

HISTOANATOMICAL RESEARCHES AT THE PLANT *CARDUUS THOERMERI* (*ASTERACEAE*)

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Abstract: In this paper the authors show the results of the histoanatomical researches made on the species *Carduus thoermeri* Weinm. The root of this plant has a secondary structure. The stem presents a primary structure. The leaf has a bifacial dorsiventral structure.

Key words: *Carduus thoermeri* Weinm., anatomy, root, stem, leaf

Introduction

From the systematic point of view, the plant *Carduus thoermeri* Weinm. belongs to *Asteraceae* (*Compositae*) family. In Romania this species is found in the region of Dobruja, through dried places and grasslands (Ciocârlan 2001).

Recently, I. Tiță had identified the plant in more stations from south of Oltenia. 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 *Carduus thoermeri* Weinm., 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, recolted 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.

Results and discussions

The root structure

The root has a secondary structure, due to the activity of two lateral meristems: cambium and phellogenium (Fig. 1).

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The phellogenium generates a blanket of suber, at the external, formed by 6-7 cellular layers, which it exfoliates step by step. At the internal, the phellogenium generates phellogenium, which is not different from the primary cortical parenchyma. At the phellogenium and cortical parenchyma levels we find laticiferous elements.

The cambium generates a thick ring of phloem at the external, and a central body of xylem. At the phloem level we find dilatation parenchyma zones, which is continued to the root center with the ligneous medullary rays.

The xylem shows both big solitary ligneous vessels, and small vessels, disposed in radially discontinued rows. The ligneous vessels are disposed in all the cellulose parenchyma mass. Between them we find medullary rays, regularly uniseriate.

The root center is occupied by a big mass of ligneous fibers, in which we find ligneous vessels with the biggest diameter.

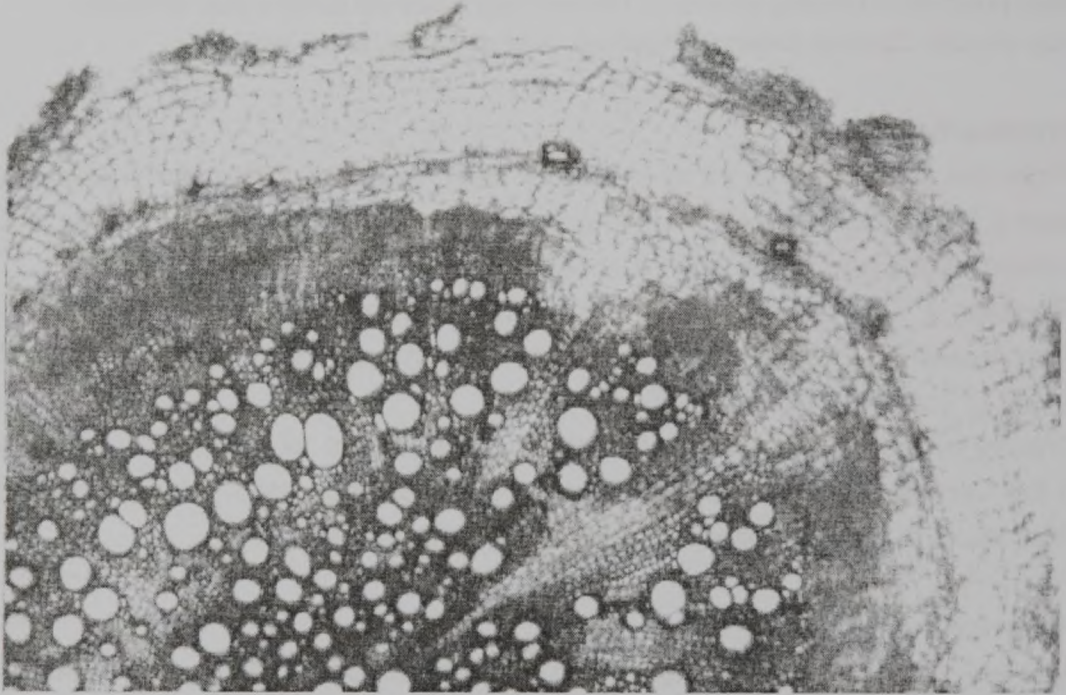


Fig. 1 Cross section through the *Carduus thoermeri* Weinm. root

The stem structure

In cross section the stem has a circular contour, modified by the large and obtuse ribs (Fig. 2, Fig. 3).

The stem has a primary structure. The epidermis is made by small cells, with external and internal walls strongly thickened. The external walls are covered by a cuticle. Between epidermal cells we find stomata, tector and secretor hairs, the most frequently structures at the epidermis level.

The cortex is made from the string of angular colenchyma, disposed in ribs and bands, and from assimilatory parenchyma between them. The central cylinder is not differentiated.

In the parenchyma mass we found approximately 48-50 libero-ligneous bundles from

collateral type. Some of them are small and rare, disposed on the external circle, and the others bigger and dense, on the internal circle.

Each libero-ligneous bundle has, from both sides, one string of sclerenchymatic elements. Also, each of the libero-ligneous fascicle is rounded by the uni- or bistratified parenchymatic theca. Near the libero-ligneous fascicles we find laticiferous elements.

The marrow is parenchymatic-cellulose, at the cross section, with hexagonal cells strongly linked between them.

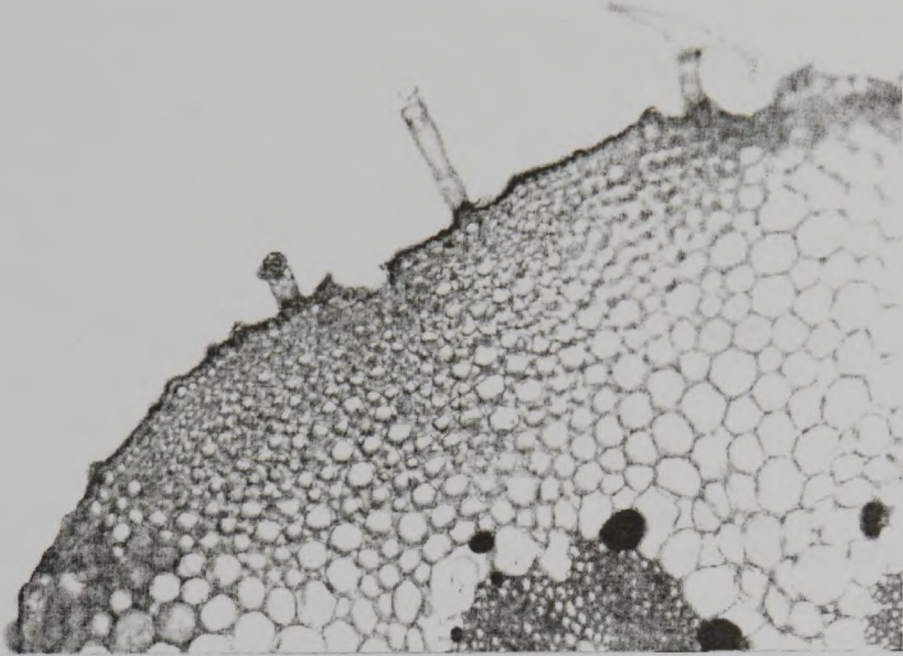


Fig. 2 Cross section through the *Carduus thoermeri* Weinm. stem



Fig. 3 Cross section through the *Carduus thoermeri* Weinm. stem

The leaf structure

The leaf's limb presents the epidermis with small cells, which are the external and internal walls thickened. The external walls are very much thickened and covered with a cuticle (Fig. 4, Fig. 5).

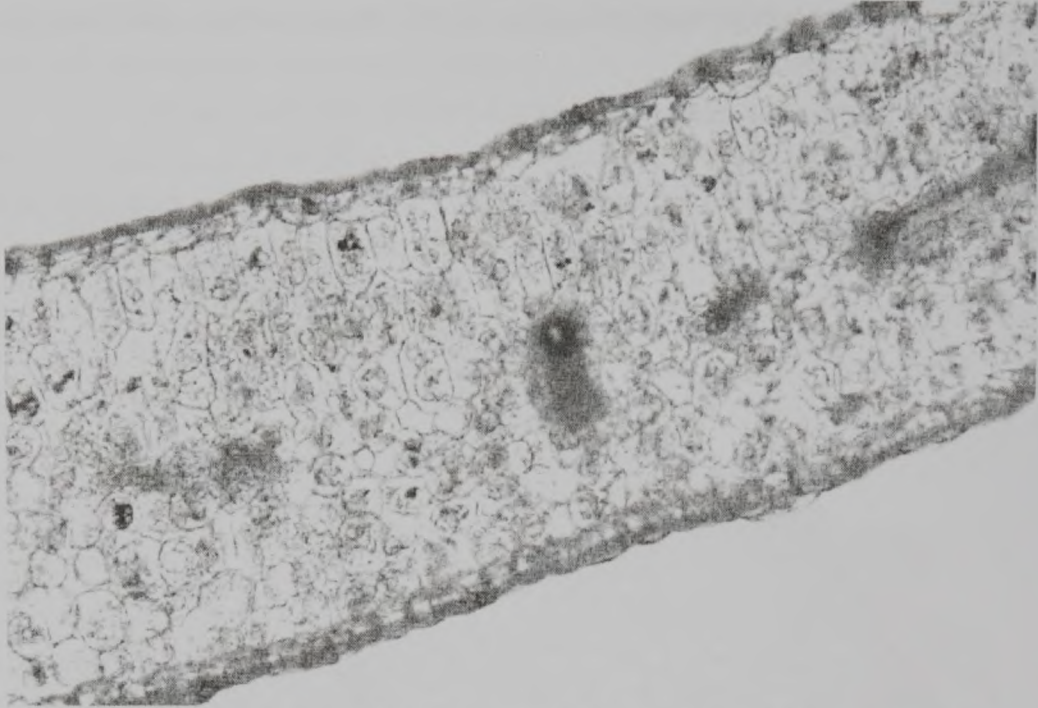


Fig. 4 Cross section through the *Carduus thoermeri* Weinm. leaf

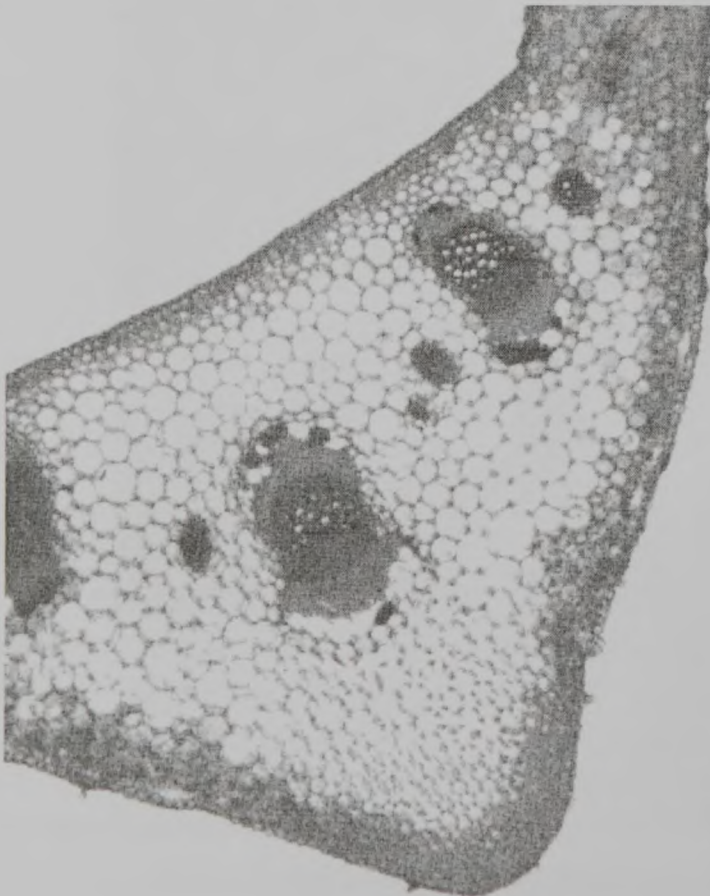


Fig. 5 Cross section through the *Carduus thoermeri* Weinm. leaf

The stomata are from anisocytic type, on the both sides of the limb, the leaf being from amphistomatic type. On the inferior epidermis we find rarely tector and secretor hairs.

In transversal cutting, the median nervure is proeminent to the inferior face of the limb. At this level, under the superior epidermis, we find a colenchyma string, the rest of parenchyma being chlorenchymatic.

Also, at the median nervure level it is the biggest libero-ligneous bundles of the limb, to these extremities the bundles size decreasing. The libero-ligneous bundles are flanked by the sclerenchyma strings, and rounded by the parenchymatic thecae.

The mesophyll is differentiated in a bistrate palisadic tissue, to the superior epidermis, and in a multistrate lacunose tissue to the inferior. The leaf has a bifacial dorsiventral structure.

Conclusions

1. The root of the species *Carduus thoermeri* Weinm. presents a secondary structure determined by the presence of lateral meristems: cambium and phellogenium.
2. The stem shows a primary structure. At the cortex level we find strings of angular colenchyma and assimilatory parenchyma. The libero-ligneous fascicles are from collateral type, having sclerenchyma strings from both sides.
4. The leaf has a bifacial dorsiventral structure.

References

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CERCETĂRI HISTOANATOMICE LA PLANTA *CARDUUS THOERMERI*

Rezumat: În această lucrare autorii prezintă rezultatele cercetărilor histoanatomice efectuate asupra speciei *Carduus thoermeri* Weinm. Rădăcina plantei are o structură de tip secundar la nivelul analizat. Tulpina prezintă o structură primară. Frunza are o structură bifacială, heterofacială (dorsiventrală).

Cuvinte cheie: *Carduus thoermeri* Weinm., anatomie, rădăcină, tulpină, frunză