

## MICROSCOPIC STUDIES OF SOME *CHELIDONIUM MAJUS L.* POPULATIONS

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### **Abstract**

*The Papaveraceae family, groups 300 of herbaceous annual, biannual or perennial species, widespread in spontaneous flora. *Chelidonium majus L.*, celandine is part of the Papaveraceae family. In our country celandine is the component of hepatic teas, as well as frequently encountered as the formula of homeopathic drugs. Nowadays, it is recommended as a remedy in case of more than 150 diseases. In the period of 2014-2015 were collected samples of celandine from two populations, Oradea's area and Ștei's area and we making a comparison between the two populations. Our results show that the largest differences appear on the level of main stems. In case of the samples from Ștei the latex is present in very small quantities. These results are important, especially if we take into account the fact that it is a widely used medicinal plant.*

**Key words:** *Chelidonium majus L.*, latex, hepatic teas

### **INTRODUCTION**

*Chelidonium majus L.*, celandine is one of Romanian spontaneous flora herbs that has been used since antiquity (Toma et al, 1998).

Celandine is part of the *Papaveraceae* family, *Rhoeadales* order, subclass of *Magnoliidae*, class *Dicotyledonatae*.

The *Papaveraceae* family, groups 300 of herbaceous annual, biannual or perennial species, widespread in spontaneous flora and other crops.

It is characterized by pivotant root, branched stems and sessile- or short petiole leaves. Flowers are grouped in inflorescences. They consist of two lapsed sepals, four brightly colored petals, numerous stamens and carpels. The gynoecium consists of 6-12 intergrown carpels. The stigma has a varied form, lobed or star shaped. The androecium may be formed from numerous stamens or reduced to 6-4 stamens (Tamas, 1990, Toma et al, 1998, Oroian, 2004).

The fruit is a globular capsule, oblong or silique, mono- or multisperma. The seeds have oily endosperm. It features the presence of laticifers in organs, secreting colored latex. From the chemical

composition's point of view the papaveraceae is characterized by the large content of alkaloids with different structures.

*Chelidonium majus* L. is widespread in Asia, North America and whole Europe, including Moldova, it grows in shady-, ruderal places, being not pretentious to pedoclimatic conditions (Tamas, 1990, Pallag, 2013, Pallag, 2015). The first pharmacological study on plant raw material was made in 1818. Although chemical and pharmacological researches has continued until today, the use of this species has slightly exceeded folk medicine's frame (Brossi, 1983, Koloff et al, 1964, Hladon, 1978, El-Readi et al, 2013, Domitian, 2013).

The upper part and the roots of *Chelidonium majus* have cholagogue-, spasmolytic- and weak analgesic effects. The cholagogue-, analgesic and spasmolytic action is obvious only in case of fresh drug. The total of alkaloids presents cholecysto-kinetic properties and ensures a good digestion tract by stimulating the pancreas and biliary drainage (Lozyuk, 1977, Sethi, 1983, Kery, 1987, Kim et al, 2001).

Nowadays, celandine it is recommended as a remedy in case of more than 150 diseases, e.g. dermatitis or viral infections. In our country celandine is the component of hepatic teas, as well as frequently encountered as the formula of homeopathic drugs. The bacteriostatic action and that of antiblastic action of alkaloids from celandine, are under investigation and verification in many countries (Tan et al, 1991, Ulrichova et al, 1996, Shin 2002, El-Readi et al, 2013, Domitian, 2013).

## **MATERIAL AND METHODS**

In the period of 2014-2015 were collected samples of celandine from two populations, Oradea's area and Ștei's area. We conducted cross sections, through vegetative organs and flowers, making a comparison between the two populations.

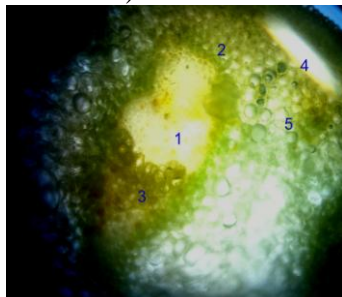
We followed the structures on the microscopic level in case of cross sections, carried out from the main stem, leaves and flower petals.

## **RESULTS AND DISCUSSIONS**

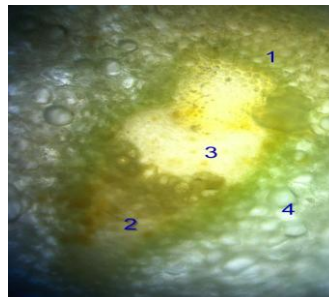
In the longitudinal section, through the stem's epidemic, may be observed the epidermal cells and the stomata. In cross section, may be observed pluricellular tector brushes.

In the stem's cross section may be observed an epidermis with pluricellular tector brushes, 2-3 layers of collenchymatous cells, elongated tangentially, and 5-6 layers of lignified yellow fiber, with wide wood; the collateral libero-wood beams, are arranged in a circular way, accompanied

by laticifers, articulated in the Liberian region, with a yellow- brown content (figure 1 and 2).

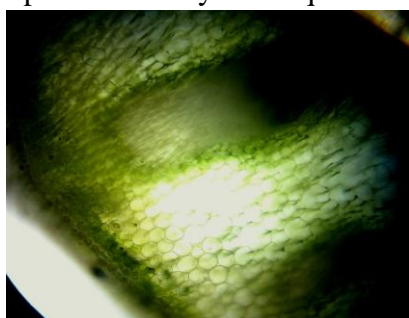


*Fig.1. Cross section through main stem, Central cylinder area (Oradea area): 1- articulated laticifers articulate in liberian region; 2- collenchymatous cells; 3- wood elements, 4- laticifers; 5- medullary rays*

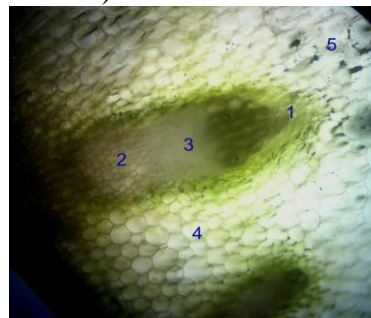


*Fig.2. Cross section through libero- woody collateral beam (Oradea area): 1- Liberian area, 2- woody area; 3- laticifers articulated in the Liberian area, with yellow content; 4- medullary rays*

Our results show that the largest differences appear on the level of main stems. In the samples from Ștei area, the Liberian area of the central cylinder is highlighted, but laticifers lack the characteristic yellow latex, or it is present in very small quantities (figure 3 and 4).

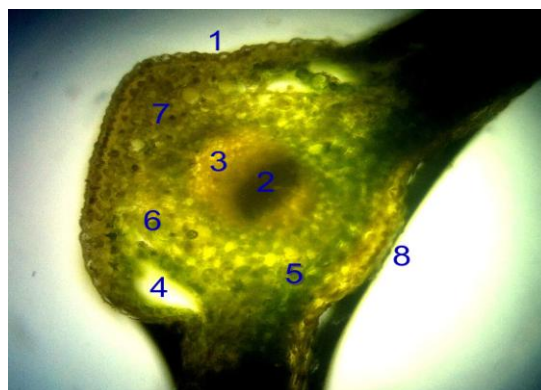


*Fig.3. Cross section through the main stem (Ștei area)*



*Fig.4. Cross section through the leading collateral beam (Ștei area): 1. woody area; 2- Liberian area; 3- Liberian area without laticifers; 4- medullary rays*

In the samples from Oradea, the laticifers from the Liberian area of the central cylinder are easily seen, presenting a yellow content (figure 5).



*Fig.5. Cross section through the leaf (Oradea area): 1- inferior epidermis; 2- woody beam; 3- Liberian beam; 4- laticifer channel; 5- palissade assimilating texture; 6- lacunar assimilating texture; 7- mechanical texture; 8- superior epidermis*

The cross section of the leaf presents a superior epidermis, an inferior epidermis, between which we may observe the multi-layered mesophyll with palissade- and lacunar parenchyma. On the level of ribs it is highlighted the libero-woody beam of collateral type.

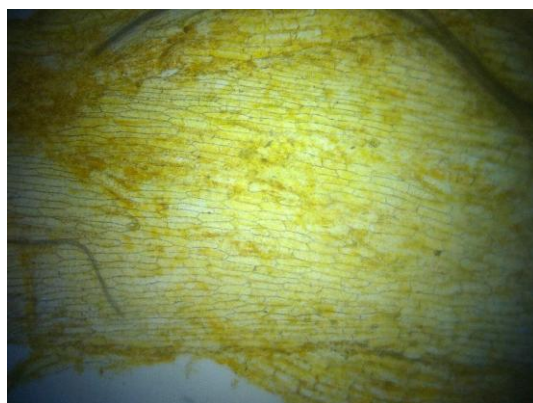
The superior epidermis consists of an isodiametric cells layer, rounded or wavy, without stomata. The inferior epidermis consists of a wavy cells layer, with numerous stomata of anomocytic type.

In mesophyll, the palissade parenchyma consists of an elongated cells layer, with rich cytoplasm, in which we may observe numerous chloroplasts.

The lacunar parenchyma consists of 4-6 layers of cell, it is rich in intercellular spaces.

The libero-woody collateral beam is surrounded by a collenchymatous pericycle and accompanied by numerous laticifers in the Liberian region, with a yellow-brown content.

In the longitudinal section through the petal's epidermis we may identify epidermal cells which form a single mono-cellular layer, the cells are small, polyhedral, closely joined together. In case of the two studied populations there were not discovered differences in the microscopic structures of the petals (figure 6).



*Fig 6. Cross section through the petal's epidermis (Oradea)*

## CONCLUSIONS

Our results show that the biggest differences appear on the level of main stems. In case of the samples from Oradea area, the laticifers in the Liberian area of the central cylinder are easily seen, presenting a yellow content.

In case of the samples from Stei, the Liberian area of the central cylinder is seen, but laticifers lack the yellow latex, which is characteristic, or latex is present in very small quantities.

These differences are important, especially if we take into account the fact that we talk about a widely used medicinal plant.

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