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Targeted anti diabetic activity of lantana Camara: A review

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Abstract
From ancient era, plants have been used as a general source of medicine. From a very long time, Lantana camara is used in traditional medicine system. This plant is used for treatment of various kinds of ulcers, swelling, cataract, itches, eczema and rheumatism. The different parts of the plants (like- leaf, stem, root, etc.) are used in the treatment of headache, eye infection, cough, cold, asthma and hypertension. Lantana camara is scientifically valuable for various therapeutic activity as antipyretic, antimicrobial, anti-inflammatory, antibacterial, antioxidant, wound healing and antidiabetic activity. This review gives us a bird's eye view on detailed information of this plants and of its various activities along with targeted antidiabetic activity study.

Keywords: lantana camara, Medicinal plant, therapeutic activity, antidiabetic activity

1. Introduction
Lantana camara (family- verbenaceae) is evergreen strong smelling shrub popularly known as weed or red sage, caturang in hindi and in Bengali it is putus, distributed all over in India [1]. Since ancient time L. camara reported to be used in traditional system of medicine for the treatment of iches, cuts, ulcers, swelling, bilious fever, cataract, eczema and rheumatism.
Different parts of the plants (leaves, flowers, roots etc.) are employed in the treatment of cold, headache, uterine haemorrhage, chicken pox, eye injuries, whooping cough, asthama, bronchitis and arterial hypertension. The fruits are effective in several conditions such as fistula, pustules, tumor and rheumatism. Leaves infusion used for bilious fever, vitiated condition of vata and kapha, eczema and eruptions. In the treatment of malaria, rheumatism and skin rashes root of this plant much effective. L. camara oil is sometimes used against skin itches, as an antiseptic for wounds, and externally for leprosy and scabies [2].
This review aims to document the morphology, distribution, phytochemistry and medicinal properties of Lantana camara and its future expectancy for the further scientific research for the development of the therapeutic compounds.

Fig 1: *Lantana camara*

2. Taxonomy:
Kingdom: Plantae;
Order: Lamiales;
Family: Verbenaceae;
Genus: Lantana;
Species: L. camara.

3. Plant Description
Lantana camara, often planted to embellish gardens in around 50 different countries including central and south America. Lantana camara is a perennial shrub. Plant grows upto 2 to 3 meters and it can spread about 2.5 meters in wide.
Lantana camara has small tubular shaped flowers which have four petals. Petals are arranged in clusters. Flowers come in different colour like red, yellow, white, pink and orange. This colours of flower differ depending on the location in age and maturity.
The leaves are ovate. The leaves are 3 to 8 cm long by 3 to 6 cm wide and colour is green. It has a strong odour when crushed. Leaves and stem are covered with rough hairs.
The stem of L. camara, it was a single layer of compactly arranged by barrel-shaped parenchyma cells with slightly thick wall. Trichomes were unicellular.
Roots system is very strong and it gives out fresh shoots after repeated cutting

Fig 2: Various parts of Lantana camara

4. Geographical distribution

Lantana camara is a tropical origin plant and found mostly in the south India, in Tamil Nadu, in central and south America, in Africa. L. camara is now spreaded to nearly 50 countries like America, Brazil, Mexico and etc.

In India it also found in Himachal Pradesh, Jammu-Kashmir and Uttar Pradesh.

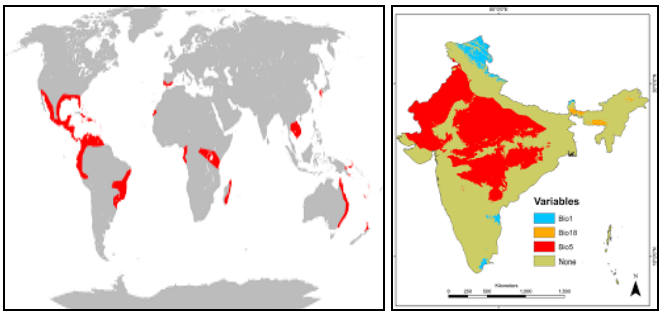

Fig 3: Geographical area of distribution of Lantana camara

5. Various Activities Study

5.1 Antioxidant Activity

The methanolic extract of L. camara exhibited significant antioxidant activity in 'in vivo' studies. The extract treatment decreased the extent of lipid peroxidation in the kidney of urolithic rats. The antioxidant activity of methanolic extract of Lantana camara has been reported and antioxidant activity carried out by DPPH radial scavenging assays and nitric oxide free radical scavenging method [3, 4]. It shows high antioxidant properties in both assay.

5.2 Anti-inflammatory Activity

Aqueous extract of L. camara leaves was reported for anti-inflammatory activity in albino rats. Therefore, essential oil from this plant would be a potent candidate in healing inflammatory and pain [5].

5.3 Antipyretic Activity

L. camara ethanolic and ethyl acetate extract shows the antipyretic activity by lowering the body temperature from 1.5th hours [5].

5.4 Anti-hypertensive and Anti Asthmatic Activity

Alkaloid extraction of L. camara lower blood pressure, accelerate deep respiration and stimulate intestinal movement. So, essential oil from L. camara may show therapeutic activity against hypertension and asthma [6].

5.5 Wound Healing and Anti-Catarract Activity

Aqueous extract of leaf of L. camara shows wound healing activity when reported in rats.

Plants extracts used in folk medicine for the treatment of cancers, chicken pox, measles, high blood pressure, billions fevers, catarrhal infections, tetanus, rheumatism and malaria[6].

5.6 Anti-anthelmintic Activity

Anti-anthelmintic activity of methanol extracts from the leaves, stem and roots of L. camara were investigated against pheritima posthuma. Methanol extracts of L. camara stem found to be most active. Leaves extracts of L. camara showed significant anti-anthemintic activity on selected warms, ethanolic extract found to be more active compared to remaining extracts [7, 8].

5.7 Anti-Motility Activity

Anti-motility activity of mrthanol extract of L. camara leaves was reported in mice. The motility was assayed by charcoal meal test in mice

The remarkable anti-motility effect of lantana camara methanolic extract against neostigmine as promotility agent points towords an anticholinergic effect due to lantana camara contituents and attests to its possible utility in secretory and functional diarrheas and other gastrointestinal disorders. This effect was further confirmed by significant inhibition of castor oil induced diarrhea in mice by various doses of LCME [9].

6. Targeted study Anti-hyperglycemic Activity

As the above mentioned plant has shown many pharmacological activities and the only activity which is left behind was the antidiabetic activity. Homeopathic medicine has accepted the fact that the leaf extracts of the plant under study has shown positive results in inhibiting diabetics. So there came an interest to prove it in an elloborated manner. Hence, The fresh leaves of Lantana camara were collected from Himachal Pradesh, Jammu-Kashmir and Uttar Pradesh and were tested for its antidiabetic activity against rats. The results proved that the leaf extracts showed positive results for anti diabetic activity. On the other hand it is previously proved that Methanol extract of L. camara leaves shows the anti-hyperglycemic activity. Oral administration of the methanol extract of L. camara leaves resulted in decrease in blood glucose level to 121.94 mg/dl in alloxan induced diabetic rats [10]. Same on the Lantana camara fruits study shows the anti hyperglysemic activity as methanolic extracts of Lantana camara Linn fruits was screened in streptozotocin induced dibatic rats. Extra treatment at doses of 100 and 200mg/kg body waight which decrease in serum glucose level in streptozotocin induced dibatic rats [11]. So it can be recommended for further studies.

Table 1

carbohydrates	Glycosides	flavonoids	Tannins	phytosterols	Saponins	fixedoils	protein	steroids	triterpenes
+	+	+	+	+	+	_	+	+	+

Presence= +, Absence= -

7. Discussion

The results of the present investigation showed the antidiabetic potential of the methanol extract of the leaves and fruits of the medicinal plant Lantana camara against rats. The antidiabetic activity was found to be effective against diabetic rats. The crude methanol extract of the leaves and fruits of Lantana camara was tested positive for the presence of Carbohydrates, Protein, oil compounds, glycosides, tannins, steroids, triterpines, flavonoid and phytostrols. It was tested negative for fixed oils. Moreover, in clinical fields also there is a need for novel antibiotics to compete the newly evolving multidrug resistance against diabetics. The crude methanol extract of the medicinal plant Lantana camara decrease the serum glucose level directly of diabetic rats. In wound healing it also shows its predominant role against burns and wounds. As the extract showed potential activity against male Wister rats for wound healing. It can be utilized for the preparation of wound healing ointments also. The phytochemical analysis of the flower and fruit extracts showed the presence of phytoconstituents such as carbohydrate, protein, glycosides, flavonoids, phytosterols etc.

8. Conclusion

Now a days phytochemical and pharmacological studies are conducted on different parts of plants. This literature supports the possible of Lantana camara as a medicinal plant. Lantana camara mainly used as an herbal medicine. The leaf extract of L. camara shows antioxidant, antihyperglycemic and antimotility activities with targeted antidiabetic activity. Essential oil of Lantana camara used for the treatment of skin itches and antiseptic for wounds. In future, there is remarkable scope in research on this plant for the development of drugs. This extensive literature survey revealed that Lantana camara is an anti diabetic plants also and as a result of our targeted study. It will give the further research a clear view about the plants various important therapeutic activity.

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