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Research Article

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PHARMACOGNOSTIC EVALUATION AND PHYTOCHEMICAL SCREENING OF *ALBIZIA ODORATISSIMA* BARK POWDER

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ABSTRACT
Pharmacognostic evaluation of the crude drugs powder is done by using the different botanical parameters in order to evaluate the quality and purity of drugs, based on the concentration of their active principles, physical and chemical standards. This article reports on pharmacognostic evaluation or standardization of the crude drug powder of *Albizia odoratissima* bark powder. *Albizia odoratissima* bark powder has been standardized on the basis of organoleptic properties, physical characteristics, and physico-chemical properties and phytochemical investigation. In the phytochemical investigation flavonoids, tannin, carbohydrate, saponin, triterpenoids are found to be present.

Key words: Pharmacognostic evaluation, Standardization, Organoleptic, Physico-chemical.

INTRODUCTION

Albizia odoratissima (Linn) Benth is a large, woody, fast-growing, deciduous, multipurpose tree reaching 15 to 25 m in heigh.[1] A medium sized tree about 20 m in height with dark colored young shoots and grey, rough, irregularly cracked bark with dark patches; leaves abruptly pinnate, alternate, main rachis with a glands on the upper side near its basal part and often with similar glands at the bases of the first two pairs of pinnate, leaflets unequal sided, rounded, obtuse or rounded at the apex, dark green, slightly pubescent above; flowers white, fragrant, sessile, numerous, in small globosely 5-10 or more flowered heads, in Cory biform spreading panicles; fruits shortly stalked pods, brown, slightly reticulate veined; seeds flat, yellow.[2]

Synonyms

Sanskrit : Bhusirisah
English : Black siris
Hindi : Kala siris
Kannada : Bilvara
Telugu : Sirisi
Tamil : Karuvakai, Sittilavakai
Malayalam : Pulivaka, Nellivaka[2]

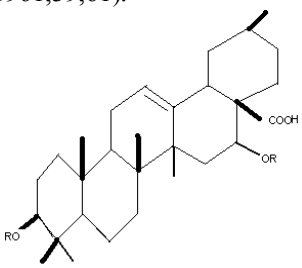
Scientific Classification *Albizia odoratissima*

Kingdom: Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Subclass : Rosidae
Order : Fabales
Family : Fabaceae
Sub-family: Mimosoideae
Genus : Albizia: Durazz
Synonym: Albizia Benth[3]

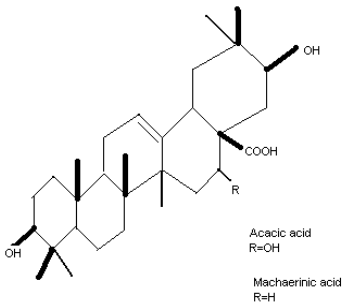
Chemical Constituents and Uses

The tree yield a dark brown, insoluble gum in the form of round tears, similar to that of the *Albizia lebbeck*. The stem and leaves contain 6.09 and 5.14%of tannin respectively. The leaves boiled in the ghee and are used in the cough remedy. The juice of the leaves is applied to the eyes. The Powder of the bark, taken with butter is considered to be the tonic. It is used in leprosy and ulcers. The bark yields a brown dye. The leaves and twigs are lopped for the fodder (Daniel et al, Indian J For,1978,1,223: Chopra et al, 1958,493: Rama Rao,153).[4]

The stem bark showed semen –coagulating activity in rabbits (Kamboj & Dhawan, Journal Ethano-pharmacology 1982, 6,216).[5] Machaerinic acid mp266^0, characterized as 3β, 21β-dihydroxy-18β-olean-12-en-28-oic acid and an acid genin isolated (Journal of Pharmaceutical Science,1961,50,923): odoratissimin, mp227^0 composed of echinocystic acid, glucose, rhamnose, arabinose and xylose, from seeds(J. Sci.Ind.Res.1962,21B,30):compound A,mp85^0 , B, mp145^0 and a third compound which was methylated to give penta-O-methyl-dihydromelanoxetin,mp146^0, isolated from the heart wood (Tetrahedron1963,19,1371): acacia acid, mp267^0 (Bull.Chem.Soc.Jpn.1965,38,1214;Trans Bose Research Institute of Calcutta 1961,39,61).[6]



Odoratissimin
R=Glu+Rha +Ara+xYL



Acacic acid
R=OH

Machaerinic acid
R=H

Seeds showed marked hypoglycemic activity in normal rats but not in alloxan diabetic rats (Indian J. Med. Res. 1976, 64,754) .[7]

MATERIALS AND METHODS

The barks of *Albizia odoratissima* were collected from the Ayurvedic shop, Delhi and same were authenticated by Dr. Seema Bhadhuaria, R.B.S. College, Agra, shade dried and powdered from 80#size.This powder was used for standardization of plant material. The powder of *Albizia odoratissima* was macerate with different solvent like petroleum ether, chloroform, alcohol and chloroform water. The extract was filtered using a muslin cloth and evaporate to dryness to get the pure extract of the drugs. This extract or powder of extract was used for preliminary phytochemical investigation of the extract.

Parameter used for standardization of *Albizia odoratissima* bark powder

Organoleptic character

Organoleptic evaluation refers to evaluation of the powder by color, odor, taste and texture etc.[10]

Physicochemical investigations

Physico-chemical studies like loss on drying at 105°C ,total ash, water soluble ash, acid insoluble ash, water and alcohol soluble extract, and extractive values like petroleum extractive value, benzene extractive values, alcohol extractive values and chloroform water extractive values by maceration extraction method, fluorescence analysis ,total solid content and determination of pH were carried out as per the WHO guide lines.[8,9] Physico-chemical investigations of powder of plants was carried out were the determination of Loss on Drying , extractive values and ash values.[10]

Loss on Drying

About 5 g of powder was accurately weighed, placed in Petri-dish and dried in hot-air oven at 110^0C for four hours. After cooling, it was placed in desiccators, later the loss in weight was recorded, and procedure was repeated till constant weight was obtained[8].

$$\text{Loss on Drying} = \frac{\text{Loss in weight}}{W} \times 100$$

W = Weight of the crude drug in grams

Ash Value

About 2g of crude drug powder was accurately weighed in a previously ignited silica crucible. Incinerated gradually by increasing the heat, not exceeding dull red heat, until free from carbon, cooled and weighed. The percentage of ash was calculated with reference to the air dried drug[9].

a) Acid Insoluble Ash

The ash from the above step was boiled for 10 min with 25 ml of dilute hydrochloric acid, and the insoluble matter was collected in a silica crucible (previously ignited and weighed). The percentage of acid-insoluble ash was calculated with reference to the air-dried drug.

b) Water Soluble Ash

The total ash was boiled for 5 min with 25 ml of water. The insoluble matter was collected in a crucible, washed with hot water, ignited and weighed. The percentage of water soluble ash was calculated with reference to air-dried drug.

Determination of Extractable Matter (Cold Maceration)

1. About 5 g of the powdered drug was weighed in a weighing bottle and transferred to a dry 250 ml conical flask.
2. 100 ml graduated flask was filled with the solvent 90% alcohol/water. The contents of weighing bottle was treated with solvent was transferred to a conical flasks and washed with the solvent.
3. Cork the flask and set aside for 24 hr, shaking frequently.
4. The contents were filtered into a 50 ml cylinder, when sufficient filtrate was collected, then 25 ml of the filtrate was transferred to a weighed thin porcelain dish.
5. The solvent was evaporated to dryness on a water-bath and dried in an oven at 105^0C for 6 hrs.
6. It was cooled in desiccators for 30 min and weighed without delay.
7. The content of extractable matter was calculated in mg/gm of dried material (w/w).
8. The percentage w/w of extractive was expressed with reference to the air-dried drug[9, 10].

Total solid content

About 5-6 g of extract was accurately weighed in a Petri -dish and kept in a hot-air oven maintained at 110^0C for four hours. After cooling in desiccators, the loss in weight was recorded. This procedure was repeated till constant weight was obtained. Found out total solid content[8].

Determination of pH

1% solution of powder was prepared in distilled water and pH was determined using pH meter SYSTRONICS DIGITAL pH METER, MK VI.

Fluorescence Analysis

Many crude drugs show the fluorescence when the sample is exposed to ultraviolet radiation. Evaluation of crude drugs based on fluorescence in daylight is not much used, as it is usually unreliable due to the weakness of the fluorescence effect. Fluorescence lamps are fitted with suitable filters, which eliminate visible radiation from the lamp and transmit ultraviolet radiation of definite wavelength. Several crude drugs show characteristic fluorescence useful for their evaluation[10].

Preliminary Phytochemical analysis

Preliminary phytochemical tests were performed as per the standard methods.

Before the preliminary phytochemical investigation all the extracts of powder drug were carried out according to the Pandey et al. Eight hundred grams bark of *Albizia odoratissima* was extracted individually with 1500 ml chloroform water, alcohol, petroleum ether, benzene by the maceration process and evaporate to dryness. The extract was filtered using a muslin cloth and concentrated. The fine powder was stored in desiccators until use.[11-13] Preliminary qualitative phytochemical analysis of all the extracts was carried out by employing standard conventional protocols [14, 15]

RESULTS AND DISCUSSION

Organoleptic parameters or the external characteristic showed that the drug is light skin or cream in color, with a characteristic odor, astringent and sweet taste, and fibrous texture. That is shown in (Table 1).

Results of quantitative analysis showed that the percentage with reference to the air dried drugs have Total ash (3.82%) , Acid insoluble ash (1.90%) , Water soluble ash (1.34 %), Alcohol soluble extractives (13.50%), Water soluble extractive (10%), , Chloroform soluble extractive (1.28%), PET soluble extractive (1.50%), Loss on drying at 105° C was found to be (3.0%w/w) . Ash value is useful in determining purity and quality of the drug. Percent weight loss on drying or moisture content was found to be 3.0% w/w. The less value of moisture content could prevent bacterial, fungal or yeast growth. (Table 1, 2).The results of preliminary phytochemical investigation are shown in (Table 3).

CONCLUSION

The powder of *Albizia odoratissima* was evaluated for various standardization parameters as per Pharmacopoeia standards. The results and research out comings from the above studies may be useful for evaluating the quality and purity of the bark powder drug of *Albizia odoratissima* .

Table 1: Results of physicochemical Evaluation of bark of *Albizia odoratissima*

Sl. No.	Name of the Test	Result
1.	Physical tests Nature Color Odor Taste	 Fibrous powder Light skin Characteristic Astringent & bitter
2.	Loss on drying	3% w/w
3.	Ash values Total ash Acid insoluble ash Water soluble ash	 3.82% 1.90% 1.34%
4.	Extractable Matter Petroleum ether Chloroform extract Alcohol soluble extractive Water soluble extractive	 1.50% 1.28% 13.50% 10%
5.	Fluorescence analysis	Blackish-brown
6.	Total solid content	90%

Table 2: Physical tests and quantity of Extract of bark of *Albizia odoratissima*

Sl. No.	Name of the Extract/ Fraction	Nature	Color	Odor	Taste	Quantity in gm	Percentage Yield
1.	Petroleum ether	Solid	Yellowish brown	Characteristic	Tasteless	1.50 (100g)	1.50%
2.	Chloroform	Solid	Blackish green	Sweet	Tasteless	1.28 (for 100g)	1.28%
3.	Alcohol	Solid	Blackish brown	Bitter	Bitter	13.50 (for 100g)	13.50%
4.	Chloroform water	Semi-solid	Dark brown	Sweet	Bitter	10 (for 100g)	10%

Table 3: Results of Phytochemical investigation of bark of *Albizia odoratissima*

Sl. No.	Name of the Test	Water Extract	Alcoholic Extract	Chloroform Extract	Petroleum ether Extract
1.	**Test for sterols**				
	a. Test solution + Sulphur (Sulphur powder test)	-	-	+	+
	b. Salkowisky	-	-	+	+
	b. Liebermann Reaction	-	-	+	+
2.	**Test for glycosides**				
	a. Keller – Killiani Test	-	+	+	-
	b. Baljet's Test	-	-	+	-
	c. Liebermann's test	-	+	+	-
3.	**Test for saponins**				
	a. Haemolytic test	+	+	-	-
	b. Foam test	+	+	-	-
4.	**Tests for proteins**				
	a. Xanthoprotein test	-	-	-	-
	b. Millon's test	-	-	-	-
	c. Biuret test	-	-	-	-
	d. Ninhydrin test	-	-	-	-
5.	**Test for tannins**				
	a. Ferric chloride test	+	+	-	-
	b. Lead acetate test	+	+	-	-
	c. Dil HNO_3 test	+	+	-	-
6.	**Test for alkaloids**				
	a. Dragendroff's test	-	+	-	-
	b. Mayer's test	-	+	-	-
	c. Hager's test	-	+	-	-
	d. Wagner's test	-	+	+	-
7.	**Test for carbohydrates**				
	a. Molisch's test	+	+	+	-
	b. Barford's test	+	+	-	-
	c. Benedict's test	+	+	-	-

8.	**Test for Triterpenoids**			
	a. Liebermann Burchard's Test	+	+	+	+
	b. Salkowaski Test	+	+	+	+
9.	**Test for flavonoids**			
	a. Shinoda test	+	+	+	-
	b. Alkaline reagent test	+	+	+	-
	c. Lead acetate test	+	+	+	-

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