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A Review on Medicinal Properties of Lantana Camara Linn

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ABSTRACT: India has a long heritage of using plant-based knowledge in health care. Few natural medications in India have been thoroughly researched despite their abundance. Lantana camara is an evergreen shrub that grows throughout India. Traditionally, it has been used to heal a variety of diseases, and these claims are confirmed by scientific evidence. Various publications have described the phytoconstituents found in all sections of Lantana camara. Over the past few decades, scientists and researchers worldwide have extensively examined the chemical composition and biological pharmacological activity of the entire L. Camara plant. These results suggest that Lantana camara has therapeutic promise in modern medicine and could be a viable drug discovery target. This article examines the pharmacological properties and toxicity of Lantana camara .
Key words : Medicinal plant , Lantana camara Linn, Antibacterial , Anti –fungal , Herbal drug , Anti- Inflammatory.Lantana camara Linn. Is a flowering orna

I. INTRODUCTION

Medicinal plants include valuable chemicals for medical use. Medicinal herbs have been utilised for centuries to treat a variety of ailments. Systemic examination of these plants yields bioactive compounds for the creation of new medicinal medicines. There is growing interest in evaluating the pharmacological properties of plants used in traditional medicine. In recent years, advanced scientific techniques have been used to study traditional plants for their medicinal properties, including anticancer, anti-inflammatory, antidiabetic, anthelmintic, antibacterial, antifungal, hepatoprotective, antioxidant, and larvicidal activity. (1-10)Lantana camara Linn. Is a flowering ornamental plant from the Verbenaceae family. L. Camara is sometimes referred to as Lantana, Wild Sage, Surinam Tea Plant, Spanish Flag, and West Indian Lantana. L. Camara is a well-known medicinal plant in traditional medicine, and new scientific investigations highlight its potential application in modern medicine.

Plant Profile :

Botanical name – Lantana camara Linn.

Synonym – Lantana aculeate, Camara vulgaris,Lantana indica Roxb., Lantana Salvifolia Jacq., Lantana trifolia, Lantana orangemene etc .

Biological Source – it is obtained from species of flowering plant. It Belong into family **verbenaceae**.

Location – India , central and south America .

Chemical constituents –

1. Alkaloids, glycosides, steroids, saponins, flavanoids, coumarins, tannins, Carbohydrates, Anthraquinone glycosides, proteins, phytosteroids, fixed oils, fats, and Triterpinoids (11).
2. B-sitosterol, Betulonic acid, Betulinic acid, Campesterol, Hispidulin, Pectolinarigenin, Pectolinarin.
3. Camaraside, Camarinic acid, Camaric acid, Lantanilic acid, Linaroside, Lantanoside, Linaroside, Oleanolic acid, Ursonic acid.
4. Lantadene A, B, C, Lantanolic acid, Lantic acid, Theveside, Ursolic acid, Verbascoside, isonuomiosideA,Isoverbascoside, Lamiridoside and 8-epiloganin .
5. ρ-Coumaric acid ,ρhydroxybenzoic acid, and vanillic acid.(12)

- **Parts Used**

The entire plant, including leaves, roots, and flower seeds bark, is used medicinally.(13 –15)

- **Leaves -**

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Lantana leaves can demonstrate antibacterial, fungicidal and insecticidal effects. L. Camara has also been used in traditional herbal treatments to treat cancer, skin itching, leprosy, chicken pox, measles, asthma, and ulcers.

Figure no. 1 Leaves of Lantana camera

- **Roots –**

The beginnings of Lantana contain oleanolic acid, which has anti- inflammatory, hepatoprotective, anti-tumor, antioxidant, and anti- hyperlipidemic properties.

- **Flower –**

Lantana plants have long been utilised in traditional medicine. They are supposed to treat a variety of common health ailments, including fever, colds, coughs, headaches, skin infections, and digestive problems.

Figure no . 2 Lantana camera of flower.

- **Seeds -**

Lantana extract has been used in folk medicine to treat chicken pox, measles, asthma, skin itches, wounds, and leprosy.

Figure no.3 Lantana camera of seeds

- **Bark –**

Camara preparations are also prescribed to treat high blood pressure, asthma, rheumatism, and colds. Attention in drug development for its anti-cancer, antibacterial, AIDS, and anti- inflammatory properties.

- **Medicinal Uses :**

1. Traditionally, the herb has been used as a diaphoretic, carminative, antispasmodic, tonic, and antiemetic to treat respiratory infections and disorders (cough, cold, asthma, and bronchitis).
2. Powdered leaves are used to treat cuts, wounds, ulcers, and swellings.
3. Leaf infusion is used to treat bilious fever, eczema, and rashes.
4. The fruits can be utilised to treat fistulas, pustules, tumours, and rheumatism. 5)The root treats malaria, rheumatism, skin rashes, dermatitis, eczema, mycotic infections, and respiratory tract illnesses such as influenza and tuberculosis.
6. A infusion of fresh roots is used as a gargle to treat odontalgia (13-15).

- **Physicochemical characteristics:**

Physical-chemical characteristics The physicochemical properties of L. Camara leaves Included 8.06 total ash, 0.95 water-soluble ash, 1.96 acid insoluble, 27.5 water-soluble Extractive value, and 25.1% alcohol-soluble extractive value (16).

The fruits had a total ash Of 1.59, water-soluble ash of 0.48, acid insoluble ash of 2.1, sulfated ash of 10.3, water-Soluble extractive value

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of 6.0, alcohol-soluble extractive value of 2.1, and 11.3% loss after drying (17).

- **Plant Distribution :**

L. camara grows naturally throughout Central and Northern South America, as well as the Caribbean. L. Camara is now found in approximately 60 nations in the tropical, subtropical, and temperate regions of the world.(18-19)

- **Description :**

L. Camara is a strong shrub with a triangular stem that grows low and erect (subscandent). It can grow up to 1-3 meters tall and 2.5 meters wide. The leaves are rectangular, acute or subacute, crenate-serrate, rugose on top, and scabrid on both sides. They are green in colour, about 3-8 cm long and 3-6 cm wide. The leaves and stems are coated with prickly hair. Small flower clusters. Colours range from orange, white, and red and usually change with age. Flowers have a golden throat and occur in the axillary head all year. The flower has a small calyx, a slender corolla tube, and a 6-7 mm wide limb with irregular lobes.
Inflorescences grow in pairs on the axils of opposite leaves.(20).

Phytochemical composition :

The phytochemical content of L. Camara has been extensively researched over the last few decades. L. Camara includes a wide range of phytochemicals, including essential oils, phenolic compounds, flavonoids, carbohydrates, proteins, alkaloids, glycosides, iridoid glycosides, phenyl ethanoid, oligosaccharides, quinine, saponins, steroids, triterpens, sesquiterpenoids, and tannin.(21-24)

- **Ethnopharmacology :**

L. Camara is a significant medicinal herb with traditional uses. It has been used globally to treat a variety of health issues. The leaves have been used to treat a variety of ailments, including cuts, rheumatisms, ulcers, catarrhal infections, tetanus, malaria, cancer, chicken pox, asthma, ulcers, swelling, eczema, tumours, high blood pressure, bilious fever, abdominal visceral ataxy,
sores, measles, fevers, colds, and hypertension.(25-27)

- **Medicinal properties of Lantana camera Linn**

L. camara is a medicinal plant that has been linked to numerous health benefits.

- **Anti-inffammatory activity :**

Anti-inflammatory action An aqueous extract of L. Camara demonstrated anti-inflammatory action in albino rats. In rats, extract treatment (500mg/kg body weight) significantly lowered paw volume in a carrageenan-induced paw oedema test.(28)

- **Wound healing activity :**

The ethanol extract of L. Camara leaf has been shown to heal wounds in adult male Wister rats. Topical use of the extract dramatically improved wound healing activity. Histological analysis of cured wounds revealed extract's significance in healing. In another study, an aqueous extract of L. Camara leaf was found to promote wound healing in rats. Topical administration of the extract (100 mg/kg/day) dramatically improved wound contraction (98%), collagen synthesis, and reduced healing time .(29-30)

- **Anticancer and antiproliferative activity:**

Oleanonic acid from L. Camara was tested for anticancer activity against a murine tumour (Ehrlich ascites carcinoma) and three human cancer cell lines: A375 (malignant skin melanoma), Hep2 (epidermoid laryngeal carcinoma), and U937 (lymphoma).
Oleanonic acid showed promising cytotoxicity against A375 cells.(31)

- **Antioxidant activity:**

An ethanolic extract of L. Camara showed substantial antioxidant activity in in vivo investigations. The extract administration lowered lipid peroxidation in the kidneys of urolithic rats. The study was conducted in vitro using DPPH and Nitric oxide free radical scavenging assays. The extract showed high antioxidant activity in both experiments.(32)

- **Anticancer effects :**

L. Camara root and leaf extracts were tested for anticancer effects on Jurkat leukaemia cells using the MTT assay. The extracts have similar antineoplastic properties (root: IC50 = 328.36±53.08 µg/ml, leaf: 394.41±99.73 µg/ml). Apoptosis induction was identified as the mechanism of anticancer effect on Jurkat cells through morphological exams (33).

- **Haemolytic activity :**

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The haemolytic activity of L. Camara aqueous extract and its solvent fractions was assessed using a modified spectroscopic approach at four concentrations (125, 250, 500, and 1000 µg/ml).

The aqueous extract and its solvent fractions showed minimal haemolytic activity against human erythrocytes. The extracts exhibited haemolytic action in the sequence listed below: The order of fractions is as follows: chloroform, hexane and ethyl acetate (50:50), aqueous extract, ethanol, and methanol.(34)

- **Antifilarial activity:**

Crude extract of L. Camara stem shown antifilarial action. The extract and chloroform fraction killed adult Brugia malayi and sterilised most surviving female worms in the mouse model Mastomys coucha.(35)

- **Extraction process of Lantana camera Linn –**
- Fresh leaf samples weighing around 350 grams will be shade dried for 10 days before Being ground into a coarse powder for future usage.
- The 320 g powder from Lantana camara L. Leaves will be hydro extracted in a soxchlet Apparatus for 6 hours using the British Pharmacopoeia (1980) technique.
- The essential oil will be dried with anhydrous sodium sulfate (Na_2SO4) for 6-8 hours, then Filtered through Whatman no. 1 filter paper, as per the Hand Book On Medical and Aromatic Plants.
- The samples were refrigerated below 4ºC for analysis.

- **Identification Test for Lantana camera Linn. –**

The Identification plant extracts were tested using established techniques to determine Their components.

***Test For Alkaloids –**

Mayer's Test: Using Mayer's reagent, alkaloids produce a cream- colored Precipitate.Potassium mercuric iodide solution.

Dragendorf's Test: Using Dragendorf's reagent, alkaloids produce a reddish brown Precipitate. Potassium bismuth iodide solution.

Wagner's Test: Alkaloids give reddish brown precipitate with Wagner's reagent. (Iodine Solution in potassium iodide).

***Tests For Flavanoids –**

Shinoda Test (magnesium hydrochloride reduction test):

To the test solution add few bits of magnesium ribbon and add strong hydrochloric acid Drop wise, pinkScarlet, crimson red or occasionally green to blue colour appears after few Minutes.

Alkaline Reagent Test: To the test solution add few drops of sodium hydroxide solution, Formation of an intense yellow colour which turns to colourless by the addition of few drops Of dilute acetic acid indicate the presence of flavonoids.

Ferric Chloride Test: To the test solution, add few drops of ferric chloride solution,intenseGreen colour was formed.

***Test For Phenolic Compounds**

Ferric Chloride Test: To the test solution and add few drops of neutral 5% ferric chloride Solution. A dark green colour indicates the presence of phenolic compounds.

Lead Acetate Test: To the test solution and add few drops of 10% lead acetate solution. White Precipitate indicates the presence of phenolic compounds.

Gelatin Test : To the test solution and add few drops of 10% Gelatin solution. White Precipitate indicates the presence of phenolic compounds.

***Test For Tannin**

Ferric Chloride Test: To the test solution, few drops of ferric chloride test reagent were Added. An intense green, purple, blue or black colour developed was taken as an evidence For the presence of tannins.

Lead Acetate Test : A few drops of 10% lead acetate were mixed into the test solution. A precipitate was generated, indicating the presence of tannins.

***Test for Glycosides**

Keller Killiani Test (cardiac glycosides): To 0.5g of plant extract, add 0.4 ml of glacial Acetic acid with a trace of ferric chloride.

Transfer to a tiny test tube; carefully add 0.5 ml of Concentrated sulphuric acid around the edges of the test tube; blue color in the acetic acid Layer indicates the presence of cardiac glycosides.

Borntrager's test (anthraquinone glycosides): 0.5 g of plant extract was shaken with Benzene until the organic layer separated, then half of its own volume of 10% ammonia Solution was added. Pink, crimson, or violet coloring in the ammonical

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phase showed the Presence of anthraquinone glycosides.

*Tests for Amino Acids

Millon's Test: Add roughly 2ml of Millon's reagent (Mercuric nitrate in nitric acid with traces Of nitrous acid) to the test solution. A white precipitate forms, which turns red when gently Heated.

Ninhydrin Test: When amino acids and proteins are cooked with a few drops of a 5% Solution of ninhydrin, the color violet occurs.

*Test for protein

Biuret Test: Add 4% NaOH solution and a few drops of 1%CuSO4 solution to the test Solution; the presence of protein is indicated by the violet color that arises.

Millon's Test: Add roughly 2ml of Millon's reagent (Mercuric nitrate in nitric acid with traces Of nitrous acid) to the test solution. A white precipitate forms, which turns red when gently Heated.

*Tests for steroids and triterpenoids

Libermann-Burchard Test: Extract is treated with a few drops of acetic anhydride, boiled And cooled, and concentrated sulphuric acid is added along the side of the test tube, Resulting in a brown ring at the junction of two layers and the upper layer turning green, Indicating the presence of sterols, and the formation of a deep red colour, indicating the Presence of triterpenoids.

Salkowski's Test: Treat the extract in chloroform with a few drops of strong sulphuric acid, Shake well, and leave to stand for some time. Red color occurs in the lower layer indicates The presence of sterols, while the production of a yellow colored lower layer indicates the Presence of triterpenoids.

*Tests for Carbohydrates

Molisch's Test: To conduct the Molisch's Test, add a few drops of alcoholic α-napthol to 1ml of test solution. Add 0.2 ml of concentrated sulphuric acid slowly along the sides of the test tube, from purple to violet. A coloured ring appears at the junction.

Fehling's Test: Mix an equal volume of Fehling's A (Copper sulphate in distilled water) and Fehling's B (Potassium tartarate and Sodium hydroxide in distilled water) reagents, add a few drops of sample, and boil until a brick red precipitate of cuprous oxide forms, indicating the presence of reducing sugar.

*Test for oils and fats.

A tiny amount of the extract was squeezed between two Filter sheets. Oil stains on filter papers indicate the presence of oils and fats.

*Tests for saponin

Froth Test: A pinch of dried powdered plant was mixed with 2-3 cc of distilled water. The Mixture was mixed vigorously. The formation of foam shows the presence of saponin.

*Test for organic acids.

Oxalic Acid: Add a few drops of 1% KMnO4 to the test solution and dilute with H2SO4. The Colour vanishes.

Malic Acid: To the test solution, add 2-3 drops of 40% FeCl3 solution, which turns Yellowish.

*Tests for Inorganic Acids

Sulphate Test: Adding lead acetate reagent to the test solution produces a white Precipitate that is soluble in NaOH.

Carbonate Test: To the test solution, add a weak HCl solution to release CO2. Indicate the Existence of carbonate.

II. CONCLUSION -

L. Camara has potential for future medicine development, as indicated by ethnomedical and scientific studies. Lantana camara is a plant that is widely utilised in traditional medicine throughout the world. Lantana oil is used to treat skin irritation, wounds, leprosy, and scabies. Triterpenes and flavones are the most common secondary metabolites found in Lantana camara. Lantana leaf extracts have antimicrobial, fungicidal, insecticidal, and nematocidal properties.

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