ISSN 0976 – 3333

Available Online at www.ijpba.info

International Journal of Pharmaceutical & Biological Archives 2012; 3(5):1180-1183

ORIGINAL RESEARCH ARTICLE

Detailed Pharmacognostical and Phytochemical Investigation on *Soymida febrifuga* Roxb. (ROOT BARK)

Ananta Krushna Palei[1], Harisha C.R[2], Shukla V.J[3]

[1]*M.Sc., Scholar (Ayu. Med. Plants) IPGT & RA Gujarat Ayurved University*
[2]*Head, Pharmacognosy Dept. IPGT & RA Gujarat Ayurved University*
[3]*Head, Pharmaceutical Lab. IPGT & RA Gujarat Ayurved University*

Received 04 May 2012; Revised 07 Oct 2012; Accepted 16 Oct 2012

ABSTRACT

Soymida ferifuga commonly known as *mamsarhohini* of family meliaceae, is a reputed folk medicinal plant. Its root bark extensively used in treating leucorrhoea, menorrhagia, dysmenorrhoea. For the first time root bark was subjected to investigate its pharmacognostical and Phytochemical evaluation. Pharmacognostical results shows the presence of multilayered cork cells, yellowish brown content, group of pitted stone cells, physicochemical parameters like ash value 4%, extractive value18.40%.

Key words: *Soymida ferifuga,* Meliaceae, Pharmacognosy Phytochemistry.

INTRODUCTION

The tribal folks spread across the country make use of medicinal plants through oral traditions. In India several thousands of plant species are being used by thousands of ethnic communities. A Tribal claim was recorded for *Mamsarohini* is the management of leucorrhoea, menorrhagia and dysmenorrheal, reported the utility of *Mamsarohini* in muscular dystrophies. The bark decoction *Mamsarohini* is found to be (50 ml twice daily) effectively reduced the CPK levels in 2 cases of DMD. The wound healing properties of stem bark are reported. No reference regarding pharmacognostical and phytochemical investigation on any part of *Soymida febrifuga* Roxb. is being reported till date.

MATERIALS AND METHODS

Collection and preservation

The root bark of *Soymida febrifuga* collected and preserved as per procedure.

Macroscopic evaluation [2, 3, 4]

A macroscopic character of root bark was recorded as per visual observation.

Organoleptic evaluation [5]

The colour, odour, and taste of root bark powder were recorded separately.

Microscopic evaluation [6]

Free hand sections of root bark cleared with chloral hydrate and then with phloroglucinol and hydrochloric acid. Histochemical tests for few constituents like tannin, etc. Microphotographs were also clicked by using Carl Zeiss binocular microscope.

Powder Microscopy

Cut pieces of root dried under shade, powdered with help of mechanical grinder and sieved through mesh no.60. S. Febrifuga root bark powder was studied under microscope with distil water and phloroglucinol and hydrochloric acid.

Histochemical tests

Root bark subjected to histochemical tests for few constituents like tannin, starch grains etc, were done [6].

PHYTOCHEMICAL EVALUATION [7-13]

Physical evaluation

In physical evaluation, moisture content, total ash, acid insoluble ash, and extractive values viz., alcohol soluble extractive value & water soluble extractive values were determined. The ash value represents the inorganic salts present in the drug (**Table 1**).

Table 1: Morphological characteristics of *Soymida febrifuga*

Characters	Observation
Colour	Brownish red
Taste	Astringent
Odour	Astringent ends sweet
Nature of powder	Smooth

***Corresponding Author:** Dr. Ananta Krushna Palei, **Email:** ananta.krushna@gmail.com, **Phone No:** +91-9408253461

Preliminary Phytochemical Screening [14]

The Methanol & water extractive was used to carry out the preliminary screening. The extract was further subjected for the presence of various constituents like alkaloids, tannins, phenols and for Flavanoids. Quantitative estimations of total tannin content and total Phenol content were done. HPTLC was carried out for analysis and showed in (**Table 2, 3 & 4**).

RESULTS AND DISCUSSION

Collection and preservation [15-18]

Fresh plants of *Soymida febrifuga*, after establishing the identity as "mamsorohini" by the local traditional practitioner, were uprooted mainly from its natural habitat from Gandhamardan hill ranges, ranging from 220-1060 meters in height, located in the western part of Orissa, in the month of December. Collected samples were identified, authentified, by expert taxonomist, by using various floras and botany texts [7-10].

Matured root bark, cut in to small pieces and shade dried, and coarsely powdered (40 mesh) drug was used for Phytochemical, Pharmacological investigations and for study of the diagnostic characters of the powder [11,12]. The rest of the sample was preserved in the solution of F.A.A. (50% Alcohol: Glacial acetic acid: Formalin (40%) in the ratio of 90: 5: 5) for the histological profile [13].

Macroscopic evaluation

Matured root bark, cut in to small pieces and shade dried, and coarsely powdered (40 mesh) drug was used for Phytochemical, Pharmacological investigations and for study of the diagnostic characters of the powder [11,12]. The rest of the sample was preserved in the solution of F.A.A. (50% Alcohol: Glacial acetic acid: Formalin (40%) in the ratio of 90: 5: 5) for the histological profile [13].

Sensory characters

Colour – outer dark brown, longitudinally crackled, inner fleshy red, when removing external bark oozing out blood colour exuded. Dried bark inward single channel, inner most layer bark light grayish with heavy fibers. Odour – astringent, taste – astringent ends in sweet and touch hard in nature.

Microscopic evaluation

Transverse Section

T.S. of root bark shows outer most layer of Cork, the stem differentiates into outer compactly arranged thick walled lignified barrel shaped cells, cells containing dark brownish coloring matters. Inner cork subarised compactly arranged barrel shaped cells. Cortex present beneath the cork. The cortex is very broad zone and composed of several rows of very large thin walled tangentially elongated cells. Those of the peripheral rows being narrower tangentially elongated, and more regularly arranged without any intercellular spaces, several rows of thin walled oblong cell, which contains simple and compound starch grains. In addition it also shows, several celled groups of large pitted stone cells. A large number of remarkable large thin walled empty cells, a number of secretory cavities at the terminal portions of medullary rays. Bast is broad and shows broad bands of phloem with proper segments of sclarnechyma along with some secretary cavity. Medullary rays are mostly biserrete to multiserrete, consisting brownish colouring matter. Simple and compound starch grains distributed all over the section. Prismatic crystal rhomboid shaped of calcium oxalate distributed in cortex zone.

Identification:-Bark identified by cork, cortex, fibers, phloem, and medullary rays.

Points of interest:-Secretay cavity, pitted stone cells, biserrate, multi-serrate medullary rays, and alternate bands of fibers and phloem heavily deposited tannin and coloring matter.

Powder microscopy:

Organoleptic Characters

Organoleptic Characters of root bark powder shows colour brownish red, odour astringent, taste astringent ends sweet and touch is smooth.

Powder microscopy:

Diagnostic character of root bark powder shows stone cells, Oil globules, Starch grains Simple and compound, Prismatic crystals of calcium oxalate, Lignified fibers, Crystal fibers and Pitted stone cells.

Histochemical Test: [6]

Various Histochemical tests were conducted on the root bark powder of *soymida febrifuga*. The results are depicted in (**Table 3**).

Phytochemical results

Physico-chemical parameters:

Physicochemical parameters of *Soymida febrifuga* root bark powder was tested using various Physico-chemical analysis such as moisture content, ash value, acid insoluble extracts and pH value was also estimated. The observed results are shown in the (**Table 2**).

Preliminary qualitative Chemical tests:

Root bark sample was qualitatively tested for the presence of different phyto-constituents like alkaloids, phenols, flavanoids, carbohydrate saponin, tannins and cyanogenic glycosides etc. The observed results are shown in the (**Table 4**).

HPTLC

Solvent system: N- Butanol, acitic acid, water (4:1:5)

Sample: Chloroform extract of root bark

Detection: Long UV 366 nm, Short UV 254 nm and Chromatographic techniques were carried out on mentioned in materials & methods section. Solvent system which were designed for TLC i.e.- N- Butanol: water: Acetic acid (4:1:5) was used for HPTLC studies. The results are tabulated in (**Table 5**)

Table 2: Physicochemical parameters of *S. febrifuga root bark* powder

S No	Physicochemical Parameters	*S. febrifuga*
1	Loss on Drying at 105°C(% w/w)	17.90%
2	Ash value at 450°C (% w/w)	4%
3	Acid insoluble ash at 450°C (% w/w)	5%
4	Extractive Value	
(i)	Water soluble extractive(% w/w)	18.40%
(ii)	Alcohol soluble extractive (% w/w)	18.46%

Table 3: Histochemical tests for *Soymidafebrifuga root* bark

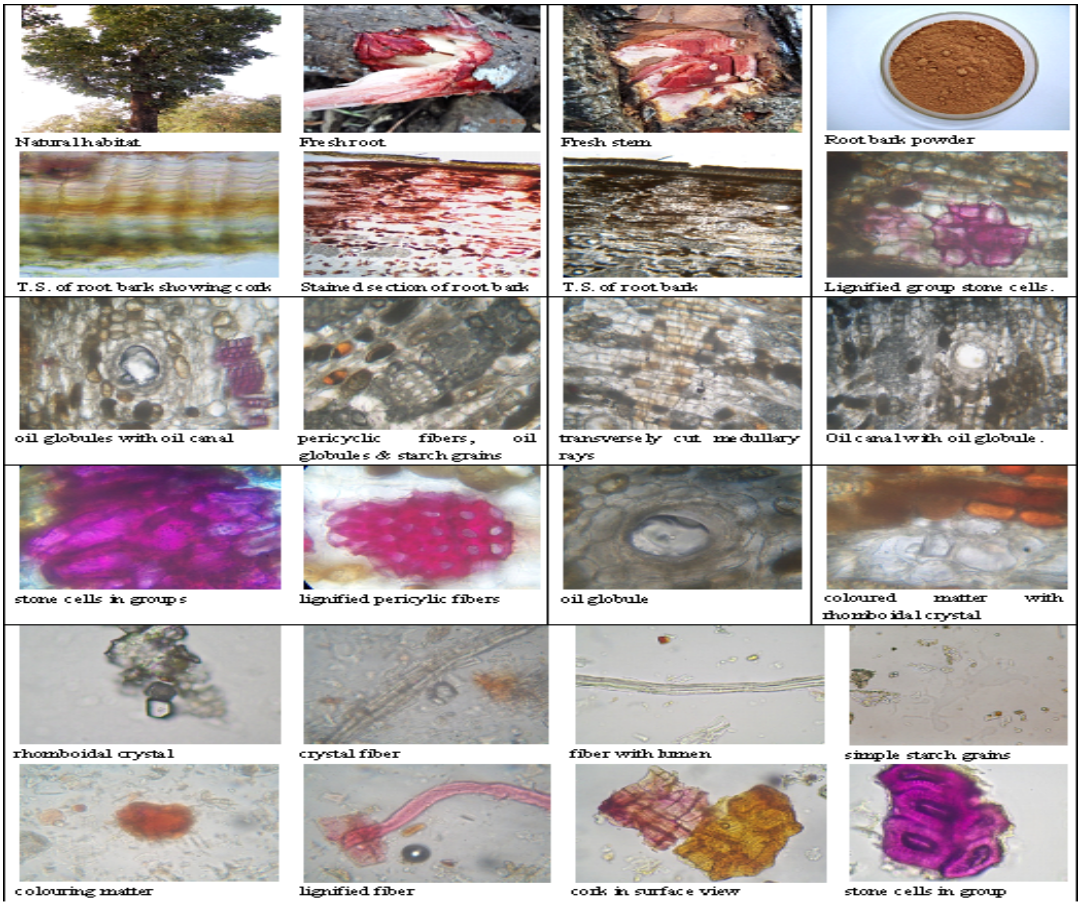
S No	Reagents	Observation	Characteristics
1	Phloroglucinol+Conc. Hcl	Red	Lignified cells
2	Iodine	Blue	Starch grains
3	Phloroglucinol+Conc. Hcl	Dissolved	Calcium
4	Fecl3 solution	Dark blue to black	Tannin cells

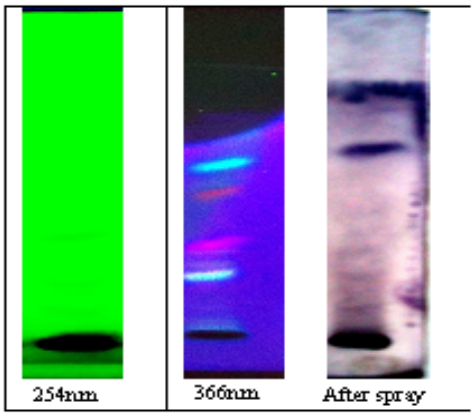
Table 4: Qualitative chemical screening of *S. febrifuga root bark* powder

Phytoconstituents	Tests	Observation
	Mayer's Test	++
Alkaloids	Dragendorff's Test	++
	Wagner's Test	++
Phenols	neutral $FeCl_3$	++
Flavanoids	Shinoda's test	++
Carbohydrate	Fehling's test	++
Saponin	Foam test	++
Tannins	Lead acetate test	++
Cyanogenic glycosides	sugars Molisch's test	++

Table 5: HPTLC Studies of chloroform extracts at 254nm and 366nm

Root	Detection	No. of spots	Rf value
bark	254nm	6	0.07,0.18,0.20,0.34,0.80,0.9
	366nm	5	0.09,0.18,0.20,0.88,0.95





DISCUSSION

Pharmacognosy as an applied science has played a crucial role in the development of different disciplines of science. In this phase of study microscopic, macroscopic and powder characteristic studies were done.

The collected root bark was identified and authentified. Cork dark brown colour, cracked, inner fleshy red, exuded blood red colour liquid on time of peeling, astringent in odour followed by sweet in taste. The characters exactly match with the classical name of *mamsarohini.*

Transverse section shows cork, cortex with lignified fiber, biserette to multi-serette, pericyclic fibers, stone cells, rhomboidal crystal, simple & compound starch grain distribute all over the cortex region, even medullary rays are the differentiate from the stem and stem bark. The powder microscopy of root bark shows individual character are very important to identified the particular part and also upto the family even helps in differentiate the species.

The results for all the physicochemical parameters are within the prescribed limit. It means that quality of the drug is up to the standard.

As describe in analytical study, the test drug give the positive test for the presence of alkaloids, phenols, flavanoids, carbohydrate, saponin, tannins, cynogenic glycosides.

Quantitative estimation of bark powder shows presence of 9.44% w/w tannin.

HPTLC study shows that all the spots are of same Rf values when scanned at two different wavelengths as 254nm (short U.V.) and 366nm (long U.V.)

REFERENCES

1. Dr. KoppulaHemadri, A Treatise on Tribal medicine,2011, Dr, K. Hemadri'shouse of tribal medicine,vijaywada.22.
2. Radha, R., Shivakumar, T., Arokyaraj, S., 2008. Pharmacognostical evaluation of *Plumeria alba* Linn., Research J. Pharm. And Tech. 1 (4), 496-501.
3. Balakrihnan, M., Dhanapal, R., Vamsi, M.L.M., Chandrashekar, K.B., 2010. Studies on Pharmacognostical specifications of *Azimatetracantha*Lam. International journal of Phytopharmacology. 1, 35-42.
4. Trease, G.E., Evans, W.C., 1983. Pharmacognosy, 12th Ed. BailliereTindall, Eastbourne. U.K. 95-99, 512-547.
5. Wallis, T.E., 1985. Text book of Pharmacognosy, 5th Ed, CBS Publishers, New Delhi, 571-578.
6. Krishnamurty, K.V., 1988. Methods in the plant histochemistry, VishwanadhanPvt, Limited, Madras, 1-77.
7. API part I, Appendix 2, Vol. V 2.2.2.
8. API part I, Appendix 2, Vol. V 2.2.10.
9. API part I, Appendix 2, Vol. V 2.2.3.
10. API part I, Appendix 2, Vol. V 2.2.4.
11. API part I, Appendix 2, Vol. V 2.2.5.
12. API part I, Appendix 2, Vol. V 2.2.8.
13. Anonymouis (2001). The Ayurvedic Pharmacopia of India, Ministry of Health and Family Welfare, Part I, Vol. II, Ed. I. P s46-47.
14. Khandelwal, K.R. techniques and experiments practical Pharmocognosy, Nirali Prakashan, Pune.
15. Saxena, H.O., Brhamam, M., 1994. The Flora of Orissa. Orissa Forest Development Corporation Ltd, Bhubanshwar, 333-334.
16. Gamble, J.S., 1997. Flora of the Presidency of Madras, published by under the authority of the secretary of state of London, Vol. 1, 226-234.
17. Henses, H.H., 1925. Botany of Bihar & Orissa, published by Bishen Singh Mahendrapal Singh, New Connaught place, Dehradun, Part 1, 202.
18. Kunjilal, Bose, 1997. Flora of Assam, published by Bishen Singh Mahendrapal Singh, New Connaught place, Dehradun, Vol. 1, 292.