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Preliminary Phytochemical Screening and Extraction of Volatileoil in Cleome Gynandropsis, DC.; (Family: Capparidaceae)

Mariya Baby[1], Dr .Sr. M Arul Sheeba Rani[2]
[1, 2]*Department of Botany, Nirmala College for Women, Coimbatore-18*

Abstract: ***Medicinal plants also called medicinal herbs, is a plant that is used to attempt to maintain health. Phytochemicals generally originated from the plant source are nothing but the bioactive compounds also known as secondary metabolites. Phytochemicals are the chemicals that present naturally in plants. Now a days these phytochemical become more popular due to their countless medicinal uses.***
Phytoconstituents are the natural bioactive compounds found in plants. Plants naturally synthesize and accumulate some secondary metabolites like alkaloids, sterols, terpenoids and flavonoids. Phytochemicals are present in different parts of plants. Phytochemical play a vital role against number of diseases such as asthma, arthritis, cancer etc. Unlike pharmaceutical chemicals these phytochemicals do not have side effects.
Essential oil is concentrated hydrophobic liquid containing volatile aroma compounds from plants. Essential oils are also known as volatile oil. The present study deals with Preliminary phytochemical screening and Extraction of volatile oil in Cleome gynandropsis, DC.;.
Keywords: Cleome, Phytochemical screening, Volatile oil.

I. INTRODUCTION

Medicinal plants are rich source of novel drugs that forms the ingredients in traditional systems of medicine, modern medicines, folk medicines, pharmaceutical intermediates, bioactive principles and lead compounds in synthetic drugs. Medicinal plants also called medicinal herbs, is a plant that is used to attempt to maintain health, (Ncube, 2008).
Primary metabolites are important for the plants regular metabolism such as growth and development. Secondary metabolites produced by plants have little need for them.
During past several years, phytochemicals have been used worldwide as the traditional herbal medicine. Also these phytochemicals present in the different plant parts are used by the local peoples for healing of certain disorders (Twinkle *et al*., 2015).
Essential oil is concentrated hydrophobic liquid containing volatile aroma compounds from plants. Essential oils are also known as volatile oil.
An essential oil is essential in the sense that it contains the essence of the plants fragrance. Essential oil is basically a natural product, obtained from fractional distillation and having a distinctive smell of the plant or other sources which is extracted. These oils are used for various purposes .Some of them are antibacterial, antioxidant, antifungal, anti- diabetic, chemoprevention and cancer suppression, aromatherapy, vaginal infection, as pesticides, insect repellents etc.

II. MATERIALS AND METHODS

A. Study Area (Plate 1&2)

Tamil Nadu is one of the 28 states in India. Coimbatore is the city in Tamil Nadu, South India. Minimum temperature prevailing is 18°C and maximum temperature is 35°C.Loamy soil, Calcareous black cotton soil are the soil found in district. The climate is generally pleasant, salubrious climate. Sungam is a place in Coimbatore from where the plant for this experiment was collected.

B. Selected Sample (Plate 3)

For the present study the sample is collected from Sungam to find out the phytochemical and volatile oil extraction. The plant sample was collected during the Month of November. After collecting, the whole plant is washed gently under tap water to remove mud.

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Plate: 1- Location map

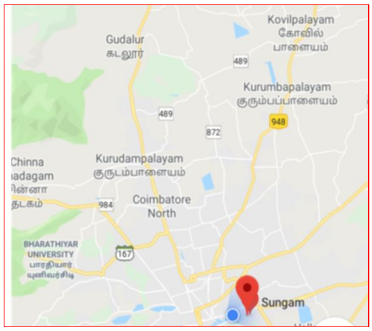


Plate: 2- Study area



Systematic position

Plate: 3- Habit of the selected sample



1) Kingdom : Plantae
2) Phylum : Angiosperms
3) Class : Rosids
4) Order : Brassicales
5) Family : Capparidaceae
6) Genus : *Cleome*
7) Species : *C. gynandropsis*, DC.;
8) Plant Description
9) Distribution

Cleome gynandropsis, DC.; is a common plant occurring throughout the tropics and subtropics of Africa, (Srinivas et al.,2014).It is an annual leafy herb. It is used as a medicinal plant and can be found in all over world .It grows as a weed in paddy fields and also in road sides and in open grass lands. In India it is never cultivated but grows spontaneously everywhere. It has a long taproot with a few secondary roots with root hair.

The stem is sticky with glandular hairs and marked with longitudinal parallel lines. Leaves are palmately compound, with 3-5 leaflets..The inflorescence is a terminal raceme, many-flowered, elongating in fruit; the bract is 3-foliolate to simple above, resembling the leaves but smaller and sessile.. Flowers are bisexual, bracteates, white or tinged with purple Fruits. The fruits are in capsule form.

The seeds are brown, circular in outline, (Mishra et al., 2011).

Uses-The plant contains vitamins E, iron, and oxalic acid .The leaves have ant oxidative properties that can help with inflammatory diseases. It is used as a medicinal herb. The pungent seed are sometimes eaten as a food. They contain anthelmintic property. The oil from seed is used to expel roundworm. The plant contains disinfectant, ant rheumatic rubefacient and vesicant properties. Decoction of the root is used to treat fevers.The leaves are commonly used as an irritant to relieve local pain the juice of the root is used to relieve scorpion bite. The whole plant is used in the treatment of scorpion stings and snake bite.

C. Preliminary Phytochemical Analysis

1) *Preparation of Plant Extract:* The whole plant was collected and washed well with running tap and by distilled water and was shade dried at room temperature. The dried parts were powdered using an electrical blender. 15g of each were measured and introduced to 100 ml of ethanol. The mixture was kept in shaker system for 48 hours with occasional shaking. The extracts were subjected to preliminary phytochemical screening by standard methods (Ramman, 2006,Karpagam *et al.*,2008).

D. Volatile Oil Analysis

The leaves were washed under running tap water followed by sterilized water and were shade dried at room temperature. The dried leafs were powdered by using an electric blender and then stored in air tight containers until further use. n –hexane was used for extraction.

50 g of leaf powder packed with Whatman filter paper. It is placed into the thimble of a soxhlet apparatus and extracted using n-hexane. Appearance of colourless solvent indicated exhaustive extraction. The extracts were then transferred into the empty petridishes and allowing evaporating the solvent.

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III. RESULTS AND DISCUSSION

Table 1: Qualitative phytochemical analysis of ethanolic leaf extract

S.No	Phytochemicals	Ethanolic extract
1	carbohydrates	+
2	proteins	-
3	amino acids	-
4	steroids	+
5	glycosides	+
6	flavonoids	+
7	alkaloids	+
8	tannins	-
9	saponins	-
10	terpenoids	-

+ indicates presence, - indicates absence

The qualitative phytochemical analysis of ethanolic extract of *Cleome gynandropsis*, DC.; shows the presence of carbohydrates, steroids, glycosides, flavonoids, alkaloids and showed the absence of proteins, amino acids, terpenoids, tannins and saponins (Table -1)

Table2: Qualitative phytochemical analysis ofethanolic shoot extract

S.No	Phytochemicals	Ethanolic extract
1	carbohydrates	-
2	proteins	+
3	amino acids	-
4	steroids	+
5	glycosides	+
6	flavonoids	+
7	alkaloids	+
8	tannins	-
9	saponins	-
10	terpenoids	-

+ indicates presence, - indicates absence

Phytochemical analysis of shoot revealed the presence of proteins, steroids, alkaloids, flavonoids, glycosides and showed the absence of carbohydrate, amino acids, saponins and terpenoids (Table 2).

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Table 3: Qualitative phytochemical analysis of ethanolic root extract

S.No	Phytochemicals	Ethanolic extract
1	carbohydrates	+
2	proteins	-
3	amino acids	-
4	steroids	+
5	glycosides	+
6	flavonoids	-
7	alkaloids	+
8	tannins	-
9	saponins	-
10	terpenoids	-

+ indicates presence, - indicates absence

Phytochemical screening of root revealed the presence of alkaloids ,proteins, ,steroids ,glycosides and showed the absence of carbohydrates ,amino acids ,saponins ,terpenoids tannins (Table 3).Essential oil is concentrated hydrophobic liquid containing volatile aroma compounds from plants. Essential oils are also known as volatile oil. Volatile oilsgenerally composed of two portions. An essential oil is essential in the sense that it contains the essence of the plants fragrance. Many essential oils constituents of same plant can be extracted from the different parts of the plants with completely different properties. They are also produced using different methods steam distillation is a common method where as other methods such as mechanical expression, solvent extraction or superficial fluid extraction is also used.
In the oil extraction the selected leaf sample showed the absence of Volatile oil (Plate -11)

Plate: 10- Solvent post evaporation Plate: 11-Evaporated sample





IV. CONCLUSION

Cleome gynandropsis, DC .;also known as African Spider which is native to Africa It is an annual herb. The plant is highly medicinal. Different parts of the plant including the leaf, stem and root are used in the treatment of bronchitis. The leaves are probably most commonly used as a counter irritant to relieve local pain, being rubbed in the affected area. Leaves are well known for its anti-inflammatory activity. Stem are used in the treatment of heart diseases. The decoction of the root is used to treat fevers. The juice of the root is used to relieve scorpion stings. The leaf sap is used in minute quantities as eyewash. A leaf -mash is warmed and laid on swollen armpit. Phytochemical analysis of ethanolic leaf extract revealed the presence of carbohydrates, glycosides, steroids, flavonoids, alkaloids, and absence of proteins, amino acids, tannins, saponins and terpenoids from its leaf. And analysis of ethanolic shoot extract showed the presence of proteins, steroids, glycosides, flavonoids, alkaloids and absence of carbohydrates,

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amino acids, tannins ,saponins and terpenoids. And analysis of ethanolic root extract revealed the presence of protein, steroids, glycosides, alkaloids and absence of carbohydrates, amino acids, flavonoids, tannins, saponins, terpenoids. Essential oil is concentrated hydrophobic liquid containing volatile aroma compounds from plants .Essential oils are also known as volatile oil. In the oil extraction the selected leaf sample showed the absence of volatile oil.Hence the present study deals with the phytochemical analysis which discloses the phytochemical components which makes this plant as a medicinal one and also analysis of the volatile oil .The secondary metabolites are naturally synthesized in almost all parts of the plant body. Hence the present study aims to improve our quality of life. And there is a large scope for this plant in the near future to be used as a medicinal plant.

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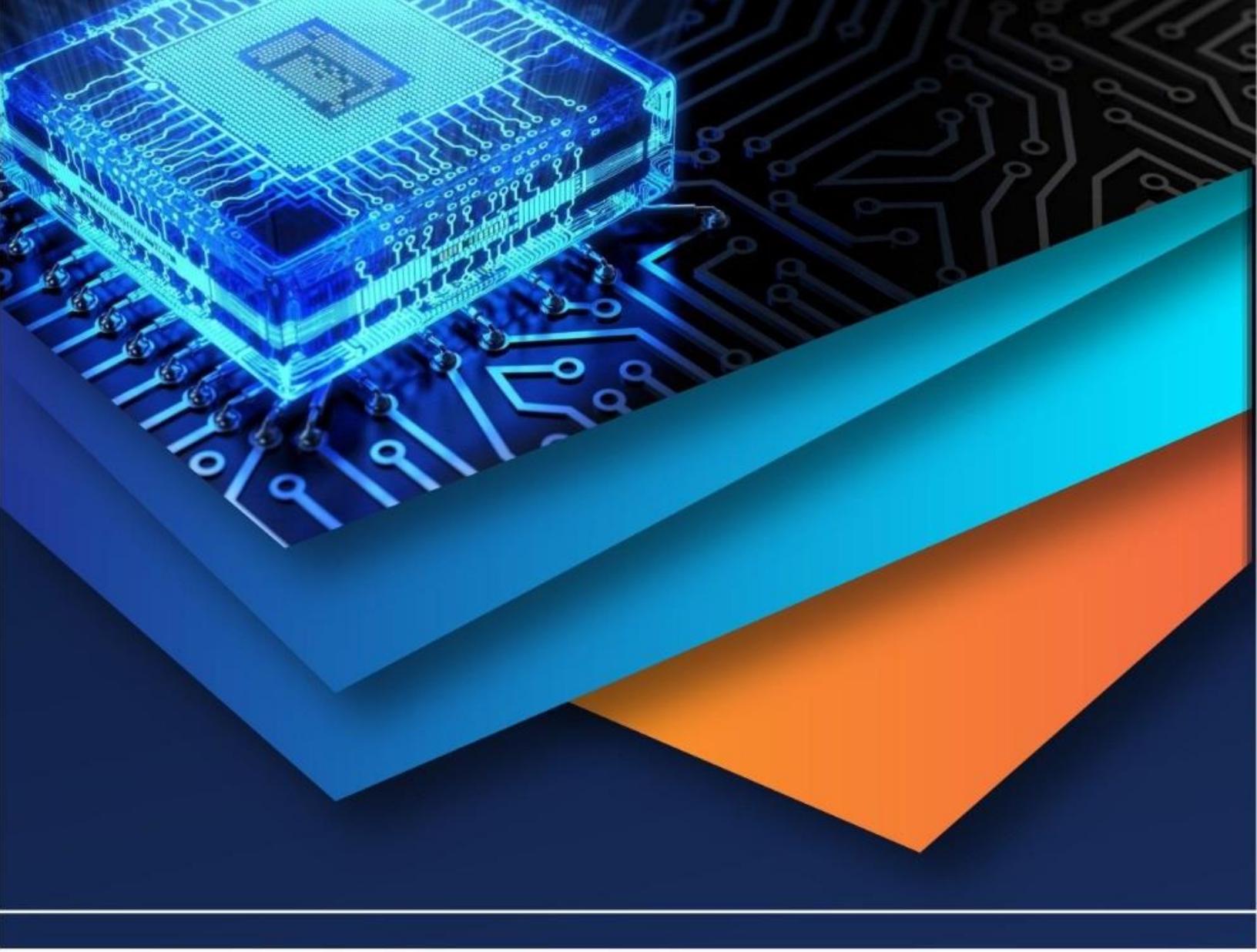
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