



PHARMACOGNOSTICAL AND PHYTOCHEMICAL STUDIES ON THE LEAVE OF *LANTANA CAMARA* L.

T. Loganathan*¹, Raghvendra Singh Bhadauria²

¹Research Scholar, SunRise University, Bagad Rajput, Alwar, Rajasthan, India – 301 030.

²Principal, Shrinathji Institute of Pharmacy, Upali Odan, Nathdwara, District Rajsamand, Rajasthan, India – 313 301.

ABSTRACT

The aim of the present study was to assess the pharmacognostic and phytochemical studies on leaves of *Lantana camara* L. The objective of the present work comprise of collection, identification, microscopical and phytochemical evaluation of leaves of *Lantana camara* L. The leaves section was taken and cellular structures were studied. The transverse section of leaves shows the presence of epidermis, vascular bundle, vein islet, vein termination, spongy parenchyma, glandular trichomes and cambium. The powder microscopy shows the presence of calcium oxalate crystal, xylem vessels, fibres, oil glands, covering trichomes and paracytic stomata. The physiochemical studies indicate the ash value, extractive value and moisture content. The preliminary phytochemical tests on methanolic extract indicates the presence of flavanoids, saponins, carbohydrates, tannins, phenols, steroids and fixed oils and fats. The study revealed specific identities for the particular crude drug which will be useful in identification and control to adulterations of the raw drug.

Key words: *Lantana camara* L, Microscopy, Phytochemical, Adulteration.

Corresponding Author **T. Loganathan** Email: ktlpharma2021@gmail.com

INTRODUCTION


The plant *Lantana camara* L family *Verbenaceae* is available throughout central and south India in most dry stony hills and black soil. A large scrambling evergreen, strong smelling shrub with stout recurved prickles; leaves opposite, often rugose, scabrid on both sides; flowers small, normally orange but often white to dark red, in heads which are prominently capitates; bracts conspicuous and persistent. Fruits are small, 5 mm diameter, greenish-blue, blackish, drupaceous, shining with two nutlets almost throughout the year and dispersed by birds. Seeds germinate very easily (Anonymous, 1992). The chemical constitution for *lantana camara* is caryophyllene, 1- α - phellandrene,

lantadene A, lantadene B, lancamarone quinine, lantanine. Analysis of the volatile oil of leaf of *Lantana camara* Linn showed that major components such as a pinene, camphene, β -pinene, myrcene, 1-8 cineole (Ouamba JM, et.al., 2006). Major components such as pentacyclic triterpenoids, namely lantanoic acid, camaranoic acid, lantic acid camarinic acid, camangeloyl acid, camarinin, oleanonic acid, and ursonic acid were isolated from the aerial parts of *Lantana camara* (Begum SS et al., 2008). The plant is vulneary, diaphoretic, carminative, antispasmodic and tonic, wounds, ulcers, swelling, tumours and rheumatism (Anonymous, 1992).

EXPERIMENTAL

Collection and authentication of plant

The plant was collected from Komarapalayam, Tamil Nadu, India. The collected plant was identified at Botanical survey of India, Ministry of environment and forest, Government of India, Coimbatore.

Access this article online		
DOI: http://onlineijp.com/		Quick Response code 
DOI: http://dx.doi.org/10.21276/ijp.2019.10.4.2		
Received:25.06.19	Revised:12.07.19	Accepted:15.07.19

Macroscopical study

Organoleptic evaluation of drug refers to the evaluation of drugs by color, odour, size, shape, taste and special features including touch and texture etc. Organoleptic evaluation can be done by means of organs of special sense which includes the above parameters and thereby define some specific characteristics of the material which can be considered as a first step towards establishment of identity and degree of purity (Kokate, C.K., *et al.*, 2006)

Microscopical study

Transverse Section of leaves was taken as per standard procedure. For quantitative microscopy fresh leaves a sample were used and observe all parameters such as Stomatal Number, Stomatal index, Vein islet number, vein termination number etc (Khandelwal KR, 2007).

Powder microscopy

The dried Leaves of plant *Lantana camara* L were powdered and sieved to obtained fine powder. It was taken up for powder microscopy evaluation as follows: A small quantity of powder was kept on a slide and after mounting on glycerine, 10min were provided as spared out time. Finally, it was observed for powder microscopical characters (Kokate, C.K., *et al.*, 2006).

Physiochemical screening

The air dried coarse powdered leaves of *Lantana camara* L was subjected to the ash values (total ash, water soluble ash, acid insoluble ash, Sulphated ash), extractive values (water soluble extractive value, alcohol soluble extractive values) and also moisture content (loss on drying) (Mukherjee, P.K, 2002; Kokate, C.K., 2007; Khandelwal, K.R., 2007; Evans, W.C., 2002; Vinod D Rangari, 2002). All the values were calculated and showed in the table no:1

Preliminary phytochemical screening

Extraction procedure

About 500 gm of air dried powdered material was taken in 1000ml soxhlet apparatus and extracted with petroleum ether for 2 days. At the end of 2nd day the powder was taken out and it was dried. After drying it was again packed and extracted by using methanol (Changshuyangyuan chemicals, China) as solvent, till colour disappeared. The temperature was maintained at 55°C-65°C. After that extract was concentrated by distillation and solvent was recovered. The final solution was evaporated to dryness.

Qualitative phytochemical analysis

One gram of the methanol extract of *Lantana camara* L leaves were dissolved in 100 ml of its own mother solvents to obtain a stock of concentration 1%

(v/v). The extract thus obtained was subjected to preliminary phytochemical screening (Mukherjee, P.K, 2002; Kokate, C.K., 2007; Vinod D Rangari, 2002). The result obtained in the present investigation of methanol extract of the leaves of *Lantana camara* L Showed in the table no: 3.

RESULT AND DISCUSSION

Macroscopic Observations

Leaf of *Lantana camara* is green in colour when fresh and become greenish brown on drying. Fresh material is having characteristic and slightly bitter in taste. *Lantana camara* L. leaves are ovate, elliptic, acute apex with uniform base. Its margin is crenate-serrate (Figure 1).

Microscopic Observations

Transverse section of *Lantana camara* L leaves

A microscopical character reveals that single layered upper and lower epidermal layer protected by thick cuticle. Palisade cells were observed below upper epidermal layer with spongy parenchyma. Covering trichomes are observed on both sides with unicellular thin walled with bulbulous base. The number of covering trichomes is more as compare to the glandular trichomes. The microscopy of the leaves shows the following observations (Figure 2).

Powder Microscopic

Observations

During the powder microscopic study of leaf of *lantana camara* following observations were made like trichomes, stomata, vessels etc (Figure 3).

Physiochemical observation

The physiochemical parameters were investigated and reported as, total ash value (9.27 %w/w), water soluble ash value (4.10 %w/w), acid insoluble ash value (2.21%w/w), sulphated ash value (1.06 %w/w), water soluble extractive value (5.12 %w/w), alcohol soluble extractive value (6.79 %w/w), loss on drying (4.85 %w/w). The above studies were enabled to identify the plant material for future investigation and form an important aspect of drug studies. The results were given in below table.

Phytochemical evaluation

The leaves of *Lantana camara* L were subjected for hot continuous extraction using methanol as solvent. The yield was found to be 9.97% w/w. the extracts obtained were subjected to various phytochemical tests, to identify the active constituents, which showed the presence of carbohydrate, fatty acids, saponins, flavanoids and phenolic compounds, etc., The results were given in below table.

Table 1: Physico chemical standards of powdered *Lantana camara* (Linn.) leaves

S.No	Parameters	% (w/w)
1.	Total ash	9.27
2.	Water soluble ash	4.10
3.	Acid insoluble ash	2.21
4.	Sulphated ash	1.06
5.	Water soluble extractive	5.12
6.	Alcohol soluble extractive	6.79
7.	Loss on drying	4.85

Table 2: Presence of Phytoconstituents in *Lantana camara* L leaves.

PHYTOCONSTITUENTS	METHANOL EXTRACT
Alkaloids	-
Saponins	+
Glycosides	-
Carbohydrates	+
Tannins	+
Flavanoids	+
Steroids	+
Phenolic compounds	+
Proteins and amino acids	-
Fixed oils and fatty acids	+
Gums and mucilage	-

(+) = present; (-) = absent.

Figure 1: Morphology of *Lantana camara* L Leaves



Figure 2: Microscopy of *Lantana camara* L Leaves

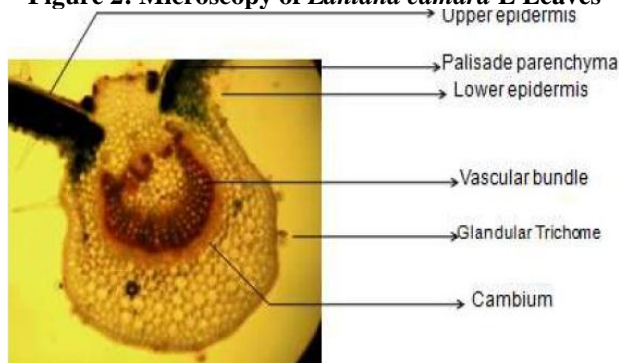
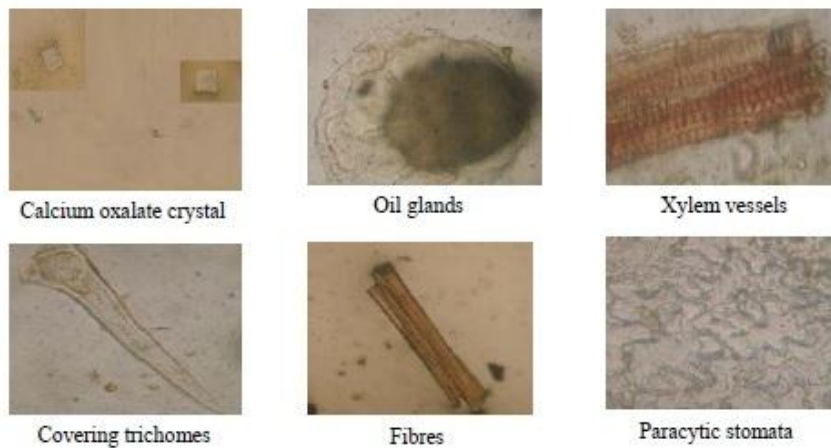


Figure 3: Powder microscopy of *Lantana camara* L leaves



CONCLUSION

The major problem faced in herbal formulation industry is the identification of authenticated raw material and in the absence of data one can use adulterant in the drug formulation. The results obtained in morphological studies reported here in established the macro & microscopic parameters that characterize the plant *Lantana camara* L. Family (*Verbenaceae*). Those macro

scopical characteristics can be utilized for quick identification of the drug and are particularly useful in the case of powder materials. Present study concludes that physiochemical parameters, Qualitative and Quantitative analysis may be used for Quality control parameters of *Lantana camara* to obtain genuine and standard drug for therapeutic purpose.

REFERENCES

- Anonymous, The wealth of India, Raw materials, Vol VI L-M, Revised edition,- Council of scientific and Industrial research, New Delhi, 1992, 31-34.
- Begum SS, Syeda Qamar SQ Zehra and Bina Shaheen Siddiqui BS, Two new pentacyclic triterpenoids from *Lantana camara* LINN Chemical & Pharmaceutical Bulletin, (56)9, 2008, 1317-1320.
- Evans WC, Trease & Evan's, pharmacognosy, 15th edition, reprinted, 2002, 98-99,103.
- Khandelwal KR, Practical pharmacognosy, seventeenth edition June, 2007, 149-153,157-159.
- Kokate CK, Practical pharmacognosy, 11th reprint, 2007, 107-114,123-125.
- Kokate, C.K. Purohit AP and Gokhale, S.B Text Book Pharmacognosy, edition 4, Pune:Nirali Prakashan,2006.
- Mukherjee PK, Quality control of herbal drugs, 1st edition, 2002 186-191,195-197,246-378,379-421,426-458,495-515.
- Ouamba JM, Ouabonzi A, Ekouya A, Bessière JM, Menut C, Abena AA, Banzouzi JT, Volatile constituents of the essential oil leaf of *Lantana salvifolia* Jacq. (*Verbenaceae*), Flavour and Fragrance Journal, 21, 2006, 158-16.
- Vinod D Rangari, Pharmacognosy & Phytochemistry, Part-1, 1st edition, 2002, 90-93,100,130-134,194-195.