

A SURVEY ON THERAPEUTIC UTILITY OF LUFFA ECHINATA ROXB. (Ethnomedicinal uses and Pharmacological activity)

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<p>*For Correspondence: Lachoo Memorial College of Science & Technology (Autonomous), Pharmacy Wing, Jodhpur, Rajasthan</p>	<p>ABSTRACT The medicinal flora of Rajasthan speaks to a decent case of powerful coordination between medicinal cures, wellbeing and traditional curative practices. One such under investigated is <i>Luffa echinata</i> Roxb. (Cucurbitaceae) a spreading climbing herb of tremendous medicinal significance. The plant has an imperative part in prescription and general wellbeing. <i>Luffa echinata</i> is prominently known, as "Bindal" in Hindi is a slim herb having a place with the Cucurbitaceae family which develops generally in India, Pakistan, and Bangladesh. Writing overview from books and journals of traditional Indian medicine uncovered that <i>Luffa echinata</i> Roxb. has a great deal of restorative properties? Leaves, roots, fruits have been accounted for therapeutic movement. It is utilized as a solution for cure like Ulcer, Diabetes, Jaundice, Heaps, Skin sicknesses, enlargement of liver and spleen. The plant has been pharmacologically contemplated for different diseases and numerous logical examinations have been completed on this plant for investigating these conventional uses. In this manner, the present survey gives updated information on the photochemistry and pharmacological properties of fruits of <i>Luffa echinata</i> Roxb. KEY WORDS: <i>Luffa echinata</i>, ethnomedicinal uses and pharmacological uses.</p>
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INTRODUCTION

Indian medicinal plants are essence of Ayurveda. Treatment of illness and maintenance of health using herbal medicine is oldest and most popular form of healthcare practice that has been practised by all cultures throughout the history of civilization. *Luffa echinata* (L. *echinata*) has a place with family Cucurbitaceae which incorporates around 130 unique genera and around 800 types of therapeutically essential plants. The genus *Luffa* comprises more than eight species, three of which are found in India viz. *Luffa acutangula* Roxb., *Luffa aegyptiaca* Mill. and *Luffa echinata* Roxb^[1]. Ayurveda is the most old conventional arrangement of medicine in India with sound philosophical, experiential and experimental basis, which is utilized to treat the human diseases^[2]. Because of expanded reactions, high cost of new medications, absence of corrective treatment at root level and improvement of new ailment, individuals not just in developing nations but additionally in developed nations depend on natural herbs^[3]. In spite of the fact that logical thinks about have been completed by researchers on numerous Indian botanicals, yet at the same time various medications have entered the universal market through the investigation of ethanopharmacology^[4]. Practitioners of

the indigenous system of medicine, affirm to obtain beneficial results with *Luffa echinata* Roxb. in the treatment of various ailments.



Photograph of *Luffa echinata*

Synonyms

Luffa bindaal Roxb.

Luffa longistyla Edgew.

Momordica erinocarpa Fenzl ex Naud.

Luffa bondel Buch.-Ham. ex Steud.

Names in different languages^[5]:

Hindi Name- Bindal, Ghagharbel, Kakoda

English Name- Bristly Luffa, Bitter luffa, Rag gourd

Bengali Name- Deyatada

Gujarati Name- Kukurvel

Kannada Name- Daivadali

Marathi Name- Devadangari

Tamil Name- Peypirkku

Telugu Name- Panibira

Local distribution: Uttar Pradesh, Bengal, Gujrat, Rajasthan

Native to: Northern tropical Africa, Pakistan, India, Bangladesh

Taxonomical classification

Kingdom	:	Planatae
Phylum	:	Tracheophyta
Class	:	Magnoliopsida
Order	:	Cucurbitales
Family	:	Cucurbitaceae
Genus	:	Luffa
Species	:	<i>Luffa echinata</i>

Distribution^[6,7]

Botanical characteristics of *Luffa echinata*

Fruits: Fruits are ashy, oblong, ovoid having 2-5 cm length and densely covered with 4-7 mm long bristles. Seeds are ovate, black 4-5 mm long, 3-5 mm broad and 2 mm thick^[8,9].

Stems: Stem pieces are slender, yellowish-brown to blackish-brown in color, longitudinally furrowed, glabrous, measuring 1.5-1.7 cm in length and 5-8 mm diameter^[10].

Flowers: Flowers are white, stalked, about 2.5 cm wide. Male flowers are borne in 5-12 flowered raceme having length up to 15 cm long. Sepal tube is about 5.6 mm long and hairy. Sepals are lance shaped while petals are ovate, 1.0-1.2 cm long, blunt and hairy at the base^[11].

Leaves: Leaves are kidney-shaped, round, shallowly or deeply 5-lobed. Tip is rounded or rarely pointed, bristly on both surfaces, margin is minutely toothed and leaf stalk is stout, bristly, up to 12 cm long^[9,12].

Ethnomedicinal uses^[6,12,13,14]

Disorder	Part used	Method
Jaundice	Fruit	Fruit powder of described plant 250mg, with Whey, 2 times a day, and nasal drops 4-4 drops of cold infusion, or snuff of fruit powder 250mg, is beneficial.
Enlargement of liver and spleen	Fruit	Tincture of fruit of described plant 10-20 drops, 3 times a day, is beneficial.
Paralysis	Leaves	Local application of paste, made of juice of leaves of described plant and pure Mercury, for 15 minutes. If reddish occurs, apply some clarified butter. Repeat after 12 hours.
Leucoderma	Fruit	Fruit powder of described plant 250 mg, seed powder of <i>Alangium salvifolium</i> 250 mg, sugar cube powder 5g, with water, after 3 hours, use meal <i>Vigna mungo</i> , for 8 days only.
Piles, prolapse rectum	Fruit	Fruit powder of described plant 250mg, tuber powder of <i>Amorphophallus paeoniifolius</i> 4g, with water, 2 times a day, for for 3 weeks, is very beneficial.
Ring worm	Fruit	Local application of paste of fruit juice of described plant and Borax, is beneficial.
Diabetes mellitus	Fruits	The ethanolic extract (50%) of the plant exhibits hypoglycaemic activity ^[6,12] .

Phytochemistry

- Fruits contain chrysoeriol and its glycosides as principal flavonoids. A number of biologically active compounds such as cucurbitacin-B, eletarin (cucurbitacin-E), eletarin-2-glucoside, isocucurbitacin B, β -sitosterol glucoside, chrysirol-7-glucoside, chrysirol-7-epiglucoside, echinatosol A, echinatosol B, and echinatin have been isolated from *Luffa echinata* fruits.^[15,16,17,18]
- Seeds contain curcubitacin B, triterpene alcohols, and sponin with oleanic acid as saponin^[6].

Pharmacological activity

Analgesic, Anti-inflammatory and Free radical scavenging activity.

Modi A., et al. (2014)^[15] *Luffa echinata* Roxb. (Cucurbitaceae) is a spreading climbing herb of tremendous medicinal importance, distributed throughout Pakistan, India, Bangladesh and Northern Tropical Africa. Traditionally various parts of the plant are being used for the treatment of different ailments such as jaundice, intestinal colic, enlargement of liver and spleen, leprosy, diabetes, bronchitis, nephritis, rheumatism, cirrhosis, dropsy, anthelmintic, stomach ache, snake bite, dog bite, fever, diarrhoea and hemorrhoid disorder. The plant also possesses antioxidant, analgesic, anti-inflammatory, antidepressant, anxiolytic, antiepileptic, hepatoprotective, antibacterial, antifungal, antiulcer and anticancer activity. Research has been carried out using different techniques to support most of these claims.

Sharma T., et al. (2012)^[19] The study was designed to investigate the free radical scavenging, anti-inflammatory and analgesic potential of methanolic extract of *Luffa echinata* seeds (MELE). Free radical scavenging potential of MELE was evaluated by DPPH (1,1-diphenyl-2-picrylhydrazyl method). The extract showed significant ($p < 0.05$) free radical scavenging activity in dose dependent manner as

compared with Ascorbic acid. The maximum free radical scavenging activity of MELE was found to be 82.34% at concentration of 150 µg mL by the DPPH free radical scavenging method. Antioxidant effect was also investigated qualitatively using 1,1-diphenyl-2-picrylhydrazyl. The extract was further evaluated for its anti-inflammatory activity by using carrageenan-induced paw oedema in rats.

Kumar V., *et al.* (2000)^[20] The dried alcoholic (50%) extract of plant *Luffa echinata* was investigated for inhibition of lipid peroxidation, for hydroxy radical scavenging activity and interaction with 1,1-Diphenyl-2-picrylhydrazyl stable free radical (DPPH). It was found that the test extract exhibited a considerable inhibition of lipid peroxidation and possessed hydroxyl radical scavenging activity. Evaluation of antiradical scavenging activity showed significant interaction with DPPH.

Anticancer

Shang LH., *et al.* (2012)^[21] In this study, the antiproliferative properties and cell death mechanism induced by the extract of the fruits of LER were investigated. MTT and LDH assay were used to test the antiproliferative and cytotoxicity of LER extract, respectively. The intracellular ROS were measured by a fluorometric assay. The expression of several apoptotic-related proteins in SW-480 cells treated by LER was evaluated by Western blot analysis.

Anti-ulcer

Kailasiya D., *et al.* (2012)^[22] The present study was undertaken to determine the anti-ulcer potential of *Luffa echinata* Roxb, a standardized extract of *Luffa echinata* commonly known as Kakora. The effect of various doses (200.0 and 400.0 mg/kg,) of *Luffa echinata* were studied on gastric ulcers by pylorus ligation method. Diclofenac sodium induced gastric mucosal injury was measured in rats. Anti-ulcer activity was evaluated by measuring the ulcer index, gastric content, total acidity, and pH of gastric fluid. *Luffa echinata* dose dependently decreased gastric content, total acidity, ulcer index and increased pH of gastric fluid in pylorus ligation ulcer model.

Hepatoprotective

Bahar A., *et al.* (2000)^[23] The different extracts of the fruits of *Luffa echinata* were tested for their hepatoprotective activity against CCl₄ induced hepatotoxicity in albino rats. The degree of protection was measured by using biochemical parameters like SGOT, SGPT, ALKP, Total albumin and total protein. The petroleum ether, acetone and methanolic extracts showed a significant hepatoprotective activity.

Jakhmola V., *et al.* (2010)^[24] Hypoproteinaemic effects and improved serum biochemical parameters such as AST, ALT and bilirubin were indications that the crude extract of *luffa echinata* root extract has a significant effect in liver injuries.

CNS activity - Antidepressant, anxiolytic and antiepileptic activity

Bhut VS., *et al.* (2012)^[25] Methanolic extract of *luffa echinata* (200 mg/kg, p.o.) fruits were evaluated for antidepressant, anxiolytic and antiepileptic activities. Antidepressant and anxiolytic effects were evaluated by behavior model viz. open field and elevated plus maze using diazepam (2 mg/kg, p.o.) as control. Treatment with extract significantly (P<0.05) reduced number of square crossed and number of rearing (antidepressant activity) while simultaneously increased the time spent in open arm (anxiolytic activity) as compared to control. Antiepileptic activity was evaluated using maximal electric shock model with phenytoin (25 mg/kg, p.o.) as a control. Treatment with the extract significantly (P<0.05) reduced extension, stupor and total recovery as compared to control.

Treat victims of dog bite

Yadav U., *et al.* (2013)^[26] The use of herbal medicine for the treatment of various diseases is increasing day by day due to no side effect. During survey it was observed that more than 80 medicinal plants are being used in curing the various diseases by the Tribal community (Tharus) of Khatima. *Luffa echinata* is one such medicinal plant which has not grabbed considerable attention,

however it is used to treat the victims of dog bite and more than 500 people have been treated successfully in this area. This research article illustrates how the victim of dog bite is treated with this plant and it also provides a novel idea for further research on the phytochemical aspects of this plants which might lead us towards the development of new medicines for the welfare of human being.

CONCLUSION

One valuable gift to human health is provided by nature in the form of medicinal plants in the locality and one of the significant ways in which humans directly reap the benefits provided by biodiversity. India has long history of medicinal plant utilization in traditional and tribal culture. Literature reveals that *Luffa echinata* Roxb. has many traditional uses in Jaundice, leucoderma, piles, enlargement of liver, paralysis, diabetes mellitus? Ethnobotanical investigation has been found to be one of the most reliable approaches toward use of medicinal plants for treatment of various conditions, and even now, there are still many more things for us to discover.

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