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## Preliminary Phytochemical Screening of Natural Anti-dandruff plant *Phylanodiflora* (L.) Greene (*Lippianodiflora*)

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### ABSTRACT

Medicinal plants are widely used by traditional medical practitioners for counteracting various diseases in their routine practice. Natural products from plants have been the basis of the treatment of human disease. Hence, the present investigation was undertaken with the main objective of screening the plant, *Phylanodiflora* L. (Verbinaceae) for its phytochemicals. The different leaf extracts of petroleum ether, chloroform, and methanol of *Phylanodiflora* L. were subjected to qualitative analysis for the identification of phytoconstituents. Powdered dried leaf sample was successively extracted with petroleum ether, chloroform and methanol by using Soxhlet apparatus until the decolorization of the solvents. Methanolic leaf extract of *Phylanodiflora* L. shows all the phytochemicals present except fixed oil and fat. Chloroform extract shows the presence of alkaloids, flavonoids, terpenoids, steroids, proteins, amino acid, Fixed oil, and fat. While terpenoids, steroids, Fixed oil, and fat are present in Petroleum ether extract.

Keywords: Phytochemical, Medicinal Plant, *Phylanodiflora*, Poduthalai, Secondary metabolites and Anti-dandruff.

### 1. INTRODUCTION

Medicinal plants occupy a significant position in community because they play a vital role in human health. The medicinal value of the plants lies in some chemical substances that cause a definite action on human body. Medicinal plants are widely used by the traditional medical practitioners for counteracting various diseases in their routine practice. Natural products from plants have been the basis of the treatment of human disease. Today 80 % of population of developing countries still rely on traditional medicine based on plant species for their primary health. Herbal medicines are currently in demand and their popularity is increasing day by day<sup>1</sup>. Herbal drugs are commonly used throughout the world because of lower side effects, easy availability, low cost and its effectiveness<sup>2</sup>. Medicinal herbs basically consists of effective sources of flavonoids, tannins, glycosides, anthraquinones, steroids antimicrobial and antioxidant natural products etc. Medicinal herbs are an important source for the have enormous physiological activities in humans and therapeutic remedies of various ailments. These include cancer prevention, antibacterial, immemorial, different parts of medicinal herbs have been antifungal, anti-oxidative, hormonal action, enzyme used to cure specific ailments<sup>3</sup>. Phytochemicals function in plant metabolism is a major constituents of nonnutritive plant chemicals that have protective or phytochemical are consist of carbohydrates, amino acids, and disease prevention process<sup>4</sup>. Herbal drugs referred as plant based materials, involves the use of whole plant or parts of plant to treat injuries or illness<sup>5</sup>.

*Phyla nodiflora* L. Greene is an important member of the family Verbenaceae. This family includes 34 genera. Plants from Verbenaceae family are well known for their use in traditional medicinal system of various countries. *Phyla* is used as the traditional medicine for the treatment of various skin diseases and is used as folk cosmetics among the tribal communities of Pakistan<sup>6</sup>. The main aim of the present study was to analyze the preliminary phytochemicals of different leaf extracts of *Phylanodiflora* L.

### 2. MATERIALS AND METHODS

Healthy and disease free leaves of *Phyla nodiflora* L. were collected from Annamalai University Campus during the months of February and March, 2021. The plant material was identified and authenticated by the Department of Botany, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu,

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India. The leaves were cleaned, dried in the shade and pulverized in a mechanical grinder, passed through a 40 mesh sieve and stored in an air tight container. Powdered dried samples (30 g) were successively extracted with petroleum ether (300 mL), chloroform (300 mL) and methanol (300 mL) by using Soxhlet apparatus until the decolourisation of the solvents.

### 2.1. Preliminary phytochemical analysis

#### 2.1.1. Test for alkaloids

1 ml of Mayer's reagent was added with 1 mL of the extract. The formation of white precipitate was taken as a positive result for the presence of alkaloids.

#### 2.1.2. Test for flavonoids

1 ml of neutral ferric chloride was added with 1 mL of extract. Appearance of brown colour indicates the presence of flavonoids.

#### 2.1.3. Test for terpenoids

1 ml of extract was treated with 1 mL of chloroform and 1 ml of concentrated sulphuric acid was added to form a layer. A reddish brown colour indicates the presence of terpenoids.

#### 2.1.4. Test for steroids

1 ml of chloroform was mixed with 1 mL of extract and then ten drops of acetic anhydride and five drops of concentrated sulphuric acid were added and mixed. The formation of dark red colour or dark pink colour indicates the presence of steroids.

#### 2.3.5. Test for tannins

5 ml of extract was added to few drops of 1% lead acetate. A yellow precipitate indicated the presence of tannins.

#### 2.3.6. Test for saponins

2 ml of the extract with 20 mL of distilled water was agitated in a graduated cylinder for 15 min. The formation of 1 cm layer of foam indicated the presence of saponins.

#### 2.3.7. Test for phenols

About 1 mL of lead acetate solution was added with 1 mL of the extract. A brown colour precipitate is observed, which showed the presence of phenolic compounds.

#### 2.3.8. Test for carbohydrate

Three to five drops of Molisch reagent was added with 1 mL of the extract and then 1 mL of concentrated sulphuric acid was added carefully through the side of the test tube. The mixture was then allowed to stand for two minutes and diluted with 5 mL of distilled water. Development of red or dull violet ring at the junction of the liquids, which showed the presence of carbohydrates.

#### 2.3.9. Test for proteins

1 ml of ninhydrin was dissolved in 1 mL of acetone and then small amount of extract was added with ninhydrin. The formation of purple colour revealed the presence of protein.

#### 2.3.10. Test for fixed oil and fat

A few drops of Sudan III solution was treated with 1 mL of extract. A shining orange colour showed the presence of fixed oil and fat.

## 3. RESULTS AND DISCUSSION

The powdered plant sample of *P. nodiflora* was extracted with various solvents viz. petroleum ether, chloroform and methanol. These extracts were subjected to qualitative chemical tests and the results were compiled in Table 1. The preliminary phytochemical analysis has revealed the presence or absence of various phytochemicals such as alkaloids, flavonoids, terpenoids, steroids, Tannins, saponins, phenols, Carbohydrates, Protein, Amino acid, fixed oils and fat (Table 1). Methanolic leaf extract of *Phylanodiflora* L shows all the phytochemicals present except Fixed oil and fat. Chloroform extract shows the presence of alkaloids, flavonoids, terpenoids, steroids, Proteins, amino acid, Fixed oil, and fat. While terpenoids, steroids, Fixed oil, and fat are present in Petroleum ether extract. In addition to that terpenoids and steroids are present in all three extracts viz., as Petroleum ether, Chloroform and Methanol.

Yenet *et al.*, (2012) reported that the preliminary phytochemical screening showed that the aerial parts of *Lippianodiflora* contained flavonoids, steroids, alkaloids, terpenoids, steroids, tannins and phenolics<sup>7</sup>. Similar results were found in the phytochemical analysis of *Lippianodiflora* showed that the plant contained flavonoids, steroids, glycosides, alkaloids, terpenoids, quinols, quinol glucosides, steroids, phenylpropanoids, resin, volatiles, tannins and phenolics<sup>8</sup>. Sudha and Srinivasan (2013) recorded that the preliminary phytochemical analysis has revealed the presence of various phytochemicals such as alkaloids, flavonoids, glycosides, steroids, saponins, phenols and tannins<sup>9</sup>.

**Table -1: Preliminary Phytochemical screening of leaf extract of *Phyla nodiflora* L.**

Phytoconstituents	Extracts		
	Petroleum ether	Chloroform	Methanol
Alkaloids	-	+	+
Flavonoids	-	+	+
Terpenoids	+	+	+
Steroids	+	+	+
Tannins	-	-	+
Saponins	-	-	+
Phenols	-	-	+
Carbohydrates	-	-	+
Proteins and amino acid	-	+	+
Fixed oil and fat	+	+	-

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#### 4. CONCLUSION

*Phyla nodiflora* L. Greene (*Lippianodiflora*) is an important medicinal plant from the family of Verbenaceae. Methanolic leaf extract of *P. nodiflora* shows all the phytochemicals present except fixed oil and fat. Chloroform extract shows the presence of alkaloids, flavonoids, terpenoids, steroids, proteins, amino acid, Fixed oil, and fat. While terpenoids, steroids, fixed oil, and fat are present in Petroleum ether extract.

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