Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
https://www.phytojournal.com
JPP 2023; 12(1): 592-596
Received: 10-09-2022
Accepted: 20-11-2022

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Preliminary physico – Phytochemical & phyto cognostical evaluation of the leaves of *Lantana camara*

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Abstract
Lantana camara Linn (Family Verbenaceae,) are broadly used in traditional system of medicine throughout different tropical and subtropical region of India. & American tropics. It is a large scrambling evergreen shrub. Lantana camara is a low, erect or scan dent shrub. It used in the treatment of diaphoretic, carminative, antispasmodic, tonic, and antiemetic, to treat respiratory infections, dysentery, and gastropathy. It is very important to standardize the plant part pharmacognostical for its utilization in different formulation. The current study deals with the determination of morphological character, determination of their physical values like total ash, acid insoluble ash, water soluble ash, loss on drying. Also determine the presence or absence of phytochemical such as alkaloids, flavonoids, tannins.

Keywords: *Lantana camara,* Verbenaceae, *tannins*

Introduction
Herbal plants are wonderful origin of traditional & modern medicine, useful for primary health care system worldwide. Herbal plants have ability for the formation of secondary metabolites such as steroids, phenolic substances, flavonoids, alkaloids, etc. These secondary metabolites are used to treatment of many diseases. *Lantana camara Linn* belonging to the family Verbenaceae brought its importance for its different traditional uses throughout India. In present scenario some herbal medicines are used as dietary supplement. They are found different dosage form as tablets, capsules, powders, teas, extracts, and fresh or dried plants. Now a day's people use herbal medicines to prevention, treatment and improve their health.
It is estimated that there are 250000 to 500000 species of plants on earth [1]. It is traditionally used as diaphoretic, carminative, antispasmodic, tonic, and antiemetic, to treat respiratory infections, dysentery, and gastropathy. *Lantana camara* is a species of flowering plant within the verbena family, native to the American tropics. In India a relatively small percentage (1-10%) of these is used as food by humans and other animal species [2]. It is known as Bigsage in Malaysia; Wild-sage, Red-Sage, White-Sage in Caribbean; Tickberry in South Africa; West Indian lantana, Umbelanterna in Bengal. Synonyms of *Lantana camara is Lantana viburonides*, *Lantana urticifolia* subsp. *L. urticifolia* subsp. *L. urticifolic*, *Lantana undulate*, *Lantana spinosa*, *Lantana sanguine* etc. [3]. Lantana camara is now distributed in nearly 60 countries. It grows up to 1-3 m and in width, it can spread to 2.5m. Leaves are ovate, acute or sub-acute, crenate serrate, rugose above, and scabrid on both sides. They are green in color, 3-8cm long, and 3-6cm wide. They are compact, dome-shaped 2-3 cm across and contained 20-40 sessile flowers [4]. The whole plant, leaves, roots, and bark have huge medicinally importance. Taxonomic classification of plant are Kingdom-Plantae, Subkingdom-Tracheobionta, Superdivision-Spermatophyta, Division-Magnoliopsida, Subclass-Asteridae, Order-Lamiales, Family-Verbenaceae, Genus-Lantana, Species-camara [31]. Common name of plant are Lantana, Mina, Mina Shajary in Arabic; Common lantana, camara Lantana in English; Lantanier, The de Gambie, Verbene in French; Raimuniya in Hindi; Angel lips, Ayam in Malaysia; Cinconegritos in Spanish [5, 6].
Standardization of herbal drugs are difficult because generally mixture of constituents and the active constituent in most cases is unknown. The aim of the current study deal the standardize leaves parts of *Lantana camara Linn.*

Materials and Methods
Fresh leaves parts of *Lantana camara Linn* were collected from field of Rajeshwar Nagar Dehradun, India in the month of January 2021and authenticated by Dr. Arti Garg, Scientist-E & Head of Office, Botanical Survey of India, Allahabad, Uttar Pradesh, India. A voucher

specimen has been preserved in Department of Natural Product Pharmacy College, Itaura, Chandeshwar, Azamgarh 276128, Uttar Pradesh, India for future reference (Vouchers pecimen no. No**.** PCA /2021/3267). The leaves parts were dried under shade and powdered (40 mesh size) and stored in airtight containers. The macroscopic characters were studies as per given procedure in WHO guidelines on quality control methods for medicinal plants materials [7]. Fluorescence analysis of powdered leaves carried out according to these method Kokoski *et al*. [8] and Pratt& Chase [9].

Macroscopical studies

The leaves of the plant were studied for their organoleptic evaluation of drug refers to the evaluation of drugs by color, odour, size, shape, taste, size of the leaf 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 [10].

Microscopical evaluation

Macroscopical parameters observed were, Unicellular covering trichomes with pointed head, Phloem, glandular trichomes with unicellular head & stalk, collenchyma, palisade cells at upper side, vascular bundles, sclerenchymatus layers etc. All determination was carried out by using Almicro compound microscope attached with a camera [10].

Powder microscopy

The dried Leaves of plant Lantana camara Linn were powderd and sieved to obtained fine powder. A small quantity of powder was kept on a slide and after mounting on glycerine, after 10 min it was spared. Finally, powder microscopy study was done with the powdered leaves [10, 11].

Physicochemical studies

The ash values (total ash, acid insoluble ash, water soluble ash), the loss of drying [12, 14], extractive values (petroleum ether 60-80 °C, chloroform, methanol, aqueous)were determined according to the official methods of ayurvedic pharmacopoeia of India [13, 15-17]., were performed according to the official methods prescibed in Indian Herbal Pharmacopeia [18]. and the WHO guidlines [11].

Total ash

Weigh accurately previously weighed and tarred crucible. Add 2 gm of ground material. Ignite the material by increasing the heat to 500-600 ℃. Cool in desiccators and weigh. If carbon free ash cannot be obtained in this manner, cool the crucible and moisten the residue with 2ml. of water or a saturated solution of ammonium nitrate R. Dry on a water bath or hot plate and ignite. Allow the residue to cool for 30 min and weigh. Calculate content of total ash [19].

Acid-insoluble ash

To the crucible containing total ash, add 25 ml of hydrochloric acid, cover with a watch glass and boil gently for 5 minutes. Rinse the watch glass with 5ml of hot water and add this liquid to crucible. Collect the insoluble matter on an ash less filter paper and wash with hot water until the filtrate is neutral. Transfer the filter paper containing the insoluble matter to the original crucible, and then ignite at 450-500 ℃ to constant weight. Cool in dedicator for 30 min and weigh without delay. Calculate the content of acid-insoluble ash in mg per gram of air-dried material [19].

Water-soluble ash

To crucible containing total ash, add 25 ml. of water and boil for 5 min. collect mater on ash less filter paper. Wash with hot water and ignite for 15 min. at temperature not exceeding 450 ℃. Subtract the weight of this residue in mg obtained from total weight of total ash [19].

Loss on drying

This test determines both water and volatile matter. Drying can be carried out either by heating to 100-150 ℃ or by drying in a desiccators over phosphorus pentaoxide R under atmospheric or reduced pressure at room temperature for a specified period of time [19].

Extraction method and preliminary phytochemical screening

The dried plant leaves was powdered and sieved to get fine powder using an electric blender. For the phytochemical

screening, the powdered leaves were extracted with petroleum ether (40 °C), chloroform, methanol, aqueous respectively in a series using cold maceration technique. All extract were concentrated in a rotary vacuum evaporator below 40^0c and subsequently dried in high vacuum to get solid crude petroleum ether extract (PELC), chloroform (CELC), methanol (MELC), aqueous (AELC) respectively. Phytochemical screening of the methanolic extract of *Lantana Camara* leaves was performed for the detection of various phyto constituents such as tannins, flavonoids, alkaloids and saponins as per standard procedure. [19, 20-22].

Tests for Alkaloid

- Extract was treated with 1 ml of Dragondroff's reagent. An orange-red precipitate indicates the presence of alkaloid.
- Extract was treated with 1 ml of Mayer's reagent. Whitish yellow or cream-colored precipitate indicates the presence of alkaloids
- Tests for Carbohydrates:
- To 1 ml of the extract, add equal quantities of Fehling A and B, upon heating formation of brick red precipitate indicate the presence of sugar.
- To 1 ml of Benedict reagent, add 1 ml of extract solution and boil.

Test for Tannin

To 1 ml of the extract, add ferric chloride solution, formation of a dark blue or greenish black color product shows the presence of tannins.

Test for Flavanoids

Extract is treated with amyl alcohol, sodium acetate and ferric chloride. A yellow color solution formed, disappear on addition of an avid indicate the presence of flavanoids.

Test for Saponins

Take small quantity of alcoholic and aqueous extract separately and add 20 ml of distilled water and shake in a graduated cylinder for 15 minutes lengthwise. A 1 cm. layer of foam indicates the presence of saponins.

Test for Triterpenoids

Extract (300 mg) was mixed with 5 ml chloroform and warmed for 30 minutes. Few drops of concentrated sulphuric acid was added and mixed well. The appearance of red color indicates the presence of triterpenes.

Test for Proteins

The plant powder was extracted in different solvent and solvent free plant extract was mixed with few ml of diluted HCl and filtered. Two drops of ninhydrin solution was added to the filtrate. The mixture was mixed properly. Purple color not seen that indicates absence of proteins.

Test for Glycosides

50 mg of extract was hydrolyzed with concentrated HCl for two hours on water bath. The hydrolyzed mixture was filtered and 3 ml of chloroform layer was separated out. 10% ammonium solution was added to the chloroform layer, pink color indicated the presence of glycosides.

Result and Discussion: In literature survey it was found that the plant possesses several traditional and pharmacological uses. The macroscopical study of the leaves of *Lantana camara* (L.) was done. The leaves were ever green in colour with pinnate, Strong aromatic, Small rounded heads, 2-2.5cm long

(Table-1). Pharmacognostical standardization was essential tool for proper utilization of the plant for pharmaceutical uses. The values of the physical constant like ash values, loss on drying, extractive value were determined. Extractive value and color of extract was investigated (Table-2). Preliminary qualitative phytochemical screening (methanolic extract) shown that presence of alkaloids, tannins and flavonoids showed the leaves are rich sources of secondary metabolites responsible for different pharmacological activities. (Table-3). *Lantana camara* (L.) Leaves powder microscopy showed trichome,

Table 1: Macroscopical evaluation of *Lantana camara* (L.) leaves

S. No.	Feature	Observation
1.	Color	greenish
2.	Odour	Strong aromatic
3.	Taste	Characteristic
4.	Head	Small rounded heads
5.	Occurrence	Dense in flat topped clusters
6.	Diameter	2-2.5cm
7.	Shape	Small tubular shaped
8.	Petals	Arranged in clusters

Table 2: Physiochemical Analysis of *Lantana camara* (L.) Leaves

S. No.	Solvent	Wt. of Plant material (gm)	%age of yield	Color of extract
1.	Chloroform	4	4.3%	Greenish Brown
2.	Pet. Ether	4	1.90%	Greenish Brown
3.	Methanol	4	6.5%	Pale green
4.	Aqueous	4	4.95%	Yellowish brown

Table 3: Phytochemical screening of *Lantana camara* (L.) Leaves

S. No.	Test	Methanolic extract
1.	Alkaloids	+
2.	Flavonoids	+
3.	Tannins	+
4.	Glycosides	+
5.	Saponins	_
6.	Carbohydrates	+
7.	Triterpinoids	+
8.	Proteins	_

(+)- present, (-)-absent

Table 4: Data showing the Physio- chemical standard values of *Lantana camara* (L.) Leaves

S. No.	Parameters	Values
1.	Tatal ash(mg/gm)	4.65
2.	Acid insoluble ash(mg/gm)	1.05
3.	Water soluble ash(mg/gm)	2.34
4.	Loss on drying(mg/gm)	2.5

Table 5: Arrangement of Leaves *Lantana camara* (L.)

S. No.	Characters	Observations
01	Venation	Pinnate
02	Shape	Lancelot
03	Arrangement	Pinnately compound
04	Margins	Entire
05	Arrangement on the stem	Opposite

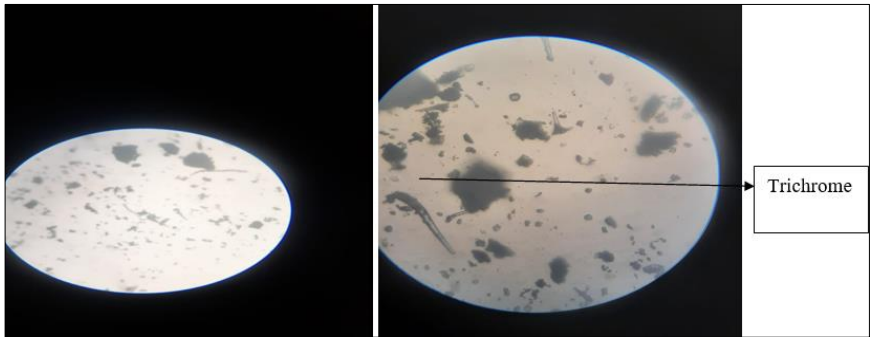

Fig 1: powder microscopy of *Lantana camara* (L.) Leaves

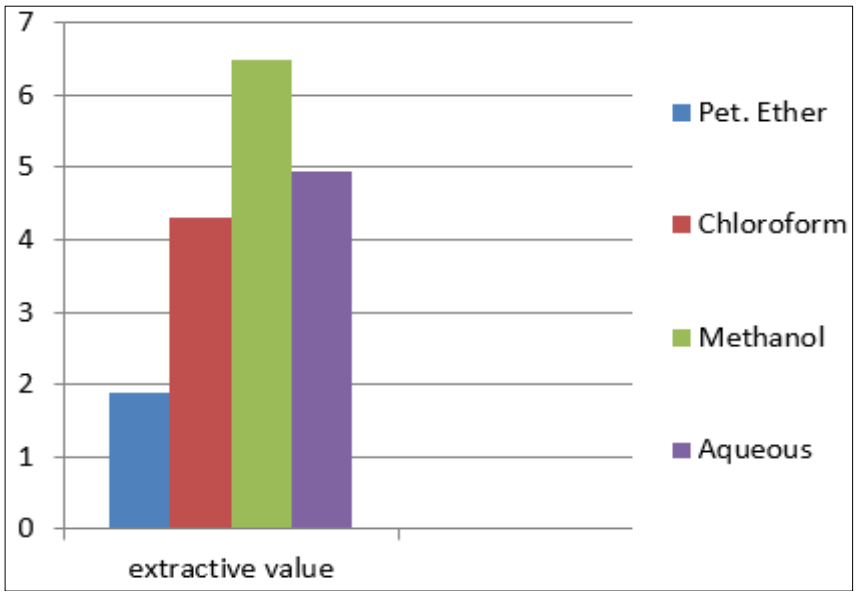

Fig 2: Extractive value (%) different extract of *Lantana camara* (L.) Leaves

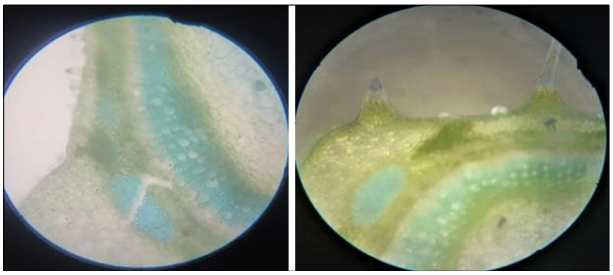

Fig 3: T.S. of stem of *Lantana camara*

Conclusion

Preliminary physico-phytochemical study of the *Lantana camara* (L.) Leaves study concluded to macroscopic, other physical values and parameters will help to identify the species of plant, phytochemical screening will help the presence of secondary metabolites, Microscopy is an important tool in the evaluation of crude drugs which is applicable at various levels such as the authentication of the crude drugs, study of powdered drugs, which is responsible for the medicinal & pharmacological importance of the plant. *Lantana camara* (L.) Leaves is known as wide range of medicinal value, it helps to identification, authentication and standardization. It also require to research on phytochemical and pharmacological aspect. However research going on it would be easier to develop new drugs.

Acknowledgement

Authors express sincerely thanks to HOD, ITM University, NH-44, Bypass Turari, Jhansi Road, Gwalior –474001, Madhya Pradesh, India and Principal, 2Pharmacy College, Itaura, Chandeshwar, Azamgarh 276128, Uttar Pradesh, India. for providing research facilities.

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