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Phytochemical and analytical evaluation of *Butea monosperma* roxb. (Palash) flower

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Abstract
Butea monosperma Roxb. (Palash) is an important medicinal plant and it is well familiar since vedickalato 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 monosperma flowers.

Keywords: Palash flower, Butea monosperma, phytochemistry, high-performance thin layer chromatography

Introduction

Butea monosperma Roxb. is a medium-sized deciduous tree belonging to the family. Fabaceae), It is commonly found through- out the greater part of the India upto about 915 m altitude[1]. It is commonly called as palash and 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 monosperma* Roxb. 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, hyper- dipsia, 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 develop- ment 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 monoperma* Roxb,. flowers.

Materials and methods

Plant Material: The Flowers of *Palash* (*Butea monoperma Roxb.*) were collected from Jhanshi District of U.P., (India). The plant material was taxonomically identified at the (DR) Lucknow India. The collected flowers were and cleaned and 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 chro- matography(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 plate.[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: Chloro- form: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 ene:Chloroform:Ethanol(4:4:1) Tolu- and scanned at 254nm, 366nm. The peak areas and densitometric scan were recorded.

Results and 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 simple. The total ash 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 (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 methanol extract of sample showed 7 and 13 spots under 366nm and 254nm respectively. The maximum R_f value 0.85 and 0.87 seen under 254 nm and 366 nm wavelength respectively and results are shown in Table – 3.

Table 1: Physico-chemical 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
Alcohal soluble extractive (% w/w)	12.74
Phytochemical Results	

Table 2: Physico-chemical screening of the flower of Palash

Parameters	Aqueous extract
Test for Alkaliods	
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	-
3. Test for flavonoids	+
4. coumerine	+
5. 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. Million's reagent	+
4. Test for amino acids	+
5. 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.

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

Sample	254 nm		366 nm	
	No. of Spots	R_f	No. of Spots	R_f
Methanol extract	13	0.02, 0.13, 0.17, 0.21, 0.25, 0.32, 0.38, 0.45, 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.

Conclusion

Butea monasperma Roxb. (Palash) is one of the important drugs used in the various indigenous system of medicines and formulations of Ayurveda. The present work focuses on the phytochemical and analytical investigation of Palash flower (*Butea monasperma* Roxb.).

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