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Botanic and anatomic study of *Papaver rheoas* L. of Tessala (Algeria, NW)

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ABSTRACT

Botanical and histological studies constitute an important data base to conserve and valorize plant species. The present work is the study on botanical and anatomical aspect of corn poppy (*Papaver rhoeas* L.) growing in Tessala region (wilaya of Sidi Bel Abbes). The anatomical and histological study has highlighted tissues characterizing leaves, stems and roots usining double coloration of red-congo and green of methyl. Among the important structures, noting the presence of trichomes and secretory hairs of active substances, particularly in the stem.

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INTRODUCTION

Papaver genera are common in much of North Africa, West Asia and in much of southern Europe to the countries of Central Europe, the species of the genus Papaver were introduced also in North America and Australia (Guassen, 1996). Thus this genus has been studied by several publications in the world (Matyášová1,2011; Bilková,2004)

Seven species of this genus are present in Algeria and other Maghreb countries (Ait Benyoussef, 2006) Among these plants, we are interested in poppy (*Papaver rhoeas* L of Tessala region (Algeria, NW).

The corn poppy is a plant that has a therapeutic effect, used to soothe sore throats and suppress coughs. Its rich in flavonoids and alkaloids facilitates sleep and calms the body.(Ait Benyoussef, 2006)

In this work we propose a botanical and anatomical study of the species using observation and description of the full plant and their histological cups.

MATERIAL AND METHODS

Botanical Study:

A botanical description of *Papaver rhoeas* L. was performed using a magnifying glass to closely examine the organs and a digital camera to photograph the different organs.

To do this, we referred to some books as the flora of Algeria (Quézel and Santa, 1962) and the flora of North Africa (Maire, 1952)

Anatomical and histological study:

A-Implementation of freehand cuts:

This method is performed in two phases: the preparation and coloration of the sections. Making a cuts.

This technique requires the use of pith with which we dug a slot for the introduction of different plant organs. With a razor blade, we made very thin cross sections by hands. Thus, the sections are ready for staining.

B-coloring sections:

Staining with methyl green combination - Congo red staining can specifically lignified cell walls in green and cellulose cell walls pecto-red. For this, the sections are:

- Soaked in bleach for a duration of 20 to 30 min,

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- Washed with distilled water (3 to 4 times),
- Etched with acetic acid for 5 min,
- Stained for 3-5 min with 0.1% methyl green (0.1 g methyl green in 100 ml of distilled water, shake and filter)
- Washed with distilled water (3 to 4 times),
- Stained for 20 min with 0.1% Congo red (0.1 g of Congo red in 100 ml of distilled water, shake and filter)
- Rinsed with distilled water (3 to 4 times).

RESULTS AND DISCUSSION

Botanical Description (figure 1):

It is known that The poppy is an annual herbaceous plant. their Stems (Plate I, figure A) are bristling, rough, sparsely branched, hairy, hairy, glaucous and fleshy, covered with coarse hair, exuding a white latex to breakage and their length varies from 20 to 90 cm. The stem generally shows no secondary formations. Leaves (B) are cut, stalkless, often with a terminal lobe largest. The blade lanceolate, can have on the adult plant forms variables (lobed, toothed).

Flowers (C) are isolated, carried by bristly stems. The petals are enclosed by two sepals that form the hull buds. They open their base and fall from the development of the corolla of four petals formed large (30-45 mm), which are still crumpled.

They are scarlet red, but are sometimes pink or white.

A large number of blue-black stamens (tens) surround the pistil which bears at its apex lobed disc adorned from July to December are the rays that stigma pollen receptor. Roots (D) are pivotable, fibrous, whitish

Fig. 1: Overview of the species *Papaver rhoeas* L.

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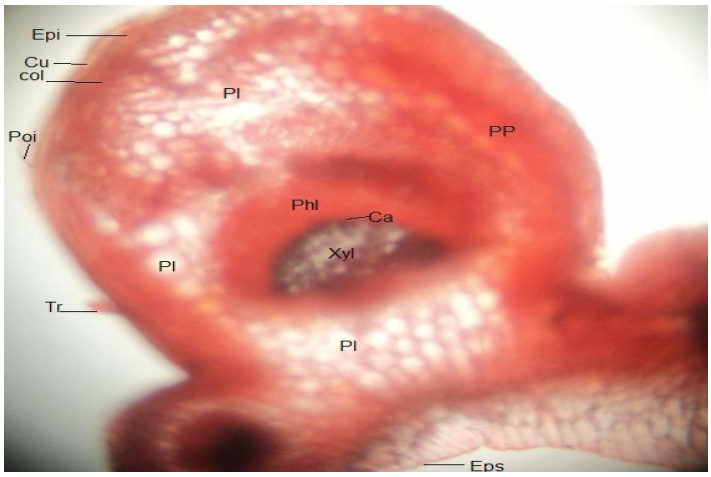

Fig. 2: Cross section freehand performed in *Paper rhoeas* leaf, colored green-red by combining methyl-Congo (photo: H. Benchiha and MM Dif) (Gr x 400)

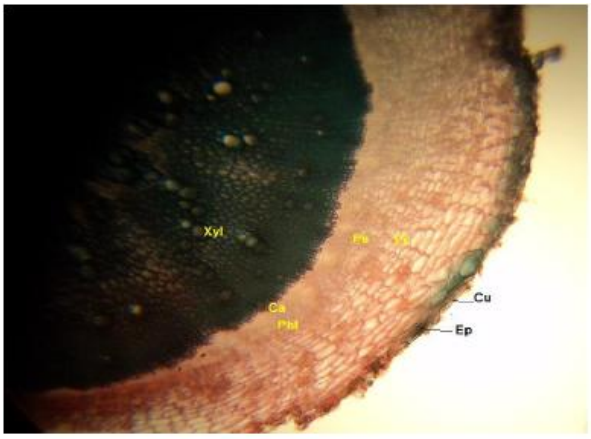

Fig. 3: Portion of a cross section of the root colored green by combining methyl-Congo red (photo: H. Benchiha and MM Dif) (Gr X40)

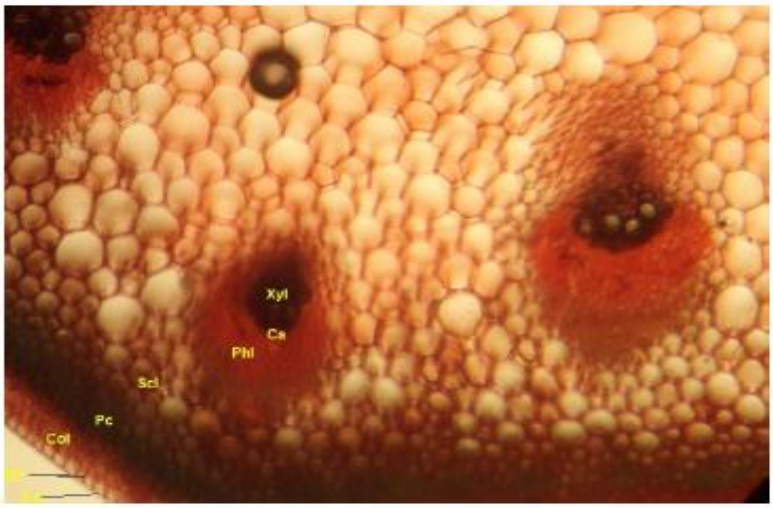

Fig. 4: Cross-section at the periphery of the stem colored green by combining methyl-Congo red (photo: H. Benchiha and MM Dif)

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The leaf (figure2):

Microscopic observation of photonic cross freehand on the leaf of Papaver rhoeas L., colored by combining green methyl- red Congo shows that the midrib is made from the exterior to the inside:
- An upper epidermis (Eps) formed cuticle cell much larger than those of the lower epidermis - A collenchyma (col) subepidermal.

- A palisade parenchyma (PP) on the side.

- A spongy parenchyma (P) large cell rounded down to the upper face of the sheet, wider at the bottom (Figure 6).

- The conducting tissue of the sap (Figure 6) xylem (Xyl) and phloem (Phl) separated by the cambium (Ca). A lower epidermis bearing glandular trichomes (Tr) and secretory hairs (POI). The number of glandular trichomes is more important on the underside the upper side.

The root (figure 3):

Microscopic observation of photonic cross freehand on a root of *Papaver rhoeas* L., colored by combining green methyl- red,Congo showing us that the root is composed of the exterior to the interior tissue following:
- A epidermis (Ep) formed of a single layer of cells, cuticle (Cu) thick.
- A cortical parenchyma (Pc) also called cortex, formed by large cells.
- A central cylinder (CC) is part of the center of the root, it consists of:
- A pericycle (Pe) formed by one or two layers of cells .
- A vessel conductor arranged in a circle: a superimposed xylem phloem and cambium sandwiched by (Ca).
- Marrow (MB) consists of central medullary parenchyma.

The Stem (figure4):

An examination of the cross-section of a stem of Papaver rhoeas L. performed and colored green by combining methyl green - red Congo showed that stem tissue is characterized by the following:
- An epidermis (Ep) cuticle (Cu) thin bearing glandular trichomes (Tr).
- A collenchyma (Col) abundant form of islands
- A cortical parenchyma (Pc) located on the sides containing intercellular spaces and in places reaching the epidermis .
- A endoderm (En) well differentiated forming two to three layers of fat cells.
- A system driver: xylem (Xyl) and phloem (Phl) separated by the cambium (Ca), forming a complete ring.

Conclusion:

The botanical study undertaken on this species has identified certain structures such as secretory hairs and glandular trichomes, specialized in the synthesis of secondary metabolites.

Histological study by the technique of double staining with methyl green and Congo red, we identified the anatomical structure of the various organs of the plant and its histological appearance as the epidermis, palisade parenchyma, parenchyma lacunae in the sheet and the collenchyma, cortical parenchyma, the conductor system (xylem, phloem) in the rod, and finally the central cylinder, the pericycle, spinal root in the central.

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