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"Ridge Gourd: A Natural Antidote for Jaundice – A Comprehensive Overview

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Abstract : Jaundice, a common liver disorder, necessitates effective and safe treatment options. Ridge Gourd (Luffa acutangula), a vegetable commonly used in traditional medicine, has been recognized for its hepatoprotective, antioxidant, and anti-inflammatory properties. This comprehensive overview provides an in-depth examination of the traditional uses, phytochemical constituents, pharmacological effects, and clinical applications of Ridge Gourd in jaundice treatment. The review highlights the vegetable's potential in reducing bilirubin levels, improving liver function, and alleviating jaundice symptoms. Furthermore, the antioxidant and anti-inflammatory activities of Ridge Gourd are discussed, providing insights into its mechanisms of action. This overview aims to provide a thorough understanding of Ridge Gourd's therapeutic potential in jaundice treatment, supporting its use as a natural antidote.

Keywords: Ridge Gourd, jaundice treatment, hepatoprotective, antioxidant, anti-inflammatory, traditional medicine

INTRODUCTION

Luffa acutangula L., belongs to the family Cucurbitaceae, Is commonly known as ridge gourd and it is used as Vegetable in Asian countries. Ridge Gourd also known as Gantali, Kosataki, Ksweda, Mridangaphalika, Sutikta in Sanskrit.

The whole Luffa acutangula L. plant has significant therapeutic value and is widely utilized in Indian traditional medicine. From an Ayurvedic perspective, ridge gourd cools and calms the dosha pitta (the energy principle that uses bile to direct digestion and hence metabolism into the venous system) in the body. It also increases vata (the impulse principle required to mobilize the function of the nervous system) and kapha (the body fluid principle which relates to mucous, lubrication, and the carrier of nutrients into the arterial system).
The plant is widely Cultivated in India, Southeast Asia, China, Japan, Egypt, and other parts of Africa. Propagation of this plant is done through seeds and are sown in February–March Or June–July.

Almost all parts of the Plant can be used, the parts that are Widely used are the fruit, seeds, leaves And, roots. The fruit is used in the Treatment of the enlarged spleen, helps Detoxify the liver, helps with Constipation, treats edema from its Diuretic effect, anti-diabetes and Stomach worm medication.

Botanical characters

The roots are cylindrical and yellowish-brown. They are tough due to longitudinal wrinkling and have several unexpected roots. The brownish-yellow stem is 0.2-0.4 cm thick, glabrous, and packed with tendrils. It has five angles.
The lamina is pale or light-green, crimped, and broad. The petiole is brownish yellow and measures 3-8 cm in length. Female flowers are gynoecious and can be alone or in groups. The petals are yellow and beautiful, with a long ovary and moderately ribbed stigma.

Ethnobotanical uses

In the hilly areas of Maharashtra, an ethnobotanical study found that fruit powder, ground to a very fine L. acutangula powder, is used as a snuff to avoid jaundice. The tribes of western Maharashtra also traditionally use it for insect bites. The swollen haemorrhoids are treated with the fruit's powder. The soft, smooth seed kernel is a useful remedy for diarrhoea, while the juice of the roasted young fruit is used to relieve migraines.

Pharmacognosy :

Botanical Name: *Luffa acutangula*
Common Name : Ridge Gourd, angled gourd, silky gourd
Family : Cucurbitaceae
Plant parts used: Fruit, seeds, leaves, roots

Phytoconstituents :

- **Chemical constituents of *Luffa acutangula:***

Sr.No.	Parts studied	Chemical constituents
1.	Fruit	Luffeine, vitamins and minerals. [15] Lignin (58.7 mg/kg), Tannin (1.84 mg /kg), Phenol (0.62 mg/kg), Flavonoid (0.45 mg/kg) and Alkaloid (0.19 mg/kg)
2.	Seed	Fixed oil, palmitic, stearic, and myristic acids. Lectin and chito-oligosaccharides. Luffangulin, cucurbitacin B, sapogenin and oleanolic acid.

Nutrient Value:

Nutrient	Nutrient Value
Carbohydrates	3.70 g
Protein	1.00 g
Total fat	0.17 g
Cholesterol	O mg
Dietary fiber	2.80 g
Folates	72 mcg
Niacin	0.400 mg
Pantothenic acid	0.212 mg
Pyridoxine	0.043 mg
Riboflavin	0.040 mg
Thiamin	0.040 mg
Vitamin A	471 IU
Vitamin C	84 mg
Sodium	5 mg
Potassium	296 mg
Calcium	19 mg
Iron	0.43 mg
Magnesium	17 mg
Zinc	0.80 mg
Lutein- zeaxanthin	170 mcg
Manganese	0.80 mg
Water	93.95 mg

Hepatoprotective activity of fractions of *Luffa acutangula:*

The medicinal potential of *Luffa acutangula* against liver disorders has been shown in numerous investigations. In Carbon tetrachloride-induced liver necrosis, ethanolic fruit extract significantly outperformed pet ether extract in terms of Hepatoprotective efficacy

Part used	Extract / Compound	Diseases	Result
Fruit	Ethanolic and petroleum ether extract	Carbon tetrachloride induced liver necrosis	SGPT, SGOT, serum alkaline phosphatase (ALP), serum bilirubin, serum cholesterol, triglycerides, serum high density, lipoproteins (SHDL), serum total proteins and serum albumin levels were reduced by alcoholic extract

Fruit	Hydro-alcoholic (70%) extract	Carbon tetrachloride and rifampicin induced hepatotoxicity	Significantly reduced serum marker enzyme (AST, ALP, ALT, and LDH) levels; non-enzymatic and enzymatic antioxidant (glutathione, catalase, and superoxide dismutase) levels were increased
Fruit	Alcoholic extract further partitioned with toluene, chloroform, ethyl acetate	Paracetamol induced hepatotoxicity	Significantly increased direct bilirubin level while ALT, AST, and ALP levels were restored to normal an ethyl acetate fraction of alcoholic extract
Leaves	Ethanolic extract	Carbon tetrachloride induced	Elevated levels of serum markers (SGPT, SGOT, ALP) reduced and significantly improved levels of glutathione peroxidase, glutathione-S-transferase, reduced glutathione, superoxide dismutase, catalase, and lipid peroxidation by leaf extract

Antioxidant activity of *Luffa acutangula:*

The antioxidant effects of various extracts from the dried leaves and other parts of Luffa acutangula var. amara have been extensively studied using multiple methods, including the DPPH reduction method, lipid peroxidation assays, and nitric oxide scavenging tests.

- **DPPH Reduction Method:**
  Both ethyl acetate and ethanol extracts of Luffa acutangula leaves demonstrated significant antioxidant activity, effectively reducing oxidative stress in DPPH and nitric oxide models. The extracts were tested at concentrations ranging from 25 to 800 µg/ml, showing a dose-dependent response.

- **Lipid Peroxidation and Glutathione Tests**:
  The extracts also exhibited notable inhibition of lipid peroxidation and increased levels of reduced glutathione, indicating their potential to protect against oxidative damage

- **Scavenging Activity of Ridge Peel Extracts:**
  Among five different extracts tested for their ability to scavenge DPPH radicals, the aqueous extract showed the highest scavenging activity (24.71%), followed by ethanol (18.87%), acetone (13.05%), methanol (11.13%), and ethyl acetate (7.14%)

- .**Comprehensive Antioxidant Evaluation:**
  The antioxidant activity of Luffa acutangula extracts was further evaluated using DPPH, ABTS, superoxide radical, reducing power, and phosphomolybdenum assays. The ethanolic extract of the fruit pericarp exhibited one of the strongest antioxidant activities, correlating with high levels of total phenolic and flavonoid contents, which are known to contribute to antioxidant capacity

- **Ethanolic Seed Extract:**
  The ethanolic seed extract of Luffa acutangula var. amara was assessed using the DPPH and hydrogen peroxide methods, revealing significant antioxidant activity at a concentration of 200 µg/ml

- **B-Carotene Bleaching Method:**
  The antioxidant activity of the methanol extract and its derivatives (n-hexane, chloroform, ethyl acetate, n-butanol, and residual aqueous fractions) was investigated. The methanol extract, along with n-hexane and chloroform extracts, displayed strong antioxidant activity, with the n-hexane extract showing the highest activity

Anti- Inflammatory activity of *Luffa acutangula:*

The anti-inflammatory effects of ethyl acetate and ethanol extracts from dried leaves using two different models: carrageenan-induced hind paw edema and cotton pellet granuloma.

In the acute carrageenan-induced model, the ethanolic extract demonstrated a higher percentage of edema inhibition compared to the ethyl acetate extract at both doses tested (250 mg/kg and 500 mg/kg). Specifically, the ethanolic extract showed 67.6% and 72.5% inhibition, while the ethyl acetate extract showed 62.5% and 65% inhibition at the same doses.

In the chronic cotton pellet granuloma model, the ethanolic extract again outperformed the ethyl acetate extract in terms of edema inhibition. The ethanolic extract exhibited 43.5% and 56.9% inhibition at doses of 250 mg/kg and 500 mg/kg, respectively, while the ethyl acetate extract showed 36.5% and 52% inhibition at the same doses.

Additionally, the study investigated the analgesic and anti-inflammatory activity of an ethanolic seed extract in albino rats. The anti-inflammatory activity was assessed using the carrageenan-induced paw edema model, with significant results observed at a dose of 300 mg/kg. The analgesic activity was evaluated using tail flick and tail immersion methods, with notable effects at a dose of 400 mg/kg.

Material and Methods:

- **Plant material:**
  The crude drug *luffa acutangula was* collected

- **Preparation of extract:**
  The plant leaf was dried under shadow (5 days) and then powdered by using grinder and then *Sieved*. The powdered material of the plant extracted by using the solvent of ethanol. 15 gm Of powder was taken in soxhelet apparatus and then extracted by using ethanol for the Duration of 6hrs. Finally, the ethanolic crude extract was found to be 4 gm.

Side effects of Ridge Gourd:

As this variety can cause emesis and purgation, precautions must taken if the formulation or any form of medicine containing ridge gourd is given to young children, old aged persons, during pregnancy and patients suffering from cardiac ailments and other systematic illness . Persons suffering from diarrhoea, vomiting should not take formulation containing ridge gourd.
However, no adverse effect is seen in the non bitter variety of ridge gourd, which is used as a vegetable.

Conclusion:

Ridge Gourd (Luffa acutangula) has been traditionally used in various cultures for its medicinal properties, including its potential in treating jaundice. The comprehensive overview provided in this review highlights the vegetable's hepatoprotective, antioxidant, and anti-inflammatory activities, which may contribute to its therapeutic effects in jaundice treatment.
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In conclusion, Ridge Gourd is a natural, safe, and effective remedy that warrants further investigation as a potential treatment option for jaundice. Its use in combination with other herbal agents or conventional treatments may also be explored to enhance its therapeutic effects.

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