International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 8; Issue 12 (C); December 2019; Page No.20721-20725
DOI: http://dx.doi.org/10.24327/ijcar.2019.20725.4058

Research Article

A REVIEW ON *Lantana Camara*– VALUABLE MEDICINAL PLANT

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A R T I C L E I N F O

Article History:
Received 10th September, 2019
Received in revised form 2nd October, 2019
Accepted 26th November, 2019
Published online 28th December, 2019

Key words:

Lantana camara, Phytoconstituents, Biodiversity and Pharmacological activities.

A B S T R A C T

Lantana camara is belongs to the family of *Verbanaceae.Lantana camara* is one such notorious weed which is affecting ecosystem and causing biodiversity loss at greater extent. It is highly invasive and currently occupies a large percentage of the vegetation cover wherever it was introduced. But, *Lantana camara* is well known to cure several diseases and used in various folk medicinal preparations. In last few decades, scientist and researchers around the globe have elaborately studied the chemical composition of whole plant of *L. camara* as well as biological pharmacological activities. Different parts of the plants are used in the treatment of cold, headache, chicken pox, eye injuries, whooping cough, asthma, bronchitis and arterial hypertension. Among the large number of herbal drugs existing in India, very few have been studied systematically so far. *Lantana camara* is an evergreen plant found throughout India. Traditionally it has been used in treating various ailments and they were supported by scientific data's. Various literatures have reported the phytoconstituents present in all parts of *Lantana camara.* This article reviews the pharmacological activities and toxicology of *Lantana camara*. Systemic analysis of these plants provides a variety of bioactive molecules for development of newer pharmaceutical product. Recently, there is a growing interesting the pharmacological evaluation of various plants used in different traditional system of medicine.

INTRODUCTION

Medicinal plants represent an important source of medically important compounds. Since ancient time, medicinal plants are used to cure several types of health problems. Systemic analysis of these plants provides a variety of bioactive molecules for the development of newer pharmaceutical products. Recently, there is a growing interest in the pharmacological evaluation of various plants used in different traditional system of medicine. In last few decades, many of traditionally known plants have been extensively studied by advanced scientific techniques and reported for various medicinal properties such as anticancer activity, anti-inflammatory activity, antidiabetic activity, anthelmintic, antibacterial activity, antifungal activity, hepatoprotective activity, antioxidant activity and larvicidal activity.*Lantana camara* Linn. is a flowering ornamental plant belonging to family *Verbenaceae*. *L. camara* is also known as Lantana, Wild Sage, Surinam Tea Plant, Spanish flag and West Indian lantana. *L. camara* is a well-known medicinal plant in traditional medicinal system and recent scientific studies have emphasized the possible use of *L. camara*in modern medicine (Aliceand Asha. 2017).

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Lantana is a perennial flowering plants native to tropical regions of the Americas and Africa. It is a somewhat hairy shrub that when bruised gives a spicy pungent odor. The aromatic flowers are borne in clusters and are a mixture of red, yellow, blue, lilac, white and orange florets. The leaves are pointed at the tip, rounded at the base and toothed in the margins. Lantana is an introduced species in the Australian-Pacific region and it is a low-maintenance, gregarious plant that can grow up to 1.2 m high. Despite its nickname, lantana is not related to the Sage family instead they are in the same family and are close relatives of Verbena. Another plant named, wild lantanas is also not related and belong to the genus Abronia (Verma, 2016).

Lantana camara Linn. is considered as a notorious weed and a popular ornamental plant. It is noted from ancient time that plants have been an excellent source of medicine. Since very long time *Lantana camara* has been reported as one of the most important medicinal plants in the world. *Lantana camara* is used in traditional medicine system for the treatment of cuts, swellings, ulcers, cataract, bilious fever, itches, eczema and rheumatism. Various parts of *Lantana camara* plant are used in the treatment of cold, headache, whooping cough, asthma, chicken pox, bronchitis, eye injuries and arterial hypertension. *L. camara* has scientifically studied for various therapeutic activities like antibacterial, antioxidant, antipyretic, insecticidal, antimicrobial and wound healing. Nowadays this

plant *Lantana camara* is worked in several recent advanced techniques like phyto-extraction of heavy metals, phytoremediation of particulate pollution and many others. Various literature has reported the phytoconstituents present in all parts of *Lantana camara* (Verma, 2017).

Parts Used: Whole Plant, Seeds, Stem, Root, Leaves and Flowers

Taxonomy

Kingdom: Planate Division: Magnoliophyta Class: Magnoliopsida Order: Lamiales Family: Verbenaceae Genus: Lantana Species:Lantana camara

Whole plant

Leaves

Flowers

Stem

Fruits

Figure 1 Various parts of *Lantana camara*

Synonyms

Lantana aculeate, *Camara vulgaris*, *Lantana indica* Roxb., *Lantana salvifolia* Jacq., *Lantana trifolia*, *Lantana orangemene*, *Lantana tiliaefolia* Cham, *Lantana achyrantifolia* Desf., *Lantana montevidensis* Briq and *Lantana viburnoides*..

Scientific Name: *Lantana Camara*

Table 1 Habitat Parameters

Habitat Parameters	Requirements
Light Range	Sun to full Sun
pH Range	4.5 - 8.5
Temperature	Intolerant of frequent or prolonged freezing
Annual Rainfall Range	1000 - 4000mm
Soil Range	Mostly sandy to clay loam
Water Range	Semi-Arid to Normal
Altitude	Less than 2000 m above sea level
Light conditions	Prefers unshaded habitats, can tolerate some shade

Common Names: Coronitas, Lantana Weed, Wild Sage, Shrub Verbena, Yellow Sage and Kantutay

Ecology

*Lantana camara'*swidespread and diverse distribution is a reflection of its wide ecological tolerances. The species occurs in varied habitats ranging from open unshaded regions which include wastelands, rainforest edges, beachfronts, and forests disturbed by activities such as fire or logging The species also thrive well in disturbed areas which include roadside, railway tracks and canals Anthropogenic activity further aggravates the invasion and allows it to spread **(**Pathakand Mishra,2018).

Ayurveda Description

Sanskrit Name: Chaturangi, Vanacchedi

Properties: Rasa: Kashaya, Tikta; Guna; Guru; Virya: Sita
Therapeutic Uses: Plant pacifies vitiated condition of vata and kapha

Physical Characteristics

Lantana camara is an evergreen Shrub growing to 1.8 m (6ft) by 1.8 m (6ft) at a fast rate. It is hardy to zone (UK) 9. The flowers are pollinated by Butterflies, Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: acid, neutral and basic (alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

Table 2 General Characteristics of *Lantana camara*

Characteristics	Description
Native	Tropical region in Central and South America
Synonym	*Camara vulgaris, Lantana scabrida*
Distribution	Naturalized in countries/islands between 35°N and 35°S latitudes
Conservation Status	Alien
Plant Category	Annuals and biennials, ground covers, perennials, shrubs
Plant Characteristics	Poisonous
Foliage Characteristics	Fragrant, evergreen, poisonous
Foliage Color	Dark green
Flower Characteristics	Long lasting, showy, unusual
Flower Color	Pink, yellow, orange
Tolerances	Drought, heat and humidity, pollution, slope, wind
Propagation Methods	From herbaceous stem cuttings
Pollinators	Lepidopteran species and thrip

Benefits ofLantana camara

*Good for landscaping***:** This plant makes a good specimen for garden landscaping. It can be used for a border or as ground cover. It is drought and salt tolerant and can also be used for dry landscaping. It is easy to cultivate, drought resistant and lasts throughout the summer.

Aids process of cross pollination: Lantana flowers attracts a wide variety of butterflies, bees and even humming birds. They are the staple for these pollinating agents. Growing Lantana in the garden can benefit other plants in flowering as it aids the process of cross pollination.

Medicinal properties of the leaves: According to a published medical review on medicinal properties of lantana, its leaves are used for treating malaria, cancer, chicken pox, asthma, ulcer, swelling, eczema, tumour, high blood pressure, bilious fever, sores, measles, fevers, cold and high blood pressure.

A source of essential oil: Lantana essential oil is extracted from the leaves through steam distillation method. The extract has a pale yellow colour and its aroma exhibits woody undertone and scent like that of basil. The processed and tested lantana essential oil is used externally for treating skin irritation, leprosy, and scabies. It is also an antiseptic for wounds.

Few more uses of the plant: *Lantana camara* can be used as an eco-friendly and durable wood polymer composite for making baskets, foot mats and pen cases. Long straight stems make a decent friction timber for starting fire**.**

Lantana leaf health benefits include being a natural soothing treatment. Traditional lantana leaf medicinal uses include being pounded and placed on the skin to soothe irritation. They can also be added to a warm bath.This helps to relieve rheumatic symptoms, including joint pain, stiffness and swelling. Traditionally, crushed lantana leaves were used as a topical treatment to help heal snakebites (Verma,2015).

Other lantana leaf health benefits include: Alleviating headaches, Relieving toothaches, Helping with indigestion, Treating sprains and wounds, Improving respiratory illnesses, Reducing fevers and Repelling mosquitoes

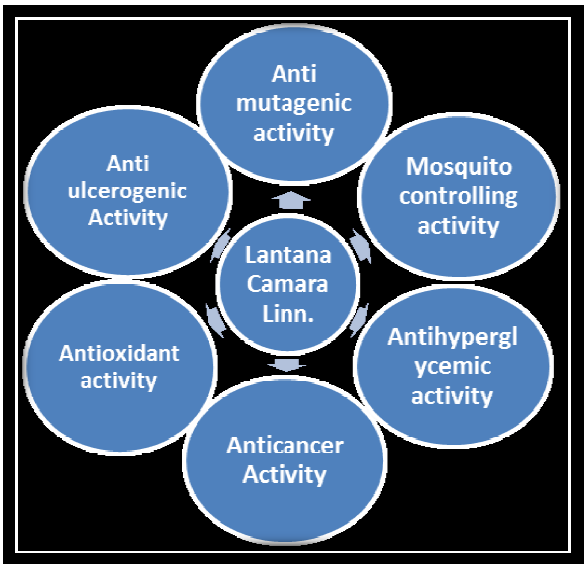

Figure 1 Therapeutic uses of *Lantana camara*

Lantana leaf medicinal uses include being a natural remedy for the following conditions

Cough - Lantana leaves have a natural cooling effect, which when inhaled, can help alleviate a cough.
Flu (Influenza) - The natural cooling sensation of lantana leaves can help to bring down a fever when infected with the flu.
Headache - Lantana leaf tea is a traditional home remedy for helping alleviate headaches.
Indigestion - Lantana leaf tea can help soothe various indigestion symptoms.
Joint Pain - Lantana leaf medicinal uses include being a natural remedy for helping to treat rheumatic pain in the joints (Verma, 2018).

Table 3 Uses of *Lantana camara*

Parts Used	Uses
Plant	Act as hedge plant, provide perch sites and cover
Flower	Nectar source for butterflies and moths
Bark	Astringent and used as a lotion in cutiginous eruptions, leprous ulcers
Stalks	Raw material for paper pulp which is used for wrapping, writing and printing paper
	Making baskets and temporary shelters
	Used as Biofuel
Leaves	Boiled and applied for swellings and pain in the body
	Alkaloidal fractions lower blood pressure, accelerate deep respiration and stimulate intestinal movements
Plant extracts	Drought tolerant plant so good candidates for xeriscaping
	Used in folk medicine for the treatment of cancers, chicken pox, measles, asthma, ulcers, swellings, eczema, tumors, high blood pressure, bilious fevers, catarrhal infections, tetanus, rheumatism and malaria

Phytochemical analysis of *Lantana camara*

Lantana camara has therapeutic activity due to the presence of natural agents, the greater part of their activity is due to bioactive compounds such as saponins, alkaloids, tannin, anthocyanins, flavones, isoflavones, flavonoids, coumarins,

lignans, catechins, iso-catechins, and triterpenoids (Hire mathand Sundaram,2015).

Antimotility of Lantana camara

The anti-motility activity of *Lantana camara* L. constituents on neostigmine induced gastrointestinal transit in mice: Methanol extract of *L camara* showed remarkable antimotility effect from an anticholinergic effect and recommended a potential utility in secretory and functional diarrheas (Sharma and Raghubanshi, 2010).

Thrombin Inhibition activity of Lantana camara

The Translactone-containing triterpenes showed that the thrombin inhibitory activity (Prasad *et al.,* 2016).

Anti-inflammatory and Antimicrobial activity of Lantana camara

The Pentacyclic triterpenoids are revealed that the antitumor, antimicrobial and anti-inflammationatory activities (Shaoand Singh,2018).

Anti-hyperlipidemic and Anti-tumor activity of Lantana camara

Oleanolic and ursolic acids from the stems, roots and leaves have application for human liver disorders, antihyperlipidemic and anti-cancer activities (Day *et al.,* 2013).

Wound Healing Effect of Lantana camara

The wound healing effect of *Lantana camara* L. in Sprague dawley rats using a burn wound model, results showed that the antimicrobial activity but not wound healing activity on burn wound in rats.*Lantana camara* L. results revealed that ED_{50} is effective in healing excision wounds in the experimental animals and suggests further evaluation as a therapeutic agent in tissue repair processes associated with injuries (Thakur *et al.,* 2017).

Cytotoxicity of Lantana camara

In a study for cytotoxic activity of *Lantana camara* Linn. Showed the leaf extract of LC is cytotoxic in nature and may possess antitumor activity that may be due to the presence of toxic lantanoids and alkaloids (Sharma *et al.,* 2015).

Termiticidal activity of Lantana camara

The 5% chloroform extract of *Lantana camara* leaves showed termiticidal effects against adult termite workers (Kohl *et al.,* 2016).

Biochemical Compositions of Lantana camara

The leaves and flowers of four *Lantana camara* plants with yellow, red, lavender and white flowers showed three of the four showed similar carbohydrates and lipid compositions. The carbohydrate levels were higher in the flowers than the leaves and the lipids higher in the leaves except for the lavender and white-flowered kinds (Dogra *et al.,* 2018).

Larvicidal Activity of Lantana camara

The larvicidal activity noted was attributed to the phytochemicals and results suggests the shrub may have a potential in the control of vector borne diseases. Phytol, a diterpene, is present in higher concentration in the methanol leaf extract of *Lantana camara* (Sastri,1962).

Antihyperglycemic Activity of Lantana camara

Oral administration of a methanol extract of *Lantana camara* leaves in alloxan-induced diabetic rats showed significant dose-dependent manner of blood glucose concentration (Verma, 2016).

Toxicity activity of Lantana camara

The toxicity of methanol extract of various parts (root, stem, leaf, flower and fruit) in *Artemiasalina*. Results showed that the all tested extracts exhibited very low toxicity in brine shrimp larva (Sharma *et al.,* 2000).

Insecticidal activity of Lantana camara

Study evaluated an extract of flowers and leaves for insecticidal activity against cockroach the results showed an insecticidal effect, with the pure extract of flowers and leaves causing cockroach death (Sharma *et al.,* 2014).

Nanoparticles activity of Lantana camara

The *Lantana camara* leaf mediated green synthesis of gold nanoparticles. The method is simple, cost-effective and non-toxic in nature. The synthesized AuNPs were utilized as catalyst for the sodium borohydride reduction of 4-nitrophenol to 4-aminophenol (Sharma *et al.,* 2010).

Nematicidal Activity of Lantana camara

Root knot nematode is one of the most harmful nematode pests in both tropical and subtropical crop production regions and cause extensive economic damage The nematicidal and nematostatic activities of *L. camera* against root nematodes have been is vitro and in soil. It was investigated that *L. camera* acquires leaf extract did not act as strong nematicide on the juveniles were not killed but only paralyses and consider as nematosetic effect (Sharma *et al.,* 2017).

Antipyretic Activity of Lantana camara

The antipyretic activity of Lantana camara could be at least in part due to enzyme inhibition and free radical scavenging activities which may be attributed the presence of flavonoids and other polyphenols in the extract. This study was provided a scientific support for the use of *Lantana camara* for the treatment of pyrexia (Begum *et al.,* 2018).

Antioxidant activity of Lantana camara

The results showed that all the plant parts possessed antioxidant properties including radical scavenging, xanthine oxidase inhibition and nitrites scavenging activities. The antioxidative activities were correlated with the total phenol. The leaves extract of *L. camara* was more effective than that of other parts (Arellanes *et al.,* 2015).

CONCLUSION

It can concluded that the *Lantana camara* is considered as used in folk medicine in many parts of the world. Ethno medical and scientific reports about the medicinal properties of *L. camara* represent it as a valuable plant and establishing it as a candidate for the future drug development. Use of lantana oil in treatment of skin itches and as an antiseptic for wounds and externally for leprosy and scabies is also reportedIt is also popular in folkloric treatment as cure to various ailments including rheumatism, wound, fever and asthma in various tribal community. Its flexible nature makes the plant invasive, widely distributed and turns a problematic weed due to its

dominant nature. So, novel strategies should be developed to optimize the usefulness of this plant such as exploring its pharmacologic potential.

Acknowledgement

This work was supported by Sacred Heart College, Tirupattur - 635601, Tirupattur District, Tamilnadu, India, through Don Bosco Research Grant. We would like to show our gratitude to the Management of Sacred Heart College, Tirupattur - 635601, Tirupattur District Tamilnadu, India for supporting the research by granting Don Bosco Research Grant.

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How to cite this article:

Poongothai Annadurai (2019) 'A Review on Lantana Camara– Valuable Medicinal Plant', *International Journal of Current Advanced Research,* 08(12), pp. 20721-20725. DOI: http://dx.doi.org/10.24327/ijcar.2019. 20725.4058

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