

STRUCTURAL FEATURES ASSIMILATING ORGANS ALLIUM VERTICILLATUM REGEL IN CONDITIONS OF INTRODUCTION

ABDULLAEVA A.T.

Institute of Botany and Zoology of the Academy of Sciences, 232 Bagishamol Str. Tashkent 100053,
Republic of Uzbekistan

Corresponding author: ABDULLAEVA A.T.

ABSTRACT: When studying the anatomical structure of the assimilating organs of *Allium verticillatum* under the conditions of the introduction of the Botanical Garden named after Acad. N.F. Rusanov AS RUz, the following diagnostic features of this species were identified: type of mesophyll leaf isolaterally-palisade; Epidermis papilliform; The outer wall of the epidermis thickened and the cuticle wavy-folded; Stomata submerged; The shape of the epidermal cells located one under each rib is triangular and relatively large; Type of structure of peduncle and peduncle parenchyma-bundle; Wall of epidermis thickened and cuticle wavy-folded; cortex parenchyma thin-walled; The primary cortex is separated from the central cylinder by a ring of sclerenchyma; vascular bundles are closed in collateral type.

Keywords: anatomy, leaf, stalk, pedicel, introduction, *Allium verticillatum*, Tashkent.

INTRODUCTION

The genus *Allium* L. comprises more than 800 species, it is one of the largest monocotyledonous genera; it is a variable group that is spread widely across the Northern to Southern Hemisphere. This genus has a major centre of diversity stretching from the Mediterranean Basin to Central Asia and Pakistan and a second less pronounced one located in western North America (Fritsch et al., 2010).

Representatives of the genus *Allium* perennial are sometimes biennial bulbous or with almost undeveloped bulbs of grass, with a sharp onion or garlic smell and taste. Because of the taste and aromatic qualities, some species of onions have long been introduced into the culture, but in many localities the population also consumes wild species. There are indications of the use of *A. paradoxum*, *A. sabulosum*, *A. monadelphum*, *A. schoenoprasum*, *A. saxatile* and others, but *A. victorialis*, *A. ursinum* is particularly widely used. Garlic smell and the taste of onions are determined by garlic butter, located in all tissues, the main part of which disulfide contains a lot of sulfur (Vvedensky, 1935, Khasanov, 2016).

Systematic genus *Allium* L. is complex and still does not exist, a modern monograph of the genus and there is no common opinion about the taxonomy and phylogeny of onions. Systematic recently began to pay much attention to anatomical and serological signs (Cheremushkina, 2004).

MATERIALS AND METHODS

Объектом исследования является многолетнее однодольное растение *Allium verticillatum* Regel представитель семейства Amarillidaceae.

The materials were collected from the exposition of rare introduced plants of the Botanical Garden named after acad. N.F. Rusanov at the Institute of Botany and Zoology of the Academy of Sciences of Uzbekistan.

Simultaneously with the morphological description, assimilating organs in 70° ethanol were fixed for anatomical study. Transverse sections of the leaf, peduncle and pedicel are made from the middle part. Preparations prepared by hand were stained with methylene blue followed by gluing in glycerol-gelatin (Barykina, Veselova, Devyatov et al.,

2004). Microphotographs are made with a computer micro photoset with a digital camera of the brand ES70 from Samsung and A123 from the company Canon under the microscope Motic B1-220A -3.

Allium verticillatum Regel is an endemic, perennial monocotyledonous plant, belongs to the Verticalillata Kamelin section of the genus *Melanocrommyum* and is not food borne. This species is considered to be a relic. In this connection, it is of interest to study.

RESULTS AND DISCUSSION.

The *Allium verticillatum* leaf on the transverse section is isolaterally-palisade type, round-oval and slightly ribbed. In the two lateral parts of the leaf there is papilliform epidermis. The epidermis is single-rowed, round-oval and small-celled. The outer wall of the epidermis is most thickened, due to a thick wavy-folded cuticle. Stomata are the most submerged. Single, triangular epidermal cells located under the ribs are relatively large than the rest. Under the epidermis there are 3-4 rows of elongated palisade and 2 rows of spongy parenchymal cells. The palisade and spongy parenchyma is chlorophylliferous. Vascular bundles are located along the periphery of the leaf, which are closed in a collateral type. The central part of the leaf is extensive, consisting of thin-walled parenchymal cells (Fig. 1).

In the anatomical study of the structure of the peduncle and pedicel, the structure was similar (Fig. 2, 3). The peduncle on the transverse section is oval-ribbed, parenchymal-beam type. The parenchyma occupies the most part of the peduncle. The epidermis is single-rowed, rounded. The outer wall of the epidermis is most thickened, due to the thick wavy-folded cuticle. Under the epidermis there is a 6-7 row round-oval, thin-walled parenchyma and there are small cavities (Fig. 2).

Primary cortex is separated from the central cylinder by a ring of sclerenchyma. The thickness of this ring and the degree of lignification of cells in some respects this feature reflects the evolutionary advancement.

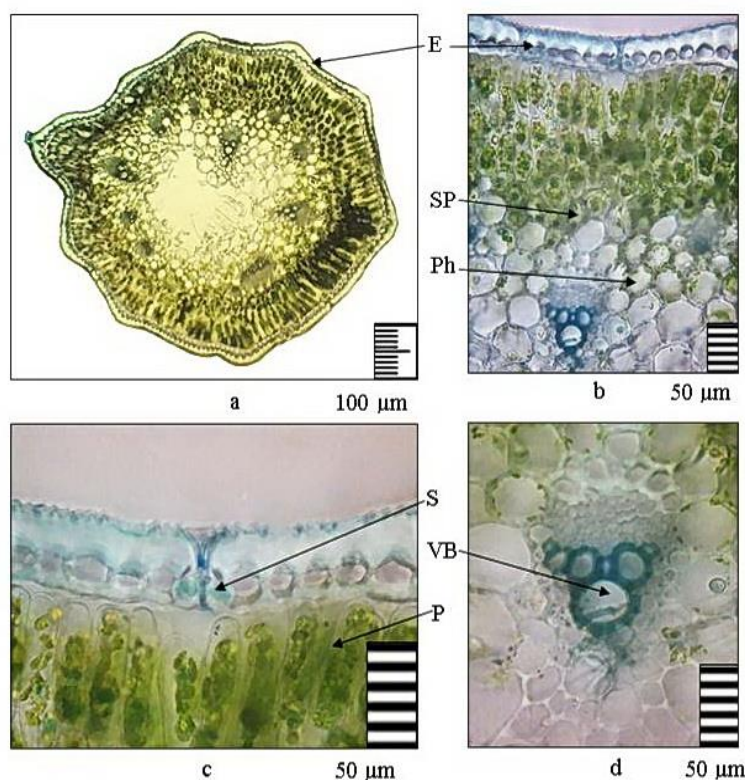


Figure 1. The structure of the mesophyll leaf *Allium verticillatum*:
 a – general view of the mesophyll leaf; b - detail; c - submerged stomata;
 d – vascular bundle. Legend:: SP – spongy parenchyma, Ph – parenchyma,
 P – palisade parenchyma, VB – vascular bundle, S – stomata, E – epidermis.

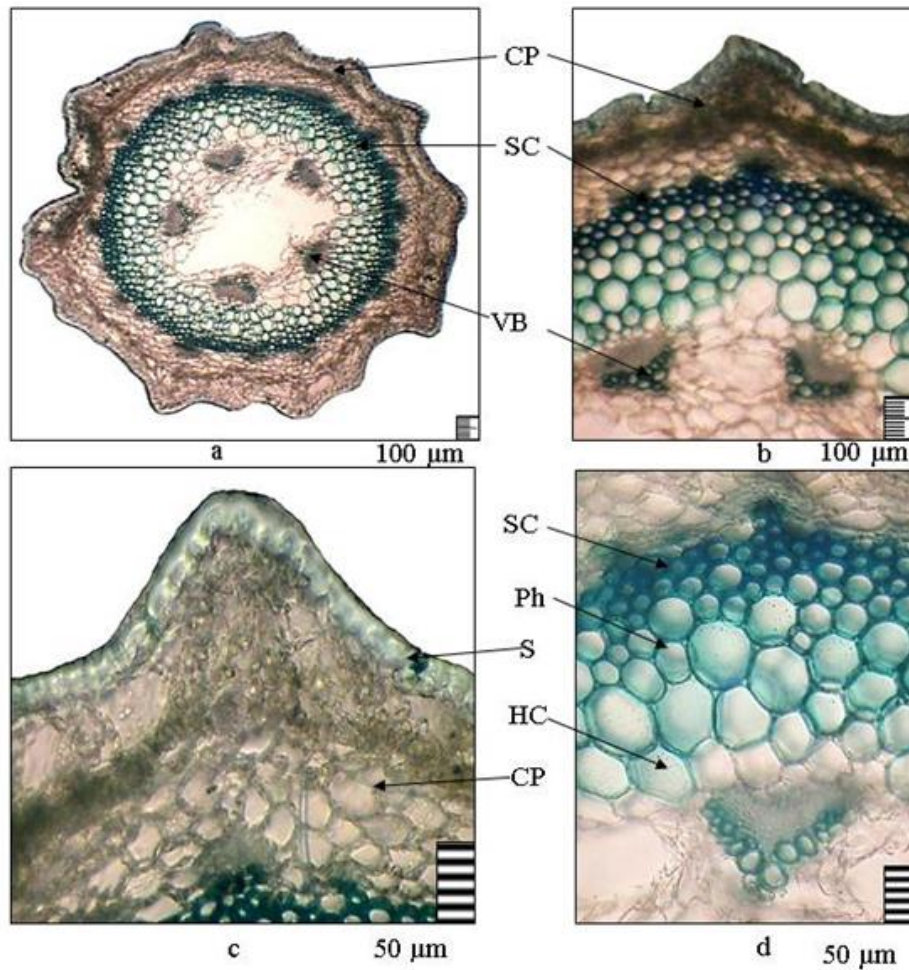


Figure - 2. Structure of the peduncle of *Allium verticillatum*:
 a - general view of the peduncle; b - detail; c - epidermis and parenchyma;
 d - sclerenchyma and vascular bundle. Legend: HC - hydrolyte cells,
 CP - core parenchyma, Ph- parenchyma, VB – vascular bundle,
 SC - sclerenchyma, S - stomata, E - epidermis.

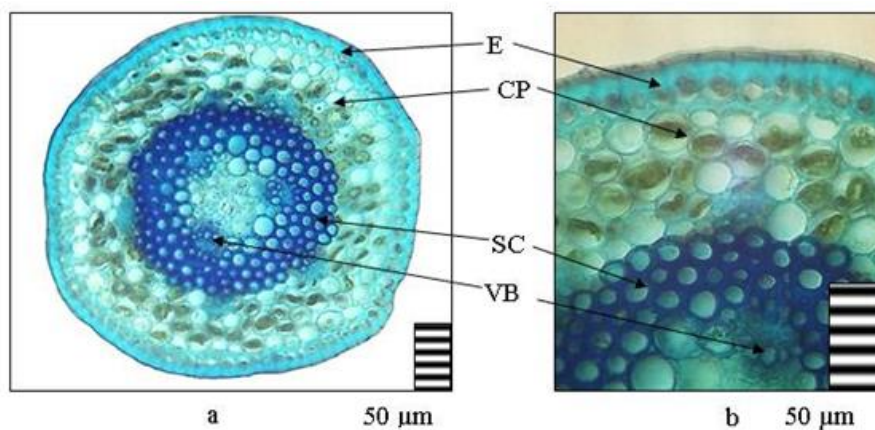


Figure – 3. The structure of the pedicel *Allium verticillatum*: a - general view of the pedicel; b - detail. Legend: CP - cortex parenchyma, VB - vascular bundle, SC - sclerenchyma, E - epidermis.

The core is communicative its cells are thin-walled. The primary conducting beams (5) are retained in it. Vascular bundles closed collateral type, which consists of phloem and xylem. Vessels are small, thin-walled - 12-14 (Fig. 2).

Pedicel *A. verticillatum* with transverse cut of rounded shape and parenchymal-bundle type. The epidermis is single-rowed, rounded. The outer wall of the epidermis is most thickened, due to a wavy-folded cuticle. Under the epidermis are 3-4 rows of round-oval, thin-walled parenchyma. Primary cortex is separated from the central cylinder by a ring of sclerenchyma. The core is narrow, its cells thin-walled. Primary vascular bundles (3) are retained in it. Vascular bundles closed collateral type, which consists of phloem and xylem. Vessels a small, thin-walled - 12-14 (Figure 3).

Thus, when studying the structure of the assimilating organs of *Allium verticillatum* under the conditions of introduction, the following diagnostic structural features were first revealed: in the leaf-type mesophyll is isolaterally-palisade; epidermis papilliform; the outer wall of the epidermis thickened and the cuticle wavy-folded; stomata submerged; the presence of a triangular shape and the relatively large size of the epidermal cells located only one under each rib; the structure of the flower spike and pedicel are similar - a strong ribbing; type structure parenchyma-bundle; the outer wall of the epidermis thickened and the cuticle wavy-folded; coronal parenchyma thin-walled; the primary cortex is separated from the central cylinder by a ring of sclerenchyma; the type of vascular bundles is closed collateral. Identified data signs show the adaptation of the studied species to habitat conditions.

REFERENCES

1. Fritsch R.M., Blattner F.R., Gurushidze M. 2010. New classification of *Allium* L. subg. *Melanocrommyum* (Webb & Berthel) Rouy (*Alliaceae*) based on molecular and morphological characters. *Phyton*, 49:145-220.
2. Vvedensky A.I. 1935. The genus *Allium* L. *Flora of the USSR*. Leningrad: USSR Academy of Sciences, Vol. 4:112-274
3. Khasanov F.U. 2016. The genus *Allium* L. *Flora of Uzbekistan*. Tashkent: Navruz, T. 1:1-119.
4. Cheremushkina V.A. 2004. *Biology of bows of Eurasia*. Novosibirsk: Science, 280 p.
5. Barykina R.P., Veselova T.D., Devyatov A.G. et al., 2004. *Reference on botanical microtechnics (foundations and methods)*. Moscow: Moscow State University. 6-68.