

Stem Anatomy of Two Genera of The Family Cucurbitaceae

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Abstract— The anatomy of the Cucurbitaceae family has attracted the attention of botanists. To understand the anatomy of this family, the anatomical diversity of two genera, *Luffa acutangula* and *Momordica charantia*, was investigated and their anatomical characters were studied.

The anatomical investigation revealed information about the type of vascular bundles, and arrangement of the tissues that determines the identity of that species.

Index Terms— Cucurbitaceae, Anatomy, Vascular bundles.

I. INTRODUCTION

Plant anatomy is a vast branch of biology; it helps to study internal characteristics of plants and helps to understand internal morphology. Plant anatomy also helps in taxonomy to identify particular species or genera. Nehemiah Grew is known as the father of plant anatomy, and Prof. P. Jayaraman is commonly considered the father of Indian plant anatomy.

The Cucurbitaceae is a remarkable plant family deserving attention because of their economic, aesthetic, medicinal, and botanical significance. This family includes about 100 genera and 850 species, belonging to class Dicotyledonae, subclass Polypetalous, series Thalami florae, and order Cucurbitales. The plants in this family are mainly tropical and subtropical in distribution.

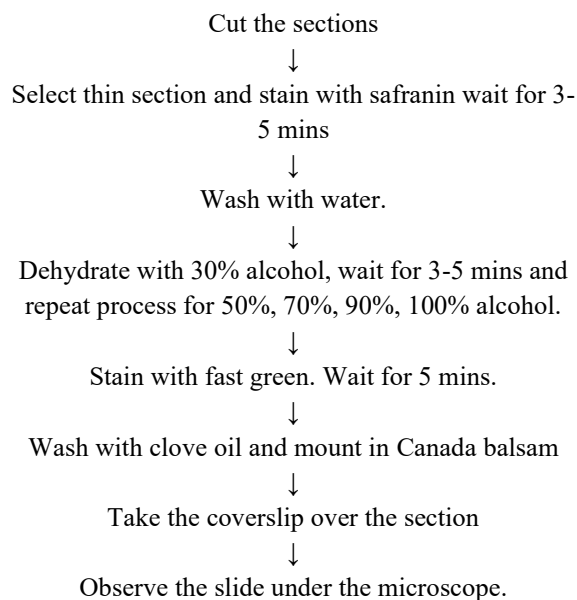
The Cucurbitaceae family includes plants that are herbaceous; these are mainly annuals or perennials. The leaves are mainly whole or are with deep lobes. They also have tendrils, which provide support to the plant.

II. MATERIALS AND METHODS

1. Collection of plants- Collection was done from Shirpur, Maharashtra.
2. Identification – The plants were identified using Flora.

Methodology-

- Requirements- Safranin, fast green, alcohol 30%, 50%, 70%, 90%, 100%, clove oil, canada balsam, slides, coverslips, blades, forceps, needle, microscope, etc.
- Procedure-



1. Description of *Luffa acutangula*

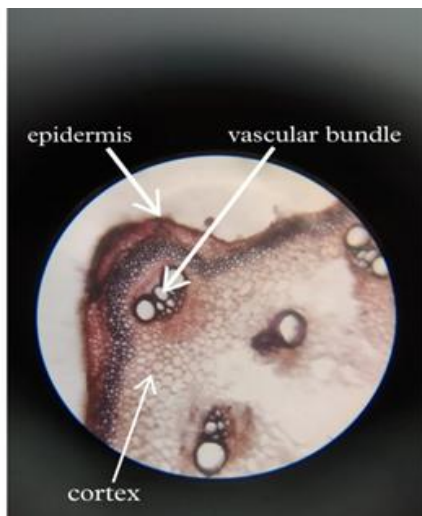
Luffa acutangula commonly known as Dodka in local language. It is widely cultivated in tropical and subtropical areas. The plant is mesophytic, succulent. The Leaves of this plant are simple, alternate and has tendrils for supporting the plant.

Anatomy Of Stem

The transverse section has oval wavy outline. Primary tissue has epidermis, cortex and stele. Epidermis is present, it has tightly packed cells, outer walls are cutinized. A small number of stomata are present across the epidermis. The middle cortex is

multilayered. The cells are oval and have prominent intercellular spaces.

Pericycle is multiseriate. There are two distinct rows of vascular bundles which are bicollateral. Vascular bundles are nine in numbers. These are endarch, conjoint, open. The phloem is made up of 4-6 layers. Xylem is formed of 3-5 layered. Pith is also present.



T.S. of Luffa acutangula stem

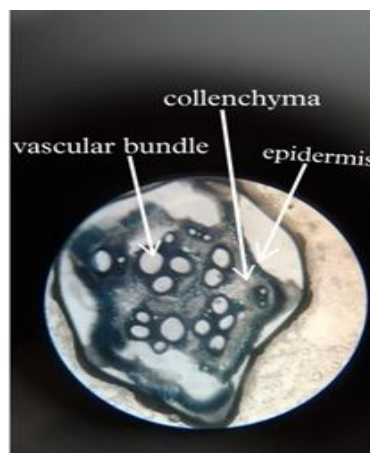
2. Description Of Momordica Charantia-

Momordica charantia is locally known as karla. It is categorized as a minor cucurbitaceous vegetable. It is cultivated in tropical and subtropical areas. It is cultivated for its edible fruit; the fruit is bitter in taste. Plant has hairs, succulent and have tendrils. Tap root system is present. Stem is aerial. The leaves are cordate.

Anatomy of stem-

Epidermis is single layered and have living cells. Outer borders of epidermis are cutinized. Cortex is thinner than the stele. The endodermis, middle cortex and hypodermis are visible in a section. Stele is thicker than the cortex. The pericycle is sclerenchyma tic, provides mechanical rigidity.

There are two rows of bicollateral vascular bundles. A total of 8 vascular bundles is observed. Each vascular bundle is conjoint, open, endarch. A hollow region in the middle of the stem is a diagnostic characteristic of Cucurbitaceae family.



T.S. of Momordica charantia stem

III. OBSERVATION TABLE

Table showing number of vascular bundle present in stem.

Anatomical features.	Luffa acutangula	Momordica charantia
1. No. Of vascular bundle in Stem	09	08
2. Vascular bundle arrangement	Bicollateral	Bicollateral
3. Pith characteristics	Present	Central hollow region

IV. CONCLUSION

Plant anatomy serves as an invaluable tool for distinguishing individual genera within the same family. This comparative study highlighted the specific anatomical variations in count of vascular bundles and structure of pith.

The foundation of this study is the idea that the anatomy of stem has been crucial in the identification, description of plants.

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