

Formulation of Herbal Cream using Leaves of Lanatana Camara Linn.

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Abstract: India has a rich tradition of plant based knowledge in health care. *Lantana camara* is well known to cure several diseases and used in various folk medicinal preparations. *Lantana camara* is an evergreen plant found throughout India. *Lantana camara* Linn. live as a wild plant. These plants can be used as a natural medicine ingredient. The leaves of these plants can be extracted and used as a cream component. *Lantana* leads to hepatotoxicity, photosensitization and intrahepatic cholestasis almost in all the animals. Also to formulate effective and stable herbal antibacterial cream evaluates its physical and antibacterial properties. The prepared cream was caused for their physical theological and antibacterial properties. Finally the efficacy of the herbal cream formulation will be compared to two commercial products. The plant having various traditional uses. Parts of plant extracts are used traditionally such as the healing of wounds, cuts, skin itches, and eczema. The plant containing many more phytoconstituents such as alkaloids, glycosides, saponins, steroids, terpenoids, carbohydrates, flavonoids, and coumarins. It has various pharmacological activities antioxidant, antimicrobial, antibacterial, antifungal, antiulcerogenic, anthelmintic, anti-hyperglycemic, anti-inflammatory, analgesic, anticancer, antitubercular, etc. The antimicrobial activity of the ethanolic extract may be found to be effective against both *Staphylococcus*. The aim of the study was to evaluate the antibacterial activity of the ethanolic extract of the plant *Lantana camara* leaves against *Staphylococcus aureus* and *E. coli* species.

Keywords: *Lantana camara* Linn., hepatotoxicity, *Staphylococcus aureus*, *E. coli*, Ethanolic extract, antibacterial cream

I. INTRODUCTION

Lantana camara is a flowering ornamental plant. It is used in several traditional medicinal preparations and is well known to cure several diseases. It is a major source of various classes of bioactive natural metabolites. From ancient times, flowers are used as pectoral for children, leaves, and fruits of that plant can be used externally in various skin diseases, cuts, and wounds. Stems and roots are used for gargles and toothaches as a toothbrush.^[1,2] "Natural-medicine" deserves to be a source of active ingredients that are useful in therapeutics.^[3] The rate of skin infections due to bacterial and fungal organisms is on the increase. This has become a significant health problem in many underdeveloped and developing countries and is particularly predominant in overpopulated areas with high humidity and poor hygienic conditions.^[4]

Traditional healers have used *lantana* species for centuries to treat various diseases. Different parts of *L. camara* is used for the treatment of various human ailments such as itches, cuts, ulcers, swellings, bilious fever, catarrh, eczema, tetanus, malaria, tumors and rheumatism.^[10] In last few decades, many of traditionally known plants have been extensively studied by advanced scientific techniques and reported for various medicinal properties viz, anticancer activity, anti-inflammatory activity, antidiabetic activity, anthelmintic, antibacterial activity, antifungal activity, etc.^[11] The leaves of the plant are used in the treatment of tumors, tetanus, rheumatism, malaria, etc. and its antiseptic and carminative properties have also been reported.^[12]

Taxonomy

Kingdom: Plantae

Subkingdom: Tracheobionta

Superdivision: Spermatophyta

Division: Magnoliopsida

Subclass: Asteridae

Order: Lamiales

Family: Verbenaceae

Genus: Lantana

Species: *Lantana camara*

Parts Used: Apart from the whole plant, seeds, stem, root, leaves and flowers are also used.

Synonyms: *Lantana aculeate*, *Camara vulgaris*, *Lantana indica* Roxb., *Lantana salvifolia* Jacq., *Lantana trifolia*, *Lantana orangemene*, *Lantana tiliaefolia* Cham, *Lantana achyranthifolia* Desf., *Lantana montevidensis* Briq., *Lantana viburnoides* Vahl^[16,17,18]

Therapeutic Uses: Plant pacifies vitiated condition of vata and kapha.^[19]

II. PLANT DESCRIPTION

The genus *Lantana camara* L. is an important medicinal, ornamental, as well as essential oil-producing plant from family Verbenaceae and termed by Linnaeus in 1753. It is mainly composed of seven species, with six reported from America and one from Ethiopia^[5]. It is a perennial shrub 1-4 m tall and forms dense stands. The leaves are opposite with long petioles, oval blades, hairy, and serrate. The species flowers all year round if the condition is adequate. A pair of inflorescences occurs at leaf axils. The flowers are small, multi-colored, and dense in flat-topped clusters. Each inflorescence bears 10-30 fruits, which are small, round drupes containing 1-2 seeds.^[6,7,8,9,]

The calyx is small, corolla tube slender, the limb spreading 6 to 7 mm wide and divided into unequal lobes. Stamen four in two pairs, included and ovary two celled, two ovuled. Inflorescences are produced in pairs in the axils of opposite leaves. Inflorescences are compact, dome shaped 2-3 cm across and contain 20-40 sessile flowers. Root system is very strong and it gives out new fresh shoots even after repeated cullings.^[13]

Chemical Constituents

L. camara is a rich source of bioactive compounds, viz., flavones, isoflavones, flavonoids, anthocyanins, coumarins, lignans, catechins, isocatechins, alkaloids, tannin, saponins, and triterpenoids. The various bioactive molecules isolated from different parts of the plant and its EOs were reported, and these details of *L. camara* phytochemistry have been compiled by a few authors.^[14,15]

Geographical Distribution

L. camara is a tropical origin plant and native to Central and Northern South America and Caribbean. *L. camara* is now spreaded to nearly 60 countries viz, New Zealand, Mexico, Florida, Trinidad, Jamaica and Brazil. It is reported in many African countries including Kenya, Uganda, Tanzania and South Africa.

In India, *L. camara* was probably introduced before 19th century. Currently *L. camara* is distributed throughout India. *L. camara* is known by different name in various different languages in India viz, Raimuniya (Hindi), Chaturangi and Vanacehdi (Sanskrit), Vanacehdi (Sanskrit), Arippu and Anti Unnichedi (Tamil), Aripooov, Poochedi, Konginipoo and Differ Nattachedi (Malayalam), Thirei, Samballei and Nongballei were (Manipuri), Tantani and Ghaneri (Marathi), Pulikampa solver (Telegu), Kakke and Natahu (Kanada).^[11]

Antimicrobial Activities

Antibacterial activity:

Different varieties of *L. camara* plants' leaves and flowers were reported for antibacterial activity. Three different solvent extract of leaves and flowers of four different varieties of *L. camara* exhibited significant antibacterial activity against *E. coli*, *Bacillus subtilis* and *P. aeruginosa* whereas poor antibacterial activity against *Staphylococcus aureus*.^[20]

Ethanol extracts of *L. camara* leaves and roots were reported for antibacterial activity. The in vitro antibacterial activity was performed by microdilution method. The extracts exhibited antimicrobial activity against *Staphylococcus aureus*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Vibrio cholerae*, *Escherichia coli* and two multiresistant strains *E. coli* and *S. aureus*.^[21]

Methanolic extracts of different parts of *L. camara* were screened for antimicrobial activity against 10 bacteria and 5 fungi by disk diffusion method and broth microdilution method. The leaves extract of *L. camara* showed highest activity against Gram positive *Bacillus cereus* and Gram 21 negative *Salmonella typhi*.^[22]

Antifungal activity:

Antifungal potential of *L. camara* was screened against *Alternaria sp.* which causes different plant diseases especially in vegetable plants. The antifungal activity was performed by food poison plate method at three different concentrations of extract viz, 10 mg/ml, 15 mg/ml and 20 mg/ml. At 20mg/ml dose *L. camara* exhibited significant antifungal activity against *Alternaria sp.*^[23]

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 body weight) showed significant protective effect in aspirin induced, ethanol induced and cold restraint stress induced ulcers in rats. The extract resulted in dose dependent antiulcerogenic activity in all models.^[24]

Antihyperglycemic activity:

Antihyperglycemic activity of methanol extract of leaves *L. camara* was reported in alloxan induced diabetic rats. Oral administration of the methanol extract of *L. camara* (400 mg/kg body weight) leaves resulted in decrease in blood glucose level to 121.94 mg/dl in alloxan induced diabetic rats.^[25]

Antioxidant activity:

Ethanol extract of *L. camara* exhibited significant antioxidant activity in in vivo studies. The extract treatment decreased the extent of lipid peroxidation in the kidneys of urolithic rats.^[26] The methanolic extract, its some fractions and oleanolic acid inhibited DPPH radical.^[27] Leaves extracts exhibited high antioxidant effect, however younger leaves exhibited strong antioxidant activity than the older or matured leaves.^[26] The extracts scavenged DPPH radical and prevented Fe²⁺-induced lipid peroxidation in rat's brain and liver homogenates, and this was likely not attributed to Fe (II) chelation.^[28]

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 *Brugia malayi* and sterilised most of the surviving female worms in the rodent model *Mastomys coucha*.^[29]

Antimutagenic activity:

22 β -acetoxy lantanic acid and 22 β -dimethylacryloyloxy lantanic acid from *L. camara* showed antimutagenic activity. The antimutagenicity test was performed by micronucleus test in Swiss mice. Both compounds exhibited high antimutagenic activity in Mitomycin C induced mutagenesis in mice.^[30]

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