

## ANATOMICAL RESEARCHES AT THE SPECIES *SENECIO VERNALIS (ASTERACEAE)*

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**Abstract:** In this paper the authors present the anatomical structure of the vegetative organs from the plant *Senecio vernalis* Waldst. & Kit. The root has a primary structure, with the well-developed cortical parenchyma. The stem has a primary structure, at the ribs level having angular colenchyma, and 4-5 layers of chlorenchym between them. At the cortical parenchyma level, in front of the one libero-ligneous fascicles we find secretor canals. The leaf had a bifacial-heterofacial structure, with three libero-ligneous fascicles from collateral type.

**Key words:** *Senecio vernalis* Waldst. & Kit., anatomy, root, stem, leaf

### Introduction

*Senecio vernalis* Waldst. & Kit., eastern groundsel, is an eurasiatic species, common in sunny places, ruderals, sandies, with broken stones, from the steppe to the common oak areas (Ciocârlan 2001).

In the Romanian ethno pharmacology this species is recommended in the treatment of digestive, genital female troubles (metrorrhagia) etc. (Ciulei et al. 1993).

The analysis of the anatomical structure of the vegetative organs is the first step for the pharmacognostic research, following the identification of the vegetal products *Senecionis vernalis herba* and *Senecionis vernalis radix*. For the good of our research we used the papers of the recognized authors (Andrei 1978, Toma & Rugină 1998, Toma & Gostin 2000, Strasburger 1998).

The motivation of this work consists in the absence of the histoanatomical researches on the vegetative organs of the species *Senecio vernalis* Waldst. & Kit., this fact being established through the consultation of speciality references.

### Material and methods

The biological material was obtained from *Senecio vernalis* Waldst. & Kit. plants, during the flowering period, in August 2002, recolcted from Craiova city, Dolj County.

The preservation of the vegetal material (roots, stems, leaves) was made using a mixture of ethylic alcohol, glycerol and distilled water, in equal quantities. Cross sections were made helping with an anatomic razor, at the root, stem and leaf of this plant (Andrei & Rădulescu 1972, Andrei 1978, Toma & Gostin 2000).

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The sections were washed with distilled water, then passed through the clarifying process using a natrium hypochlorite 10 % solution (Javel water). The successive washing of the sections was made for the elimination of the clarifying agent. The colouring of the sections was made with Genovese reagent, which results by the combination of a two solutions: Congo red and crisoidine (Andrei & Rădulescu 1972, Andrei 1978, Toma & Gostin 2000).

The coloured and fixed cuttings were studied using a binocular microscope type Krüss (objectives x10, x20, x40), then taking microphotos using a Nikon system with photoadapter.

## Results and discussions

### *The root structure*

In cross section, the root presents circular contour and a primary structure (Fig. 1, Fig. 2).

The rhizodermis is unistratified, having more absorbant hairs.

The cortex is made from: exodermis, cortical parenchyma, and endodermis.

The unistratified exodermis has the cellular walls impregnated with suberine, here and there having passage cells.

The cortical parenchyma is well developed, having 12-15 cellular layers.

The endodermis is unistratified, with cells disposed ordonately, having thickened radial walls with lignine, here and there with passage cells.

The central cylinder presents, at the external, an unistratified pericycle, the cells being disposed alternately with those of the exodermis.

The conducting tissue is made from simple bundles, ligneous and liberian, with alternately disposition.

The protoxylem, respectively protophloem, are disposed to the pericycle, and the metaxylem, respectively metaphloem, are disposed in bundles to the medullar parenchyma.

The medullar rays are uniseriated. The medullar parenchyma has a central disposition, being well represented and having the cellular walls a little thickened.

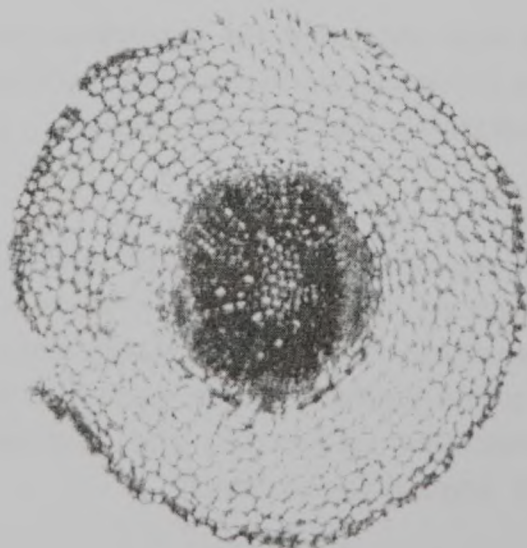


Fig. 1 Cross section through the *Senecio vernalis* Waldst. & Kit. root



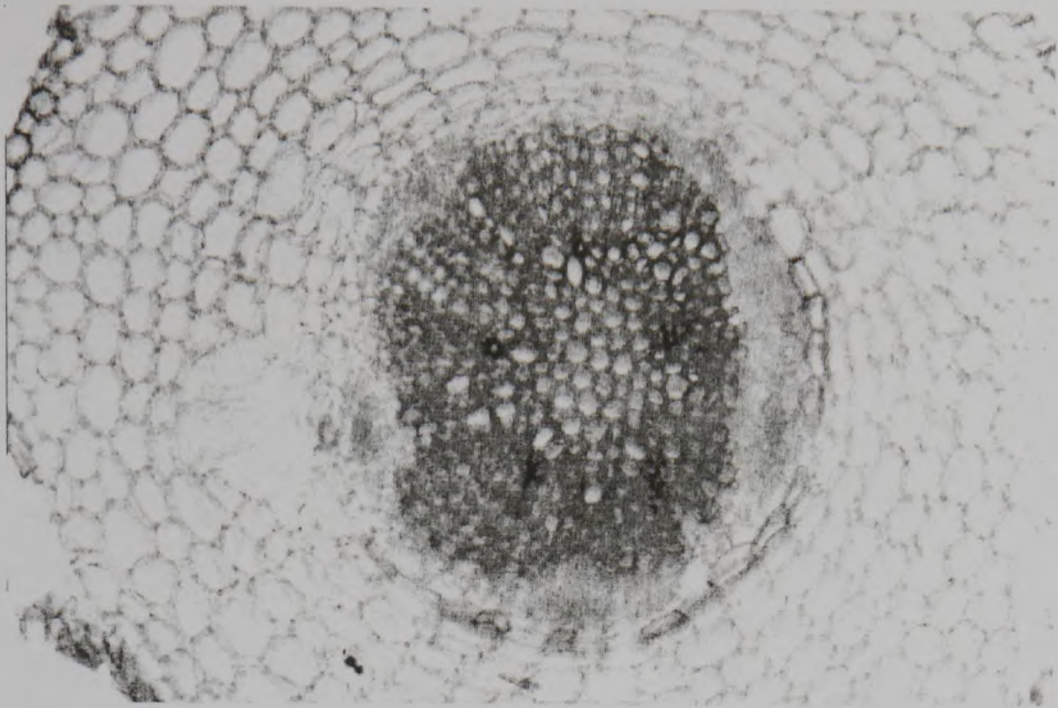


Fig. 2 Cross section through the *Senecio vernalis* Waldst. & Kit. root

### ***The stem structure***

On the cross section, the stem has a circular-ribbed contour and a primary structure (Fig. 2, Fig. 3).

The epidermis is unistratified, made by isodiametric cells with thin radial walls, and with internal and external tangent walls impregnated with suberine. Here and there we find pluricellular uniseriated tector hairs.

At the ribs level an angular colenchyma is, disposed in 4-5 layers at the small ribs level, and in 15 layers, at the big ribs. Between the ribs we find 4-5 layers of chlorenchym.

The cortical parenchyma is made from two big cellular layers. At this level, in front of the ones libero-ligneous bundles we find secretor canals.

The conducting tissue is made by more mixed libero-ligneous bundles, from different sizes. The big libero-ligneous bundles are flanked at the extremities by the sclerenchyma skullcap.

Between the libero-ligneous fascicles we find a fundamental parenchyma, which presents the cellular walls thickened with suberine and cellular inclusions (pyrolizidinic alkaloids).

The medular parenchyma is well developed, having big cells with intercellular spaces. This parenchyma accumulates starch granules and pyrolizidinic alkaloids.

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

On the cross section the leaf's limb had the following structure:

The superior and inferior epidermis are made from big cells, with the external walls thickened and covered by cutine. Here and there we find pluricellular tector hairs.

The mesophyll is made from 2-3 layers of palisadic parenchyma, and 4-5 layers of lacunose parenchyma.

At the median nervure level we find three libero-ligneous bundles from collateral type. The leaf had a bifacial-heterofacial structure.



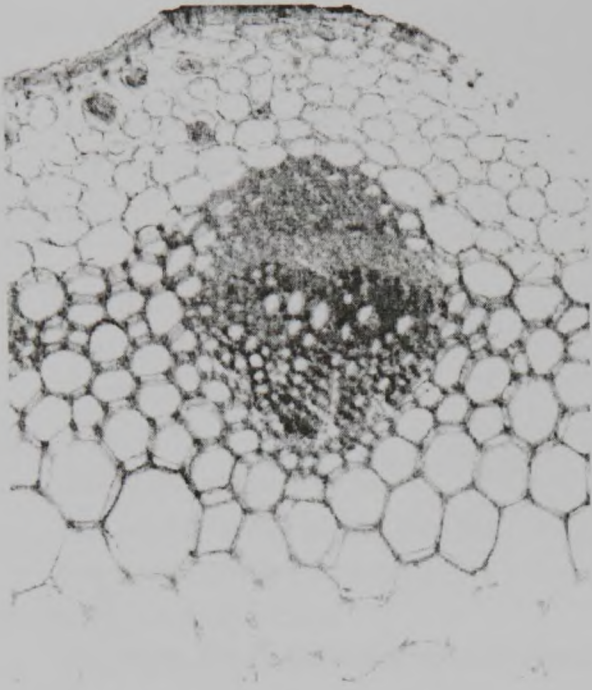


Fig. 3 Cross section through the *Senecio vernalis* Waldst. & Kit. stem

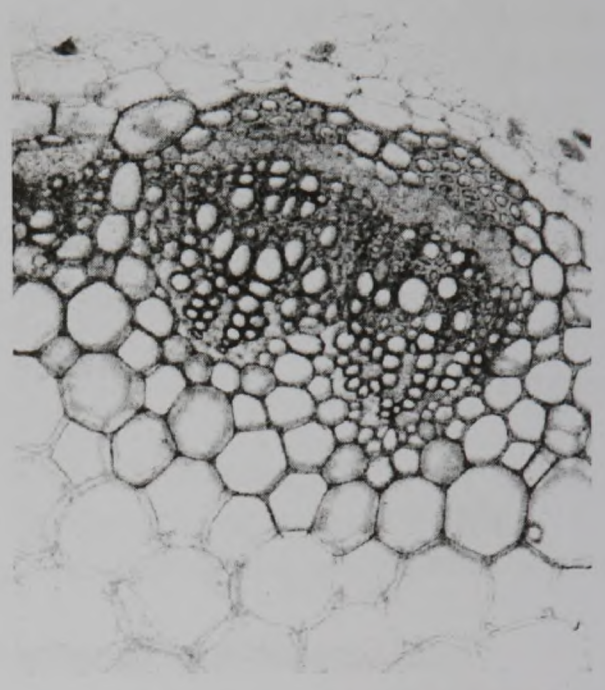


Fig. 4 Cross section through the *Senecio vernalis* Waldst. & Kit. stem

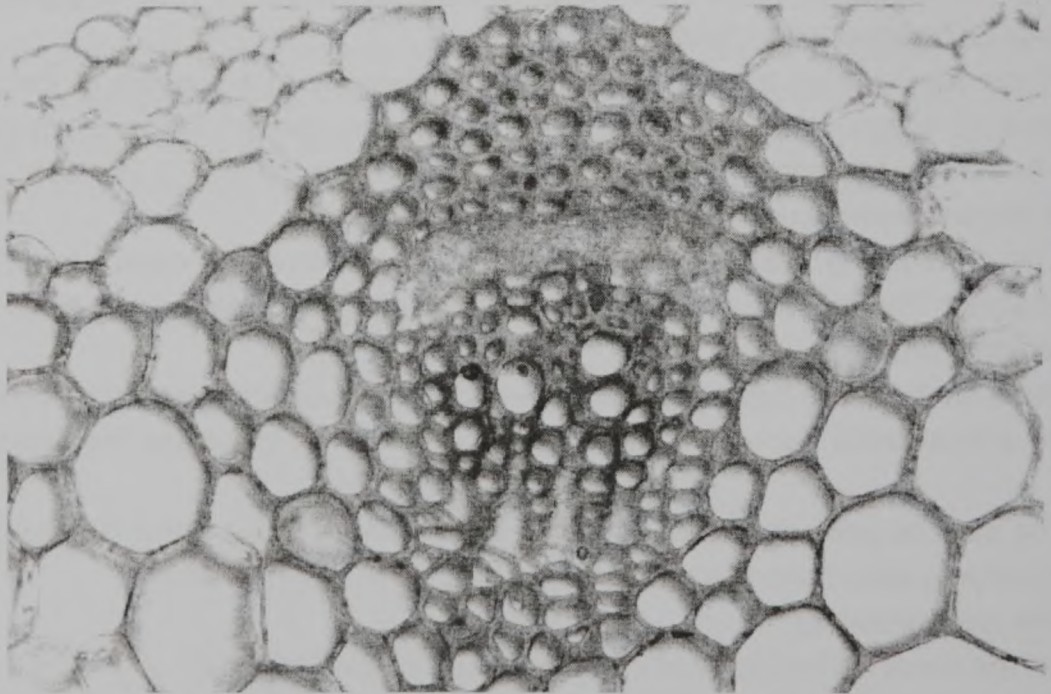


Fig. 5 Cross section through the *Senecio vernalis* Waldst. & Kit. stem



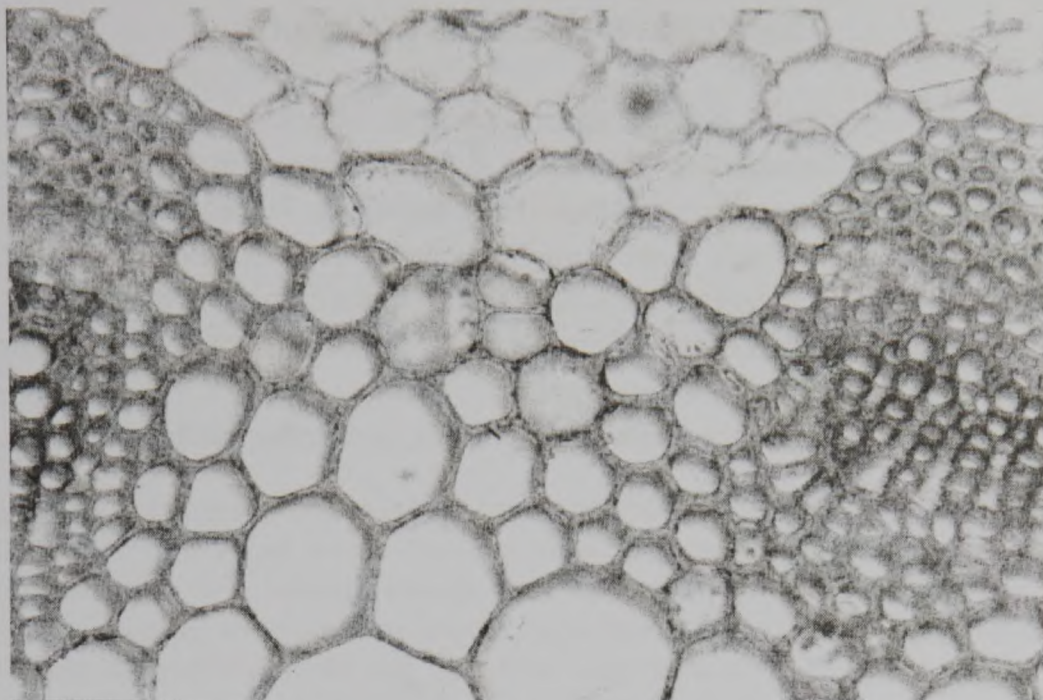


Fig. 6 Cross section through the *Senecio vernalis* Waldst. & Kit. stem

### Conclusions

1. The contributions at the microscopic study of the species *Senecio vernalis* Waldst. & Kit. were consist in the evidentiatio of the anatomic structures of the root, stem and leaf.
2. The root had a primary structure, with the well developed cortical parenchyma.
3. The stem had a primary structure, at the ribs level having angular colenchyma, and 4-5 layers of chlrenchym between them. At the cortical parenchyma level, in front of the one libero-ligneous bundles we find secretor canals.
4. The leaf had a bifacial-heterofacial structure, with three libero-ligneous bundles from collateral type.

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**CERCETĂRI ANATOMICE ASUPRA SPECIEI  
*SENECIO VERNALIS (ASTERACEAE)***

**Rezumat:** În această lucrare autorii prezintă structura anatomică a organelor vegetative de la specia *Senecio vernalis* Waldst. & Kit. Rădăcina prezintă o structură primară la nivelul analizat, cu parenchimul cortical bine dezvoltat. Tulpina are de asemenea o structură primară, prezentând la nivelul coastelor cordoane de colenchim angular, iar între acestea, 4-5 straturi de clorenchim. La nivelul parenchimului cortical, în dreptul unor fascicule libero-lemnoase, se află canale secretoare. Frunza are structură bifacială-heterofacială, cu trei fascicule libero-lemnoase de tip colateral.

**Cuvinte cheie:** *Senecio vernalis* Waldst. & Kit., anatomie, rădăcină, tulpină, frunză