

## SOME ANATOMICAL FEATURES OF *BASELLA ALBA*

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**Abstract.** *Basella alba* L. is a tropical spinach used as a vegetable which belongs to *Basellaceae* family. The physiological and biochemical study of *Basella alba* L. plants under crop conditions of our country represented the subject of one PhD. Because of missing data about anatomy of these plants in special literature, it was necessary to study it to establish the features of internal structure. *Basella alba* L. is a C<sub>4</sub> plant type.

**Key words:** anatomy features, rhizome structure, stem structure, *Basella alba* L. *Basellaceae* family

### Introduction

*Basella alba* L. is well known as “tropical spinach” or Bengalese spinach, a vegetable with a nourishment values comparable to that of *Spinacia oleracea*. It is a tropical vegetable from Est India very much used from ancient times in nourishment of Indians and Chinesees.

It was set up one *Basella alba* L. crop in greenhouse and another in field conditions for an accurately comparison, both in the Botanical Garden from Iași.

### Materials and methods

Histo-anatomical analyses were made on cross-sections both for rhizome and stem on young and mature plants. They were fixed in 70% ethylic alcohol.

The sections prepared in this way were processed in accordance with the usually methods in the Morphological and Anatomical Vegetal Laboratory of Biology Faculty from “Al. I. Cuza” University Iași.

The sections were visualized by Amplival microscope and the drawings were made by MC<sub>1</sub>- IOR microscope.

We enjoyed every time in this study by professional assistance of Professor Constantin Toma (Toma C. 1977).

### Results and discussions

*Basella alba* L. has two types of stem, one underground and one overground. The underground stem is a rhizome.

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During the mature phenological phase the rhizome is covered with a lot of buds, which will give rise to over ground stems. The rhizomes are a form of strength of these plants only in wet tropical zone. But in dry tropical zone and in temperate zone, tropical spinach dies in unfavorable season.

The rhizome structure shows us the following features:

- circular outline of cross section (Fig. 1);
- peripheral zone of rhizome is composed by 6-8 strata of suberin cells prolonged in tangent position; these strata are very strictly arranged in radial succession (Fig. 4);
- the phelloderma is more thin and in direct contact with central cylinder; that's one of the reasons for what we believe that the phellogen is differentiated from endoderma or pericycle (Fig. 4) (Toma & Gostin 2000);
- the central cylinder is a very considerably one: in its fundamental parenchyma there are few (frequently 5) fascicules of vessels (Fig. 3), arranged in circle (Fig. 1);
- between vascular bundles and also in center of rhizome there are some phloem and xylem elements (Fig. 2);
- in all vascular bundles it can be observed few elements of second structure (Fig. 3);
- the medullary rays are very large and consist in cellulose parenchyma cells.

The structure of overground stem is quite different. First the cross section has elliptical form (Fig. 5).

Isomorphic little cells compose the epidermis, not much tangent prolonged, with external walls a little thickened comparatively to others (Fig. 6).

The cortex is very thick, formed by 10-12 cells strata bigger and bigger to the middle of zone, and smaller to the central cylinder.

The hypodermic stratum is an angular collenchyma which cells have moderate thick walls.

Central cylinder is relatively thin and has only 2 vascular bundles arranged in opposite position. These fascicules are collateral-open type one (Fig. 7).

Between these normal vascular bundles it can observe some groups of vessels elements (Fig. 5).

The pith is a cellulose-parenchyma composed by cells with thin walls and visible intercellular spaces.

### Conclusions

The conductive tissue of rhizome of *Basella alba* L. is composed by five mixed vascular bundles, collateral-open type.

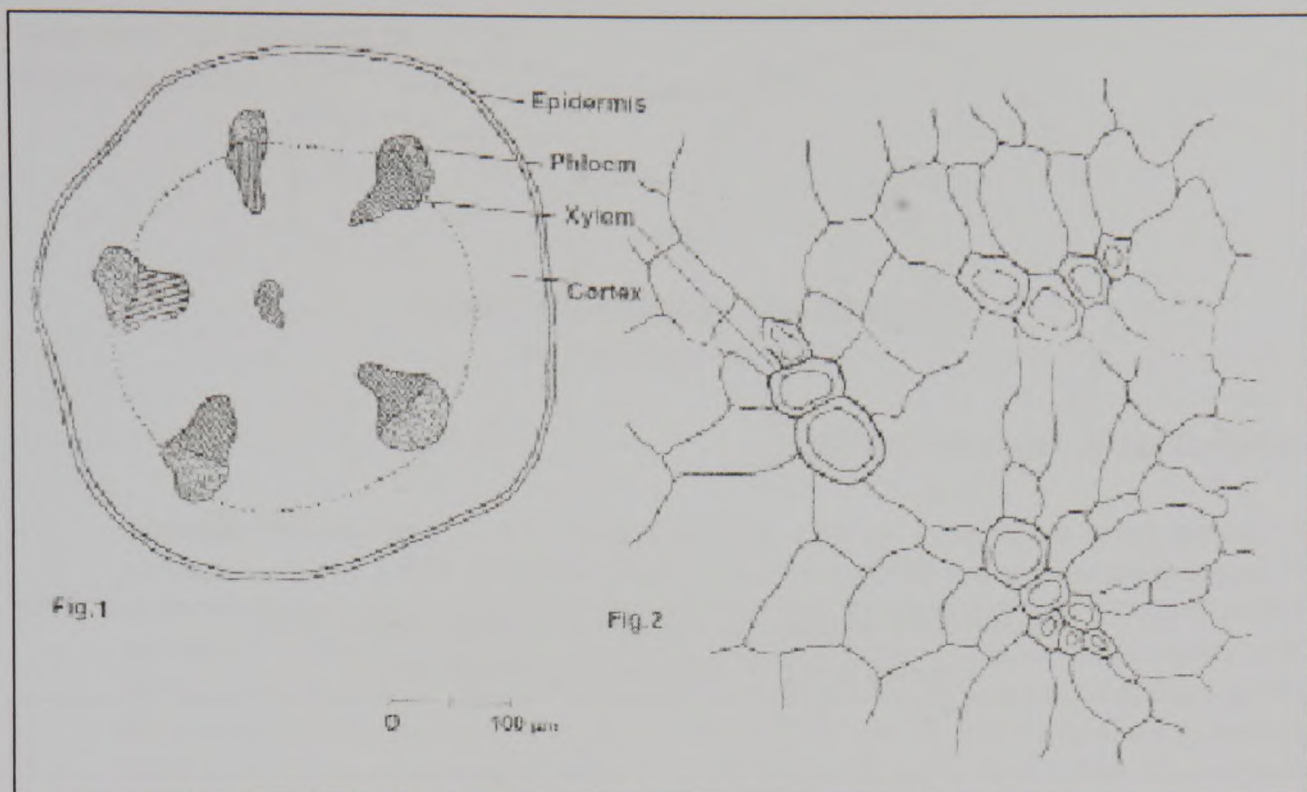
The phellogen is differentiated from endoderma or pericycle.

The young stem of plants of *Basella alba* L. has only two mixed vascular bundles.

In the structure of conductive tissue it can observe the parenchymatic boundle sheath, which is typical for C<sub>4</sub> plants.

### References

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Figures 1 and 2 represent cross sections by rhizome of *Basella alba* L., respectively details of pith tissue.

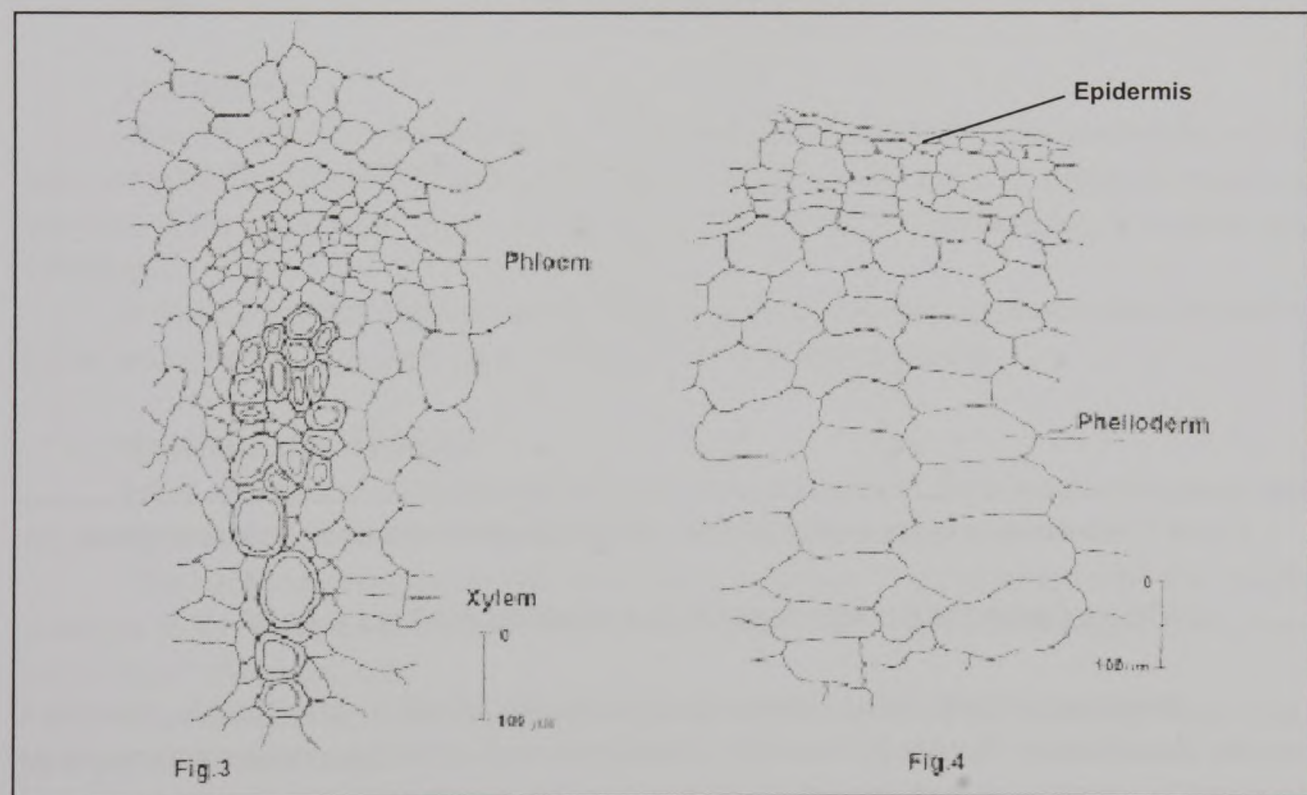


Figure 3 reproduces one of vascular bundle, and the 4<sup>th</sup> figure is part of cortex, both in rhizome structure of *Basella alba* L.

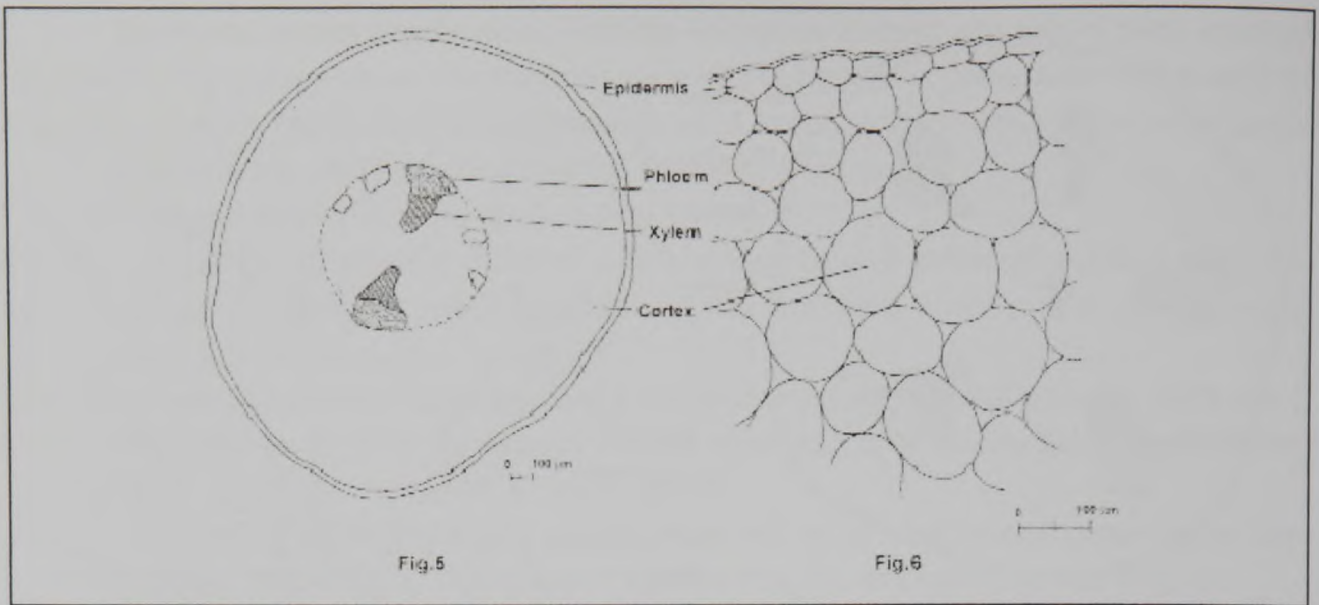


Figure 5 is the elliptical cross section by stem of *Basella alba* L.

Figure 6 is part of stem cortex of *Basella alba* L.

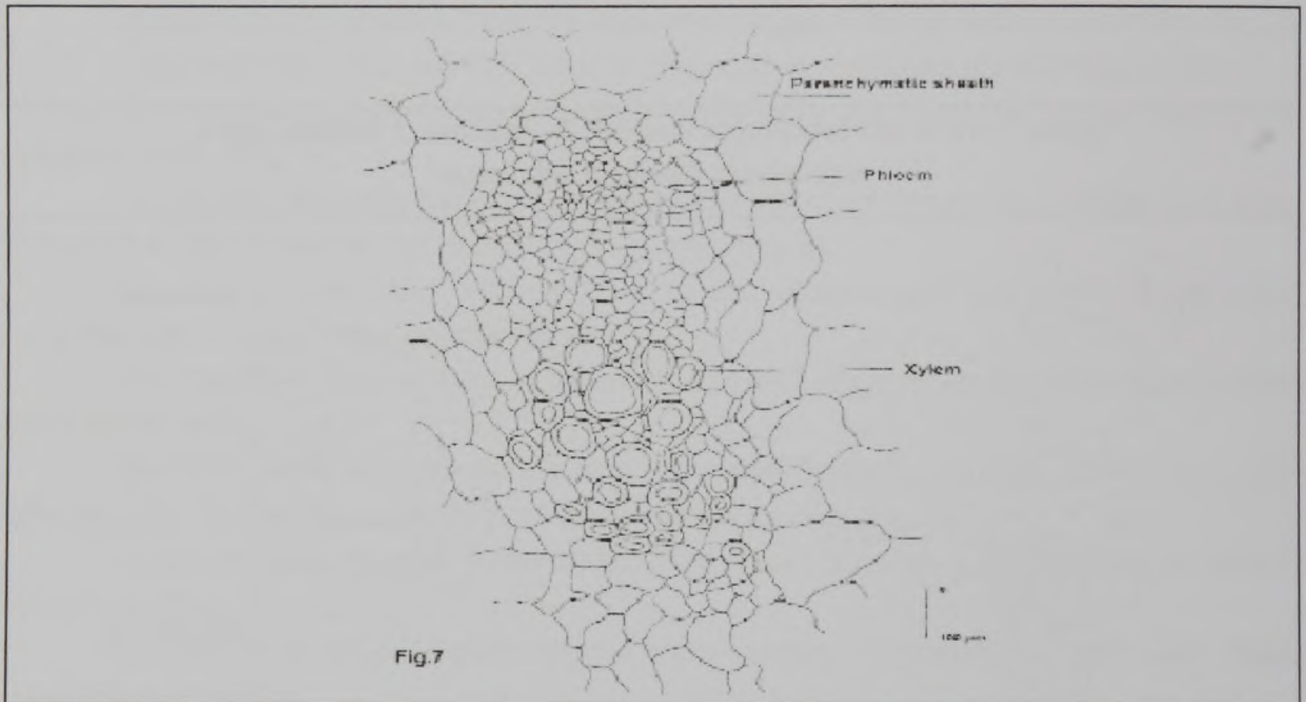


Figure 7 represents a cross section by one vascular bundle of the stem of *Basella alba* L.

### CÂTEVA CARACTERE ANATOMICE ALE SPECIEI *BASELLA ALBA*

**Rezumat:** *Basella alba* L. este o specie tropicală utilizată în gastronomie, aparținând familiei *Basellaceae*. Studiile de fiziologie și biochimie care urmăresc comportamentul acestei specii în condițiile de cultivare oferite de țara noastră, reprezintă tema de cercetare a unei teze de doctorat. Datorită lipsei de informații din literatura de specialitate despre anatomia acestei plante, a fost necesar un studiu care să urmărească evidențierea acestor caractere. *Basella alba* L. este o plantă de tip  $C_4$ .

**Cuvinte cheie:** caractere anatomice, structura rizomului, structura tulpinii aeriene, *Basella alba* L., *Basellaceae*