ANATOMICAL RESEARCH ON ARTEMISIA SANTONICA AND ARTEMISIA SCOPARIA (ASTERACEAE)

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Abstract: The species subjected to the study belong to Asteraceae family, Artemisia genus found in Romania’s spontaneous flora. This work presents an anatomic study of petiole from Artemisia santonica and Artemisia scoparia plants. The petiole secretory structures are represented by hairs and ducts.

Keywords: Asteraceae, Artemisia scoparia, Artemisia santonica, secretory hairs, tectorial hairs.

Introduction

The genus Artemisia L. (Asteraceae) contains upwards of 500 species, is the largest genus in the tribe Anthemideae, and one of the largest genera in the family [6]. Several Artemisia species have medicinal importance and are used in traditional medicine for the treatment of a variety of diseases and complaints [1].

Genus Artemisia is represented by herbs or small shrubs, frequently aromatic. Leaves alternate, capitula small, usually pendent, in racemose, paniculate or capitate inflorescences, rarely solitary. Involucral bracts are disposed in few rows. Receptacle is flat to hemispherical without scales, sometimes hirsute. Florets are all tubular. Achenes is obovoid, absent or sometimes a small scarious ring [5].

The objective of this study is to bring new data regarding the anatomy of secretory tissues found in the petiole of Artemisia santonica L. and A. scoparia Waldst. et Kit. plants. On this aspect, these species were studied for the first time in Romania.

In some others Artemisia species the secretory tissues are also represented by hairs and ducts [4].

Researches carried out by Persson in 1974 showed that at the A. santonica plants the density of secretory glands is higher in the inflorescence compared to the leaf [3]. According to Jackson and Snowadan (1990), A. santonica specie presents numerous secretory hairs at the bracts level [2].

Materials and methods

The plants were collected from Tulcea county, Mahmudia village. The identity of the plants was confirmed by Professor dr. Vasile Ciocârlan, from the Systematic Botany Division of Faculty of Horticulture, USAMV Bucharest, with herbarium specimens.

Cross sections of the petiole have been executed, being cleared in sodium hypochlorite solution for 20-35 minutes and washed with acetic water and distilled water. The sections thus processed were firstly colored with green iodine (1 minute), washed in 90° ethanol and then colored in alum carmin (20 minutes), washed with distilled water and installed in glycerol-gelatin (liquefied in advance through heating at the spirit lamp). The

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sections’ photos were taken using the Novex (Holland) optic microscope with a Canon photo camera.

Results and discussions

In cross section through the petiole from *Artemisia santonica* it has trapezoidal contour, irregular, with the large base in adaxial position and the small base in abaxial position. The unistratified epidermis contains cells with external walls thicker than the other ones and covered by a thin cuticle. At both sides of the leafstalk, one can notice the presence of numerous tectorial hairs, long, pluricellular, in single series, and the presence of numerous secretory hairs with unicellular base, uni- or bicellular pedicel and the secretive part as bi- or tetracellular, especially in the leafstalk’s creeps, on the adaxial and the latero-abaxial sides (Figs. 1, 2).

In hypodermic position, on the latero-adaxial and abaxial sides there is a tangent bi- or trilayered collenchymas, that separates similar meatic type parenchyma islets. The conductive tissues are organized as 5 collateral type fascicles (median, very large, flanked by two much smaller ones on each side) arranged in an arch. All conductive fascicles have a sclerenchymatous mechanical sheet on the wood’s and phloem’s fringe, with elements including very thickened and intensely lignified walls.

Regarding *A. scoparia*, the petiole cross sections presented a circular-irregular contour, with numerous ribs alternating with many valleculas. At the epidermis level, especially in the valleculas, one can observe the presence of secretory hairs, with a unicellular base and pedicel, and a bicellular secretive part. In hypodermic position, near the ribs one can notice the angular collenchyma islets, as well as the assimilating bi- or trilayered meatic type parenchyma. At the ribs level, under the assimilating parenchyma, one can distinguish secretory ducts (Figs. 3, 4).

Similar secretory ducts were found in *Artemisia absinthium* L. and *A. dracunculus* L. plants [4].

Conclusions

The *Artemisia santonica* species presented many long, pluricellular, in a single row tectorial hairs and secretory hairs with a unicellular base, uni- or bicellular pedicel and bi- or tricellular secretory part.

At the *Artemisia scoparia* species, secretory hairs were presented with a single cell base and pedicel and a bicellular secretive part, and under the assimilating parenchyma, secretory ducts have been identified at the ribs’ level.

This anatomical study of *A. santonica* and *A. scoparia* petiole secretory structure is the first one in Romania.

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REFERENCES


Explanation of Plate I
Artemisia santonica L. – Figure 1. Cross-section of petiole; Figure 2. Secretory hair details
Artemisia scoparia Waldst & Kit. – Figure 3. Cross-section petiole; Figure 4. Secretory hairs and secretory ducts.