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Pharmacognostic Study of *Bauhinia Acuminata* Linn.

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ABSTRACT

Aim: To study pharmacognostic and phytochemical standards of *Bauhinia acuminata* Linn

Method: The leaves of *Bauhinia acuminata* Linn. Were studied by Microscopic parameter, physicochemical parameter and phytochemical parameter.

Result: The microscopic study leaf of *Bauhinia acuminata* Linn showed presence of xylem & phloem upper epidermis, lower epidermis and stomata. The powder studies of leaves of *Bauhinia acuminata* Linn showed the presence of Trichomes, Xylem & Phloem, Stomata and Ca- oxalate crystals. Physicochemical parameters such as ash value, acid insoluble value, moisture content and alcohol soluble and water soluble extractive value were determined. The petroleum ether extract of *Bauhinia acuminata* Linn showed the presence of phenolic compound & flavonoids while chloroform extract showed the presence of Glycoside, flavonoids and phytosterol. The ethyl acetate extract of *Bauhinia acuminata* Linn showed the presence of phytosterol and flavonoids and ethanolic extract showed the presence of Glycoside, flavonoids, saponins and phenolic compound. The aqueous extract of *Bauhinia acuminata* Linn showed the presence of phytosterol, flavonoids, saponins and phenolic compound.

Conclusion: The results of the studies can provide standards for *Bauhinia acuminata* Linn

INTRODUCTION:

The standardization of herbal drug involve selection and handling of crude material and more attention given towards macroscopic, microscopic examination, extract value, chemical

evaluation, ash values, moisture content and different physicochemical parameter.^(1,2) Phytochemicals and pharmacologically active compounds are found in plants by primary and secondary metabolism which give health benefits other than macronutrients and micronutrients⁽³⁾. Phytochemicals contribute to the plants colour, aroma, flavour and protect plants from various disease, environmental hazards, stress, UV exposure and pollutions^(4,5). The phytochemicals are also having role in human health when their dietary intake is significant. More than 4,000 phytochemicals are identify by physical and chemical characterization.⁽⁶⁾ And about 150 phytochemicals have been studied in detail. These phytochemicals are present in vegetable, fruits, legumes, nuts, whole seeds, fungi, grains, species and herbs⁽⁷⁾. And also found in Broccoli, cherries, tomatoes, beans, garlic, carrots, grapes, cabbage, strawberries, raspberries, onions, whole wheat bread, and soy foods.⁽⁸⁾ These phytochemicals present in different parts of the plants, such as in the stems, roots, leaves, fruits, flowers, or seeds⁽⁹⁾.

Bauhinia acuminata Linn belong to family Caesalpiniaceae and native to Asia. The plant will grow up to 3 meter height. It consist white flowers cover this tree in spring and have sweet clean fragrance. Sometimes it is called Snowy Orchid Tree because of white flowers look like snowflakes hanging on the branches. The leaves are of cow's hoof shaped. The *Bauhinia acuminata* Linn consist of flavonoids, alkaloids, glycoside, Saponin, tannin, and steroids. The Indian vaiydas recommended the leaves and bark of *Bauhinia acuminata* Linn for the treatment of biliousness. In Malaysia and Indonesia the plant is used for common cold and cough treatment.⁽¹⁰⁾

This study is designed to various pharmacognostic and phytochemical standards of *Bauhinia acuminata* Linn which will ensure the safety, purity, and efficacy of this medicinal plant.

METHODS

Collection and preparation of plant material: The fresh leaves of *Bauhinia acuminata* Linn used in the study, the plants are collected from Kolhapur, Maharashtra state, and authenticated by Botanical Survey of India, Pune, and Maharashtra. (BSI/WRC/IDEN.CER./2019/H3 dated 19/08/2019)

Preparation of Extract: The leaves of plants were separated dried. After drying leaves were exposed to size reduction. The powdered leaves (500 g) were undergone to Soxhlet extraction with different solvent to get Petroleum ether extract (PE), Chloroform extract (CH), Ethyl

acetate extract(EA) ,Ethanol extract(ET),Aqueous extract (Aq).

Microscopic Studies of Plants

Thinnest possible section of leaf (through midrib to study nature of epidermis, trichomes and stomata) were taken on a slide, mounted in a solution of chloral hydrate and warmed slightly to decolorize. To study microscopic examination of powdered drug, powder samples were taken on a slide and add few drops of chloral hydrate heated for 1-2 minutes and viewed under the microscope after mounting it on a glass slide using glycerine and covering with a cover slip. For observing Lignified tissues, powder first treated with chloral hydrate and then add few drops of 1:1 Phloroglucinol and conc. Hcl after 3- 4 minutes, mounted in glycerine. Pink stained are observed for Lignified tissues. ^(11, 12, 13).

Physicochemical Evaluation

1. Determination of Ash values

2g of the air-dried leaf powder of *Bauhinia acuminata* Linn taken in separate a tared silica dish and incinerate at a high temperature about 450°C until it is free from carbon, cool and take a weight.

2. Acid insoluble ash

Ash boiled for five minute with 25 ml of 1 N HCl. It was filtered through an ashless filter paper to collect the insoluble residue. The residue obtained was washed with hot water and was further ignited, cooled and weighed. The percentage of acid insoluble ash was calculated with reference to air-dried sample of the drug.

3. Moisture Content

Take container with lid and clean it. Dry the container and note down its weight (W1). Take a powder of *Bauhinia acuminata* Linn in the container and weigh with lid (W2). Keep the container in oven and removed the lid. Dry the sample to constant weight maintaining the temperature between 105°C to 110°C for a period usually 16 to 24 hours. Finally record the constant weight (W3).

4. Water soluble extractive values

5 g powdered drug was weighed and transferred in a conical flask and macerated with 100 ml water. After maceration, the content of the flask was filtered. 25 ml of the filtrate was placed

in a weighed porcelain dish and evaporated to dryness. Further weight difference was calculated and extractive values were expressed in % (w/w).

5. Alcohol soluble extractive values

5 g powdered drug was weighed and transferred in a conical flask. It was macerated with 100 ml alcohol. After maceration, the content of the flask was filtered. 25 ml of the filtrate was kept in a weighed porcelain dish and evaporated to dryness. Further weight difference was calculated and extractive values were expressed in % (w/w).

Phytochemical Investigation

Phytochemical test on different extract were performed according to Khandelwal K. Practical Pharmacognosy book. ⁽¹¹⁾

RESULT

Microscopic Studies of Plants

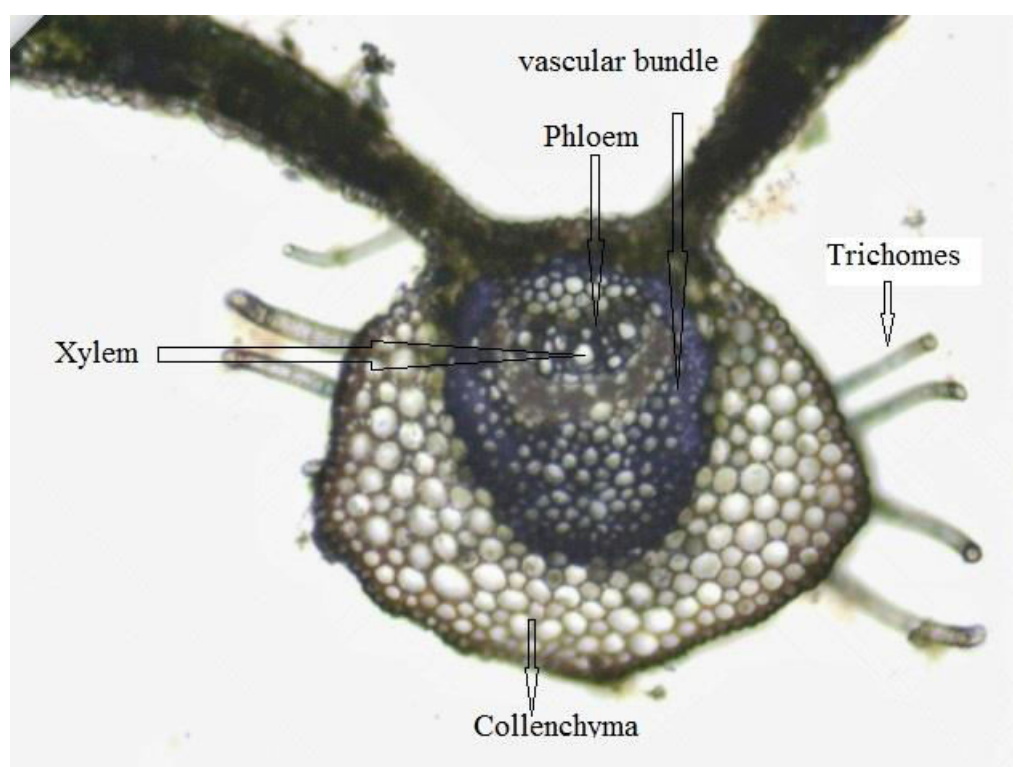


Figure 1: T.S of *Bauhinia acuminata* Linn leaf

Powder characteristics of *Bauhinia acuminata* Linn.



Figure 2: Lignified cell



Figure 3: Calcium oxalate



Figure 4: Trichomes



Figure 5: Lignified bordered pitted



Figure 6: Phloem

Physicochemical studies

Table-1. Physical Parameters of the Leaves of *Bauhinia acuminata* Linn.

Sr. No	Parameters	Result (%)
1.	Ash value	10
2.	Acid insoluble value	0.9
3.	moisture content	8.5
4.	Extractive value(water soluble)	20.2
	(Alcohol soluble)	6.3

Phytochemical Investigation

Table-2: Preliminary phytochemical screening of various extracts of *Bauhinia acuminata* Linn.

Chemical constituents	Tests	PE	CH	EA	ET	AQ
Alkaloids	Mayer's	-	-	-	+	-
	Wagner's	-	-	-	-	-
	Dragendroff's	-	-	-	-	-
Flavonoids	Shinado	+	++	++	+++	+
	Lead acetate	++	+	+	++	+++
	Alkaline reagents	+	+	+++	++	++
Carbohydrates	Molisch's	+	-	-	-	-
	Barfoed's	-	-	+	-	+

	Libermann Burchard's	-	-	-	+	-
Phytosterols and Triterpinoids.	Salkowaski	-	++	++	-	+
	Libermann Burchard's	-	+	+++	+	++
Glycosides	Legal's	-	++	-	++	-
	Borntrager's	-	+	-	-	-
	Liebermann Burchard	-	++	+	+	-
Saponins	Foam or Froth	-	+	-	++	+
Tannins and Phenolic Compounds	5% FeCl ₃	+	-	-	+	-
	Lead Acetate	++	-	-	+	++
	Solution	+	-	-	+	-
	Gelatin Solution	+	-	-	++	+
	Bromine Water	+	-	-	-	+
	Acetic Acid	++	-	-	-	+
	Potassium Dichromate	+	-	-	-	+

Abbreviations: PE:- Petroleum ether extract, CH:- Chloroform extract , EA:- Ethyl acetate extract , ET:- Ethanol extract, Aq:- Aqueous extract.

(+++) Appreciable amount; (++) Moderate amount; (+) Trace amount; (-) completely absent

DISCUSSIONS

The pharmacognostic study established the diagnostic characteristics of *Bauhinia acuminata* Linn. Which is helpful for quality control measures to ensure the quality, safety and efficacy. The different pharmacognostic parameters studied here are helpful to identify and authenticate the *Bauhinia acuminata* Linn and this will prove useful in the preparation of herbal monographs. (14) Most herbal preparations available in market are easily adulterated or substituted. The application pharmacognostic parameter like microscopy, macroscopy, phytochemical analysis, physicochemical parameter would be helpful for identification of

herbal plant. The microscopical character like epidermal cell, stomata, vein termination number and palisade ratio widely recognized in taxonomic considerations and used in the identification of taxa at genus as well as species levels. ^(15,16) The microscopic study of leaf of *Bauhinia acuminata* Linn showed presence of phloem and xylem, upper epidermis, lower epidermis and stomata. The powder studies of leaves of *Bauhinia acuminata* Linn showed the presence of Trichomes Xylem & Phloem, Stomata and Ca- oxalate crystals.

The physicochemical parameters are constant for a plant hence it is useful for setting standards for crude drug. Various physicochemical parameters like, acid insoluble value, ash value, moisture content and alcohol soluble and water soluble extractive value were determined. These parameters are important for detection of drug improper handling or adulteration of raw materials. The ash value, indicate inorganic composition and impurities in a plant drug.⁽¹⁾ The moisture content gives the information of stability of crude drug. The phytochemical study is important parameter which will give an indication of pharmacological activities. The petroleum ether extract of *Bauhinia acuminata* Linn showed the presence of flavonoids and phenolic compound while chloroform extract showed the presence of glycoside, flavonoids and phytosterols. The ethyl acetate extract of *Bauhinia acuminata* Linn showed the presence of phytosterols and flavonoids and ethanolic extract showed the presence of Glycoside, flavonoids, saponins and phenolic compound. The aqueous extract of *Bauhinia acuminata* Linn showed the presence of phytosterols, flavonoids, saponins and phenolic compound.

CONCLUSIONS

The pharmacognostic studies of *Bauhinia acuminata* Linn is carried by various parameters. The information gather by this study will help in identification and authentication of *Bauhinia acuminata* Linn.

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DISCLOSURE

Author declares that he has no conflict of interest. And also this article does not contain any studies with human or animal subjects.

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