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PHARMACOGNOSTICAL AND PRELIMINARY PHYTOCHEMICAL INVESTIGATION OF LEUCOMERIS SPECTABILIS.

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ABSTRACT:

Leucomeris spectabilis is a medicinal plant widely known for its traditional use in various folk remedies. The present study was carried out to investigate morphological, microscopical and phytochemical screening of Leaves of Leucomeris spectabilis, aimed at unraveling its therapeutic potential and validating its traditional medicinal claims.

In the microscopical studies, leaves showed the presence of epidermis at the upper surface. The epidermis on the outside is covered with thick cuticle. It is differentiated into the palisade parenchyma composed of tall compactly placed cells and the spongy parenchyma comprising oval or round loosely-arranged cells with inter cellular spaces. The vascular bundles which are the conducting tissues called xylem and phloem present and are conjoint and closed.

Ash value, extractive value, foreign organic matter and moisture content was determined for quality standards of drugs. The powdered drugs were defatted with petroleum ether and successive extraction was performed. Phytochemical investigation shows the presence of Alkaloids, glycoside, flavonoids, phenolics, and saponins. Fluorescence analysis were carried out under UV light. The result of the study could be useful for identification and preparation of monograph of the plant.

Keywords: Leucomeris spectabilis, pharmacognostical studies, phytochemical analysis.

1. INTRODUCTION

Leucomeris spectabilis, a member of the Asteraceae family, is a traditional medicinal plant that has been widely used in various folk remedies for centuries. Its therapeutic potential is attributed to a rich array of bioactive compounds found in different plant parts. In recent years, there has been a growing interest in investigating the pharmacognostical aspects of *Leucomeris spectabilis* to scientifically validate its traditional medicinal claims and explore its potential applications in modern healthcare.¹

Pharmacognostical studies involve the detailed examination of various macroscopic and microscopic characteristics of the plant leaves. These studies are essential to verify the authenticity and quality of the plant material and provide crucial information for identification and standardization purposes. Additionally, phytochemical analysis allows for the detection and quantification of bioactive compounds, providing insights into the potential medicinal properties of *Leucomeris spectabilis*.²

The objectives of the present study was to establish various Pharmacognostical standards and to evaluate preliminary phytochemical and physiochemical analysis that can facilitate identification and assist in the preparation of monograph of the plant.

2. MATERIALS AND METHODS

Collection and Authentication of the Plant Material: The plant of *Leucomeris spectabilis* was collected from the area of Jhunsi, Prayagraj, U.P. and authentication by Taxonomist, Botanical Survey of India, Prayagraj Uttar Pradesh. The leaves of *Leucomeris spectabilis* were dried in shade and then powder with a mechanical grinder. The powder was passed through sieve no. 40 and stored in a labeled air tight container for further studies.³

Pharmacognostical Evaluation

Microscopical Evaluation of Leaf of *Leucomeris spectabilis*

The leaf was cut thin transverse section through the midrib portion with help of sharp blade and put thin section with the help of camel brush in the clean watch glass and added potassium hydroxide use as clearing agent and conc.(1:1) HCl transfer a thin uniform section to this solution which was prepared slides and observed under the compound microscope at 100 X.⁵

Physicochemical Evaluation:

The determination of various physiochemical parameters such as total ash, acid insoluble ash, water soluble ash, water soluble extractive value, alcoholic soluble extractive value, foaming index, moisture content. were calculated as per Indian pharmacopoeia.³

Preliminary phytochemical screening for preliminary phytochemical screening, 50gm of powdered drug was extracted with petroleum ether (60-80), ethyl acetate, ethanol and water successively. The extract obtained from successive solvent extraction. Then subjected to various qualitative chemical tests to determine the presence of the various phytoconstituents like alkaloids, glycosides carbohydrates phenolics and tannins, fixed oils and fats, protein and amino acids, flavanoids, saponins.

FLUORESCENCE ANALYSIS

The fluorescence analysis of the powdered leaves of *Leucomeris spectabilis* shown in table 4 were studied under UV light of the powdered samples with different chemicals reagents at 254 nm, 365 nm and ordinary light.

PHYTOCHEMICAL SCREENING⁹

Preliminary phytochemical screening of the HAE was carried out for detection of the presence of various phyto-constituents. Where alkaloids, glycosides, flavonoids, phenolic compounds, tannins, saponins was found and fat, protein, amino acids and steroids was absent.

3. RESULTS AND DISCUSSION

Macroscopic character

The macroscopic character was useful in quick identification of plant material and also serves as important standardization parameter. Organoleptic evaluation of leaves of *Leucomeris spectabilis* were found to be lanceolate with serrate margins and prominent midribs.

Table No. 1: Morphological Characters ⁴ of Leaf of *Leucomeris spectabilis*

S. No.	Characteristics	Observation
1.	Apex	Acuminate
2.	Margin	Serrated or toothed
3.	Base	Cordate or rounded
4.	Mid rib	Prominent
5.	Veins	Pinnate
6.	Size	50-100cm
7.	Shape	Ovate
8.	Taste	Bitter
9.	Color	Greenish yellow
10.	Odour	Odorless

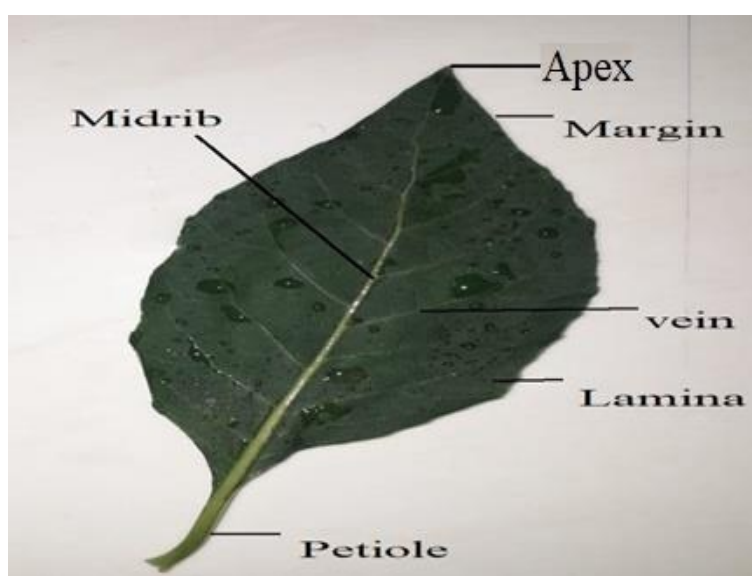


Figure 2. Leaf of *Leucomeris spectabilis*

Microscopic characters

The microscopic characters of the leaf of *Leucomeris spectabilis* include features like trichomes, epidermal cells and vascular bundles.. Trichomes are unicellular. Epidermal cells found on the outermost layer of the leaf revealed the presence of anomocytic stomata, vascular bundles contains the xylem and phloem for transporting water and nutrients. All the reported observations confirmed that its dicotyledonous nature⁴.

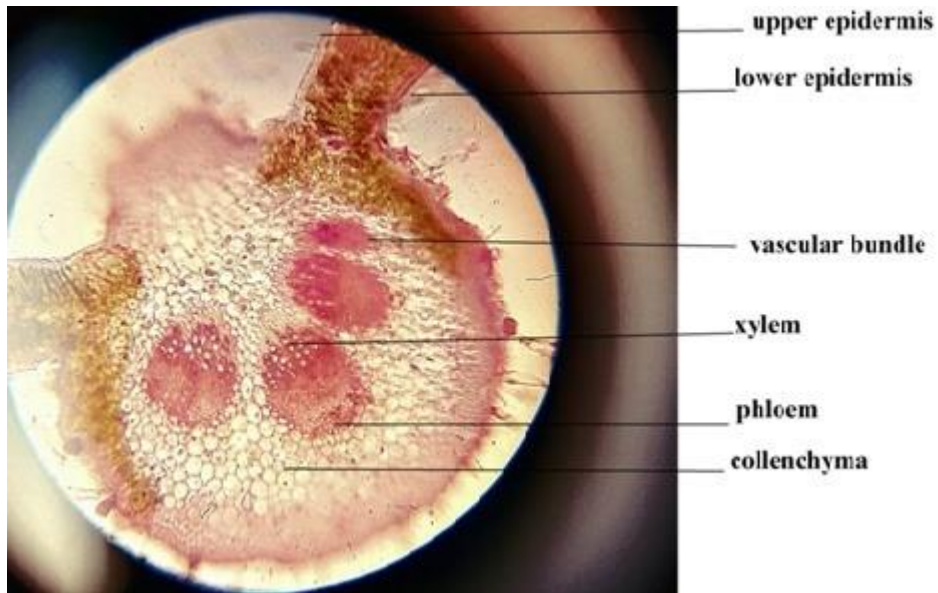


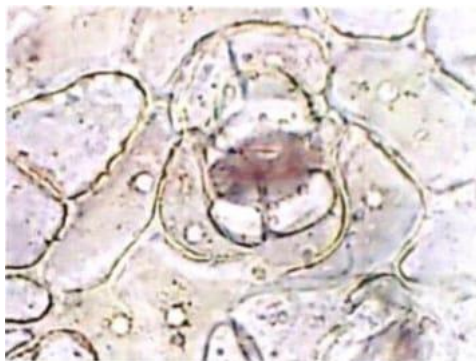
Figure.3. T.S. of leaf of *Leucomeris spectabilis* at 100 X



Calcium oxalate crystal



Trichomes



Stomata lower epidermis



Stomata upper epidermis

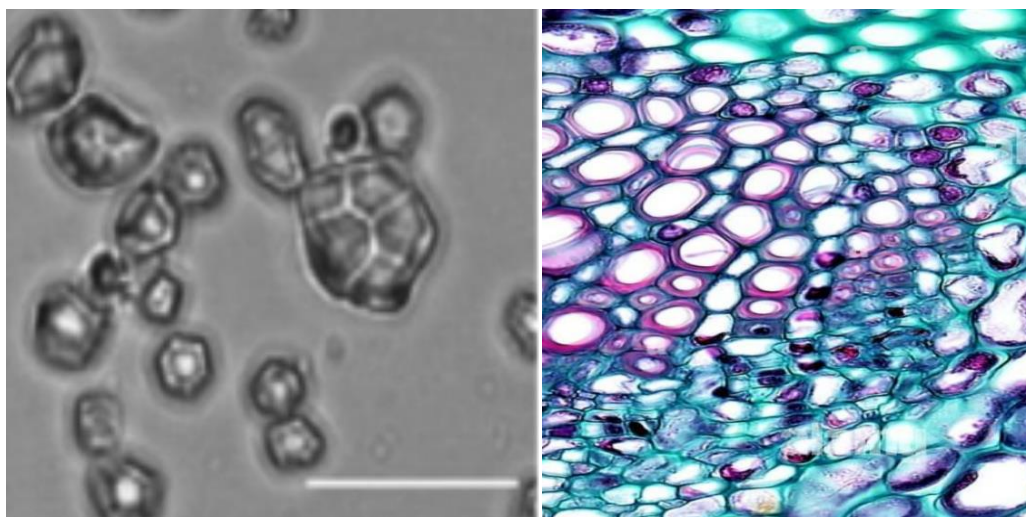


Image of Starch

Image of Vascular bundle

Physico -Chemical Parameter**Table No. 2: Physicochemical Parameters of Leaves of *Leucomeris spectabilis***

Physico chemical parameter	Value(% w/w)
Ash values	
a) Total ash	4.5
b) Acid insoluble	1.5
c) Water soluble	2.5
Extractive values	
a) Ethanol soluble	15
b) Water soluble extractive	20
Moisture content	
Loss on drying at 110°C	2.8

Preliminary phytochemical screening

Preliminary Phytochemical Screening to identify the presence of various phytochemicals in Hydro-alcoholic extract of leaves of *Leucomeris spectabilis*.

Table No. 4: Fluorescence Analysis of the Powdered Leaves of *Leucomeris spectabilis*

S.No.	Chemical constituents	Pet. Ether Extract	Ethyl acetate Extract	Ethanollic Extract	Aqueous Extract
1.	Alkaloids	-	-	+	+
2.	Carbohydrates	-	-	+	+
3.	Glycosides	-	-	+	-
4.	Proteins	-	-	-	-
5.	Tannins and Phenolic compounds	-	-	+	+
6.	Flavonoids	-	-	+	+
7.	Fats And Oils	+	+	-	-
8.	Saponins	-	-	+	+

(+): Presence, (-): Absence

S/No.	Treatment with Chemical Reagents	Observation 254nm	Observation 365nm	Day Light
1.	Powder as such	Deep green	Light green	Green
2.	Powder+1N Sodium Hydroxide Solution	Brown	Brown	Dark brown
3.	Powder +1N sodium hydroxide in water	Green	green	Light green
4.	Powder +50%hydrochloric acid	Yellowish brown	Yellowish brown	Brown
5.	Powder+50% sulphuric acid	Yellowish green	Yellowish green	Green
6.	Powder+50%nitric acid	Green	Light Green	Dark green
7.	Powder+ petroleum ether	Green	Green	Dark green
8.	Powder+ chloroform	Deep green	Deep green	Light green
9.	Powder+ picric acid	Green	Green	Greenish black
10.	Powder+5%ferric chloride solution	Blue	Light Blue	Dark blue
11.	Powder+5%iodine solution	Deep brown	Deep brown	Light brown
12.	Powder+ methanol	Light green	Light Green	Green
13.	Powder+(nitric acid+ ammonia)	Green	Light Green	Light green

4. CONCLUSION

In present investigation various standaradization such as macroscopy, microscopy, physico-chemical parameter and phytochemical screening were carried out which could helpful in authentication of *leucomeris spectabilis*. The result of present study will also serve as reference material in preparataion of monograph.

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5. REFERENCES

1. <https://haryanaforest.gov.in/medicinal-plants/>
2. Khandelwal KR, Pawar AP, Kokate CK and Gokhale SB, Practical Pharmacognosy, Pune: Nirali Prakashan: 2001,19-153
3. Anonymous, pharmacopoeia of India, vol II, Govt of India, Ministry of health, controller of publication, New Delhi,1996.pg.,53-54.
4. Kirtikar KR, Basu BD. Indian Medicinal plants, vol 3. International book Distr: 2005, 2017-2018.
5. Bahadur KD,Sen AB. Chemical examination of *Leucomeris spectabilis*. Quart J CrudeDrug Res 1969;9:1453-1454.
6. Anonymous, WHO Monographs on Selected Medicinal Plants 1999; 1:295.
7. Funke I, Melzig MF. Traditionally used plants in diabetes therapy phytotherapeutics as inhibitors of α -amylase activity. Brazilian Journal of Pharmacognosy 2006; 16(1):1–5.
8. Trease GE, Evans W C. Pharmacognosy. Ed. 15. New Delhi; WB Saunders Company Ltd: 1996, 516-547.

9. WHO 2002. WHO traditional medicine strategy. World Health Organization, Geneva. 223-225.
10. Kokate, C.K., Purohit, A.P. and Gokhle, S.B. "Pharmacognosy" 5th edition, Nirali Prakashan Publication, 2000, 3-5.
11. Liu Y, You Y, Li Y, Zhang L, Yin L, Shen Y, Li C, Chen H, Chen S, Hu B, Chen D. The characterization, selenylation and antidiabetic activity of mycelia polysaccharides from *Catathelasma ventricosum*. *Carbohydrate Polymers* 2017; 174:72–81.
12. Garmus, T.T., Paviani, L.C., Queiroga, C.L., Magalhães, P.M., Cabral, F.A. Extraction of phenolic compounds from pitanga (*Eugenia uniflora* L.) leaves by sequential extraction in fixed bed extractor using supercritical CO₂, ethanol and water as solvents. *Journal of Supercritical Fluids*, 86, 4-14 (2014).
13. Mukherjee P.K, *Quality Control Herbal Drugs* 1st edition reprint 2010 published by Business Horizons New Delhi Pg. No.186-89,287-90. 11.
14. Khandelwal, K.R. *Practical Pharmacognosy, Techniques and Experiments*.
15. Lam SH, Chen JM, Kang C J, Chen CH, Lee SS. α -Glucosidase inhibitors from the seeds of *Syagrus romanzoffiana*. *Phytochemistry* 2008; 69(5):1173–1178.
16. Miyaichi Y, Segawa A, Tomimori T. Studies on Nepalese crude drugs. XXIX. Chemical constituents of *Dronapuspi*, the whole herb of *Leucas cephalotes* SPRENG. *Chem Pharm Bull (Tokyo)* 2006; 54(10): 1370-9.
17. Nadkarni A.K;"*Indian materia medica*"; popular prakashan; vol.1; pg 16. Orient Longman" *Indian medicinal plants*" vol.3; pg no.300-302
18. Harborne J.B;"*Phytochemical methods, a guide to modern techniques of plant analysis*, third edition; pg no 40-179.
19. Shivendu Mishra. Antidiabetic Activity of *Leucas cephalotes* (roth) Spreng. in Alloxan Induced Diabetic Rats. International Conference on Promotion and Development of Botanicals, Kolkata 2002.