



COMPREHENSIVE REVIEW ON: LANTANA CAMARA PHYTOCHEMISTRY, ETHNO PHARMACOLOGY

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ABSTRACT

Lantana Camara belong to verbenaceae family. *Lantana Camara* also known as *lantana*. The genus *lantana* consists of 150 PA tropical species used as traditional medicines all around the world. *Lantana Camara* is well known to cure several disease & used in various folk medicinal preparations. India has rich traditional of plant based knowledge in health care. *Lantana camara* is formulated for use in cuts and wounds in a limited number of formulations (e.g., ointments and creams). Among the large number of herbal drugs existing in India, very few studied systematically so far. Plant is used to treat asthma, abdominal disorder, cancer, swelling & ulcer. The present review aims to document the medicinal properties of *L. camara* its future prospects for the further scientific investigation for the development of effective therapeutic compounds. The stem, root and leaves contain many of the bioactive compounds responsible for various therapeutic applications such as cancers, chicken -pox, asthma, ulcers, swellings, eczema, tumours, high blood pressure, bilious fevers, catarrhal infections, rheumatism, malaria, antiseptic, antispasmodic, carminative and diaphoretic.

KEYWORD: - *Lantana Camara*, Medicinal Plant, Herbal Drug.

I. INTRODUCTION^[1,2,3]

Medicinal plants represent an important source of medically important compounds. Since ancient time, medicinal plants are used to cure several types of health problems^[2]. *Lantana camara* is known by different name in various different languages in India viz, Raimuniya (Hindi), Chaturangi and Vanacehdi (Sanskrit), Arippu and Unnchedi (Tamil), Airproof, Poochedi, Konginipoo and Nattachedi (Malayalam), Thirei, Samballei and Nongballei (Manipuri), Tantani and Ghaneri (Marathi), Pulikampa (Telegu), Kakke and Natahu (Kanada). *L. camara* is distributed throughout India where there is a moderate to high summer rainfall and well-drained sloping sites. *Lantana camara* Linn. is a flowering ornamental plant belonging to family Verbenaceae^[3]. *lantana Camaralinn* is considered as a notorious weed & popular ornamental plants. *Lantana Camara* used in traditional medicine system for treatment of cuts, swelling, ulcers, cataract, fever, itches & rheumatism.^[4] The plant-based, traditional medicine system continues to play an essential role in health care, with about 80% of the world's inhabitants relying on traditional medicines for their primary health care. Several researchers have reported antimicrobial activity of leaves and their essential oil. It is one of the world's worst weed and a popular ornamental plant. The genus is a difficult one to classify taxonomically since species are not stable and hybridisation is widespread, shape of inflorescence changes with age, and flower colours vary with age and maturity.

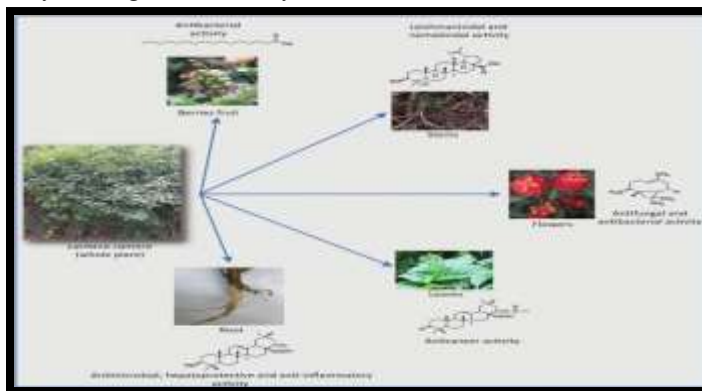


Figure No.1: Effects of parts of plant (*lantana camara*).



II. PLANT DESCRIPTION^[4,5,6]

L. camara is a robust, low, upright or subscandent shrub with a tetragonal stem, thick, recurved leaves, and a potent black current odor. The plant can extend to a width of 2.5 meters and reach heights of 1 to 3 meters. Oval or rectangular, acute or subacute, crenate serrate, rugose above, and scabrid on both sides are the characteristics of the leaves. The green leaves measure 3–8 cm in length and 3–6 cm in width. Rough hairs cover the stem and leaves. Umbels are tiny flowers that are held in bunches. The flower's color typically changes as it ages, sometimes shifting from orange to white to red in different shades. Almost all year long, the axillary head of flowers has a yellow neck. The calyx is little. Stem: Tetragonal stem, stout recurved pickles and covered with bristly hairs. Leaves: Opposite, simple, scented leaves with long petioles and rough, oval-shaped surfaces. Seeds: Initially seeds are green colored, turn into purple and finally black when they get matured. Flowers: Small, flower held in clusters (called umbels). Color usually orange, sometime white, pink. Fruits:- Round, fleshy, two-seeded bean, poisonous.

- Barriers fruits: - Antibacterial activity.
- Stems: - Nematicidal activity.
- Flower: - Antifungal & Antibacterial activity.
- Leaves: - Anticancer Activity.
- Roots: - Antimicrobial, hepato protective & anti-inflammatory activity.



Figure No.2: Morphology of Lantana camara Linn.
A) Flower, B) fruits, C) leaves) plant, E) stem, F) Roots.

Taxonomy^[7]

- ✓ **Kingdom:** Planate
- ✓ **Division:** Magnoliophyta
- ✓ **Class:** Magnoliopsida
- ✓ **Order:** Lamiales
- ✓ **Family:** Verbenaceae;
- ✓ **Genus:** Lantana
- ✓ **Species:** Lantana camara Linn.

General Characteristic

Table No.1:- General characteristics of lantana Camara.

Characteristics	Description
Native	Tropical region in central & South America
Synonym	Camera Vulgarise
Distribution	Naturalised in countries at 35°N & 35°S latitudes
Conservation Status	Alien
Plant Category	Annuals & biennials, ground covers
Plant Characteristics	Poisonous
Foliages Characteristics	Fragrant, evergreen
Foliages Color	Pink Yellow
Propagation Method	From Herbaceous stem cuttings



III. CHEMICAL CONSTITUENTS^[8,9]

Phytochemicals analysis of the leaves of *L. camara* showed that the plant contained alkaloids, glycosides, steroids, saponins, flavonoids, coumarins, tannins, carbohydrates, hydroxy anthraquinones, anthraquinones glycosides, proteins, phyosteroids, fixed oils, fats⁽⁹⁾. A chemical examination of the floral extract and leaves revealed ten comparable lipid and carbohydrate compositions. The extracts from the leaves had more lipids, whereas the flowers had more carbohydrates than the leaves. The polyphenol content of *L. camara* was 917.60 mg/100 g in the leaves and 328.56 mg/100 g in the stem, while flavonoids content was 3.29 mg/100 g in the leaves and 8.03 mg/100 g in the stem. *L. camara* leaves yielded 0.8% of essential oil. α -guaiene, α -humulene, α -copaene, α -cubebene, α -selinene, β -elemene, β -selinene, δ -cadinene, germacrene D, B, aromadendrene, caryophyllene oxide, nerolidol, and spathulenol represented the major components of the essential oil of *L. camara*^[9]. However, 26 compounds were characterized from essential oil of *L. camara* from Tamil Nadu regions, these included: Bicycloelemene, α -cubebene, α -copaene, β -elemene, bicyclo, germacrene, α -guaiene, α -humulene, aromadendrene, naphthalene, germacrene D, β -selinene, epi-bicyclosesquiphellandren, α -selinene, 1-hydroxy-1, 7-dimethyl-4-iso, β -cadinene, caryophyllene oxide, veridifloral naphthalenamine, 4-bromo, (-)-spathulenol, isospathulenol, tetracyclo, δ -cadinene, 1-naphthalenol.

Traditional Use of *lantana camara*^[10]

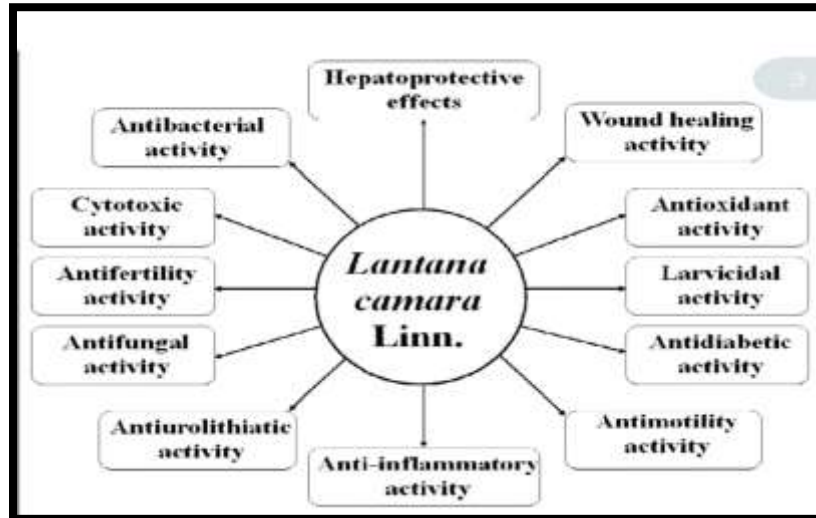
Table No2: Traditional use of *lantana Camara*.

Parts	Traditional uses
Leaves	Cuts, rheumatism, ulcer, catarrhal infection, tetanus, malaria, cancer, chicken pox, asthma, swelling, eczema, high blood pressure, bilious fever, ataxy of abdominal viscera, sores, measles, cold and fever
Whole plant	Bronchitis
Berries/Fruits	Fistula, pocks, tumors and rheumatism
Flowers	Chest complaint in children
Powdered root	Given with milk to treat stomachache and as a vermifuge, toothache
Bark	Astringent and used as a lotion in cutaneous eruptions, leprosy ulcers
Lantana oil	Skin infection, itches, and as an antiseptic for wounds
Plant extract	Drought-tolerant plant so good candidate for xeriscaping. Employed in the folk drug for the treatment of cancers, chickenpox, measles, asthma, ulcers, swellings, eczema, tumors, high blood pressure, bilious fevers, catarrhal infections, tetanus, rheumatism and malaria



IV. MEDICINAL PROPERTIES OF LANTANA CAMARA LINN^[11]

Figure No 3: Medicinal properties of lantana Camara



1. Antibacterial Activity

The leaves and flowers of some *L. camara* plant types have been shown to have antibacterial properties. While *Staphylococcus aureus* showed weak antibacterial activity, three distinct solvent extracts of the leaves and flowers of four distinct varieties of *L. camara* showed strong antibacterial activity against *E. coli*, *Bacillus subtilis*, and *P. aeruginosa*. There have been reports of antibacterial activity in ethanolic extracts of *L. camara* leaves and roots. The microdilution method was used to measure the antibacterial activity in vitro. *Staphylococcus aureus*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Vibrio cholerae*, *Escherichia coli*, and two multiresistant strains of *E. coli* and *S. aureus* were all susceptible to the extracts' antibacterial activity.

2. Antifungal Action

The antifungal properties of *L. camara*'s ethanol and hot water extract were tested against fungi that cause brown and white rot in wood. Both extracts demonstrated effective antifungal activity against the fungi that cause white and brown rot, but at very low concentrations (0.01%), ethanol extract showed great promise. Additionally, *L. camara* was tested against *Alternaria sp.*, which causes a variety of plant diseases, particularly in vegetable plants. Using the food poison plate method, the antifungal activity was assessed at three distinct extract concentrations: 10 mg/ml, 15 mg/ml, and 20 mg/ml. *L. camara* demonstrated strong antifungal activity against *Alternaria sp.* at a dosage of 20 mg/ml.

3. Antimicrobial Effects

The antimicrobial activity of the petroleum ether, methanolic, and water extracts of *L. camara* was investigated against *Bacillus subtilis*, *Escherichia coli*, and *Candida albicans*. At concentration of 250 mg and more, petroleum ether and methanolic extracts of the leaves showed potent antibacterial and antifungal activity.

4. Antioxidant Effects

Antioxidant activity of *L. camara* of aerial parts methanolic extract, its fractions and purified compounds (lantadeneoleanolic acid, and lantanilic acid) were determined using 1, 1-diphenyl-2 picrylhydrazyl (DPPH). The methanolic extract showed 67% inhibition of DPPH free radical with EC₅₀ value of: 875 µg/ml, the three fractions were also active and exhibited 70%, 72%, and 65% inhibition, respectively, with EC₅₀ value of 375 µg/ml (10).

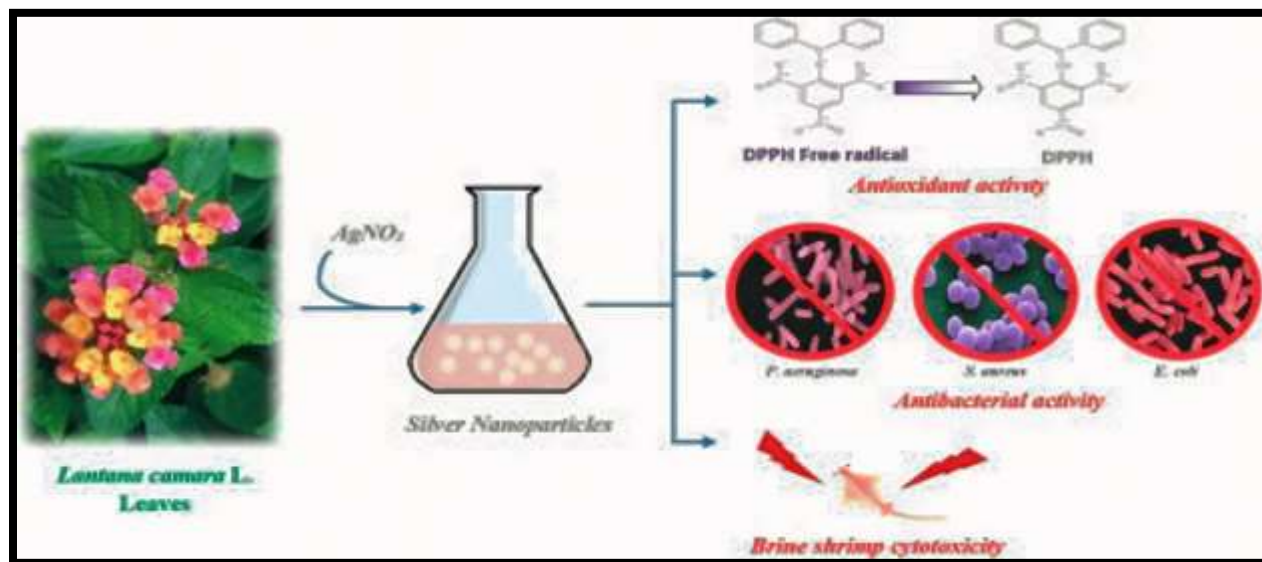


Figure No.4: Antioxidant activity of *lantana camera*.

5. Wound Healing Activity

Wound healing property of aqueous extract of leaf of *L. camara* was reported in rats. Topical application of the extract on the wound (100 mg/kg/day) significantly enhanced the rate of wound contraction (98%), synthesis of collagen and decreased wound healing time.

6. Effect on Red Blood Cells

An aqueous extract of *Lantana camara* was tested for its effects on RBC shape and osmotic fragility. The results showed a significant ($p < 0.05$) increase in hemolysis and changes to RBC morphology when the extract was present. These *Lantana camara* effects could be linked to certain pharmacological characteristics of the chemical components in the aqueous extract.

7. Antiulcerogenic Activity

Antiulcerogenic activity of the methanol extract of leaves of *L. camara* was reported on aspirin, ethanol and cold resistant stress induced gastric lesions in rats. Pre-treatment of the effected rats with the extract (200 and 400 mg/kg bodyweight) showed significant protective effect in aspirin induced, ethanolinduced and cold restraint stress induced ulcers in rats. The extract resulted in dose dependent antiulcerogenic activity in all models.

8. Antifilarial Activity

Antifilarial activity of crude extract of *L. camara* stem was reported. The extract and its chloroform fraction resulted in the death of adult *Brugiamalayi* and sterilised most of the surviving female worms in the rodent model *Mastomyscoucha*.

9. Anti fertility Activity (Embryo Toxicity):

Effects of hydro alcoholic extract of *L. camara* leaves were studied on fertility, general reproductive performance and teratology in female albino Wistar rats. The extract interfered in the frequency of fetal skeleton anomalies from dam's treated with the extract and induced embryo toxicity as indicated by postimplantation loss, without any signs of maternal toxicity.

V. CONCLUSION

The demand for herbal medications has significantly increased in recent years. It is well known that plants have a wide variety of chemical components with numerous pharmacological characteristics. Medicinal plants have yielded numerous potent and effective medications for the treatment of terrible illnesses. Therefore, it is evident that research on medicinal plants is crucial for human welfare in terms of producing herbal medications. One of these fundamental medicinal plants that have been utilized in traditional medicine all around the world is *Lantana camara*. Numerous Phytochemical studies have revealed that the plant is abundant in both essential oils and significant chemical components. Numerous chemical components, including steroids, coumarin, monoterpenoids, flavonoids, and diterpenes, have been identified in *L. camara*. The greatest number of pharmacological studies conducted. Leaf extracts of *lantana* exhibit antimicrobial, fungicidal, insecticidal and nematicidal properties. Which possess antimicrobial, immunosuppressive and anti tumour activity.



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