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Research Article

PHARMACOGNOSTICAL AND PHYTOCHEMICAL SCREENING OF *ASYSTASIA GANGETICA* (CHINESE VIOLET)

Kavitha Sama, Rajeshwari Sivaraj*, Hasna Abdul Salam and Rajiv. P
Department of Biotechnology, School of Life Sciences, Karpagam University, Coimbatore-641021, Tamil Nadu, India

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*Email: rajeshwarishivaraj@gmail.com

ABSTRACT
Medicinal plants are of great importance to the health of individuals and communities in general. Plants contain some chemical substances that produce definite physiological actions in and on the human body. The main aim of the present study was to evaluate the pharmacognostical properties and screen the bioactive constituents of *Asystasia gangetica*. Phytochemical screening of different extracts of the plant flower was carried out. The ethanol extract showed presence of maximum bioactive compounds including phenols, flavonoids, alkaloids, glycosides, tannins, terpenoids and saponins compared to other extracts. The yield and colour of the extracts varied with solvents and fluorescence analysis of powder was treated with various chemicals according to standard procedure. The results suggested that the plant flower possesses phytochemical constituents which are helpful to develop natural drugs to treat various diseases.
KEY WORDS: Medicinal plants, bioactive constituents, *Asystasia gangetica,* Acanthaceae, saponins.

INTRODUCTION

Plants are an important source of therapeutic remedies for various ailments. Plant based drugs have been used world wide in traditional medicines for treatment of various diseases. India is the largest producer of medicinal herbs and appropriately called the Botanical garden of the world [1]. The increased interest in plant-derived drugs is mainly because of the wide spread belief that 'herbal medicine' is safer than costly synthetic drugs which possess side effects [2]. Hence, there is need to screen medicinal plants for promising biological activity. In recent years, secondary plant metabolites (phytochemicals), previously with unknown pharmacological activities, have been extensively investigated as a source of medicinal agents[3]. Research on the chemistry and pharmacology of products of plant origin are much essential and this may eventually lead to the discovery of medicine that can be used in the treatment of several diseases [4].

Asystasia gangetica (Chinese violet) belongs to Acanthaceae family. Leaves are opposite petioles, flowers are pale purple blue to violet or lime white in colour, and capsules are 2.5-3.5 cm long with wide base and the seeds are 5 mm in diameter. *Asystasia gangetica* reported to contain biologically active substances such as carbohydrates, proteins, alkaloids, tannins, steroidal aglycones, saponins, flavonoids and triterpenoids. It has been reported that the ethanol extract of *Asystasia gangetica* leaves have α-amylase inhibitory activity[5]. The plant has been claimed for anti-asthmatic, anthel-mentic and antidiabetic property [6]. It is used as folk remedy for the treatment of diabetes mellitus in parts of south India [7].

The main aim of the present investigation was to study the pharmacognistical properties of *Asystasia gangetica* and screen for phytochemical constituents.

MATERIALS AND MEHTODS

Collection and extraction of Plant Material

The flowers collected in Coimbatore and authenticated by BSI of Coimbatore district of Tamil Nadu, India. The shade-dried flowers were coarsely powdered and extracted with different solvents in their increasing order of polarity such as hexane, chloroform, acetone, ethanol and water. All the extracts were concentrated by distilling the solvent in a rotary flash evaporator and stored at 4ºC for phytochemical analysis.

Pharmacognostical studies

Extractive values

Extract of the powdered leaf and fruit were prepared with different solvents for the study of extractive value[8].

Fluorescence Analysis

A small quantity of dried and finely powdered leaf and fruit was placed on grease-free clean microscopic slide, treated with 1-2 drops of the freshly prepared reagent solution, mixed gently by tilting the slide and waited for 1-2 minutes. Then the slide was viewed in day light and (365 nm) ultraviolet radiations. The colors observed by application of different reagents in different radiations were recorded[9].

Preliminary Phytochemical Screening

Phytochemical screening of the *Asystasia gangetica* extracts were carried out using standard procedures to test the presence of alkaloids, saponin glycosides, flavonoids, tannins, phenolic compounds, saponons, anthraquinones, glycosides, and carbohydrates[10,11].

Test for alkaloids

Mayer's test

To a fraction, each extracts were treated with Mayer's test reagent observed for the formation of cream coloured precipitate.

Wagner's test

About 5 ml of each extracts few drops of Wagner's reagent were added to observe the formation of reddish brown colour precipitate.

Hager's test

To 1 ml of each extract 3 ml of Hager's reagent was added for the formation of prominent yellow precipitate**.**

Test for flavonoids

NaOH test

To 1 ml of the extract few drops of aqueous NaOH and HCl were added along the sides of the test tube to observe for the formation of yellow orange colour.

Sulfuric acid test

A fraction of the extract was treated with concentrated H_2SO_4 for the formation of orange colour.

Lead acetate test

A volume of 3 ml of extract were mixed with 5 drops of lead acetate was added to observe the formation of white or cream precipitate.

Test for glycosides

Each extracts were dissolved (0.1g) in pyridine, added sodium nitro prusside reagent and made alkaline with NaOH solution. Pink to red colour solution indicates the presence of glycosides.

Test for phenols

Ferric chloride test

A fraction of each extracts were treated with 5% ferric chloride and observed for the formation of deep blue or black colour.

Test for tannin

The extracts were dissolved in water and then it was then subjected to water bath at 37°C for 1 hour and the filtrate was treated with ferric chloride and observed for the formation of dark green colour.

Test for saponin

Foam test

To a small amount of each extracts few drops of distilled water were added and shaken vigorously until a persistent foam forms.

Test for sterols

Liebermann-burchard test

To a volume of 1 ml extracts was treated with chloroform, acetic anhydride and few drops of H_2SO_4 were added along the sides of the tube and for the formation of dark pink or red colour.

Test for quinone

To 1 g of the extract 5 ml of concentrated HCl was added for the formation of yellow colour precipitate.

Test for carbohydrates

Molisch's test for carbohydrates

A few drops of Molisch's reagent were added to each of the portion dissolved in distilled water; this was then followed by addition of 1 ml of conc. H2SO4 by the side of the test tube. The mixture was then allowed to stand for two minutes and then diluted with 5 ml of distilled water. Formation of a red or dull violet colour at the inter phase of the two layers was a positive test.

Test for terpenoids

Chloroform test

A volume of 5 ml of the plant extract was taken in a test tube with few ml of chloroform and add concentrated sulfuric acid carefully on the side of the test tube to form a layer and observed for presence of reddish brown colour.

Table 1: Percentage and Colors of Successive Extracts of *Asystasia gangetica*

Solvents	Extract values (% w/w)	Colors of extracts
Hexane	2.24	Light green
Chloroform	3.46	Light green
Ethyl acetate	7.50	Light brown
Ethanol	11.7	purple
Water	9.41	purple

Table 2: Fluorescence Analysis of *Asystasia gangetica* powder

Plant sample	Day light	UV light
Powder	Light Brown	Brown
Powder+NaOH	Light brown	Brown
Powder+$FeCl_3$	Brown	Brown
Powder +acetic acid	Purple	Dark purple
Powder +HNO3	Brown	Brown
Powder +HCl	purple	Dark purple
Powder+water	Light purple	Brown

Table 3: Phytochemical screening results of *Asystesia gangetica* different extracts

+ = Present, - = Absent

Phytochemicals	Hexane extract	Choloroform extract	Ethyl acetate extract	Ethanol extract	Water extract
Alkaloids	-	-	+	+	-
Flavonoids	-	-	+	++	-
Phenols	-	+	+	++	+
Tannins	-	-	+	+	-
Terpenoids	-	-	+	+	+
Saponins	+	+	+	+	-
Sterols	-	-	+	+	-
Quinines	-	-	-	-	-
Cardiac glycosides	+	+	+	+	-
Carbohydrates	+	+	-	-	-

RESULTS

Extractive Values

Extractive values are given in the Table 1.

Fluorescence Analysis

The powder was subject to fluorescence analysis as per the standard procedure and shown in Table 2.

Phytochemical Screening

The present study carried out on the plant sample revealed the presence of medicinally active constituents. Ethanol extract of the plant showed maximum results which show the presence of bioactive compounds including phenols, flavonoids, alkaloids, glycosides, tannins, terpenoids and saponins (Table 3). In this present study the preliminary phytochemical screening of all extracts showed presence of bio active compounds which may retain a wide range of actions. Phenolic compounds are commonly found in both edible and non-edible plants and they have been reported to have multiple biological effects, including antioxidant property Flavonoids are water soluble polyphenolic compounds, which are extremely common and wide spread in the plant kingdom. There are reports that polyphenolic compounds like flavonoid are known antioxidant. There are reports that antioxidants through their scavenging power are useful in the prevention of such oxidative damage[12].

DISCUSSION

Plant-derived substances have recently become of great interest due to their multiple applications. Medicinal plants are the richest bio-resource of drugs of traditional systems of medicine, modern medicines, pharmaceutical intermediates and chemical entities for synthetic drugs[13]. Medicinal plants are still major parts of traditional medicinal systems in developing countries many infections disease are known to be treated with herbal remedies throughout the history of mankind. Even today plant materials continue to play a major role in primary health care as therapeutic remedies in many developing countries [14]. Different phytochemicals have been found to possess a wide range of activities, which may help

in protection against chronic diseases. For example, glycosides, saponins, flavonoids, tannins and alkaloids have hypoglycemic activities, anti- inflammatory activities[15]. Flavonoids are a group of phenolic compounds with known properties, which include free radical scavenging inhibition of hydrolytic and oxidative enzymes and anti-inflammatory action[16].

REFERENCES

1. Ahmedulla M and Nayar M.P., "Red data book of Indian plants", Botanical Survey of India, Calcutta. 1999:4
2. Shariff ZU. "Modern Herbal Therapy for Common Ailments", Spectrum Books Limited, Ibadan, Nigeria in Association with Safari Books (Export) Limited, United Kingdom, Nature Pharmacy Series 2001; 9:84.
3. Krishnaraju AV, Rao TVN, Sundararaju D. Assessment of bioactivity of Indian medicinal plants using Brine shrimp (Artemia salina) lethality assay. Int J Appl Sci Eng 2005; 2:125-134.
4. Dev S. Current Sci 1997; 73: 909.
5. Sykes WR. "Contributions of the flora of nine New Zealand", Department of scientific and industrial, Res Bull 1970; 37:200.
6. Guha Bakshi DN, Sensarma P, Pal DC. A lexion of medicinal plants in India, vol.-I, line drawings, Naya Praheash publisher, Calcutta, India 1999; 1; 552.
7. Kokashi CJ, Kokashi RJ, Sharma M. Fluorescence of powdered vegetable drugs in ultra-violet radiation. J American Pharm Assoc 1958; 47:715-717.
8. Pratt RT, Chase ER. Fluorescence powder vegetable drugs in particular to development system of identification. J Am Pharm Assoc 1949; 38: 324-331.
9. Raaman N. Phytochemical Techniques by New India Publishing Agency 2008.
10. Trease GE, Evans W C. Text book of pharmacognosy. Edition 12, Balliere Tinad, London. 1983; 257.
11. De Pascual-Teresa S, Moreno DA, Garcia-Viguera C. Flavanols and Anthocyanins in Cardiovascular Health: A Review of Current Evidence. Int. J. Mol. Sci 2010; 11, 1679-1703.
12. Ncube NS, Afolayan AJ, Okoh AI. Assessment techniques of antimicrobial properties of natural compounds of plant origin: current methods and future trends. African Journal of Biotechnology 2008; 7 (12): 1797-1806.
13. Sukanya SL, Sudisha J, Hariprasad PNiransjana SR, Prakash HS, Fthima SK, AftricJ Biotech, 2009; 8(23): 6677-6682.
14. Augusti KT and Cherian S. Insulin sparing action of leucopelargonidin derivative isolated from Ficus bengalesis Linn. Indian J. Exp. Biol 2008; 33: 608-611.
15. Hausteen B. Flavonoids, a class of natural products of high pharmacological potency. Biochem Pharm 1983; 32:1141-1148.

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