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Research Article

Phytochemical screening of *Pogostemon auricularis* (L.) Hassk. of Lamiaceae

K. Kamaleswari and V. Nandagopalan

PG & Research Department of Botany, National College, Tiruchirappalli-1, Tamil nadu, South India.
k.kamaleswari09@gmail.com

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Abstract

Pogostemon auricularis (L.) Hassk. belonging to family Lamiaceae. It's mainly found in Bangladesh, India, Malaysia and China. Pogostemon used for stomachache, discomfort and hysteria. Phytochemical analysis confirmed the presence of alkaloids, tannin, glycosides, saponins, phenolic, flavonoids, flavon glycosides, cardiac glycosides, phytosterols, fixed oils and fats in leaves. Fixed oils and fats showed high scores while alkaloids flavonol glycosides showed moderate scores phenolics, flavonoids, cardiac glycosides phytosterols showed lowest amount but saponin and glycosides were absence. Oil is found in 9.9% in 2gm of dry weight of powder of leaves of *Pogostemon auricularis*.

INTRODUCTION

Higher plants are a treasure house of potential drugs and in the recent years there has been an increasing awareness phytodrugs investigation studies (Cathrine and Prabavathi, 2011). Drugs from the plants are easily obtained, less expensive, safe, and efficient and without side effects as compare with synthetic drugs. The importance of medicinal plants in the management of human ailments cannot be overemphasized (Murugan and Mohan, 2011; Dhale and Mogle, 2011).

Among the dicot, the member of Lamiaceae contains 45 genera and 574 species with 256 endemic species (Erik and Tarikahya, 2004), which is a global distribution. There are about 47 species mainly used for ethanomedicine and traditional medicinal system. It's mainly used for medicinal purpose such as diuretic, sedative, digestive, antiparasitic, carminative, appetizer, anticonvulsant, antiiflammatory, and stimulant (Britto *et al.*, 2012). Among the Lamiaceae members the *Pogostemon* genera have been used by tribal mostly for snake bite (Sen *et al.*, 2008)

Morphological characters:

Densely hispid herb to 75cm. Leaves elliptic- lanceolate, 2.8 × 1.5cm, chartaceous, base truncate to attenuate, margin irregularly crenate-serrate, apex acute, petiole to 0.5 cm. Racemes dense, terminal, peduncle 8 (16) cm; bracts and bracteoles ∝, minute, calyx- lobes 5, (sub) equal, 1.5mm, glabrous, ciliate, acute. Corolla - violet, 2mm across; lobes 4, equal, tubular, 3.5 mm, anterior lobe villous without. Stamen 4, sub equal; filaments 5 mm, anthers 0.4 mm. ovary 0.2 mm; style 5 mm. (Matthew, 1983). Flowers- throughout the year

Medicinal properties:

The taxonomical studies on their distribution stated that *P. auricularis* categorized as an endemic species in India (Falak *et al.*, 1988). The leaf juice is used as eye drops for hysteria. The plant extract with salt is given for diarrhoea by the marma in Bandarban. It is also used to treatment of stomachache and discomfort (Nur *et al.*, 2015). Therefore, the present study mainly focused on the

phytochemical screening of *P. auricularis*.

MATERIALS AND METHODS

Collection and identification of Plant material

The plant samples were collected from Kolli hills, above the 1100 MSL and exclusively located in and around the wet land areas of Namakkal District, Tamil nadu, South India. The plants sample were preserved as herbarium specimen and identified by Botanical Survey of India (BSI/SRC/5/23/2015/Tech/1549), Coimbatore. The voucher specimens were deposits in Department of Botany, National College, Tiruchirappalli.

Plant extracts preparation:

The healthy plant leaves were collected and washed thoroughly in distilled water. The leaves allowed drying in shade place for one week. Well dried leaf samples were powdered by conventional methods. The powder samples were used for preliminary phytochemical screening. The phytochemical includes alkaloids, saponins, phenolic compounds, tannins, flavonoids, phytosterols, Fixed oils and fats.

Qualitative screening test:

Alkaloids (wagner's test):

0.5 g of powder was stirred with few ml of diluted HCL and filtrated. To this, 2 ml of Hager's reagent was added. A prominent yellow precipitated indicated the presence of Alkaloids.

Saponin (Frothing test):

The plant extract (0.5g) was dissolved with distilled water made up to 20ml. The suspension was shaken in a graduated cylinder for 15 min. A 2cm layer of foam indicated the presence of saponins.

Phenolic (Ferric chloride test):

A few drop of filtrate and a drop of neutral 5% ferric chloride solution were added. A dark green colour was indicated the presence of phenolic.

Tannin (Potassium hydroxide test):

About 1 g of extract was dissolved into 10ml of 10% potassium hydroxide in a beaker and shaken to dissolve. A dirty precipitate indicated the presence of tannins.

Flavonoids (Alkaline reagent test):

A drop of aqueous filtrate was treated with 10% ammonium hydroxide solution. A bulky white is presence of flavonoids.

Glycosides (Borntrager test):

A few amount of extract was hydrolyzed with Con. HCL for 2 hours in boiling water bath and filtrated. Drop of filtrate was treated with chloroform and shaken well. The chloroform layer was separated and 10% ammonia solution was added to it. Pink color is presence of glycosides.

Flavonol glycosides (magnesium and hydrochloride acid reduction):

Drop of filtrate was dissolved with alcohol and few fragments of magnesium ribben were added. Whereas, treated with Con H_2So_4. Pink or crimson colour indicated the presence of flavonol glycosides.

Cardiac glycosides (Keller Killiani test):

A few drop of filtrate was dissolved in glacial acetic acids containing one drop of ferric chloride solution. This was then under layer with Con H_2So_4. A brown ring indicated the presence of cardiac glycosides.

Phytosterols (Lieberman and Burchard's test):

0.5 ml of filtrate was dissolved in acetic anhydride and drop of Con H_2So_4. An array of colour changes showed the presence of phytosterols.

Fixed oils & fat (spot test):

A small amount of powder is pressed between two filter papers. It's indicated the presence of fixed oils.

Detection of Oils (Gravimetric methods)

3 g of dry powder and added 10 ml of methanol and chloroform (1:2) mixture. After centrifuged and collect the supernatant carefully. Add two drop of 0.005 N KCL on the supernatant, it was thoroughly shaken and allowed to stand up for 5 minutes. The bottom lipid layer was collected in a pre-weighed beaker. Then the beaker kept in a water bath to evaporate the methanol and chloroform content. After cooling the beaker were reweighed using a electric balance.

$$\% \text{ of the lipid content } = \frac{weight\,of\,the\,lipid}{weight\,of\,the\,sample} \times 100$$

Results and discussion:

Medicinal plants are the best sources for chemical ingredients, antimicrobial and antioxidant agents for cure of different diseases. The present investigation, quantitative phytochemical screening test were analysed in leaf extract of *P. auricularis*. The result was showed in table -1 which indicated the present or absence of compounds of

P. auricularis leaf extract. Results showed that, fixed oils and fats was present in high intensity followed by alkaloids, phenolic, flavonol glycosides, tannin, flavonoids, cardiac glycosids, and phytosterols compounds. These compounds also can be correlated with the medicinal potential of the plant. Other group of saponin, and glycosides were not present in the leaf plant extract. Naise and Bhadange, 2014 showed similar result were exhibits in *Pogostemon benghalensis*. Most natural compounds are derived from primary metabolites such as amino acids, carbohydrates and fatty acids and are generally categorized as secondary metabolites. Secondary metabolites are considered products of primary metabolism but not involved in metabolic activity (alkaloids, phenolics, essential oils and terpenes, sterols, flavonoids, lignins, tannins, *etc*.) (Pal, 2007). Subhadra devi, 2012 reported the phenolic compound are present in most widely distributed in the plant kingdom. Mainly, the phenolic and flavonoids compounds extracted from the leaves samples antibiotics activity of the plant leaf extracts (Hossain *et al*., 2013). Further, the phenyl propanoidal derivatives such as phenol, flavone, flavonoids, lignin and lignan etc. have been experimental proved in many pharmacological studies that act as antimicrobial agents in wide spectrum of bacterial and fungal strains (Nitiema *et al*., 2012; Alves *et al*., 2014). These compounds also have been reported as a good source of antioxidant agents (Gengaihi *et al*., 2014). The presence of tannin in plant to protected from animal does not graze (Ulhe and Narkhede, 2013).

Table – 1 Qualitative analysis of *P.auricularis*

Phytochemical constituents	***Pogostemon auricularis***
Alkaloids	++
Saponins	_
Phenolic compounds	++
Tannins	+
Flavonoid's	+
Glycosides	_
Flavonol Glycosides	++
Cardiac Glycosides	+
Phytosterols	+
Fixed Oils and fats	+++

+: Presence of chemical compound; - : Absence of chemical compound

+ < ++ < +++: Based on the intensity of characteristic colour.

Table 2: Analysis of oil percentage in leaf

S. No	Empty flask weight	Flask weight oil	Oil in percentage
1	84.009	84.207	9.9

Conclusion

We concluded that the extract of *P. auricularis* possess a good source of essential oil, alkaloids, flavonol glycosides followed by phenolic, flavonoids, gardiac glycosides and phytosterols. The essential oil mainly used for pharmacological properties. Exploitation of these pharmacological properties involves further investigation of these action ingredients by implementation of these techniques like extraction, purification, separation and identification.

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