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PHYTOCHEMICAL AND ANALYTICAL EVALUATION OF *PALASH (BUTEA MONOSPERMA KOEN Ex. Roxb.)* FLOWER

GavitManishaPundlik[1], Wankhede RajeshTukaram[2], NirbhawaneJyotiDilip[3], GaikwadNitinShivaji[4]

[1,] Assistant professor, [2]-Associate Professor Dept. of Dravyaguna, [3]Assistant Professor, Dept. of Shalakyatantra, [4]Assistant Professor, Dept. Of Kriyasharir

SMBT Ayurved College, Dhamangaon, Nashik, Maharashtra, India

ABSTRACT

Palash (Butea frondosaKoen ex. Roxb syn.B.frondosa) is an important medicinal plant & it is well familiar since *vedickala*to the present era. It is deciduous tree belonging to the family Fabaceae, is found growing in many parts of India. All the parts of plant are highly medicinal with its mention in different systems of medicine.It is popularly known as Flame of the Forest. Any plant which is used medicinally requires detail study prior to its use because the therapeutic efficacy is absolutely depends on the quality of the plant drug used. So before using a drug it is very much essential to carry out its detailed study.The present study was conducted to evaluate physicochemical, phytochemical and HPTLC analysis of the *Butea frondosa* flowers.

Keywords: *Palash* flower,*Butea frondosa,* phytochemistry, high –performance thin layer chromatography

INTRODUCTION

Palash (Butea monosperma Koen ex. Roxb.)] is a medium-sized deciduous tree belonging to the family Fabaceae. It is commonly found throughout the greater part of the India upto about 915 m altitude.[1]It is commonly called the flame of the Forest due to its gorgeous canopy of scarlet flowers which looks like a flame. The Uttar Pradesh government has declared 'Flame of Forest'as the state flower.[2] Butea flowers are astringent, sweet, cooling, constipating, aphrodisiac, haemostatic, diuretic, febrifuge, depurative and tonic.They are useful in diarrhea,haemorrhoids, menorrhagia, fever, leprosy, skin diseases, swelling, hyperdipsia, haemoptysis, arthritis, burning sensation and bone fracture.The chemical constituents of flower is seven flavonoid glycosides like butrin, isobutrin, monospermoside, isomonospermoside, coreopsin, isocoreopsin and sulphurein.[3] With increasing demand for safer drugs, attention has been drawn to the quality, safety, efficacy and standards of the Ayurvedic drugs.[4] Hence, there is a need for standardization and development of reliable quality protocols for Ayurvedic drugs using modern techniques of analysis.[5] Keeping this in view, present study was carried out to evaluate physicochemical, phytochemical and HPTLC analysis of the *Butea frondosa* flowers.

MATERIALS & METHODS:

Plant Material

The Flowers of *Palash (Butea frondosa)* were collected from Karjat, Raigad District, Maharashtra, India. The plant material was taxonomically identified at the Agharkar Research Institute,Pune, India. The collected flowers were cleaned & shade dried with occasional shifting and then powdered with mechanical grinder, passing through sieve no.40 and stored in an air tight container.

Physico-chemical Parameters:

The powdered material was subjected to analysis of various physico-chemical parameters like loss on drying, ash value, acid-insoluble ash, water soluble extractive and alcohol soluble extractive.[6]

Phytochemical screening:

Aqueous extract of sample was used for phytochemical screening for alkaloid, tannin, steroid, flavonoids, saponin, glycoside, protein, amino acid, mucilage, sugar etc., had been carried out.[7]

High- performance thin layer chromatography(HPTLC) analysis:

HPTLC was carried out by the standard method.

Chromatographic conditions

A CAMAG HPTLC system equipped with a sample applicator was used for the application of the samples. CAMAG TLC scanner 4, Reproster, and Win CATS version(1.4.6) were used for scanning the plates. A CAMAG twin through a glass chamber was used for developing the plates.[8]

Preparation of sample solution:

Accurately weighed 100 mg of *Palash* flower powder was refluxed with 100 ml of methanol for 1hour separately and filtered using Whatmann filter paper and made up to 100 ml to get methanol extract at 1mg/ml.

Phase: The stationary phase used was TLC Silica gel 60 F254. The mobile phase selected was Toluene: Chloroform:Ethanol(4:4:1)for *Palash* flower powder extract.The test solution of 2,4,8,10,12,14,18µl were spotted by CAMAG Linomat 5 auto applicator. The plate was developed in a mobile phase of Toluene:Chloroform:Ethanol(4:4:1) and scanned at 254nm, 366nm. The peak areas and densitometric scan were recorded.

OBSERVATIONS AND RESULTS:

Physicochemical Results

Table 1: Physicochemical parameters of the flower of *Palash*

Parameters	Results
Loss on drying at 105^0C (% w/w)	5.39
Total ash value (% w/w)	7.82
Acid insoluble ash (% w/w)	1.07
Water soluble extractive (% w/w)	21.93
Alcohol soluble extractive (% w/w)	12.74

Phytochemical Results

Table 2: Phytochemical screening of the flower of *Palash*

Parameters	Aqueous extract
Test for Alkaloids	
1) Dragendroff's reagent	+

2) Mayer's reagent	+
3) Wagner's reagent	+
Test for Tannins	
1) Ferric chloride test	+
2) Lead acetate	+
3) Potassium dichromate	+
4) Bromine water	+
Test for steroids	
1) Salkowski reaction	-
2) Libbermann&Burchard	-
Test for coumerine	+
Test for flavonoids	+
Test for saponins	-
Test for glycosides	
1) Cardiac glycosides – Keller Kilani test	-
2) Anthraquinone glycosides – Borntranger test	-
Test for proteins	
1) Biuret	+
2) Xanthoproteic	+
3) Millon's reagent	+
Test for amino acids	+
Test for mucilage	-
Test for sugars	
1) Benedict's reagent	+
2) Felhing reagent	+

(+) indicates presence and (-) indicates absence of that chemical constituent in the plant sample.

HPTLC analysis Results:

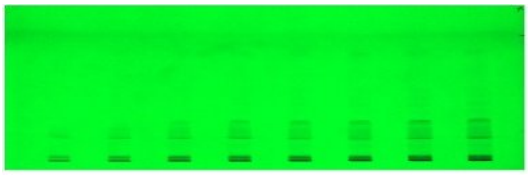

Figure 1: Spots under UV 254

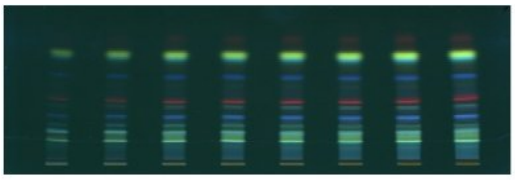

Figure 2: Spots under UV 366

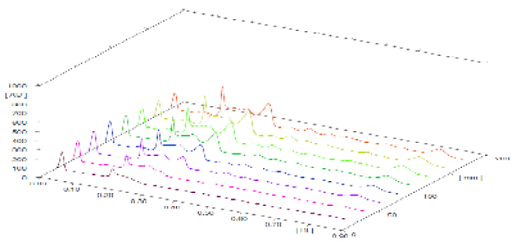

Figure 3: Densitogram at 254nm

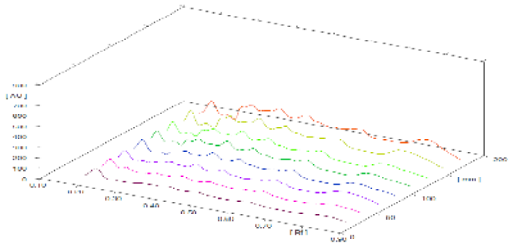

Figure 4:Densitogram at 366nm

Table:3 HPTLC profile of Methanol extract of flower of *Palash*

Sample	254 nm		366 nm	
	No.of Spots	R_f	No.ofSpots	R_f
Methanol extract	13	0.02,0.13,0.17,0.21,0.25, 0.32,0.38,0.45,0.49,0.57, 0.67,0.71,0.85	7	0.24,0.26,0.34,0.42,0.52, 0.64,0.87

HPTLC: High performance thin layer chromatography

DISCUSSION

Physicochemical data presented in Table 1 indicates that the loss on drying in the sample was 5.39% w/w, which shows that the value of moisture content is higher in the sample. The total ash value was 7.82% w/w, indicating presence of inorganic content in it. The acid insoluble ash was 1.07% w/w. The water soluble extractive value is comparatively higher (21.93% w/w) than the alcohol soluble extractive value (12.74% w/w). [Table 1].

The aqueous extract showed the presence of alkaloids, tannins, steroids, flavonoids, proteins, amino acids and sugars in phytochemical analysis. [Table 2].

In HPTLC analysis [figure 1,2,3,4], methanol extract of sample showed 7 and 13 spots under 366nm and 254nm respectively.The maximum R_f value0.85 and 0.87 seen under 254nm and 366nm wavelength respectively.

CONCLUSION

Palash(*Butea frondosa)* one of the important drugs used in the various indigenous medicines and formulations of Ayurveda. The present work focuses on the phytochemical andanalytical investigation of *Palash* (*Butea frondosa)*flower.The phytochemical and analytical study was carried out and their details are mentioned along with the results, observation obtained in the experiments. These findings may help to generate qualitative and quantitative standards to determine the quality and purity of the plant materials.

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CORRESPONDING AUTHOR
Dr.Wankhede RajeshTukaram
Associate Professor, Dept. of Dravyaguna,
SMBT Ayurved College, Dhamangaon,
Nashik, Maharashtra, India
Email: rajesh_wankhade1975@rediffmail.com

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