

Preliminary ethnomedical and phytochemical study of *Cleome viscosa* L.

FIRDOUS MALA, NEETU ARYA, P.N. SHRIVASTAVA, AND R.C. SAXENA

ABSTRACT

Cleome viscosa Linn. Commonly known as 'Hul-Hul' is used as Anthelmintic, Rubefacient and the seeds are given occasionally in fever and diarrhoea. Powdered roots are put on the lips by santhals to restore consciousness when fainted. The smoke of the leaves is used by the local people at night to protect them from mosquito bite. Phytochemical details of methanol extract through spectroscopic analysis showed a methylenic proton of the pentet type. *Cleome viscosa* L. (capparidaceae) Syn. *Cleome icosantra* L. is a herbaceous weed, and erect glandular pubescent annual, one to three feet high. Flowers are on long pedicels, half inch long, yellow in colour, sepals ovate, petals four, two approximate and two spreading, obtuse, stamens 12-24, capsule 2-3 ½ inch, narrowed upward, striate, gland pubescent, style glabrous, seeds small, glandular and black.

Mala, Firdous, Arya, Neetu, Shrivastava, P.N. and Saxena, R.C.(2011). Preliminary ethnomedical and phytochemical study of *Cleome viscosa* L. *Ann. Pharm. & Pharm. Sci.*, 2 (1 & 2) : 32- 34.

Key words : *Cleome viscosa*, Folk medicine, Herbaceous weed, Fever, Diarrhoea.

INTRODUCTION

In spite of the vast scientific development in this modern age, man is still looking towards the traditional medicine-culture and way of life which has got its own origin and development. In remote places where modern science has not reached, not taught, people know much about diseases, medicine and so many things about life, health and human welfare. Traditional medicine is knowledge based on folklore, which has been growing on years and years together and from one generation to another generation.

Surveys of certain pharmacologically active phytoconstituents in wild plants which are commonly used in folk medicine have been quite important during the past few decades. The result of these studies have proven to be of much significance for their commercial exploitation. Many

reports are available now on the phytochemical screening of plant of a particular geographical region (wall *et al.*, 1954; persinos and Quimby *et al.*, 1967; Kapoor *et al.*, 1969; Bhattacharjee and Das, 1969; Smolenski *et al.*, 1975; Kapoor *et al.*, 1975). However, only few are concerned with such plants used by rural folks and tribal peoples.

In the present communication an effort has been made to screen the phytochemical details of the *Cleome viscosa* Linn of family Capparidaceae, which is used as folk medicine.

MATERIALS AND METHODS

The fresh material of *Cleome viscosa* was collected in spring season in the year 2010 from the Hamirpur district of Bundelkhand region of India. The plant material collected from the study area was identified by Dr. S.K. Jain Professor of Botany S.S.L. Jain College Vidisha. The herbarium and the voucher specimen were procured in the herbarium record of pest control and Ayurvedic drug research laboratory of S.S.L. Jain College at Serial no. 40. The shade dried plant materials were powdered and extracted for 48 hours in different solvents of increasing order of polarity by Soxhlet apparatus in the laboratory. The crude extracts thus obtained were vacuum evaporated under reduced pressure below 40° C. The percentage yield of the crude plant extract in different solvents has been given in Table 1. Separation of the three crude extracts was done by column and thin layer chromatographic methods.

Address for correspondence :

FIRDOUS MALA, Pest Control and Ayurvedic Drug Research Laboratory, S.S.L. Jain College, VIDISHA (M.P.) INDIA
E-mail : firdousmalla44@gmail.com

Authors' affiliations:

NEETU ARYA, P.N. SHRIVASTAVA AND R.C. SAXENA, Pest Control and Ayurvedic Drug Research Laboratory, S.S.L. Jain College, VIDISHA (M.P.) INDIA
E-mail : rcsvds@yahoo.com.

Table 1 : Percentage yield of *Cleome viscosa* Linn. using different solvents in soxhlet apparatus

Solvent used	Weight of powdered material (g)	Volume of solvent (ml)	Weight of extract obtained (g)	Characteristic of extract	Yield
Petroleum ether	500	900	6.58	Yellow green, Semi-solid State with Oily nature	1.316
Acetone	500	700	9.01	Dark green, Semi-solid State	1.802
Methanol	500	700	7.25	Light green With yellow Tinch, semi- Solid state	1.45

Table 2 : Different fractions isolated from petroleum ether extract of *Cleome viscosa*

Amount of crude acetone extract = 500 mg., Amount of silica gel packed in glass column = 11.857 g.

Eluent	Fraction code	Weight of fraction (mg)	Characteristics and biologically active fraction.
n-Hexane	P	52.3	On TLC two spots visible, rechromatographed. Fraction p1-slight yellow color (5 mg), Rf=0.465 found effective against mosquitoes.
Petroleum ether	1P	25.6	No spot obtained on TLC, not found effective.
P.ether : C ₆ H ₆	2PC	56.1	Three spots on TLC observed, rechromatographed. Fraction tested only one fraction P ₃ found little effect not tested further.
Benzene	3PC	35.2	Negligible amount obtained hence did not test against the stages.
C ₆ H ₆ : EtOAc (1:1)	4PC	60.2	On TLC three spots obtained out of which fraction P ₅ -light dark green (6.2 mg) Rf=0.573 found much effect on the mostuitoes
Ethyl acetone	5PC	12.5	Negligible amount on rechromatography hence not tested.
Acetone	6PC	13.3	-do-
Methanol	7PC	16.0	Two spots on TLC could not recover on rechromatogra phic technique.
Chloroform : p-ether	8PC	20.5	On TLC three spots obtained, rechromatographed.
EtOAc. (2:2:1)			Two fractions showed some biological activity as compared To fraction P ₁ and P ₅ .

Table 3 : Different fractions isolated from acetone extract of *Cleome viscosa*

Amount of crude acetone extract = 500 mg., Amount of silica gel packed in glass column = 11.875 g.

Eluent	Fraction code	Weight of fraction (mg)	Characteristics and biologically active fractions
Benzene : ethyl acetate (5:1)	A	48.8	On TLC five spots visible hence rechromatographed. Fraction A – yellow green color (2mg). Rf = 0.46. Found effective against the mosquitoes.
Ethyl acetate	B	25.4	Fraction E-1- lemon yellow color (60 mg). Rf = 0.67. Found effective.
Benzene : Acetic acid (19:1)	C	54.5	Rechromatographed to obtain seven fractions. No one found biologically effective.
Chloroform : MeOH	D	20.5	Four fraction on further purification obtained comparatively had no effect on the larvae.
Acetone : Benzene (4:1)	E	90.8	Negligible amount obtained on rechromatography hence not tested.
Acetone : Benzene : H ₂ O (9:3:2)	F	10.5	-do-

**Table 4 : Different fractions isolated from methanol extract of *Cleome viscosa*
Amount of crude methanol extract = 700 mg. Amount of silica gel packed in glass column = 11. 875 gm.**

Eluent	Fraction code	weight of (mg) fraction	Characteristics and biologically active fractions
n-hexane	C	15.6	On TLC obtained two spots, rechromatographed and for testing against the larvae found ineffective.
Benzene	1CB	35.2	light green fraction, was not found effective.
P : ether benzene (1:1)	IPC	62.2	On rechromatography three fractions obtained fraction IPC2 (5.2mg) Rf = 0.37, dark green color. Found effective.
Benzene : ethyl acetate (1 : 1)	2CB	76.5	one fraction obtained on rechromatography fraction CBE (5.5 mg) Rf = .57 slight green in color found effective against mosquitoes.
C ₆ H ₆ : Et OAC : p. ether (97: 2 : 1)	2PC	48.2	Two fractions on rechromatography obtained. Negligible amount hence could not use for bioassay.
Chloroform : p. ether EtOAc (2:2:1)	3PC	80.5	Three fractions obtained on rechromatography none was found effective on bioassaying.
Ethyl acetate	CEA	75.6	Three fractions obtained, one CEA1 (3.5mg) was found effective Rf = 0.52, bright yellow colour
Acetone : C ₆ H ₆ (4: 1)	MCF	92.8	Two fractions obtained on assaying MCF – 1 (6. 2mg) Rf = 0.29. dark green with brown tinch was found most effective.

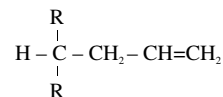
RESULTS AND DISCUSSION

The dried material of *Cleoma viscosa* eluted with different solvents *viz.*, petroleum ether, acetone and methanol yielded 1.316, 1.802 and 1.45 per cent of extracts, respectively. Which shows that in eluting with acetone a higher yield of extract was obtained. Isolation and separation of the three crude extracts was done by column and thin layer chromatographic methods which on purification and isolation gave 11 fractions in petroleum ether crude extract, 21 fractions in acetone extract and 24 fractions in methanol extract (Table 2 - 4)

The most effective fractions of methanol extract MCF-1, IPC₂ and CBE through spectroscopic analysis revealed that it contains certain aliphatic compounds. Following four peaks were visible at 3500-Cm⁻¹ which indicates the -OH group at 2950 Cm⁻¹ with C-H bond at 1600 Cm⁻¹ a strong C=C bonding is visible at 1400 Cm⁻¹ also a strong bond of C-O is indicated at 1370, C- H bond of either alkane geur-dimethylor alkane tertiary butyle is suspected. At 815 Cm⁻¹, 780 Cm⁻¹ 680 Cm⁻¹ C-H bonding was noted.

The NMR results indicated a sharp point at 5.36-5.30 ppm. a pentet which may be due to olefinic proton of the type - H-C=CH₂.

At 3.59 ppm. (a singlet) a peak is noted which may be presumed as the alcoholic one, H-O-C. At 2.80-2.76 ppm. (a triplet) it is due to methylenic proton of the pentet type given below.



REFERENCES

- Bhattacharjee, A.K. and Das, A.K.** (1969). *Econ. Bot.*, **23**:274.
- Kapoor, L.D., Singh, A., Kapoor, S.L. and Shrivastava, S.N.** (1969). *I. Lloydia*, **32**: 297.
- Kapoor, L.D., Singh, A., Kapoor, S.L. and Shrivastava, S.N.** (1975). *II. Lloydia*, **38**: 211- 223.
- Persinos, G.J. and Quimby, M.W.** (1967). *J. Pharm. Sci.*, **56**: 1512.
- Smolenski, S.J., Silinis, H. and Fransworth, N.R.** (1975). *V Lloydia*, **38**: 22.
- Wall, M.E., Krider, M.H., Krewson, C.F., Reddy, C.R., Williaman, J.J. Corell, D.S. and Gentry, H. S.** (1954). *J. Amer. Pharm. Assoc. Sci. Ed.*, **43**: 1.

