



PHYTOCHEMICAL AND PHARMACOGNOSTICAL EVALUATION OF *PALASH PANCHANG* (*BUTEA MONOSPERMA* LAM. KUNTZ.)

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ABSTRACT

The present work deals with the pharmacognostical and preliminary phytochemical study of *Palash* (*Butea monosperma* Lam. Kuntz.) *panchanga* (Rootbark, stembark, leaf, flower and seed). The purpose of this study is to determine the medicinally active substances present in solvent –extracts from *Palash Panchanga*. The active substances were isolated by soxhlet extractor and identified by phytochemical test. The soxhlet extraction of *Palash Panchanga*, in coarse powdered form, was performed using petroleum ether and followed by ethanol. The evaluation of *Palash Panchanga* coarse powder was supported by physic-chemical analysis. Pharmacognostical parameter for *Palash Panchanga* were studied with the aim of drawing the pharmacopoeial standards for this species. TLC profile was also established.

Key words: Pharmacognostical, Phytochemical, *Palash Panchanga*.

INTRODUCTION

The use of Plants and animals as source of medicine and food is as old as humanity. One finds abundant references to use of plants as healing agents, both in works of Indian medicine and other works of antiquity like Papyrus Ebers(1550 B.C), works of Hippocrates(460-370 B.C), Aristotle(384-322 B.C), Theophrastus (370-287 B.C) [1]. Realizing the importance of medicinal plants as a natural source of newer medicines, now the world is moving towards the plant based medicine or phytomedicines that repair and strengthens bodily systems (especially the immune system, which can then properly fight foreign invaders) and help to destroy offending pathogens without toxic side effects. The major limitation of modern medicine, being its adverse effects has opened new doors to *Ayurveda*, where physicians of the traditional systems of medicine are using plants from many years. In developed countries too, people are seeking alternative to modern therapies. In order to make sure the safe use of these medicines, a necessary first step is the establishment of standards of quality, safety and efficacy. Keeping this fact in to consideration, the attempts were made to establish physicochemical standards of the plant. *Palash* is commonly known as Flame of forest, belonging

to the family Fabaceae. It is commonly found throughout the greater part of India, ascending the Himalayas up to 900m and in peninsular India up to 1,200m. It is rare or absent in most arid regions. The tree is very typical of open grassland, where it is frequently gregarious as in the Terai in North India. It grows in waterlogged situations, on black cotton soils, even on saline, alkaline and swampy badly drained soils, and on barren lands [2]. In literature, the *Butea monosperma* is known for several medicinal properties. *Palash* is well known plant in *Ayurveda*. It has been mentioned in *Vedas*, *Béhatrayí* and later it has been described in *NighaĒŌu*. The synonyms of *Palash* which are found in most of the literatures are *BrahmavrĀa*, *Kinshuka*, *Ksarashrestha*, *Parna*, *Yajniya*, *RaktapuŌpa*, *Samidvara* and *Vatapotha*³. In present work preliminary phytochemical and pharmacognostical study on *Palash* has been done.

MATERIAL AND METHODS

Palash panchanga (Rootbark, stembark, leaf, flower and seed) were collected by rural area of Varanasi and identified by the teacher of Dravyaguna department in Faculty of Ayurveda B.H.U Varanasi. Macroscopic and

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microscopic evaluation was carried out with different parts of plant. They were pulverized in the mechanical grinder to a moderate fine powder to carry out microscopic studies and were stored in a well closed airtight vessel for further analysis. All reagent and chemicals used for the study were of analytical grade.

PHYSICO-CHEMICAL EVALUATION -

In present work, preliminary phytochemical and pharmacognostical study on *Palash Panchanga* has been done.

- Macroscopic study of powder
- Microscopic study of powder
- Phytochemical study of powder

Preliminary Pharmacognostic Characteristics

Macroscopic characteristic of Palash: In present study, the *panchanga* of *Palash* were investigated for its macroscopic and microscopic characteristics.

Materials

- Coarse powder of *Palash panchanga*
- Petri dish.

Method

5 gm coarse powder was taken in a petri dish and examined with naked eye.

Microscopic characteristic of Palash

The coarse powder of *panchanga* of *Palash* were pulverized in to fine powder. The powder was investigated for their microscopic characteristics.

Materials

- Fine powder of *Palash panchanga*
- Chloral hydrate
- Plain water
- Microscope
- Slide & Coverslip
- Watch glass

Method

5 gm powder of *panchanga* of *Palash* was boiled separately with chloral hydrate solution in small quantity. Cleaved powder was removed in three separate watch glasses respectively and stained with one drop each of phloroglucinol and conc. HCL. A little of the treated powder was mounted in dilute glycerine and the slide was

observed under microscope at low power [4].

OBSERVATIONS

Preliminary Screening of Phytochemicals

The results demonstrated presence of Saponins glycosides, Volatile oils, Proteins, Amino Acid, Fat & Oils, Steroids flavonoids, Tannins and Phenolic Compounds, in *Palash*. The presences of various phytoconstituents in various extracts are summarized in table 5.

Thin Layer Chromatography (TLC) of Palash Extracts

Objective

- To separate the constituents using thin layer chromatography (TLC) method.
- To analyze and detect their spots using UV and spraying agents.
- To develop skills including use of solvent system for TLC separation method.

Material

- Extracts from lab
- Solvents; chloroform, methanol, diethyl ether, distilled water and acetic acid
- Aluminum TLC plate
- Developing tanks
- Spraying agent: 10% sulphuric acids
- Heating oven
- UV Lamp Detector.

RESULTS

The Hydro alcoholic extract of *Palash panchanga* was prepared. A large number of solvent systems were tried to achieve a good resolution. Finally the solvent system chloroform: methanol (5:1) ratio was selected for Hydro alcoholic extract. The three bands are appeared at Rf 0.8, 0.1 and 0.09 by kept TLC plate in Iodine chamber.

$$\text{Rf value} = \frac{\text{Distance travelled by the substance}}{\text{Distance travelled by the solvent}}$$

Spot	Rf Values
1	0.8
2	0.1
3	0.09

Table 1. Macroscopic characteristic of powder of rootbark of Palash

S. No	Parameters	Observation of seeds
1	Nature	Coarse powder
2	Colour	Brownish
3	Odour	Aromatic
4	Taste	Bitter
5	Texture	Rough & fibrous
6	Size	Uneven sized coarse particles

Table 2. Macroscopic characteristic of powder stembark of Palash

S. No	Parameters	Observation of seeds
1	Nature	Coarse powder
2	Colour	Brownish
3	Odour	Aromatic
4	Taste	Bitter
5	Texture	Rough & fibrous
6	Size	Uneven sized coarse particles

Table 3. Macroscopic characteristic of powder of leaves of Palash

S.No	Parameters	Observation of seeds
1	Nature	Coarse powder
2	Colour	Green
3	Odour	Aromatic
4	Taste	Bitter
5	Size	Uneven sized coarse particles

Table 4. Macroscopic characteristic of powder of flower of Palash

S.No	Parameters	Observation of seeds
1	Nature	Coarse powder
2	Colour	Yellowish orange
3	Odour	Aromatic
4	Taste	Bitter
5	Texture	Rough & fibrous
6	Size	Uneven sized coarse particles

Table 5. Macroscopic Characteristic of powder of seed of Palash

S.No	Parameters	Observation of seeds
1	Nature	Coarse powder
2	Colour	Brownish
3	Odour	Aromatic
4	Taste	Bitter
5	Texture	Rough & fibrous
6	Size	Uneven sized coarse particles

Table 6. Powder Microscopy of Rootbark of Palash

S.No.	Reagents	Observations	Characteristics
1.	Phloroglucinol+Conc. Hcl	Pink	Lignified Vessels
2.	Dil.Hcl	Orange	Rosette of Calcium oxalates & Medullary Ray
3.	Phloroglucinol+Conc.Hcl	Pink	Cork

Table 7. Powder Microscopy of Stembark of Palash

S.No.	Reagents	Observations	Characteristics
1.	Phloroglucinol+Conc. Hcl	Pink	Pericycle fibres, cork cells(Lignified)
2.	Dil.Hcl	Soluble	Calcium oxalate crystals
3.	Phloroglucinol+Conc.Hcl	Pink	Stone cells

Table 8. Powder Microscopy of Leaf

S.No.	Reagents	Observations	Characteristics
1.	Phloroglucinol+Conc. Hcl(1:1)	Red	Lignified vascular bundles
2.	Acetic acid	Crystal insoluble	Calcium oxalate crystals
3.	Dil. Iodine Solution	Blue	Endodermis
4.	Sudan Red	Red	Trichomes

Table 9. Powder Microscopy of Flower

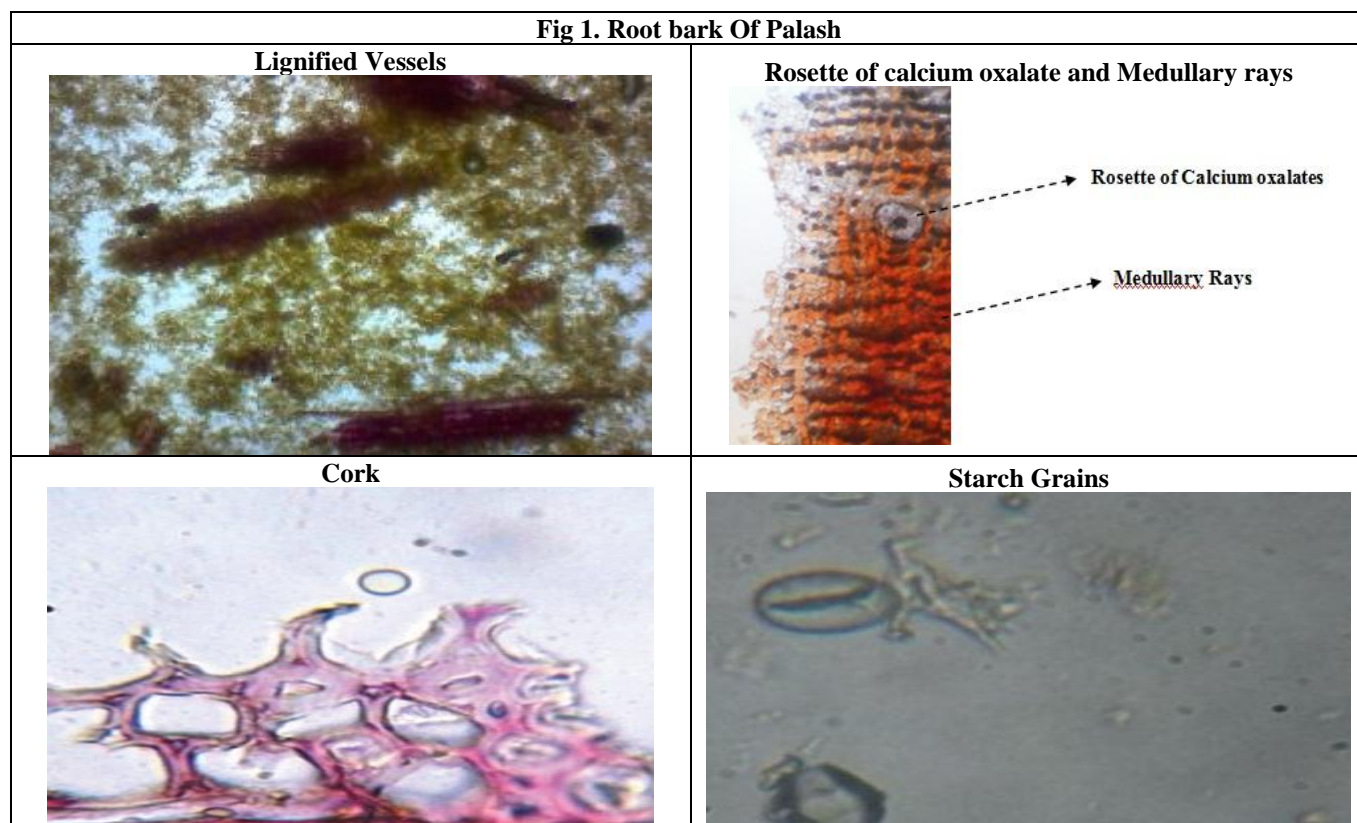
S.No.	Reagents	Observations	Characteristics
1.	Phloroglucinol+Conc. Hcl(1:1)	Pink	Vascular bundles & fibers
2.	Strong KOH solution	Blue	Pollen grains
3.	Dil. Hcl	Crystal soluble	Calcium oxalate crystals
4.	Strong KOH solution	Blue	Anther wall

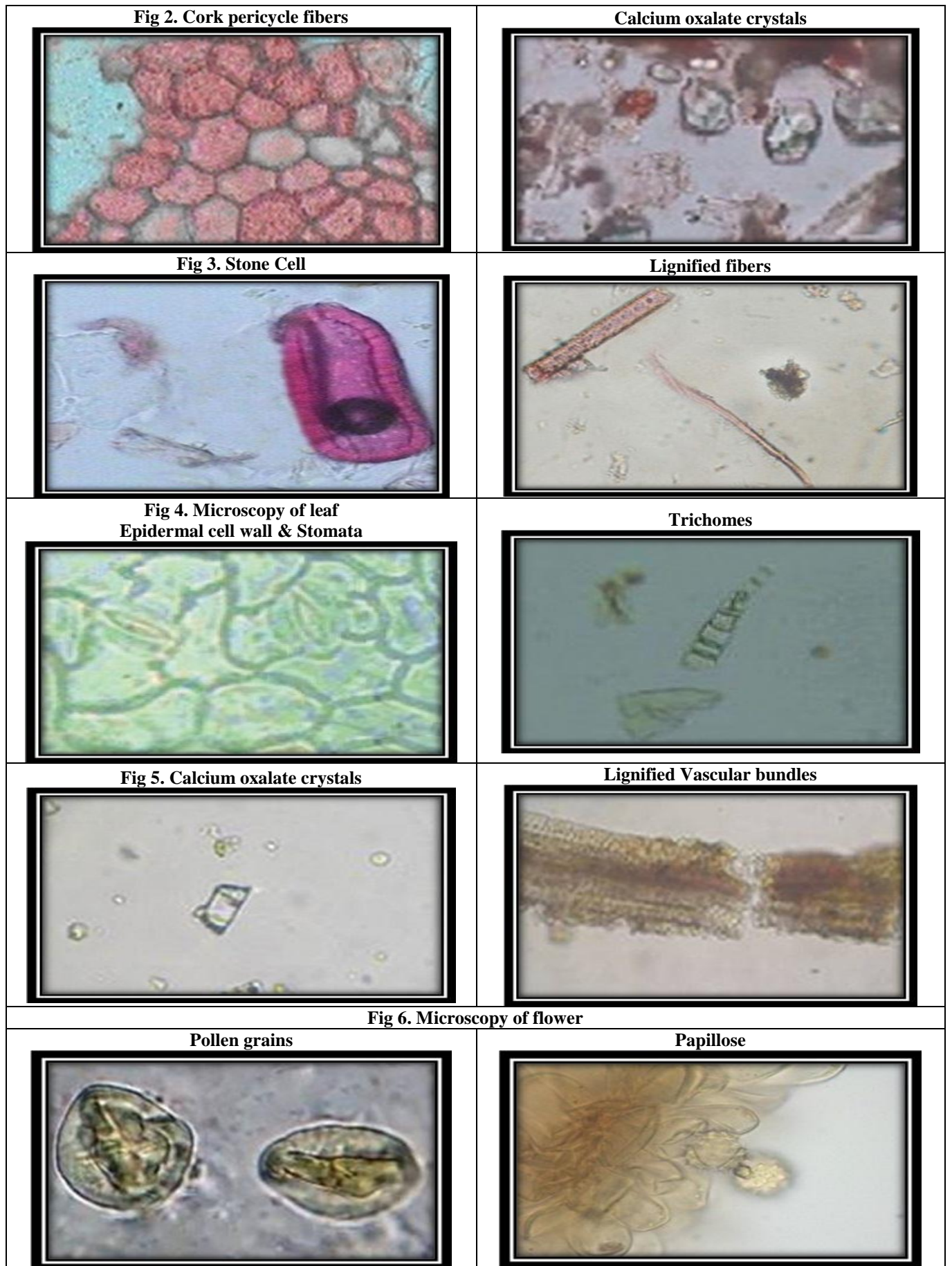
Table 10. Powder Microscopy of Seeds

S.No.	Reagents	Observations	Characteristics
1.	Phloroglucinol+Conc. Hcl(1:1)	Red	Vascular bundles
2.	Alcoholic picric acid	Yellow	Aleurone grains
3.	Dil. Iodine +Conc.H ₂ SO ₄	Blue	Hemicellulose Endospermic wall
4.	Sudan Red III	Pink	Oil globules

Table 11. Genuine sample of Palash gave the presence of following Phytochemicals:

S.No.	Test Sample	Alcoholic Extract	Hydroalcoholic extract
1.	Test for alkaloids		
	Dragendorff's test	+	+
	Hager's test	+	+
	Wagner's test	+	+
	Mayer's test	+	+
2.	Test for Carbohydrates		
	Anthrone test	+	+
	Benedict's test	+	+
	Fehling's test	+	+
	Molisch's test	+	+
3.	Test for Flavonoids		
	Shinoda's test	+	+
4.	Test for Proteins		
	Biuret's test:	-	-
	Millon's test:	-	-
5.	Test for Glycosides	+	+
6.	Test for Fats and oils	+	-
7.	Test for steroids	+	-
8.	Test for Tannins & phenolics	+	+
9.	Test for Amino acid	-	-
10.	Test for volatile oils	-	-





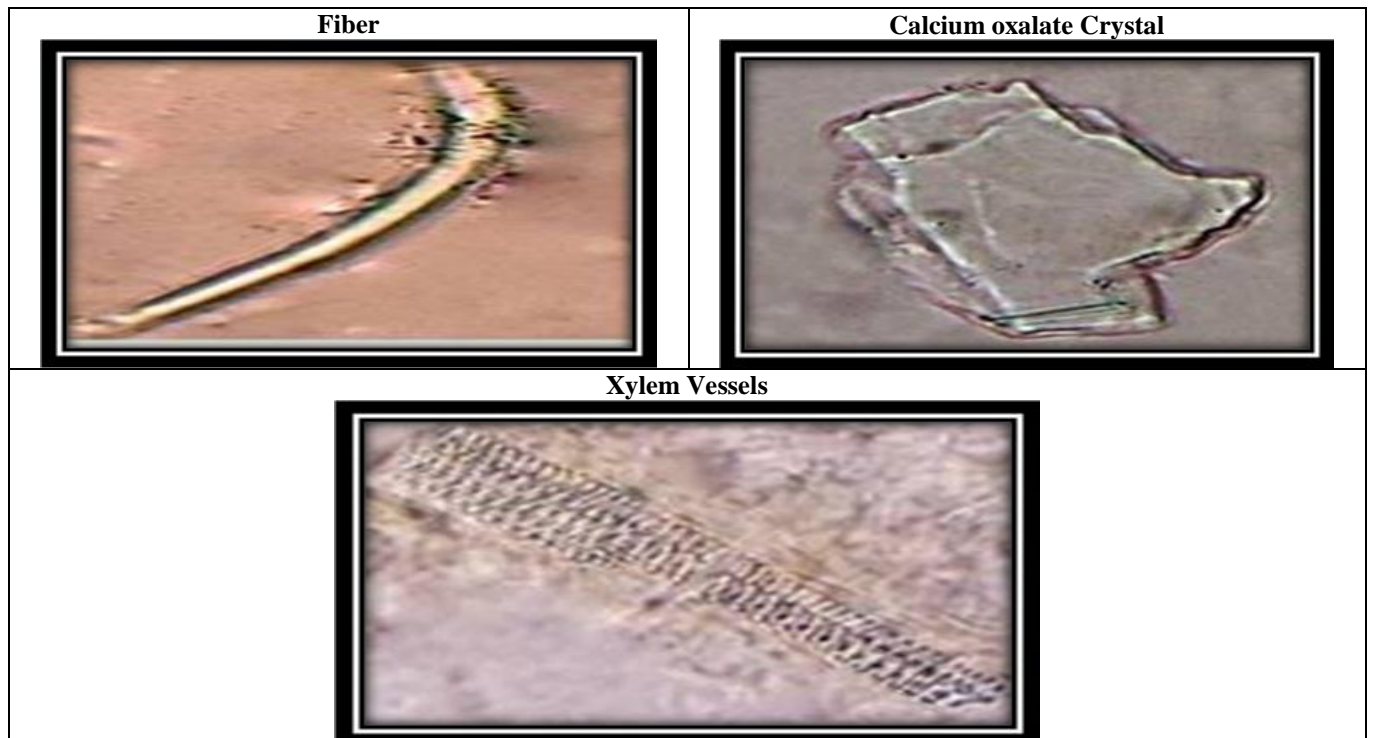
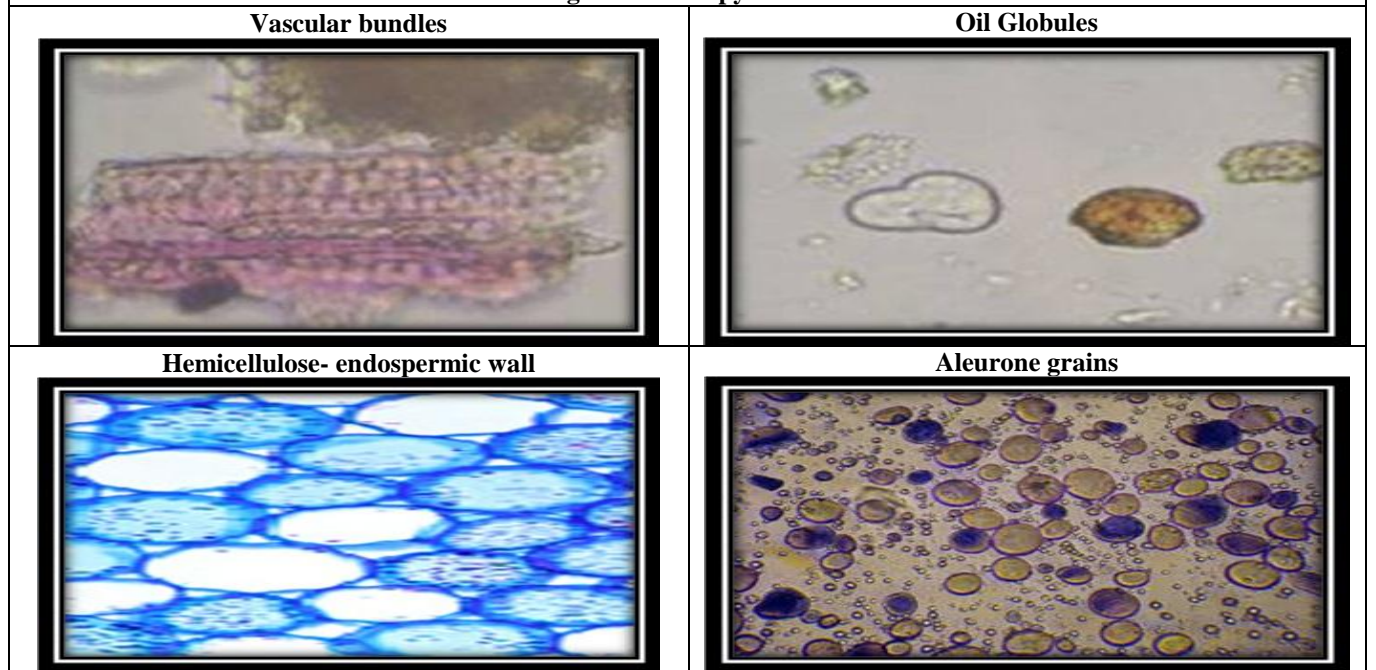
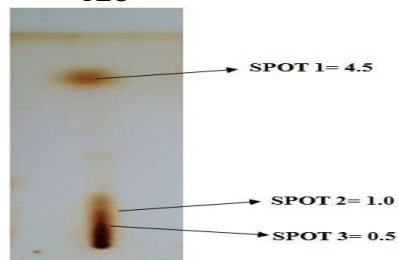


Fig 7. Microscopy of seed



TLC



$$R_f = \frac{\text{Distance travelled by solute}}{\text{Distance travelled by solvent}}$$

DISCUSSION AND CONCLUSION

Pharmacognosy' literally meaning the knowledge of pharmaceuticals has been a part of the medical arts and science since mankind first began to treat illness. Pharmacognosy research studies play an important role in identification of the authentic drugs. It is also meant by identification of drugs by its every aspect, habit, cultivation, procurement, micro and macroscopic characters, physical and chemical properties etc. In Powder microscopy study of stem bark of *Palash* shows pericycle fibres, cork cells, calcium oxalate crystals and stone cells. In powder microscopy study of flower shows vascular bundles & fibres, Pollen grains, calcium oxalate crystals and anther wall. In Leaf lignified vascular bundles, endodermis and trichome were found. In seed vascular bundles, oil globules, hemicellulose endospermic

wall and aleurone grains were found. In the phytochemical study, it was found that carbohydrates, flavonoides, alkaloids, glycosides, tannins and phenolic compounds was present in both alcoholic and hydroalcoholic extract but fat and oils and steroids was present only in alcoholic extract. Study was carried out in order to assess the quality of *Palash panchanga* and also to detect the adulteration and substitution etc., which may be helpful to researchers in future.

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