

RESEARCH ARTICLE

PRELIMINARY PHYTOCHEMICAL STUDIES OF SELECTED MEDICINAL PLANT *PACHYGONE OVATA* (POER.) HOOK.F. & THOMS FROM MENISPERMACEAE FAMILY FOR BIOACTIVE CONSTITUENTS

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ABSTRACT

The present study deals with the phytochemical examination of *Pachygone ovata* (Poer.) Hook.f.& Thoms., an important medicinal plant from menispermaceae family. Leaf and Stem extracts were prepared by using different solvents systems and phytochemical screening was performed using the standard methods given by Harborne. Leaf and stem extracts were prepared from aqueous and organic solvents like petroleum ether, acetone, ethyl acetate and ethanol. Qualitative phytochemical analysis of the petroleum ether, acetone, ethyl acetate, ethanol and aqueous extracts prepared from *P. ovata* leaf and stem part. Leaf part revealed the presence of alkaloids, flavonoids, glycosides, cardiac glycosides, phenols and tannins. Stem part revealed the presence of alkaloids, flavonoids, glycosides, Resin, Steroids, phenols and tannins. The ethanolic extract showed higher amount of secondary metabolites than the other solvent extracts. This observation becomes important in the context of the therapeutically and drug applications of *P. ovata*.

Keywords: *Pachygone ovata* (Poer.) Hook.F. & Thoms, Endemic, Western ghats and preliminary phytochemical screening.

1. INTRODUCTION

Plants were main sources of new pharmacological active compounds, many important drugs being derived from plant materials. (1, 4). In Indian folk medicine, members of the Menispermaceae family have been used against many diseases like diabetes, oedema, pain, rheumatoid arthritis, bone fracture, nephritis, pyrexia and hypertension (3, 8, 9, 10). In Menispermaceae family have been indicate to be rich in secondary metabolites; mainly alkaloides. In the present study, the medicinal potential activities of the plant *Pachygone ovata* (Poir.) Miers ex Hook. f. et. Thoms was investigated to learn more about their healthful effects on humans.

2. MATERIALS AND METHODS

2.1. Collections of plant material

Leaf and stem parts of *Pachygone ovata* were collected from Western ghats region of Coimbatore district, Tamilnadu, India. The voucher specimen has been deposited in Kongunadu Arts and Science College, Coimbatore.

2.2. Description of the selected plants

Pachygone ovata (Poir.) Miers ex Hook. f. & Thoms., Fl. Ind. 203. 1855 & in Hook. f., Fl. Brit. India 1: 105. 1872; Gamble, Fl. Pres. Madras 31 (22). 1915; Gangop. in B. D. Sharma et al., Fl. India 1:329.1993; Sasidh., Fl. Chinnar WLS 15. 1999.

Cissampelos ovata Poir. in Lam., Encycl. 5:10. 1804.
Cocculus plukenetii DC., Syst. Nat. 1: 520. 1817.

Family: Menispermaceae

Common Name(s): Katukodyvally

Habit: Climber

Flowering & Fruiting: January-September

Distribution: Indo-Malesia to Australia

2.3. Preparation of plant extract

The Leaf and stem parts of *Pachygone ovata* were washed with tap water and shade dried for a week and powdered coarsely. Then they were powdered mechanically by using Pulverizer and passed through 40 mesh sieve and stored in airtight containers. About 30g of powdered leaf and stem parts were extracted by using shaker apparatus with petroleum ether, ethyl acetate, acetone and ethanol. The extract was dried under reduced pressure at low temperature (40-50°C). The last traces of the solvent were removed under vacuum drier and the solid mass obtained was stored at 4°C until further use.

2.4. Phytochemical study

The stored filtrate was used for the various phytochemical and biological studies. A preliminary phytochemical analysis to screen the samples for the presence of phytochemical components such as alkaloids, glycosides, tanins, phenol, saponin and

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tannins was performed according to the method described (7).

2.4.1 Qualitative Analysis

The qualitative analysis were completed to get the presence of the active phytochemicals in the various solvent extracts (2, 5, 6).

Alkaloids (Mayer's test)

To the extract added 1% HCl and 6 drops of Mayer's reagent were added. An organic yellow precipitate indicated the presence of alkaloids in the sample.

Flavonoids (Lead acetate test)

The aqueous extract was treated with few drops of 10% lead acetate solution. The formation of yellow precipitate confirmed the presence of flavonoids.

Terpenoids (Salkowski test)

10mg of the extract was dissolved in 1ml of chloroform, 1ml of acetic anhydride was added following the addition of 2ml of conc. H₂SO₄. Formation of reddish violet colour indicates the presence of triterpenoids.

Cardiac glycosides (Keller-Killiani test)

0.5g of extract diluted to 5ml of water then added 2ml of glacial acetic acid containing one drop of ferric chloride solution. In this test was underlayed with 1ml of concentrated sulphuric acid. A brown ring at the border indicates the presence of a deoxysugar characteristic of cardenolides. A violet ring may show below the brown ring, while in the acetic acid layer a greenish ring may appearance just above the brown ring and slowly spread throughout this layer.

Phenols (Ferric chloride test)

Various solvent extracts were treated with 2-4 drops of ferric chloride solution. Development of bluish black colour indicates the presence of phenols.

Sterols (Lieberman-Burchard's test)

Various solvent extracts were treated with chloroform and filtered. The filtrates were treated with few drops of acetic anhydride, boiled and cooled. Conc. Sulphuric acid was added. Development of brown ring at the junction indicates the presence of phytosterols.

Saponins (Froth Test)

Extracts were diluted with distilled water to 20ml and this was shaken in a graduated cylinder for 15 minutes. Development of 1cm layer of foam indicates the presence of saponins.

Tannins (Lead acetate test)

In a test tube containing about 5ml of an aqueous extract a few drops of % solution of lead acetate was added. A yellow or red precipitate was formed indicating the presence of tannin.

Resins

To 2ml of chloroform extract 5-10ml of acetic anhydride was added, dissolved by gently heating coding and then 0.5ml of sulphuric acid was added. Bright purple colour was produced. It indicates the presence of resins.

Glycosides

A small amount of alcohol extract samples was dissolved in 1ml water and then aqueous sodium hydroxide solution was added. Formation of a yellow colour indicators the presence of glycosides.

Triterpenoids

10mg of the extract was dissolved in 1ml of chloroform, 1ml of acetic anhydride was added following the addition of 2ml of conc. H₂SO₄. Formation of reddish violet color indicates the presence of triterpenoid.

Reducing sugar

The crude extract of each plant was shaken with 5ml of distilled water and filtered. The filtrate was boiled with drops Fehling's solution A & B for 2 minutes. An orange red precipitate indicates the presence of reducing sugar.

3. RESULTS AND DISCUSSION

Phytochemical are organic chemicals that are produced by plants. They may be nutritive or non-nutritive in nature. These can be regarded as naturally occurring non-nutritive chemicals of plant origin. In the present study the phytochemical compounds present in *P. ovate* leaf and stem illustrated in (Table 1). This plant is highly medicinal and endemic to Western Ghats region, which belong to the family Menispermaceae. The various solvent systems like petroleum ether, Acetone, ethyl acetate, ethanol and aqueous were employed to extract the various phytochemical constituents in shade dried plant parts. The qualitative test of extracts confirmed in the presence of alkaloid, flavonoid, phenol, tannin, steroids and cardiac glycosides in leaf and stem extracts. Stem extract showed the better result when compared to stem and root extracts. The presence of these secondary metabolites may vary with solvents. This might be due to various degrees of solubility of different solvents for different

phytoconstituents and the phytochemical constituent alkaloid is indicated in high degree in all extracts like leaf and stem extract. Therefore the plant *P. ovata* highly medicinal and needed wide research.

Table 1: Preliminary phytochemical analysis of different solvent extracts of whole plant of *P. ovata*.

| Secondary Metabolites | Petroleum ether | | Acetone | | Ethyl acetate | | Ethanol | | Aqueous | |
|-----------------------|-----------------|------|---------|------|---------------|------|---------|------|---------|------|
| | Leaves | Stem | Leaves | Stem | Leaves | Stem | Leaves | Stem | Leaves | Stem |
| Alkaloid | + | + | + | + | + | + | + | + | + | - |
| Flavonoid | - | - | + | + | - | - | + | - | - | - |
| Phenol | + | + | + | + | + | + | + | + | + | + |
| Tannin | - | - | + | + | - | + | - | - | - | - |
| Glycoside | + | + | + | + | + | + | - | - | - | - |
| Saponin | - | - | - | - | - | - | - | - | - | - |
| Resin | - | + | - | + | - | + | - | - | - | - |
| Steroids | - | - | - | + | - | + | - | - | - | - |
| Terpanoids | - | - | - | - | - | - | - | - | - | - |
| Cardiac glycosides | + | - | + | - | + | - | - | - | - | - |

6. CONCLUSION

The present investigation proved that the presence of alkaloid, flavonoid, phenol, tannin, steroids and cardiac glycosides in leaf and stem extracts. The phytochemical constituent alkaloid glycoside is indicated in high content in all extracts like leaf and stem extract. The results are proved that plant *P. ovata* is highly medicinal and effective for the treatment of various ailments. A more comprehensive research is needed to isolate the essential compounds in this medicinal plant. More over this study also highlights the importance of conservation and sustainable utilization of such potential medicinal herbs to future generation.

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