Journal of Pharmaceutical and Scientific Innovation

www.jpsionline.com (ISSN : 2277 -4572)

Research Article

PHYTOCHEMICAL PROFILING OF AQUEOUS EXTRACTS OF SELECTED MEDICINAL PLANTS

B. Ramya [1], S. Seetharaman [1], V. Indra [1]*, D. Sheela[1], K. Perinbam [2], G. Augustain [3]
[1]Department of Zoology, Presidency College (Autonomous), Chennai, India
[2]Department of Botany, Government Arts College for men (Autonomous), Nandanam, Chennai, India
[3]Department of Plant biology and Biotechnology, Loyola college, Nungambakkam, Chennai, India
*Corresponding Author Email: drindravadivel@gmail.com

DOI: 10.7897/2277-4572.06145

Received on: 25/01/17 Revised on: 04/02/17 Accepted on: 19/02/17

ABSTRACT

The objective of the present study was to find out the presence of phytochemicals in the Aqueous extracts of six medicinal plants such as *Adathoda vasika, Syzegium cumina, Terminalia arjuna, Mukia maderaspatana, Naringi crenulata, Vitex negunda* by qualitative screening methods. In qualitative analysis, the phytochemical compounds such as flavonoids, carbohydrates, proteins, phenols, saponins, tannins, terpenoids, quinones, alkaloids and glycosides were screened in six medicinal plants aqueous extract by using standard methods. The Aqueous extract of *Adathoda vasica* showed positive results for 8 phytochemical tests. When compared with other plants aqueous extract. More active compounds will be isolated from the selected medicinal plants and they may be used for medicinal purposes in future.

Keyword: Phytochemical, medicinal plants, aqueous extract qualitative analysis.

INTRODUCTION

Phytochemicals are bioactive chemicals of plant origin. They are regarded as secondary metabolites because the plants that manufacture them may have little need for them. They are naturally synthesized in all parts of the plant body; bark, leaves, stem, root, flower, fruits, seeds, etc. i.e. any part of the plant body may contain active components[1]. Medicinal plant products are considered to be the most important components of diet for a good health. A plant as the source of medicine plays an important role in the health services around the globe [2]. The plants are consumed by both animals and human beings as food. This mineral becomes part of the food chain. The plants absorb much of the essential elements from the soil in which they grow and serve as indicators of the materialization and are in fact used for this purpose [3]. A good number of our population particularly those living in rural areas depend largely on herbal remedies for the treatment of different types of diseases [4].

A new branch of science has emerged for validation of the herbal drugs and to prioritize the standards of the natural drugs and products where most of the phytochemicals have overlapping mechanism of action. Higher plants are a rich source of secondary metabolites with interesting biological activities. In general, these secondary metabolites are an important source with a variety of structural arrangements and properties. Medicinal plants are at great interest to the researcher in the field of life science especially biotechnology where most of the pharmaceutical industries depend on the plant parts for the production of pharmaceutical drugs. It had been reported that aqueous and methanolic extracts from plants used in allopathic medicines were potential sources of antiviral, antitumour and antimicrobial agents [5]. The leaves of *Adhatoda vasica* contain phytochemicals such as alkaloids, tannins, saponins, phenolics and flavonoids (https://en.wikipedia). Hence the present study focused on phytochemical analysis of bioactive compounds from aqueous leaves extracts of *Adathoda vasica, S. cumina, T. arjuna, M. maderaspatana, N. crenulata, V. negunda*.

MATERIAL AND METHODS

Authentication of Plants

All six medicinal plants were identified and authenticated by Prof. Dr. Jayaraman, Plant Anatomical Research Centre (PARC), Tambaram Chennai, Tamil Nadu, India

Preparation of extract

The plant leaves were cleaned and shade dried. The dried leaves were reduced to fine particles using dry blender and passed through the 25 µ mesh sieved. Then the powdered leaves were extracted successfully with aqueous by using Whatman No.1 filter paper. The extract obtained was stored in a container and used for further investigation.

Phytochemical analysis

Phytochemical analyses were done by the standard methods of [6, 7] and [8].

Qualitative Phytochemical Analysis

Detection of Flavonoids

Sulphuric Acid Test: A fraction of the extract was treated with concentrated sulphuric acid and observed for the formation of orange colour.

Test for Quinones

Sulphuric Acid Test: To 1ml of the extract, 1ml of con.H2 SO4 was added. Formation of red color indicates the presence of quinines.

Detection of Terpenoids
Salkowski s Test
Five mg of the extract of the leaves, flowers and seeds was mixed with two ml of chloroform and concentrated H2SO4 (3ml) was carefully added to form a layer. An appearance of reddish brown colour in the inner face was indicates that the presence of terpenoids.

Detection of Phenols
Ferric Chloride Test: To 1ml of plant extract, 2ml of 5% ferric chloride was added. Formation of dark blue or greenish black indicates the presence of tannins.

Detection of Saponins
Foam Test: To 1ml of plant extract, 5-10ml of distilled water was added and shaken in a graduated cylinder for 15minutes lengthwise. Formation of 1cm layer of foam indicates the presence of saponins.

Detection of Tannins
A small quantity of extract was mixed with water and heated on a water bath. The mixture was filtered and ferric chloride was added to the filtrate. A dark green colour was formed. It indicates that the presence of tannins.

Detection of Carbohydrates
0.5mg extracts were dissolved individually in five ml distilled water and filtered. The filtrate was used to test the presence of carbohydrates.

Detection of Protein
Biuret test
To 0.5 mg of extract equal volume of 40% NaOH solution and two drops of one percent copper sulphate solution was added. The appearance of violet colour indicates that the presence of protein.

Test for Alkaloids
Mayer's Test: To 2ml of plant extract, 2ml of concentrated hydrochloric acid was added. Then few drops of Mayer's reagent were added. Presence of green color or white precipitate indicates the presence of alkaloids.

Test for Glycosides
Sulphuric Acid Test: To 2ml of plant extract, 1ml of glacial acetic acid and 5%ferric chloride was added. Then few drops of concentrated sulphuric acid were added. Presence of greenish blue color indicates the presence of glycosides.

Table 1: Phytochemical analysis of 6 plants extraction (aqueous)

Phytocompounds	*A. vasica*	*S. cumina*	*T. arjuna*	*M. maderaspatana*	*N. crenulata*	*V. negunda*
Carbohydrates	+	+	-	-	+	+
Tannins	-	-	+	-	-	+
Saponins	+	++	-	+	++	-
Flavonoids	++	+	+	+	+	+
Quinones	-	-	-	-	-	-
Glycosides	+	-	-	+	-	+
Terpenoids	++	+	+	-	+	-
Phenols	+	-	++	-	-	+
Proteins	+	+	+	-	+	-
Alkaloids	+	-	+	-	-	+

"-" Absent "+" present, "++" strong present

RESULT AND DISCUSSION

Plants and their products have been used for many years for human health. There are still many plants which have various medicinal values but still not explored and used. Plants contain many novel compounds with medicinal values which need scientific exploration. Phytochemical are very important in medicine and constitute most of the valuable drugs. Several chemicals which are derived from plants acts as a drug that is currently used in more countries in the world [1].

Phytochemical active compounds of *A. vasica, S. cumina, T. arjuna, M. maderaspatana, N. crenulata, V. negunda* were qualitative analysed from leaves aqueous extract. Investigation showed that *Terminalia arjuna* contains tannin, flavonoids, terpenoids, phenols, alkaloids and protein And also showed that *A. vasica* possesses carbohydrates, flavonoids, protein, saponins, glycosides, terpenoids, phenols, alkaloids and tannins. The screening showed that *N. crenulata* possesses carbohydrates, flavonoids, saponins, terpenoids and protein. The results of other plant aqueous extract were given in Table 1 respectively. Medicinal properties of plants are due to the secondary metabolites (alkaloids, phenols, tannins etc.) Present in different plant parts [9]. The phenols possess redox properties and thus impart antioxidant properties to the plants in which they are present. They act as reducing agents, hydrogen donors, singlet oxygen quenchers and metal chelators [10]. Flavonoids and tannins are major group of compounds that act as primary antioxidants or free radical scavengers [11]. Tannins, alkaloids, saponins, flavonoids and sterols have been found to be active against pathogenic bacteria [12]. Thus the leaf of both plants can be used as effective medicines owing to their phytochemical constituents.

CONCLUSION

Phytochemicals found in six medicinal leaf aqueous extracts of plants indicates their potential as a source of principles that may supply novel medicines. Further studies are therefore suggested to ascertain their antibacterial and antifungal activities. Furthermore, isolation purification and characterization of the phytochemicals found present will make interesting studies.

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How to cite this article:
B. Ramya *et al*. Phytochemical profiling of aqueous extracts of selected medicinal plants. J Pharm Sci Innov. 2017;6(1): 14-16.

Source of support: Nil, Conflict of interest: None Declared