



Pharmacognostical and Phytochemical Studies on Stem Bark of *Ficus Benghalensis* L.

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ABSTRACT

Various Pharmacognostical and phytochemical parameters such as macroscopy, physicochemical and behavior of powder drug on treatment with different chemical reagents were studied on the stem bark *Ficus benghalensis* Linn. belongs to family Moraceae. It is useful in "Kapha", biliousness, ulcers, erysipelas, vomiting, vaginal complaints, fever and inflammation. The leaves are good for ulcers; the young leaves are efficacious to cure leprosy. The milky juice is aphrodisiac, tonic, vulnerary, maturant, lessens inflammation and useful to treat piles, diseases of the nose. The aerial roots are styptic, aphrodisiac, and utilized to manage gonorrhea, syphilis, biliousness, dysentery and inflammation of the liver. Dried stem bark was subjected to various physicochemical parameters like foreign organic matter, ash values, extractive values, fluorescent analysis, treatment with different chemicals, preliminary phytochemical screening. These parameters can be utilized for quick identification of the bark of *Ficus benghalensis* and are particularly useful in powdered form.

KEYWORDS: *Ficus benghalensis*, standardization.

1. INTRODUCTION

Ficus benghalensis Linn. (Moraceae) Commonly known as Banyan tree, Vad in Marathi and Vata in Sanskrit, is one of the reputed Panchavalka drugs of ayurveda. It is native to India where it grows from low altitudes to 2000 ft (610 m), especially in dry regions (Alok Semwal et al., 2013). It grows in planes, in roadsides etc. especially in dry regions. It grows in planes, in roadsides etc. It is native to a wide area of Asia from India through Myanmar (Burma), Thailand, Southeast Asia, Southern China and Malaysia. Useful parts include Aerial root, Bark, Leaves, Buds, Fruits, Latex [Neal MC. (1965); Riffle

RL. (1998)]. the bark and leaves *Ficus benghalensis* Linn. used as astringent, haemostatic, anti-inflammatory, ant-septic: prescribed in diarrhea, dysentery, and in the treatment of skin diseases, ulcers, vaginal disorders, leucorrhoea, menorrhagia, deficient lactation (Patil Vikas V, Patil Vijay R. F. 2010; Khare CP. 2002; Nadkarni KM 2006; Nadkarni KM, Nadkarni AK 1982). The tender ends of the hanging roots are prescribed to stop obstinate vomiting (Kritikar and Basu., 1999). The bark yields flavanoid compound A, B and C. A flavanoid and C flavanoid compounds are identified as a different forms of a leucoanthocyanidin A

and B as aleucoanthocyanin (Varghese Indumon et al., 1998).

The stem barks of *Ficus benghalensis* Linn. is important but very less studies has been reported so far on pharmacognostic and phytochemical parameters. Hence this study was undertaken to develop comparative pharmacognostical and preliminary phytochemical standards for the steam bark of *Ficus benghalensis* Linn. This may be useful to researchers for authentication of commercial sample and also to explore the possibility of its use in medicines.

2. MATERIALS AND METHODS:

Plant Material: The stem bark of *Ficus benghalensis* L. was collected by self in the month of July Latitude N190, 52'62.9" Longitude E0750, 38'12.1" Altitude 458.5m, from Jayakwadi, Paithan Tal:- PaithanDist:- Aurangabad. Bark was pulverized in the mechanical grinder to a fine powder to carry out different pharmacognostical and phytochemical evaluation and was stored in a well closed airtight vessel for further analysis.

Behaviour of Bark Powder towards some chemical reagents: The powder of *Ficus benghalensis* L. bark was treated with different chemical reagents. The mixture of the powdered drug and chemicals were allowed to warm and cold down for two hours. Changed colour of powdered drug was noted (Table No: - 2).

Physico-chemical Evaluations:

Physico-chemical parameters such as water soluble ash, water insoluble ash, acid insoluble ash, acid soluble ash, total ash, loss of weight on drying 1050 was determined. Considering the diversity of chemical nature and properties of contents of drugs, different solvents benzene, petroleum ether, chloroform, methanol, water, alcohol, chloroform water of extractive values were determined as per reported methods (Mukherjee PK 2002, Kakate CK 1994, Khandelwal KR 2005) (Table No: - 3).

Phytochemical screening:

Qualitative examination of inorganic matters and determination of heavy metals was done as per reported methods. The dried powdered bark was subjected to preliminary phytochemical screening for qualitative detection of phytoconstituents. The dried powdered bark (100g) was extracted successively hexane, petroleum ether, benzene, benzene, chloroform, acetone,

methanol, water in Soxhlet Extractor by continuous hot percolation. Each time before extracting with the next solvent of higher polarity the powdered material was dried in hot air oven below 500 C for 10 minutes. Each extract was concentrated in vacuum on a Rote Evaporator and finally dried in hot air oven. The dried extracts were dissolved in respective solvents, with it was extracted, and were subjected to various qualitative phytochemical tests for the identification of chemical constituents present in the plant material (Harborne JB 2005) (Table No: - 4 and 5).

3. DISCUSSION AND CONCLUSION:

Pharmacognocny enfolds the knowledge of history, distribution, cultivation, collection, processing for market and preservation, the study of organoleptic, physical, chemical and the uses of crude drugs. The objective of pharmacognocny is to contribute towards establishment of rational relationship between the chemical moieties of naturally occurring drugs and their biological and therapeutic effects, which ultimately helps in the standardization of the plant bark drugs (Evans WC (2002).

The phytochemical investigation revealed the presence of tannins, alkaloids, saponin, and sterols compounds mainly in the stem bark of *Ficus benghalensis* L. The physical evaluation furnished different ash values, extractive values in different values. Water soluble ash, total ash, and acid soluble ash, acid insoluble ash values were also determined. Thus a variety of standardization parameters viz. morphology, physic-chemical, phytochemical were studied and data was generated for the assessment of quality of plant material, and also to check the adulteration and substitution etc. which may be helpful for future reference.

After present investigation it can be concluded that the pharmacognostic study of stem bark of *Ficus benghalensis* L. have furnished a set of qualitative and quantitative parameters that can serve as an important source of information. All these parameters which were being reported could be useful in identification of distinctive features of the drug.

Table 1. Organoleptic characteristic of stem Bark of *Ficus benghalensis* L.

Parameters	
Condition	Dried
Colour	Outer surface – Brownish Inner surface – Reddish brown, Yellowish brown
Odour	Stimulant
Taste	Astringent
Texture	Rough with fracture
Fracture	Brittle with fibrous
Size	Length 5-7cm Thickness 8-25mm

Table 2. Reactions of stem bark powder of *Ficus benghalensis* L. with different chemical reagents.

Sr. No.	Chemical Reagents	Observation
1	Conc. Sulphuric acid	Brown
2	Conc. Hydrochloric acid	Blackish brown
3	Conc. Nitric acid	Light brown
4	Picric acid	Brown
5	Glacial Acetic acid	Light brown
6	Iodine solution	Light brown
7	Sodium hydroxide solution (aq. 5%)	Green
8	Potassium hydroxide solution (aq. 5%)	Brown
9	Ferric chloride solution (aq. 5%)	Green
10	Powder as such	Dark brown
11	Methanol	Brown
12	10% NaOH	Green
13	Chloroform	Light brown
14	Petroleum ether	Brown
15	Distilled water	Yellowish brown

Table 3. Physico-Chemical Properties of *Ficus benghalensis* L. stem bark.

Sr. No.	Quantitative Standards	%w/w
1	Total ash	10.86
2	Acid soluble ash	8.29
3	Acid insoluble ash	0.57
4	Water soluble ash	5.02
5	Water insoluble ash	5.84
6	Loss of weight on drying 105°C	61.3
7	Alcohol soluble extractive value	6.13
8	Water soluble extractive value	7.12

Table 4. Successive Extractive Values of the stem Bark of *Ficus benghalensis* L.

Sr. No.	Solvent	Weight of Drug	Average Extractive Value (%w/w)
1	Methanol	10gm	3.6
2	Alcohol	10gm	9.14
3	Benzene	10gm	5.10
4	Petroleum ether	10gm	5.30
5	Chloroform	10gm	0.70
6	Acetone	10gm	4.82
7	Water	10gm	9.40

Table 5. Observation of Quantitative analysis of organic of *Ficus benghalensis* L.

Sr. no.	Test of organic mater	Petroleum ether	Chloroform	Acetone	Methanol	water
1	Tannin	+	+	+	-	-
2	Alkaloid	-	+	-	-	-
3	Saponin	+	-	+	+	-
4	Sterols	+	-	-	-	-
5	Flavonoids	-	-	-	+	+

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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