

STUDIES OF PHARMACOGNOSTICAL PROFILES OF *CLEOME VISCOSA L* (FAMILY:CAPPARIDACEAE)

B. Parimala Devi, R. Boominathan, Subhash, C. Mandal*

Division of Pharmacognosy & Phytochemistry, Department of Pharmaceutical Technology

*Faculty of Engineering & Technology, Jadavpur University, Calcutta – 700 032. India.

Received : 18-12-2002

Accepted: 26-02-2003

ABSTRACT: The macroscopic characters of the whole plant, physical constant values, extractive values, behavior on treatment with different chemical reagents, fluorescence characters under ultraviolet light after treatment with different reagents of the powdered entire plant of *Cleome viscosa* Linn. (Capparidaceae) were studied to fix some pharmacognostical parameters. Preliminary phytochemical screening on the methanol extract of the plant also performed. These studies will help in identification of this plant for further research.

INTRODUCTION

Cleome viscosa Linn. (Family Capparidaceae) Syn. *Cleome icosandra* Linn is a widely distributed sticks herb with yellow flowers and long slender pods containing seeds which resemble those of mustard with strong penetrating odour (Asolkar, 1992). It is known as Hurhur (Hindi) Hurhuria (Bengali), Nayikkadugu (Tamil) in Indian traditional medicine, found freely in Bengal and the greater part of India, often in waste places as a weed. The plant is said to be used by the poorer classes as vegetable. The juice of the plant diluted with water and given internally in small quantity in fever (Kirtikar & Basu, 1975; Anonymous, 1950). This plant is reputed for its rubefacient, vesicant and anthelmintic properties. Almost all parts of this plant are used for various ailments like rheumatism, scabies, inflammations and in external applications for wound and ulcers (Nadkarni KM, 1976; Theophilus & Arulanatham 1949).

Considering its various therapeutic efficacy and usage in traditional medicinal practice, it was thought desirable to investigate some pharmacognostical parameters for further

identification of the active plant material. The present investigation deals with studies on some important pharmacognostical profiles of the whole plant and its powdered form being reported hereunder.

MATERIALS AND METHODS

Plant materials

Cleome viscosa Linn. were collected from the Jhilimili, Bankura, West Bengal, India. The taxonomical identification of the plant was done by The Botanical Survey of India, Shibpur, Howrah, West Bengal. The voucher specimen was preserved in our laboratory for future reference. The plant were collected, powdered and passed through 40-mesh sieve and stored in an airtight container for further use.

Reagents

All the reagents were of analytical grade and obtained from S.D. Fine Chemicals Ltd. Mumbai.

Methods

The macroscopic characters (colour, size, shape, odour, surface, texture, taste) of the

plant were observed (Wallis, 1985). Water soluble extractive was determined by the process of maceration. Other extractive values were determined successively starting from petroleum ether (60^o – 80^oC), benzene, chloroform, methanol by using Soxhlet extraction apparatus. The dried extractives were obtained after evaporation of solvent under reduced pressure. The physical constant values were determined by pharmacopoeal methods (Anonymous, 1966). The behavior of the powdered roots with different chemical reagents were studied and the fluorescence characters were studied and the fluorescence characters were observed under ultraviolet light at 254 nm (Reghunathan, *et al*, 1982). Preliminary phytochemical tests for the methanol extractive was performed by using specific reagents (Trease *et al* 1985; Tylor *et al* 1985).

RESULTS AND DISCUSSION

The macroscopical characters are shown in (Table -1). The total ash, acid insoluble ash, alcohol soluble extractive and loss on drying are reported in (Table-2). After successive extraction the extractive values are reported in (Table – 3). The methanol extract shows the maximum yield. Phytochemical screening of the same reveals the presence of active

REFERENCES

1. Asolkar, L. V. Kulkarni K.K. and Chakraborty, O.J., “*Second supplement to Glossary of Indian Medicinal plants with Active principles*” Part I (A-K), Publication and information Directorate, Dr. K.S. Krishnan Marg. New Delhi. 1992, p. 217.
2. Anonymous, *The Indian pharmacopoeia*, 2nd Edn. Govt. of India Publication, Delhi 1966, p.947-948.
3. Anonymous, *The wealth of India* (Raw materials), Vol. II (C.S.I.R) 1950, p.231
4. Kirtikar, K.R., and Basu, B.D., “*Indian Medicinal plants*” . Vol. 1 2nd Edn. 1975, 212 - 213.
5. Nadkarni, K.M., and Nadkarni, A.K., “*Indian Materia Medica*”. Vol. 1 Popular Prakashan, Bombay 1976, p.498.

constituents is reported in (Table – 4). As evident from the results, the methanol extract of the entire plant contains sterol, saponin, alkaloid, tannin and reducing sugar. The behavior of powdered plant on treatment with different chemical reagents and the fluorescence characters of the same under ultraviolet light is shown in (Table-5 & Table-6) respectively. The results obtained can help in authenticating the sample and its powder form for research purposes and prior to any formulation.

CONCLUSION

The studies of *Cleome viscosa* L. relating to macroscopical characters, physical constant values, extractive values. Phytochemical screening of the methanol extract of the plant, behavioral characteristics of the powdered plant with different chemical reagents and fluorescence characteristics will help in proper identification of the plant as a whole and its powder form for future studies.

ACKNOWLEDGMENT

The authors are grateful to All India Council of Technical Education for the financial assistance to Dr. Subhash C. Mandal.

6. Raghunathan, K and Mitra, R. “*Pharmacognosy of Indigenous drugs*” Vol 1 & 2
7. Central council for research in Ayurveda and Siddha, New Delhi, 1983.
8. Theophilus, F. and Arul ananthum, R. *Analysis of some edible green leaves in South India.* Indian J. Med. Res. 37 (1949) 29.
9. Trease, G.E., and Evans , W.C., *Pharmacognosy* 12th Edn., ELBS Publica tion (1985). Wallis, T.E., *Textbook of pharmacognosy* 3rd Edn., CBS Publishers & Distributors, Delhi (1985)

Table – 1 Macroscopic Characters of *Cleome viscosa* Linn.

Color	The fresh plant is greenish in colour, with yellow flowers, dried ones are greenish brown in colour.
Shape	The roots are tuberous, Cylindrical with tapering towards end
Size	About 1 – 1.5 m height
Odour	Strong penetrating odour.
Texture	Smooth and the roots are fibrous
Taste	Slightly astringent.

Table – 2 Extractive Values of *Cleome viscosa* Linn.

Solvent	% Yield	Color of extractive
Petroleum ether (60-80 ⁰ C)	3.230	Greenish brown
Benzene	2.016	Yellowish brown
Chloroform	4.450	Brownish green
Methanol	12.350	Greenish brown
Water	10.240	Brown

Table – 3 Physical Constant Values of Root of *Cleome viscosa* Linn.

Constants	Yield in Percentage (w/w)
Total ash	13.210
Acid insoluble ash	4.158
Water soluble ash	10.316
Loss on drying	1.350

Table – 4 Pretiminary Phytochemical Tests for Methanol Extract of *Cleome viscosa* Linn.

Extracts	Alkaloid	Reducing sugar	Tannin	Flavanoid	Steroid	Saponin	Anthroquinone
Petroleum ether (60 ⁰ -80 ⁰)	-	-	-	-	+	-	-
Benzene	-	-	-	-	-	-	-
Chloroform	-	+	-	+	+	-	-
Methanol	-	+	+	+	+	-	+
Water	-	+	+	+	-	+	-

‘+’ = Present ; ‘-’ = Absent

Table – 5 Behaviour Pattern of the powdered sample of *Cleome viscosa* Linn on different reagents.

Chemical reagents	Color of powder
Powdered as such	Greenish yellow
Picric acid (saturated aqueous solution)	Yellow
Nitric acid (specific gravity 1.42)	Reddish brown
Hydrochloric acid (Specific gravity 1.16)	Greenish brown
Sulphuric acid (80%)	Greenish black
Acetic acid (Glacial)	Greenish brown
Iodine solution	Bluish brown
Antimony trichloride	Brownish green
Ferric chloride	Greenish yellow
Sodium hydroxide (1 N. aqueous)	Brown

Table – 6 Florescence Characteristics of the powdered sample of *Cleome viscosa* L

Treatment	Color developed
Powder as such	Greenish yellow
Powder treated with dil. Nitric acid	Reddish orange
Powder with sodium hydroxide in methanol	Yellow
Powder with sodium hydroxide in methanol, dried and mounted with nitro cellulose	Brown
Powder with sodium hydroxide in water	Yellow
Powder with sodium hydroxide in water, dried and mounted with nitro cellulose	Greenish yellow
Powder with hydrochloric acid	Dull yellow
Powder with sodium hydroxide in water, dried and mounted with nitro cellulose	Greenish black
Powder with nitric acid diluted with equal volume of water	Reddish orange
Powder with diluted sulphuric acid	Reddish orange
Powder treated with antimony trichloride	Yellowish green