

Chapter 11

Phytochemical screening of fruits of *Casearia graveolens*

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Abstract: Qualitative phytochemical analysis of *Casearia graveolens* fruit extracts was carried out using acetone, ethanol, and distilled water solvents. Our results show the presence of tannins, phenolic compounds, reducing sugars, and steroids in various extracts, while saponins, flavonoids, terpenoids, alkaloids, and carbonyl compounds were absent. These findings provide valuable insights into the bioactive compounds present in *C. graveolens* fruits, which may have implications for their potential medicinal properties and applications

Keywords: Bioactive compounds, trees, riparian

INTRODUCTION

For centuries, plants have been fundamental to traditional medicine, and trees are especially valued for their healing properties (Sahu et al., 2024). They are a treasure trove of bioactive compounds, showcasing antioxidant, anti-inflammatory, and antimicrobial properties (Roy et al., 2025). The varied phytochemicals in trees have paved the way for developing many pharmaceuticals and nutraceuticals, demonstrating their crucial role in

uncovering new therapeutic leads (Bolling et al., 2011). The screening of bioactive compounds from trees has gained significant attention in recent years, driven by the need for novel and sustainable sources of medicines (Batiha et al., 2022). Trees have evolved complex defence mechanisms to protect themselves against pathogens and environmental stressors, resulting in the production of a wide range of phytochemicals with potential medicinal applications (War et al., 2012). By exploring the secondary metabolites of trees, researchers can identify novel compounds with therapeutic potential, which can be developed into new treatments for various diseases. *Casearia graveolens* Dalzell, (Figure 1) a tree species belonging to Salicaceae family and known for its medicinal properties, has been studied for its bioactive compounds (Shin et al., 2018). The fruit of this tree has been reported to exhibit various biological activities (Panda et al., 2017). Present study aims to investigate the phytochemical composition of *C. graveolens* fruit extracts, with a focus on identifying bioactive compounds that may have potential medicinal applications. By exploring the phytochemical profile of this tree species, we hope to contribute to the discovery of novel therapeutic agents and further highlight the importance of trees in the screening of bioactive compounds.

METHODOLOGY

The fruits of *C. graveolens* were collected from the Mahanadi River areas, Cuttack district, Odisha, India (Figure 2). The Soxhlet extraction method was adopted using acetone, ethanol and distilled water. Detection of selected secondary metabolites were conducted using standard methods (Kumar et al., 2013a; Devi et al., 2023; Marndi et al., 2024; Jena et al., 2024).

Table 1: Phytochemical analysis of fruits of *Casearia graveolens* using different extracts

Bioactive compounds	Acetone extract	Ethanol extract	Aqueous extract
Tannin	+ve	+ve	+ve
Saponin	-ve	-ve	-ve
Flavonoids	-ve	-ve	-ve
Terpenoids	-ve	-ve	-ve
Phenolic compounds	+ve	+ve	+ve
Reducing sugar	+ve	+ve	+ve
Steroids	+ve	+ve	-ve
Alkaloids	-ve	-ve	-ve
Carbonyl compounds	-ve	-ve	-ve

(+ve: Present; -ve: Absent)

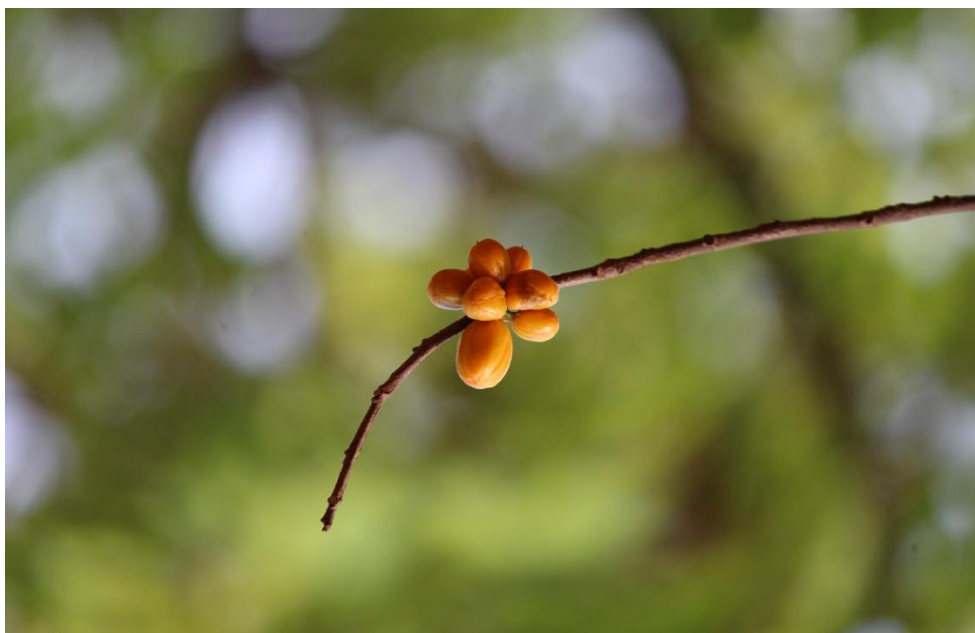


Figure 1: Fruits of *C. graveolens*



Figure 2: Powder of fruits of *C. graveolens*

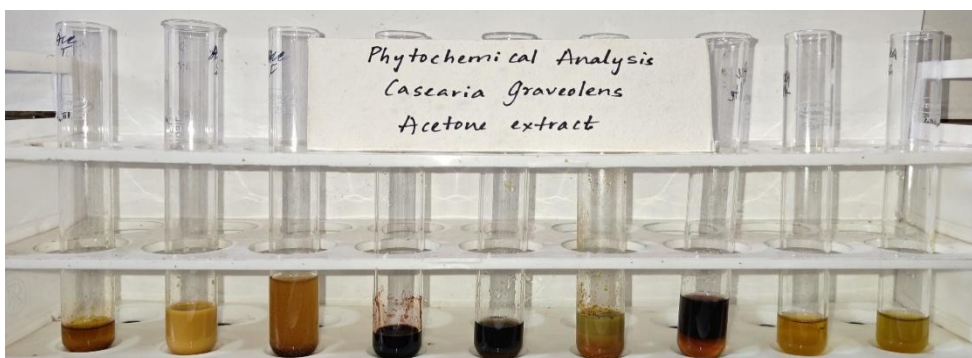


Figure 3: Phytochemical analysis of the fruits of *C. graveolens* using acetone extract

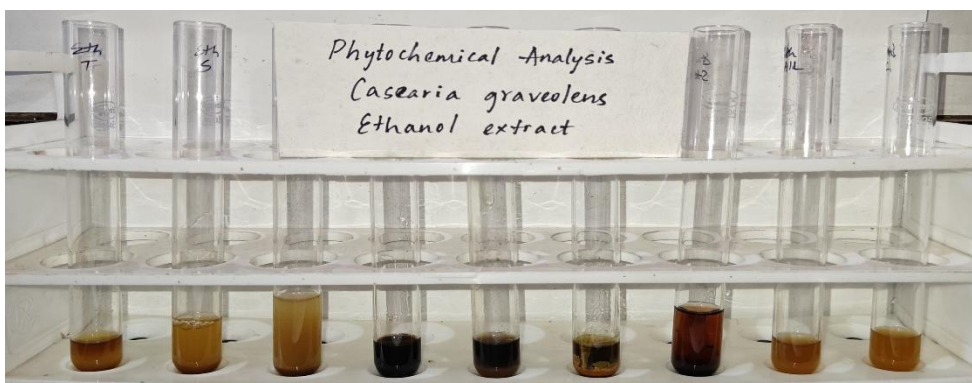


Figure 4: Phytochemical analysis of the fruits of *C. graveolens* using ethanol extract

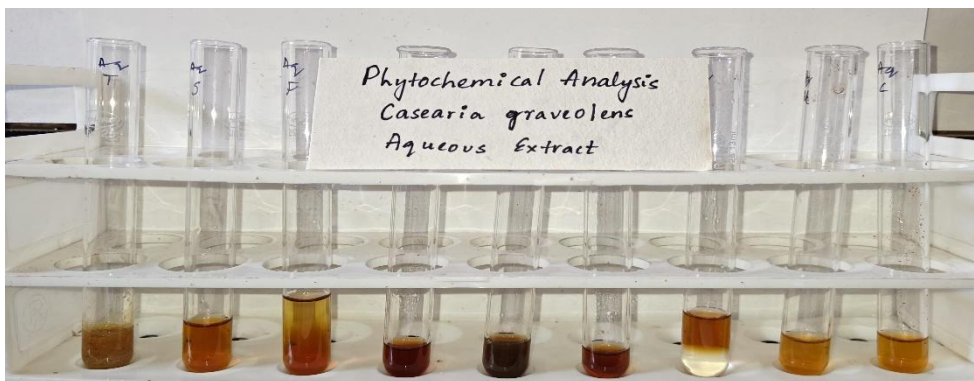


Figure 5: Phytochemical analysis of the fruits of *C. graveolens* using aqueous extract

RESULTS AND DISCUSSION

The phytochemical analysis of *Casearia graveolens* fruit extracts showed that tannins, phenolic compounds, and reducing sugars were consistently present across acetone, ethanol, and aqueous extracts (Figures 3-5). Meanwhile, steroids were found only in acetone and ethanol extracts, and several compounds, including saponins, flavonoids, terpenoids, alkaloids, and carbonyl compounds, were not detected. The presence of these bioactive compounds suggests that *C. graveolens* fruits may possess medicinal properties, including antioxidant, anti-inflammatory, and antimicrobial effects.

CONCLUSION

Present study confirms the presence of bioactive compounds in *Casearia graveolens* fruit extracts, underscoring their potential health benefits and validating traditional usage. Additional research is needed to investigate therapeutic uses and clarify the pharmacological impacts of these compounds.

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