Available online at www.ijpcr.com
International Journal of Pharmaceutical and Clinical Research 2010; 2(1): 51-53

Research Article ISSN 0975 1556

Pharmacognostic Studies on The Leaf of *Ventilago maderaspatana* Graetn

Syeda Sanobar[1], Sandhya S[1*], Vinod KR[1], David Banji[1], Rao KNV[1], Narender Prasad D[1], Nema RK[2]

[1]*Nalanda College of Pharmacy, Nalgonda, Andhra Pradesh India*
[2]*Rishiraj College of Pharmacy, Sanwer Road, Indore, Madhya Pradesh, India*

ABSTRACT
The history of herbal medicine is extricably interwined with that of modern medicines. Many drugs listed as conventional medications were originally derived from plants. The plant *Ventilago maderaspatana* is commonly known as Red creeper. It is widely distributed through out the Indian forests. Traditionally it is used as stimulant, diabetes, scabies, tonic, skin disoders, fevers, dyspepsia. The whole plant is used for the treatment of asthma, jaundice, anorexia, spleenic disorders and Piles. In the present work Pharmacognostical standardization has been developed for the proper identification of the drug. The evaluations like microscopical and proximate studies were performed. The results obtained for the microscopical studies like T.S, powder analysis, leaf constants and fibre length and width measurements enables to compare an authentic material with any given sample of the drug. Various quantitative analysis like moisture content, ash values, extractive value can be set as parameter conforming the identity, quality, purity of the *Ventilago maderaspatana*.

Keywords: *Ventilago maderaspatana Gaertn,* stomatal index, proximate analysis, fluorescence analysis, palisade ratio.

INTRODUCTION

Herbal drugs constitute a major part in all the traditional systems of medicine. Herbal medicine is a triumph of popular therapeutic diversity. Plants above all other agents have been used for medicine from time immemorial because they have fitted the immediate personal need are easily accessible and inexpensive. [1] The plant *Ventilago maderaspatan* is commonly known as Red creeper belongs to the family *Rhamnaceae.* [2] The plant is large much branched woody climber in which the leaves are ovate or lancoelate. It is widely distributed in the scrub jungles of Papavinasanam at Tirumala, Horsely hills. [3] *Ventilago mederaspatana* is a climber which is found in dense forest of Nalamalai hills, which was used traditionally for various for the treatment of various diseases like diabetes, ulcers etc. The plant is constituted with isofuranonaphthaquinones, ventilone-c, ventiloquinones E, G, J, Eleuthrin, enantiopure 1, 3-dimethyl pyranonappthoquinones. [4-7] It is useful in vitiated conditions of kapha, dyspepsia, colic flatulence, erysipelas, leprosy, scabies, and pruritis.Traditionally it is used for curing many disorders like skin problems, fever, leprosy, diabetes and also it is a good tonic, stomachic, digestive and carminative. [11] Though the plant is widely used for multiple property, it has not been standardized Pharmacognostically.

***Corresponding author: Mrs. Sandhya S,**
Nalanda College of Pharmacy, Nalgonda, Andhra Pradesh India; **E-mail:** sanpharm@gmail.com

Hence an attempt has been made to standardize the leaf from the pharmacognostic point, as these studies stand as evident proof for confirming its identity, authenticity and purity of the plant.

Ventilago maderaspatana is a large, woody, ever green climber, with branches hanging down in festoons. Bark is dark grey in colour with vertical cracks exposing the vermillion inner bark surface.Young branches are grey. Pubescent and older branches are dark grey and glabrous. Leaves are alternate, oblong –lanceolate or elliptic – ovate to orbicular, pubescent beneath when young, base generally rounded, apex acute or sub-acuminate, margins or crenate; lateral nerves 4 to 8 pairs, ascending and covering near the margin. Inflorescence is axillary and terminal panicles minutely grey pubescent, occasionally with leafy bracts. Flowers are terminal or axillary, cymose reacemer or cymose**,** panicle across, yellowish-green,with an Offensive odour, Unisexual flowers, 5-15 cm, Calyx tube pubescent; numerous 3 to 5. Reproduction is through pollination Fruits are subglobose nut 5 to 7 mm in diameter, yellow to grey, enclosed in a persistent calyx rim to about the middle and prolonged in to a linear pubescent wing. Seeds are globose, thin walled brown. [8-11]

MATERIALS AND METHOD

The plant was identified and authenticated by Dr. Madhava Chetty Asst professor, Dept of Botany, Sri Venkateshwara University Tirupati. Prepared herbarium was submitted and

the plant was certified as *Ventilago maderaspatana* Gaertn Family: *Rhamnaceae*.

Transverse section of leaf [12]

A thin T. S was taken by free hand using a sharp razor blade. Phuloroglucinol and hydrochloric acid in the ratio 1:1 was used as a stain and mounted on a glass slide and focused under a microscope.

Powder analysis of leaf

Shade dried leaves of the plant was powdered with the help of a electric grinder till a fine powder was obtained .This fine powder was subjected to powder microscopy using equal quantities of phuloroglucinol and hydrochloric acid as the stain.

Fluorescence analysis

The leaf powder was mixed with different types of solvents like 1 N hydrochloric acid, 50 % sulphuric acid, 40 % sodium hydroxide, 40 % sodium hydroxide-ethanol.

Determination of leaf constants

The different parameters like stomatal number, stomatal index, vein islet number, vein termination number and palisade ratio was determined as per standard procedure.

Proximate analysis [13]

The various physicochemical parameters like ash values, extractive values, and crude fibre content was determined.

Measurement of length and width of fibre

The experiment was performed as per the standard procedures.

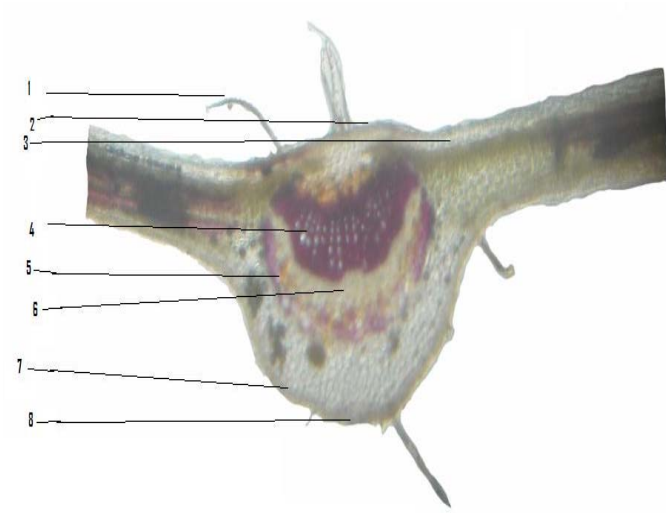

Fig. 1: T.S of the leaf
1.Trichome, 2.Cuticle, 3.Palisade cells, 4.Xylem, 5.Pericyclic layer, 6.Phloem, 7.Collenchyma, 8.Epidermal cells

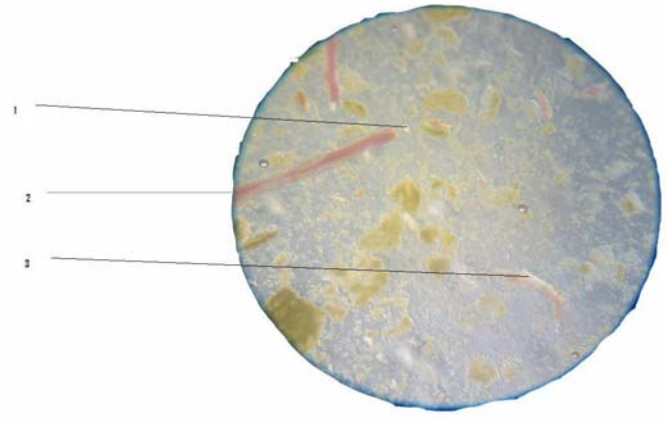

Fig 2: Powder microscopy of Leaf
1. Calcium oxalate crystals, 2.Lignified fibres, 3.Trichomes

Table 1: Flourescence analysis

	Ordinary Light	UV Long	UV Short
Powder as such	Green	Green	Dark green
Powder + 1 N HCl	Yellowish green	Blackish green	Dark green
Powder + 50 % sulfuric acid	Brownish black	Black	Dark green
Powder + 40 % NaOH	Yellowish green	Dark green	Greenish yellow
Powder + 40 % NaOH-ethanolic	Dark green	Blackish yellow	Green

Table 2: Determination of leaf constants

Palisade ratio:	Upper surface 5.5.i.e; 1:5. Lower surface: 3.5 i.e:1:3
Vein islet Number:	3
Vein Termination Number:	6
Stomatal Number	Upper Surface: 3 Lower surface: 5
Stomatal Index	Upper surface: 42.8-50.0 Lower surface: 55.5-60.0

Table 3: Proximate analysis

Moisture content	Not more than 7
Solubility	Completely soluble in alcohol, partially soluble in water
Ash values	Total ash: 20 % acid insoluble ash: 7.55 % water soluble ash: 25 %
Extractives	Water soluble extractive: not less than 32 % w/w, Alcohol soluble extractives not less than 6.2 % w/w
Crude fibre content	15.35 residue (Dutch method)

Table 4: Measurement of fibre

Length of fibre	42.9-104 μm
Width of fibre	4.8-17.6 μm

RESULTS AND DISCUSSION

Transverse section

A thin T. S of leaf showed dorsiventral nature. The following tissues were observed under lamina and midrib region (Fig. 1).

Lamina

Upper epidermis: It consists of a thin layer of thick cuticle followed by a single layer of epidermal cells. Thick unicellular covering trichomes with pointed apex were observed. Few anomocytic type of stomata were present on the upper epidermis.

Mesophyll: It is differentiated into palisade and a spongy parenchyma..Single layer of elongated palisade cells were seen below the upper epidermis. Calcium oxalate crystals were present in the spongy parenchymatous cells. 3-4 layers of spongy parenchymatous cells were observed.

Lower epidermis: It was found to be similar to that of upper epidermis. Trichomes and stomata were present in more in lower epidermis than the upper epidermis.

Midrib

Below the upper epidermis & above the lower epidermis collenchymas cells were present. Below the upper epidermis 3 layers of collenchymas cells were seen and above the lower epidermis 5 layers of collenchyma cells were seen.

Arc shaped vascular bundles were present with which were surrounded by pericyclic fibers. Xylem towards the ventral surface and phloem towards the dorsal surface. Collateral type of vascular bundles was observed.

Powder microscopy

When observed under microscope this revealed the presence of calcium oxalate crystals, lignified fibres and trichomes (Fig. 2).

Fluorescence analysis

Different colour ranges were obtained for the leaf powder in different reagents (Table 1).

Determination of leaf constants

The leaf constants like palisade ratio, vein islet and termination number, stomatal number and index were obtained and is tabulated in Table 2.

Proximate analysis

The values of ash values and extractive values are given in Table 3.

Measurement of length and width of fibre (Table 4)

The detailed microscopical examinated (T.S., Powder microscopy, length & width of fibre) showed that the leaf has a dorsiventral nature with unicellular covering trichomes and pericyclic fibers as it its main tissue of diagnostic importance. Anomocytic type of stomata & calcium oxalate crystals were observed.The powder fluorescence showed different colors in ordinary, long &short wavelength (Table 1). These parameters can be used as diagnostic feature for the easy identification of the plant. The leaf constants stomatal index, stomatal number, palisade ratio were analyzed for both upper & lower leaf surfaces (Table 2). The quantitative physical analysis were total ah value, acid insoluble ash value, moisture content were done and the results were calculated (Table 3). The information obtained for ash is useful during the time of collection of leaves from the plants and also during the extraction process. The measurement values for the length and breadth of the phloem fibres (Table 4) will assist in identifying the presence of contamination. These values are limits to help identify samples of genuine drug.

ACKNOWLEDGEMENT

The authors are thankful to the management of Nalanda College of Pharmacy for their constant encouragement and support in carrying out this work in the Pharmacognosy laboratory of the college.

REFERENCES

1. Pullaih T. Flora of Andhra Pradesh.Vol. 1, Scientific publishers, Anantapur, 1997, pp. 206.
2. Indian Medicinal Plants. Vol. 5, Orient Longman, Chennai, 2004, pp. 352.
3. Hanumantaiah T. Synthesized ventilone-c from the roots of *Ventilago maderaspatana* Gaertn. *Tetrahedron* 1985; 45: 635-642.
4. Charles B. Synthesized and confirmed that structures of the Ventiloquinones E, G & J with the compounds isolated from the root bark of *Ventilago maderaspatana*. *J. Chem. soc. Perkin Trans*. 1991; 1: 2743-2748.
5. Leonic M. Synthesized enantiopure 1.3-dimethyl pyranonappthoquinones, including ventiloquinones E, G, L & elutherin. *J. Org. Biomol. Chem*. 2006; 4: 3311-3318.
6. Robin. Synthesized Ventiloquinone F & isoventlone F from roots of *V. Maderspatana* as by condensation and addition of mercury as main steps. *European J. org. chem*. 2004; 21: 4416-4423.
7. Kapoor LD. Ayurvedic Medicinal Plants; Edn 1, CRC Press, Mumbai, 2005, pp. 2-4.
8. Chetty M. Flowering Plants of Chittor District. Edn 1, Students Offsets Printers, Tirupati, 2008, pp. 68.
9. Khare CP. Indian Medicinal Plants. Edn 1, Rajkamal Electric Press, New Delhi, 2007, pp.697-698.
10. Gamble JS. Flora of Residency of Madras. Vol.1, Shiva Offset Press; Dehradun, 2005, pp. 217-218.
11. Nandkarni AK. Materia medica. Edn 2, Vol.1,Tarun Enterprises, 2000, pp. 266.
12. Khandelwal KR. Practical Pharmacognosy. Edn 5, Nirali prakashan, Pune, 2005, pp.149-154.
13. Kokate CK. Practical Pharmacognosy. Edn 4, 2003; Vallabh Prakashan, New Delhi, 2003, pp. 122-126.