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Leaf Anatomy of Turkish Endemic *Iris schachtii* Markgraf

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Abstract: *Iris schachtii* Markgraf is an endemic plant species spreading around Salt Lake, Turkey. Flower color shows variations within the species. There are two colors, violet and yellow, observed but these are not important for the separation of species into subspecies or variants and weren't used for this purpose. Leaf anatomy of the individuals having each color was examined. Small and thin leaves are annual. Leaves are linear-lanceolate and show parallel venation. Epidermal cells of ensiform leaves axially elongated. Small papillae are rarely present on one layer epidermis. Stomas are in amaryllis type. Epidermal cell numbers and stoma numbers per mm² of leaves are determined. Sclerenchyma cells are in bundles at leaves apex and vascular bundles. Also there are some tannin resembling substances observed in mesophyll.

Key words: *Iris schachtii* Markgraf, leaf anatomy

INTRODUCTION

Leaf anatomy of Iridaceae shows variations. Rudall (1994) gave a general description of leaf anatomy in Iridaceae and the importance of leaf anatomical characters for the systematic of the family is assessed by means of a cladistic analysis utilizing characters from morphology, anatomy and biochemistry. Although there is a high homoplasy among both morphological and anatomical characters, leaf anatomy provides some significant data for Iridaceae systematic, especially at the tribal level. There has not been any anatomical study on leaves of *I. schachtii* which is an endemic species.

MATERIALS AND METHODS

I. schachtii spreads between 1200-1700 m on open stony hills around Salt Lake, Central Anatolia, Turkey (Davis, 1984). Plant specimens were collected from Konya, Kulu on May 2004. Specimens were prepared as a herbarium material Fig. 1 and plant as a whole preserved in 70% ethanol solution.

Cross-sections and surface sections were taken by hand from individuals having violet and yellow flowers. Staining were made with safranin. Cross-sections were preserved in 10% glycerin. Mean epidermal and stoma cells numbers in mm² of surface section were determined. Cell counts were made by using Leica DM-LS2 research microscope and photographs were taken with DFC-320 digital camera.



Fig. 1: Herbarium specimen of *I. schachtii* (violet and yellow flowers)

RESULTS AND DISCUSSION

Small and thin leaves are annual. Leaves are linear-lanceolate and show parallel venation. Leaves are



Fig. 2: Epidermal and stoma cells

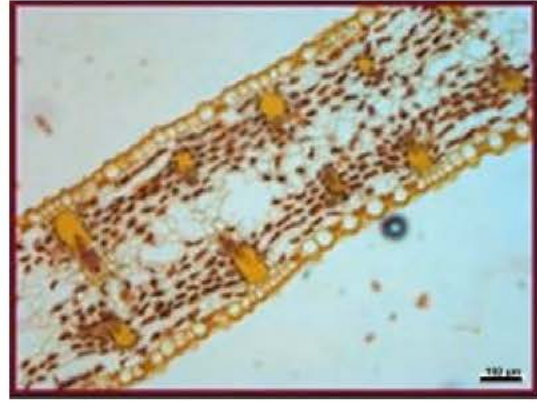


Fig. 5: Cross section of a leaf

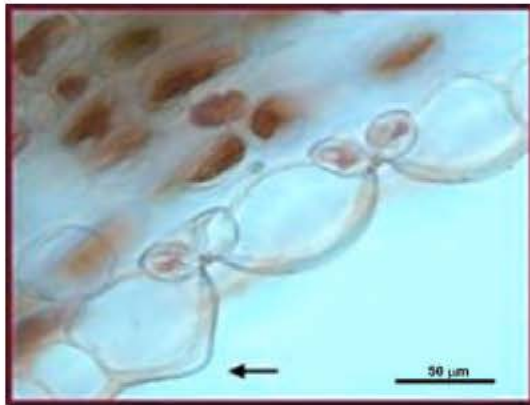


Fig. 3: Papillae (arrow) and stoma are in cross section

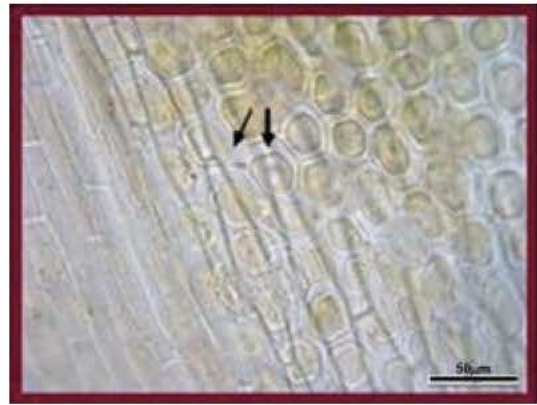


Fig. 6: Parenchyma cells with thick cell wall (arrows)

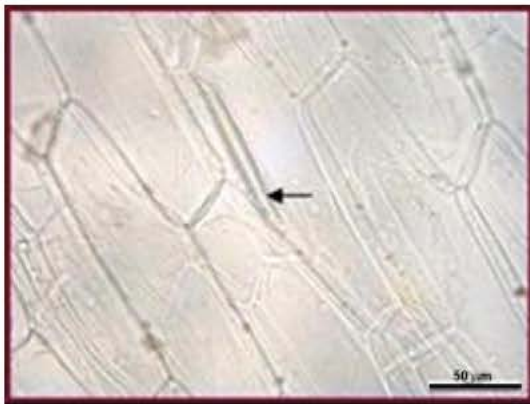


Fig. 4: Prismatic crystal (arrow)

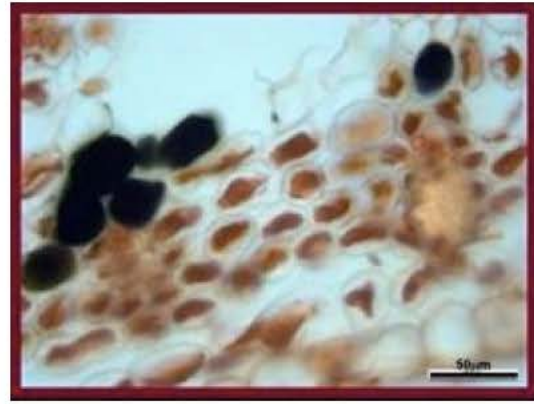


Fig. 7: Parenchyma cells that have tannin like structures

unifacial ensiform type. End walls of epidermal cells are straight (Fig. 2).

Small papillae are present on epidermis. Stomas are amaryllis type. Stoma appeared embedded in the epidermis (Fig. 3). Prismatic crystals, running longitudinal to the

axis, were observed (Fig. 4). According to Wu and Cutler (1985), diversity of shape and size of styloid crystals are taxonomically important characteristics in *Iris* species.

It was determined that there is no difference in epidermal and stoma cells between individuals with

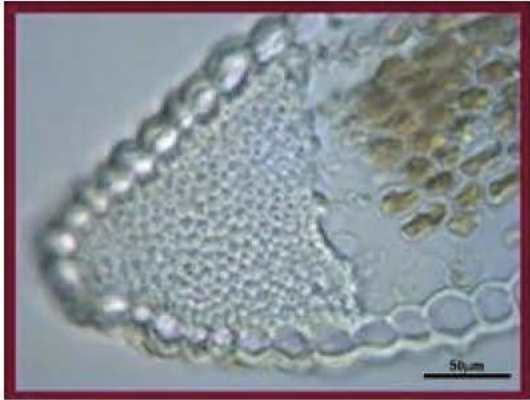


Fig. 8: Sclerenchyma bundles at the leaf apex



Fig. 9: Vascular bundle sheath

different flower color. Mean number of epidermal and stoma cells in mm^2 was found respectively as; 193.95 and 99.05.

Photosynthetic region at mesophyll cells is continuous along the leaf axis. Mesophyll cells are getting larger awards the center and encircle the intercellular spaces (Fig. 5). Cell walls of parenchyma cells are relatively thick (Fig. 6). When stained, tannin like structures were observed in parenchyma cells (Fig. 7).

Bundles of sclerenchyma cells are at leaves margins and vascular bundles (Fig. 8). Vascular bundles are lined in rows. Xylem of vascular bundles is directed towards the leaf center. Vascular bundle sheath consists of outer layer of thin walled parenchyma cells and there is also a discontinuous inner layer of 2-3 sclerenchyma cells (Fig. 9).

The prismatic crystals observed in *I. schachtii* will be investigated in other organs of the plant and evaluated whether they have a taxonomical importance or not. This endemic plant with two different flower colors is a valuable ornamental plant and can provide economical income.

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