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PHARMACOGNOSTICAL STUDY ON THE LEAVES OF *MERREMIA EMARGINATUS*

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ABSTRACT

Many unknown and lesser known plants are used in folk and tribal medicinal practices as a source of medicine. All the medicinal plants are not brought into the light of scientific world. One such plant is *Merremia emarginata* which has been used as analgesic, hypoglycemic, diuretic and as purgative in the traditional system of medicine. Keeping this in view, an attempt was made to study the leaves of the plant *Merremia emarginata* by evaluating it Pharmacognostically to identify its structure which may be useful in the future for the plant identification and standardization.

Keywords: *Merremia emarginata*, Lamina & Vascular bundle.

INTRODUCTION

Merremia emarginata commonly known as Mouse ear wort in English & Elikkadhu keerai in tamil belonging to the family Convolvulaceae is found commonly in Africa & Asia [1]. It grows normally in open grasslands and in waste places at low altitude. The plant was found to contain flavonoids, tannins, amino acids, carbohydrates, alkaloids and some specific lipids. The folklore claims revealed that the plat was used to treat Inflammation, headache, cough, rheumatism, diuretic and also as purgative [2]. The literature review revealed that the Pharmacognostical study of the leaf has not yet been evaluated. Hence we had taken the chance to evaluate the Pharmacognostical characters of the leaf of *Merremia emarginata.*

MATERIALS AND METHODS

1. Anatomical Studies

The Plant specimen for the proposed study was collected from Valayampattu, Villupuram, Tamil Nadu. It was identified and authenticated by Dr. P. Jayaraman, Director, Plant Anatomy Research Center, (PARC) Tambaram, Chennai.

Staining

The leaf of the plant *Merremia emarginata* was cut and fixed in FAE (Formalin - 5 ml+ Acetic acid – 5 ml + 70 % Ethyl alcohol – 90 ml). After 24 hrs of fixing, the specimens were dehydrated with graded series of tertiary – butyl alcohol.

Infiltration of the specimens was carried by gradual addition of paraffin wax (melting point 58-60 ° c) until TBA solution attained super saturation. The specimens were cast into paraffin blocks [3].

Sectioning

The paraffin embedded specimens were sectioned with the help of Rotary Microtome. The thickness of the section was 10-12 µm. De waxing of the sections was by customary procedure [4]. The sections were stained with toluidine blue, since toluidine blue is a polychromatic stain [5].The staining results were remarkably good and some phytochemical reactions were also obtained. The dye rendered pink color to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies etc. Wherever necessary, sections were also stained with Safranin and fast

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green and IKI (for starch). Powdered materials were cleared with NaOH and mounted in glycerin medium after staining. Different cell component were studied and measured.

Photomicrographs

Microscopic descriptions of tissues are supplemented with micrographs wherever necessary. Photographs of different magnifications were taken with Nikon Lab photo 2 Microscopic Unit. For normal observation, bright field was used. For the study of crystals, starch grains and lignified cells, polarized light was employed. Since these structures have birefringent property, under polarized light they appear bright against dark background. Magnifications of the figures are indicated by the scale-bars. Descriptive terms of the anatomical features are as given in the standard anatomy books [6].

RESULTS AND DISCUSSION

Anatomy of the leaf

The leaf is flat or slightly folded adaxially along the midrib. The leaf dorsi-ventral with thick midrib and smooth &even lamina (fig.1.1).The midrib is flat on the adaxial side and broadly conical on the adaxial side. It is 600 micrometer thick and 500micrometer wide. The epidermal layer consists of semicircular, thin walled cells with thick cuticle on the flat outer tangential wall. The ground tissue of the midrib includes circular, thin walled, less compact parenchyma cells. The vascular system consists of a single bowl shaped, bicollateral, vascular bundle (fig 1.2).The vascular bundle consists of 7 to 10 long &compact, xylem elements which are angular, wide and thick walled (fig 1.3). Phloem elements occur both on the adaxial and abaxial ends of the xylem strand. The adaxial phloem includes small groups of 2 or 3 phloem elements and larger groups of abaxial phloem elements (fig 1.3.).The xylem elements are 15 micrometer wide.

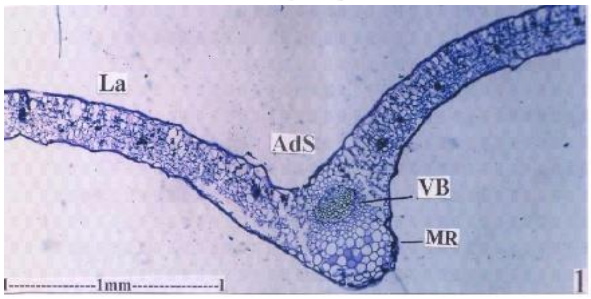
Lamina

Lamina is flat on the adaxial side and slightly uneven on the abaxialside.It is dorsi-ventral and hypo - stomatic. The lamina is 300 micrometer thick. The mesophyll is differentiated into wide adaxial zone of 2 layers of columnar palisade cells.The palisade zone is 150 micrometer thick.The spongy parenchyma consists of 6or7 layers of small, loosely arranged parenchyma cells.The stomata on the abaxial epidermis are slightly raised above the surface of the epidermis [fig 1.4 & 1.5]

Leaf margin

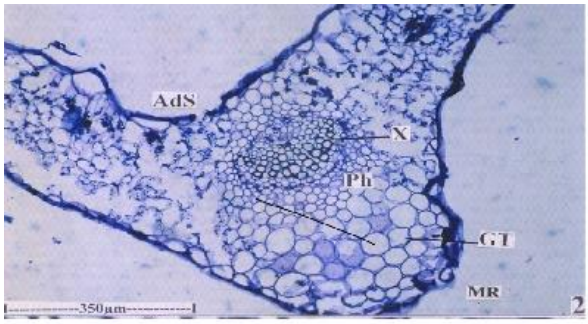
The marginal part of the lamina is widely conical measuring 100 to 150micrometer thick. The epidermal cells of the marginal part are thicker with prominent cuticle. The mesophyll tissue becomes more compact without intercellularspaces in the marginal Part [fig 1.6].

FIG 1.1 T.S OF LEAF THROUGH LAMINA AND MIDRIB



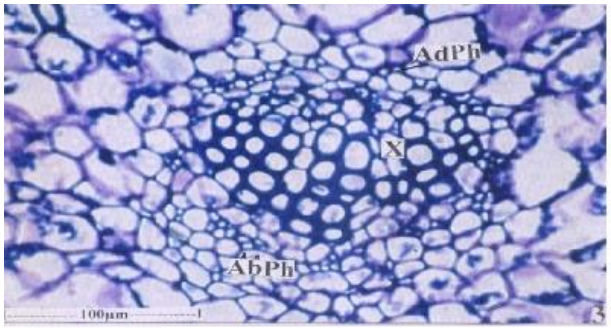
(La-Lamina, VB-Vascular bundle, MR-Margin, AdS-Adaxial side)

FIG.1.2 T.S OF MIDRIB –ENLARGED



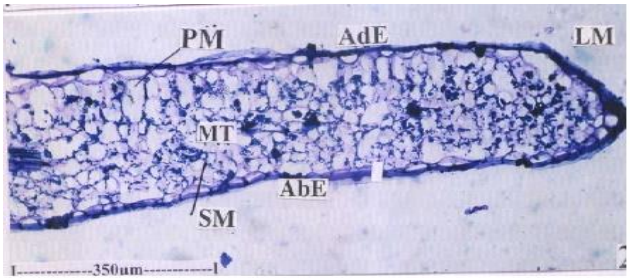
(Ads-Adaxial side, X-Xylem, Ph-phloem, MR-Midrib, GT-Growth tissue)

FIG.1.3 MIDRIB VASCULAR BUNDLE-ENLARGED



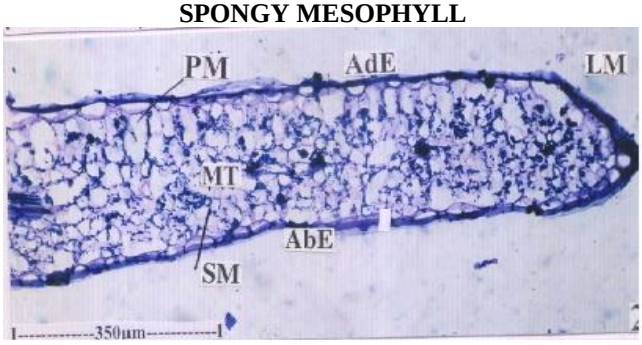
(AdPh-Adaxial phloem, X-Xylem)

FIG.1.4 T.S OF LEAF THROUGH LAMINA



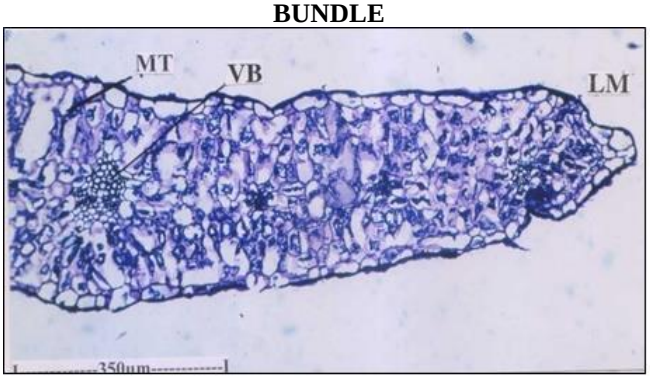
(PM-Palisade Mesophyll, AdE-Adaxial Epidermis, AbE-Abaxial Epidermis, LM-Leaf Margin, SM-Spongy Mesophyll, MT-Mesophyll Tissue)

FIG.1.5.T.S OF PALISADE MESOPHYLL AND SPONGY MESOPHYLL



(PM-Palisade Mesophyll, AdE-Adaxial Epidermis, LM-Leaf Margin, MT-Mesophyll Tissue, AbE-Abaxial Epidermis, SM-Spongy Mesophyll)

FIG.1.6.T.S OF LEAF MARGIN AND VASCULAR BUNDLE



(LM-Leaf Margin, MT-Mesophyll Tissue & VB-Vascular Bundle)

CONCLUSION

This dissertation work covers an extensive study on the leaf of *Merremia emarginata* Pharmacognostic parameters had been determined for the leaf of this plant in order to substantiate and identity the plant for future work to maintain the quality and purity of the medicinal plant.

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