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Phytochemical and Medicinal Insights into *Flacourtia Jangomas*: A Review

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Abstract

Flacourtia jangomas (Lour.) Raeusch is a valuable medicinal plant from the Flacourtiaceae family, widely recognized for its therapeutic applications. For centuries, it has played a significant role in traditional medicine, offering antimicrobial, anti-inflammatory, anti-diabetic, anti-asthmatic, and antioxidant benefits. Additionally, it has been used as a remedy for snake bites and jaundice, reflecting its broad medicinal potential. Recent scientific investigations have unveiled its anti-cancerous properties, alongside a rich profile of bioactive phytochemicals and pharmacological effects. Despite these promising findings, research on its micropropagation remains scarce, presenting an opportunity for further exploration in biotechnological and conservation studies.

Keywords: *Flacourtia jangomas, antimicrobial, anti-diabetic, antioxidant, pharmacological.*

1. INTRODUCTION

Medicinal plants have historically played a crucial role in traditional healthcare systems worldwide. In developing countries, reliance on plant-based medicine remains significant, with an estimated 65% to 80% of the population using medicinal plants for therapeutic purposes (WHO). Despite the vast botanical diversity, with over 300,000 known plant species, only 15% have been scientifically evaluated for their pharmacological potential (De Luca et al., 2012). This gap underscores the need for further research into medicinal flora, particularly those with documented traditional applications.

Among these, *Flacourtia jangomas* (Lour.) Raeusch. a member of the Flacourtiaceae family, has garnered attention due to its ethnomedicinal significance and bioactive properties. Traditionally utilized for its antimicrobial, anti-inflammatory, anti-diabetic, anti-asthmatic, and antioxidant effects, it has also been employed in treating snake poisoning, jaundice, and gastrointestinal disorders. Recent investigations have expanded its known pharmacological profile, highlighting its anticancer potential and a diverse spectrum of phytochemicals**.** While the therapeutic attributes of *Flacourtia jangomas* are well documented**,** its propagation remains a challenge due to slow seed germination rates, necessitating alternative propagation techniques such as inarching and budding onto self-seedlings (Hossain et al., 2011).

Additionally, its distribution is facilitated by frugivorous birds, which disperse the seeds across wide geographic areas. The species is indigenous to northeastern India, predominantly occurring in regions such as Uttar Pradesh, Bihar, Maharashtra, West Bengal, Assam, Odisha, and the southern peninsular states, as well as along the Brahmaputra Valley and northeastern territories (Dutta & Borah, 2017). Beyond its medicinal properties, *Flacourtia jangomas* is valued for its nutritional significance, primarily through its edible fruits, which are dark red or purple when ripe, possessing **a** pleasant tart flavor. These fruits are commonly consumed raw or processed into jams and pickles (Singh et al., 1994). In Ayurvedic and Indian traditional medicine, the fruits are regarded for their ability to balance doshas and alleviate toxic conditions**,** while decocted leaves are prescribed for the treatment of dysentery, diarrhea, and piles (Kritikar et al., 1993).

This review aims to explore the phytochemical composition, pharmacological applications, propagation challenges, and future research

directions of *Flacourtia jangomas*. By synthesizing current knowledge on this species, the study seeks to identify potential avenues for further scientific investigation and practical applications in conservation and medicinal research.

2. Flacourtia Jangomas (Lour.) Raesuch

Flacourtia jangomas (Lour.) Raeusch. is an important medicinal plant that exhibits wide distribution across various ecological zones of India. It is particularly prevalent in the Terai region of Uttar Pradesh, including Gorakhpur district, as well as Bihar, Maharashtra, West Bengal, Assam, and Odisha. Additionally, populations of *Flacourtia jangomas* are observed in southern regions of the Indian peninsula, where the species thrives in subtropical and tropical climates (Dutta & Borah, 2017).

The North-eastern region of India serves as a key habitat for *Flacourtia jangomas*, as it is located within one of the biodiversity hotspots of India, encompassing areas rich in endemic flora and fauna (Barua et al., 2022). The plant is frequently encountered along the Brahmaputra Valley and its adjoining regions, where its growth is facilitated by favourable1 climatic conditions and seed dispersal mechanisms, particularly by birds that consume its fruits and aid in natural propagation (Hossain et al., 2011).

Beyond its widespread distribution, *Flacourtia jangomas* contributes significantly to local ecological stability, serving as a vital component of forest ecosystems and agroforestry systems. Its ability to thrive in diverse environmental conditions underscores its ecological adaptability and potential for sustainable cultivation and conservation efforts. Furthermore, its role in traditional medicine and nutritional applications has enhanced interest in its ethnobotanical, pharmacological, and genetic study.

3. Taxonomic Classification

Kingdom : Plantae
Subkingdom : Viridiplantae
Infrakingdom : Streptophyta (Land plants)
Superdivision : Embryophyta
Division : Tracheophyta (Vascular plants)
Subdivision : Spermatophytina
Class : Magnoliopsida
Superorder : Rosanae
Order : Malpighiales
Family : Salicaceae (Willows)
Genus : Flacourtia
Species : angomas (Lour.) Raeusch.

4. Vernacular Name

Hindi : Talispatri
Sanskrit : Sruvavrksha, Vikankatah
English : Indian coffee plum, Indian sour cherry
Arabic : Talisfir, Zarnab
Assamese : Paniyal
Bangladesh: Painnagola
Bengali : Tipafol, Luluki
Brazilian : Cereja-De-Cameta
Chinese : Yun Nan Ci Li Mu
Kannada : Chankali, Goraji
Konkani : Jagam
Manipuri : Heitroi
Malayalam : Lubica, Lovlolika, Vayyamkaitha
Marathi : Champeran
Oriya : Baincha
Tamil : Vaiyyankarai
Telugu : Kuragayi

5. Botanical Description

Flacourtia jangomas, commonly known as paniala, is a fascinating evergreen fruit tree native to lowland regions of Southeast and East Asia. Though cultivated widely, it isn't typically found growing in truly wild conditions, as noted by Sleumer in 1954. Farmers primarily propagate the tree through seeds, though germination tends to be slow, making techniques like inarching or budding onto self-seedlings more effective. Standing at about 8–9 meters tall, this tree has a dense canopy of foliage and an irregular shape. Its rough bark, often adorned with multiple spines at the base, adds to its distinctive appearance. The leaves, ovate or ovate-lanceolate, follow an alternate phyllotaxy, providing an aesthetic contrast to its rugged trunk. *Flacourtia jangomas* produces dioecious flowers that emerge in axillary and terminal racemes, later giving way to small, globular fruits. These fruits start out green but gradually transition to a deep reddish-brown when ripe, at which point they are either enjoyed fresh or sold in local markets.

Beyond its visual appeal and edible fruits, this species is rich in pharmacological potential. Its leaves, stem, bark, and fruit exhibit a wide array of medicinal properties, including anti-inflammatory, antimicrobial, antioxidant, antimalarial, antidiabetic, anti-asthmatic, and

antibacterial activity. The ripe fruit, in particular, is a powerhouse of beta-carotene, flavonoids, phenolic compounds, tannins, and minerals—making it a valuable resource both nutritionally and therapeutically (Dubey & Pandey, 2013; Hossain et al., 2021). It's remarkable how this tree, with its rugged charm and medicinal benefits, plays such a vital role in traditional healing practices and local economies.

6. Anti-Bacterial Or Anti-Microbial Activity

Flacourtia jangomas has gained attention for its promising antibacterial and antimicrobial properties, making it a valuable resource in natural medicine and pharmaceutical research. Studies have shown that its fruit extract effectively combats pathogens such as *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *E. coli* (Srivastava et al., 2012). More recent research has demonstrated that the n-butanol extract of its fruits exhibits significant antimicrobial activity against *E. coli* and *Staphylococcus aureus*, even outperforming Chloramphenicol, a widely used antibiotic (S. Das et al., 2017).

Beyond its antibacterial properties, the ripe fruit contains an impressive array of bioactive compounds, including amino acids, anthocyanins, β-carotene, tannins, alkaloids, saponins, flavonoids, and phenolic compounds. These constituents contribute to its potent antioxidant capacity and ability to support overall health (Sajeesha Sasi et al., 2018). Intriguingly, an aqueous extract of the ripe fruit, combined with silver nanoparticles, has demonstrated strong inhibitory effects against various pathogenic bacterial strains. This innovative approach has even been explored as an alternative to EDTA in silver nanoparticle biosynthesis (Farooq Ahmad et al., 2020).

In experimental conditions, concentrated formulations of *Flacourtia jangomas* have shown antagonistic effects against both Gram-positive and Gram-negative bacteria when tested using plate dispersal methods (Parvin et al., 2011). Additionally, the methanolic extract from the roots of *Flacourtia indica* has exhibited antibacterial potential against human pathogens (Gayathri Devaraja et al., 2013). The cumulative findings suggest that *Flacourtia jangomas* and related species may hold significant potential for developing new antimicrobial treatments, particularly as resistance to conventional antibiotics continues to rise.

7. Antioxidant Activity

Flacourtia jangomas has demonstrated remarkable antibacterial and antimicrobial potential, positioning it as a promising natural solution against harmful bacteria. Research highlights its effectiveness in inhibiting pathogens like *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *E. coli* (Srivastava et al., 2012). Recent studies have gone further, showing that its n-butanol extract offers strong antimicrobial activity against *E. coli* and *Staphylococcus aureus*, even outperforming the standard antibiotic Chloramphenicol (S. Das et al., 2017). Its ripe fruits are packed with bioactive compounds—amino acids, anthocyanins, β-carotene, tannins, alkaloids, saponins, flavonoids, and phenolic compounds—all contributing to its robust antioxidant properties (Sajeesha Sasi et al., 2018). Notably, aqueous extracts combined with silver nanoparticles have shown promising antibacterial effects, revealing potential applications in nanoparticle biosynthesis as an alternative to EDTA (Farooq Ahmad et al., 2020).

Further experimental findings suggest concentrated *Flacourtia jangomas* formulations could serve as effective antimicrobial agents, particularly in controlling Gram-positive and Gram-negative bacterial strains in controlled lab settings (Parvin et al., 2011). Additionally, methanolic extracts from *Flacourtia indica* roots have also demonstrated antibacterial efficacy against human pathogens (Gayathri Devaraja et al., 2013). The research points to *Flacourtia jangomas* as a valuable natural alternative in antimicrobial treatments, particularly as antibiotic resistance becomes an increasing concern.

8. Analgesic Potential

Flacourtia jangomas has been recognized for its analgesic effects, particularly through its ethanol leaf extract. Two key experimental approaches have demonstrated its pain-relieving capacity:

- **Acetic Acid Writhing Test** – When administered at doses of 250 mg/kg and 500 mg/kg, the extract significantly reduced writhing responses by 45.45% and 67.05%, respectively, highlighting its effectiveness in alleviating pain (Talukdar et al., 2012).
- **Hotplate Test** – The ethanol extract also elevated the pain threshold in test subjects, further validating its potential as a natural analgesic agent.

These findings suggest that *Flacourtia jangomas* may serve as a valuable candidate for developing plant-based pain management solutions.

9. Anti-Diabetic Properties

The methanolic extract derived from *Flacourtia jangomas* leaves and stems (in a 1:1 combination) has shown promising results in controlling diabetes, particularly in streptozotocin-induced diabetic rats. Research indicates that the ethanolic extract enhances its anti-diabetic efficacy by targeting blood glucose regulation while leveraging secondary metabolites like flavonoids, saponins, and tannins (Singh & Singh, 2010).

Another study examined the effects of *Flacourtia jangomas* extract on hyperglycemic rats, measuring key parameters such as blood glucose levels, body weight, serum lipid profiles, and glycogen levels in liver and muscle tissues. Notably, oral administration at doses of 200 mg/kg and 400 mg/kg led to a significant reduction in glucose levels, reinforcing the plant's potential in diabetes management (Surjit Singh et al., 2010). These findings for exploring *Flacourtia jangomas* as a natural remedy for pain relief and diabetes treatment, warranting further research into its bioactive compounds and underlying mechanisms.

10. Antifungal Potential

While the antifungal properties of *Flacourtia jangomas* remain unexplored, other species within the Flacourtiaceae family have demonstrated promising activity. Notably, *Flacourtia inermis*, a flowering plant native to the Philippines, has been reported to exhibit antifungal effects. Research suggests that its acetonic fruit extract contains compounds capable of inhibiting human opportunistic pathogenic fungi. However, given the absence of specific studies on *Flacourtia jangomas*, its potential antifungal properties remain uncertain and warrant further investigation.

11. Potential Antidote For Snake Poisoning

The antidotal properties of *Flacourtia jangomas* have yet to be studied, but research on related species within the Flacourtiaceae family suggests potential medicinal applications. *Flacourtia sepiaria*, for example, has been documented as an effective antidote for snake bites, with leaf and root infusions showing promising effects in neutralizing venom (Kumar Patro et al., 2013). This raises intriguing possibilities for *Flacourtia jangomas*, encouraging further research into its chemical composition to determine whether similar properties exist.These gaps in knowledge highlight the need for continued exploration, as the medicinal value of *Flacourtia jangomas* may extend beyond its currently known applications.

12. Conclusion

Flacourtia jangomas is an intriguing plant with a diverse range of bioactive properties, making it a valuable subject of pharmacological and ecological research. Its antimicrobial, antioxidant, analgesic, and anti-diabetic effects provide a strong foundation for exploring its medicinal potential. While its antibacterial and antifungal activities have been partially documented, further studies could unlock new applications, particularly in developing natural alternatives to synthetic drugs**.**

Additionally, its untapped antidotal properties suggest exciting possibilities for venom neutralization, inspired by related species within the Flacourtiaceae family. The need for advanced chemical profiling and metabolomic investigations remains, offering a deeper understanding of its phytochemical composition and therapeutic mechanisms. Overall, *Flacourtia jangomas* stands as a promising candidate for future studies, reinforcing the importance of biodiversity conservation and plant-based medicinal discoveries.

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References

[1] De Luca V, Salim V, Atsami SM, Yu F (2012) mining the biodiversity of plants: *a revolution in the making ,science* 336; 1658-61 do,10. 1126/ science, 1217410, pmid: 22745417.

[2] Dutta Band Borah N. Studies on nutraceutical properties of *Flacourtia jangomas* fruits in Assam. *India j Med, plants stud* 2017; 5:50-3.

[3] Hossain M. A, Sen S, Jewel M.I.Uand Kabir, M.A. Propagation of *Flacourtia jangomas*: an approach towards the domestication of a wild fruit species in Bangladesh. Dendrobiology 2011; 65:63-71.

[4] WHO (world health organization) (2011).The world traditional medicines situation, in Traditional medicines global situation, issues and challenges Geneva 3:1-14.

[5] Singh M.P., Nayar M.P. and Roy R.P. Textbook of forest taxonomy, New Delhi*:* Anmol Pub Pvt Ltd; 1994.p 132.

[6] Krithikar K.R., Basu B.D. and Taylor L. G. Indian medicinal plants.2nd ed.1. Dehra Dun, India: Bishen Singh Mahendra Pal Singh; 1993.p. 220.

[7] Dubey N., and Pandey V. N., (2013).reducing activity of fruits of Flacourtia jangomas (Lour.)Raeusch. *Adv. life Sci*., 2(2):82-83.

[8] Hossain, M., Rahim, A. and Haque, R. (2021). Biochemical properties of some, important underutilized minor Fruits. *Journal of Agriculture and Food Research.*5, 1-7.

[9] Talukder, C., Saha, S., Adhikari, S., Mondal, H.K., Khirul Islam, Md., Anisuzzman, Md. (2012). Evaluation of antioxidant, analgesic and antidiarrhoeal activity of *flacourtia jangomas* (lour.) Raeusch. Leaves. *Pharmacology OnLine* 3, 20-28.

[10] Senthil Kumar, R., Vinoth Kumar, S., Abdul Lathiff, MKM. Uma Krithika, S., Sudhakar, P. (2018). Antioxidant and anti-inflammatory activities of leaf extracts of *Flacourtia jangomas* (Lour.)Raeusch: An in vitro study. *Advance Pharmaceutical journal* 3(6), 169-176.

[11] Rahman, M. MD., Habib, R. MD., Hasan,R., Islam, T.M.A., Khan, N.I., (2011). Comparative antioxidant potential of different extracts of Flacourtia jangomas lour fruits. *Asian journal of pharmaceutical and clinical research* 5(1), 2012.

[12] Singh, A.K., Singh, J., Evaluation of anti-diabetic potential of leaves and stem of Flacourtia jangomas in streptozotocin-induced diabetic rats. Indian J Pharmacol 42(5), 301-305.

[13] Srivastava, D., Prabhuji, S., Tripathi, A., Srivastava, R., Mishra, P (2012). In vitro antibacterial activities of *Flacourtia jungomas* (Lour.) Raeus. Fruit extracts. Med. Plants-Int J. Phytomed. Related Indust. 4(2), 98–100.

[14] Das, S., Dewan, N., Das, K.J., Kalita, D (2017). Preliminary phytochemical, antioxidant and antimicrobial studies of *Flacourtia jangomas* fruits. Int. J. Curr. Pharm. Res. 9(4), 86–91 (2017).

[15] Sasi, S., Anjum, N., Tripathi, Y (2018). Ethnomedicinal, phytochemical and pharmacological aspects of Flacourtia jangomas: a review. Int. J. Pharm. Pharm. Sci. 10, 9–15.

[16] Ahamd, A., Taj, M.B., Ramzan, M., Ali, H., Ali, A., Adeel, M., Iqbal, H.M.N., Imran, M (2020). One- pot synthesis and characterization of in house engineered silver nano particals from *Flacourtia jangomas* fruit extract with effective antibacterial profiles. jounral of nanostruscture of chemistry .September 2020. DOI: 10.1007/s 40097-020-00354-w.

[17] Parvin, S., Kader, A., Sarkar, G.C., Hosain, S.B (2011) In-vitro studies of antibacterial and cytotoxic properties of *Flacourtia jangomas*. International journal of Pharmaceutical sciences and Research. 2(11) 2786-2790.

[18] Eramma, N., and Gayathri, D., (2013) Antibacterial potential and phytochemical analysis of *Flacourtia indica* (Burm.F) Merr. Root extract against human pathogen. Indo American journal of Pharmaceutical research. 3(5) 2231-6876.

[19] Singh, N.S., Geetha, M., Amudha, P., Chakraborty, A (2010). Evaluation of anti-diabetic activity of methanol extract of *Flacourtia jangomas* (lour) in streptozotocin induced diabetic rats. *International Journal of Pharma and Biosciences* 1 (3), 1-11

[20] Patro, S.K., Behera, P., Kumar, P.M., Sasmal, D., Pandy, R.K., Dash, S.K (2013). Pharmacological review of *Flacourtia sepiaria* (Ruxb). Scholars Academic Journal of Pharmacy 2(2), 89-93.

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