside.

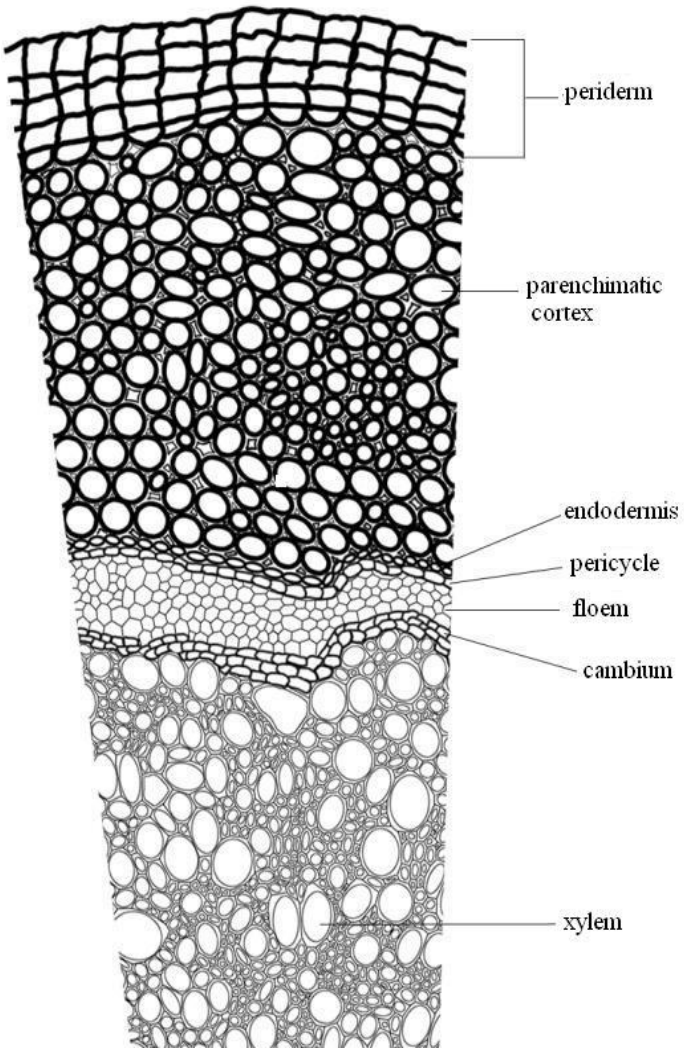

Figure 2. *Potentilla buccoana* Clem.'nın kök enine kesit.

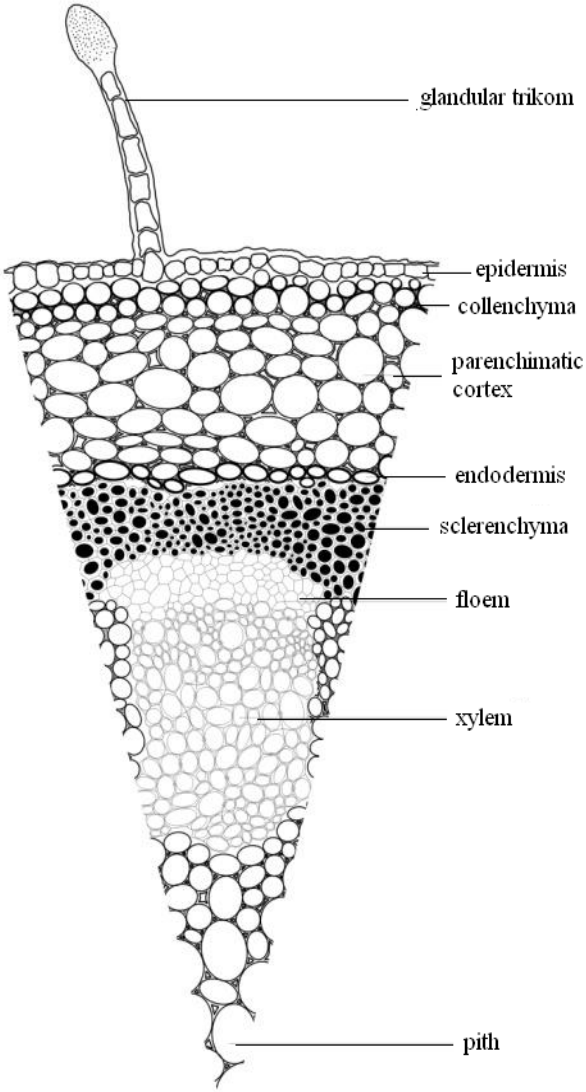

Figure 3: *Potentilla buccoana* L.'nın gövde enine kesit.

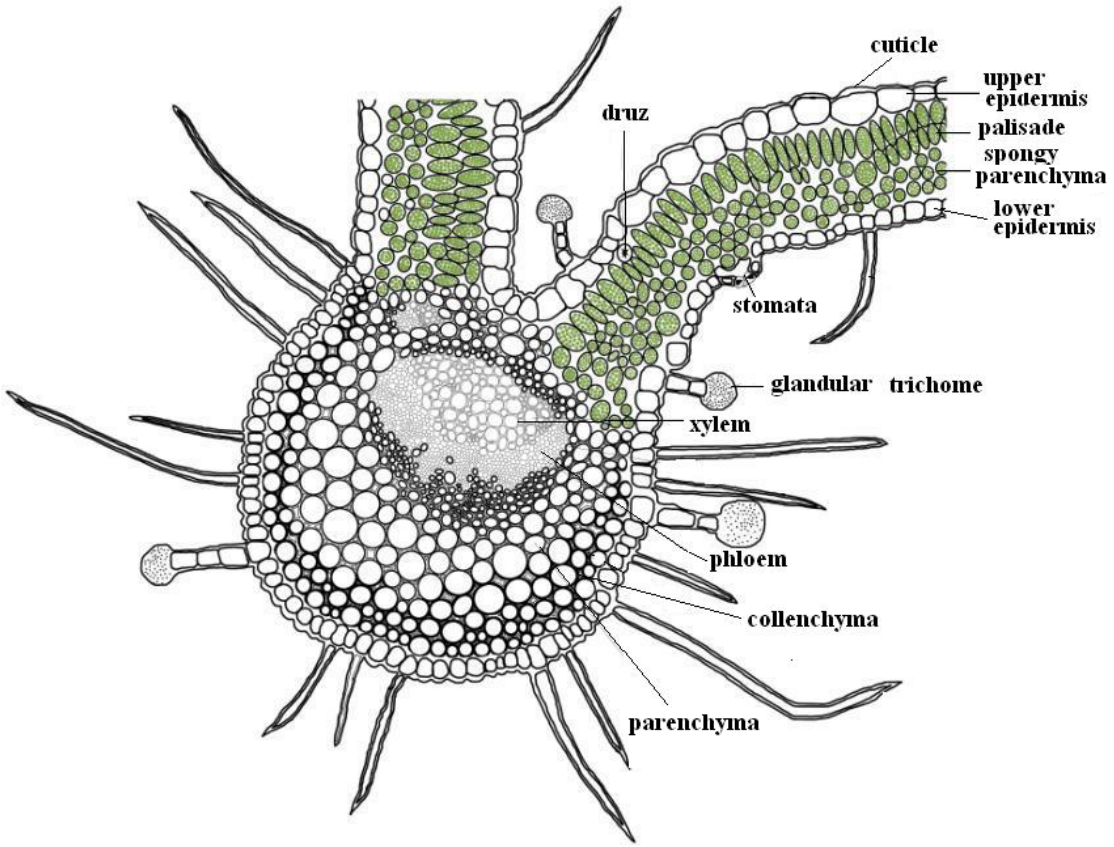

Figure 4. A cross-section of leaf mid-rib of *Potentilla buccoana* Clem.

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