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RESEARCH ARTICLE

Preliminary Phytochemical studies on *Bauhinia racemosa* Roots

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ABSTRACT:
Bauhinia racemosa Lam is a small, crooked, bushy, deciduous tree with drooping branches, which contains therapeutic values of its secondary metabolites from the time immemorial. The main objective of this study is extraction and phytochemical analysis of the roots of *Bauhinia racemosa*. Methods: Cold percolation method was used for extraction. Phytochemical & Fluorescence analysis, Ash value testing and Loss on drying were done to reveal the nature of phytocompounds present in the extract. Results and Conclusion: Extraction and Preliminary phytochemical analysis were done on the roots of the plant showed maximum percentage yield and the presence of the phytochemicals like alkaloids, saponins, glycosides, flavonoids, terpenoids, poly phenolics, gums and mucilage etc. Their ash values and fluorescent analysis were significant to the secondary metabolites present in the roots of *Bauhinia racemosa*. These secondary metabolites were confined the therapeutic potentials of the plant and acts as a remedial measures for the various diseases and this was proved in another studies.

KEYWORDS: *Bauhinia racemosa*, roots, extraction, phytochemical analysis, ash values, fluorescent analysis.

INTRODUCTION:
Nature is the best combinatorial chemist and possibly has answers to all diseases of mankind. Failure of some synthetic drugs and its side effects have prompted many researches to go back to ancient healing methods which use herbal medicines to give relief. Till now, natural product compounds discovered from medicinal plants have provided numerous clinically useful drugs. Four billion people or about 80% of the world's population uses herbal medicine as apart of health care[1]. Human brain disorders range which includes Alzheimer's disease, Parkinson's disease, depression, epilepsy, schizophrenia, anxiety, Huntington's disease etc. Psychotherapeutics does not meet properly for therapeutics possibilities for majority of patients with mental health problems but herbal remedies are ultimate therapeutic hope for such patients[2].

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Ayurvedic system of medicine, which originated in India long back in pre-vedic period, deals elaborately with measures for healthful living during the entire span of life and its various phases. Ayurvedic texts like Charak Samhita and Sushruta Samhita were documented about 1000 years B.C. Besides, dealing with the principles for maintenance of health, it has also developed a wide range of therapeutic measures to combat illness. Ayurveda, one of the oldest systems of health care deals with both the preventive and curative aspects of life in a most comprehensive way. It presents a close similarity to the WHO's concept of health propounded in the modern era[3]. Metal based drugs known as 'bhasma' play a major role in Ayurvedic medicine and are used in the treatment of a variety of conditions.

B. racemosa is typically reaching a height of 6–12m and their branches spread 3–6m outwards. The leaves are broader than long, having size 2-5cm by 2.5- 6.3cm, divided a little less than half way down into two rounded lobes[4]. The upper surface of leaf being green and glabrous, rigidly coriaceous, slightly cordate, clothed more or less densely beneath with grey pubescence and base is usually cordate. The five-petaled flowers are 7.5–12.5cm diameter, generally in shades of red, pink, purple, orange, or yellow, and are often fragrant[5]. The

aim of the present investigation has been to analyse the important phytochemical nature of the roots of *Bauhinia racemosa*.

MATERIALS AND METHODS:

Extraction:

The roots of *Bauhinia racemosa* was collected from Tirupathi. The root was dried under shade, powdered and passed through 40 mesh sieve. Using cold percolation method the powder was extracted with different solvent ranging from non- polar to polar solvent. The powdered roots of *Bauhinia racemose* were used for extraction purpose. Powdered roots were percolated with solvent for 72 hours. The solvent used for extract were Water, Ethanol, Chloroform, Acetone, Ethyl Acetate and Petroleum Ether. The extract was concentrated by vacuum distillation to reduce volume. Then, they were cooled and placed in a dessicator to remove excessive moisture. The dried extract was weighed for calculation of extractive yield. Then the extract is placed in airtight container and used for further studies such as phytochemical screening.[6]

Preliminary Phytochemical Screening[7]

Test for carbohydrate: A small quantity of the *Bauhinia racemosa root* extract was dissolved separately in 5ml of distilled water and filtered. The filtrate was subjected to Molisch test to detect presence of carbohydrate. Filtrate was treated with 2-3 drops of 1% alcoholic α-Napthol solution and 2ml of conc. sulphuric acid was added along the sides of test tube. Appearance of brown ring at the junction of two liquids shows presence of carbohydrate. Test for Glycosides: Another portion of the *Bauhinia racemosa root* extract was hydrolyzed with hydrochloric acid for few hours on water bath and the hydrolysate was subjected to legal's test to detect the presence of different glycosides. Legal's test: Hydrolysate was treated with chloroform and then chloroform layer was separated. To these equal quantities of dilute ammonia solution was added. Ammonia layer acquire pink colour, showing presence of glycosides. Test of alkaloids: A small portion of the solvent free extract was stirred separately with few drops of dilute hydrochloric acid and filtered. The filtrate was tested with various reagents for presence of alkaloids. Mayer's reagents: Mayer's reagent is prepared by using mixture of mercuric chloride and potassium iodide in water. Alkaloids will form precipitate by adding Mayer's reagent. Dragendroff's reagents**:** Orange or Orange red precipitate is produce by reaction of Dragendroff's reagent with Alkaloids. Hager's reagents: Hager's reagent gives yellow colour precipitate in the presence of Alkaloids. Wagner's Reagent: Reddish brown precipitate is formed in presence of alkaloids by mixed solution of iodine and potassium iodide in water i.e Wagner's reagent. Test for Phytosterols: Solkowski test: The extract was mixed with 2ml of chloroform and 2ml of concentrated sulphuric acid. Brown or red color ring on the sulphuric acid layer indicates the presence of phytosterols. Test of saponins: The extract was diluted with 20ml of distilled water and it was agitated in graduated cylinder for 5minutes. The formation of 1cm layer shows presence of saponins. Test for Phenols and tannins: Ferric chloride test: The extract is diluted with water and then 5% of ferric chloride is added add to the diluted solution of extract the violet color presence indicates presence of tannins and phenols. Lead acetate test: To the extract add 3 ml of lead acetate solution the presence white precipitate indicates presence of tannins and phenols. To the extract add 1% gelatin containing 10% of sodium chloride solution the presence of white precipitate indicates the presence of tannins and phenols. Test for flavonoids: To the extract add sodium hydroxide solution if the solution changes color it indicates the presence of anthocyanins, if the solution turns yellow it indicates pres amino acids.

Ash analysis[8]

Total ash: Take 1gm of plant material into a pre weighed crucible and place the crucible in muffle furnace at the temperature of 450^{o}c for 20 mins then cool the temperature of the crucible to room temperature by placing it in dessicator then weigh the crucible by using the difference between before and after weight of crucible total ash will be determined. Acid insoluble ash: To the previously obtained ash add concentrated Hydrochloric acid and put it aside for 15 mins then wash the acid using warm water through Whatman filter paper no 40. After complete filtration place the folded paper in crucible. Place the crucible in muffle furnace at the temperature of 450^{o}c for 20 mins then cool the temperature of the crucible to room temperature by placing it in dessicator then weigh the crucible by using the difference between before and after weight of crucible acid insoluble ash will be determined. Water soluble ash: Ash is diluted with distilled water and the water is filtered using filter paper the filtrate is collected in a pre-weighed petridish and the evaporate the aqueous solution by placing it on a water bath after complete evaporation of aqueous layer the petridish temperature is decreased to room temperature then weighed the difference between the weights of petridish determines the water soluble ash.

Loss on drying:

Take 10 gm of sample powder in pre-weighed petridish and then place it in a hot air oven for one hour at 110^{o}C then cool the petridish to room temperature using dessicator and weigh the petridish continue the same process until you get same weight simultaneously then determine the loss on drying by the difference of weight of the petridish.

Fluorescence Analysis[9]:
The sample is mixed with different solvents and solution is taken in a cuvette then the ordinary light and UV light of 365 nm has been passed though the sample the variation in the appeared colour is noted.

RESULTS AND DISCUSSION:

B.racemosa root extract was analysed for phyto constituents. Physicochemical parameters included determination for Total ash, Acid insoluble ash, Water soluble ash and Loss on drying. Phytochemical analysis revealed the presence of tannins, alkaloids, saponins, terpenoids, glycosides, flavonoids and steroids. Extractive yield: The *Bauhinia rascemosa root* is extracted using different solvents by using percolation method. The extractive yield is different form solvent to solvent the result is in the below table.

Table 1: Extractive Yield of *Bauhinia racemosa root*

S. No	Solvent of extraction	Percentage of yield
1	Chloroform	11.23 %
2	Petroleum Ether	0.86 %
3	Ethyl Acetate	7.97 %
4	Ethanol	14.41 %
5	Aqueous	12.5 %

Phytochemical screening: The phytochemical screening for the *Bauhinia rascemosa root* extract results are in below table no.2.

Table. 2: Phytochemical screening of *Bauhinia rascemosa root* extract

S. No	Chemical constituents	Petroleum Ether Evtract	Chloroform Extract	Ethyl acetate extract	Ethanol Extract	Aqueous extract
1	Carbohydrates	-	-	-	+	+
2	Glycosides	-	-	-	+	+
3	Alkaloids	+	+	-	-	-
4	Phytosterols	+	-	-	-	-
5	Saponins	-	-	-	+	+
6	Phenols	-	-	+	-	+
7	Tannins	-	+	+	+	+
8	Flavonoids	-	-	+	+	+
9	Proteins and Amino acids	+	-	-	-	-

Table 3: Ash Analysis and Loss on drying

2	Type of Ash	% (W/W)
1	Total ash	6.22
2	Acid insoluble ash	0.12
3	Water Soluble ash	5.01
4	Loss on Drying	0.9

Table 4: Fluorescence Analysis of *Bauhinia racemosa roots*

S. No	Treatment	Ordinary light	UV light, 365 nm
1	Powder	Yellow	Brown
2	Powder+ 1N NaOH in H_2O	Yellowish Brown	Dark Brown
3	Powder+1N NaOH in Ethanol	Brown	Black
4	Powder+1N HCL	Yellow	Dark Brown
5	Powder+1N H_2SO_4	Light Brown	Dark Brown
6	Powder+ 1N HNO_3	Brown	Yellowish Brown

CONCLUSION:

The present research reveals the root extract of *B.racemosa* contains therapeutically significant bioactive compounds which exhibits the use of the roots for treatment of various diseases. Further purification, identification and characterisation of the phytochemical constituents would form a part of our future study.

REFERENCES:

1. Borikar VI, Jangde CR, Rekhe DS, Philip P, Study of analgesic activity of *Bauhinia racemosa* in rats. Veterinary World, 2, 2009, 135-136.
2. The Wealth of India: Raw materials. VoI. II, Publication and Information Directorate, CSIR, New Delhi, 1988; 53-54.
3. Asima Chatterjee, Satyesh Chandra Pakrashi, The Treatise of Indian Medicinal Plants. Vol.2, Publication and Information Directorate, CSIR, New Delhi, 1992: 16-21.
4. Nandkarni K M, Indian Materia Medica. Vol. I Popular Prakashan Pvt Ltd, Bombay, 1995; 182.
5. Chopra R N, Nayar S L, and Chopra I C, Glossary of Indian Medicinal Plants. Publication and Information Directorate, CSIR, New Delhi, 1992; 35.
6. Borikar VI, Jangde CR, Philip P, Study of antipyretic activity of Bauhinia racemosa Lam in rats, Veterinary World, 2, 2009, 217-218.
7. El-Hossary GA, Selim MA, Sayed AE, Khaleel AE, Study of the flavonoid content of Bassiamuricata and *Bauhinia racemosa*, Bulletin of the Faculty of Pharmacy-Cairo University, 38, 2000, 93-97.
8. Mohan VR, Janardhanan K. Chemical and nutritional evaluation of two germ plasms of the tribal pulse, *Bauhinia racemosa*. Plant Foods Hum Nutr 1994; 96:367-74
9. Kumar RS, Sivakumar T, Sunderam RS, Gupta M, Mazumdar UK, Gomathi P, Rajeshwar Y, Saravanan S, Kumar MS, Murugesh K Kumar KA, Antioxidant and antimicrobial activities of Bauhinia racemosa L. stem bark, Brazilian Journal of Medical and Biological Research, 38, 2005, 1015- 1024.