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Research Article

Phytochemical analysis of Different extract of *Hyptis suaveolens(L.)Poit*

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Abstract

Aromatic plants are the basin of secondary metabolites that are accountable for the plants medicinal efficacy and major origin of aromatic compound and essential oils. Now days due to richness of bioactive elements in plants they play a crucial role in production of enormously increasing herbal product. In the present study *Hyptis suaveolens (L.)Poit* from Mahodari ghat region were analysed for secondary metabolites by using plant parts (roots, leaves, stem and seed) and by using range of solvent from polar to non-polar. Many of different phytochemical Glycosides, Terpenoids, tannins, Flavonoids, alkaloids, coumarins, phlobatannins and phytosterols were found in methanolic extract of leaf and stem, seeds. While extract of hexane, Petroleum ether and chloroform exhibits presence of some of them. Obtained results show importance of biological active molecules for pharmaceutical and cosmetic industries.

Keywords Phytochemical, Secondary metabolites, bioactive compound

INTRODUCTION

Today herbs play a crucial role in pharmaceutical Industry. From ancient period we use plants for various purposes as they are easy to available and very negligible side effect. Indian economy and area of medicinal research greatly depend on the number of wild plant species. Tribal knowledge of medicine is getting a huge exposure due to various research works that expose the Potential and truthfulness of the knowledge. World is searching for new Herbal products that will be suitable for variety of infection and diseases. Medicinal plants besides therapeutic agents are also a huge source of knowledge for spacious variety of chemical constituents which could be used to develop as drug with meticulous selectivity. The Proposed study has been focused on phytochemical profiling of different extract of *Hyptis suaveolens* which belongs to family Lamiaceae. Family Lamiaceae is one of the most important Flowering family plants with more than 236 genera and 7200 species. Many of the members show the presence of prominent aromatic compound and essential oil[2,3]. The *Hyptis suaveolens (L.)Poit* is commonly known as Bush mint or Pignut. It grows in foothills of open Forest area and roadside of forest. The plant is medicinally important because of its wide curable spectra. Ethanobotanically the leaves and seeds are widely used in preparation of decoction[4]. As the aerial part is rich in essential oils it is used for extract of essential oils that is used in variety of herbal product. From over 3,00,000 species of higher plants to occur in nature, only about 2 % have been screened so far. The world is now looking towards India for new drugs to manage various formidable diseases because of its rich biodiversity of medicinal plant and abundance of traditional consciousness. The present study helps us to expose the phytochemical profiling in different extract.

Taxonomical position

Kingdom: Plantae

Sub-kingdom: Angiosperm

Division: Monocots

Sub-division: Eudicots

Order: Lamiales

Family: Lamiaceae

Genus: *Hyptis*

Species: *suaveolens*

Scientific name: *Hyptis suaveolens (L.) Poit*

MATERIAL AND METHODS

Collection of plant material

Hyptis suaveolens (L.) Poit plant was collected During November 2022 to March 2023 from Mahodari Ghat Region, Nashik (Maharashtra). The Plant material cleaned and shade dried at room Temperature. The Dried material Finely Powdered and Stored in air tight container until further use.

Methods of Extraction

1gm of Powdered Plant material of Root, Leaves, Stem and Seeds were Extracted with 10ml of Different Solvents (Hexane, Petroleum ether, Chloroform and Methanol). Plant Material

Soaked in Different Solvent and sonicated By Using Ultrasonic Bath at 33KHz at 40°C For 40 Min and allowed to Stand for atleast 24hrs (Bidve &Auti2021)[1]. Then extract were Filtered, Concentrated and used for Phytochemical analysis.

Phytochemical Screening

The commonly Known Phytochemical From plants are Cardiac glycosides, Terpinoides, Saponin, Tannin, Flavonoid, Alkaloids, Carbohydrate, Amino acids, Phenolic Compounds, Tannins, Phlobatannins, Phytosterols, Fixed Oils, Anthocyanins, Steroids, Carboxylic acid, Coumarins and Quinones. The following Qualitative Tests were performed to explore phytochemicals Profile of different extracts.

I. Test For Cardiac glycosides

0.5ml of each extract was treated with 0.2ml glacial acetic acid then 1 drop of 3.55% Ferric Chloride ($FeCl_3$) was added to the solution this was layered with 1ml of concentrated H_2SO_4. A reddish Brown ring was occurred at the Interface indicates the presence of Cardiac glycosides.

II. Test For Terpenoides

5ml of each extract was dissolved in 2ml of chloroform (Evaporated on water bath).3ml of concentrated H_2SO_4 was added carefully from the wall of test tube. The solution was boiled on water bath. A grey coloured Solution indicated the Presence of Terpenoids.

III. Test For Saponin

0.5ml of extract was taken in the test tube and ml of distilled water was added to it. The solution was vigorously shaken and stable persistent Froth was observed for the Presence of Saponin.

IV. Test for Tannin

0.5ml of extract and 5ml of distilled water was taken in test tube then it was boiled then filtered. Few drops of concentrated H_2SO_4 and 1% $FeCl_3$ were added to the Filtrate. Deep Green, Brownish green or Blue Black coloration was indicates the Presence of Tannin.

V. Test For Flavonoid

0.5ml of extract and 5ml of distilled water was added to test tube then it was filtered. 5ml of diluted ammonia solution was added to the filtrate then concentrated H_2SO_4 was added. A yellow coloration indicated the presence of Flavonoid. The yellow Colour disappeared on standing.

VI. Test For Alkaloids

0.5ml of each extract was dissolved in 2ml of methanol. Few drops of 1%HCL added to it. Then the mixture was heated, kept in steam and after cooling. Then the mixture was treated with few drops of Wagner's reagent (Iodine in Potassium Iodide). Formation of brown/reddish precipitate indicates the presence of alkaloids.

VII. Test For Carbohydrate

0.5ml of extract was treated with 0.5ml of Benedict's reagent and boiled for 2 min. Orange red precipitate indicates the presence of reducing sugars.

VIII. Test For Amino acids

Few ml of extract was treated with 0.25% w/v Ninhydrin reagent and boiled for few minutes. Formation of blue colour indicates the presence of amino acid.

IX. Test For Phenolic Compounds

1ml of extract was treated with few drops of diluted Iodine solution. Transient red colour indicates the presence of phenols.

X. Test For Phlobatannins

2ml of extract was treated with 2ml of 1% HCL and boil it for few minutes. A red precipitate indicates the presence of Phlobatannins.

XI. Test For Phytosterols

0.5ml extract was treated with few drops of conc.H_2SO_4 the mixture was shaken well and allowed to stand for 2min. Formation of red colour in lower layer indicate the presence of Phytosterols.

XII. Test For Quinone

Few ml of each extract is treated with 1ml of conc.HCL. Formation of green colour indicates the presence of Quinones.

XIII. Test For Anthocyanins

2ml of extract was treated with 2ml of 2N HCL and then few ml of ammonia. Pink-red solution which turns blue-violet after addition of ammonia.

XIV. Test For Steroids

0.5ml of plant extract was dissolved in 3ml of Chloroform. The solution was filtered, 2ml of concentreated H_2SO_4 was added to form a lower layer. A reddish-brown colour rings at interface the presence of Steroid.

XV. Test For Carboxylic acid

1ml of extract is treated with 1ml of sodium bicarbonate solution. Appearance of Effervescence indicates the presence of Carboxylic acid.

XVI. Test For Coumarins

Few ml of extract was treated with 10% NaOH and then few drops of Chloroform. A yellow colour indicate the Presence of Coumarins

XVII. Test For Fixed Oils

1ml of extract is pressed between two filter papers. Oil stain on the paper indicates the presence of Fixed Oil.

Observation Table 1: Phytochemical screening of Root Extract. ('+++ve' indicate strong presence, '++ve' indicate moderate presence, '+ve' indicate weekly presence, '-ve' indicate absence of chemical.)

Sr.No	Phytocompound	Hexane	Petroleum ether	Chloroform	Methanol
1	Cardiac Glycoside	+	+	-	++
2	Terpenoids	+	-	-	++
3	Saponin	-	+	++	+
4	Tannin	-	-	-	+
5	Flavonoids	-	-	+	-
6	Alkaloids	-	++	+	+++
7	Carbohydrate	-	-	-	++
8	Reducing sugar	-	+	+	+
9	Amino acids	-	+	++	+
10	Phenolic Compound	++	+	+	-
11	Phlobatannins	-	-	-	+
12	Phytosterols	-	-	+	+++
13	Quinones	-	+	+	++
14	Anthocyanins	-	++	+	++
15	Steroids	-	+	-	+
16	Carboxylic Acid	-	+	-	-
17	Coumarins	-	+	-	+
18	Fixed Oils	+	++	+++	+

Observation Table 2: Phytochemical screening of Leaves Extract

Sr.No	Phytocompound	Hexane	Petroleum ether	Chloroform	Methanol
1	Cardiac Glycoside	+	+	++	+++
2	Terpenoids	+++	+	+	+++
3	Saponin	++	-	++	+++
4	Tannin	++	-	-	-
5	Flavonoids	+++	+	+	+
6	Alkaloids	++	+	+++	+
7	Carbohydrate	+	++	-	-
8	Reducing sugar	++	+++	+	+
9	Amino acids	+++	++	+	+
10	Phenolic Compound	-	++	+	+++
11	Phlobatannins	-	-	-	-
12	Phytosterols	++	-	-	++
13	Quinones	+++	+	++	+
14	Anthocyanins	-	+	-	-
15	Steroids	++	-	+	-
16	Carboxylic Acid	+	-	+	+
17	Coumarins	-	+	++	+++
18	Fixed Oils	+++	++	+++	+

Observation Table 3: Phytochemical screening of Stem Extract

Sr.No	Phytocompound	Hexane	Petroleum ether	Chloroform	Methanol
1	Cardiac Glycoside	+	-	++	+++
2	Terpenoids	+	+	-	-
3	Saponin	-	+	+++	++
4	Tannin	+	+	-	-
5	Flavonoids	+	-	+	+
6	Alkaloids	+	++	+++	+
7	Carbohydrate	++	-	-	-
8	Reducing sugar	+	+	+	-
9	Amino acids	+	+	+++	++
10	Phenolic Compound	-	-	+	++
11	Phlobatannins	+	-	-	-
12	Phytosterols	+++	-	+	-
13	Quinones	++	+++	+	+
14	Anthocyanins	+++	++	+	+
15	Steroids	++	-	-	+
16	Carboxylic Acid	+	+	-	-
17	Coumarins	+	+++	-	-
18	Fixed Oils	+	+	++	-

Observation Table 4: Phytochemical screening of Seed Extract

Sr.No	Phytocompound	Hexane	Petroleum ether	Chloroform	Methanol
1	Cardiac Glycoside	+	++	+++	+++
2	Terpenoids	+	++	-	+
3	Saponin	+++	+	++	+++
4	Tannin	+	++	+	-
5	Flavonoids	-	-	-	-
6	Alkaloids	++	-	++	+
7	Carbohydrate	+	++	-	-
8	Reducing sugar	-	+	-	-
9	Amino acids	+	+	+	-
10	Phenolic Compound	-	+++	++	++
11	Phlobatannins	-	-	+	-
12	Phytosterols	++	+	-	+
13	Quinones	-	++	+	-
14	Anthocyanins	+	-	-	-
15	Steroids	++	-	-	-
16	Carboxylic Acid	-	-	-	+
17	Coumarins	++	+++	+	-
18	Fixed Oils	+	+	++	+

RESULT AND DISCUSSION

In the present study secondary metabolites such as Cardiac glycoside, terpenoids, sapnonin, tannin, flavonoids, alkaloids, carbohydrate, reducing sugar, amino acids, phenolic compound, phlobatannins, phytosterols, quinones, anthocyanins, steroids, carboxylic acid, coumarins and fixed oils have screened in hexane, petroleum ether, chloroform and methanol extracts of root, leaves, setmm and seeds of *Hyptis suaveolens (L)Poit.* The Root (Table.1) Hexane extracts show presence of cardiac gylcosides, terpenoids, phenolic compound and fixed oils. Petroleum ether extract show presence of cardiac glycosides, saponin, alkaloids, reducing sugar, amino acids, phenolic compound, anthocyanins, steroids, carboxylic acid, quinone and fixed oils. While chloroform extract show presence of saponin, flavonoids, alkaloids, reducing sugar, amino acids, phenolic compound, phytosterols, anthocyanins,quinones and fixed oils. Methanol extract show presence of Cardiac glycoside, terpenoids, sapnonin, tannin, alkaloids, carbohydrate, reducing sugar, amino acids, phlobatannins, phytosterols, quinones, anthocyanins, steroids, coumarins and fixed oils. The leaves (Table.2) hexane and petroleum ether extract showed similar presence of Cardiac glycoside, terpenoids, sapnonin, flavonoids, alkaloids, reducing sugar, amino acids, phenolic compound, phytosterols, quinones, carboxylic acid, coumarins and fixed oils. Chloroform extract showed presence of Cardiac glycoside, terpenoids, flavonoids, alkaloids, carbohydrate, reducing sugar, amino acids, phenolic compound, quinones, anthocyanins, coumarins and fixed oils while methanol extract showed presence of all phytochemical except phenolic compound, phlobatannins, anthocyanins, coumarins. The stem (Table.3) extract of methanol almost showed presence of all phytochemical which were screened and chloroform show absence of Cardiac glycoside, flavonoids, carbohydrate, amino acids, phenolic compound, phlobatannins, phytosterols, steroids. Hexane extract showed presence of Cardiac glycoside, sapnonin, flavonoids, alkaloids, amino acids, phenolic compound, quinones, anthocyanins, steroids while petroleum ether show similar result as hexane. The seed extract (Table.4) of hexane showed presence of Cardiac glycoside, terpenoids, sapnonin, alkaloids, phenolic compound, phytosterols, carboxylic acid, and fixed oils. While petroleum ether and chloroform showed similar presence of phytochemical. Methanol extract of seed showed presence of as Cardiac glycoside, terpenoids, sapnonin, tannin, alkaloids, carbohydrate, amino acids, phytosterols, anthocyanins, steroids, coumarins and fixed oils.

Above result depict that methanolic extract were rich in all most all type of metabolites while hexane extracts showed less variety of compounds.

CONCLUSION

Phytochemical screening of chemical constituents is important for discovery of novel drug for pharmaceutical industries as well as for cosmetic industries also[6]. In the present study it was detected that the plant having presence of wide range of secondary metabolites, which were proved the importance of phytochemicals and there is scope for identification bioactive compounds. The phytochemical investigation reported the presence of Cardiac glycoside, terpenoids, sapnonin, tannin, flavonoids, alkaloids, carbohydrate, reducing sugar, amino acids, phenolic compound, phlobatannins, phytosterols, quinones, anthocyanins, steroids, carboxylic acid, coumarins and fixed oils. Phytochemical present in the plant that can be very helpful for development of new herbal product and good alternative to synthetic medicines. These biologically active compounds can be used in advancement in organic pesticides. The phytochemical present in this plant can be further used as an active principal for making medicine on diseases like cancer and cardiac diseases.

Conflict of Interest

The author hereby declares no conflict of interest.

Consent for publication

The author declares that the work has consent for publication.

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