

PHARMACOGNOSTICAL AND PHYTO-CHEMICAL STUDY OF *PARIBHADRA PATRA (Erythrina indica Lam.)*

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ABSTRACT

Paribhadra, one of the easily available drug in Ayurveda. Botanically identified as *Erythrina indica* Lam. belonging to leguminaceae family. It is a thorny deciduous tree growing 60 feet tall. The present work includes an exploration of morphology, qualitative and quantitative microscopy and phytochemical screening of *Erythrina indica* Lam. The powder microscopy revealed that, it has included paracytic stomata, xylem vessels, calcium oxalate crystals and lignified pericyclic fibres. Phytochemical analysis showed the presence of phytoconstituents like alkaloids, flavonoids, sterols, triterpenoids and carbohydrates. This study would provide a way for further research.

KEYWORDS: *Erythrina indica*, Paribhadra, Patra, Pharmacognosy, Phytochemical etc.

INTRODUCTION

Paribhadra is one of the important drugs in Ayurveda. Different parts of the plant are used in various medicinal purposes. *Erythrina indica* Lam. is a medium-sized, spiny, deciduous, quick growing tree normally reaching up to 60 feet height¹. The leaf is widely used for its analgesic, antipyretic, anthelmintic, and emmenagogue properties². Various properties and uses of the drug Paribhadra have been described in Ayurvedic texts and various Nighantus like Raja Nighantu, Kaideva Nighantu, Madanapala Nighantu and Bhavaprakasha Nighantu. Sushruta mentioned its different usages for preparing the *Kshara*³, in the treatment of *Udakameha*⁴, *Krimi*⁵, *Vata vyadhi*⁶ and as *ksharagada* in *Visha*⁷. Its leaves have a cathartic, diuretic, antiseptic and anti-inflammatory action. The alkaloids

extracted from the leaves of *Erythrina indica* Lam. are reported to have anti-inflammatory and analgesic activity.

MATERIALS AND METHODS

Collection:

Leaves of *Erythrina indica* Lam. was botanically identified and collected from the herbal garden of K.V.G Ayurveda Medical College and Hospital, Sullia, Karnataka. Collected leaves are washed thoroughly in water, dried under shade and micropulverised as per rules of GMP to obtain fine powder.



Photograph No. 01: Leaf of *Erythrina indica* Lam.

Pharmacognostical studies:

Morphology of fresh leaves of *Erythrina indica* Lam. was observed. Transverse sections of fresh leaves were taken and stained, observed under electronic microscope. The leaves were dried under shade, finely powdered, stored in airtight containers and used for powder study and quantitative microscopy.

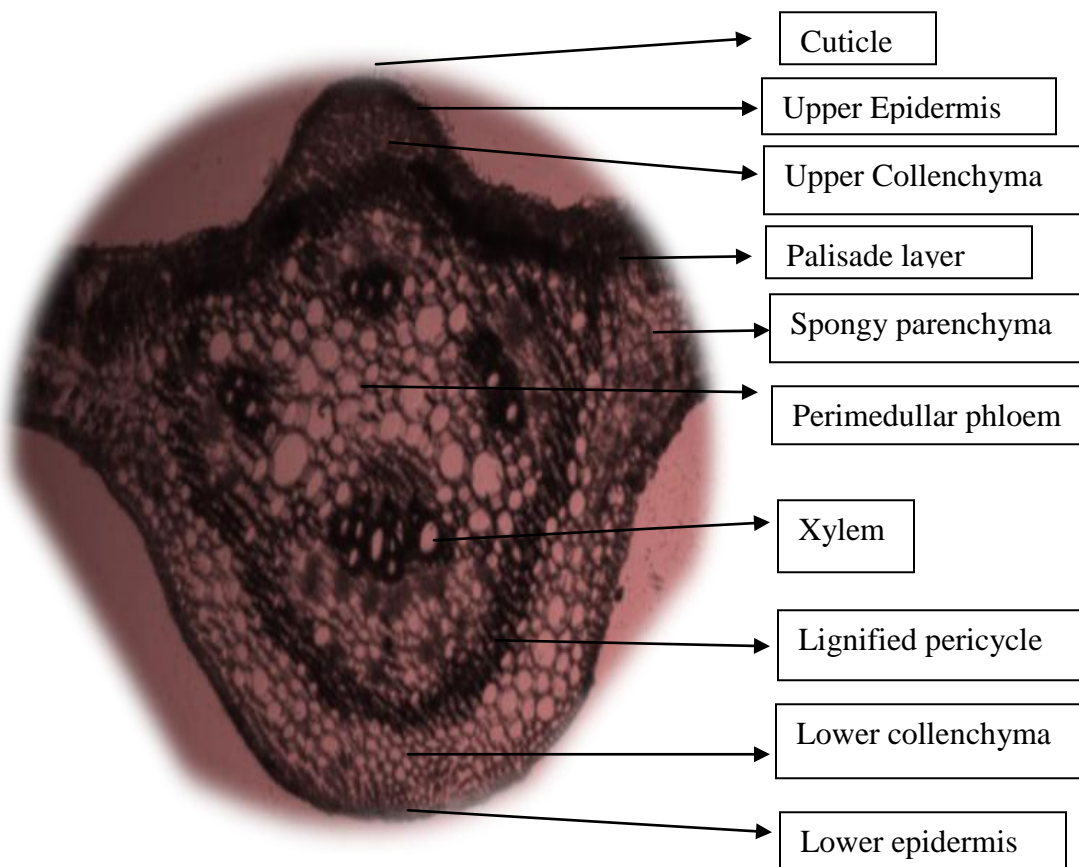
Phytochemical study:

The powder was extracted with 50ml each of water, ethyl alcohol, petroleum ether and chloroform for 30 minutes at 50°C. Various phytoconstituents present in the leaves were detected by their respective chemical test using the appropriate extracts¹⁰⁻¹⁵.

OBSERVATIONS AND RESULTS

1. PHARMACOGNOSTICAL STUDY

Photograph No. 02: Transverse section of leaf



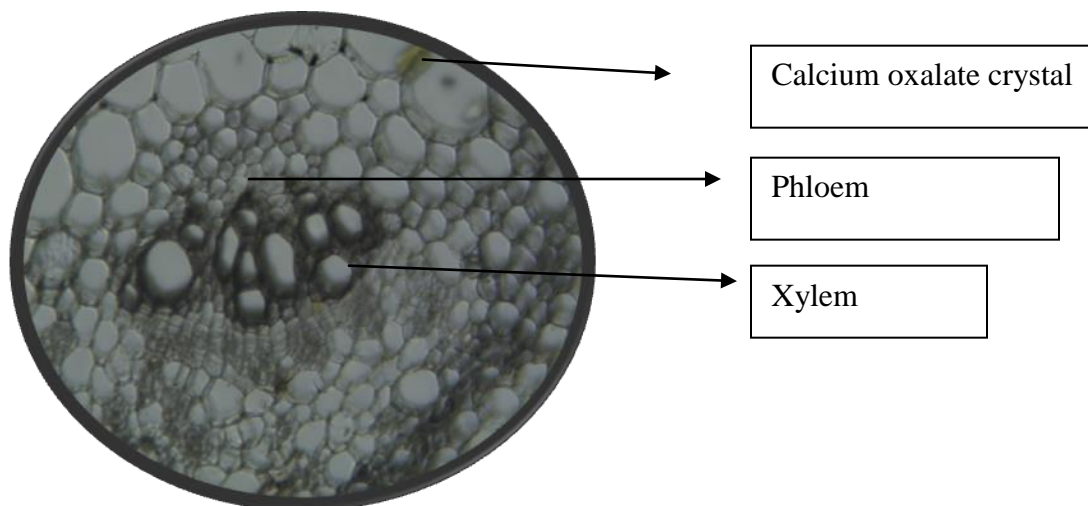
a) Macroscopic study:

The leaves of *Erythrina indica* Lam. was studied macroscopically in the Dravyaguna laboratory of K.V.G.A.M.C, Sullia. Leaves trifoliate, alternate, bright emerald-green, on long petioles 6-15 cm, rachis 5-30 cm long, prickly; leaflets smooth, shiny, broader than long, 8-20 by 5-15 cm, ovate to acuminate with an obtusely pointed end. Leaf petiole and rachis are spiny⁸.

B) Microscopic study:

The transverse sections (T.S) of leaf and bark of *Erythrina indica* Lam. were taken and photomicrography was done after proper mounting and staining in K.V.G.A.M.C, Sullia under the guidance of Botanist⁹.

Photograph No. 03: Transverse section of leaf showing vascular bundle



T.S of the leaf of *Erythrina indica Lam.* showed thick walled epidermal cells and paracytic stomata. Lamina shows an upper epidermis, which is covered by a thin cuticle. Below the upper epidermis, single-layered, compact, radially elongated palisade parenchyma cells followed by spongy mesophyll which is composed of 2-3 layers of loosely arranged parenchymatous

cells. Midrib consists of well-developed collenchyma beneath the epidermis. Stele contains bicollateral vascular bundles, lignified pericyclic fibre, perimedulary phloem and the xylem. Ground tissue consists of loosely arranged polygonal parenchymatous cells. Parenchymatous cells contain prism crystals of calcium oxalate. There was no trichome.

A) Powder microscopy:

Powder microscopy of *Erythrina indica Lam.* was done in Care Kerala, Thrissur.

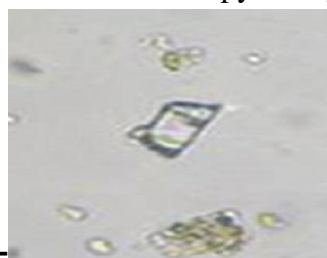


Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

Photograph No. 04: Powder microscopy

Figure 1: Calcium oxlate crystals.

Figure 2: Epidermal cells containing palisade cells.

Figure 3: Lignified vessels

Figure 4: Unicellular trichomes.

Figure 5: Rectangular parenchyma cells.

1.PHYTOCHEMICAL STUDY:

The powder was extracted with 50ml each of methanol and water for 30 minutes at 50°C. The following phytoconstituents were detected in the leaves⁽¹⁰⁻¹⁵⁾:

1) ORGANOLEPTIC EVALUATION:

Organoleptic characteristics of leaf powder:

- Color : Dark green.
- Odour : Unpleasant.
- Taste : Pungent and bitter.
- Texture : Smooth

2) PHYSICAL EVALUATION:

Table 1: Showing the results of physical analysis of leaf:

Table 2: Showing results of chemical analysis of leaf powder: Organic compounds.

SL No	Tests	Aqueous	Ethyl Alcohol	Petroleum Ether	Chloroform	
1	Carbohydrate	Molisch's	-ve	+ve	+ve	-ve
		Fehling's	-ve	+ve	+ve	-ve
		Benedicts	-ve	+ve	+ve	-ve
2	Starch		-ve	-ve	-ve	-ve
3	Proteins	Biuret test	-ve	-ve	-ve	-ve
4	Amino-acids	Ninhydrin test	-ve	-ve	-ve	-ve
5	Steroids	Salkowski reaction	-ve	-ve	-ve	-ve
6	Flavanoids	Shinoda test	+ve	+ve	+ve	+ve
		Alkaline reagent test	-ve	-ve	+ve	+ve
		Lead acetate test	-ve	+ve	+ve	-ve
7	Glycosides	Keller killiani test	-ve	-ve	-ve	-ve
8	Saponins	Foam test	-ve	-ve	-ve	-ve

Parameters	Values
Moisture content % at 105° C	9%
Total ash value	30.12%
Acid insoluble ash	59.8%
Water soluble ash	46.75%
Water soluble extractive	46.75%
Alcohol soluble extractive	75%
Petroleum ether Extractive value	34.5%
Chloroform extractive value	43.1%
Total % of foreign matter	Nil
p ^H	7.2
Loss on drying	0.92%

3) CHEMICAL EVALUATION:

Preliminary phytochemical screening:

The results obtained after the phytochemical analysis of the aqueous, petroleum ether, ethyl alcohol and Chloroform extracts of *Erythrina indica* Lam. were as follows,

9	Alkaloids	Mayer's	-ve	-ve	-ve	+ve
		Hager's	-ve	-ve	-ve	+ve
		Wagner's	-ve	-ve	-ve	-ve
		Dragendroff's	-ve	-ve	-ve	+ve
10	Tannins and Phenolics	5% FeCl ₃	+ve	+ve	-ve	-ve
		Lead acetate	+ve	+ve	-ve	-ve

Table 3: Showing results of chemical analysis of leaf powder: Inorganic compounds:

Inorganic constituents	Result
Calcium	+
Magnesium	+
Sodium	+
Potassium	+
Iron	+
Sulphates	+
Phosphates	+
Carbonates	+

DISCUSSION

Erythrina variegata is the synonym of *Erythrina indica* Lam. It is a medium sized, quick growing tree, distributed widely in deciduous forests throughout India and also grown in gardens as an ornamental plant. *Erythrina suberosa* and *Erythrina stricta* are reported to be used as substitutes of *Erythrina indica* Lam. The leaves of *Erythrina indica* Lam. are if applied locally, used to kill worms in sores, relieve the joint pain. Fresh juice of the leaves is used to treat earache and tooth ache. The leaf juice is mixed with equal quantity of castor oil used for acute dysentery.

CONCLUSION

The present work deals with the macroscopic, microscopic and phytochemical evaluation of the leaves of

Erythrina indica Lam. The morphological features of leaf was observed and noted. Transverse section of leaf was taken and the cuticle, upper epidermis, palisade parenchyma cells, and spongy mesophyll, which is composed of parenchymatous cells were noted. There was well-developed collenchyma in midrib. Bicollateral vascular bundles, lignified pericyclic fibre, perimedullary phloem and the xylem were seen in stele. Ground tissue consists of loosely arranged polygonal parenchymatous cells. Parenchymatous cells contain prism of calcium oxalate crystals. Powder microscopy of leaf revealed the presence of calcium oxalate crystals, epidermal cells containing palisade cells, lignified vessels, multicellular trichomes and rectangular parenchyma cells.

Phytochemical analysis showed the presence of phytoconstituents like carbohydrate, flavanoids, alkaloids, tannins and phenolics, which shows the clear indication that, the leaves can be used in treating different diseases.

REFERENCES

1. Anonymous, Wealth of India, Vol 3, Raw materials, Ph-Re, National Institute of Science and communication and information resources, Council of Scientific and Industrial research, New Delhi, India, p-197.
2. Khare CP. Indian Medicinal Plants: An Illustrated Dictionary. Springer, New York 2007; 246-247.

3. Sushruta, Sushruta Samhita, with the Nibandhasangraha commentary of Sri. Dalhanacharya, edited by Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia, Varanasi, 8th Edition, 2005, p-46.
 4. Sushruta, Sushruta Samhita, with the Nibandhasangraha commentary of Sri. Dalhanacharya, edited by Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia, Varanasi, 8th Edition, 2005, p-452.
 5. Sushruta, Sushruta Samhita, with the Nibandhasangraha commentary of Sri. Dalhanacharya, edited by Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia, Varanasi, 8th Edition, 2005, p-774.
 6. Sushruta, Sushruta Samhita, with the Nibandhasangraha commentary of Sri. Dalhanacharya, edited by Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia, Varanasi, 8th Edition, 2005, p-423.
 7. Sushruta, Sushruta Samhita, with the Nibandhasangraha commentary of Sri. Dalhanacharya, edited by Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia, Varanasi, 8th Edition, 2005, p-580.
 8. Anonymous, Wealth of India, Vol 3, Raw materials, Ph-Re, National Institute of Science and communication and information resources, Council of Scientific and Industrial research, New Delhi, India, p-197.
 9. Khandelwal KR, Kokate CK and Gokhale SB. Practical Pharmacognosy Techniques and Experiment. Nirali Prakashan, Pune 1996; 100-148.
 10. Anonymous. Quality Control Methods for Medicinal Plant Materials. World Health Organization, Geneva 2002; 28-33.
 11. Feigl F. Identification of individual organic compound in spot test in organic analysis. Elsevier, London 1956; 237- 245.
 12. Fishcher R. Praktikum der pharmakognosic, 3rd edition. Springer, Berlin 1952; 362-364.
 13. Geissman A. Modern methods of plant analysis, Vol III. Peach K, Tracy MV eds. Springer, Berlin 1995; 434-473.
 14. Harborne JB. Phytochemical methods, 2nd edition. Chapman and Hall, London 1973; 42- 131.
 15. Robinson T. The organic constituents of higher plants, their chemistry and interrelationships. Burgers, Minneapolis 1964; 64-66
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- Source of support: Nil
Conflict of interest: None Declared
- Cite this article as**
Dr. Soumyashree K.M: Pharmacognostical and Phyto-Chemical Study of Paribhadra Patra (*Erythrina Indica Lam.*). ayurpub; V(3): 1489-1494