Pharmacognostic evaluation of Toona Ciliata bark

Article *in* Journal of Advanced Pharmaceutical Technology & Research · April 2010

DOI: 10.4103/2231-4040.72261 · Source: PubMed

5 authors, including:

Deenanath Jhade
Mody University of Science and Technology, Lakshmangarh
80 PUBLICATIONS **671** CITATIONS

SEE PROFILE

Ganesh N Sharma
Jaipur National University
52 PUBLICATIONS **1,352** CITATIONS

SEE PROFILE

J. Adv. Pharm. Tech. Res. Vol. 1 (2), Apr-Jun, 2010 ISSN 0976-2094

Journal of Advanced Pharmaceutical Technology & Research

PHARMACOGNOSTIC EVALUATION OF *TOONA CILIATA* BARK.

Ajay Gautam[1], Deenanath Jhade[2]*, Dheeraj Ahirwar[2], Manish Sujane[3], Ganesh N. Sharma[4]

1. Sanjeevan College of Pharmacy, Dausha, Rajasthan (India)
2. School of Pharmacy, Chouksey Engg. College, Bilaspur, Chattisgarh (India)
3. Department of Pharmacognosy, VEL'S University, (India)
4. School of Pharmaceutical Sci., Jaipur National University, Jaipur, Rajasthan (India)

Corresponding Author's E-mail: - deenasiper_2006@yahoo.co.in

Received: 07th April 2010 Revised: 31st May 2010 Accepted: 07th June 2010

ABSTRACT

Pharmacognostic standardizations of powdered and anatomical sections of the *Toona ciliata* bark was carried out to determine its macro- and microscopical characters and also some of its quantitative standards. Externally bark are Grey to reddish-brown in colour when it is dry, 200 mm in length, 20 to 60 mm in width and 2 to 3 mm in thickness outer surface brown coloured, strong odour, bitter taste, rough and hard, double quill and curved curvature. The transverse section (T.S.) revealed the presences of periderm, cortex, Sclerides, medullary rays and phloem fiber. Physico-chemical evaluation includes ash values, extractive values and moisture content. These findings will be useful towards establishing pharmacognostic standards on identification, purity, quality and classification of the plant, which is gaining relevance in plant drug research.

Key words: *Toona ciliata,* Pharmacognostic standardization, physicochemical evaluations.

INTRODUCTION

Toona ciliata is a large deciduous tree with a spreading crown, commonly attaining a height of 20-30 m and a girth of 1.8-3 m. Barks dark grey or reddish-brown, smooth up to middle age, afterwards rough, with shallow reticulate cracks exfoliating in irregular woody scales. Blaze 1.3-1.5 m, fibrous throughout, pink or pinkish-brown, sometimes with just a few white bands towards the outside, turning brown on exposure, bitter to the taste, juice turning purple on the blade of a knife. Leaves are 30-50 cm long, on young trees up to 90 cm long, usually imparipinnate, sometimes paripinnate by the abortion of the terminal leaflet; leaflets 11-29, opposite or alternate, 5-

15 x 2-6 cm, lanceolate or ovate-lanceolate, acuminate, glabrous, pubescent, margin entire or wavy, base oblique; petiolules 0.3-1.3 cm long. Flowers small, honey scented, cream coloured, in drooping or sub-erect terminal panicles, usually shorter than the leaves. Calyx divided nearly to the base. Petals 5 mm long, ovate-oblong, sub-acute, with ciliate margins. Capsule dark brown, 1.8-2.5 x 0.5-0.8 cm, oblong, usually smooth outside, sometimes sparsely lenticellate. Seeds pale brown, very light, winged at both ends, 1.3-1.5 cm long including the wing. The synonymous name 'cedrela' is from the Latin 'cedrus', the cedar, the name given on account of its scented wood. Native range**:** Tropical America, but common in many tropical regions as a weed.

MATERIALS AND METHODS

Collection and Authentication

The bark of *Toona ciliata* is belonging to the family Meliaceae were collected and authenticated from Dr. Harish Botanist. Alva's education foundation (R). Alva's Health center complex Moobdidri-574227. D. K. The bark was then dried, powdered and stored in airtight containers for further use.

Pharmacognostic Standardization

Morphological studies were done the shape, color, taste and odor of bask were determined. Microscopic studies were done by preparing thin hand section of bark. The section was cleared with chloral hydrate solution, stained with phloroglucinol -hydrochloric acid (1:1) and mounted in glycerin.

Physico-chemical evaluations

Total ash, water-soluble ash, acid-insoluble ash and sulphated ash were determined. Alcohol and water-soluble extractive values were determined to find out the amount of water and alcohol soluble components. The moisture content was also been determined (9).

Premilnary Phytochemical Screening:

The coarse powder of bark of *Toona ciliata* (25 g) was subjected to successive extraction with different solvent in their increasing order of polarity from petroleum ether (60-80°), chloroform, ethanol and water. The extract were concentrated and subjected to various chemical tests to detect the presence of different phyto constituents (11).

RESULTS AND DISCUSSION

Macrocscopy

Externally bark are grey to reddish-brown in colour when it is dry, 200 mm in length, 20 to 60 mm in width and 2 to 3 mm in thickness outer surface brown coloured, strong odour, Bitter taste, rough and hard, double quill and Curved curvature. (Fig. 1)

Microscopy (Transverse section)

The microscopy revealed the presences of periderm, cortex, Sclerides, medullary rays and phloem fiber.

Fig. 1: Bark of *Toona ciliata*

The TS of bark was stained with phloroglucinol and hydrochloric acid, the surface shows the general arrangements of the periderm, cortex and secondary phloem. In the Periderm Cork (Several layer of thin walled, flat, polygonal cells with reddish brown content, impregnatd with suberin.) Phellogen (2 to 3 layers of thin walled cells without any cellular content) Phelloderm (6 to 8 layers of thin walled rectangular cells without any cellular content) Cortex (Scattered U-shaped stone cells, isolated or in groups) Sclerides (Sclerenchymatous cells, pitted inner andradial walls more thick) Medullary rays (Narrow at inner side, wider in the scleride band side, acicular raphides) Phloem fiber (Single, isolated, circular, lignified with stratification) (Fig. 2). Powder characters of *Toona is* cork cells are seen in surface view, stone cells are present in cortex, Phloem fibers are observed in the powder, Pieces of Medullary rays are also seen (Fig. 3).

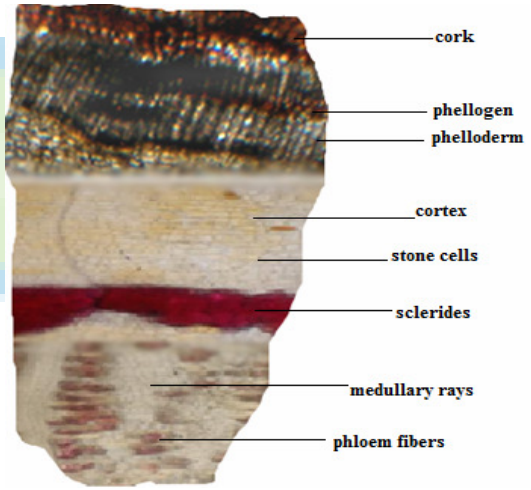

Fig. 2: T.S. of *Toona ciliata* bark

(A) **(B)** **(C)**

Fig. 3: Powder characters of *Toona ciliata*.

(40x) (A) Pieces of cork cells (B) Stone cells (C) Medullary rays

QUANTITATIVE STANDARDS

Physicochemical parameters

Table 1: Physicochemical parameters of *Toona ciliate*

S. No.	Physical parameters	Percentage value
1	Alcohol soluble extractive value	20%
2	Water soluble extractive value	21.2%
3	Loss on drying	10%
4	Total ash	6%
5	Water soluble ash	2.5%
6	Acid insoluble ash	1.6%

Table 2: Percentage Yield of successive solvent extraction

S. No.	Extracts	Color of the extract	% Yield (w/w)
1.	Pet Ether	Yellowish to brownish	4.68 %
2.	Benzene	Dark brownish	3.53 %
3.	Chloroform	Dark reddish	5.76%
4.	Methanol	Dark reddish	16.0 %
5	Aqueous	Dark reddish	15.66 %

Table 3: Phyto constituents of different extracts of *Toona ciliata*

Chemical Constituent	Tests	PEE	BE	CE	ME	AE
Carbohydrates	Molisch's test	-	-	-	+	-
	Fehling's test	-	-	-	+	-
Coumarin glycoside	Made alkaline	+	-	-	+	-
Flavanoids	Shinoda test	-	-	-	+	+
Phytosterols	Salkowski test	+	-	+	+	+
	Libermann Burchard test	+	-	+	+	-
Phenols	Ferric Chloride test	-	-	-	+	+
Tannins	Alkaline Reagent	-	-	+	+	+

Where PEE- Pet Ether Extract; BE- Benzene Extract; CE- Chloroform Extract; ME- Methanol Extract; AE- Aqueous Extract

ACKNOWLEDMENT

I express my sincere thanks to S. Kambhoja, Lecturer, The Oxford College of Pharmacy, Bangalore who took interest in looking into our research needs and thus providing us with the best available resources.

REFERENCES

1. Dasgupta N. Antioxidant activity of Piper betle L. leaf extract in vitro. Food Chem 2004; 88:219-224.
2. David JM, Barreisors AL, David JP. Antioxidant phenyl propanoid esters of triterpenes from Dioclea lasiophylla. Pharm. Biol. 2004; 42:36-38.
3. Gupta VK, Sharma SK. Plants as natural antioxidants. Nat. Prod. Rad 2006; 5(4):326-334.
4. Kumar V and Sharma SK. Antioxidant studies on some plants: a review. Hamdard Medicus (Pakistan) XLIX 2006; (4):25-36.
5. Cos P, Ying L, Calomme M, Hu JP, Cimanga K, Poel BV, et al. Structurally-activity relationship and classification of flavonoids as inhibitors of xanthine oxidase and super oxide scavengers. J. Nat. Pro 1998; 61:71-76.
6. Totter JR. Spontaneous cancer and its possible relationship to oxygen metabolism. Proc. Natl. Acad. Sci 1980; 77(4):1763-1767.
7. Ames BN, Shigenaga MK, Hagen TM. Oxidants, antioxidants and the degenerative diseases of aging. Proc. Natl. Acad. Sci 1993; 90:7915-7922.
8. Jayaprakasha GK, Selvi T, Sakariah KK. Antibacterial and antioxidant activities of grape (Vitis vinifera) seed extract. Food Res. Int. 2003; 36:117-122.
9. Arnold TH. Plants of southern Africa: names and distribution. Mem. Bot. Surv. S. Africa no. 62. (Pl SAfr). De Wet, eds 1993.
10. Boutelje JB. Encyclopedia of world timbers, names and technical literature. (Ency WTimber); 1980.

