

STRUCTURAL FEATURES OF LEAVES OF SOME ENDEMIC SPECIES OF THE GENUS OF IRIS L. FROM THE SECTION *HEXAPOGON* (BUNGE EX ALEF.) BAKER IN CONDITIONS OF INTRODUCTION

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ABSTRACT: The anatomical structure of a leaf of 2 endemics - *Iris korolkowii* and *Iris stolonifera* under conditions of introduction of the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan was studied. The following diagnostic features of the leaf were determined: rectilinear, round-oval outline of epidermal cells; submerged, numerous stomata of anomocytic type; isolaterally-spongy type of mesophyll leaf; closed, collateral type vascular bundles.

Keywords: Anatomy, Leave, Introduction, *Iris korolkowii*, *Iris stolonifera*, Tashkent.

INTRODUCTION

Preservation of species diversity is a priority, as the botanical gardens and collectors around the world. Plant protection can be carried out both in the form *in situ*, that is, in habitats of species, and in the form of *ex situ*, that is, by creating and maintaining the conditions necessary for conservation.

Along with traditional methods of *ex situ* conservation of plants it is becoming increasingly important to use for these purposes the culture of isolated tissues and organs (Kamelin, 1997).

The genus *Iris* L. is the most polymorphic in the homonym family with more than 200 species (Takhtadzhyan, 1982). In the flora of Uzbekistan, this genus includes more than 30 species.

One of the last large-scale revisions of the genus *Iris* was conducted by P. Wendelbo in *Flora Iranica* (1975), where he combined all 3 genera into one and brought 45 species to this territory. Recent studies based on the study of DNA have confirmed the correctness of this concept (Ikinci, Hall, Lledo et al., 2011). The given species from the Hexapogon section (Bunge ex Alef.) Baker are based on revisions of the systems and lists of R.V. Kamelina (1973), P. Wendelbo (1975), as well as the revision of F.O. Hassanov & N.K. Rakhimova (2012, 2016).

The anatomical structure of the leaf of two species of the genus *Iris* from the section Hexapogon (Bunge ex Alef.) Baker - *Iris korolkowii* and *Iris stolonifera* has not been studied. It determines the relevance and novelty of our research.

MATERIALS AND METHODS

Species were collected under natural growth conditions from the South-western Tien-Shan (*Iris korolkowii*) and Samarkand region of the Aman-Kutan pass (*Iris stolonifera*). Both species are the endemics of Central Asia. Introduced in the Botanical Garden named acad. F.N. Russanov (Institute of Botany and Zoology of the Academy of Sciences of Uzbekistan).

Simultaneously with the morphological description, fixed assimilating plant organs (leaf, leaf's vagina) 70° ethanol for anatomical study. The epidermis was studied in the paradermal and transverse sections. Transverse leaf

slices are made through the middle. Each tissue was described, epidermis - according to S.F. Zakharevich (1954). Preparations prepared by hand were stained with methylene blue followed by gluing in glycerin-gelatin (Barykina, Veselova, Devyatov et al., 2004). Photomicrographs are made with a computer microphotoset with a digital camera brand ES70 from Samsung and A123 from Canon under the microscope Motic B1-220A -3.

RESULTS AND DISCUSSION

Iris korolkowii Regel – is perennial grass, leaves simple, the shape of the plate is linear, sessile, the tip is sharp, the edge is smooth, the leaf in the shoot is regular, in the basal - rosette.

The leaves of *Iris korolkowii* on the paradermal section of the outline of the epidermal cells are rectilinear, the projection is polygonal. The cells of the adaxial epidermis are larger than the cells of the abaxial epidermis. The leaves are amphistomatic. The stomata are located transversely to the longitudinal axis of the leaf. The shape of the stomata is round-oval. Stomata most numerous on the abaxial side than on the adaxial side. The closing cells of stomata on both sides of leaf of almost the same length. Stomata immersed, anomocytic type (Figure 1a, b, g).

The leaf's mesophyll on the transverse section of an isolaterally- spongy type, which is represented by 5-6 rows of spongy cells on both sides of the leaf, water-bearing layer different thickness there between and vascular bundles (Figure -1, c, d).

The epidermis is round-oval, represented by one row of cells with a thin-walled cuticle layer. The spongy parenchyma is located under the epidermis, consisting of 5-6 rows of cells, chlorophyllous (Figure 1 c, d, e). On the periphery of the leaf's mesophyll under the epidermis there are large, medium and small conducting beams alternating with each other. Large and medium vascular bundles and issued on adaxial and abaxial side of leaf. Under the adaxial and abaxial epidermis and above the vascular bundles, there is an angular 4-5 row collenchyma. Vascular bundles closed, collateral, numerous consisting of phloem and xylem, 6-7 large and small vessels (Figure - 1, d).

In the center of the leaf mesophyll there is a large-celled water-bearing parenchyma of various sizes, consisting of 5-6 rows (Figure 1 c, f).

Iris stolonifera Maxim. - perennial grass, simple leaves, linear shape of the plate, sessile, acute tip, smooth edge, leaflet in the shoot, regular, in the basal - rosette.

The leaves of *Iris stolonifera* on the paradermal section of the outline of the epidermal cells are rectilinear, the projection is polygonal. The cells of the adaxial epidermis are larger than the cells of the abaxial epidermis (Figure 2a, b, g).

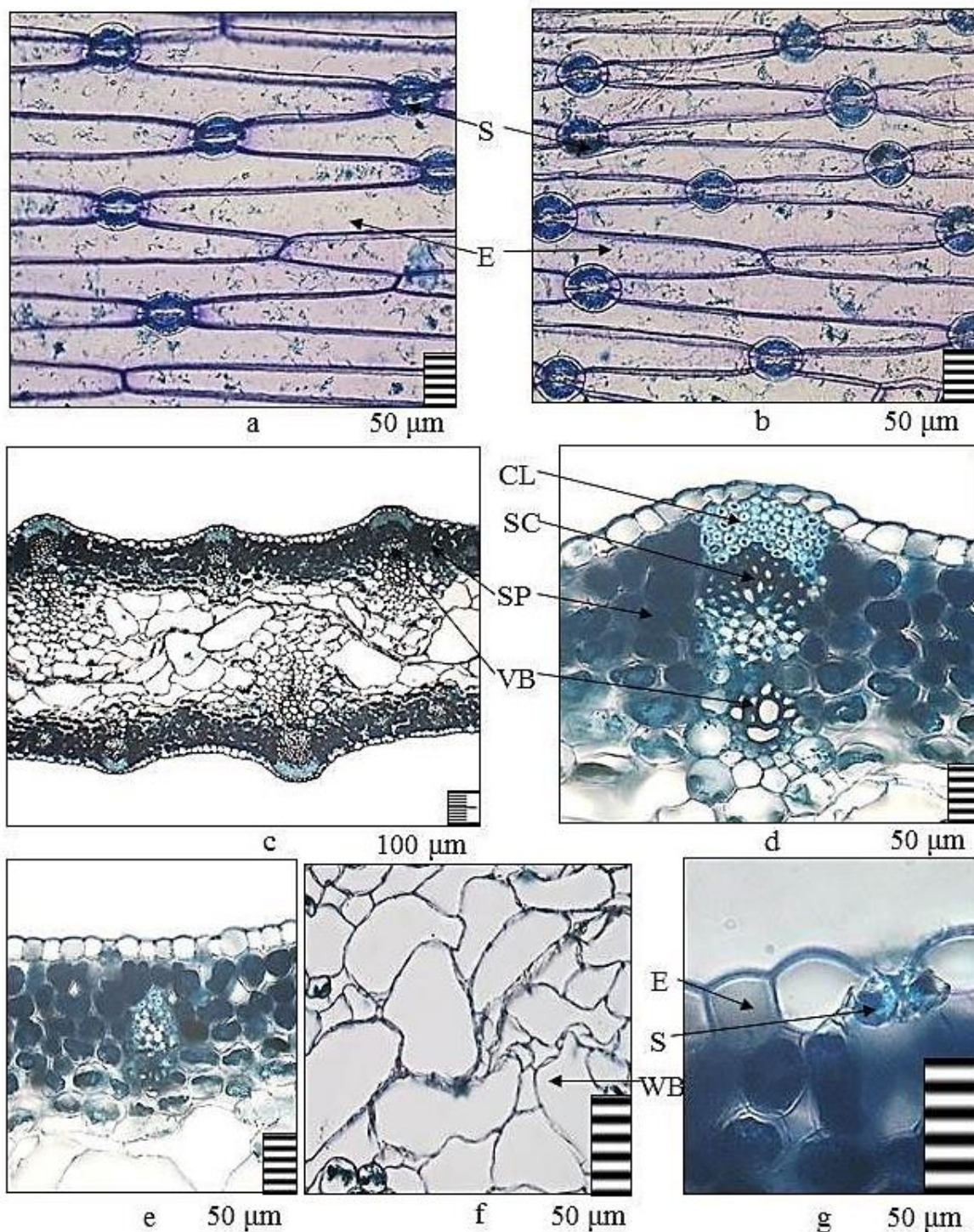


Figure 1. Structure of the epidermis and leaf's mesophyll of *Iris korolkowii*: a - adaxial epidermis; b- abaxial epidermis; c - mesophyll leaf; d - vascular bundle; e - chlorophyll spongy parenchyma; f - water-bearing parenchyma; g - submerged stomata. Legend: WB - water-bearing parenchyma, SP - spongy parenchyma, CL - collenchyma, VB - vascular bundle, SC - sclerenchyma, S - stomata, E - epidermis.

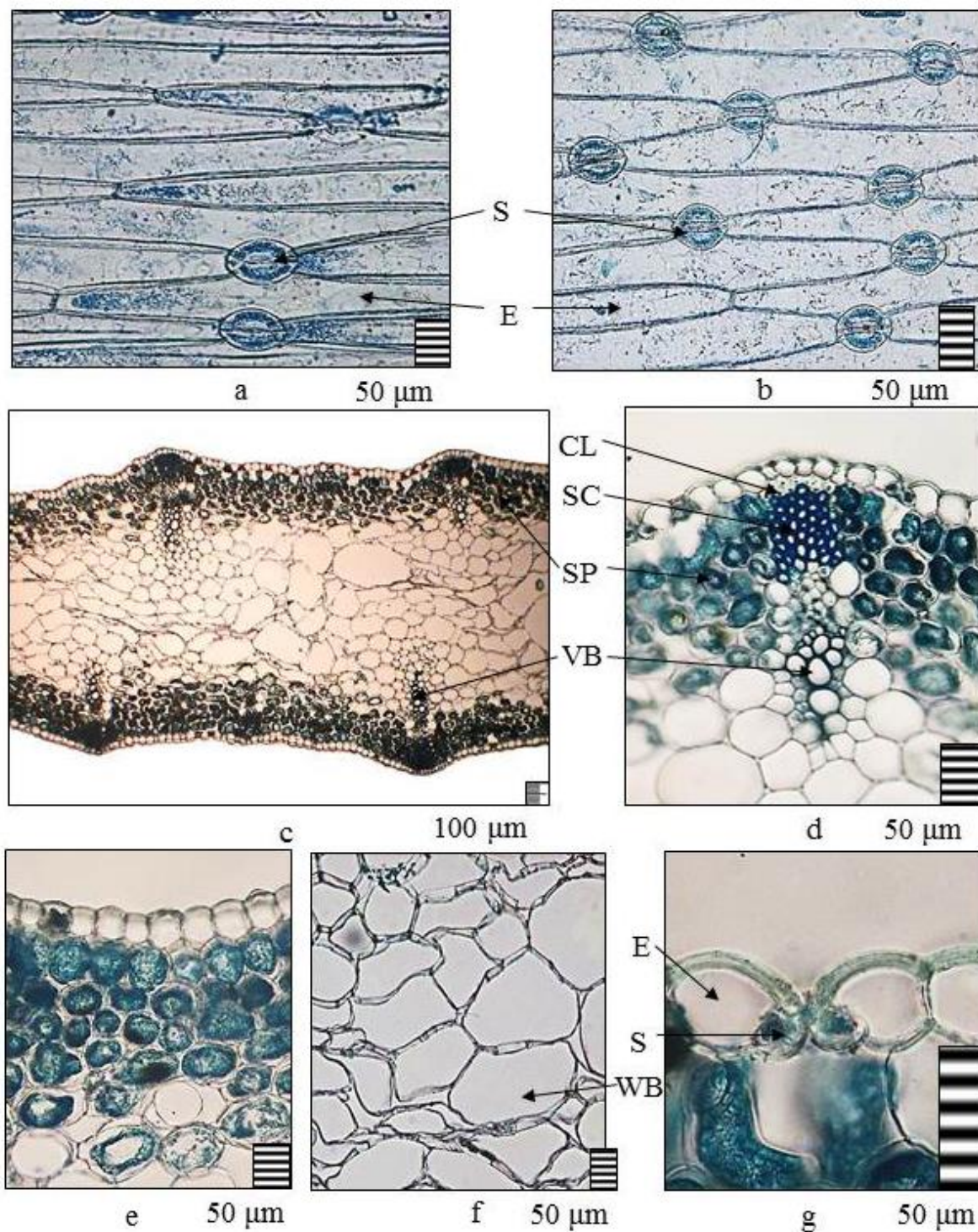


Figure 2. Structure of the epidermis and leaf's mesophyll of *Iris stolonifera*: a - adaxial epidermis; b - abaxial epidermis; c - mesophyll leaf; d - vascular bundle; e - chlorophyll spongy parenchyma; f - water-bearing parenchyma; g - submerged stomata. Legend: WB - water-bearing parenchyma, SP - spongy parenchyma, CL - collenchyma, VB - vascular bundle, SC - sclerenchyma, S - stomata, E - epidermis.

The leaves are amphistomatic. The stomata are located transversely to the longitudinal axis of the leaf. The shape of the stomata is round-oval. Stomata most numerous on the abaxial side than on the adaxial side. The closing cells of stomata on both sides of leaf of almost the same length. Stomata immersed, anomocytic type (Figure 2a, b, g).

The leaf's mesophyll on the transverse section of an isolaterally- spongy type, which is represented by 4-5 rows of spongy cells on both sides of the leaf, water-bearing layer different thickness there between and vascular bundles (Figure -2, c, d, e).

The epidermis is round-oval, represented by one row of cells with a thin-walled cuticle layer. The spongy parenchyma is located under the epidermis, consisting of 4-5 rows of cells, chlorophyllous (Figure 2 c, d, e).

On the periphery of the leaf's mesophyll under the epidermis there are large and small conducting beams alternating with each other. Large vascular bundles and issued on adaxial and abaxial side of leaf. Under the adaxial and abaxial epidermis and above the vascular bundles, there is an angular 2 row collenchyma. Vascular bundles closed, collateral, numerous consisting of phloem and xylem, 7-9 large and small vessels (Figure - 2, d).

In the center of the leaf mesophyll there is a small-celled water-bearing parenchyma of various sizes, consisting of 6-7 rows (Figure 2 c, f).

Thus, the anatomical structure of a leaf of 2 species of *Iris* has been studied. The next diagnostic features are revealed: the outline of the epidermal cells is rectilinear, round-oval; stomata submerged anomocytic, numerous on the abaxial side than on the adaxial; the type of leaf mesophyll is isolaterally-spongy; vascular bundles closed collateral type and more sclerification. These identified signs are characteristic diagnostic for the *Hexapogon* section and can serve for the identification of plant raw materials.

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