

## SESELI GIGANTISSIMUM CIOCÂRLAN – ANATOMY OF LEAVES

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### Abstract

*Seseli gigantissimum* is a new taxon identified by Professor Vasile Ciocârlan in Șipote Valley (Constanța county). Were performed observations on anatomical peculiarities of the leaves of plants grown in the Botanical Garden of USAMV-Bucharest and were observed some peculiarity of the leaf rachis and ultimate segments that aren't describes in morphological diagnosis.

**Key words:** *Seseli gigantissimum*, secretory ducts, trichome, transversal sections.

### INTRODUCTION

In 2011, V. Ciocârlan describe a new species to the science, found on Șipote Valley (Constanța County), on a rocky substrate, with south-west exposition (Figure 1). Named *Seseli gigantissimum*, this species shows morphological characters similar to *S. tortuosum* and *S. campestre* without, however, to be identified with any of them.

In the sixth volume of Flora of Romania (1958) there are described nine species of the *Seseli* genus,



Figure 1. *Seseli gigantissimum* Ciocarlan - in their natural habitat

including *S. tortuosum* and *S. campestre*. Ciocârlan, in 2009, indicate eleven species in the same genus in Romania and Sârbu et colab., in 2013, included *Seseli gigantissimum*

Ciocârlan between the twelve *Seseli* species from our country.

To elucidate some taxonomical aspects, anatomical studies are also important, in addition to those morphological, such as those related to the secretory ducts of vegetative organs (Coassini et Corsi, 1986; Pimenov et Sdobnina, 1975) or mericarp anatomy (Doğan Güner et Duman, 2013).

In this paper, anatomical characters of the *Seseli gigantissimum* leaf are presented, in order to highlight some peculiarities of this species.

### MATERIALS AND METHODS

Individual plants of *Seseli gigantissimum*, obtained from seeds harvested from Șipote Vally, were acclimatized in the Botanical Gardens of USAMV-Bucharest. Plants form a monocarpic aerial stem which initiate fruits formation in the second life year. For the first life year, on a short aerial stem, arise sessile leaves, 4-6 pinnatisect, the last lamina segments having 0.5-2 cm in lenght and 0.5-1.5 mm in width (Ciocarlan, 2011). Microscopic samples were obtained by cross-section of the leaf at the rachis and lamina level. The cross-sections were clarified with a saturated solution of Chloral hydrate and stained with Alun-Carmine and Iodine Green to highlight the cell

wall structure. Images were obtained with a digital camera (Panasonic DMC-LZ7) at an optical microscope (Optika DM-20).

## RESULTS AND DISCUSSIONS

### The rachis structure

Rachis, in cross-section, is winged, with edges (Figure 2).

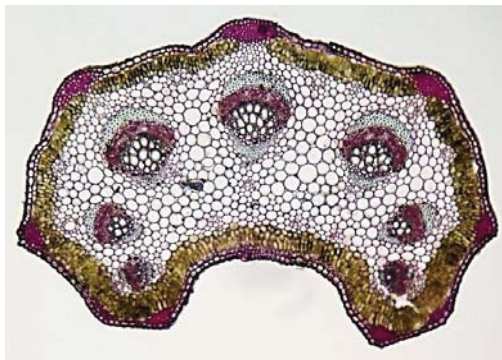


Figure 2. Rachis (general view, in cross-section)

From species diagnosis, leaves are glabrous (Ciocarlan, 2011). So are described leaves of the *Seseli tortuosum* and *S. campestris* in Romanian Flora (Todor, 1958). But, in our sections, it may be observed, on the abaxial side of the rachis, a unicellular, epidermal trichome. Thus, to the morphological description, one may add the presence of rare bristles on the underside of lamina rachis.



Figure 3. Unicellular, epidermal trichome on the abaxial side of the lamina rachis

The internal structure of the rachis is intermediary between the stem and the leaf lamina structure; it can discern the following sequence of tissue (Figure 4 and 5):

- The epidermis: a row of cells protected by a thick cuticle on the outside walls; cells have obvious external and internal walls, thickened with cellulose. The description of two *Umbelliferae* (*Apiaceae*) species - *Angelica archangelica* and *Eryngium planum*, shows that their epidermal cells have only external walls thickened (Toma and Rugina, 1998). Stomata are observed and they are at the level of the epidermal cells.

- 3-4 rows of angular collenchyma appear below the epidermis, at the edges level; beneath epidermis is formed a layer of parenchymatous cells, followed by the palisade tissue, bistratified; the assimilation tissue is continuous arranged around the section, interrupted only by the collenchyma layers on the adaxial side.

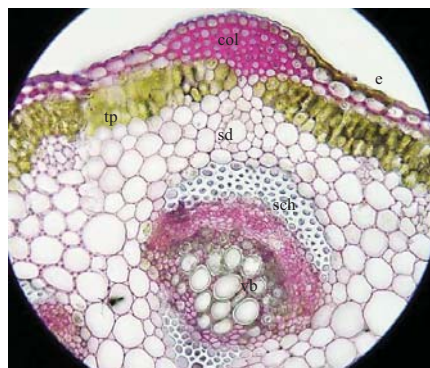


Figure 4. Rachis cross-section detail: e – epidermis, col.- angular collenchyma, t.p.- palisade tissue, s.d. – secretory ducts, v.b. – vascular bundle, sch. - sclerenchyma

- The center of the section is occupied by a fundamental parenchyma; vascular bundles, of different size, are arranged in a semicircle: three large bundles are on the abaxial side and two smaller are on each lateral side; urticaria can be found in some parenchymal cells (Figure 5).

- Vascular bundles are delimited by two arcs of sclerenchyma - one higher, above the phloem zone, and the second, less developed is beneath the xylem; vascular tissues are of primary origin, although between the phloem and xylem tissues fascicular cambium can be observed (collateral bundles with open structure).

- Secretory ducts are arranged in a fundamental parenchyma, on an outside circle from vascular bundles and inside bundles, in the phloem area -

identified also in archangelica *Angelica archangelica* species.



Figure 5. Ursini in parenchyma cells

### The lamina segments structure

In cross-section, the median vein is prominent on the abaxial side of the lamina segments; a sclerenchyma bundles support the main vein; secondary veins are without sclerenchymatous tissue (Figure 6).



Figure 6. The main vein prominate on abaxial side

Epidermis is formed by a layer of cells with external walls thickened; stomata are at the same level as the epidermal cells.

The mesophyll is differentiated in a palisade tissue, compact arranged around the section and a parenchymatous tissue in the center, where the vascular bundles and secretory ducts are included (Figure 7).

Vascular bundles are small, with the phloemic zone more developed as the xylem.

Secretory ducts are evident in the outer part of the parenchymatous tissue.

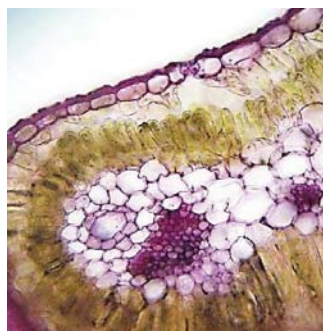


Figure 7. The lamina segments structure (detailed)

## CONCLUSIONS

Microscopic observations showed the presence of unicellular trichome on the abaxial face of *Seseli gigantissimum* leaf rachis, unlike morphological descriptions.

Secretory ducts are both in the rachis and the terminal segments of the lamina. they are arranged in the fundamental parenchyma, on an outside row of vascular bundles.

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