



Analysis of Preliminary phytochemicals of leaf extracts of *Cleome gynandra* L.

R. Srinivas¹, P. Jyothi Chaitanya², R. Chandrashekar², N. Lakshmi Bhavani²

¹Lecturer in Department of Botany, S.R.R Government Arts and Science College, Sathavahana University, Karimnagar, Telangana, INDIA

²Plant tissue culture and plant molecular genetics lab, Department of Botany, University College of science, Saifabad, Osmania University, Hyderabad-500004, Telangana, INDIA

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Abstract

Present investigation concentrated on phytochemical screening of leaf crude extracts of *Cleome gynandra* L. in different solvents like methanol, ethanol, petroleum ether, chloroform and acetone. Specific tests were conducted to identify each group of the phytochemicals of various extracts of *Cleome gynandra* L. The leaf extracts of *Cleome gynandra* L was extracted separately with methanol, ethanol, acetone, petroleum ether and chloroform that were screened for phytochemical constituents. Among the entire extracts tested methanol, ethanol extracts showed more phytochemicals than the others followed by acetone chloroform and petroleum ether. Analysis revealed the presence of alkaloids, phenols, saponins, steroids, flavonoids, cardiac glycosides and tannins. The Phytochemical studies indicate that the crude leaf extracts of *Cleome gynandra* L Tannins, phenols, steroids and cardiac glycosides were mainly found in all the five tested solvent extracts of leaf followed by Saponins and Alkaloids.

Key words: Phytochemicals, *Cleome gynandra* L, solvent extracts, leaf crude extracts.



INTRODUCTION

Cleome gynandra L. (Capparidaceae) is commonly known as 'Hurhur' and 'Karaila' and vaminta in Telugu. *Cleome gynandra* is used as a medicinal plant and can be found in all over world .It grow as a weed in paddy fields and also in roadsides and in open grass lands. In India it is not at all cultivated but grows unexpectedly all over the place. Different species of *Cleome* can be found in all states of India. According to the Indian traditional system of Ayurveda medicine, lays prominent on promotion of health concept of strengthen host defenses against different diseases¹. In the literature of pharmacopoeia of India and also in other ancient medical texts describe that the medicinal application of *Cleome gynandra* L is an important medicinal plant in Ayurveda. In Ayurvedic medicine these plant is a chief constituent in Narayana Churna². Natural products are identified to take part in an important role in both drug discovery and chemical biology. Though some therapeutic benefits can be traced from the specific plant compounds, most of herbs contain several

active phytochemical constituents those are have its therapeutic value may be their combined action or individual. Any part of the plant may contain active components^{3&4}. Phytochemical studies of *Cleome gynandra* L have shown antimicrobial activity due to their bioactive constituents such as tannins, flavonoids, alkaloids and saponins⁵.

MATERIAL AND METHODS

The healthy and disease free mature leaves of *Cleome gynandra* L plant material was collected from the Sathavahana university campus, Karimnagar district, Andhra Pradesh, India in the month of February, 2014. Collected plant material was washed thoroughly in running tap water, shade dried in open air separately. Powder of the leaf is obtained by grinding them mechanically. About 100 gm of each dried powder of the plant were soaked separately in 100 ml of different solvents like methanol, ethanol, chloroform, pet ether and acetone in conical flasks and then subjected to agitation on a rotary magnetic shaker for about 72 hours. After three days the plant extracts were

*Corresponding Author Address: R. Srinivas, Lecturer in Department of Botany, S.R.R Government Arts and Science College, Sathavahana University, Karimnagar, Telangana, INDIA; E-mail: seenuds81@gmail.com

subjected to filtration, filtered with No 42 whatman filter paper separately. Concentrated extracts was preserved in sterilized air tight labeled bottles and preserved in refrigerator at 4°C until required for further use. The extract was filtered under reduced pressure using rotary flash evaporator and subjected for further preliminary phytochemical tests. Different tests conducted for the identification of phytochemicals is adopted by using the methods described by^{6, 7&8}.

Test for alkaloids: To the 5ml of extract 5ml of 2N HCL is added and boiled and then the mixture is filtered. To the filtrate a few drops of Mayer's reagent is added. A cream colour precipitate was produced immediately indicating the presence of alkaloids.

Test for saponins: Saponins are tested by boiling 5ml of extract in 10ml of distilled water in a test tube and are shaken vigorously for about 30 seconds. The test tube is allowed to settle for half an hour. Formation of froth indicates the presence of saponins.

Test for tannins: Tannins are tested by adding a few drops of 1% lead acetate to 5 ml of plant extract. Appearance of yellow precipitate indicates the presence of tannins.

Test for phenols: Phenols are tested by adding 2ml of ferric chloride solution to 2ml of plant extract. Appearance of bluish green colour solution indicates the presence of phenols.

Test for steroids: For testing the presence of steroids 1ml extract was dissolved in 10ml of chloroform and equal volume of concentrated sulphuric acid was added from the walls of the test tube. Appearance of red colour in the upper layer and yellow with green fluorescence indicates the presence of steroids.

Test for cardiac glycosides: To 1ml of extract glacial acetic acid, few drops of ferric chloride and then finally concentrated sulphuric acid were added from the walls of the test tube. Appearance of the reddish brown at the junction of two layers and the bluish green colour in the upper layer indicates the presence of cardiac glycosides.

Test for anthraquinones: 5ml extract was boiled with 10ml of sulphuric acid and filtered while hot. The filtrate was shaken with 5ml of chloroform the chloroform layer was pipette out into another test tube then 1ml of dilute ammonia is added. The resulting solution was observed for colour changes. The change in colour indicates the presence of anthraquinones.

Flavonoids: To one ml of the extract, a few drops of dilute sodium hydroxide are added. An intense yellow colour was produced in the plant extract, which became colorless on addition of few drops of dilute acid. This indicates the presence of flavonoids.

Terpenoids: 1ml of the extract was dissolved in 1ml of chloroform; 1ml of acetic anhydride was added following the addition of 2ml of concentrated sulphuric acid. Formation of reddish colour indicates the presence of terpenoids.

RESULTS AND DISCUSSIONS

The phytochemical analysis of leaf extracts of *Cleome gynandra* L were tested by different specific tests. Methanol, ethanol, petroleum ether, chloroform, acetone leaf extracts of *Cleome gynandra* L., were analyzed for their compounds such as tannins, saponins, flavonoids, steroid, cardiac glycosides, alkaloids. Phytochemical analysis table explained that methanol and ethanol extracts showed more phytochemicals than acetone, pet ether and chloroform. Phytochemicals like tannins, phenols, flavonoids, cardiac glycosides, steroids were all the tested extracts. On the other hand saponins are found in methanol, ethanol and acetone they were not found in pet ether and chloroform. Terpenoids and anthraquinones were not found in all the tested extracts. Whereas alkaloids are present in all the extracts but absent in chloroform.

CONCLUSION

The plant phytochemical studies could be provide an answer to the people seeking for better therapeutic medicine from natural sources which is supposed to be more efficient with less or no side effects when compared to the commonly used synthetic chemotherapeutic agents. In The present study proved the traditional use of *Cleome gynandra* L. for human disorders. In this study we partially explained its preliminary phytochemicals present in it. Annadurai and Ahmed John 2014⁹ has explained that the use of *Cleome gynandra* Lin herbal medicine as rich source of phytochemicals are tannins, flavonoids, cardiac glycosides, steroids, saponins, phenols, alkaloids, Alkaloids and flavonoids have been used as antiviral, antibacterial, antiameobial and anticancer agents. Phenols and flavonoids are the groups of secondary metabolites are of great importance as cellular support material because they form the integral part of cell wall structure by polymeric phenolics¹⁰ and they can protect the human body from the oxidative stress which may cause many disease, including

cancer, cardiovascular problems and ageing¹¹. This present study we concludes that the leaves of *Cleome gynandra* L can be utilized as an alternative source of useful drugs. Further

phytochemicals found in the leaves of *Cleome gynandra* L will be tested for their antimicrobial activity.

Table 1: Preliminary Phytochemical analysis of leaf extracts of *Cleome gynandra* L

phytochemicals	Methanol	Ethanol	Chloroform	Pet ether	Acetone
Tannins	+	+	+	+	+
Phenols	+	+	+	+	+
Saponins	+	+	—	—	+
Alkaloids	+	+	—	+	+
Flavonoids	+	+	+	+	+
Antraquinones	-	-	-	-	-
Terpenoids	—	—	—	—	—
Cardiac glycosides	+	+	+	+	+
Steroids	+	+	+	+	+

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