ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Studies on the pharmacognostic profile of the stem and root bark of *Feronia elephantum Linn* (Family-Rutaceae)

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ABSTRACT

The microscopic character of the stem and root bark, physical constant values, extractive values, behaviour on treatment with different chemical reagents. Fluorescence characters under UV light after treatment with different chemical reagents of the powdered whole plant of *Feronia elephantam Linn* (Family; Rutaceae) were studied to characterize some pharmacognostical parameters. Preliminary phytochemical study on different extracts of the whole plant was also performed. These studies will help in identification of this plant for further research.

Keywords: *Feronia elephantam,* Pharmacognostic, phytochemical, extracts

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ISSN: 0975-8585

INTRODUCTION

Feronia elephantum Linn (Family; Rutaceae) Syn. *Feronia limonia* is a small deciduous tree with short, erect, cylindrical 30-40 ft high and 2-4 ft width bearing thorny branches found throughout the plains of India, particularly in dry, situations. It is known as Bilin (Hindi), Kait (Bengali), Velaga (Telugu), Vilanga (Tamil) in Indian traditional medicine. The various parts of this plant are used for various ailments like fever, throat disorders, diarrhea, dysentery and others. Unripe fruit is employed alone or in combination with other medicine in diarrhea and dysentery. Young leaves have fragrant smell like tulsi and their juice mixed with milk (or) curd and sugar candy is given for biliousness and the juice is externally applied to the skin eruptions caused by biliousness [1].

Considering its various therapeutic efficacy and usage in traditional medicinal practice, it was thought desirable to investigate some pharmacognostical parameters for further identification being reported hereunder.

MATERIAL AND METHODS

Plant material

The whole plant of *Feronia elephantum* Linn was collected from Perambalur, Tamilnadu, India and identified by the Botanist, Department of Botany, St.Joseph's college, Tiruchirappalli and the voucher specimen has been kept for future references. The plants were picked up and dried under shade, powdered and passed through 40 mesh sieve and stored in a closed container for future use.

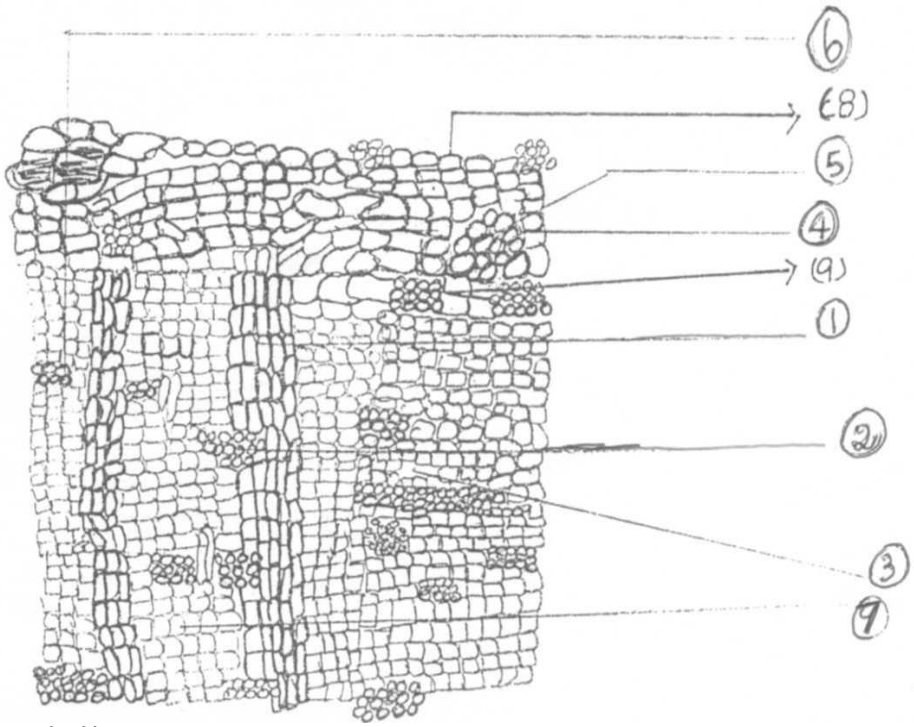
Reagents

All the reagents were of analytical grade and obtained from S.D. Fine Chemical Ltd, Mumbai.

Methods

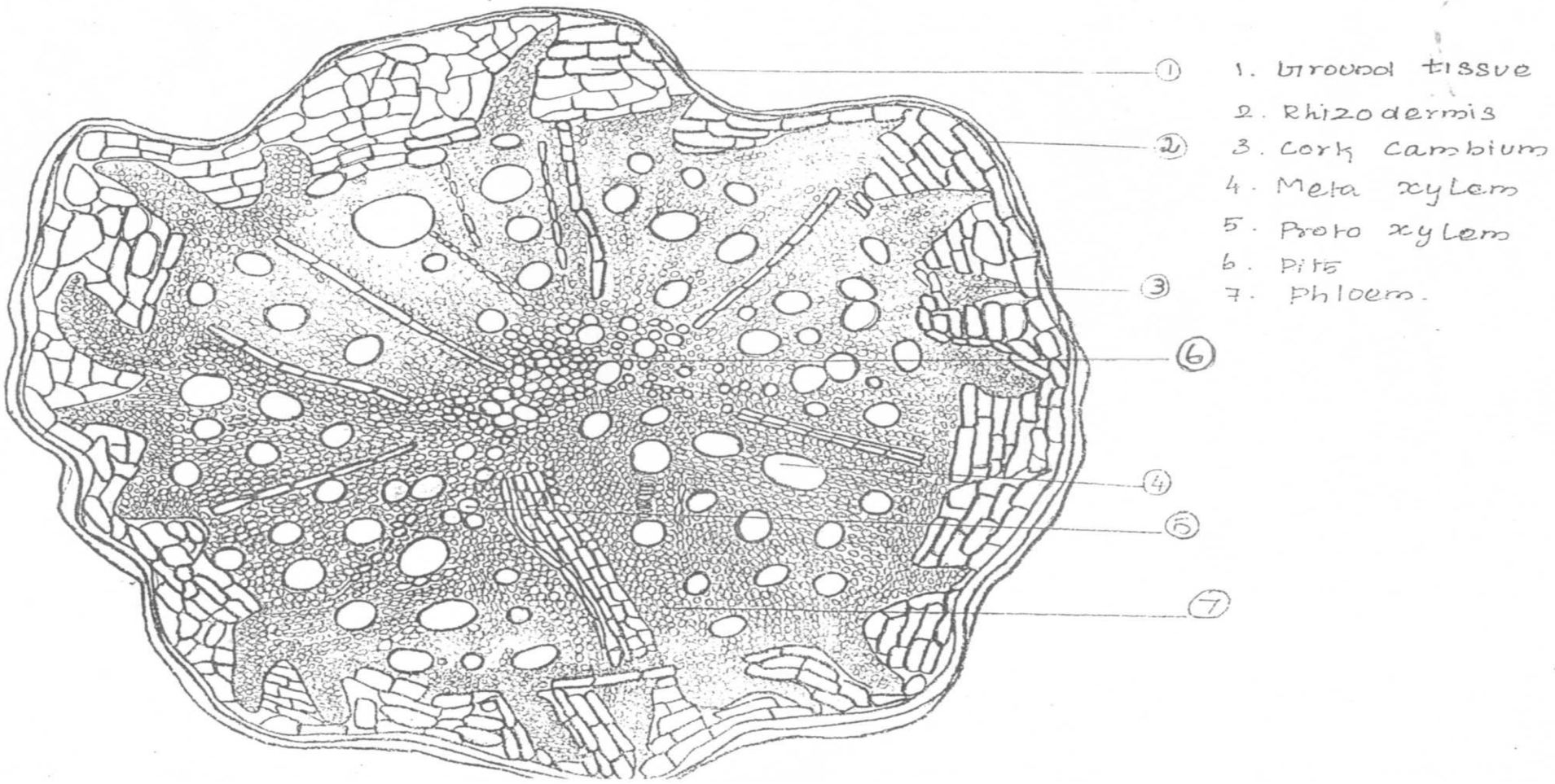
Water soluble extractive was determined by the process of maceration. Other extractive values are determined by using soxhlet extraction apparatus. The dried extractives were obtained after evaporation of the solvent under reduced pressure. The physical constant values were determined by pharmacopoeia methods [2-5]. The alcohol (90%) soluble and water soluble extractive values were determined by maceration process. The behaviour of powdered plant materials with different chemical reagents were studied and the fluorescence characters also observed under UV light at 254 nm .Preliminary phytochemical tests of different extractives were performed by specific reagents [6-9].

Fig: 1 STEM BARK OF FERONIA ELEPHANTUM Linn.



1. Medullary rays
2. Phloem fibres
3. xylem fibres
4. Bast fibres
5. Cork Cambium/Phellogen
6. Stone cells/Sclerides
7. Cork
8. Cortex

Fig:2 ROOT BARK OF FERONIA ELEPHANTUM LINN.



1. Ground tissue
2. Rhizodermis
3. Cork cambium
4. Meta xylem
5. Proto xylem
6. Pits
7. Phloem.

ISSN: 0975-8585

Table -1: Extractive values of *Feronia elephantum* Linn and their colours

Solvent	% yield	Colour of the Extractive
Petroleum ether (60-80)	2.320	Yellowish brown
Bnzeen	1.720	Yellowish brown
Chloroform	2842	Brownish red
Acetone	5.120	Brownish red
Methanol	10.360	Brown
Water	11.260	brown

Table -2: Physical constant values of *Feronia elephantum* Linn

Constants	% yield
Total ash	15.235
Acid insoluble ash	4.232
Water soluble ash	10.862
Loss on drying	1.750

Table -3: Preliminary phytochemical tests for the presence of active constituents of methanol extract of *Feronia elephantum* Linn

Constituent	Present/Absent
Steroid	Present
Tannin	Present
Reducing sugars	Present
Alkaloid	Present
Flavanoids	Present
Anthroquinones	Absent

Table4: Behaviour pattern of the powdered sample of *Feronia elephantum* Linn on different reagents

Treatment	Color
Powder as such	Yellowish brown
Picric acid (sat.aquous soln)	Yellow
Nitric acid (Specific gravity 1.42)	Orange
Hydrochloric acid (Specific gravity 1.16)	Yellowish brown
Sulphuric acid (80%)	Red
Acetic acid (Glacial)	Yellowish green
Iodine solution	Bluish black
Antimony trichloride	Yellowish brown
Ferric chloride	Bluish green
Sodium hydroxide (1N aqueous)	Brown

ISSN: 0975-8585

Table -5 Fluorescence characteristics of the powdered sample of *Feronia elephantum* Linn under UV light

Treatment	Color
Powder as such	Yellowish brown
Powder with dilute nitric acid	Orange
Powder with sodium hydroxide in methanol	Greenish black
Powder with sodium hydroxide in methanol dried and mounted with nitro cellulose	Brownish black
Powder with sodium hydroxide in water	violet
Powder with sodium hydroxide in water dried and mounted with nitro cellulose	Black
Powder with Hydrochloric acid	Dull yellow
Powder with Hydrochloric acid Powder with Hydrochloric acid dried and mounted with nitro cellulose	Greenish black
Powder with nitric acid diluted with equal volume of water	Yellowish green
Powder with dil sulphuric acid	Gray
Powder with antimony trichloride	Deep violet

RESULTS AND DISCUSSION

The detailed pharmacognostical evaluation would give valuable information for further studies, The present study gave a detailed report on its pharmacognostical characters such as macroscopical, microscopical studies that include histology of the stem and root bark (Fig 1 & 2). The extractive values and physical constant values are reported in the Table-1,2. The results of preliminary phytochemical tests for the presence of active constituents is reported in Table 3. The behaviour of the powdered drug on treatment with different chemical reagents and the fluorescence character of the same under UV light is shown in Table 4 & 5 respectively.

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