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PHARMACOGNOSTICAL, PHYTOCHEMICAL STUDIES OF THE LEAVES OF *MILLINGTONIA HORTENSIS* LINN.

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ABSTRACT
The plant *Millingtonia hortensis* is an ornamental plant mainly found in south India and which is used in various disease conditions like antioxidant, anti-inflammatory, antibacterial, etc. The present study includes the pharmacognostical studies Transverse section, Powder microscopy, physicochemical studies were carried out. Phytochemical studies were carried out by successive solvent extraction and the chemical test shows the presence of carbohydrates, alkaloids, flavanoids, etc.

KEYWORDS: *Millingtonia hortensis*, Pharmacognostical study, Phytochemical study.

1. INTRODUCTION

Millingtonia hortensis Linn is commonly known as the Indian cork tree or tree jasmine which is commonly found in southern Asia and belongs to the family Bignoniaceae. The plant has fragrant flowers so it is used as an ornamental plant in gardens and avenues. The plant parts are used as antimicrobial, anthelmintic, hepatoprotective, antioxidant, etc. The leaves of *Millingtonia hortensis* contain flavanoids, polyphenolic compounds, alkaloids, etc.[1] The methanolic extract of the leaves shows the antioxidant as well as antibacterial activity against micrococcus luteus.In this study, we perform the pharmacognostic and phytochemical studies of the leaves of *Millingtonia hortensis* Linn. [2]

2. MATERIALS AND METHODS

2.1 Plant collection and authentication

The herbarium specimen of *Millingtonia hortensis* were prepared by pressed and processed following standard practices[3] and which is authenticated by Dr.Abdussalam Assistant professor, Department of Botany, Sir Syed College, Taliparamba. The specimen voucher number were provided accordingly.

The plant was collected from the medicinal garden of Kottakkal Aryavaidyasala, Malappuram district. The collected plant was dried under shade at room temperature. Dried leaf materials were powdered and sieved at mesh size 40. Stored in polythene containers at room temperature. The powder was used for further pharmacognostic, phytochemical, and in-vitro studies.

2.2 Pharmacognostical studies

2.2.1 Macroscopic evaluation

Macroscopical studies of the leaves of *Millingtonia hortensis* were examined and described. by the evaluation of external characters like color, taste, odor, surface, Phyllotaxy.

2.2.2 Microscopical studies

A transverse section of the leaves was carried out. The leaf section was taken by cutting the midrib portion and the leaf was boiled in chloral hydrate solution and stained with phloroglucinol and Hcl and which are observed through a microscope at 10X.[4,5]

Powder microscopy was carried out with the leaf powder, stained with phloroglucinol and Hcl, observed through a microscope at 40X.

2.2.3 Physicochemical evaluation

Physiochemical properties like ash value, extractive value, moisture content(loss on drying), foaming index, swelling index, mucilage content, etc are carried out according to the procedure.[4]

2.2.4 Phytochemical studies

Preliminary phytochemical analysis was carried out by successive solvent extraction, Solvents are used according to the polarity petroleum ether, chloroform, ethyl acetate, ethanol.[6]

Phytochemical analysis of different extracts of *Millingtonia hortensis* was carried out by qualitative chemical test.[7]

3. RESULTS AND DISCUSSION

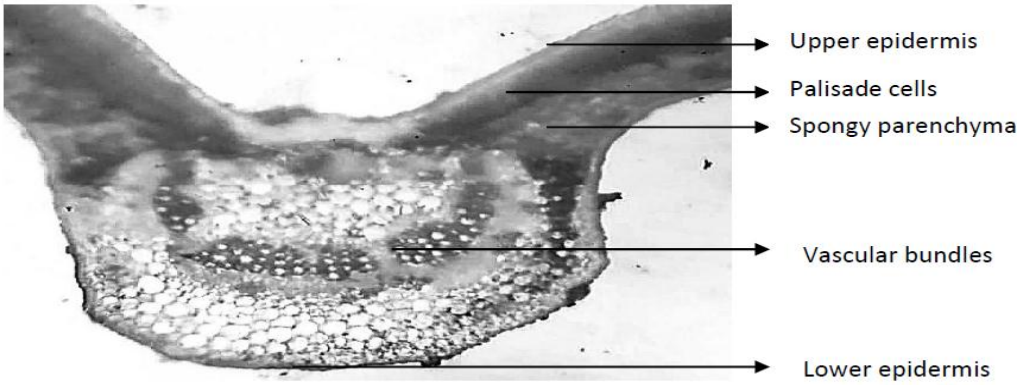
3.1 Macroscopic evaluation

The result of macroscopical evaluation reveals the color and type of leaves Table 1.Organoleptic analysis of *Millingtonia hortensis* leaves.

Colour	Surface	Phyllotaxy	Type	Margin	Venation
Dark green	Glabrous	Compound	Deltoid	Serrated	Reticulate

3.2 Microscopic evaluation

Various microscopical characters were studied for *Millingtonia hortensis* leaves. Fig 1: Transverse section of *Millingtonia hortensis* leaves.



3.2.1 Epidermis

The transverse section of the leaf shows a typical dorsoventrally structure. Epidermis of both the structure is single-layered. Epidermal cells are rectangular and covered externally with a cuticle. The upper epidermal cells are slightly bigger than the lower. The epidermal cell size is varying considerably being sometimes more or less isodiameteric and sometimes roughly rectangular and irregular in shape, lobed and somewhat papillose cells were wavy in contour with U-shaped undulations. The leaves were amphistomtatous with a lesser number of stomata on the dorsal surface. Stomata are anomocytic oval to wide elliptical. The leaf was characterized with peculiar cuticular striation running parallel to each other and occasionally twined as the rope. Striations were generally confined within the perimeter of an epidermal cell but sometimes passing over several cells[8]

3.2.2 Mesophyll

The mesophyll is differentiated into two layers, viz. palisade tissue and spongy tissue.

3.2.2.1Palisade

Palisade tissue is two rows of the elongated chloroplast.

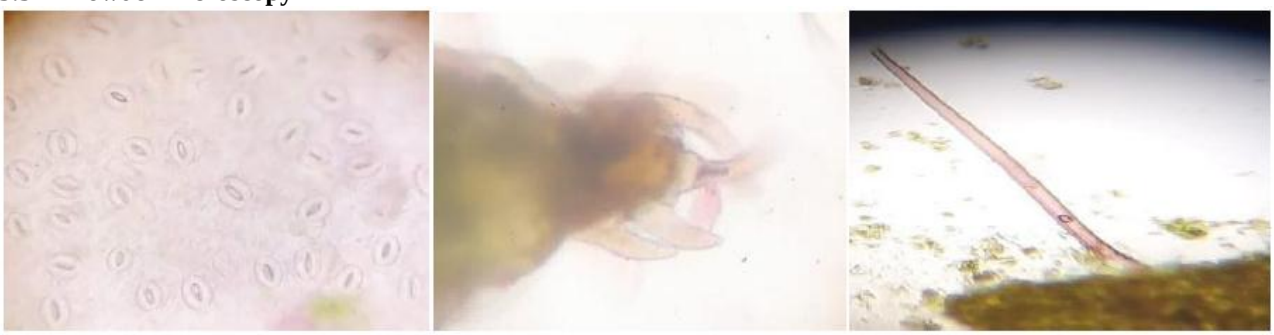
3.2.2.2Spongy tissue

Spongy parenchyma cells are loosely arranged with intercellular spaces on the lower side. The midrib portion has bulged towards the adaxial side of the leaf.

3.2.3 Vascular bundles- are numerous

The vascular bundles are surrounded by the parenchymatous bundle sheath. The xylem is characterized by the presence of small vessels, tracheids, and fibers. The xylem lies towards the upper epidermis and the phloem lies below the xylem i.e. towards the lower epidermis.

3.3 Powder microscopy



a)Anomocytic stomata. b)Apex with non-glandular trichomes. c)Trichome d&e) Vessel elements. f)Epidermal cells.

Fig. 2: Powder microscopy of *Millingtonia hortensis* leaves.

Stomata of *Millingtonia hortensis* is anomocytic i.e. oval to wide elliptical shape.[9] Both glandular and non-glandular trichomes are found in Millingtonia hortensis and the leaf surface mainly contains glandular trichomes.[10]

3.4 Physiochemical characters

The physiochemical characters were analyzed according to the standard protocols.[4] Moisture content of the leaves of the plant should be within the acceptable limit.[11] Ash values are indicative of the purity of the powder and also an indication of the presence of foreign matter.[12] The material remaining after ignition is the total ash value.[13] Water soluble ash value is a measure of already extracted material.[14] Acid insoluble ash value is the amount of silicaceous matter present.[13] Details of Physiochemical properties were present in table 2.

Table 2: Physiochemical evaluation of *Millingtonia hortensis.*

Parameter	Value(%w/w)
Moisture content	5
Total ash	16.5
Acid insoluble ash	3.25
Water soluble ash	2
Sulphated ash	7.5
Nitrated ash	6.4
Water soluble extractive	4.8
Ethanol soluble extractive	17.26
Non volatile ether soluble extractive	4.5
Mucilage content	8.38
Swelling index	1ml

3.5 Phytochemical studies

Preliminary Phytochemical analysis is carried out by successive solvent extraction. Colour, consistency, and the yield obtained for each extract are given in table 3.

Table 3: Color, Consistency, and yield of each extract.

Solvent	Color and Consistency	%Yield
Petroleum ether	Deep olive green(Sticky semi solid)	2.5
Chloroform	Greenish black(Sticky solid)	4
Ethyl acetate	Dark green(Sticky semi solid)	4.2
Ethanol	Brownish black(Sticky semi solid)	5.4

The preliminary phytochemical analysis was carried out by qualitative chemical test and it shows the presence of flavonoids, polyphenolic compounds, alkaloids, carbohydrates in various extracts.[15,16]

Table 4: Qualitative chemical tests in different extracts.

Test	Petroleu mether	Chloroform	Ethyl acetate	Ethanol	Water
Alkaloids	-	+	-	-	-
Carbohydrate	-	-	-	+	+
Phytosterols	+	-	-	-	-
Fat and oil	+	-	-	-	-
Saponins	-	-	-	-	-
Phenolic compounds	-	-	+	+	+
Mucilage	-	-	-	-	+
Flavanoids	-	-	-	+	+

The petroleum ether extract contains Phytosterols, fixed oils, and mucilage, and chloroform extract contains alkaloids are the main constituents. Ethyl acetate extract contains phenolic compounds as the main active

constituent. Ethanolic extraction contains carbohydrates and flavonoids. Ethanolic extraction of *Millingtonia hortensis* shows the presence of flavonoids as an active constituent.

4 CONCLUSION

This study includes the pharmacognostical and phytochemical characteristics of the leaves of *Millingtonia hortensis* Linn. This study will show the purity of the particular drug and the chemical compound present in the leaf drug. Macroscopic, Microscopic characters are the same as the standard drug and the phytochemical studies prove the presence of various constituents such as flavonoids and polyphenolic compounds.

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