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PHARMACOGNOSTICAL AND PRELIMINARY PHYTOCHEMICAL STUDIES ON THE LEAVES OF *DESMODIUM LONGIPES* (C.) SCHINDL

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ABSTRACT

In the present study, the macroscopic and microscopic characters along with certain physico chemical characters of the leaf of the plant were evaluated. Such findings will be useful for the proper authentication of the herb for future research works.

KEYWORDS: *Desmodium longipes*, Macroscopy, Microscopy, Physico-Chemical Standards.

INTRODUCTION

The primitive man used herbs as therapeutic agents and medicaments, which they were able to collect easily. Nature has provided abundant resource of plants, which possess medicinal values for all living creatures. The essential values of some plants have long been published but a large number of them remain unexplored as yet.

Desmodium longipes (C) Schindl is an evergreen shrub possess varied medicinal property. It is traditionally used for the treatment of cancer, bodily discomfort, Diabetes, cyst in stomach, pile, fistula, fibroid.

MATERIALS AND METHODS

Plant material

The fresh leaves of the plant *Desmodium longipes* were collected from Joy Garden of Mannuthy, Thrissur district, Kerala during August 2022. The botanical identity of the was confirmed by Dr. Sreeja P, M.Sc. Ph.D., PG Department of Botany& Research Centre, Sir Syed college, Thaliparamba, Kannur, Kerala. A voucher specimen bearing specimen number 9945 has also been deposited in the department.

Macroscopic studies were carried out using the organoleptic evaluation method. The shape, size, colour, odor, taste, texture, margin apex, venation, arrangement of leaves of the plants were observed. Macroscopic and microscopic characters were studied as described in the quality control method.[1,2]

Microscopic studies of the leaf were carried out by preparing thin sections of the same. The thin sections were washed with water, stained with safranin dye, mounted using glycerin on a glass slide and observed through microscope under both 10x and 40x resolution. Photomicrographs of the sections were taken with the help of Mag Cam Microscope.[1,2] Ash content of the crude drug is generally, the residue remaining after complete incineration. It represents the inorganic salts naturally occurring in the drug and adhering to it, but it may also include inorganic matter added for the purpose of adulteration. Total ash is the residue remaining after incineration. Acid insoluble ash is the part of the total ash, which is insoluble in dilute hydrochloric acid. Water-soluble ash is the part of total ash, which is soluble in hot water.[3,4,5] Detailed alcohol and water-soluble extractive value, loss on drying and preliminary phytochemical screening has also been carried out.[1,2]

RESULTS

Macroscopic Studies

The macroscopical evaluation reveals the colour and type of leaves, arrangement, venation. Colour of the leaf is green with velvet smooth upper surface and densely brown hairy lower surface and the type is simple, non-palm, trifoliate-end leaflet blade is oblong, lateral ones obliquely ovate. The leaves are having alternative arrangement with pinnate venation and entire margin.

Figure 1: Morphology leaf of *Desmodium longipes.*

Microscopic Studies

The Transverse section of the leaf shows a bifacial structure. In the lamina portion of the transverse section, we can find the following tissues.

Upper epidermis: - Single layered, rectangular cells and we can find numerous unicellular covering trichomes.

Mesophyll: - It is divided in to palisade and spongy parenchyma cells.

Lower epidermis: - Being a bifacial leaf structure, the lower epidermis is identical to upper epidermis.

In the Mid region of the transverse section, we can find Bicollateral vascular bundles means xylem lies in the centre with phloem on either side of the xylem along the same radius.

Figure 2: Transverse section of leaf (10X).

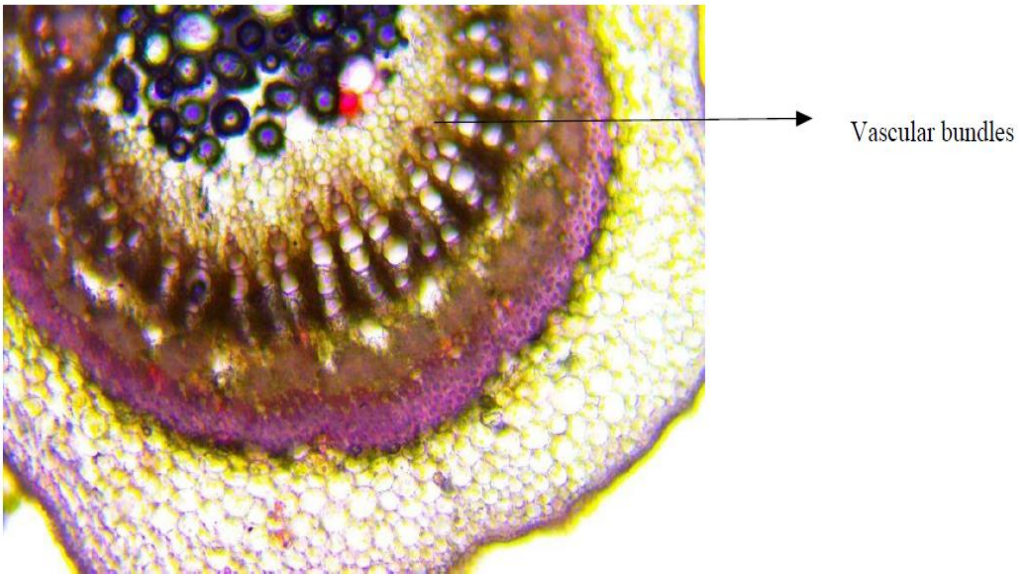

Figure 3: Transverse section of leaf (40X).

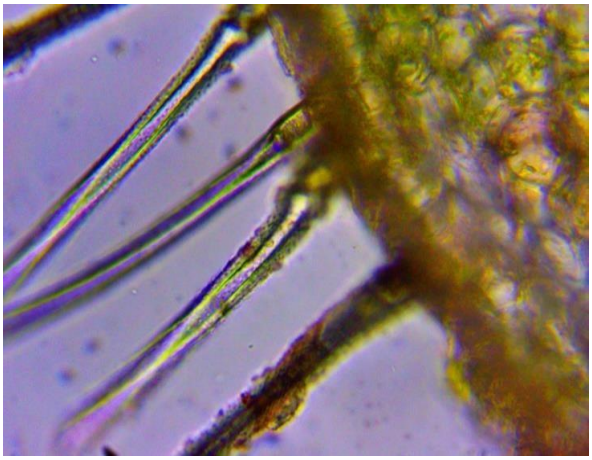

Figure 4: TS showing trichomes.

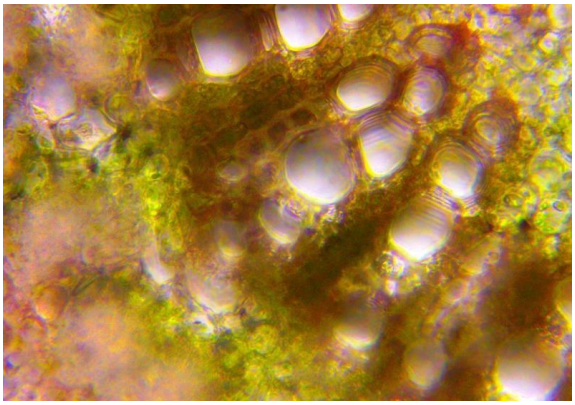

Figure 5: TS showing vascular bundles and its surrounding cells.

The Transverse section (TS) of the leaf shows a bifacial structure.

In the Lamina portion of the Transverse section, we can find the following tissues.

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In the Mid region of the transverse section, we can find Bicollateral vascular bundles means xylem lies in the centre with phloem on either side of the xylem along the same radius.

Powder Microscopy

In Powder microscopy we could find many covering trichomes, which is expected to be the most prominent identification character of this particular plant species.

The trichomes observed, they are covering trichomes which are protective in function, they are having the features like; many in number, unicellular with blunt apex and warty border.

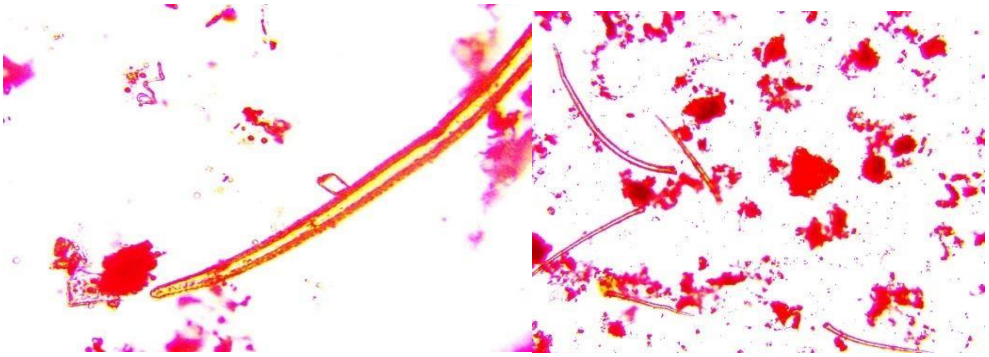

Figure 6: Powder microscopy of the leaf of *Desmodium longipes.*

Physicochemical constants

Table 1: Physicochemical evaluation of *Desmodium longipes.*

Parameter	Value(%W/W)
Ash value	
Total Ash	13.86
Water Soluble Ash	8.50
Acid Insoluble Ash	2.95
Extractive value	
Water soluble extractive value	12.35
Alcohol soluble extractive value	14.5
Moisture content	
Loss on drying	1.57

Table 2: Qualitative preliminary phytochemical screening of *Desmodium longipes.*

Phyto-constituents	Test performed	Results
Carbohydrates	Molisch's test	+
	Benedict's test	+
Alkaloids	Hager's test	+
	Wagner's test	+
Phenolic Compounds	Ferric chloride test	+
Tannins	Gelatin test	+

DISCUSSION

Microscopy and Microscopy of plants is crucial for several reasons. It allows for the study of plant cells, tissues, and structures, providing insights into their

organization, function and development. Microscopy of plants helps in identifying plant diseases, pests and abnormalities at cellular level aiding in timely intervention and management. Microscopic studies are also essential for botanical research, helping scientists to understand plant anatomy, which is crucial for breeding and genetic studies. Microscopy is used in industries such as agriculture and food to ensure the quality and authenticity of plant-based products. Microscopy assists in studying the effects of environmental factors on plant growth and health, aiding in conservation and sustainability efforts. Over all, microscopy of plant is indispensable for various fields, from basic research to agriculture and environmental science, contributing significantly to our understanding of plant life.

Physico chemical standards play a role in ensuring the quality, safety and efficacy of plant-based products, benefiting both consumers and industries. These standards also provide a basis for comparing different plant samples, facilitating research on plant properties, and supporting the development of new products or formulations.

Preliminary phytochemical screening is important because it helps in the initial assessment of the bioactive compounds present in the plants. It helps in the identification of bioactive compounds, in drug discovery and development, in quality control. It is also having ecological significance and economic importance.

Conflict of interest: Nil

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