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MICROSCOPY OF TAMARIND SEEDS

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ABSTRACT

In this study, we are reporting anatomical features of seeds of *Tamarindus indica Linn*. The transverse sections of these seeds are differentiated into two layers outermost is sclerotesta and inner one is sarcotesta. There are two cotyledons which comprise outer layer of smaller square shaped epidermal cells. The ground tissue consists of homogenous, circular, highly thick walled parenchyma cells. Hope, these will surely be useful to global researchers in preparation of pharmacopoeial standards.

Keywords: Microscopical Characteristics, *Tamarindus indica* Linn, Anatomical features

INTRODUCTION

Tamarindus indica Linn. belonging to Caesalpiniaceae subfamily is commonly identified and known as Chincha in Ayurveda system of medicine **[1]**. Its fruit, tender leaves and flowers are used extensively in culinary and medicinal preparations. It's a large wide spreading tree 12 to 18 meters high. The trunk with dark

rough bark has deep cracks; leaves 5 to 12.5cm long, leaflets sub sessile, 10 to 20 pairs; flowers in lax few flowered racemes, petals 3, yellowish with pink stripes; pods pendulous, 7.5 to 20 cm long, slightly curved, sub compressed; seeds smooth, reddish brown, enveloped by tough leathery membrane **[2]**. The study was designed to study microscopy of the Tamarind Seeds.

MATERIALS AND METHODS

Plant Material and Authentication

Tamarindus indica Linn. seeds were collected from Malshej Hills of Pune District of Maharashtra, India. Authentication of collected plant material was carried out at Botanical Survey of India, Western Regional office, Koregaon Park, Pune. Voucher Specimen (BSI/WRC/Tech/2010/409 HLT2) was deposited for future reference **[3]**.

Microscopic Evaluation

Transverse sections (T.S.) of soaked *Tamarindus indica Linn.* seeds were taken using microtome. Seeds were soaked in water to revive the material and when ready fixed in FAA (Formaldehyde Alcohol Acetic Acid, 10%:50%:5% + 35% water) and sectioned using rotary microtome. Sections were stained by using toluidine blue solution (0.05% w/v) and then mounted on slide with Canada balsam brush **[4]**. T. S. were observed under Photographic Microscopes at Plant Anatomy Research Center, Tamil Nadu under Normal and Polarized Lights. Transverse Sections of seeds were studied for different microscopic characters.

Photographs of all microscopic characters were captured, printed, labeled and stored for further referencing **[5]**.

RESULTS AND DISCUSSION

Structure of the Seeds

The seed coat measures about 390µm thick. It is differentiated into outermost region of sclerotesta and inner sarcotesta. The outer sclerotesta includes two types of cells, the outermost part is made up of narrowly cylindrical compact, palisade like macro sclereids. The cell wall are thick and lignified and cell lumen is very narrow. Inner to the palisade zone is narrow layer of osteosclereids. The cells of osteosclereids are narrow in the middle and dilated at the ends resembling bone or dumbbell. The sarcotesta is homogenous and parenchymatous. The cells are wide, angular, thin walled and compact. Inner to the seed coat is seen the cotyledons. **(Figure 1.1 and 1.2)**.

There are two cotyledons which comprise outer layer of smaller square shaped epidermal cells. The ground tissue consists of homogenous, circular, highly thick walled parenchyma cells. The cells have highly thick walls with numerous simple pits. Within the

cells are seen dark amorphous cell inclusions. Vascular strands are seen ramifying throughout the cells of cotyledons **(Figure 2.1, 2.2 and 2.3)**.

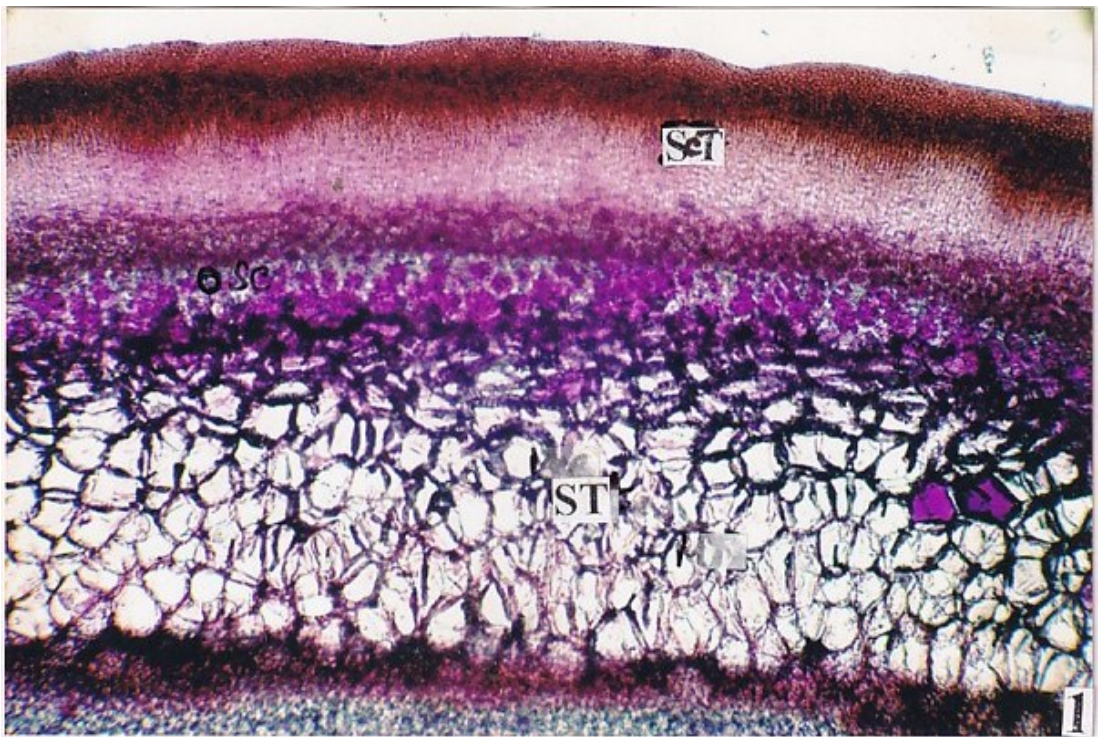

Figure 1.1: T. S. of Seed Coat Stained with Safranin

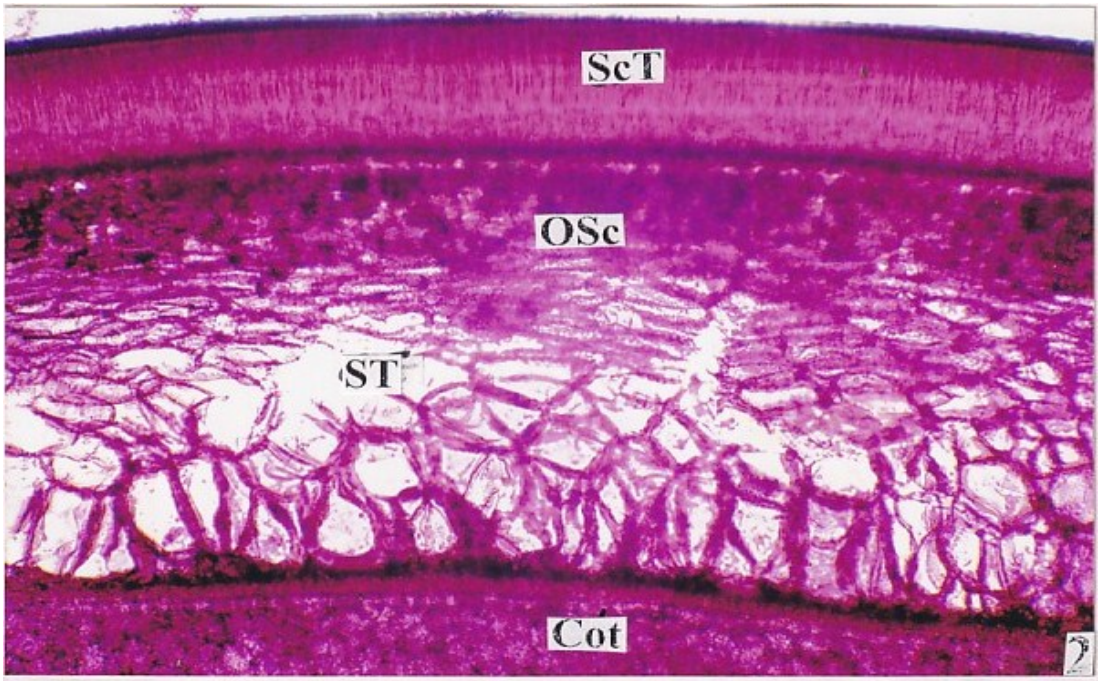

Figure 1.2: T. S. of Seed Coat Stained with Sudan Red
(Cot – Cotyledon, Osc – Osteosclereid, ScT – Sclerotesta, ST – Sarcotesta)

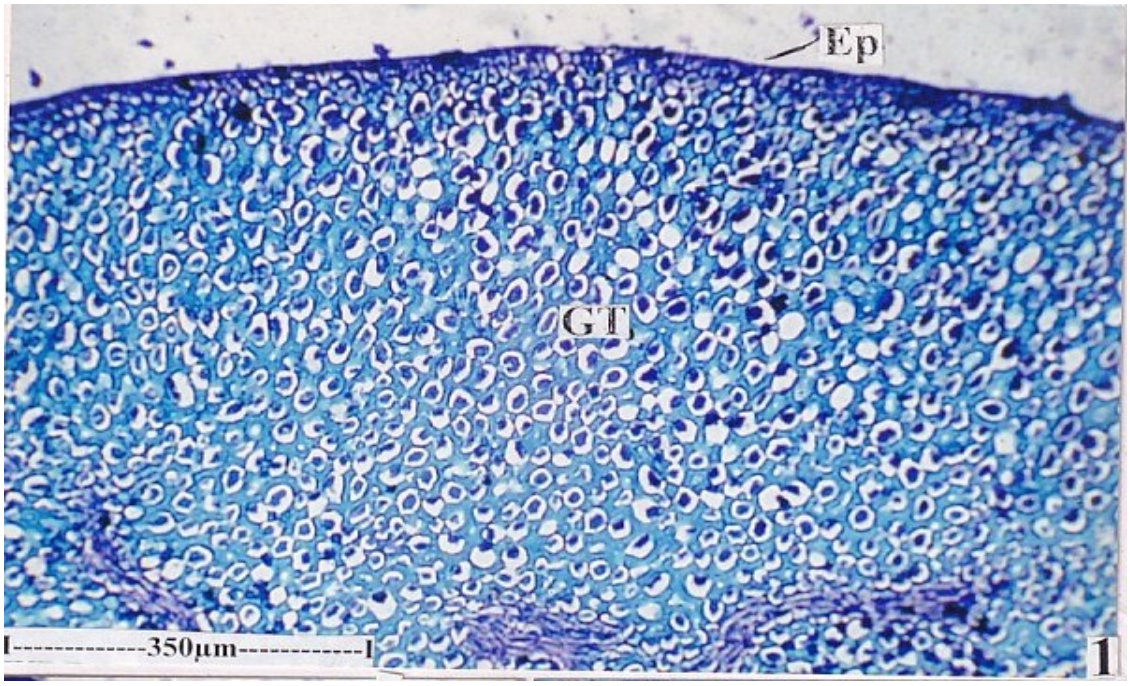

Figure 2.1: T. S. of Cotyledon

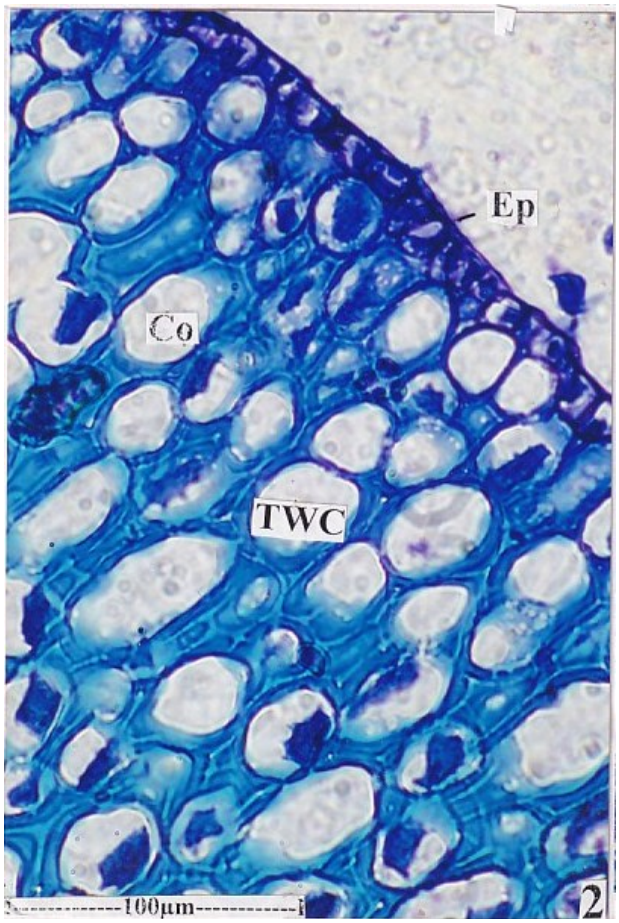

Figure 2.2: T. S. of Cotyledon – A Sector Enlarged

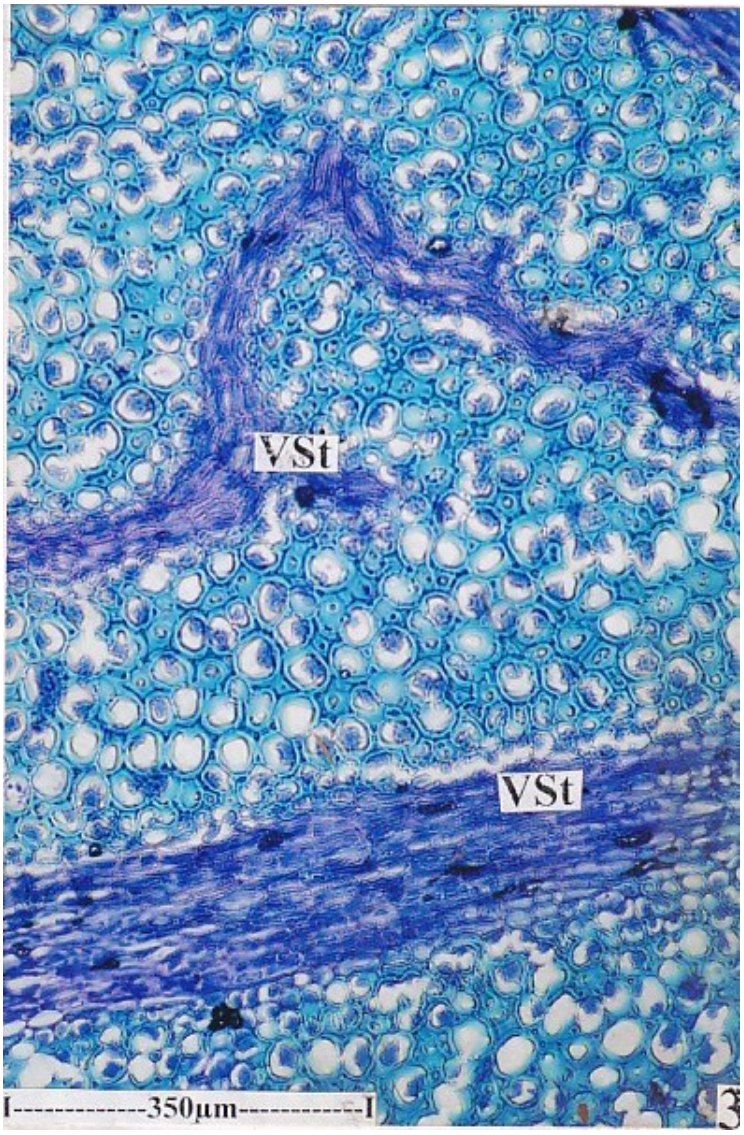

Figure 2.3: Vascular Strands of the Cotyledon
(Co – Cortex, Ep – Epidermis, GT – Ground Tissue, Vst – Vascular Strand, Twc – Thick Walled Cells)

CONCLUSION

Microscopic characteristics of *Tamarindus indica Linn.* seeds were successfully determined and reported for the first time. The parameters determined in present study will also be useful for establishing the pharmacopoeia standards for *Tamarindus indica Linn.*

Source of Funding

None

Conflict of Interest

None

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