HISTO-ANATOMY OF THE STEM OF *SOLANUM TUBEROSUM* L.

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Abstract. The paper reveals the anatomical structure of the stem of *Solanum tuberosum* L. in the incipient stages of the ontogenetic development (the popular denomination „sprout"). Cross sections of the stem of this species were performed. The appearance of the secondary structure – even in this early ontogenetic stage – was confirmed by the presence of the cambium and the tissues generated by this. As a result, at the potato, the purely primary structure of the stem is of a short duration.

Keywords: *Solanum tuberosum* L., stem, anatomy

INTRODUCTION

There is plenty of research referring to the anatomy of the vegetative organs at potato (*Solanum tuberosum* L.). Thus [3, 4], carry out studies regarding the anatomy of the potato leaves, insisting upon the vascular system. They specify that in the primary initial structure of the potato stem there are 6 bicollateral vascular bundle, 3 big and 3 small. **Maghiar** and **Şipoş** [2] have described the anatomy of the subterraneous stolons of this species. There has also been made research regarding the expression of some genes in the external and internal phloem from bicollateral vascular bundle, which are to be found in the structure of the stems and leaves of this species [1]. The present article reveals the anatomy of the aerial stem of the potato, the stem being in the ontogenetic stage of development popularly known as „sprout".

MATERIALS AND METHODS

There have been used potato sprout preserved in alcohol 70º. Cross sections have been performed through these and they were coloured with Congo red. The examination was made at the optic microscope, with objectives 4x, 10x and 20x. The photographs were taken at the ocular set 10x and objectives 4x or 10x, with a Canon A550 camera. The images were downloaded in the computer and processed with a program destine to this purpose.

RESULTS AND DISCUSSIONS

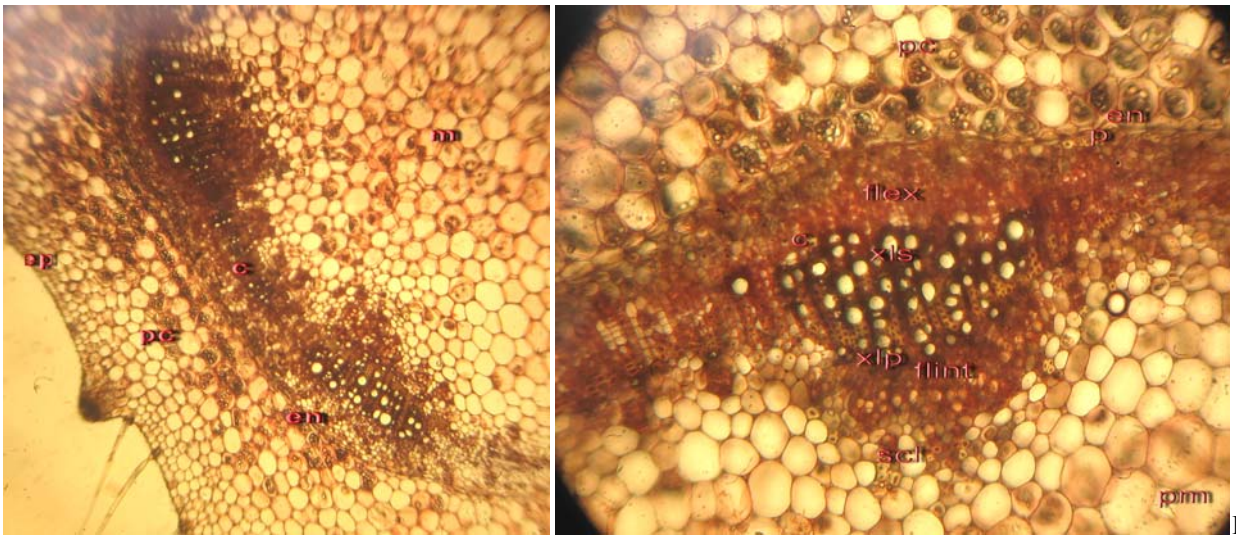
The experimental results make the object of **Figures 1** and **2** (**A** and **B**).

The contour of the cross sections through the potato stem was round or oval.

From the exterior to the interior of the sections, in the anatomic structure of the potato stem, there could be distinguished: epidermis, cortex and the central cylinder.

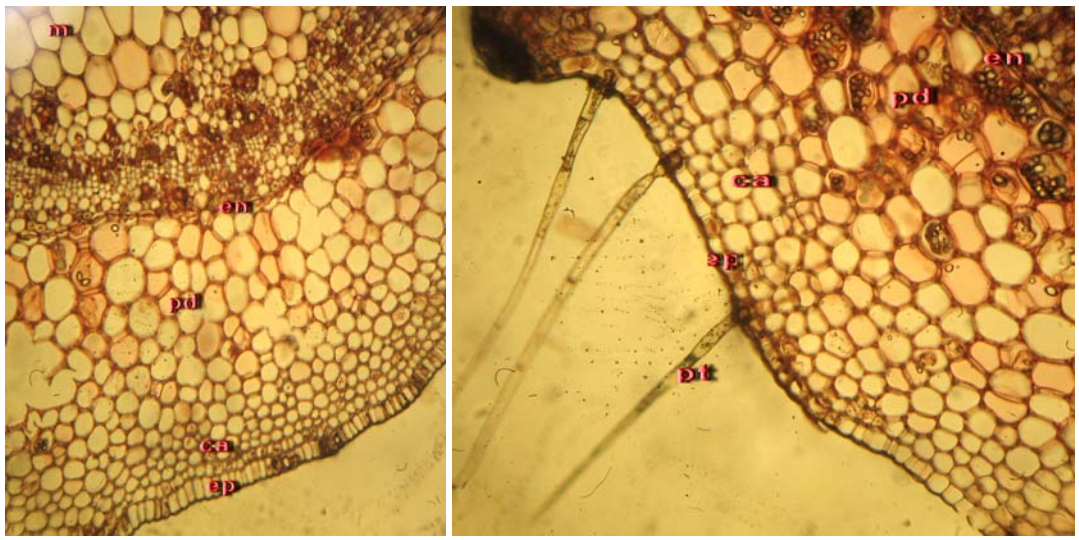
The epidermis is made up of izodiametric cells, closely connected among them, with external cellular walls slightly curved, covered by a thin cuticle. Every now and then one can observe the pluricellular tector trichomes and stomatal complexes (**Fig. 2**, **A** and **B**).

The cortex is made up of two types of tissues. At the exterior there can be observed 4-5 layers of cells, the cellular walls of which are supplementary thickened with cellulose. In fact, the forming of an angular collenchyma begins. The following layers of cells make up a parenchyma of depositing the



A. 40x 100x **B.**

Figure 1. Anatomical structure of the stem of *Solanum tuberosum* L. (**ep** – epidermis; **pc** – cortical parenchyma with the amyloplasts; **en** – endodermis; **p** – pericycle; **flex** – external phloem; **flint** – internal phloem; **c** – cambium ; **xls** – secondary xylem; **xlp** – primary xylem; **scl** – sclerenchyma; **pm** – medullary parenchyma)



A. 100x 100x **B.**

Figure 2. Anatomical structure of the stem of *Solanum tuberosum* L. (**ep** – epidermis; **pt** – tector trichomes; **ca** – angular collenchyma; **pd** – cortical parenchyma with the amyloplasts; **en** – endodermis; **p** – pericycle; **m** – medullary parenchyma)

amyloplasts (**Fig. 1** and **Fig. 2B**). The endoderma is present and well differentiated, known as being the last stratum of cells of the cortex (see **Fig. 1B** and **Fig. 2A**).

The central cylinder begins with a first stratum of cells named pericycle, placed right beneath the endoderma. This is made up of small cells, with cellular cellulose walls, alternatively disposed with cells having the cellular walls complimentarily thickened with lignin (**Fig. 1B**). The conductive tissue from the central cylinder is to a great extent the result of the activity of the secondary meristem called cambium. The cambial ring well differentiated in this stage of ontogenetic development of the potato stem (**Fig. 1A**), has generated secondary phloem towards the exterior and secondary wood towards the interior (**Fig. 1B**). It is well known the fact that the conducting vascular bundles at the potato are of bicollaterally type [1, 2, 3], there being observed besides the external and internal, primary phloem (**Fig. 1B**). The cambium permanently generates elements of secondary conductive tissue even in areas between the great fascicles (**Fig. 1A** and **Fig. B**).

CONCLUSIONS

- At potato (*Solanum tuberosum* L.) the cambial ring appears in the structure of the stem since the ontogenetic stage of „sprout". As such, the purely primary structure of the stem at this species is of a short duration.

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