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# Comparative Preliminary Phytochemical Screening of Leaf, Stem and Root in *Cleome gynandropsis*, DC.; (Family: Capparidaceae)

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**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 day's 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. The present study deals with Comparative preliminary phytochemical screening of leaf, stem and root in *Cleome gynandropsis*, DC.;

**Keywords:** leome, Phytochemicals, Leaf, Stem and Root extracts.

## 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. 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).

Phytoconstituents are the natural bioactive compounds found in plants. These can also be considered as "man friendly medicines" (Sahara Banuet *et al.*, 2015).

Phytochemicals are present in different parts of plants such as leaf, stem and root. Not only their chemical compounds such as carbohydrates, protein, and lipids are used by men, but also a multitude of compounds like glycosides, alkaloids, flavonoids etc. are used by man in various ways and means. Knowledge of the chemical constituents of plants is desirable, not only for the discovery of therapeutic agents, but also because the medicinal value of plant lies in the chemical substance that produces a definite therapeutic action on the human body.

## 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 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.

Plate: 1- Location map



Plate: 2- Study area



#### Systematic position

Kingdom : Plantae

Phylum : Angiosperms

Class : Rosids

Order : Brassicales

Family : Capparidaceae

Genus : Cleome

Species : *C. gynandropsis*, DC.;

Plate: 3- Habit of the selected sample



#### C. Plant Description

*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 antioxidant 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.

#### D. I. 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. 15gm 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).

### III. RESULTS AND DISCUSSION

Table 1: Comparative phytochemical analysis of ethanolic extract of leaf, stem and root.

S.No	Phytochemicals	Leaf	Stem	Root
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. Phytochemical analysis of shoot revealed the presence of proteins, steroids, alkaloids, flavonoids, glycosides and showed the absence of carbohydrate, amino acids, saponins and terpenoids. Phytochemical screening of root revealed the presence of alkaloids, proteins, steroids, glycosides and showed the absence of carbohydrates, amino acids, saponins, terpenoids and tannins. Steroids, glycosides and alkaloids are commonly present in leaf, stem and root (Table 1).

### 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. Comparative 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, 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. Hence the present study deals with the comparative phytochemical analysis which discloses the phytochemical components which makes this plant as a medicinal one. 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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