



Received on 25 November, 2010; received in revised form 25 January, 2011; accepted 25 March, 2011

PHARMACOGNOSTICAL INVESTIGATIONS ON *SESBANIA GRANDIFLORA* (L.) PERS

Vipin Kachroo*¹, Arun Kumar Gupta² and Rajesh Gupta¹

Sri Sai College of Pharmacy*¹, Dalhousie road, Badhani, Pathankot, Punjab, India
Department of Pharmacy, BPS Mahila Vishwavidyalaya², Khanpur Kalan Sonipat, Haryana, India

ABSTRACT

The plant *Sesbania grandiflora* (L.) Pers is reported to have great medicinal value in Indian medicine. *Sesbania grandiflora*, commonly known as "sesbania" and "agathi," is widely used in Indian traditional medicine for the treatment of a broad spectrum of diseases. *Sesbania grandiflora* is a fast-growing tree with a typical adult height of between 3 and 5 m. The leaves are regular and rounded and the flowers are white and large, very characteristic. The fruits look like flat, long and thin green beans, belongs to the family Fabaceae under the subfamily Faboideae. It is believed to have originated either in India or Southeast Asia and grows primarily in hot and humid tropical areas of the world. The chemical constituents found are galactomannans, linoleic acids, β -Sitosterol and carbohydrates. The microscopic examination of crude drug aims at determination of the chemical nature of the cell wall along with the determination of the form and chemical nature of the cell contents. Thus it determines the size, shape and relative structure of the different cells tissues in the plant drug. Before taking the TS (if samples are dried), it requires softening before preparation for microscopical studies. It may be done by exposing the samples in moist condition (for leaves and stem bark and flowers) or by boiling in water (for bark, root and wood). Sometimes water-soluble components can be removed by soaking in water e.g., heating with water gelatinizes starch grain. Physicochemical parameters such as ash values (total ash, acid insoluble ash, and water soluble ash), extractive values (alcohol and water soluble extractive values) and loss on drying were determined as per Indian Pharmacopoeia. The present study deals with the pharmacognostical investigation on bark of *Sesbania grandiflora*. Pharmacognostical evaluation such as macroscopical and microscopical characters, ash value, moisture content and extractive values were carried out.

Keywords:

Sesbania grandiflora,
Pharmacognosy,
Physicochemical Parameter

Correspondence to Author:

Vipin Kachroo

Asst. Prof., Sri Sai College of
Pharmacy, #Q.NO 399 Purkhoo
Camp, Phase 3rd Dumana Jammu,
Jammu & Kashmir, India

INTRODUCTION: *Sesbania grandiflora* (L.) Pers also called *agati*, an open branching tree up to 15 m tall and 30 cm in diameter ¹ belongs to the family *Fabaceae* under the subfamily *Faboideae*. *Sesbania grandiflora* (L.) Pers native range through Tropical Asia including, India, Indonesia, Malaysia, Myanmar and Philippines with possibly Indonesia as the center of the diversity and Southeast Asia is non-contiguous ³. The chemical constituents found are galactomannans, linoleic acid, β -Sitosterol and Carbohydrates ⁴. Traditionally the bark is used as astringent and utilized for the treatment of smallpox, ulcers in the mouth and alimentary canal, in bitter, in juvenile, infantile disorders of stomach, scabies, the juice of the leaves are utilized for the treatment of epileptic fits and clinical research supports the anticonvulsive activity of Agati leaves, astringent, bitter, termogenic, styptic, alexeteric, anti-helminthic, vulnerary, demulcent, constipating, expectorants and antipyretic, bronchitis, cough, vomiting, wounds, ulcers, diarrhoea, dysentery, internal and external haemorrhages, dental caries, oral ulcers, proctoptosis, stomatitis and intermittent fevers ⁴.

The literature survey also revealed that there are no reports on correlation between chemical constituents and their pharmacological properties. Pharmacognostic studies also have not been reported for the bark of this plant. The present study is therefore undertaken, to study the pharmacognostic characteristics of the steam bark of *Sesbania grandiflora* (L.) Pers.

MATERIALS AND METHODS:

Materials: Dried steam bark of *Sesbania grandiflora* (L.) Pers was collected and authenticated from Sheikh international Mfg & Exp of medicinal herbs 65B/1, Periyar Nagar, Dindigul-624001, Tamil Nadu, India vide letter no TCN/41/2009 dated 09/09/2009.

Methods: Morphological studies were done using simple microscope. The shape, size, surface, taste

and odor of stem bark were determined. Microscopically preparing a thin hand section of the stem bark did studies and the average thickness of the sections was 10-13 m. The section was cleared, stained with phloroglucinol and hydrochloric acid, and mounted in glycerin and observed under microscope. Powder (# 60) of the dried stem bark was used for the observation of powder microscopical characters. The powdered drug was separately treated with phloroglucinol-HCl solution and mounted in glycerin for microscopical evaluation. Physicochemical parameters such as ash values (total ash, acid insoluble ash, and water soluble ash), extractive values (alcohol and water soluble extractive values) and loss on drying were determined as per Indian Pharmacopoeia⁷. Standard procedures were followed for all the evaluations ^{5, 6, 7} all the chemicals and solvents used in experiment was of analytical grade.

RESULTS AND DISCUSSION:

Pharmacognostical Characteristics of the steam bark:

Macroscopical Characteristics: The morphological evaluation revealed the shape of the bark as, incurved, exfoliating in irregular scales thick, hard, rough, 0.5- 1 cm externally yellowish-grey and longitudinally fissured, internally light brown to reddish-brown, internal surface longitudinally striated and fibrous, fracture, fibrous; odor and taste, not distinct.



FIG 1: MACROSCOPICAL CHARACTERISTICS

Transverse Section: Stem Bark consisting of cork cells, thin-walled cortical cells, phellogen, phelloderm, phloem cells, cortex, pericycle, traversed by medullary rays; cork consisting of 4-8 layers of thin-walled, square to rectangular cells, secondary phloem wide, consisting of sieve elements, parenchyma, fibers, all traversed by medullary rays, xylem parenchyma thin-walled some cells contain prismatic crystals of calcium oxalate; phloem fibers thin-walled, with tapering ends, crystal fibers elongated, thick-walled having numerous chambers containing a prismatic crystals of calcium oxalate in each chamber; medullary rays multiseriate composed of thin-walled, radially elongated cells. Pith is also present (**fig. 2**).

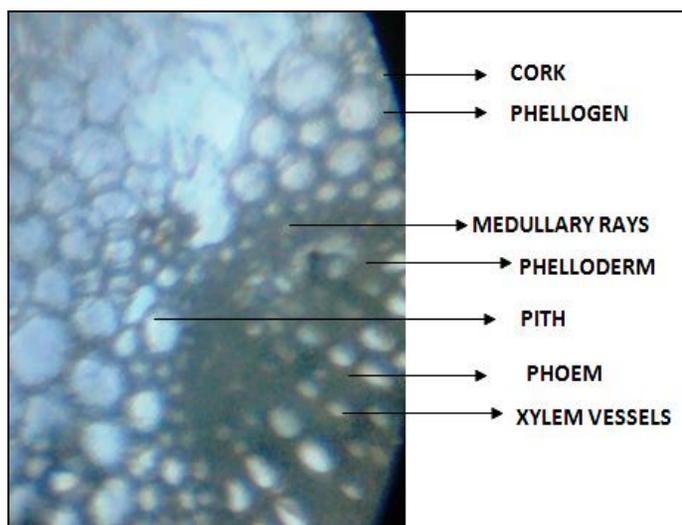


FIG. 2: TRANSVERSE SECTION



FIG. 3: CORK CELL



FIG. 4: XYLEM PARENCHYMA

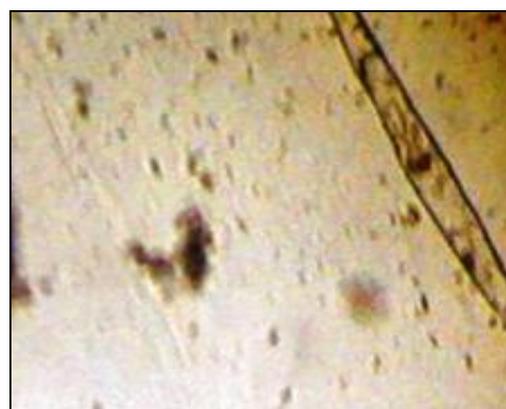


FIG. 5: FIBER

FIG. 3, 4, 5: MICROSCOPY OF BARK OF *SESBANIA GRANDIFLORA* (L.) PERS

Physico- chemical Parameters: Physicochemical parameters includes extractive value, ash value and loss on drying are tabulated in **Table 1**.

TABLE 1: PHYSICOCHEMICAL PARAMETERS OF *SESBANIA GRANDIFLORA* (L.) PERS

Physical parameters	Constant value
Alcohol soluble extractive value	7.0%w/w
Water soluble extractive value	8.0% w/w
Loss on drying	9.5% w/w
Total ash	14.0% w/w
Water soluble ash	1.0% w/w
Acid insoluble ash	1.5% w/w

DISCUSSION: *Sesbania grandiflora* (L.) Pers is used extensively in the Traditional System of Medicine for the treatment of number of ailments. As there is no work on record on its macroscopical and microscopical standards of this traditionally much valued drug, the present work was taken up with a view to lay down pharmacognostical standards, which could be used in authenticating the drug.

ACKNOWLEDGMENT: The authors would like to express their sincere thanks to Dr. R. L. Mahajan, Principal, Sri Sai college of Pharmacy, Badhani, Pathankot for providing facility for research.

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