

# Petioler Anatomy of Some Species of Ficus (Moraceae)

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**Abstract:** *The present investigation was made on anatomy of petiole of Ficus krishnae C. DC, Ficus hispida linn and Ficus virens Ait. The aim was to contribute with more information concerning the knowledge of anatomy. All three species belongs to the family Moraceae, less reports were available on anatomical studies, hence present efforts were undertaken to investigate the microscopic studies. In this paper mainly included study of macroscopic characters and (microscopic) anatomical characters. Latex ducts, laticifers, tannin cells, crystals and trichomes were few main characters found in present investigation of petioler anatomy of Ficus krishnae C. DC, Ficus hispida linn and Ficus virens Ait.*

**Keywords:** *Ficus krishnae C. DC, Ficus hispida linn and Ficus virens Ait. Anatomy, Crystals, tannin cells etc*

## 1. Introduction

Anatomical characters are the important biomarker and would help in the identification and authentication of the selected plants species. *Ficus hispida* linn is large shrub or small tree, all parts of this plant are hispid (pubescent hairs), spreading branches with no aerial roots, medicinally all parts of plant are important. *Ficus krishnae* C. DC is large tree, worshiped in India various mythological stories are seen regarding the formation of cone-shaped leaves are associated with this species. *Ficus virens* Ait. is medium size tree, used traditionally for an inflammatory swellings, boils and wound healing purpose. Moraceae is one of the largest family of dicot and Ficus is the largest genus of the family, includes more than 1000 species, species of Ficus spread all over India which are economically important for fruits, timber, medicine etc. and having religious importance. Some species of Ficus shows significant development of aerial roots and they may start life as epiphytes. Genus Ficus includes shrubs, climbers, trees, stranglers, sometimes woody epiphytes, evergreen or deciduous, with latex.

## 2. Materials and Methods

The required material of three species of Ficus, *Ficus krishnae* C. DC, *Ficus hispida* Linn and *Ficus virens* Ait. was collected on June 2017, from different localities in Amravati and Akola at various river sides and garden. Species found near watery area like near valley, river side area.

Confirmation of species was made with standard floras. The required samples were cut and fixed in formalin solution; hand cut sectioning had been taken with the help of raiser. Permanent slides were prepared by double staining method. Under different magnifications of light microscope slides were studied, and detail microscopic features of each section of petiole of each species were noted. Photomicrography of slides had been taken in Department of Botany of Govt. Vidarbha Institute of Science And Humanities, Amravati, Maharashtra using trinocular research microscope and A.S.A. 200 film.

## 3. Result and Discussion

### 3.1 Morphology and Macroscopic Characters

#### *Ficus krishnae* C. DC

Medium size tree, solid, much branched, glabrous, dull whitish colour, leaf simple form pouch at base cupuliform (peculiar leaves), alternate, 10-20cm long and 5-10cm broad, leaflet like appendages on the petiole. Petiole 3-10 cm long, ovate lanceolate, entire, acute or bluntly acuminate, glabrous, reticulate unicostate venation, inflorescence hypanthodium.

#### *Ficus virens* Ait

Medium or large deciduous tree, often epiphytic when young, aerial, smooth, grey, leaf simple alternate, 7-15 cm long, 4-9 cm long broad, petiole 4-6 cm long stout, oblong ovate, ovate lanceolate, shortly acuminate, base rounded succordate, reticulate venation, inflorescence hypanthodium.

#### *Ficus hispida* Linn.

Large shrub or small tree, no aerial root found, stem with hollow internodes, rough surface, grey colour, leaf simple alternate, 10-30cm long 5-10 cm wide, petiole 1-4 cm long hispid densely, stipule two to each leaf ovate, lanceolate, 1 cm long pubescent outside, elliptic-ovate, oblong, obovate, entire or toothed, acute, acuminate or cuspidate, upper surface hispid scabrid and lower surface pubescent, base cuneate rounded subcordate, reticulate, inflorescence hypanthodium.

### 3.2 Microscopic Study

#### T. S. of Petiole of *Ficus hispida* Linn. –

Nonglandular trichomes observed, average  $93.9 \times 13.7 \mu\text{m}$  and range  $69-118.8 \times 9.0-18.4 \mu\text{m}$ . Epidermis well distinct with single layered small compact rounded to rectangular cells, average  $3.65 \times 7.33 \mu\text{m}$  and range  $3.15-4.16 \mu\text{m} \times 4.55-10.11 \mu\text{m}$ . Hypodermis with collenchyma 6-7 layered, average  $3.65 \times 3.20 \mu\text{m}$  and range  $3.30-4.00 \times 3.00-3.40 \mu\text{m}$ . Below that parenchyma form cortex, phloem, average  $3.10 \times 2.51 \mu\text{m}$  and range  $2.90-3.30 \times 2.22-2.80 \mu\text{m}$ . xylem, average  $10.25 \times 7.75 \mu\text{m}$  and range  $5.50-15.00 \times 5.0-10.50 \mu\text{m}$ . Vascular bundles form nearly heart shaped

structure, laticifers abundant in phloem. Central ground tissue (pith) with some phloem patches, phloem tissue was surrounded by fibres. Conjoint, bicollateral type. Crystals present.

#### T. S. of Petiole *Ficus krishnae* C. DC-

Trichomes unicellular nonglandular observed, average 22.1×19.3 µm and range 21.1-23.1×15.1-23.5 µm. Thick cuticle, epidermis with single layered papillose cells, Average 3.625×3.155µm and range 3.14-4.11×2.10-4.21µm. Collenchyma 7-8 layered, average 3.87 ×3.39µm and range 3.33-4.41×3.31-3.47µm. A large and many small vascular bundles noted, phloem, average 2.965×2.515µm and range 2.22-3.71×2.22-2.81µm. xylem, average 8.455×7.165µm range 4.41-12.5×4.22-10.11µm. some phloem patches surrounded by conjunctive tissues at centre. Crystals, idioblast, prism, tannin cells, latex cells and laticifers present abundantly to all over. Laticifers noted specially at phloem region.

#### T. S. of Petiole *Ficus virens* Ait. –

Trichomes nonglandular, average 97.5×18.8 µm and range 70-125×13.4-24µm. Moderate thick cuticle, epidermis single layered of papillose cells, average 3.66×4.17µm and range 3.11-4.21×4.15-4.19µm. Collenchyma 6-9 layered, average 3.63×4.86µm and range 3.11-4.15×4.61-5.11µm. Cortex average 9.34×7.76µm and range 8.17-10.51×6.71-8.81µm. in vascular region phloem, average 2.555 ×3.25µm and range 2.22-2.89×2.91-3.14µm and xylem, average 9.49×8.425µm and range 8.19-10.79×6.66-10.19µm. and pith was filled with granules, tannin cells, latex cells, crystals. Vascular bundle form ring like structure, laticifers abundant in phloem region. Pith with intraxylary phloem patches surrounded by fibres. Conjoint, bicollateral type.

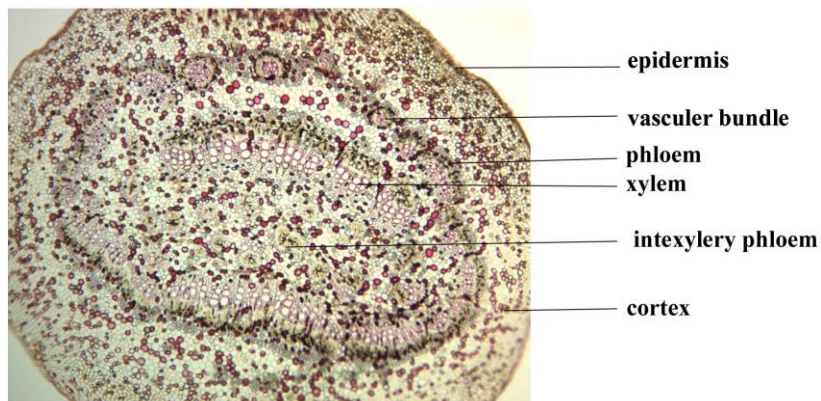
## 4. Conclusion

In present study, detail anatomical information of petiole of three species of *Ficus* is given, which will be very useful for researchers and students of anatomy. Laticifers, tannin cells, crystals were very common in all microscopic structures of petiole. Trichomes were glandular and unicellular type noted.

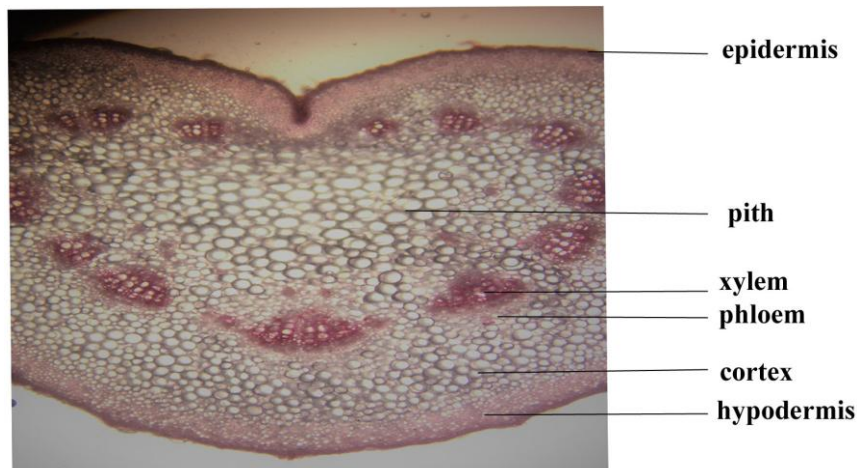
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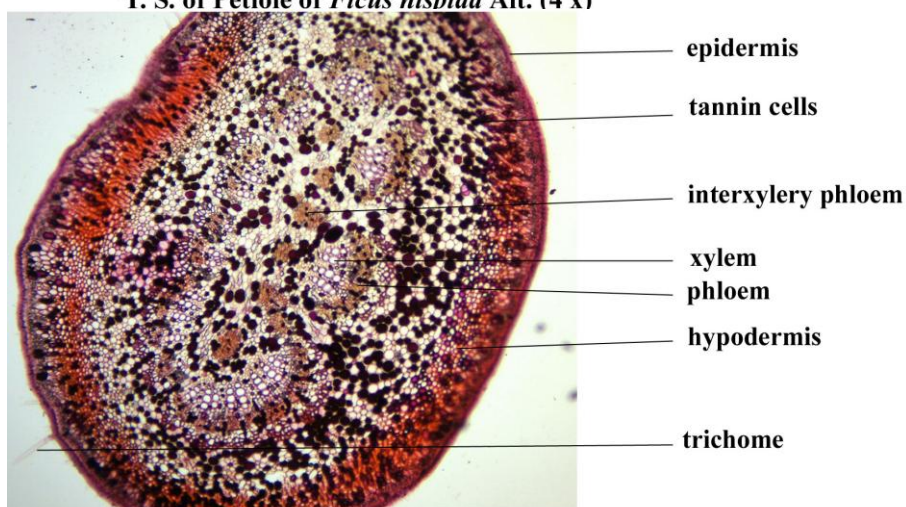
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T. S. of Petiole of *Ficus krishnae* C. DC (4 x)



T. S. of Petiole of *Ficus hispida* Ait. (4 x)



T. S. of Petiole of *Ficus virens* Linn (4 x)