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Review

Standardization Parameter of *Luffa Acutangula*

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Abstract

*Luffa acutangul*a (L.) Roxb., commonly known as ridge gourd or angled luffa, is a widely cultivated vegetable in Asia, valued for its nutritional and medicinal properties. Despite its extensive traditional use, scientific standardization of its plant parts is essential to ensure quality, efficacy, and safety in herbal formulations. This study aims to evaluate the standardization parameters of *Luffa acutangula* fruit and leaves in accordance with pharmacognostical and phytochemical guidelines. Macroscopic and microscopic characteristics were documented to aid in the identification and authentication of plant materials. Physicochemical parameters such as moisture content, ash values, extractive values, and PH were determined to assess purity and stability. Preliminary phytochemical screening revealed the presence of key bioactive constituents including flavonoids, saponins, tannins, alkaloids, and glycosides. The results serve as a baseline for the quality control of *Luffa acutangula* and support its future use in standard herbal drug development. Standardization of plant materials not only safeguards consumer health but also promotes the rational use of medicinal plants in traditional and modern medicine.

Keywords: Macro and microscopic characteristics, phytochemical, physicochemical, organoleptic parameters and health benefits and medicinal uses.

INTRODUCTION

Luffa acutangula *(L.) Roxb.)* has many uses, including as a medicinal plant. Angled *luffa acutangula (L.),* also known as ridge gourd, is a plant native to India, particularly the western, central, and southern parts of the country. It belongs to the Cucurbitaceae family and has been used by the community for many generations. In Asian countries, *L. acutangula* has been used as a vegetable and for food, as well as a remedy for a variety of

ailments, including fungal-induced skin disorders. Ridge gourd is primarily eaten or cooked as a vegetable, and its dry form is also used as a cleaning sponge. (1)

A phytochemical analysis of the extracts showed that luffa acutangula fruits contained tannin, saponins, Anthraquinones, sterols, glycosides, carbohydrates, reducing sugar, flavonoids, phenolic compounds, lignin's, cucurbitaceous, oil, and triterpenes. Pharmacological research showed that luffa acutangula had a number of beneficial properties, such as being antimicrobial, anti-parasitic, anticancer, antioxidant, hypoglycemia, hepatoprotective, anti-inflammatory, analgesic, and immunomodulatory. The plant as a whole has significant medicinal value and is used extensively in India's traditional medical system. Ridge gourd is thought to increase vata (impulse), kappa (body fluid), as well as to cool and
calm the pitta dosha (energy) in the body. (2)

Fig 1: Ridge gourd (luffa acutangula) (3)

Table 1: Biological classification

Kingdom	Plantae (4)
Subkingdom	Tracheophytes (5)
Infra kingdom	Streptophyta (5)
Super division	Embryophyta (5)
Class	Magnoliopsida (5)
Superorder	Rosids (5)
Order	Cucurbitales (4)
Family	Cucurbitaceae
Genus	Luffa
Species	Luffa acutangula (L.) Roxb (4)

Table 2: Various language name of luffa acutangula.

English	Ridge gourd (4)
Tamil	Pirkanga (4)
Telugu	Beer kaya (6)
Hindi	Tori, Turai (6)
Kannada	Eere kay (4)
Bengali	Jhinga, Jhingge
Gujarati	Turiya
Thai	Buap liyam
Marathi	Dodaki
Indonesian	Gambas, Oyong (4)
Malayalam	Peerkka (4)
Malay	petola segi
Urdu	Tori
Sinhalese (srilanka)	Pipinya
Tagalog(Philippines)	Patola (4)
Chinese (mandarin)	Okra (6)

BIOLOGICAL SOURCE

The plant species known as ridge gourd is consists of dried whole plant of Luffa acutangula (L.) Roxb. (angled luffa, ridged luffa, vegetable gourd). And also cultivated throughout the greater part of India. (7)

FAMILY NAME: Cucurbitaceae. (7)

Propagation: seeds. (8)

Native Range:

It is widely grown in tropical and subtropical climates in India, Southeast Asia, and parts of Africa. (8)

Cultivation: Luffa acutangula, which may be cultivated in any kind of soil and during the summer or rainy season. As a result, seeds can be planted in February through March or June through July. (8)

Part used medicinally: Fruits, leaves, roots, stems, seeds, and seeds oil. (9)

STANDARDIZATION PARAMETER:

1. Macroscopic parameters
2. Microscopic parameters
3. Physiochemical parameters
4. Phytochemical screening
5. Evaluation of organoleptic

MACROSCOPICAL PARAMETERS

The morphology, shaped, colour, size, and other specificities of luffa crude medicine are found using this method. (10)

LEAVES

Palmately 5-7 angled or sublobate, scabrid on both sides, base cordate, nerves and veins noticeable beneath; petiole 3-8 cm long; slightly twisted, wrinkled, scabrid, angular; brownish yellow; lamina crimpled, curled, corrugated; leaf pale or light-green, 6-9 cm long and broad. (7)

FRUITS

The fruit is club-shaped, obovate, tapering towards the base, pale yellowish-brown, with three chambers, the inner part being fibrous and easily detaching from the outer part; it has a bitter taste; a transverse section of the fruit through a rib reveals a single layer of papillose. Fruit measures two to four centimetres in width and nine to twelve centimetres in length (7).

Major chemical constituents the fruit of the plant contains cucurbitacin B, E and oleanolic acid. Ridge gourd contains triterpene, saponins. (11)

Fig 2: Macroscopic parameters of luffa acutangula (ridge gourd) leaves and fruit

Table 3: Morphological characters of luffa acutangula:

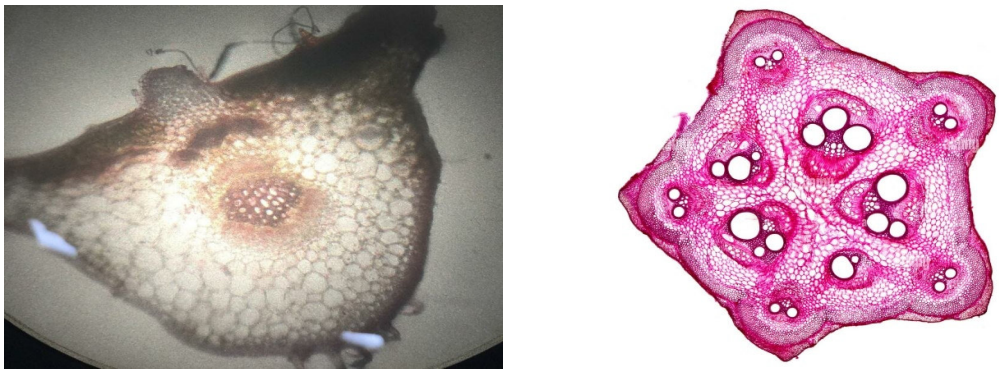
S.no	Macroscopy	Leaf	Fruit
1.	Color	bright, light green	Pale, green yellowish- brown
2.	Odour	Characteristic odor	Mild odor, bland or slightly bitter taste
3.	Size	6-9 cm long, broad	9-12 cm long, 2-4cm broad
4.	Shape	Angular, curled, corrugated (12)	Elongated, cylindrical with prominent longitudinal ridges (13)
5.	Surface	Slightly rough, hairy texture (14)	Ridged (angled), sometime grooved (14)

MICROSCOPIC PARAMETERS

LEAF

Petiole: 6-7 prominent ridges in single-layered epidermis with thick cuticle covering them; secondary cortex: wide in each ridge, made up of parenchymatous cells with thin walls; ground tissue: zone where each ridge has six to seven bicollateral vascular bundles.

lamina: single-layered epidermis on both surfaces, with glandular hairs with a spherical head with 3–4 cells and simple unicellular hairs with blunt tips; stomata, anomocytic, in both surfaces. (7)



(A) (B)

Fig 3: (A, B) Transverse section of luffa acutangula leaf (lamina) (15), and fruit section (16)

Leaf Constants of lamina:

1. Vein islets number 14–19 per sq. mm.;
2. palisade ratio of no more than
3. stomatal numbers 59–64 on the lower surface and 29–39 on the top surface
4. stomatal index 13–14 on the lower surface and 9–10 on the higher surface. (7)

FRUIT

The striated cuticle with a few bristles, 4-6 layers of thin-walled, parenchymatous cells with bio collateral vascular bundles, 8-10 layers of thick-walled, polyhedral, sclerenchyma, and fibres, and 8-10 prominent ribs give the section its irregular outline. (7)

3. PHYSICO-CHEMICAL PARAMETER

Non-specific parameters are all those that are not directly related to pharmacological activity but have an impact on safety and stability. They are crucial for assessing the quality, purity, and stability of plant materials (such as luffa acutangula). These parameters aid in standardisation for pharmacognostical and pharmaceutical applications. (10)

1.Moisture Content (loss on drying)

* Denotes water content.
* Microbial development is facilitated by high moisture levels.
* A 2.56% decrease in dryness. (17)

2. Ash Values

* The total Ash value is 6.36%. (17)
* Total Ash: represents the total mineral content; it does not exceed 16%. (10)
* Acid-Insoluble Ash: quantifies siliceous matter (such as sand), with a content of more than 4%. (10)
* Ash that dissolves in water is measured by water-soluble ash. (10)

3. Extractive values

* For instance, hexane four is 38%, chloroform is 1.23%, and water is 17%.
* Identifies the active ingredients in various solvents.
* Alcohol-Soluble Extractive: this extract of L is suitable for substances that dissolve in alcohol. Acutangula is not greater than 6%. (17)
* Water-soluble extractive: for compounds that are soluble in water, this is not greater than 13%. (5)

5. Organic Matter from Outside

* material not coming from the original plant sources.
* Checks for impurities like stems, dirt, or other plants.
* determination of total fungi foreign object it's not more than 2%. (10)

6. Crude Fibre Content

* crude fibre is the residue of resistant tissues which can be obtained giving treatment in the vegetable powder with dilute acids and alkali.
* measures the indigestible portion of the plant material. (17)

FRUITS

Physiochemical characteristics of luffa acutangula fruit were: loss in dryness 2.56%, total ash 6.36, acid insoluble ash 0.68, water soluble ash 3.77%, sulphated ash 8.05%, solubility (alcohol 17.2%,) and extractive values (hexane 4.38%, ethanol 5.43%) Ash values of luffa acutangula fruit (% w/w) were: total ash 9.0, acid insoluble ash 1.0, water soluble ash 7.6 and sulphated ash 6.4, while, the extractive values of luffa acutangula fruit (%w/w) were: petroleum ether 60-80° 1.03, ethyl acetate 0.97, alcohol 1.56 and water 9.3. while, the composition of luffa acutangula fruit were: moisture 94.6%, ash content 0.26%, carbohydrates 3,86, crude protein 0.46, crude fibre content 42.94%, fat 0.1% and energy 18.18 kcal/100gm (5)

However, GC-MS analysis of hexane extract of luffa acutangula fruits revealed The GC-MS of the chloroform extract of the fruits of Luffa acutangula showed the presence of 35 different classes of compounds, such as undecane, 2,2-dimeyhyl, ethyl ester, methyl ester, eicosanoic acid ethyl ester, and others. (5)

The minerals found in the fruits of Luffa acutangula were: sodium 282.9 ppm, potassium 702 ppm, calcium 312 ppm, P 4.86%, S 2.22%, Mo 0.07%, Mg 2.62%, Si 2.19%, Fe 0.85%, Al 0.17%, Zn 0.06%, and Cu 0.10% (5). The contents of total phenolic and total flavonoids were examined in aqueous petroleum ether, ethanol, and ethyl acetate extract to the presence of the fruits of Luffa acutangula. (5).

LEAVES

According to the mineral content analysis of the leaves of Luffa acutangula, potassium (143.6 mg/g) and calcium (58.6 mg/g) were the most abundant micronutrients, while zinc and copper had the lowest concentrations of 0.6 mg/g each.

The nutritional analysis showed that the leaves had a high moisture to ash and fat content of 10.6%, 6.3%, fibre 4.0%, protein 2.6%, moisture 10.6%, carbohydrate 71.4%, calcium (58.6 mg/g), sodium (14.4 mg/g), potassium (143.6 mg/g), manganese (0.9 mg/g), copper (0.6 mg/g), magnesium (12.4 mg/g), and zinc (0.6 mg/g) (5).

4. PHYTOCHEMICAL SCREENING

Carbohydrates, carotene, lipids, amino acids, alanine, saponins, leuain, oleanolic acid, tryptophan, and other phytoconstituents are among the chemical components of luffa fruits. (14).

Several ribosome-inactivating proteins (rips) were extracted from diverse luffa acutangula sections. Since rip has a variety of pharmacological properties, such as abortifacient, antifungal, anti-tumor, antiviral, and HIV-1 integrase inhibitory properties, its medicinal uses have drawn a lot of interest. (9)

About fifty substances, including flavonoids, anthraquinones, proteins, fatty acids, saponins, triterpene, volatile components, and other phytoconstituents, have been isolated and identified as a consequence of the phytochemical investigations.

QULITATIVE ANALYSIS

Different biochemical parameters like reducing sugar, flavonoid, terpenoids, tannin, saponins, anthraquinones, glycosides, alkaloids, etc. were tested. (18)

Table 4: Phytochemicals test for luffa acutangula (Fruit).

Test	Test Result
Flavonoids (4)	Presence
Steroid (4)	Presence
Saponins (18)	Presence
Tannin (4)	Presence
Reducing sugar (18)	Presence
Alkaloids (4)	Presence
Anthraquinones (4)	Presence
Glycosides (4)	Absent

The reducing sugar test involves adding an aqueous extract to a boiling Fehling solution in a test tube; The presence of reducing sugars is indicated by a brick-red colour; (18) The flavonoid test involves extracting flavonoids, adding a few magnesium turnings, and adding concentrated HCL drop by drop; A pink hue indicates the flavonoid test; (4) The presence of tannins is indicated by the presence of a green precipitate. (4)

The steroid and terpenoids test involves extracting, drying, and dissolving in chloroform; adding a few drops of acetic anhydride and concentrated H2SO4 and leaving undisturbed for a few minutes; the presence of a green colour indicates the presence of steroids, while the terpenoids are indicated by a pink colour. (4)

Tannins are indicated by the presence of a green precipitate (4). The saponins test involves extracting 5ml of distilled H2O + heating to the boiling point frothing indicates the presence of saponins. (18) For the anthraquinones test, mix powdered material with 10 millilitres of 1% HCL, boil for 5 minutes to filter the sample, then let it cool. Then, carefully transfer the chloroform layer into clean test tubes. The presence of a delicate rose pink colour indicates the presence of combined anthraquinones. (4) For the glycosides test, dilute 0.5 gm of extract with 5 ml of water, add 2 ml of glacial acetic acid, 1 drop of Fecl solution, and 1 ml of concentrated H2SO4; brown ring is form presence of glycosides. (4) Test for alkaloids: 5ml of sample the residue is heated with 2% HCL in a boiling water bath, then filtered and treated Mayer's reagent. Alkaloids are shown by the yellow precipitate. (4)

ORGANOLEPTIC PARAMETERS

Organoleptic examination including shape, smell, taste, and color. (1) The fruit of L. The acutangula is 2-4 cm wide, 9-12 cm long, and cylindrical, with a pale yellowish-brown colour (1). The leaves of the plant have an angular, twisted petiole shape, are brownish yellow in colour, have a specific odour, are 3–8 cm in size, and are light green, 6–8 cm curled, and corrugated. (12) The leaves are simple, palmately reticulate, 5-7 lobed, orbicular, taste somewhat bitter and astringent, and are 10-20 cm long by 8-10 cm broad. (9) There was a significant correlation between the luffa variety and colour (B fig, x2=118.06), as well as between the luffa variety and the texture (D fig, x2=59.05), the luffa variety, and the aroma (A fig, x2=44.32), and the overall preference (C fig, x2=95.23). (21)

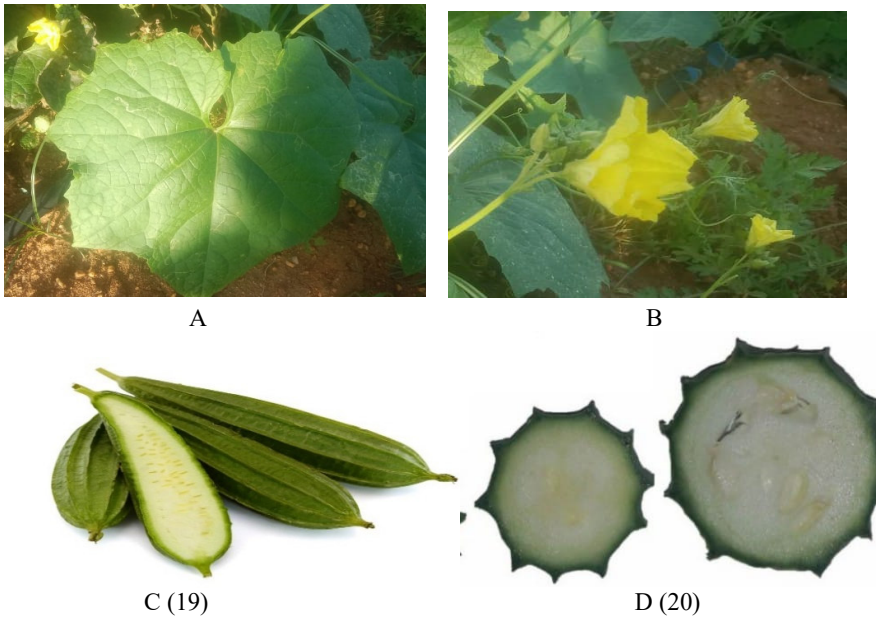


Fig 4: (A)-leave of luffa acutangula, (B)- Flower of luffa acutangula, (C)- length and inside the part of fruits, (D)-size of fruit in luffa acutangula.

Because of their capacity to absorb and hold liquids, luffa fruit are used in many different cuisines, especially in Asia. The mature fruit's fibrous inside is used as a biodegradable sponge for cleaning and personal hygiene. (22)

RIGED GOURDS HAVE MANY HEALTH BENEFITS

- Ridge gourd seeds are used as a laxative and purgative, and their oil is used to treat skin conditions. (17)
- Ridge gourd roots can be used to reduce lymph gland oedema and kidney stones. (12)
- The leaves are used to treat dysentery conditions and as a dressing for diseases like ringworms, piles, leprosy, and inflammation of the spleen. (17)

- Ridge gourds have been used as a bitter tonic, hypoglycemia, expectorant, and to stop premature greying of the hair. (12)
- It has a good quantity of fibre, calcium, phosphorus, carotene, niacin, vitamin B2, vitamin C, and other vitamins and minerals. (17)

Medicinal uses

TRADITIONAL USES

In India, different ethnic groups have utilised different sections of the luffa acutangula for medical purposes. The leaves and fruit powder are used to treat jaundice, the fruit powder is used to treat diabetes, and the sponges are applied topically to treat swollen haemorrhoids and diuretic properties. After being cleaned, the sponges were bleached and then dried in the sun, and they were used for cleaning, filtering, and bathing. Tribes in western Maharashtra used it to treat insect bites. (9), while the java-in af juice was used to treat amenorrhoea, and java-in af juice was used to treat snake bites and diarrhoea in fans. (5) In many parts of the Asian continent, the fruit is typically eaten raw or pickled like a vegetable. (22)

Luffa acutangula in Ayurveda

Luffa acutangula is rich in minerals and is very alkaline for the body, so it has a cooling effect on the body. From an Ayurvedic perspective, it increases vata and kapha but cools and pacifies the body's dosha pitta. Ayurveda has linked luffa acutangula to several health advantages, which are corroborated by recent clinical studies. (23)

Ayurvedic remedies

- To treat jaundice, mix one cup of luffa acutangula juice with two spoons of sugar and take it twice a day;
- To kill stomach worms, boil one luffa acutangula in two glasses of water, then add enough salt to it;
- To stop bleeding from wounds, grind the pulp of the luffa acutangula and apply it to the wound to stop the bleeding;
- You can grind the luffa acutangula to extract it to treat asthma, and you can cure cancer by taking half a cup of luffa acutangula juice mixed with sugar twice a day. (12)

USES

- Luffa acutangula has many biological properties, including anti-diabetic, anti-ulcer, anti-angiogenic, anti-cancer, anti-oxidant, CNS depressant, fungi static, anti-cataleptic, analgesic, anti-microbial, developmental toxicity, larvicdal, and immune-modulatory effects. (14)
- Luffa acutangula has a high water content, making it a food with very few calories, making it a great choice for people trying to lose of weight. (12)
- Blood purification, hypoglycemia, constipation, skin care, and immune system stimulation are all treated with ridge gourd. (12)
- In juice of roasted young fruit is used to treat headaches. (14)
- Dried fruit is used in China to treat joint, muscle, chest, and stomach discomfort
  Moreover, the fruits are employed in the treatment of rheumatism, dyspnea, cough and skin inflammation in Chinese folk medicine. (23)
- The fibrovascular bundle of luffa acutangula dried fruit is officially listed as a treatment of for paralytic disease in Chinese pharmacopoeia (23)
- Fruit pulp from the luffa acutangula plant is used in Korea to treat fever, induce hemostatic effects, promote menstrual flow, fortify blood vessels, and cleanse phlegm. (23)
- In Japan, used as anti-tissue and skin lotion, to treating snake bites. (23)

CONCLUSION

Luffa acutangula, it is including Macroscopic, microscopic, organoleptic, physicochemical (ash values, extractive values, moisture content), and phytochemical screening are among the standardisation parameters of luffa acutangula fruit and leaves that are essential for ensuring the crude drug's safety, quality, purity, and authenticity. These parameters offer a scientific basis for quality control, dosage formulation, and therapeutic validation in both traditional and modern pharmacognosy; therefore, standardisation helps prevent adulteration and supports the efficient use of luffa acutangula in herbal medicine.

REFERENCES

1. Efek Hepatoprotektif Ekstrak Etanol Daun Sendok (Plantago major L) Pada Tikus Model Hepatotoksik: Tinjauan Anatomi Dan Histopat [Internet]. Googleusercontent.com 2020. Available from: https://scholar.googleusercontent.com/scholar?q=cache:a9DU3hvoufcJ:scholar.google.com/+phytochemicals+and+pharmacology+review+of+luffa+acutangula&hl=en&as_sdt=0
2. Luffa acutangula- A brief rev... [Internet]. Googleusercontent.com. 2018 [cited 2025 Aug17]. Available from https://scholar.googleusercontent.com/scholar?q=cache:DIDKPQVVq4gJ:scholar.google.com/+phytochemical+and+pharmacological+review+of+luffa+acutangula&hl=en&as_sdt=0
3. Bhubaneswar in. Buy Fresh Vegetable Ridge Gourd or Janhi in Bhubaneswar at Ritikart [Internet]. www.google.com. 2024 [cited 2025 Aug 17]. Available from: https://images.app.goo.gl/VAL1cRWYMvxQyyLy8
4. Google Scholar [Internet]. Google.co.in. 2025 [cited 2025 Aug 17]. Available from: https://scholar.google.co.in/scholar?q=traditional+medicine+uses
5. Shendge PN, Belemkar S. Therapeutic Potential of Luffa acutangula: A Review on Its Traditional Uses, Phytochemistry, Pharmacology and Toxicological Aspects. Frontiers in Pharmacology [Internet]. 2018 Oct 22 [cited 2019 Sep 2];9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6232903/
6. Al-Snafi AE. A review on Luffa acutangula: A potential medicinal plant. 2019 Sep 1;9(9):56–67. Available from: https://www.researchgate.net/publication/335842958
7. Google Scholar [Internet]. Google.com. 2025 [cited 2025 Aug 17]. Available from: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=A+Critical+review+%26+compilation+on++koshataki+%28 luffa acutangula%29%3A++potential +drug+
8. Vijayasanthi P, Mydhili G, Aswini M, Seshadri S, Ramasubramania Raja R, Sreenivasulu M. Luffa Acutangula- Phyto Pharmacological Review. Int Journal of Pharmaceutical Sciences and Medicine (IJPSM) [Internet]. 2017 [cited 2025 Aug 17];2(1):1-09. Available from: https://ijpsm.com/Publish/Jan2017/V2I101.pdf
9. Google Scholar [Internet]. Google.com. 2025 [cited 2025 Aug 17]. Available from: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Pharmacological+review+of+Luffa+acutangula+%28L%29++Roxb+Preetha+S+Panicker&btnG=#d=gs_qabs&t=1755444719130&u=%23p%3DB-8HoZE6fH8J
10. A Review on the Phytochemical and Pharmacological Activitities of Luffa acutangula (L.) Roxb. Tinjauan Fitokimia dan Aktivitas Farmakologi dari Gambas Luffa acutangula (L.) Roxb. Erna Harfiani - Google Search [Internet]. Google.com. 2025 [cited 2025 Aug 18]. Available from: https://www.google.com/search?q=A+Review+on+the+Phytochemical+and+Pharmacological+Activitities+of+Luffa+acutangula+(L.)+Roxb.Tinjauan+Fitokimia+dan+Aktivitas+Farmakologi+dari+GambasLuffa+acutangula+(L.)+Roxb.Erna+Harfiani
11. Dr. J V Hebbar MD (Ayu. Ridge Gourd: Benefits, Remedies, Side Effects [Internet]. Easy Ayurveda Hospital. 2016. Available from: https//www.easyayurveda.com/2016/09/21/ridge-gourd-luffa-acutangula-benefits-research/ (share. google [Internet]. Share. google. 2025. Available from: https://share.google/27meqqqxq0kykqf0n).
12. Raja RR. Pharmacognostical phytochemical and larvicidal activity of ethanolic leaf extract of luffa acutangula (Cucurbitaceae). World Journal of Pharmaceutical Research. 2017 May 1;1357–78.
13. Alok Bhat, Arun Kumar, Ashok Kumar, Deepika chandra, Pallavi Ghildiyal. A Review on Ethno medicinal Uses and Biological activities of Luffa acutangula. International Journal of Pharmaceutical Sciences Review and Research [Internet]. 2021;98–102. Available from: www.globalresearchonline.net
14. Surbhi Ahirwar, Disha Kurmi, Deeksha Kurmi, Nisha P. Luffa acutangula: A brief review on phytochemical and pharmacological profile. Asian journal of pharmacy and pharmacology. 2023 Jan 1;9(1):20–8.
15. leaf. Transverse section of luffa acutangula leaf (lamina) | Download ... [Internet]. www.google.com. 2024 [cited 2025 Aug 20]. Available from: https://images.app.goo.gl/FYXYqYQVbJSBsn4J9
16. App.goo.gl. 2024 [cited 2025 Aug 19]. Available from: https://images.app.goo.gl/nSdbiGGK4u1Tat44A
17. Alagbe Seyi Valerie. Antimicrobial and Physicochemical Evaluation of Luffa acutangular Leaf Extracts. Biochemistry and molecular biology. 2017 Jan 1;2(6):80–0.
18. Prajapati Palash, Dwivedi Sangeeta, Vyas Narendra, Malviya Kirti, Malviya Sapna, Kharia Anil. Anti-inflammatory activity of ethanolic extract of Luffa acutangula, World Journal of Pharmaceutical research [Internet]. 2017;6(16):519–29. Available from: www.wjpr.net
19. App.goo.gl. 2024 [cited 2025 Aug 19]. Available from: https://images.app.goo.gl/gNZFmy8PKWhmE9BHA

20. The establishment of the species-delimits and varietal-identities ... wwwgoogle.com [Internet]. 2024 [cited 2025 Aug20]; Available from: https://images.app.goo.gl/RdD7E1LgZrk3prck9
21. Kumari M, N. D. U. S. Nakandala, P. W. I. Nawanjana, R. M. S. K. Rathnayake, H. M. T. N. Senavirathna, R. W. K. M. Senevirathna, et al. The establishment of the species-delimits and varietal-identities of the cultivated germplasm of Luffa acutangula and Luffa aegyptiaca in Sri Lanka using morphometric, organoleptic and phylogenetic approaches. PLOS ONE. 2019 Apr 9;14(4): e0215176–6.
22. Sharma A, Mishra S, Singh S, Ahmed S, Mehta D. Review on imperative species of medicinal plant: Luffa acutangula. An Update. American Journal of Pharm Tech Research. 2019 Dec 8;9(6):170–4.
23. Vijay Raja ram Maindkar, Abhishek.G Shinde, Yashkumar.R. dhole, Dr. Swati Deshmukh. A Review On Phytoconstituents and Pharmacological Activities of Potential Plant Luffa Acutangula (Roxeb). International Journal of creative research thoughts [Internet]. 2023; 11:616–26. Available from: www.ijcrt.org