

Phytochemical and Physicochemical screening of different extracts of *Butea monosperma* flowers

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ABSTRACT

India has well recorded and practiced knowledge of traditional herbal medicines. Plants are used as medicinal and cosmetics purposes since in ancient times. *Butea monosperma* commonly known as Flame of forest has been widely used in traditional Indian medical system of 'Ayurveda' for the treatment of variety of diseases. The aim of this study is extraction and isolation of components present in flowers of *Butea monosperma*

Keywords: *Butea monosperma*, medicines, flowers etc.

INTRODUCTION

It is evident that without nature human being life is impossible. There are three basic necessity of humans is food, clothes and shelter and now the fourth one is good health, which provided by plant kingdom. Nature stands a golden mark and provided the storehouse of remedies to cure all ailments of mankind. Plant kingdom represents a rich house of organic compounds, many of which have been used for medicinal purposes and could serve as lead for the development of novel agents having good efficacy in various pathological disorders in the coming years. Herbs have always been the principal form of medicine in India and presently they are becoming popular throughout the world, as people strive to stay healthy in the face of chronic stress and pollution, and to treat illness with medicines that work in count with the body's own defense. There is a widespread belief that green medicines are healthier and more harmless or safer than synthetic ones [1]

Plant products are part of phytomedicines. This can be derived from barks, leaves, flowers, roots, fruits, seeds. Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances [2, 3, 4]. These compounds are synthesized by primary or rather secondary metabolism of living organisms. Secondary metabolites are chemically and taxonomically extremely diverse compounds with obscure function. They are widely used in the human therapy, agriculture, scientific research, veterinary and many other areas [5].

Phytochemical constituents are the basic source for the establishment of several pharmaceutical industries. The constituents present in the plants play a significant role in the identification of crude drugs. Phytochemical screening is very important in identifying new sources of therapeutically and industrially important compounds like alkaloids, flavonoids, phenolic compounds, saponins, steroids, tannins, terpenoids etc. Medicinal plants are rich sources of antimicrobial agents. Plants are used medicinally in different countries and are the source of potential and powerful drugs [6].

According to World Health Organization (WHO), medicinal plants would be the best source to obtain variety of drugs. About 80% of individuals from developed countries use traditional medicines, which has compounds derived from medicinal plants. However, such plants should be investigated to better understand their properties, safety, and efficiency [7]. Now day's phytochemical studies have attracted the attention of plant scientists due to the development of new and sophisticated techniques. Plant synthesizes different types of chemical compounds, which can be differentiated on the basis of their chemical class, functional groups and bio synthetic origin into primary and secondary metabolites. Knowledge of the chemical constituents of plants is desirable, not only for the discovery of therapeutic agents, but also because such information be of value in disclosing new resources of such chemical substances.

METHODOLOGY

Butea monosperma

Butea monosperma (Lam.) Taub (Syn. *Butea frondosa* Willd. Family Faboideae), a deciduous tree, is found chiefly in the mixed or dry deciduous forests of Central and Western India. This plant is popularly known as dhak or palas, palash, mutthuga, bijasneha, khakara, chichara and commonly known as "Flame of the forest" This tree grows to 50 ft high, with stunning flower clusters. Tree is almost leafless during spring season forming an orange- red hue of flowers on the upper portion, giving the appearance of flame from a distance. [8,9] Flowering & Fruiting: March to May.

i. Collection of plant material:

Plants *Butea monosperma* will be collected from remote area of Soegaon region near Ajantha caves. Subsequent visit will be planned to photograph the plant in proper blooming period and confirm the folk of medicinal uses. The plant parts will bring to the laboratory. After completion of description, identification and noting medicinal uses the plant will be subjected for phytochemical constituents through literature. The plant parts will be dried, crushed to make powder and the powder material used for the study of phytochemical test.

The collected flowers were cleaned and shade dried. Fresh samples were used for anatomical studies and dried parts were powdered, sieved and stored in an airtight container for further use.

ii. Extraction of Plant Drug:

The fine powdered plant material will be subjected to extraction in soxhlet apparatus. The powdered plant material will be subjected to successive solvent extraction using different organic solvents such as methanol, Ethanol, Acetone, chloroform, and Ethyl acetate. Twenty grams of powdered plant material will be used to soxhlet extraction with 250 ml of the various organic solvents for 8 hrs. Each time before extracting with next solvent, the powder residue will dried. Extract obtained in each solvent will be concentrated, solidified and used for preliminary phytochemical analysis.

iii. Phytochemical Screening:

For preliminary phytochemical screening powder tuber of *Butea monosperma* will be subjected to various qualitative chemical tests to determine the presence of various phyto-constituents like glycosides, tannins, phytosterols, proteins, amino acids, flavonoids, saponins etc

iv. Physicochemical evaluations:

Physico-chemical parameters of the powdered drug such as total ash, water-soluble ash, acid insoluble ash and sulphated ash were determined. Extractive value, solubility tests, moisture test, mineral content and nutritive value (ash, fat, fiber, protein and carbohydrate) of flowers were determined as per standard procedures

RESULTS AND DISCUSSION

Phytochemical analysis was performed on the hot water, methanol acetone chloroform and ethyl acetate extract of *Butea monosperma*. Hot water extract was found to contain proteins, amino acids, alkaloids, phenolic compounds, glycoside, carbohydrate protein. Methanolic extract contains carbohydrates, glycosides, alkaloids, flavonoids, saponins Acetone extract contain

steroid carbohydrate protein glucoside .chloroform extract contain carbohydrate glucoside and ethyl acetate extract contain alkaloids phenolic compounds carbohydrate protein. (Table 1.)

This work is beneficial for analyzing the quality and purity of the crude drug. In this study different parameters used for the evaluation of *Butea monosperma* like moisture content, extractive values ash values. Physicochemical evaluation of *Butea monosperma* was shown that the results of physicochemical constants found within limit. (Table no. 2) This indicates that the quality and purity of raw material was good enough.

Table no.2: Physico-chemical analysis of *Withania somnifera*

Sr. No.	Physicochemical parameters	Values (in %w/w)
1	Total ash value	7.3%
2	Water soluble ash	3.02%
3	Acid insoluble ash	1.04%
4	Moisture content	4.80%
5	Alcohol soluble extractive value	9.25%
6	Water soluble extractive value	7.16%

Table 1: Preliminary Phytochemicals Screening of *Butea monosperma* flower

Sr.N.	Test	Hot water	Methanol	Acetone	Chloroform	Ethyl Acetate
I	Alkaloids					
	Mayer's Te	+	+	-	-	+
II	Flavonoids					
1	Shinod test	-	+		-	-
2	Lead acetate test	-	+			
III	Phenolic compound and Tannins					
	FeCl ₃ test	+	+	-	-	+
IV	Terpenoids					
	Liebermann Burchards Test	-	-	-	-	-
V	Steroids					
	salkowski test	+	+	+	-	-
VI	Carbohydrates					
	Fehling's Test	+	+	+	+	+
VII	Protein					
	Millon's Test	+	+	+	-	+
VIII	Saponins					
	Foam Test	+	+	-	-	-
IX	Glucosides					
1	Keller-Killian test	+	+	+	+	-
2	Legal's test	+	+	+	+	-

The result of moisture content 3.64%w/w implies that the drug is properly dried and stored. The value of moisture content 4.80%w/w implies that the drug is properly dried and stored. The physicochemical parameter like total ash is an important as it shows the purity of drug, which implies presence or absence of foreign material like metallic salts etc. The physicochemical analysis result for total ash was found to be 7.3. W/w. The ash value lies within limit implies purity and quality of crude drug. The water soluble extractive value found to be 7.16%. While ethanol soluble extractive value found to be 9.25% w/w.

CONCLUSION

The phytochemical screening confirmed the presence of various phytochemical constituents such as alkaloids, flavonoids, amino acids, carbohydrate, proteins, saponin and tannins. Phytochemical constituents confirmed utilization of flower for therapeutic medical treatment. The people of India are turning to usage of medicinal plants and phytochemicals in health care. Different Physicochemical parameters such as, total ash, acid insoluble ash, water soluble ash, water soluble extractive and alcohol soluble extractive value were observed. All studied standardization parameters like phytochemical screening and physicochemical parameters provide the knowledge in the identification authentication of *Butea monosperma*.

Conflicts of interest: The authors stated that no conflicts of interest.

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