Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

J P P Journal of Pharmacognosy and Phytochemistry

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2016; 5(3): 86-88
Received: 12-03-20116
Accepted: 14-04-2016

A Lavanya
Research Scholar Dept. Of Botany & Microbiology, A.V.V.M Sri Pushpam College (Autonomous), Poondi-613503.

V Ambikapathy
Assistant Professor Dept. Of Botany & Microbiology, A.V.V.M Sri Pushpam College (Autonomous), Poondi-613503.

Correspondence:
A Lavanya
Research Scholar Dept. Of Botany & Microbiology, A.V.V.M Sri Pushpam College (Autonomous), Poondi-613503.

Preliminary Qualitative Analysis of Phytoconstituents of *Dichrostachys cinerea* L.

A Lavanya, V Ambikapathy

Abstract
Medicinal plants have bioactive compounds which are used for curing of various human diseases like and also play an important role in healing. The aim of the present study was to investigate the presence of phytochemicals in the medicinal plant *Dichrostachys cinerea* L. The bark is used to treat dysentry, tooth-aches and elephantiasis. The leaves are laxative and used to treat gonorrhoea and piles. It is also a remedy for stomach problems and can remove poison from snake-bites. Phytochemical screening reveals the presence of terpenoids, coumarins, flavonoids, and alkaloids. It is expected that the important phytochemical properties have been recognized by our study in the indigenous medicinal plant *Dichrostachys cinerea*.

Keywords: Bioactive compounds, phytochemicals, *Dichrostachys cinerea*

Introduction
Medicinal plants constitute the main source of new pharmaceuticals and healthcare products. *Dichrostachys cinerea* is a thorny, fast-growing woody bush or treelet which invades fields, wasteland, road sides and other disturbed areas. Originally from Africa, it has been introduced to the West Indies during the 19th century.

Description of the plant: Bush or treelet 1.5-6m high. Branches bearing short, thorn-ended twigs. Leaves bipinnate, 3-10cm long, with 5-10 pairs of pinnae, each one with 10-30 pairs of folioles 3-6mm long. Spikes 3-8cm long, upper florets sulphur-yellox or yellow, the basal ones neutral, with long lilac-pink staminodes. Pods crowded, glomerate, ondulate and contorted, dark brown. Seeds obovate, dark brown, 4mm long. The bark is used to treat dysentery, tooth-aches and elephantiasis. The leaves are a laxative and used to treat gonorrhoea and boils. It is also a remedy for stomach problems and can remove poison from snake-bites. It is used as an aphrodisiac and as an astringent for scorpion bites (Rulangaranga 1989).

Taxonomic name	**:**	*Dichrostachys cinerea.* L
Systematic Position		
Class	**:**	**Dicotyledons**
Order	**:**	**Fabales**
Family	**:**	**Fabaceae**
Genus	**:**	***Dichrostachys***
Species	**:**	***cinerea.L***
Tamil name	**:**	**Vidatharai, Vidathalai**

Other Uses
The pods are high in protein and are highly valued for goat fodder in. The flowers are regarded as a good food for honey bees. It is also nitrogen fixing.

Materials and Methods
Collection of plant material
The leaves of *Dichrostachys cinerea* were collected from Sathyamangalam area and used for qualitative analysis of phytoconstituents.

Preparation of Solvent extracts
The collected leaves were shade-dried, and coarsely powdered using a pulverizor. The powders were subjected to successive extraction with organic solvents such as ethanol, methanol and chloroform by Soxhlet method (Harborne, 1998). About 25 g of plant materials leaf powder was used for extraction. The weight of a blank thimble filter and a blank round bottom extraction flask were weighed before and after placing 3 grams of sample into thimble. The cotton is then placed into the thimble and its weight along with sample was recorded again. The purpose of using cotton was to ensure the presence of samples inside the thimble during the experiment. The Soxhlet extraction processes using ethanol, methanol and chloroform as extraction solvent were carried out for 5 hours. After the extraction process, the weight of thimble containing sample and the weight of round bottom extraction flask containing solvent and extracted crude were weighed. The extracts were then collected and distilled off on a water bath at atmospheric pressure and the last trace of the solvents was removed in vacuum. The solvent extracts were used for preliminary phytochemical screening.

Qualitative Phytochemical analysis of the plant extracts (Harborne 1988).
The leaf extracts were analyzed for flavonoids, pholabatannins, glycosides, saponins, lipids, tannins, and anthroquinones.

Tannins
Ferric chloride (2ml of 5%) was added to 1ml of each of the plant extracts and the formation of dark blue or greenish black indicated the presence of tannins.

Saponins
Distilled water (2ml) was added to 2ml of each plant extracts and shaken in graduated cylinder of 15 minutes lengthwise. The formation of 1cm layer of foam indicated the presence of saponins.

Flavonoids
Sodium hydroxide (1ml of 2N) was added to 1ml of each plant extracts. Yellow color indicated the presence of flavonoids.

Alkaloids
Concentrated hydrochloric acid (2ml) was added to 2ml of each of the plant extracts. Then few drops of Mayer's reagent were added. Presence of green colour or white precipitate indicated the presence of alkaloids.

Anthocyanin and betacyanin
Sodium hydroxide (1ml of 2N) was added to 2ml each of plant extracts and heated for 5 minutes at 100 ˚C. Formation of bluish green colour indicated the presence of anthocyanin and formation of yellow color indicated the presence of betacyanin.

Glycosides
Chloroform (3ml) and ammonia solution (10%) was added to 2ml of plant extract. Formation of pink color indicated the presence of glycosides.

Phenols
Distilled water (2ml) followed by few drops of 10% ferric chloride was added to 1ml of the extracts. Formation of blue or green color indicated the presence of phenols.

Coumarins
10% NaOH (1ml) was added to 1ml of the plant extract. Formation of yellow color indicates presence of coumarins.

Acids
Plant extract (1ml) was treated with sodium bicarbonate solution. Formation of effervescences indicates presence of acids.

Protein and amino acids
Ninhydrin test: few drops of 0.2% Ninhydrin was added 2ml of plant extract, and heated for 5minutes. Formation of blue color indicated the presence of proteins.

Phlobatannins
Few drops of 10% ammonia solution were added to 1ml of plant extract. Appearance of pink colour precipitates indicated the presence of Phlobatannins.

Anthroquinone
0.5ml of the extract was boiled with 10 ml of sulphuric sacid and filterted while hot. The filtrate was shaken with 5 ml of chloroform. Observed for colour changes.

Result
Preliminary Phytochemical Screening:
The results of preliminary phytochemical screening of leaves of *Dichrostachys cinerea* were given in the Table.1. Tannins, Alkaloids, Anthocyanin, Glycosides, Flavonoids, Phenols, Steroids, Coumarins, and Acids were present in ethanol and methanol extracts. Amino acids and proteins were present in methanol extract but absent in ethanol extracts. Anthraquinones, Phlobatannins, Saponins were absent in all the tested extracts.

Table 1: Preliminary Screening for Phytochemical Constituents

S. No	Phytochemical constituents	Ethanol extract	Methanol extract	Chloroform extract
1.	Tannins	+	+	+
2.	Saponins	-	-	-
3.	Flavonoids	+	+	+
4.	Alkaloids	+	+	+
5.	Anthocyanin and betacyanin	+	+	_
6.	Glycosides	+	+	+
7.	Phenols	+	+	+
8.	Coumarins	+	+	+
9.	Acids	-	+	+
10.	Protein and Amino acids	-	+	+
11.	Steroids and Phytosteroids	+	+	-
12.	Phlobatannins	-	-	-
13.	Anthroquinone	-	-	-

+ indicates Presence, - indicates Absence

Discussion

Isolation and characterization of pharmacologically active compounds from medicinal plants continue today to develop novel drugs for variety of infectious and non-infectious ailments (Mukhtar *et al.*, 2008) [2].

Many of the compounds exhibited potent biological activity, tended to be present in plants at low concentration levels (Douglas Kinghorn *et al*., 2011) [3]. Medicinal plants remain an important source of new drugs, new drug leads, and New Chemical Entities (NCEs) (Douglas Kinghorn, 2005). This indicates the chemical potential of the extracts to facilitate the process of chemical isolation as supported by previous studies (Douglas Kinghorn, 2005; Muthaura *et al.*, 2011) [4].

It has been reported that many medicinal plants are rich in varieties of secondary metabolites such as alkaloids, flavonoids, tannins and terpenoids (Lewis and Ausubel, 2006) [5], (Swetha venpoosa *et al*., 2013) [6], (Viajayalakshmi 2013) [9]. These secondary plant metabolites exert a wide range of biological activities on physiological systems (Olagunju *et a*l., 2006) [7]. The results of preliminary phytochemical screening showed the presence of flavonoids, phenolic groups, steroids and terpenoids in all the extracts of leaves and stem. Flavonoids are reported to possess anti-oxidant, anti-proliferative, antitumor, anti-inflammatory, pro-apoptotic activities; with molecular targets have been identified (Williams *et al*. 2004; Taylor and Grotewold 2005) [10].

The health-promoting effects of flavonoids may relate to interactions with key enzymes, signaling cascades involving cytokines and transcription factors, or antioxidant systems (Polya 2003) [8]. Phenolic compounds have also been known as antioxidant agents, which act as free radical terminators and have shown medicinal activity as well as exhibiting physiological functions. It was reported that compounds such as flavonoids, which contain hydroxyls, are responsible for the radical scavenging effects of most plants (Omale and Okafor, 2007) [11]. Due to the presence of these many compounds the extracts possess the medicinal potential to develop novel therapeutic agents.

Thus the present study reveals the pharmacologically potential compounds like Tannins, Alkaloids, Anthocyanin, Glycosides, Flavonoids, Phenols, Steroids, Coumarins, and Acids.

Summary and Conclusion

It is concluded that the preliminary phytochemical analysis of medicinal plant *Dichrostachys cinerea.L* shows the presence of bioactive compounds like Tannins, Saponins, Flavonoids, Alkaloids, Anthocyanin and betacyanin, Glycosides, Phenols, Coumarins, Acids, Protein and amino acids, Steroids and Phytosteroids and Phlobatannins. The phytochemical analysis of the medicinal plant *Dichrostachys cinerea. L* is very important commercially and has great interest in pharmaceutical companies for the production of the new drugs for curing of various diseases.

Acknowledgment

We acknowledge the Secretary & Correspondent and Principal of A.V.V.M. Sri Pushpam College (Autonomous), Poondi, for the support.

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