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.

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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) Hururia (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 ulcer (Nadkarni KM, 1976; Theophilus & Arulanathum 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 Jhilmili, 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°C – 80°C), 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 pharmacopoeial methods (Anonymous, 1966). The behavior of powdered roots with different chemical reagents were studied and the fluorescence characters were observed under ultraviolet light at 254 nm (Regunathan, et al., 1982). Preliminary phytochemical tests for the methanol extractive were performed by using specific reagents (Trease et al 1985; Taylor 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 methanol extract of the plant, behavioral characteristics of the powdered plant with different chemical reagents and fluorescence characteristics will 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 macroscopic 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.

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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°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 Preliminary Phytochemical Tests for Methanol Extract of *Cleome viscosa* Linn.

| Extracts             | Alkaloid | Reducing sugar | Tannin | Flavonoid | Steroid | Saponin | Anthroquinone |
|----------------------|----------|----------------|--------|-----------|---------|---------|---------------|
| Petroleum ether (60°-80°) | -        | -              | -      | -         | +       | -       | -             |
| 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 hydroxice (1 N. aqueous)                | Brown            |
| 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         |