

Brief Review on *Lantana camera*

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Abstract: Medicinal plants are widely spread in nature with their unique habitats and effective medicinal properties. One of them plant is *Lantana Camera*. The *L. camera* is well known invasive weed. Used to cure several diseases in Ayurvedic preparations with different formulations. This plant has great ethnobotany and Pharmacology however it is lagging behind in the list of medicinal plants for their applications in drug preparations due to mere research study and awareness. Therefore present review may help to reveal different aspects of *L. camera* with their awareness in society.

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1. INTRODUCTION

The term "biodiversity hotspot" was coined by the British biologist Norman Myers in 1988. He described them as a biogeographic region by characterizing their exceptional levels of plant endemism and serious levels of habitat loss [1]. Further, in between 1989-1996, Conservation International (CI) adopted 'Myers hotspots criteria' and they made one organization for the reassessment of the hotspots concept and in 2005 they have published an revised title "Hotspots Revisited: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions" [2]. According to the CI report, there is the total of thirty-five biodiversity hotspots in the world, amongst them, four are in India. Mainly these three biodiversity hotspots are situated in the Himalaya, Indo-Burma, Sundaland, and the Western Ghats. Total 17000-18000 flowering plant species, 8000 medicinal plants, are documented in folk and Ayurveda, Unani, Siddha, and Homoeopathy [3]. Medicinal plants are a great resource base for the traditional medicine & herbal industry and also it provides livelihood and health security to a large segment of Indian inhabitants. India has the greater natural ecosystem from past two decades, there has

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been a marvelous augment in the use of herbal medicines; though there is still a noteworthy deficiency in the research of medicinal plants and it has the great resources of medicinal plants which are noteworthy to human beings in many ways [4].

According to the World Health Organization, medicinal plants are used as the best resource to obtain a variety of bioactive compounds in the development of different drugs, those are effective as an antimicrobial, anti-tuberculosis, antioxidant, anticancerous, anti-inflammatory, antidiabetic, anthelmintic, hepatoprotective activity, larvicidal activity [5,6]. One of them plant is *Lantana camera*, Linn. The word *Lantana camera* Linn, was derived from the Latin word 'lento' meaning is to bend. Linnaeus first time described and placed them in the binomial system under the family of Verbenaceae. They are present worldwide with the native place America and also obtained from Mexico, Trinidad, Jamaica, Brazil, Florida, Africa, and India. *L. camera* is regionally differing in their names such as in Marathi: Ghaneri, Hindi: Raimuniya, Tamil: Unnichi, Kannada: Kakke, Manipuri: Samballei and Telugu: Pulikampa [7]. In India, *L. camera* is considered as poisonous plant and included in top ten as invasive weeds [8]. Invasive weeds are nothing but a species that is not native to the ecosystem under consideration whose introduction causes economic or environmental harm or to human harm. Due to invasive nature *L. camera* is lagging behind in the list of medicinal plants for their uses in the drug preparation [9,10].

Therefore the main objective of the present review is to create awareness about ethnobotany and pharmacological studies of *L. camera* in society.

2. HISTORY

L. camera's range extends from Bega Shire in southern NSW to Cape Melville in north Queensland. It is found on the Lord Howe and Norfolk Islands. The chief infestations are east of the huge in-between range in NSW and QLD [3,4].

Pink-edged red lantana grows on the:

1. North Coast around Kempsey, south-east of Dorrigo, Bellingen, in the Coffs Harbour and Grafton areas Central Coast [8].
2. Red varieties grow on the North Coast, around Kempsey, Bellingen and Coffs Harbour.
3. *L. camera* is improbable to invade new regions in NSW. It is increasing in density and invades new areas within its range [8].
4. *L. camera* comes from the tropical and subtropical regions of Central and South America. It was introduced to Australia in 1841 as a decorative plant. By the 1860s it was common in Sydney and Brisbane [16].

3. TAXONOMY [6,9,14]

Kingdom: Plantae
Class: Angiosperms
Order: Lamiales
Family: Verbenaceae
Genus: *Lantana*
Species: *L. camera*

4. ECOLOGY

4.1 Habit

L. camera belongs to the family Verbenaceae. It is also known as a red sage. It grows up to 1-3 meter and can spread to 3 meters in width. It is a thorny multistemmed, deciduous shrub. It contains leaves which are opposite, simple, and aromatic, with long petioles, with oval rough

and hairy blades at margins [2]. Leaves are 3-8 cm long by 3-6 cm wide with green color, the pungent smell will emit when it is in crushed condition. Flowers are small, stalked, with different colors such as orange-blue-red-yellow-and bright red flowers. They are dense in the flat-topped cluster with corolla having the narrow tube with the four short spreading lobes. Flowers always go under color changes with weather conditions. Flowering occurs in between March and August [6]. The stem is square in outline, covered with bristly hairs. Roots are dipped in soil up to 50-100cm. they are yellowish-whitish in color with strong nature. Berries are rounded, fresh, fleshy, poisonous, 2-seeded, initially green-purple in color and finally turns into blue-black color. Berries are attractive to insects and birds due to their attractive nature. It is 6 – 8 mm in diameter, round berries, in a group, green to start, shiny, dark purple-black when ripe, and with one seed per fruit [1,6,7,9].

4.2 Habitat

L. camera is a tropical origin plant [3]. It requires diverse and broad geographic distribution. It is perennial shrub therefore mainly grows in open, disturbed areas such as roadside, railway tracks, and canals. It establishes at altitudes from the sea level up to 2000 m and can flourish extremely well under rainfall ranging area from 750 to 5000 m per annum. It belongs to Central and Northern South America and the Caribbean by birth [6]. It is currently spread in 60 countries. In India, this plant is spread over 7-10 states includes Maharashtra, Himachal Pradesh, Karnataka, Kerala, Uttar Pradesh, Uttarakhand, Gujarat, Rajasthan, Goa, and Arunachal Pradesh [8,11]. They require high sunlight for their growth. They grow in mostly grow in sandy or loamy soil which has pH 4 -9. The lowest temperature requires for their growth [12].

Table 1. General Characteristics and habitat of *L. Camera*

Sr. No	Parameters	Description
1	Native	Tropical region in Central and Northern south America
2	Distribution	Nearly spreaded in 60 countries between 35°N and 35°S latitude.
3	Conservation studies	Unknown
4	Plant colour	Dark green
5	Plant features	Aromatic, Evergreen, Poisonous
6	Flowers	Long lasting, small, stalked, with different colors
7	Tolerances	Wind, slope, pollution, drought, heat and humidity
8	Pollinators	Lepidopteron species and thrip
9	Light	High sunlight
10	pH	4.5 to 8.5
11	Temperature	Below 45°C
12	Soil	Sandy to clay
13	Water	Any water (semi-arid to normal)
14	Propagation methods	Herbaceous stem cuttings

5. ETHNOBOTANY

L. camera is an important medicinal plant. It has several medicinal applications in the medicinal field. The explants such as leaves, stem, roots, flowers, and seeds are used to extract different bioactive compounds by using different solvents such as water, methanol, ethanol, n-Butanol [6,7]. Leaves are used to treat cuts, rheumatism, ulcers, catarrhal infection, tetanus, rheumatism, malaria, cancer, chicken pox, asthma, ulcer, swelling, eczema, tumor, high blood pressure, and bilious fever, ataxy of abdominal viscera, sores, measles, fevers, cold and high

blood pressure. The whole plant is used to cure bronchitis and the powdered root in milk was given to children for stomach-ache and as a vermifuge. Lantana oil is used to treat a skin infection, itches, and as an antiseptic for wounds [4,8,11].

5.1. Phytochemistry

Phytochemistry of *L. camera* has been extensively studied from long back for different applications. The explants of *L. camera* such as leaves, stem, roots, flowers, and seeds revealed different phytochemicals such as tannin, alkaloids, catechin, steroids, saponins, phenol, anthraquinone, protein, terpenoids, flavonoids, glycosides, different reducing sugars and essential oils. The essential oil consists consist Sabiene, 1,8- Cineole, β -caryophyllene, α -humulene, two are sesquiterpenoids [2,8,11].

Table 2. Used explants for the analysis of Phytochemistry

Plant	Explants	References
<i>Lantana camera</i> Linn.	Leaves	Sing et al., 1999
	Flowers	Day et al., 2003
	Stalks	Underwood et al., 2003
	Roots	Prasad et al., 2001
	Seeds	Day et al., 2003
	Berries	Thakur et al., 1992

6. PHARMACOLOGICAL STUDIES

In India, the Lachhiwala village is situated near to Dehradun around 24 km. The scientists from NGO Himalayan Environmental Studies and Conservation Organization (HESCO) established one lakhs hectors of land with *L. camera* plants. The village people use *L. camera* and mud to make the walls of their houses and chicken coops. They are using bark, stems for furniture, trays and baskets purposes. The *L. camera* leaves have been used to make excellent mosquito repellents and incense sticks. Such innovative use of the weed brings in Rs 75,000 a year for each of the families there therefore they have named village name as a Lantana village. All lantana villagers are using this *L. camara* plant for economic purposes [6,9].

6.1. Antimicrobial Activity

Different extracts of *L. camara* explants are used against different microorganisms such as bacteria and fungi. The explants such as leaves, stem, roots, flowers, and seeds extracts revealed effective Phytochemistry and their useful applications against different microorganisms. Aqueous, ethanol and methanol extracts of leaves, roots stem, and flowers of *L. camara* showed effective antibacterial activity against *E. coli*, *Proteus vulgaris*, *Vibrio cholerae*, *Bacillus subtilis*, *P. aeruginosa* and *Staphylococcus aureus* by disc diffusion and micro dilution method [2,4,7,9]. Further antifungal activity of *L. camara* extract was screened against Alternaria species which causes dissimilar plant diseases in vegetable plants. The 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 species. Both extracts exhibited well-organized antifungal activity against white and brown rot fungi, however ethanol extract was highly potential at very low concentration (0.01%) therefore it is concluded that *L. camara* has effective antimicrobial activity [9-11].

6.2. Antimotility activity

L. camara has great antimotility activity which was proved by the report of leaves methanol extract antimotility activity in mice. 1 g/kg body weight dose was used to check the intestinal motility by charcoal meal test in mice which resulted into completely inhibition and Intraperitoneal management of 125 and 250 mg/kg body heaviness the extracts considerably reduced the fecal production in castor oil induced diarrhoea in mice [1-3].

6.3. 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 noteworthy defensive 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 [4-6].

6.4. Hemolytic activity

The hemolytic activity of *L. camara* aqueous extract and their solvent fractions was performed by spectroscopic method with different concentrations such as 125, 250, 500, 1000 µg/ml which was resulted into very low hemolytic activity towards the human erythrocytes [7,8].

6.5. Antihyperglycemic activity

Different extracts of *L. camara* has been proved effective and digestive antihyperglycemic activity. Extracts includes methanol extract of leaves, aqueous extract of roots. These both extracts were reported in alloxan induced diabetic rats. Oral administration of the methanol extract of *L. camara* (400 mg/kg body weight) leaves revealed decreased blood glucose up to 121.94 mg/dl. Extract action also showed development in body weight, HbA1c profile as well as renewal of liver cells [6,8,16].

6.6. Wound healing activity

Wound healing activity of aqueous leaves extract of *L. camara* was reported in rats. 100 mg/kg/day of dose significantly enhanced the rate of wound contraction (98%), synthesis of collagen and decreased wound healing occasion. Then ethanol extract of leaves of *L. camara* was also reported for wound healing activity in adult male Wister rats. Histological analysis of healed wounds established the role of take out in healing [5,16].

6.7. Antiinflammatory activity

Anti inflammatory activity of aqueous extract of *L. camara* was reported in albino rats. The 500mg/kg body weight significantly decreased paw volume in carrageenan induced paw oedema rat tests [11,12].

6.7. Antirolithiasis activity

Different extracts of the *L. camara* leaves was reported for antirolithiasis activity against ethylene glycol and ammonium chloride induced calcium oxalate urolithiasis in male albino rats which revealed significant reduction of the deposition of calcium, oxalate and also reduced urinary excretion of calcium, oxalate and creatinine [12,13].

7. CONCLUSION

Lantana camara is the poisonous, invasive, a noxious weed, present worldwide however due to insufficient knowledge and myths weed is lagging behind in the list of medicinal plants. The Ethanopharmaceutical and pharmacological studies revealed different aspects of *Lantana camara* therefore present study may helpful to create awareness in society about the plant.

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