

## HISTOANATOMICAL RESEARCHES AT THE SPECIES *XANTHIUM ITALICUM* (ASTERACEAE)

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**Abstract:** In this paper the authors show the results of the histoanatomical researches made on the species *Xanthium italicum* Moretti. The root has a secondary structure. The stem has a primary structure. At the central cylinder level, the stem presents a beginning of secondary structure, because of the cambial ring made from inter- and intrafascicular cambium. The leaf has a bifacial dorsiventral structure.

**Key words:** *Xanthium italicum* Moretti, anatomy, root, stem, leaf

### Introduction

From the systematic point of view, the species *Xanthium italicum* Moretti belongs to *Compositae* (*Asteraceae*) family. In Romania the plant is found in steppe areas (Ciocârlan 2001).

In ethnopharmacology from the certain areas of Oltenia, this plant is recommended in the treatment of abscesses. For the good of our research we used the papers of the recognized Romanian authors (Andrei 1978, Ciobanu 1971, Toma & Rugină 1998).

The motivation of this work consists in the absence of the histoanatomical researches on the vegetative organs of the species *Xanthium italicum* Moretti, this fact being established through the consultation of speciality references.

### Material and methods

The biological material (roots, stems and leaves) was obtained from the plants, during the flowering period, collected from Seaca de Câmp village, Dolj County.

The preservation of the vegetal material was made using a mixture of ethylic alcohol, glycerol and distilled water, in equal quantities. The colouring of the cuttings was made with Genovese reagent, which results by the combination of a two solutions: Congo red and crisoidine (Andrei 1978).

The microphotos were obtained using a microscope system MBL 2100 with photoadapter.

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## Results and discussions

### *The root structure*

In cross section, the root has a secondary structure (Fig. 1).

The phellogenium is differentiated from a deeply cortical layer, at the external generating 2-4 layers of suber, and few layers of phelloderm at the internal.

The cambium produces, at the external, a relatively thickened ring made by phloem, and a ligneous body at the internal, occupying all the central space.

The small ligneous vessels are disposed in radiar rows, the biggest vessels being discontinuous.

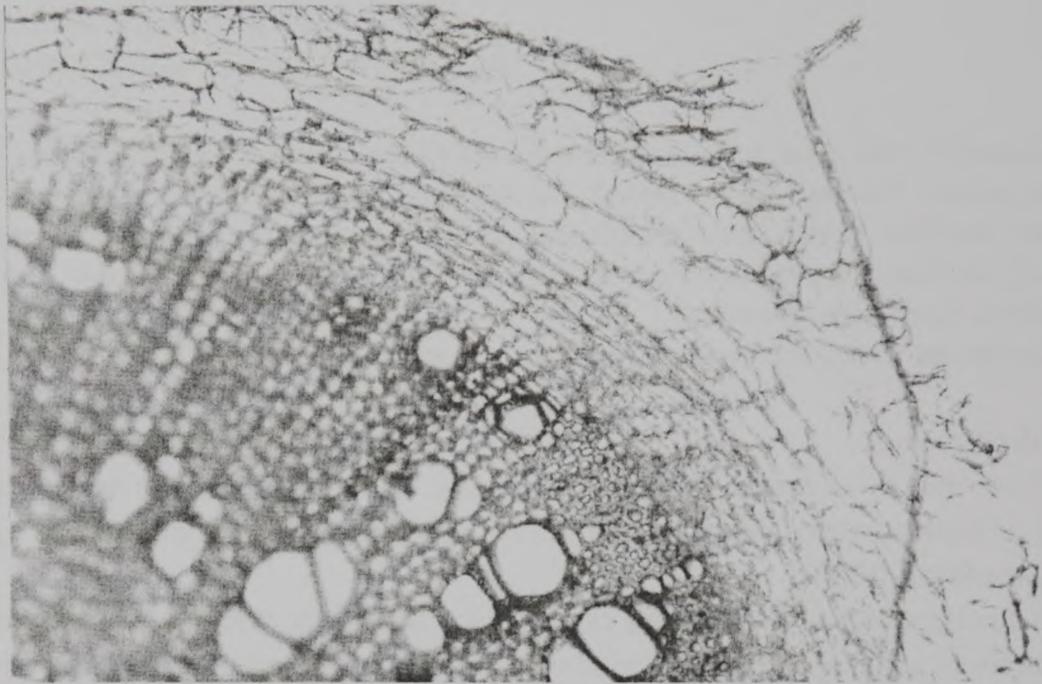


Fig. 1 Cross section through the *Xanthium italicum* Moretti root

### *The stem structure*

In cross section the stem has a circular contour, easy ondulate (Fig. 2, Fig. 3).

The epidermis presents small isodiametric cells, with the external wall strongly thickened and covered by a thick cuticle. Between epidermal cells, here and there, we find stomates, pluricellular uniseriated tector and secretor hairs.

The cortex is differentiated in a colenchyma ring, formed by 4-5 cellular layers, and in an internal zone made from parenchymatous cells and secretor channels.

At the level of central cylinder the stem shows a beginning of secondary structure, because the cambial ring is made from inter- and intrafascicular cambium. The interfascicular cambium generates few ligneous and liberian elements.

The libero-ligneous ansamble with cambium had the aspect of a circular beds row. Ones of the libero-ligneous bundles are small, and the others big. At the biggest libero-ligneous bundles level, in front of the primary phloem, it is one of the very thickened string, made from sclerenchyma fibers, with strongly thickened and lignified walls.

By comparison with the xylem, the phloem is in a small quantity. At the big libero-ligneous bundles level, the ligneous vessels appear uniseriated in the parenchyma mass, and having a disorderly disposition in the small libero-ligneous bundles.

Between the libero-ligneous bundles we found very large medullar rays. The marrow is parenchymatic-cellulose, at the external having secretor canals and cellular inclusions.

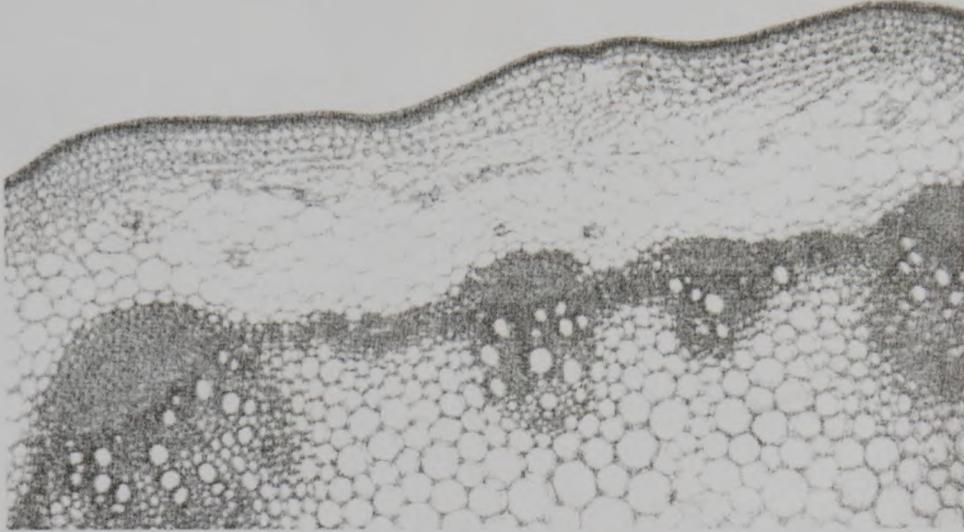


Fig. 2 Cross section through the *Xanthium italicum* Moretti stem

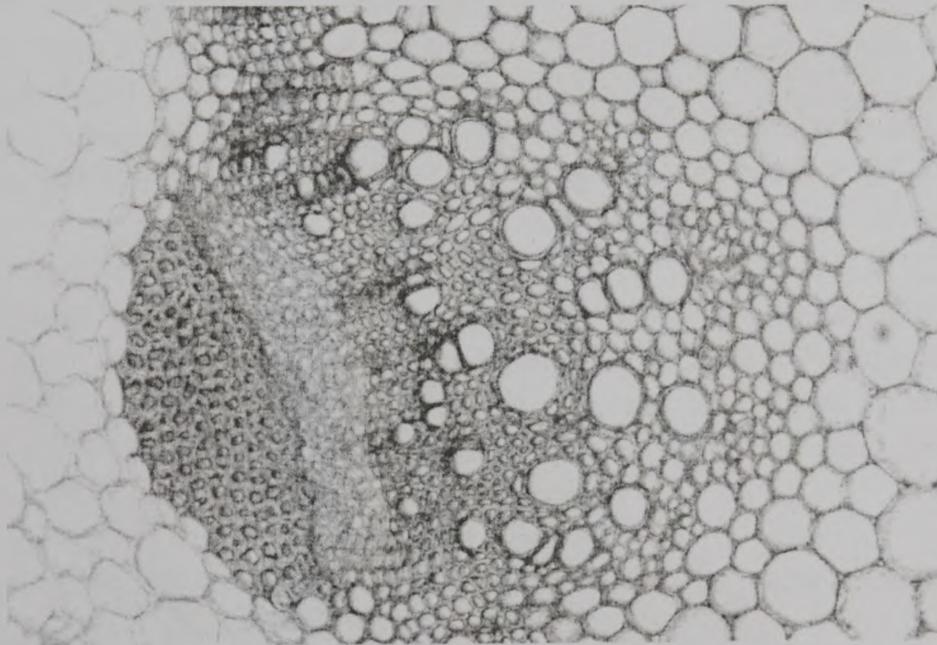


Fig. 3 Cross section through the *Xanthium italicum* Moretti stem

### ***The leaf structure***

The leaf's epidermis, superior and inferior, are made from a single small cellular layer, with thickened walls and covered with a cuticle. The stomata are from anomocytic type, on the both sides of the limb, the leaf being from amphistomatic type (Fig. 4, Fig. 5, Fig. 6).

On the epiderms it is uniseriated pluricellular tector hairs, with long terminal cell, and also short and thick secretor hairs with an oval gland.

The mesophyll is differentiated in a tristratificated palisadic tissue, on the superior limb's epidermis, and in lacunose pluristratificated tissue, on the inferior side. The libero-ligneous fascicles of the limb are rounded by thecae of parenchymatic cells.

The leaf has a bifacial dorsiventral structure. The petiol had the same structure as the stem.

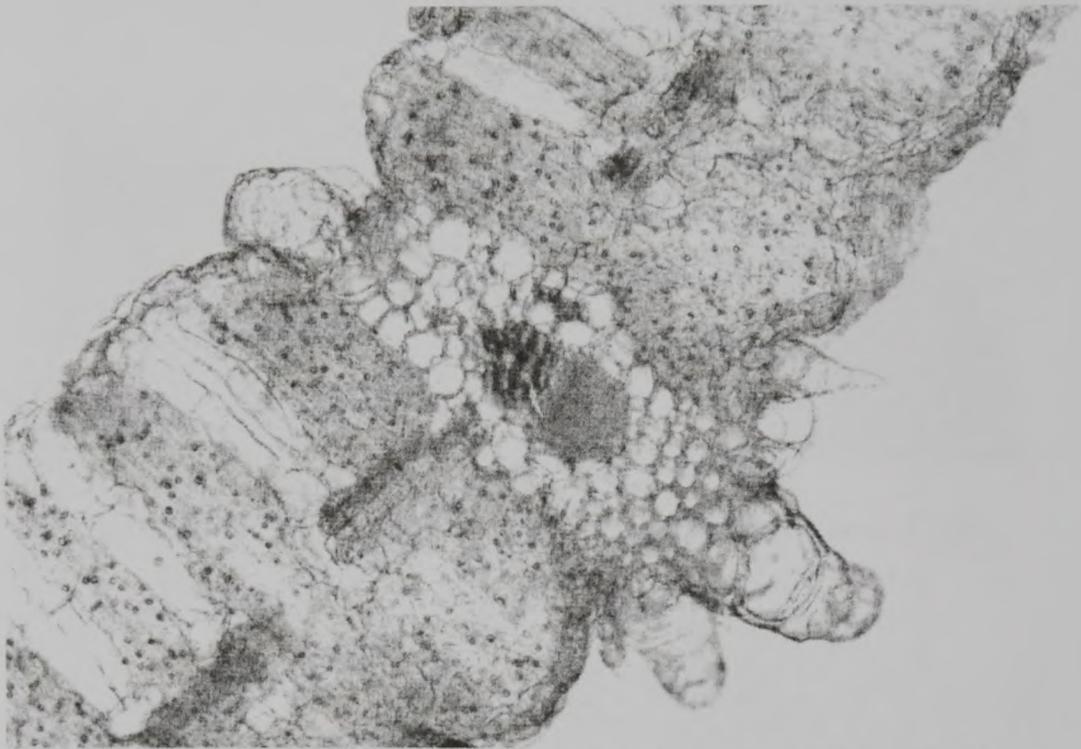


Fig. 4 Cross section through the *Xanthium italicum* Moretti leaf

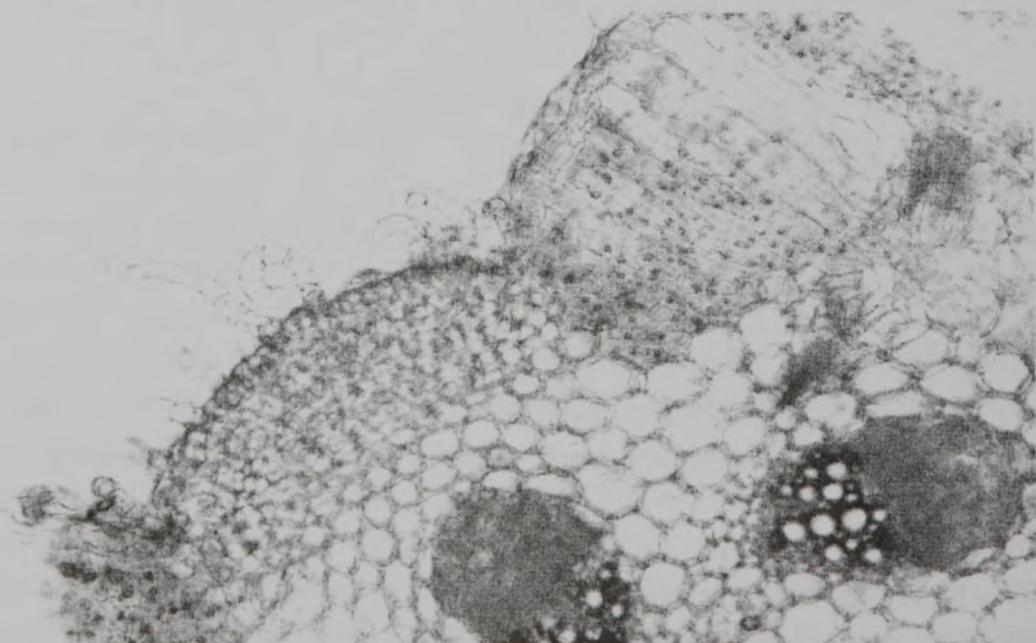


Fig. 5 Cross section through the *Xanthium italicum* Moretti leaf



Fig. 6 Cross section through the *Xanthium italicum* Moretti leaf

### Conclusions

1. The root of the species *Xanthium italicum* Moretti presents a secondary structure.
2. The stem of this plant has a primary structure. At the central cylinder level, the stem shows a beginning of secondary structure, because the cambial ring is made from inter- and intrafascicular cambium.
3. The leaf has a bifacial dorsiventral structure.

### References

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### CERCETĂRI HISTOANATOMICE LA SPECIA *XANTHIUM ITALICUM*

**Rezumat:** În această lucrare autorii prezintă rezultatele cercetărilor histoanatomice efectuate asupra speciei *Xanthium italicum* Moretti. Rădăcina prezintă o structură tipic secundară la nivelul analizat. Tulpina are o structură primară. La nivelul cilindrului central tulpina prezintă un început de structură secundară, datorită inelului de cambiu alcătuit din cambiu interfascicular și cambiu intrafascicular. Frunza are o structură bifacială, heterofacială (dorsiventrală).

**Cuvinte cheie:** *Xanthium italicum* Moretti, anatomie, rădăcină, tulpină, frunză