

## ANALYSIS OF PHYTOCHEMICAL CONSTITUENTS IN LEAF EXTRACTS OF *CLEOME VISCOSA* L.

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### ABSTRACT

The Present paper focused on phytochemical screening of leaf crude extracts of *Cleome viscosa* L. Specific tests were conducted to find out each group of the phytochemicals of various extracts of *Cleome viscosa* L. The leaf extracts of *Cleome viscosa* L was extracted separately with methanol, ethanol, acetone, petroleum ether and chloroform that were screened for their phytochemical constituents. Among all the extracts tested acetone extracts showed more phytochemicals than the others followed by methanol, ethanol, chloroform and petroleum ether. Analysis revealed the presence of alkaloids, phenols, saponins, steroids, flavonoids, tannins and terpenoids. The Phytochemical studies indicate that the crude leaf extracts of *Cleome viscosa* L Tannins, flavonoids, terpenoids, alkaloids

were mainly found in all the five tested solvent extracts of leaf. Phytochemicals like saponins are found only in acetone extracts.

**KEYWORDS:** Phytochemicals, *Cleome viscosa* L, solvent extracts, leaf extracts.

### INTRODUCTION

According to the World Health Organization (WHO, 2002) it is estimated that 80% of populations of rising countries depends on traditional medicines for their primary health care need and because of vast areas and variety of agro-climates in India, a huge number of medicinal and aromatic plants found growing widely and many of these plants have been in used their medicinal properties (Sahu *et al.*, 1992). *Cleome viscosa* L. commonly known as

"wild or dog mustard," in telugu these plant is called as kukka vaminta is an annual, sticky herb belonging to family *Capparaceae* found as a common weed all over the plains of India and throughout the tropics of the world. These medicinal plant can be found in all over the 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 strengthening host defenses against different diseases (Thatte and Dhanukar 1986).The whole plant and its parts (leaves, seeds, and roots) are widely used in traditional and folkloric systems of medicine. In Asia and Africa the leaves and seeds used to treat infections, fever, rheumatism and headache. The whole herb is used in treatment of inflammation of the middle ear and applied on wounds and ulcers. A decoction is used as an expectorant and digestive stimulant and the vapour from a steaming decoction of the whole plant is inhaled to treat headache (CSIR, 1950). The roots are a remedy for scurvy and rheumatism (Rukmini, 1978). An aqueous seed extract displayed significant analgesic activity in mice and local anesthetic activity in guinea pigs (Parimala devi *et al.*, 2003). Williams *et al.*, (2003) evaluated the hexane extract of the leaves and stems of *Cleome viscosa* L. for biological activities such as antibacterial, antifungal, contact insecticidal and nematocidal.

## MATERIAL AND METHODS

The healthy and disease free mature leaves of *Cleome viscosa* L. plant material was collected from the Osmania University campus, Hyderabad, Telangana, 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 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 (Edeogal *et al.*, 2005), (Thamilmalai selvi *et al.*, 2011) and (Jyothi Chaitanya and Lakshmi Bhavani 2013).

#### **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 cardioglycosides**

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 pipetted 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.

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

S.NO	phytochemicals	Methanol	Ethanol	Chloroform	Pet ether	Acetone
1	Tannins	+	+	+	+	+
2	Phenols	-	-	+	+	+
3	Saponins	-	-	—	—	+
4	Alkaloids	+	+	+	+	+
5	Flavonoids	+	+	+	+	+
6	Anthraquinones	-	-	-	-	-
7	Terpenoids	+	+	+	+	+
8	Cardiac glycosides	-	-	-	-	-
9	Steroids	-	-	+	+	+

+ Indicates the presence the presence of phytochemicals

- Indicates the absence the presence of phytochemicals

## RESULTS

The phytochemical analysis of *Cleome viscosa* L leaf extracts were tested by different precise tests. Methanol, ethanol, petroleum ether, chloroform, acetone leaf extracts of *Cleome viscosa* L analyzed for phytochemical compounds such as tannins, saponins, flavonoids, steroids, alkaloids, phenols, terpenoids. Phytochemical analysis table explained that the presence of terpenoids, tannins, flavonoids, alkaloids in all the extracts. Whereas steroids and phenols are found to be present in acetone, pet ether and chloroform only those were not observed in ethanol and methanol. Saponins are found in acetone extracts only.

## CONCLUSION

Alkaloids and flavonoids are the phytochemicals widely used as antiviral, antibacterial, antiamoebial and anticancer agents. Phenols and flavonoids are the groups of secondary metabolites having great importance as cellular support material because they form the integral part of cell wall structure by polymeric phenolics (Gupta *et al.*, 2010). Phenols and flavonoids can protect the human body from the oxidative stress which may cause many diseases, including cancer, cardiovascular problems and ageing (Robards *et al.*, 1999). The variations in flavonoids and saponins may be associated with variety of plant, geographical conditions, methods of extraction and solvent used (Jane and Patil, 2012). In this present study we are concluding that the leaves of *Cleome viscosa* L can be utilized as an alternative source of useful drugs. Further phytochemicals found in the leaves of *Cleome viscosa* L will be tested for their antimicrobial activity.

## REFERENCES

1. Anbazhagi, K., Kadavul, G., Suguna and Petrus A.J.A, 2009, "A Studies on the pharmacognostical and in vitro antioxidant potential of *Cleome viscosa* Linn. Leaves". *Natural Product Radiance*, 8(2): 151-157.
2. Annadurai A. and Ahmed John S, 2014, "Preliminary phytochemical screening in *Cleome viscosa* L." *Advances in Applied Science Research*, ISSN: 0976-8610, 5(2):122-124.
3. Chukwuka, KS, Ikheloa JO, Okonko IO, Moody JO., and Mankinde TA 2011. *Adv. Appl. Sci. Res.*, 2 (4), 37-48.
4. Dhanalakshmi D, Kumar S, Prasad MS, Koli V, Kumar BP., and Harani A. 2011, *Eur. J. Exp. Bio.* 1 (1); 103-105.
5. Edeogal HO, OKWUDE and Mbaebie Bo 2005 "Phytochemical constituents of some Nigerian medicinal plants". *African J. Biotechnol.* 4; 685-688.
6. Gupta V.K, G.D Singh, Singh A. Kaul, 2010, *Medicinal Plants: Phytochemistry, Pharmacology and Therapeutics*, Daya Publishing House, Delhi.
7. Jane, R. R. and Patil, S. D. 2012: *Cleome viscosa*: an effective medicinal herb for otitis media ISSN 2229 – 6441, I.J.S.N., VOL. 3(1) 153-158.
8. Jyothichaitanya P and Lakshmi Bhavani N, 2013, "Analysis of phytochemicals in the leaf and bark of *Pterocarpus santalinus* L." *Ad. Plant Sci.* ISSN 0970-3586, 26 (11) 531-534.
9. Narendhirakannan, R.T. Subramanian S. Kandaswamy, M. 2005 Anti-inflammatory activity of *Cleome viscosa* L. on hematological and cellular constituents in adjuvant induced arthritic rats. *Food and Chemical Toxicology*, 45: 1001-1012.

10. Robards K, Prernzler. P.D. , G. Tucker, P. Swatsitang, W. Glover1999, Food Chem, 66: 401-36.
11. ThamilmaraiSelvi. B, S. Ahamed John and G.Theivandran, 2011 “Preliminary phytochemical investigation and antimicrobial activity of *Sphaeranthusindicus* Linn”. Ad Plant Sci.24 (I) 81-85.
12. Thatte, U.M., and Dhanukar, 1986, Trends in Pharmacological Sci, 7:247.