

A Comparative Pharmacognostical Study of two varieties of flowers of Palash (*Butea monosperma* Lamk. Taub) Rakta Palash and Pita Palash

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Abstract

The Palash (*Butea monosperma* Lamk. Taub.) belonging to family Fabaceae is used for therapeutic uses since ancient time. Most of the regions of India, it is used for worship of god as well as in many festivals. Palash is pungent (katu), bitter (tikta) and astringent (kashay) in taste (Rasa), and its vipaka is katu and veerya is ushna. It alleviates kapha and vata doshas, but aggravates the pitta doshas. The flowers of Palash are bitter (tikta), pungent (katu) and astringent (kashay) in test (Rasa), madhur vipaka and sheeta veerya. So it alleviates pitta and kapha dosha and vata doshas. Narahari has mentioned the four types of Palash viz. Rakta (red), Pita (yellow), Shweta (white) and Nila (blue) in Raj Nighantu. The Rakta Palash (*Butea monosperma* (Lamk.) Taub) is commonly available all over India. Out of above varieties, Shweta and Nila are seldomly available and Pita is rare. The abundantly available Rakta variety is used commonly in medicines and is called as flame of the forest. Palash (*Butea monosperma* (Lamk.) Taub) has been widely used in the traditional Indian medical system of 'Ayurveda' for the treatment of a variety of ailments. It is very essentials to have a proper documentation of such useful medicinal plants. In this article an attempt to compile and document on Comparative Pharmacognostical Study of two varieties of flowers of Palash (*Butea monosperma* Lamk. Taub) Rakta Palash and Pita Palash.

Keywords: Palash (*Butea monosperma* Lamk. Taub.), Pharmacognosy, Rakta Palash flower, Pita Palash flower.

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1. Introduction

Palash (*Butea monosperma* Lamk. Taub)[1], is medium-sized deciduous tree, 10-15 meters high belonging to the family Fabaceae, is found throughout India. There are four type of Palash viz. Rakta (red), Pita (yellow), Shweta (white) and Nila (blue) as mentioned by Narahari in Raj Nighantu[2]. Out of above varieties, Shweta and Nila are seldom available and Pita is rare. As Pita variety becomes endangered the abundantly available Rakta variety is used commonly in medicines and it is called as flame of the forest [3]. It is the most important plant for Yajna (ritual) according to Vedic literature. In India, in most of the regions it used in worship of god. In many festivals it is

used in different way. According to an ancient science of life i.e. Ayurveda, there is always scientific theory behind celebrating any festivals and Acharyas have scientific view for using any drug as medicine. The use of Rakta Palash flowers used for 'Holi', i.e. festival of colour in India. The thought behind it was that, the colour prepared from flowers is natural, good for skin and has no any adverse effect. Though there is an evidence of the uses of Rakta and Pita Palash flowers in Ayurveda, there is need to prove its efficacy as per modern research methodology so as to make knowledge and properties of Palash flowers global. Standardization is the first step essential before

starting clinical and preclinical study. Therefore, in the present study, an attempt was made to compare *Pita Palash* flowers with *Rakta Palash* flowers pharmacognostically.

1.1 Aim and Objectives

Aim:

Comparative pharmacognostical study of flowers of *Rakta* and *Pita Palash*.

Objectives:

To study the pharmacognostical differences in flowers of *Rakta* and *Pita Palash*.

2. Material and methods

2.1 Collection of flowers of *Rakta* and *Pita Palash*:-

Flowers of *Rakta Palash* were collected in the month of February to April-2016 and *Pita Palash* flowers were collected from March to May-2016 from Wardha district (M.S.) [figure 1].

2.2 Storage of flowers

The flowers were allowed to shade dry, avoiding damaged by insects, flies and other contaminants [figure 2 and 3]. Later they were grinded into coarse and fine powder and stored in an airtight container for further study [figure 4 and 5]. Fresh flowers were used for macroscopical and microscopical study.



Figure 1: Flowers of *Pita* and *Rakta Palash*



Figure 2: Flowers of *Rakta Palash* without calyx



Figure 3: Flowers of *Pita Palash* without calyx



Figure 4: Powder of *Rakta Palash* flower



Figure 5: Powder of *Pita Palash* flower

2.3 Pharmacognostical evaluation

2.3.1 Macroscopic evaluation:

Colour, external features, texture etc. were examined for both flowers.[Table 1]

2.3.2 Microscopic evaluation:

Microscopic study of test drug, either in entire or powdered form, is one of the important aspects of its

histological evaluation. The arrangement of tissues in transverse and longitudinal sections and type of cells and cell contents are revealed by suitable histological study of a crude drug with an aid of a microscope. Microscopic characteristics are important for anatomical characteristics of organized drugs.

Materials:

Flowers of *Rakta* and *Pita Palash*, 50% glycerine, water, sharp razor blade, watch glass, thin painting brush, needles, forceps, glass slides, cover slips, blotting paper, dropper, compound microscope, microscope attach with Motic software installed in computer.

Procedure:

Fresh flowers of *Rakta* and *Pita Palash* were used for taking sections. Thin sections were taken of different parts of flowers by sharp razor blade and put into watch glass containing water. A thin uniform and entire section was selected and transferred on to a clean glass slide with the help of a brush. Section was mounted with 1-2 drops of 50% glycerine and covered with a clean cover glass. Excess glycerine was removed by blotting paper. The sections were treated with reagents like phloroglucinol, concentrated

hydrochloric acid were before examining. Slide was observed under microscope attached to Motic camera and images were taken in Motic software installed in computer [Table 2].

2.3.3 Powder microscopy:**Procedure:**

Studies were done on unstained powder to identify different structures present in powder such as trichomes; epidermal cells etc. and powders were stained with phloroglucinol (1% W/V in 90% alcohol) and conc. HCl to identify lignified tissues. The dimensions of different cellular characters were determined using Motic software installed in computer which is attached with microscope. Various features were traced with the Motic camera. Motic plus 2.0 images were taken.[Table no.2]

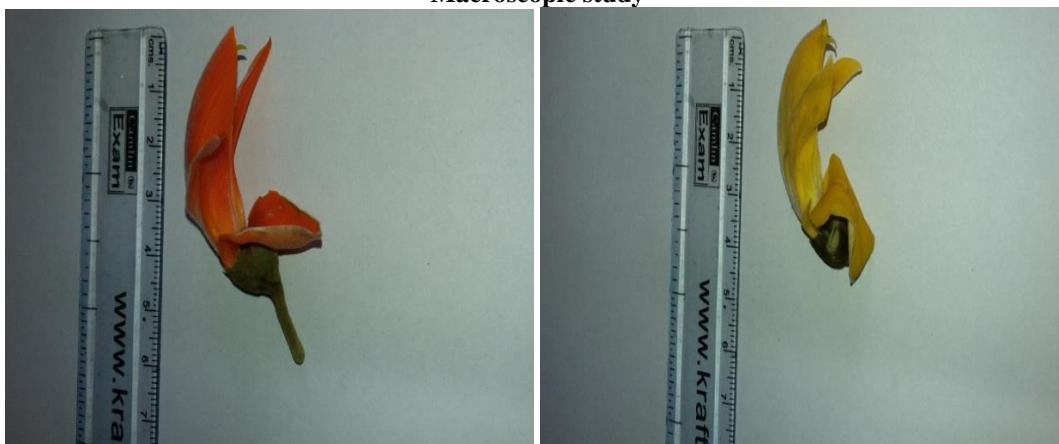
Macroscopic study

Figure 6: Flowers of *Rakta* and *Pita Palash*



Figure 7: Flowers, leaves and pods of *Rakta* and *Pita Palash*



Figure 8: *Rakta* and *Pita Palash* flowers soaked in water

3. Results

3.1 Pharmacognostical study

3.1.1 Macroscopical Study

Table 1: Results of macroscopic Study

Sr. No.	Characteristics of <i>Palash</i> flowers	<i>Rakta Palash</i> flowers	<i>Pita Palash</i> flowers
1	Inflorescence with buds and open flowers	3-4.5cm long, rigid racemes of orange (flame) colour	3-4.5cm long, rigid racemes of yellow colour
2	Bracts and bracteoles	Small	Small
3	Pedicels	1.6-2.4, Densely brown-velvety	1.6-2.4, Densely brown-velvety
4	Calyx	0.8to1.2cm long, dark brown colour	0.8to1.2cm long, dark brown colour
5	Cepals	5 campanulate, densely velvety outside, clothed with silky hairs within.	5 campanulate, densely velvety outside, clothed with silky hairs within.
6	Corolla	2to7cm	2to7cm
7	Petals	5, polypetal, unequal keel clothed outside with silky silvery hairs, orange coloured, keel semicircular, beaked, veined.	5, polypetal, unequal keel clothed outside with silky silvery hairs, yellow coloured, keel semicircular, beaked, veined.
8	Stamens	Stamens -10, diadelphous	Stamens -10, diadelphous
9	Anther	2 celled	2 celled
10	Carpel	Superior unilocular	Superior unilocular
11	Style	One	One
12	Stigma	One	One

Rakta and *Pita Palash* flowers have same macroscopical character except colour of flower i.e. colour of petals is Yellow of *Pita Palash* flowers and orange in *Rakta Palash* flowers.

3.1.2 Microscopical study

- **T.S. of petal** shows single layered, thin walled, epidermal cells, covered with numerous, unicellular, pointed trichomes and a few glandular hairs, thin walled, capitate or cone shaped papillae present on both surface, mesophyll consisting of thin walled, loosely arranged, parenchymatous cells, a large number of larger and smaller vein found scattered in this region, some of the cells contain oil globules.
- **L.S. of petal** show rosette cells, oil globules cell, trichome bearing cells.
- **T.S. of Ovary** -Ovary is monocarpellary with marginal placentation. The ovary all consists of an outer thick layer of rectangular or squarish epidermal cells. Inner to the epidermis, occurs thick darkly stained tannin –

containing layer of cells. The remaining portion of the ovary wall consist of thin –walled, rectangular compact parenchyma cells. The ovules are anatropous and bitegmic

3.1.3 Powder microscopy

Powder consist of fragments of petals in surface view with long and short unicellular trichomes, numerous entire and fragments of trichomes scattered as such in the powder. The petals bear dense epidermal trichomes. The trichomes were long, thin either straight or coiled the basal part was wide and the terminal part was tapering. Powder shows fragments of parenchyma, epidermis with stomatal cells, numerous, pointed, multicellular trichomes and oil globules and calcium oxalate crystals.

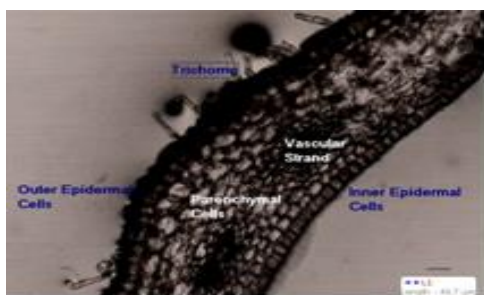


Figure 9: T.S. of Petal of Rakta Palash Flower



Figure 10: T.S. of Petal of Pita Palash Flower



Figure 11: L.S. of Petal of Rakta Palash Flower

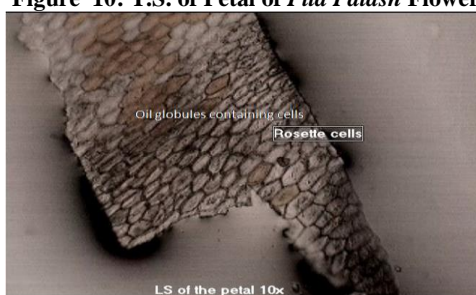


Figure 12 L.S. of Petal of Pita Palash Flower

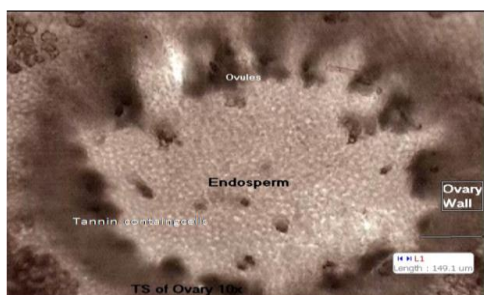


Figure 13: T.S. of Ovary of Rakta Palash Flower

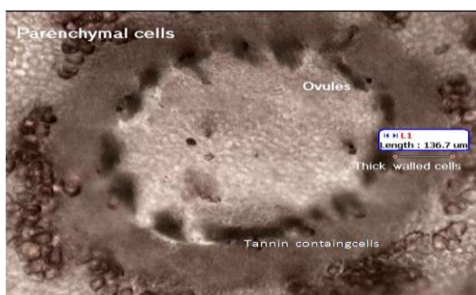


Figure 14: T.S. of Ovary of Pita Palash Flower

Microscopic study

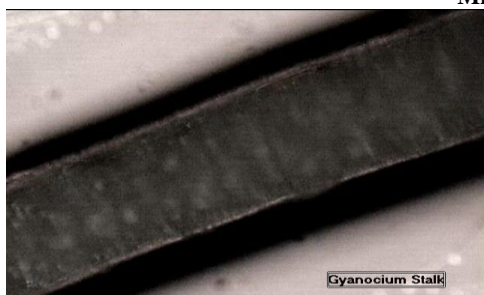


Figure 15: T.S. of Pollen Tube of Rakta Palash Flower

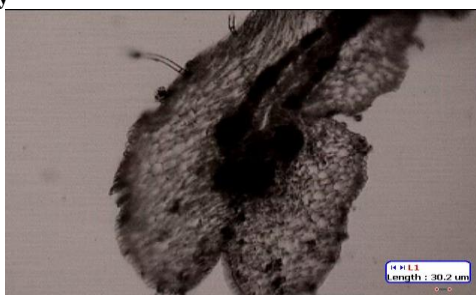


Figure 16: T.S. of Anther of Rakta Palash Flower

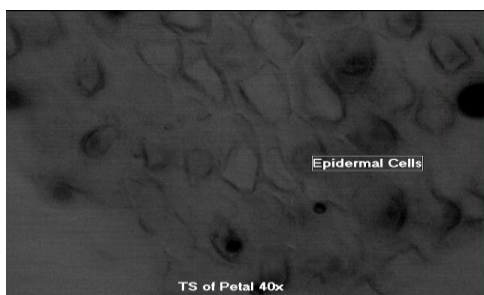


Figure 17: T.S. of epidermal cell(40x) of Rakta Palash Flower

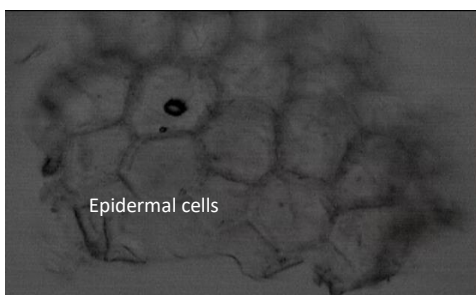


Figure 18: T.S. of epidermal cell(40x) Pita Palash Flower

Powder Microscopy

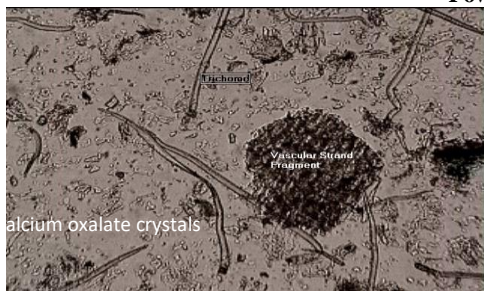


Figure 19: Rakta Palash Flower showing trichomes

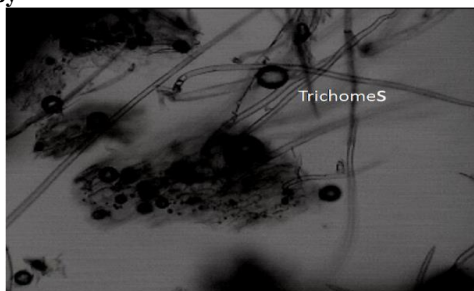


Figure 20: Pita Palash Flower showing trichomes



Figure 21: Rakta Palash Flower showing trichomes

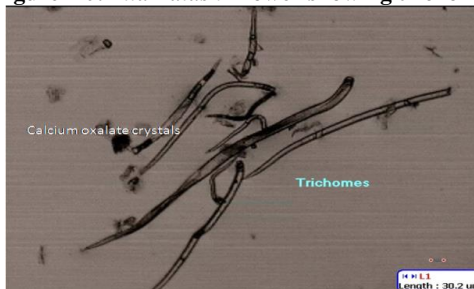


Figure 22: Pita Palash Flower showing trichome

Table 2: Results of microscopic study

Sr. No.	Study	Structures	Rakta Palash flowers	Pita Palash flowers
1	T.S of Petal[figure 9 and 10]	Epidermal cells	+	+
		Trichomes	+	+
		Parenchymal cells	+	+
		Vascular strands	+	+
	T.S of Petal(40x)[figure 17 and 18]	Epidermal cells	+	+
2	L.S. of Petal[figure 11 and 12]	Roset cells	+	+
		Trichomes bearing cells	+	+
		Oil globules cell	+	+
3	T.S. of Ovary [figure 13 and 14]	Endosperma	+	+
		Ovules	+	+
		Tannin containing cells	+	+
	Powder microscopy [figure 19, 22]	Trichomes	+	+
		Calcium oxalate crystals	+	+

4. Discussion

In Pharmacognostical study, *Rakta* and *Pita Palash* flowers have same macroscopical character except colour of flower i.e. colour of petals is yellow in *Pita Palash* flower and orange in *Rakta Palash* flowers [Table 1]. Epidermal cells, Parenchymal cells are observed in T.S. of Petal of both flowers. Oil globules cell are seen in L.S. of petals of both flowers and tannin containing cells were observed in T.S. of ovary of both flowers. T.S. of ovary shows ovules, endoderm and ovary wall in both flowers. In T.S. of *Pita Palash* flower specific pattern was observed. Trichomes are more in number in T.S. of petals of red flowers that means it is softer than *Pita Palash* flowers. One more observation was that *Pita Palash* flowers are light weighted than *Rakta Palash* flowers [Table 2].

Conflict of Interest: None

5. Conclusion

Morphology of both flowers is same except colour of petals of flowers. The microscopic study of the both flowers revealed the presence of trichomes, Tannin containing cells, oil globules containing cell. Internal structure shows changes in T.S. of petals. *Pita Palash* flower petals shows specific pattern in structure. Trichomes are similar in both flowers

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