JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Phytochemical Screening of Banaba (*Lagerstroemia Speciosa*) Leaves

Ravi Ahirwar*, Sachin Kumar Jayswal, Sahil Siddiqie, Salakram Bairagi, Satyendra Kumar, Saurabh Kumar, Saurabh Paradhar, Jagdish Chandra Rathi

NRI Institute of Pharmaceutical Sciences, Bhopal (Madhya Pradesh)

ABSTRACT

Plants have served human beings as a natural source for treatments and therapies from ancient times, amongst them medicinal herbs have gain attention because of its wide use and less side effects. In the recent years plant research has increased throughout the world and a huge number of evidences have been collected to show immense potential of medicinal plants used in various traditional systems. Tropical plant *Lagerstroemia speciosa* Pers., (Lythraceae) also called banaba and found in India, Philippines, southern China, Malaya and tropical Australia, has been used as a folk medicine for the treatment of diabetes and kidney diseases. Hypoglycemic activity of banaba extract was studied in genetically induced diabetic type II KK-Ay mice. Originally, because of its hypoglycemic activity, banaba leaf was thought to contain "insulin-like principle a type of plant derived peptide hormone. The aim of the present study is to examine banaba leaves for phytochemical profile. Qualitative analysis of various phytochemical constituents was determined by the well-known test protocol available in the literature. Phytochemical analysis revealed the presence of flavonoids, tannins, saponins, and glycosides. It is expected that the important phytochemical properties recognized by our study in the indigenous medicinal plants will be very useful in the curing of various diseases when taken along with our food.

Keywords: *Lagerstroemia speciosa*, Phytochemical screening, Flavonoids, Tannin.

Introduction

India is the largest producer of medicinal herbs and appropriately called the Botanical Garden of the world [1]. Since ancient times plants have been traditionally used in therapeutic practices for the treatment of different types of ailments [2-5]. There are a number of crude drugs where the plant source has not yet been scientifically identified. A phytochemical is a natural bioactive compound found in plants foods that works with nutrients and dietary fibre to protect against diseases. Many researchers suggest that, phytochemical working together with nutrients found in fruits, vegetables and nuts. They can have complementary and overlapping mechanism of action in the body including antioxidant effect.*Lagerstroemia speciosa* (Lythraceae) or Banaba locally known as 'Jarul' in Bangladesh. It is a medium sized to large deciduous tree with a rounded crown, have been used in

traditional medicine to treat diabetes mellitus in Southeast Asia for a many year. Banaba extracts are also known to have antiobesity, anti-oxidant and anti-gout effects. Corosolic acid, a,n active ingredient in these extracts, displays a potential anti-diabetic activity as well as anti-oxidant, anti-inflammation and antihypertension properties. The leaves of this tropical plant have been used as a folk medicine for treatment of diabetes, kidney diseases and also the tribal people use it for heart diseases. It is also used for abdominal pain, mouth ulcers, stimulant and febrifuge. Ethanol and water extracts of leaves showed prominent antimicrobial activity against all micro-organisms. Free radical scavenging and anti-inflammatory properties have been demonstrated in leaf extracts of the plant. Ethyl acetate extract of leaves has been shown to ameliorate cisplatin-induced nephrotoxicity in BALB/c mice. The preliminary phytochemcial studies reveal the presence of tannins, triterpenoids, proteins and amino acid. Xanthine oxidase inhibitors (valoneic acid dilactone and ellagic acid) have been isolated from leaves of the plant. The literature study revealed that the different extracts of the seeds have been shown to possess antimicrobial properties. A phytochemical, orobol 7-O-D-glucoside has been isolated from the plant, reported to have inhibitory effects on human rhinoviruses replication. Anti-fungal activity has been demonstrated with hot water as well as methanol extract of the plant against Arthrinium sacchari M001 and Chaetomium funicola M002 strains [6]. Based on the many ethnomedicinal values of this plant, it is becoming imperative to determine the active ingredients present in different parts of the plant as well as their composition.

Materials and methods

Plant materials

Leaves of *Lagerstroemia speciosa* were collected in the month of September 2024 from the NRI campus Bhopal.

Chemical reagents

All the chemicals used in this study were obtained from HiMedia Laboratories Pvt. Ltd. (Mumbai, India), SigmaAldrich Chemical Co. (Milwaukee, WI, USA), SD Fine-Chem Chem. Ltd. (Mumbai, India) and SRL Pvt. Ltd. (Mumbai, India).All the chemicals used in this study were of analytical grade.

Extraction procedure

The collected plant materials (leaves) were brought to the laboratory on the same day. Plant samples were washed with water and airdried at room temperature for 7 days, oven-dried at 40°C to remove the residual moisture. The dried leaves were powdered using a mixer grinder and stored it air-tight container for future use. Use the maceration method for collecting extracts. Two different solvents such as ethanol and distilled water were used for extraction. About 25 gm of the plant samples were added respectively into the test tubes containing 200 ml solvents, and were extracted for 24hr at room temperature. The liquid portion was collected then subjected to slow evaporation in a water bath in temperature not exceeding 40°C [7, 8].

Qualitative phytochemical analysis of plant extract

The *Lagerstroemia speciosa* leaves extract obtained was subjected to the preliminary phytochemical analysis following standard methods [9, 10]. The extract was screened to identify the presence or absence of various active principles like phenolic compounds, carbohydrates, flavonoids, glycosides, saponins, alkaloids, fats or fixed oils, protein, amino acid and tannins.

Results and Discussions

The crude extracts so obtained after the maceration process, extracts was further concentrated on water bath for evaporate the solvents completely to obtain the actual yield of extraction. To obtain the percentage yield of extraction is very important phenomenon in phytochemical extraction to evaluate the standard extraction efficiency for a particular plant, different parts of same plant or different solvents used. Preliminary phytochemical screening of *Lagerstroemia speciosa* leaves extracts revealed the presence of various components such as compounds, flavanoids, glycosides, saponins and tannins Table 1.

Table 1: Result of phytochemical screening of leaves extracts of *Lagerstroemia speciosa*

Phytoconstituent	Test Performed	Result
Glycoside test	Borntrager test	+
	Killer kilani test	+
Alkaloidal test	Dragondroff test	-
	Hager test	-
	Wagner test	-
Tannin test	Ferric chloride test	+
	Gelatin test	+
Flavonoid test	Lead acetate test	+
	Zinc hydrochloride test	+
Saponin test	Frothin test	+
Terpenoid test	Salkowskis test	-

Conclusion

Lagerstroemia speciosa leaves have potential to act as a folk medicine and a source of useful drugs because of the presence of various phytochemical components. Ethanolic extracts shows good results regarding presence of phytoconstituents hence these plants may directly use in medicine preparation or for the development of novel agents for various pathological disorders. Further research on the health benefits of phytochemicals in this plant may be warranted.

References

1. Ahmedulla M. and Nayar M.P. Red data book of Indian plants. 1999, Vol-4, Calcutta: Botanical survey of India.
2. Balakumar S, Rajan S, Thirunalasundari T, Jeeva S. Antifungal activity of Aegle marmelos (L.) Correa (Rutaceae) leaf extract on dermatophytes. Asian Pac J Trop Biomed, 2011; 1(3): 169-172.
3. Mohamed Saleem TK, Azeem AK, Dilip C, Sankar C, Prasanth NV, Duraisami R. Anti-inflammatory activity of the leaf extracts of Gendarussa vulgaris Nees. Asian Pac J Tropical Biomed, 2011; 1(2):147-149.
4. Pour BM and Sasidharan S. In vivo toxicity study of Lantana camara. Asian Pac J Trop Biomed, 2011; 1(3): 189-191.

5. Paulraj K, Irudayaraj V, Johnson M, Patric Raja D. Phytochemical and anti-bacterial activity of epidermal glands extract of Christella parasitica (L.) H. Lev. Asian Pac J Trop Biomed, 2011; 1(1): 8-11.
6. Nasrin F, Ahmad S. Evaluation of antimicrobial, antioxidant and cytotoxic activities of methanolic extracts of Lagerstroemia speciosa leaves and barks. Journal of Applied Pharmaceutical Science. 2012 Oct 28;2(10):142-7.
7. Sonika G, Manubala R, Deepak J. Comparative studies on anti-inflammatory activity of coriandrum sativum, datura stramonium and azadirachta indica. Asian Journal of Experimental Biological Sciences. 2010; 1(1):151-4.
8. Vikram PK, Malvi R, Jain DK. Evaluation of analgesic and anti-inflammatory potential of Mimosa pudica Linn. International Journal of Current Pharmaceutical Research. 2012; 4(4):47-50.
9. Jatav MP, Jain DK, Chandel HS. Anti-inflammatory activity of polyherbal formulation. World Journal of Pharmacy and Pharmaceutical Sciences. 2015; 4(4):770-3.
10. Jain DK, Gupta S, Jain R, Jain N. Anti-inflammatory activity of 80% ethanolic extract of Acorus calamus Linn leaves in albino rats. Research Journal of Pharmacy and Technology. 2010; 3:882-4.