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PHARMACOGNOSTIC STUDIES OF WOOD OF *HIBISCUS TILIACEUS* LINN

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ABSTRACT

Hibiscus tiliaceus L. is plant of family Malvaceae and is also known as Belpata. Belpata have use in treatment of skin conditions, constipation, contraceptive, morning sickness, diabetics and fracture. In present study were carried out the characterization of morphological and microscopic features, determination of physical constant such as the total ash value, extractive value, moisture content and preliminary phytochemical screening *Hibiscus tiliaceus* L. wood. Wood show dark brown in color, hard and often longitudinally fissured, cylindrical shape and bitter in taste Microscopy shows long pitted vessel, bi or triseriate medullary ray and xylem fiber. Total ash, acid insoluble ash and water soluble ash value were 2.59 %, 0.76% and 1.43% respectively. Loss of weight on drying was 0.94%, the percent extractive value 1.8 %, 1.6 % and 2.8 % for petroleum ether, chloroform and methanol respectively.

Keywords: *Hibiscus tiliaceus* L, malvaceae, physical constant, phytochemical

INTRODUCTION

Herbal drugs play an important role in health care programs especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers all plant parts to be potential sources of medicinal substances. However a key obstacle, which has hindered the acceptance of the alternative medicines in the developed countries, is the lack of documentation and stringent quality control. There is a need for documentation of research work carried out on traditional medicines. With this backdrop, it becomes extremely important to make an effort towards standardization of the plant material to be used as a medicine. The process of standardization can be achieved by stepwise pharmacognostic studies. These studies help in identification and authentication of the plant material. Correct identification and quality assurance of the starting materials is an essential prerequisite to ensure reproducible quality of herbal medicine which will contribute to its safety and efficacy. Simple pharmacognostic techniques used in standardization of plant material include its morphological, anatomical and phytochemical characteristics.

Hibiscus tiliaceus Linn (Belpata) is branched tree of 20 – 30 fit height belonging to the family Malvaceae. The plant is found along the eastern and western coast of India [1]. Plant has a large heart shaped green color, alternate petiolated leaves and bright yellow with crimson color center flower. Fruit are sub-globular, capsule up to 2.5 cm long with numerous small seeds [2]. The crude extracts of Belpata have use in treatment of skin conditions, [3] constipation, [4] contraceptive, [5] morning sickness, [6] diabetics, [7] fracture [8]. Chemical constituents reported are gossypol, Mansonones – D and F, Gossypetin glycoside, Hibiscones, Hibiscoquinones – A & D, [9] Lapachol, Quercetin, kampferol and p- coumaric acid are reported in different parts of Hibiscus tiliaceus Linn [10]. Standardization is difficult because herbal drug are usually mixture of constituents and the active principal in most cases is unknown. Therefore the present study was designed to standardize bark of *Hibiscus tiliaceus* Linn.

MATERIAL AND METHODS

Plant Material

The wood of the plant *Hibiscus tiliaceus* Linn collected from the local area of Nasik District Maharashtra, India. It was authenticated by Botanical survey of India, Pune and a voucher specimen was preserved in the herbarium record in college for further reference [BSI/WC/Tech/2003/598]. The wood was stored under the normal environmental condition and

the macroscopic and microscopic characters were studies as per the produce given in WHO guidelines [11].

Physicochemical Studies

The loss of drying, ash value (total ash, acid insoluble ash, water soluble ash) [12], extractive value (petroleum ether, chloroform and methanol), were determined according to the official methods of Ayurvedic Pharmacopoeia of India [13].

Extraction Method

The extraction was performed according to the method given by Harborny [14]. The wood of the plant were washed with water, shade dried and ground into powder by using pestle and mortar. The powder of the plant material was extracted in soxhlet apparatus using different solvents of increasing polarity. The extraction was done for 48 hrs. duration and up to 8 cycles of extraction. The crude extracts were concentrated in a rota evaporator below 40 ºC. After that, the crude extracts were evaporated on a water both to get dryness. The extracts obtained with solvents were weighed and their percentages were calculated as compared to the initial weight of the plant material to get the extractive values. The extracts were subjected to qualitative phytochemical investigation and thin layer chromatography for the preliminary identification of the phytoconstituents [15].

RESULTS AND DISCUSSION

The macroscopical study of the wood of *Hibiscus tiliaceus* Linn was done. For the study, the wood was kept in the natural environment.

Morphology

Shape: Cylindrical

Size: 8 – 10 cm in diameter and 15 – 20 cm in long.

Surface: Smooth

Nature: - Hard

Colour: dark brown in color externally and pale yellow internally

Taste: Bitter

Odour: Characteristic

Microscopy

Large vessel, xylem parenchyma, bi or triseriate medullary rays running longitudinally and xylem fiber surrounding to vessel was observed in transverse section of wood (Fig - 1). In

transverse longitudinal section vessel show elongated, pitted with thin wall in between wood fiber and medullary ray are look like grains surrounded to the fiber (Fig - 2). In radial longitudinal section vessel look like long with pitted center with thick wall and collapsed end. Xylem parenchymas are observed very elongated thin walled with granular deposition. Medullary ray shows mesh like arrangement perpendicular to parenchyma cells (Fig - 3). Powder characteristic show large number of xylem parenchyma and fiber (Fig - 4)

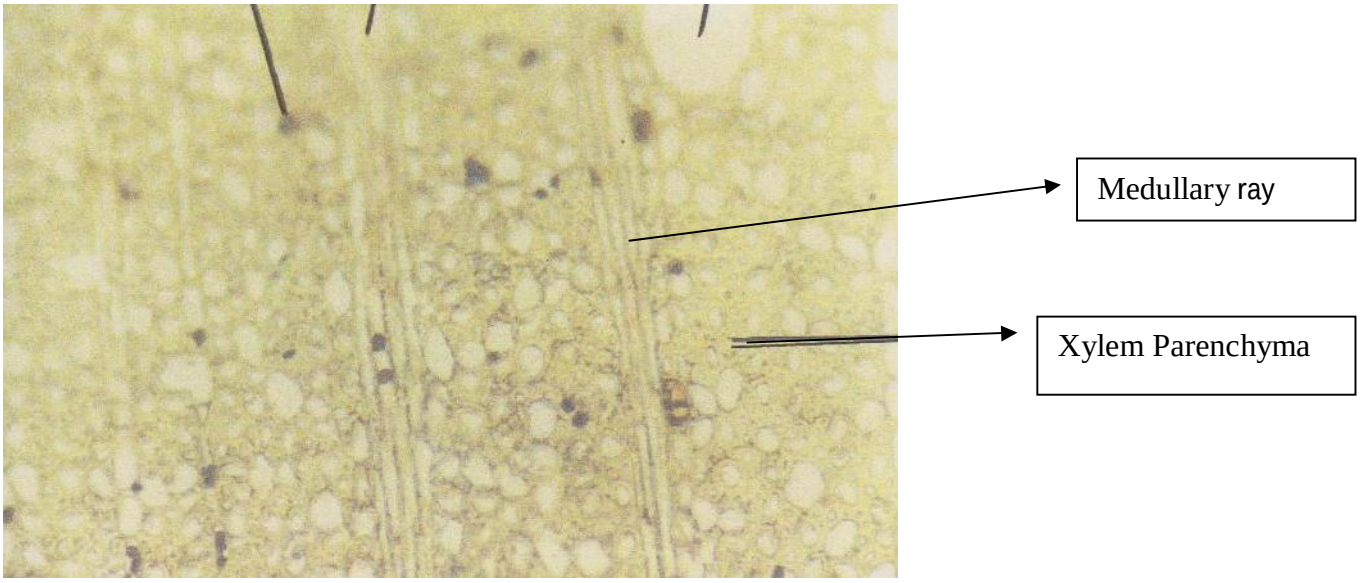

Figure 1 – T.S of *Hibiscus tiliaceus* Linn wood

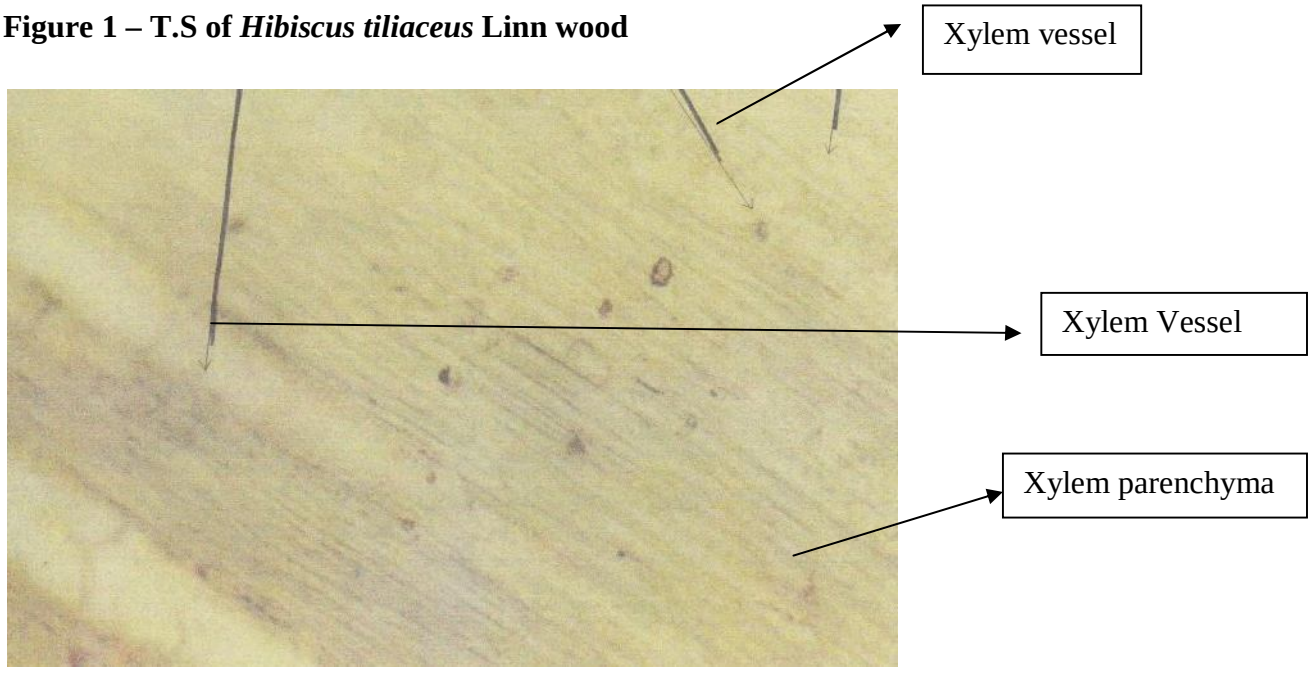

Figure 2 – T.L.S of *Hibiscus tiliaceus* Linn wood

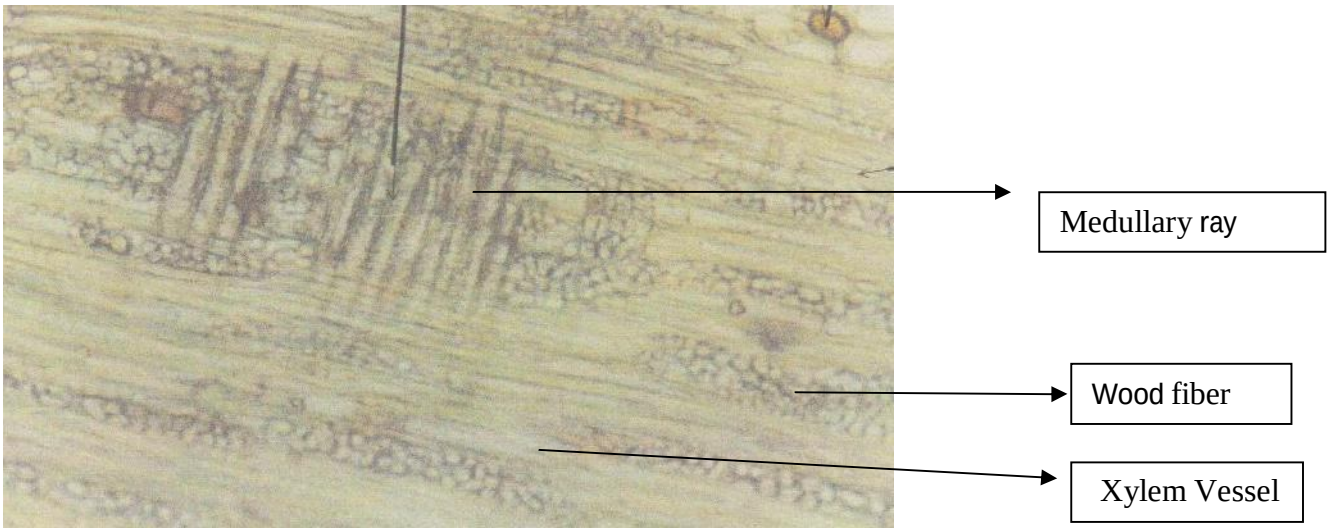

Figure 3 – R.L.S of *Hibiscus tiliaceus* Linn wood

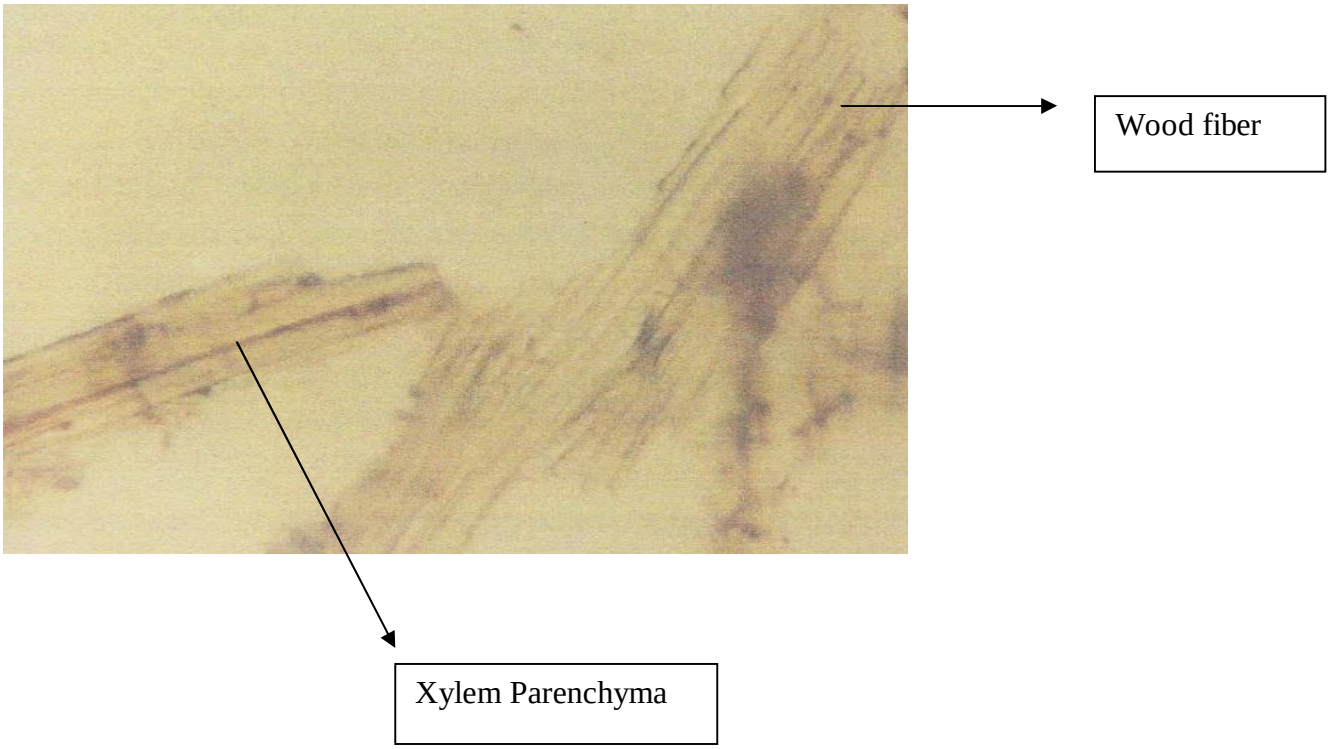

Figure 4– Powder characteristic of *Hibiscus tiliaceus* Linn wood

The values of the physical constants like extractive values (Table- 1), ash values and loss on drying were determined (Table- 2). Preliminary qualitative phytochemical screening revealed the presence of glycoside, terpenoids, alkaloid, flavonoids, steroids and tannins (Table-3).

Table 1: Physical nature of different extracts of wood of *Hibiscus tiliaceus* Linn

S .No.	Solvent	Weight of plant material (gm)	Percentage of Yield (%)	Colors of extracts	Physical nature of extract (consistency)
1	Pet. Ether	200	1.8	Dark brown	Sticky
2	Chloroform	200	1.6	Brown	Semisolid
3	Methanol	200	2.8	Yellowish	Thick and sticky

Table 2: Physico-chemical parameters of wood of *Hibiscus tiliaceus* Linn

No	LOD (Moisture content)	Ash value		
		Total ash	Acid insoluble ash	Water Soluble ash
1	0.94 %	2.59 %	0.76%	1.43%

Table 3: Phytochemical screening wood of *Hibiscus tiliaceus* Linn

Group	Name of the Test	Extract		
		Pet ether	Chloroform	Methanol
Alkaloid	(a) Dragendorff's test (b) Mayer's test	- -	+ +	- -
Flavonoids	(a) Alkaline reagent test (b) Ferric chloride test	- -	- -	+ +
Sterols	(a) Sulfuric acid test	+	+	+
Glycoside	(a) Modified Borntagers	+	-	+
Saponin	(a) Froth formation test Tannins (b) Ferric chloride test Amino acid (c) Ninhydrine test	- - -	- - -	- - -
Protein	(a) Xanthoprotein test (b) Heat test	- -	- -	+
Carbohydrate	(a) Barfoeds test (b) Fehling solution test	- -	- -	+ +

+ Present, - Absent

DISCUSSION

The pharmacognostic standards for the wood of *Hibiscus tiliaceus* Linn are laid down for the first time in this study. Morphological and anatomical studies of the leaf will enable to identify the crude drug. The information obtained from preliminary phytochemical screening will be useful in finding out the genuity of the drug. Ash values, extractive values can be used

as reliable aid for detecting adulteration. These simple but reliable standards will be useful to a lay person in using the drug as a home remedy. Also the manufacturers can utilize them for identification and selection of the raw material for drug production.

CONCLUSION

Present study may be concluded to supplement information in respect of macroscopic and other physical values and parameters will help to identify the species of plant, phytochemical study will reveal the presence of the compounds, which play major role in the medicinal value of this plant. Since wood of *Hibiscus tiliaceus* Linn is known for its wide range of medicinal properties, the study may be useful in respect to its identification, authentication and standardization.

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