

Preliminary Phytochemical Screening of *Asteracantha longifolia* and *Pergularia daemia*

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Abstract: The aim of the study was to analyze the phytochemical constituents of two potential folklore medicinal plants such as *Asteracantha longifolia* and *Pergularia daemia*. Methanol and Aqueous extract of the dried leaves of these plants were collected and used for phytochemical analysis. The selected plants were found to contain alkaloids, phenolic compounds, tannins and flavonoids except for the absence of terpenoids in *A. longifolia* and saponin in *P. daemia* respectively. The significance of the plants in traditional medicine and the importance of the distribution of these chemical constituents were discussed with respect to the role of these plants in ethnomedicine in Tamilnadu.

Key words: Secondary metabolites • Alkaloids • Saponins • Phenolic compounds

INTRODUCTION

Medicinal plants are an important source for the therapeutic remedies of various ailments. Scientific experiments on the antimicrobial properties of plant components were first documented in the late 19th century. Since time immemorial, different parts of medicinal plants have been used to cure specific ailments in India. Now-a-days there is widespread interest in evaluating drugs derived from plant sources. This interest primarily stems from the belief that green medicine is safe and dependable, compared to costly synthetic drugs which are invariably associated with adverse effects. Natural antimicrobials have been often derived from plants, animal tissues or microorganisms. The adverse effects of the drugs available today, necessitates the discovery of new harmless pharmacotherapeutic agents from medicinal plants [1].

Phytochemicals are responsible for medicinal activity of plants [2], these are non-nutritive chemicals that have protected human from various diseases. Phytochemicals are basically divided into two groups that are primary and secondary metabolites based on the function in plant metabolism. The major constituents are consists of carbohydrates, amino acids, proteins and chlorophylls while secondary metabolites consist of alkaloids, saponins, steroids, flavonoids, tannins and so on [3]. Phytochemical constituents are the basic source for the establishment of several pharmaceutical industries. The constituents are playing a significant role in the

identification of crude drugs [2]. The main purpose of the present study was to evaluate the presence of various phytochemicals in two potential traditional medicinal plants.

Fresh plant samples were collected from different agro-climatic regions of Trichy District, Tamilnadu from the natural stands. The taxonomic identities of these plants were determined by Dr. V. Sampath Kumar, Scientist-C, Botanical Survey of India (Southern Circle), Coimbatore, Tamilnadu, South India. Fresh plant materials were washed under running tap water, air dried and then homogenized to fine powder and stored in airtight bottles. 25 g of air-dried powder was taken in 100 ml of water in a conical flask, plugged with cotton wool and they were shaken at room temperature for 2 days. After 2 days hours the supernatant was collected and the solvent was evaporated to make the final volume one fourth of the original volume (12) and stored at 4°C in airtight bottles. 25 g of air-dried powder was taken in 100 ml of methanol in a conical flask, plugged with cotton wool and they were shaken at room temperature for 2 days. After 2 days the supernatant was collected and the solvent was evaporated to make the final volume one fourth of the original volume (12) and stored at 4°C in airtight bottles. This was carried out according to the methods described by Trease and Evans [4]. Qualification phytochemicals analysis of the crude powder of the three plants for the identification of phytochemicals like as a tannins, alkaloid, steroid, phenols and terpenoid, flavonoid etc.

All plant parts synthesize some chemicals by themselves, to perform their physiological activities. In our present study, the investigated plants have exhibited different kinds of secondary metabolites. The medicinal value of these secondary metabolites is due to the presence of chemical substances that produce a definite physiological action on the human body. The most important of these substances include, alkaloids, glucosides, steroids, flavonoids, fatty oils, resins, mucilages, tannins, gums, phosphorus and calcium for cell growth, replacement and body building [5]. Phytochemical screening and qualitative estimation of two medicinal plants studied showed that the leaves were rich in phenolic compounds followed by alkaloids, tannins and saponins, maximum number of secondary metabolites were found in *Asteracantha longifolia* followed by *Pergularia daemia*. Alkaloids have been well investigated for many pharmacological properties including antiprotozoal, cytotoxic, antidiabetic [6] and anti-inflammatory [7] properties, but there are only few reports about their antimicrobial properties. Plants with alkaloids in the present study are *Asteracantha longifolia* and *Pergularia daemia* is used to cure asthma.

Saponins are glycosides occurring widely in plants. They are abundant in many foods consumed by animals and man. Saponin is used as mild detergents and in intracellular histochemistry staining to allow antibody access to intracellular proteins. In medicine, it is used in hypercholesterolemia, hyperglycemia [8], antioxidant, anti-cancer, anti-inflammatory [9], central nervous system activities (Aral & Pathak, 2006) and weight loss etc. It is also known to have antifungal properties [8]. The plants having saponins are *Asteracantha longifolia*. Plant steroids are known to be important for their cardiogenic activities, possession of insecticidal, anti-inflammatory [10], analgesic properties [11], central nervous system activities [12] and antimicrobial properties. They are also used in nutrition, herbal medicine and cosmetics. Out of the two plants, studied steroids are present in *Asteracantha longifolia*. Tannins were reported to exhibit antidiabetic [6], anti-inflammatory, antibacterial and antitumor activities. It has also been reported that certain tannins were able to inhibit HIV replication selectively besides use as diuretics. Plant tannins have been widely recognized for their pharmacological properties and are known to make trees and shrubs a different meal for many caterpillars [13]. Glycosides were reported to exhibit anti-diabetic characteristics [6]. Cardiac glycosides on the other hand are known to hamper the Na^+/K^+ pump. This results in an increase in the level of sodium ions in the

Table 1: Phytochemical screening of *Pergularia daemia*

S.No.	Phytoconstituents	Methanol	Aqueous
1	Alkaloids	+	+
2	Saponins	-	-
3	Steroids	+	-
4	Phenolic compounds	+	-
5	Tannins	+	+
6	Flavonoids	+	+
7	Terpenoids	+	-
8	Cardiac Glycosides	+	+
9	Protein & Amino acids	+	+
10	Anthraquinones	-	-

Table 2: Phytochemical screening of *Asteracantha longifolia*

S.No.	Phytoconstituents	Methanol	Aqueous
1	Alkaloids	+	-
2	Saponins	-	+
3	Steroids	+	-
4	Phenolic compounds	+	-
5	Tannins	+	+
6	Flavonoids	+	+
7	Terpenoids	-	-
8	Carbohydrate & Glycosides	+	+
9	Protein & Amino acids	+	+
10	Anthraquinones	-	-

myocytes which then enhance the level of calcium ions. This consequently increases the amount of Ca^{2+} ions available for contraction of the heart muscle, which improves cardiac output and reduces distention of heart and thus are used in the treatment of congestive heart failure and cardiac arrhythmia.

The plant extractive studied could be an answer to the people seeking for better therapeutic agents from natural sources which is believed to be more efficient with little or no side effects when compared to the commonly used synthetic chemotherapeutic agents. The anti-inflammatory, antispasmodic, antianalgesic and antidiuretic can be attributed to their high steroids, tannins, terpenoids and saponins. Further studies are needed with this plant to isolate, characterize and elucidate the structure of the bioactive compounds of this plant for industrial drug formulation.

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