

Preliminary phytochemical evaluation of bambusa arundinacea seeds

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Abstract

Bambusa arundinacea belongs to the family poaceae is highly reputed ayurvedic medicinal tree commonly known as Bamboo. It plays a significant role in human civilization since ancient times and still contributing to the subsistence of over two billion people living in tropical and subtropical belts in Asia, latin America and Africa. Traditionally bambusa leaves, stem and root were used as astringent, laxative, diuretics and also it has anti-inflammatory, anti microbial, antifertility, antispasmodic, antidiabetic and antiulcer activity. Leaf buds are used to treat menstrual problems. Roots are used to treat cirrhosis and tumors of liver, spleen and abdomen.. The information on the phytochemicals of bambusa arundinacea seed is limited. The objective of this research work was to evaluate phytochemicals of Bambusa arundinacea seeds. Preliminary phytochemical evaluation of seed extract bambusa arundinacea reveals the presence proteins, carbohydrates, flavanoids, phenols and tannins.

Keywords: Bambusa arundinacea, seed, physiochemical and phytochemistry.

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INTRODUCTION

Bambusa arundinacea (Retz.) Roxb belongs to a family poaceae, a graceful spinous bamboo, distributed throughout the moist parts of India, up to an altitude of 1,250m, particularly near river banks; native to south-east Asia, also cultivated in the plains of North-West India, and on the hills of Andhra Pradesh, Tamil Nadu and Karnataka. It flowers gregariously once in 30-40 years. Rhizomes short, stout, knotty; culms dense, reaching 24-30m in height and 15-17cm in diameter, leaves linear, flowers in large panicles, sometimes occupying the whole culm; caryopsis oblong 5-8mm long, grooved on one side^{1,2}. The plant is considered as

one of the world's most useful trees, as almost every part of the Bamboo tree can be used for medication, food and industrial purposes. Bambusa arundinacea has been proven to have great pharmacological potential with a great utility and usage in folklore medicine. various parts of this plant such as leaf, root, shoot and seed possess anti-inflammatory, anti-ulcer, anti-diabetic, anti oxidant, anthelmintic, astringent, emmenagogue activity^{3,4}. The kani tribes of kanyakumari district used the seeds as food and they believe that the seeds of bambusa arundinacea enhance the fertility⁵. Despite the traditional medicinal uses no clear information could be obtained as regards the phytochemical screening of bambusa seeds. The present work has been carried out to evaluate the phytochemicals of Bambusa arundinacea seeds.

MATERIALS AND METHODS

Plant Collection and Identification

Dried seeds of Bambusa arundinacea (Retz.) Roxb. were purchased from Suresh Forestry Network, Chickballapur, Karnataka. The seeds and plants were authenticated by Prof. Dr. Jayaraman. PhD., Director Plant Anatomy Research Institute, Thambaram, Chennai. A Voucher specimen were kept in the Pharmacology museum, ACS Medical College for future reference.

Preparation of seed extract^(7,8)

The plant materials were air-dried at room temperature (26°C) for two weeks, after which it was ground to a uniform powder. After complete drying, the seeds were passed through sieve no.40 and were extracted by using soxhlet apparatus, successively with petroleum ether, ethyl acetate and alcohol. Each time before extracting with next solvent the powdered material was dried in hot

air oven below 40°C. At the end of each respective extraction, the extracts were filtered using Whatman1 filter paper. The filtrate was concentrated under reduced pressure in vacuum at 40°C for 25 min using a rotary evaporator (Super fit-ROTAVAP, India). The percentage yield of extracts was calculated. The extracts were used for the preliminary screening of phytochemicals.

RESULTS AND DISCUSSION

Table 1: Physicochemical parameters of powdered seeds of *Bambusa arundinacea*

Sr. No.	Parameters	%W/W*
1.	Ash values	
	Total ash	4.56
	Acid insoluble ash	0.265
	Water soluble ash	0.572
2.	Loss on drying	6.878
3.	Moisture	3.134
4.	Energy	280 Kc

*mean of triplicate

Table 2: Extraction values of seeds extracts of *Bambusa arundinacea*

Sr. No	Solvent extracts	Colour	Consistency	Yield (%)
1.	Petroleum ether extract	Light brown	Semi- solid with sticky	7.0
2.	Ethyl acetate extract	Light brown	Non sticky	7.6
3.	Alcohol extract	Light brown	Non sticky	9.4

Phytochemical screening

Table 3: Preliminary phytochemical screening of powered seed extracts of *Bambusa arundinacea*

Sr. No	Chemical Category	Name of test	PE	EAE	AE
1.	Carbohydrates	Molisch test	+	+	+
		Bial' test	-	+	+
		Biuret test	+	+	+
2.	Proteins and Amino acids	Xanthoprotein test	-	+	+
		Millon' s reagent test	-	-	-
		Dragondroff' s test	-	-	-
		Mayer' s test	-	-	-
3.	Alkaloids	Hager' s test	-	-	-
		Wagners Test	-	-	-
		General Test	-	-	-
4.	Glycosides	Borntragers test	-	-	-
		Cardiac Glycosides	-	-	-
		Coumarin Glycosides	-	-	-
5.	Phenolics/Tannins	Ferric Chloride test	-	-	+
		Drug + lead acetate + water	+	+	+
		Potassium dichromate	+	+	+
6.	Flavonoids	Shinoda' s Test	+	+	+
		NaOH	+	-	+
7.	Saponins	Drug +Water+Shaking	-	-	-
8.	Fixed oils and Fats	Spot test	+	+	+
9.	Steroids	Liebermann-Burchard test	+	+	+

Key: +=Present; - = Absent

PE-Petroleum ether extract; EAE=Ethyl acetate extract; AE=Alcohol extract

The results generated from the present study are represented in respective tables. The powdered seeds of *Bambusa arundinacea* was subjected to physiochemical and phytochemical evaluation which were found to be very promising. The physiochemical parameters of seeds of *Bambusa arundinacea* are tabulated in **Table -1**. The determination of ash value was carried out which gives an idea of the earthly material or inorganic composition and other impurities present along with the drug. (Table -1). The percentage yield W/W of the different extracts were analysed where in the highest yield was found to be in the alcohol extract i.e. 9.4% (Table-2). The curative properties of medicinal plant are perhaps due to the presence of various secondary metabolites such as flavonoids, alkaloids, glycosides, tannins and sterols. The alcoholic seed extracts of *Bambusa arundinacea* have revealed the presence of flavonoids, tannins, phenols, quinines, sterols, carbohydrates and aminoacids (Table-3). The preliminary phytochemical screening test may be useful in the detection of the bioactive principles and subsequently may lead to the drug discovery and development. Further these tests facilitate their quantitative estimation and qualitative separation of pharmacologically active chemical compounds. The phytochemical screening in the present study has revealed the presence of flavonoids, tannins, phenols, carbohydrate and aminoacids in the seed extracts. Flavonoids and tannins are phenolic compounds and plant phenolic are a major group of compounds that act as primary antioxidants or free radical scavengers. since these compounds were found to be present in the extracts, it might be responsible for the potent antioxidant capacity of *Bambusa arundinacea* seeds.

CONCLUSION

The presence of phytochemicals make the plant useful for treating different ailments and have a potential of providing useful drugs of human use. In the present study we have found that most of the biologically active phytochemicals were present in the ethanolic extracts of *Bambusa arundinacea* seeds. These preliminary studies

will be even helpful in quantifying the nutrient properties of the seed.

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