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PRELIMINARY PHYTOCHEMICAL ANALYSIS OF GUDUCHI (TINOSPORA-CORDIFOLIA (WILLD) MIERS.LEAF IN DIFFERENT SOLVENT EXTRACTS

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ABSTRACT

A proper knowledge of the phytochemical constituents of the plants is important, as this information is necessary for synthesis of new products. The main objective of current investigation was to study the qualitative preliminary analysis of Tinosporacordifolia leaf, which is a trial to protect the plant, as leaf regrowth occurs quickly when compared to stem.G uduchi is a very renowned medicinal plant for its versatile pharmaceutical properties.For finding several compounds qualitative phytochemical analysis is very important. Five different solvents viz; water, ethanol, methanol, chloroform and petroleum ether were used to obtain extracts of leaves. These extracts were used for qualitative preliminary phytochemical analysis using standard chemical tests. Data indicates the presence of flavonoids, alkaloids, proteins, phenolic compounds, phytosterols, cardiac glycosides and tannins. Most of the phytochemical components were found in methanolic and Aqueous extracts due to high solubility of active compounds of Tinosporacordifolia leaf in this solvent as compared to other solvents. The presence of these secondary bioactive phytochemicals signifies the importance of these medicinal plants as an efficient source of therapeutic agent.

Keywords: Tinosporacordifolia, phytochemicals, medicinal plant, leaf extract.

INTRODUCTION

India is regarded as the treasure trove of herbs in the world. The proper and judicious use of herbs is often successful in the treatment of illness, when other conventional methods and medicines fail. It has been universally accepted that the Ayurvedic medicines are far safer than that of other synthetic medicines in the management of complex diseases. The WHO estimated that approximate 65% of the world population still de-

pends mainly on herbal and traditional remedies.[1]India is one of the richest countries in the world with huge diversity of medicinal plants. Chemicals present in the medicinal plants known to have medicinal benefits are referred to as “active ingredients” or “active principles”

Such Phytochemicals could provide health benefits as: (1) substrates for biochemical reactions; (2) cofactors of enzymatic reactions; (3) inhibitors of enzymatic reactions; (4) absorbents/sequestrants that bind to and eliminate undesirable constituents in the intestine; (5) ligands that agonize or antagonize cell surface or intracellular receptors; (6) scavengers of reactive or toxic chemicals; (7) compounds that enhance the absorption and or stability of essential nutrients; (8) selective growth factors for beneficial gastrointestinal bacteria; (9) fermentation substrates for beneficial oral, gastric or intestinal bacteria; and (10) selective inhibitors of deleterious intestinal bacteria. Such phytochemicals include terpenoids, phenolics, alkaloids and fiber.[2] Research supporting beneficial roles for phytochemicals against cancers, coronary heart disease, diabetes, high blood pressure, inflammation, microbial, viral and parasitic infections, psychotic diseases, spasmodic conditions, ulcers, etc is based on chemical mechanisms using in vitro and cell culture systems, various disease states in animals and epidemiology of humans These phytochemicals are mainly synthesized in root, stem, bark, leaf, flower, fruits. Medicinal plants are mainly screened for these phytochemicals that may lead to its further characterization of bioactive compound. Isolation of bioactive compound from plants is mainly depending upon the solvents which are used for extraction. This emphasizes an urgent need to try as many solvents as possible in qualitative phytochemical screening of plants.

Tinosporacordifolia belongs to family Menispermaceae, commonly known as Guduchi or Giloy. A large glabrous climber with succulent, corky, grooved stems, branches sendingdown slender pendulous fleshy roots, shining or glaucous bark. Leaves membranous 7-9 nerved 5-10 cm roundish or subdeltoid, cordate with a broad sinus and basal lobes, reticulately veined with microscopic glistening glands beneath, petiole 2.5-7cm long and bear yellow flowers.[3]It is widely used in Ayurveda and folk system of medicine in India since ancient time. Traditional Giloy has been used as anti-inflammatory, anti-diabetic, antispasmodic, antioxidant and carminative.[4]

Phytochemical analysis of medicinal plants attracts the attention of plant researchers due to development of more sophisticated tools. These tools played an effective role in the search of new resources of unanalyzed materials for pharmaceutical research. In the current study therefore five different solvents viz; petroleumether, chloroform, methanol, ethanol, water were used to obtain extract of leaves of Tinosporacordifolia as per the availability and most of the research studies showed the presence of varying phytochemicals in these solvents only. These extracts were used for preliminary phytochemical analysis by standard chemical methods.[5]

AIMS AND OBJECTIVES:-

To analyze the preliminary qualitative phytochemical screening of Tinosporacordifolia leaf.

Fig No.1 **T. Cordifolia climber**

Fig No.2 **T. Cordifolia with infloresence**

MATERIALS AND METHODS:

Plant Material: Fresh leaves of Tinosporacordifolia were collected from Dr. B.R.K. RGOVT. Ayurvedic College garden Erragadda Hyderabad and authenticated by Professor & HOD, Department of Dravyaguna, Director Telangana state level DTL.

Chemicals: Methanol, Ethanol, Petroleumether, Chloroform, HCL, Mayer's reagent(Potassium Mercuric Iodide), Benedicts' reagent, FeCl3, Benzene, Ammonia, H2SO4, FeCl3, Leadacetate, Ninhydrin reagent, Copperacetatesolution.

Extractive values of Tinospora leaf with different solvents is determined with the specific standard methods explained Ayurvedic Pharmacopoeia of India[6].

Preparation of plant extract and phytochemical screening: Collected leaf material washed under running tap water to eradicate dust and microbes. The leaf samples were then air dried under shade at room temperature for 15 days. The leaf material was crushed well into fine powder in an electronic grinder and kept into air tight polythene bags for further use and stored at room temperature.

Solvent extract of sample:

The extracts of sample powder were prepared by soaking 5 gm of dried powder in 100 ml of each methanol, ethanol, petroleum ether, chloroform and water and shaken well. The solution left at room temperature for 72 hours and then filtered with the help of filter paper. The filtrate was taken and used for further phytochemical screening.

Phytochemical screening was done by standard methods[7].

Phytochemical screening:

1. Detection of alkaloids:

Extracts were dissolved individually in dilute Hydrochloric acid and filtered.

Mayer' Test: Filtrates were treated with Mayer's reagent (Potassium Mercuric Iodide).Formation of a yellow coloured precipitate indicates the presence of alkaloids.

2. Detection of carbohydrates:

Extracts were dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

Benedict' Test: Filtrates were treated with Benedict's reagent and heated gently. Orange red precipitate indicates the presence of reducing sugars.

3. Detection of glycosides:

Extracts were hydrolysedwith dil. HCl, and then subjected to test for glycosides.

Modified Borntrager's Test: Extracts were treated with Ferric Chloride solution and immersed in boiling water for about 5 minutes. The mixture was cooled and extracted with equal volumes of Benzene. The Benzene layer was separated and treated with Ammonia solution. Formation of rose- pink colour in the ammonical layer indicates the presence of anthranol glycosides.

4. Detection of saponins:

Foam Test: 0.5 gms of extract was shaken with 2ml of water.If foam produced persists for ten minutes it indicates the presence of saponins.

5. Detection of phytosterols:

Salkowski's Test: Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of con. Sulphuricacid , shaken and allowed to stand.Appearance of golden yellow colour indicates the presence of triterpenes.

6. Detection of phenols:

Ferric Chloride Test: Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicates the presence of phenols.

7. Detection of tannins:

Ferric Chloride Test

Extracts were treated with 3-4 drops of ferric chloride solution. Formation of green colour indicates the presence of tannins.

8. Detection of flavonoids:

Lead acetate Test: Extracts were treated with few drops of lead acetate solution. Formation of yellow coloured precipitate indicates the presence of flavonoids.

9. Detection of aminoacids:

Ninhydrin Test: To the extract, 0.25% w/v ninhydrin reagent was added and boiled for few minutes. Formation of blue colour indicates the presence of aminoacids.

10. Detection of diterpenes:

Copper acetate Test: Extracts were dissolved in water and treated with 3-4 drops of copper acetate solution. Formation of eme-

rald green colour indicates the presence of diterpenes.

RESULTS:

Table 1: The extractive values of Tinosporacordifolia leaf are presented

EXTRACTS	EXTRACTIVE VALUES
Aqueous	27.894 %
Methanol	17.533 %
Ethanol	19.390 %
Chloroform	4.989 %
Ether	4.582 %

The preliminary phytochemical screening of leaves of T.cordifolia revealed the presence of different bioactive secondary metabolites which might be responsible for their medical attributes. The outcome of qualitative phytochemical analysis of leaf is presented in Table 2.

Table 2: Phytochemical screening of Tinosporacordifolia leaf extracts

Phytochemical Test	PET	CHL	MET	ETH	AQS
Alkaloids	-	-	-	-	+
Carbohydrates	-	-	+	+	-
Glycosides	+	+	-	-	-
Saponins	-	+	+	-	-
Phytosterols	-	-	-	-	+
Phenols	-	-	+	+	+
Tannins	+	+	-	-	-
Flavanoids	-	-	-	-	+
Aminoacids	-	-	+	+	-
Diterpenes	+	+	+	+	+

+ sign indicates presence and - sign indicates absence.

PET, CHL, MET, ETH and AQS indicate petroleum ether, chloroform, methanol, ethanol, and water respectively.

DISCUSSION

The outcome of the physicochemical study is as follows: The aqueous extractive value of Tinospora cordifolia leaf is 27.89, the methanolic extractive value is 17.533%, the ethanolic extractive value is 19.39%, the chloroform extractive value is 4.989%, and the ether extractive value of Tinospora cordifolia leaf is 4.582%.

The preliminary qualitative phytochemical screening has revealed different phytochemicals in different extracts. The petroleum ether extract of Tinospora cordifolia leaf showed the presence of glycosides, tannins and diterpenes. The chloroform extract of T.cordifolia leaf showed the presence of glycosides, saponins, tannins and diterpenes. The methanolic extract of T.cordiflia leaf showed the presence of carbohydrates, sa-

ponins, phenols, aminoacids, diterpenes.The ethanolic extract showed the presence of carbohydrates, phenols, aminoacids, diterpenes.The aqueous extract of T.cordifolia leaf showed the presence of phytosterols, phenols, flavonoids and diterpenes.

CONCLUSION

Phytochemical screening of leaf extract of T.cordifolia indicates the presence of alkaloids, carbohydrates, glycosides, saponins, phytosterols, phenols, tannins, aminoacids, diterpenes and suggested that it is an important source of bioactive compounds that may supply novel medicine. Phytochemical analysis of this plant may be useful in developing new specialized drugs with more efficiency.

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