



PHARMACOGNOSTIC AND PHYTOCHEMICAL STUDIES OF *CLEOME VISCOSA* Linn.

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ABSTRACT

The *Cleome viscosa* Linn. is annual herb belongs to family Cleomaceae commonly called as Pivli Tilwan. The plants and its parts are used in traditional medicine in the treatment of diseases. *Cleome viscosa* Linn. is used in the treatment of Gastrointestinal disorders, asthma, earache, ulcer and snakebite. Whole plant and its parts have been used in different formulation. The current study is focused on pharmacognosy, phytochemical analysis and medicinal uses of plant. The extract obtained from leaf of plant was characterized by phytochemical analysis. In leaf extract Alkaloid, Glycoside, Flavonoids, Tannins, Saponins, are present. The pharmacognostic studies of plant are carried out for evaluation of drug and to detect the adulteration. It includes dermal characters like stomata, trichomes and anatomical features. The present study helpful to evaluate the drugs.

Keywords: *Cleome viscosa* Linn., pharmacognostic studies, phytochemicals analysis, Medicinal uses.

INTRODUCTION

The plants grows on west land are widely used by local people, medicinal practitioner, vender in the treatment of different diseases. The different drugs are also preparing form parts of such plants. The whole plant and its parts are used by local people for the treatment of various diseases (Gupta and Rao, 2012). The study of plant drugs form pharmaceutical study point would include the habitat, general characters of plant, parts used of plant. (Singh *et.al.* 2017.) The *Cleome viscosa* Linn. (Fig. 1) is annual herb belongs to family Cleomaceae, grow in crop and waste land around the field. Stem is erect, green, branched with glandular hairs. The leaves are compound petiolate, alternate. The compound leaf is with three or five leaflets. The leaflets are sessile, obovate with serrate margin, glandular hairs are present on both surface of leaflets. Flowers are yellow arranged in axillary and terminal position. Siliqua is with small, brown, kidney shaped seeds. The plant is used in the treatment of Gastrointestinal disorders, cough, bronchitis, cardiac disorders, rheumatism, fever, asthma, earache, ulcer, snakebite etc. (Divya Jain, *et.al.*, 2020, Muralidhara Rao, *et.al.*,2006, R. Karthiyayini, 2012, K.Kalaichelvi, *et.al.*,2017, Manali Upasania, *et.al.*, 2018, S.W. Dighe, 2021.) Therefore the bioactive chemical investigation is necessary to prove proclaimed ethnomedicinal uses.

MATERIAL AND METHODS

a) Plant material:

The *Cleome viscosa* Linn. were collected from medicinal garden of Nutan Mahavidyalaya Sailu, Dist. Parbhani Maharashtra. The collected plant was taxonomically identified by using renowned floras (Naik 1979, Naik *et al* 1998., Chetty *et al.* 2008 and Yadav and Sirdesai 2002). The voucher specimen was deposited in Department of Botany, Nutan Mahavidyalay Sailu, Dist. Parbhani. Leaves were shade dried and powdered. The powdered leaves were successively extracted with different solvent. The fresh stem was used for the study of macroscopic and microscopic characters.

b) Preliminary phytochemical Screening:

Phytochemical screening of leaves extracts of *Cleome viscosa* Linn. in different solvent were undertaken by using standard method for the analysis secondary phytoconstituents like alkaloids, glycosides, flavonoids, tannins, saponins, terpenoids, Phlobatannins, steroid and cardiac glycosides (Harborne, 1984).

c) Preparation of extract:

Leaves powder was subjected to Soxhlet extraction with petroleum ether (60-80⁰c), Methanol (64.5-65.5⁰c) and water for 3-4 h in the order of increasing polarity of solvents (Daniel, 1991). The extracted solvent is evaporated to make the final volume one fourth of its original volume. Yield of extracts are 2.4, 3.4 and 5.2 % respectively. The extracts are stored at 4⁰c in airtight bottles for further study.

Pharmacognostic studies:

Macroscopic study:

Morphological studies were done using simple microscope. The shape, apex, base, margin, taste and odour of plant powder were observed.

Microscopic studies:

The free hand transactions of stem was taken and stained by using double stained differential staining technique and mounted in DPX (Johanson, 1940). The cellular and anatomical illustrations were prepared by using camera lucida and some photographs were taken with the help of digital camera. The leaf is peeled off for the study of stomata and the trichomes of upper and lower epidermis.(Kokate, 1997).

OBSERVATIONS

T. S. of Stem: The T.S. of stem is circular in out line. The epidermis is single layered, with thin cuticle. Many Glandular trichomes are present on epidermis. 1-2 layered thick hypodermis present beneath the epidermis, followed by multilayered thin walled parenchymatous cortex. Next to the cortex a ring of many conjoint, collateral open vascular bundles are present. Multilayered parenchymatous pith is present in center (Fig. 2).

Stomata: the leaf is amphistomatic. The stomaties of both the surfaces are anomocytic, the guard cells are surrounded by four subsidiaries, three subsidiaries cells are large and one is small. Number of stomata is more on lower surface of leaf (Fig. 3 A and B).

Trichome: Glandular trichomes are present on both surfaces of leaflets (Fig. 4).

Phytochemical constituents: The preliminary phytochemical analysis of plant powder shows the presence of alkaloids, glycosides, flavonoids, saponins and Tannins. The Steroid, Phlobatannins, Terpenoids and Cardiacglycosides are absent (Table. 1).

Powder analysis: The leaves powder was characterized by its morphological features like green colour; presence of specific odour and bitter taste (Table. 2)

DISCUSSION AND CONCLUSION

Cleome viscosa Linn. has long history of traditional use. In the present study various parameters such as phytochemical analysis, powder analysis and pharmacognosy were studied. The study of Macroscopic and Microscopic characters of plant is useful in botanical identity of the herbal drug (Vanitha, *et.al.*, 2015).Phytochemical study and pharmacognostic investigation of *Cleome viscosa Linn.* is useful to detect the authenticity of medicinal useful of plant. The aqueous leaf extract contain alkaloids, glycosides, flavonoids, saponins and Tannins. The plant is medicinal potential due to presence of these phytochemicals. The powder characters of drug are mainly used in he identification of drug in the powder form (Singh *et.al.* 2017). The preliminary test of leaf powder showed green colour, presence of specific odour and bitter test. The data of present study shows the potential of the traditional medicine of *Cleome viscosa Linn.*

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Sr.no	Phytochemicals	Test	Sr.no	Phytochemicals	Test
1	Alkaloid	+	6	Phlobatannins	-
2	Glycoside	+	7	Saponins	+
3	Flavonoids	+	8	Terpenoids	-
4	Tannins	+	9	Cardiacglycosides	-
5	Steroid	-			

Table. 1–Preliminary phytochemical screening of leaves powder

Sr. no	Test	Observation	Inference
1	Colour	Green	Leaf of <i>Cleome viscosa</i> Linn.
2	Odour	Specific	Aromatic crude drug
3	Taste	Bitter	Drug contain alkaloid

Table 2 Preliminary test

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Fig. 1. *Cleome viscosa* Linn



Fig. 2. T.S. of Stem

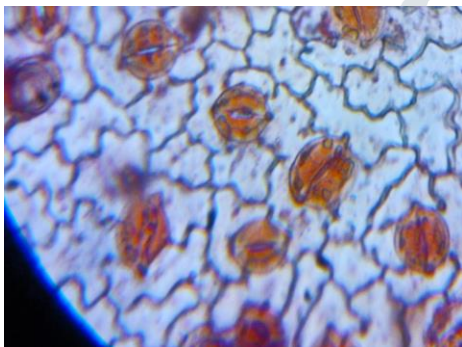


Fig. 3 A. Stomata Upper epidermis

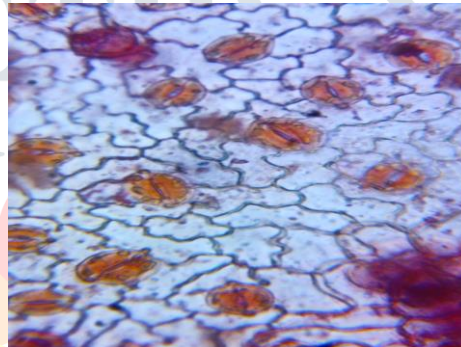


Fig. 3 B. Stomata Lower epidermis



Fig.4. Trichome s