

## SOME HISTO-ANATOMICAL ASPECTS CONCERNING THE LEAF STRUCTURE OF *BASELLA ALBA* AND *BASELLA RUBRA*

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**Abstract:** We analyze the histo-anatomical peculiarities leaf of two *Basella* species cultivated in the Botanical Garden of Iași (Romania). The aim of the papers is to identifying their leaf characteristics which is typically for *Basellaceae* family and the differences between this two species who was observed on the studied material.

**Key words:** Leaf histo-anatomy, *Basella* sp.

### Introduction

The studied taxa are rather fleshy, twining plants and belongs to a small tropical family - *Basellaceae*. The fleshy, mucilaginous leaves of *Basella* species have been used locally (Africa, China, etc.) as vegetables or for medicinal purposes.

The anatomical data are fewer [1, 2, 4] and is focused especially on other *Basellaceae* species.

### Material and method

The vegetal material is represented by the leaves of two taxa: *Basella alba* L. and *Basella rubra* L. [5]. Both the taxa were cultivated in the greenhouses of the Botanical Garden of Iași.

The fixing and processing of the material was done according to the usual protocol of the Vegetal Morphology and Anatomy Laboratory belonging to the Biology Department of the University "Al. I. Cuza" of Iași.

The sections were made transversal at the middle level of the root, of the stem and of the leaves. As well as there were made superficial sections at the leaf level [3]. The obtained permanent preparations were analyzed and photographed at the Novex optical microscope.

### Results

#### *Basella alba* L.

**The petiole** (Figures A-C). The outline of the transverse section is incompletely circular, with plane adaxial surface and with two small lateral-adaxial ribs.

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The epidermis has isodiametrical cells with several sizes, all of them with an external wall slightly thickened than the others. Here and there we can notice the cruciferous type stomata.

The fundamental parenchyma is cellulose and of a meiotic type, some cells contain simple crystals or, more often, the calcium oxalate druses.

In the fundamental parenchyma there is a big vascular bundle; its outline is following the petiole outline. A few parenchymatous-cellulose rays traverse this vascular bundle, an argument in the favour of the assertion that we are talking about a composed vascular bundle. The phloem has the sieve tubes and companion cells; the xylem has irregular scattered vessels and separated by the cellulose parenchyma cells. At the phloem outskirts there is a thin belt of angular colenchyma.

**The lamina** (Figures **D-H**). The epidermis in surface view. The upper epidermis has composed by polygonal cells with straight lateral walls. The lower epidermis has irregular cells with wavy lateral wall (the rare wavy, but with a big amplitude).

The cruciferous type stomata, are presented in both epidermis, thus the lamina is amphistomatous. By transparency we can observe simple crystals of calcium oxalate.

In transverse section the midrib is less prominent at the lower side of the lamina. The midrib comprises a small vascular bundle without mechanical elements at the phloem pole.

Both epidermis have slightly tangential elongated cells, with thin walls; here and there we can notice stomata. The mesophyll is homogenous, is composed of isodiametrical cells, polygonal-rounded, with intercellular spaces among them. Some cells of the hypodermic adaxial layer are slightly perpendicular on the epidermis remembering the palisade cells. The lamina has a bifacial isofacial structure, some cells of the mesophyll contain druses or simple crystals of calcium oxalate.

#### **Basella rubra L. (Figures I-M).**

*This taxon has just a few differences. The outline of transverse section of the petiole is semicircular with two obvious lateral wings and an adaxial depression. The vascular area is represented by seven bundles who contain colenchyma layers in phloem position.*

The lamina has a mesophyll which seem to be differentiated, the 2-3 subepidermal layers are composed by the palisade-like cells.

### **Conclusions**

In this paper we note the histo-anatomical aspects which can be useful for the taxonomical diagnosis.

The differences between these two taxa are smaller and are obvious at the structure of the vascular bundles and the mesophyll.

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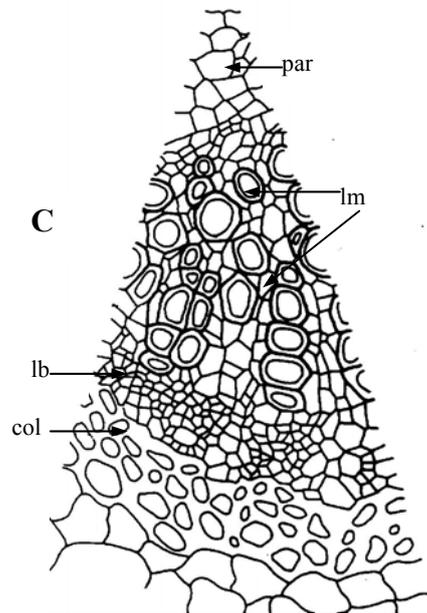
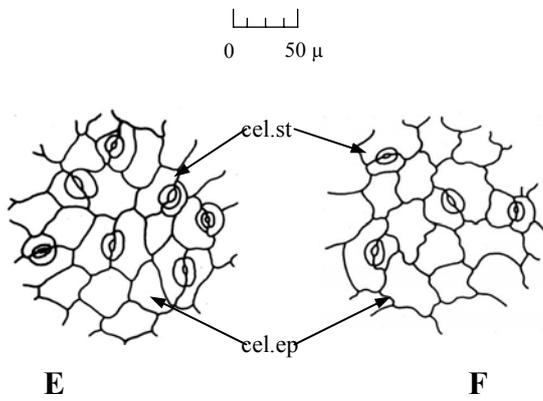
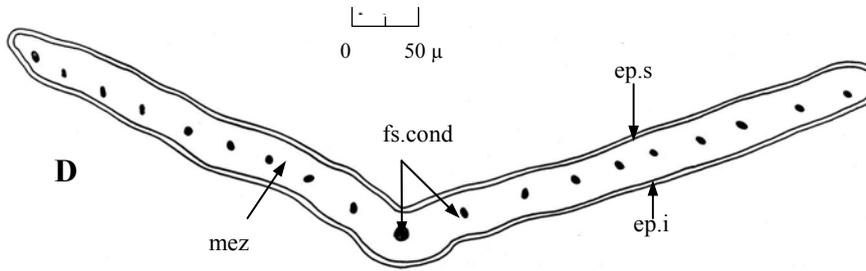
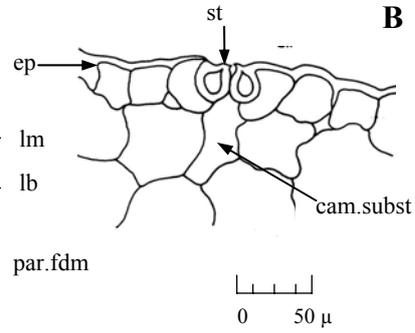
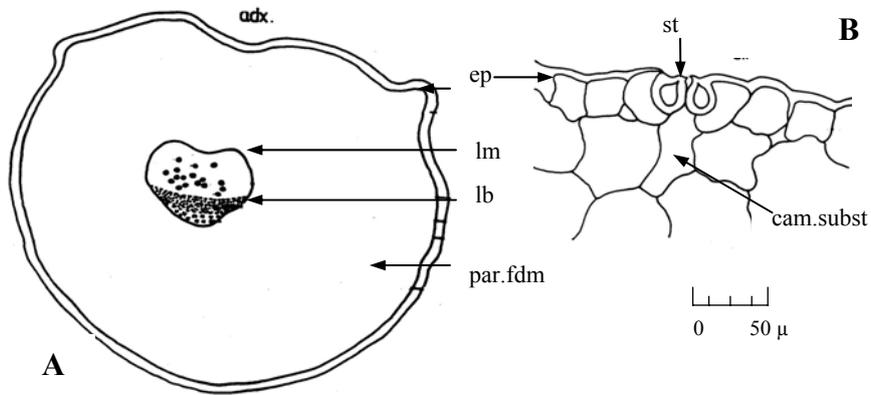
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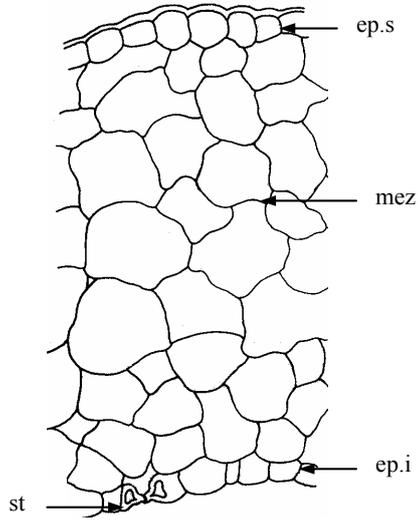
**Basella alba** L. – The structure of the petiole (**A, B, C**) and the leaf lamina (**D, E, F, G, H**). **A** - diagram of the petiole; **B** - detail of the stomate; **C** - detail of the vascular bundle; **D** - diagram of the lamina; **E** - the lower epidermis; **F** - the upper epidermis; **G** - detail of the mesophyll; **H** - detail of the midvein.

**Basella rubra** L. – The structure of the petiole (**I, K, L**) and the leaf lamina (**M**). **I** - diagram of the petiole; **K** - detail of the collenchyma; **L** - detail of the minor vein; **M** - detail of the mesophyll.

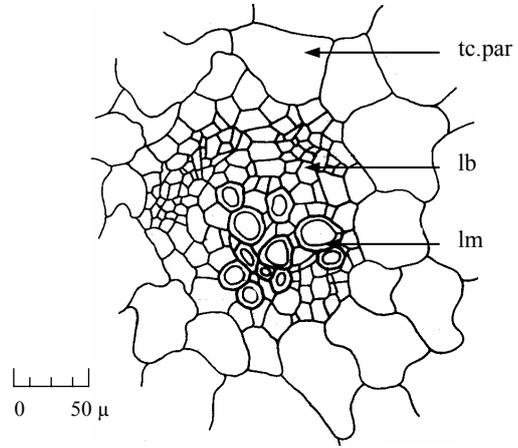
### Abbreviations

**cam.subst** - substomatal chamber; **cel.ep** - epidermal cells; **cel.st** - stomatal cells; **col** - collenchyma; **ep** - epidermis; **ep.i** - lower epidermis; **ep.s** - upper epidermis; **fs.cond** - vascular bundle; **lb** - phloem; **lm** - xylem; **mez** - mesophyll; **par.fdm** - fundamental parenchyma; **tc.par** - parenchymatous sheat; **tlc** - spongy parenchyma; **tpsd** - palisade parenchyma.

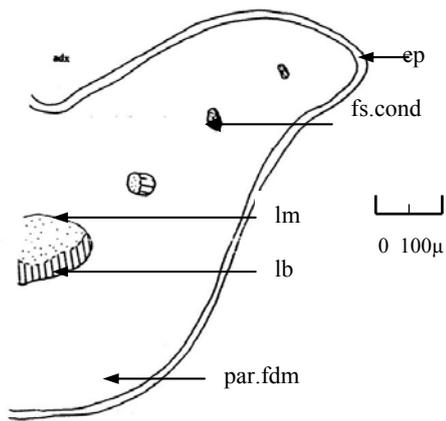




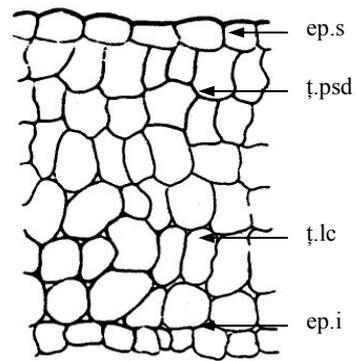
**G**



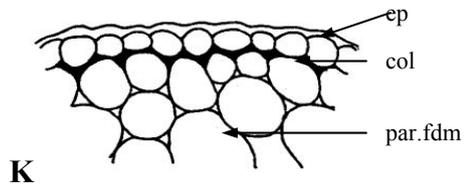
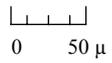
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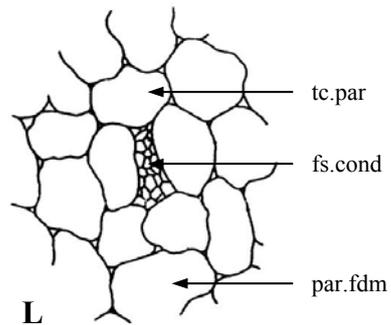
**I**



**M**



**K**



**L**