Casearia tomentosa Roxb: A comprehensive review on botany, traditional uses, phytochemistry and pharmacology

Md. Al-Mahdi Talukdar, Md. Abdul Mannan, Razia Sultana Nijhu and Ambia Khatun

DOI: https://doi.org/10.22271/phyto.2021.v10.i5b.14231

Abstract

Casearia tomentosa is a member of the Salicaceae family, which is also known as Chilla. Different portions of Casearia tomentosa have traditionally been used to treat ulcers, dropsy, fissures, malarial fever, tonsillitis pain, wounds, and plaster. The fruit juice of Casearia tomentosa have traditionally been used to treat ulcers, dropsy, fissures, abdominal colic discomfort, malarial fever, tonsillitis pain, wounds, and severe bone fractures as a plaster [3; 4; 5]. The fruit juice of Casearia tomentosa is used to cure seafood poisoning, while a decoction of the boiling water extract of the root bark is taken to treat diabetes. Ringworm is treated with stem bark juice. A decoction of leaves is used to cure dropsy and snake bites. The fruit's pulp has diuretic effects [6]. Casearia tomentosa is an understudied plant with a wide range of traditional applications. This article summarizes the findings of a thorough research of secondary metabolites, total phenolic content, and biological activities such as antioxidant, antidiabetic, and antibacterial, in order to offer reliable scientific information about the plant Casearia tomentosa.

As a result, the goal of this study is to offer a complete overview of Casearia tomentosa's botany, phytochemistry, and pharmacology, as well as to highlight information gaps for future research.

2. Taxonomical Classification

Kingdom: Plantae
Phylum: Tracheophyta  
Class: Equisetopsida  
Order: Malpighiales Juss.  
Family: Salicaceae  
Genus: Casearia  
Species: *Casearia tomentosa* Roxb.

3. Synonyms  
*Anavinga lanceolata* Lam.  
*Bedousia malabarica* Dennst.  
*Casearia ovata* Roxb.  
*Guidonia tomentosa* Roxb.  
*Casearia elliptica* Willd.  
*Casearia pauciflora* Royle

4. Vernacular Names  
English: Toothed Leaf Chilla  
Bangladesh: Bhari, Chilla, Maun  
Pakistan: Chilla  
Hindi: Chilla, Churcha  
Nepali: Sonne bethe  
Tamil: Kottukkovai, Kakoli, Kodichai

5. Description  
*Casearia tomentosa* is a deciduous tree with a short trunk. It may reach a height of 7-8 meters. All portions of the plant are bitter, and the branches are spreading. The leaves are serrated, elliptic-oblong, and oblique at the base. The stem is 6-12 mm long and the leaves are 5-12 cm long. The hairy midrib and stalks of fully developed leaves. Flowers are velvety, greenish-yellow, regular bisexual, and thickly grouped on scaly axillary tubercles, measuring 8 mm wide. There are no petals. The average number of sepals is five. Stamens generally number eight and are alternated with short hair-like staminodes. The fruit has six ribs, three valves, and seeds buried in a crimson flesh. Fish poison is made from the fruit’s juice. Combs may be made from the wood. March-May are the months when the flowers bloom.

![Image](image_url)

**Fig 1:** *Casearia tomentosa* Roxb

6. Geographic Range  
6.1 Distribution  
Global Distribution  
Asia: India, Nepal, Pakistan, Sri Lanka.

Local Distribution  
Andaman and Nicobar Islands, Andhra Pradesh, Jammu and Kashmir, Karnataka, Kerala, Maharashtra.

6.2 Habitat  
Dry deciduous forests to scrubs, altitude up to 900 m.

7. Traditional Uses  
It has a long history of traditional applications, including diabetes, skin disorders, gastric ulcers, and malarial fever, according to literature. When fruit juice or powder is added to water, it acts as a fish toxin and kills the fish. Root bark decoction is used to treat diabetes. Its use of stem bark juice aids in the healing of ring worm. Bark juice is used to treat snake bites. In the case of oedema, bark juice is administered externally. *Casearia tomentosa* is also listed as a source of antidotes for snake bites in a review of medicinal plants used in the treatment of local tissue damage caused by snake venom, from traditional use to pharmacological proof.

8. Phytochemical Constituents  
The phytochemical screening and various pharmacological properties of several extracts of the leaves of the plant *Casearia tomentosa* were examined in this study. Alkaloids, flavonoids, carbohydrates, glycosides, protein, and other phytochemicals are found in *Casearia tomentosa* leaves. Preliminary phytochemical analysis of this plant's extract indicated the presence of active phytoconstituents such as steroids, phytosterol, terpenoids, fats and oils, and other phytocomponents. Terpenoids are one of the most common and chemically varied classes of natural compounds. Plant-derived terpenoids have been shown to have antioxidant, anticancer, anti-inflammatory, sedative, and cytotoxic properties. Plant steroids, often known as "cardiac glycosides," are one of the most commonly found phytoconstituents in plants, and several studies have supported their use as heart medicines and antioxidants. Aside from phytosteres, this plant extract also included flavonoids, which are responsible for antioxidant action. Various studies show that plant-fixed oil has a wide range of biological activities, including cytotoxic and antioxidant properties. GC-MS Analysis of leaves oil. This study revealed 13 chemical entities that accounted for 77.62 percent of the overall oil composition. Terpenoids, diterpenoids, sesquiterpenoids, fatty acid esters, hydrocarbons, and other compounds make up leaves essential oil. The oil is mainly composed of 9,12-Octadecadienoic acid, ethyl ester (31.45%) followed of the 9,12,15-Octadecatienoic acid, ethyl ester (20.11%), Phytol (10.7%), Di-epi-alpha-cedrene (3.74%), Betabisabolene (1.87%), β-Caryophyllene (0.83%) and some other trace components.

9. Pharmacological Activities  
A study of the antioxidant activity of the leaves of the *Casearia tomentosa* plant revealed that it has a high antioxidant property. Different extracts of the leaves of the plant *Casearia tomentosa* have been found to be a possible natural source of antioxidant, anti-convulsive, and antibacterial agents in the current investigation. The goal of this study is to see if *Casearia tomentosa* Roxb's bark and leaf extracts have antibacterial and antioxidant properties. The extracts have good to satisfactory antimicrobial properties, with methanolic leaf extract having a maximum bactericidal potential of 37 3.03 mm in an agar-well diffusion experiment against *E. coli* and 0.013 0.05 (at 0.9 mg/L) in an agar-well diffusion assay against B. subtilis by broth-dilution (MIC) analysis. Methanolic leaf extract also has antifungal activity against F. solani, with a value of 34.5 4.59 mm, and A. oryzae, with a MIC of 0.010 0.001 (at 0.9 mg/L). The bark
petroleum-ether extract had a radical scavenging potential of 92.5 0.03 percent, while the chloroform extract of the leaf had an IC_{50} of 10.77 1.02 g/mL. TAA (maximum at 1.131 0.10 by bark methanolic extract), FRAP (highest at 296 0.23 by chloroform bark extraction), and TPC (peak at 86.16 0.08 GAE mg/mL of chloroform bark extract) are used to confirm the plant's antioxidant capabilities [14].

10. Acute Toxicity
Mice were used in an acute toxicity test, as described before. Mice were split into nine groups, with each group including six mice. 1 percent Tween 80 in normal saline was administered to Group 1. (2 ml per kg body weight). The remaining eight groups (Groups 2-9) were given 100, 200, 300, 600, 800, 1000, 2000, and 3000 mg of MECE per kg of body weight, respectively. For the following 8 hours, all animals were closely monitored for any behavioral abnormalities or death, and they were kept under close monitoring for the next two weeks. Even at the highest dose tested, the crude extract (MECE) showed no toxicity in mice. There were no behavioral changes, and no mortality was reported [15].

11. Conclusions
Casearia tomentosa is a medicinal herb with ethnopharmacological significance. Alkaloids, flavonoids, carbohydrates, glycosides, protein, steroids, phytosterol, terpenoids, lipids and oils, and other active phytoconstituents were found in this plant. The leaves of Casearia tomentosa have been shown to be a natural source of antioxidants, antidiabetic, and antibacterial agents. However, there is a scarcity of pharmacological information about this therapeutic herb. To discover the active chemicals and the underlying processes, more study is required. As a result, the goal of this study is to offer a complete overview of Casearia tomentosa's botany, phytochemistry, and pharmacology, as well as to highlight information gaps for future research.

12. Conflict of interest statement
We declare that we do not have any competing interests.

13. Acknowledgements
The authors would like to express their gratitude to the Department of Pharmacy at Stamford University Bangladesh for their continued support and encouragement.

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