

Chapter 13

Nutritional and medicinal profiling of *Annona reticulata* (Annonaceae) fruit pulp

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Abstract: *Annona reticulata* L., is a tropical fruit-bearing tree with a history of traditional medico-food use. Present study investigated the nutritional and medicinal properties of *A. reticulata* fruit pulp using various solvent extracts. The results revealed that the fruit pulp contains essential primary metabolites, including carbohydrates, starch, and lipids, as well as proteins and amino acids. Furthermore, the pulp was found to possess a range of bioactive compounds, including tannins, saponins, flavonoids, terpenoids, phenolic compounds, reducing sugars, and alkaloids. Present study underscores the potential of *A. reticulata* as a rich source of phytochemicals with considerable medicinal and nutritional value. Further research is necessary to isolate and characterize the bioactive compounds present in the fruit pulp of *A. reticulata*.

Keywords: Fruits, food, medicinal, trees

INTRODUCTION

Annona reticulata is a tropical fruit-bearing tree belonging to the family Annonaceae (Figure 1). It is commonly known as Bullock's heart (Jamkhande and Wattamwar, 2015). It has been used in traditional medicine for various purposes (Zaman and Pathak, 2013). The fruit pulp is used as medico-food by the tribal communities (Nayak and Kumar, 2023). The fruit pulp is particularly valued for its medicinal properties and is used in various traditional remedies (Nayak and Kumar, 2023). Despite its traditional use (Nirmal et al., 2010) further scientific investigation into the evaluation of medico-food values of fruit pulp of *A. reticulata* is

needed. Therefore, present study aimed to investigate the primary and secondary metabolites of *A. reticulata* fruit pulp using different solvent extracts. Present study highlights the importance of fruit pulp as traditional medico-food.

METHODOLOGY

The fruit pulp of *A. reticulata* was collected from Cuttack district, Odisha, in March 2025. The Soxhlet extraction method was employed using three solvents (n-hexane, ethanol, and aqueous) to evaluate the food and medicinal values of the fruit pulp (Devi *et al.*, 2023; Rout *et al.*, 2024; Hossain *et al.*, 2025).

RESULTS AND DISCUSSION

The primary metabolites analysis of *A. reticulata* fruit pulp revealed the presence of primary metabolites, including carbohydrates, starch, and lipids (Table 1; Figures 2-4). Proteins and amino acids were detected in the ethanol extract, indicating the potential nutritional value of the fruit pulp (Table 1). The secondary metabolites analysis of the pulp of *A. reticulata* was carried out using n-hexane, ethanol, and aqueous extracts.

Table 1: Phytochemical analysis of primary metabolites in *Annona reticulata* fruit pulp using different extracts

Primary metabolites	n-Hexane extract	Ethanol extract	Aqueous extract
Protein	-ve	+ve	+ve
Carbohydrates	+ve	+ve	+ve
Starch	+ve	+ve	-ve
Sucrose	-ve	-ve	-ve
Lipid	+ve	-ve	+ve
Amino acids	-ve	+ve	-ve

Table 2: Phytochemical analysis of pulp of *Annona reticulata* using different extracts

Bioactive compounds	n-Hexane 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: Presence; -ve: Absence)



Figure 1: Fruit pulp of *A. reticulata*

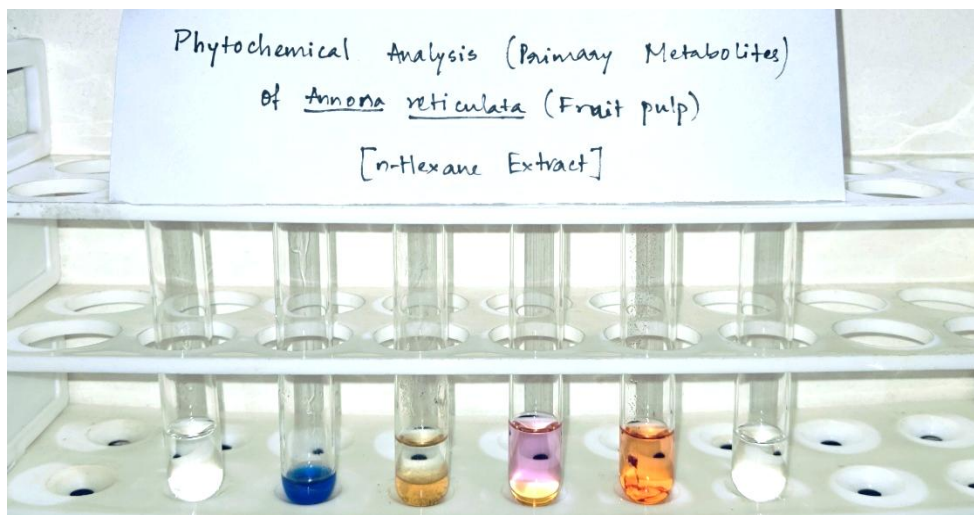


Figure 2: Phytochemical analysis of primary metabolites of *A. reticulata* fruit pulp using n-hexane extract

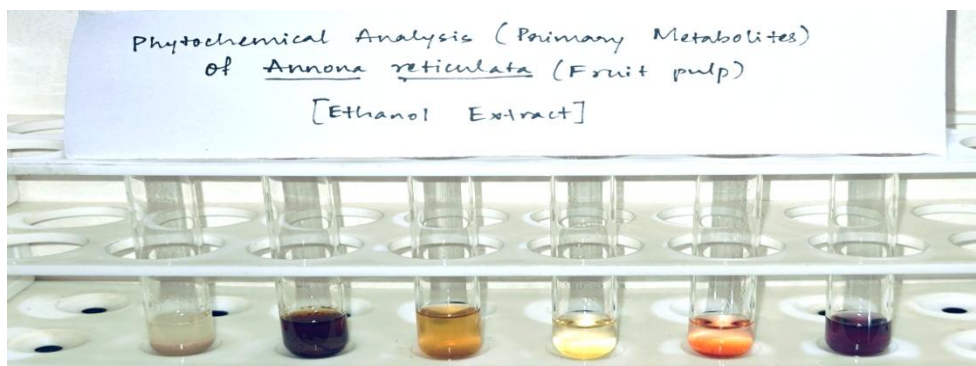


Figure 3: Phytochemical analysis of primary metabolites of *A. reticulata* fruit pulp using ethanol extract

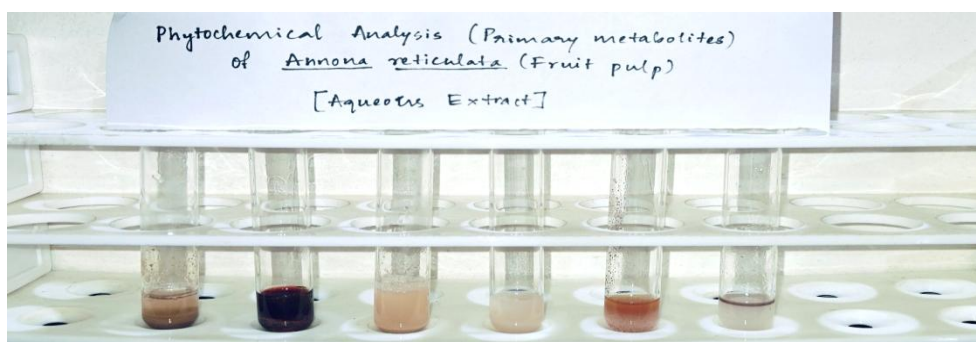


Figure 4: Phytochemical analysis of primary metabolites of *A. reticulata* fruit pulp using aqueous extract

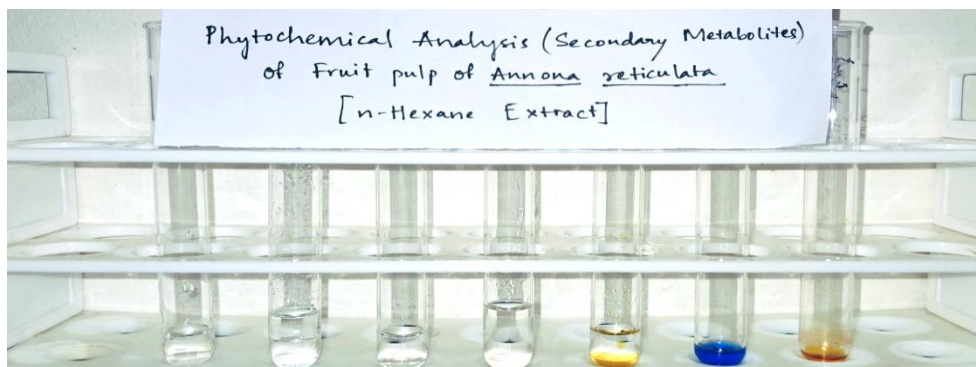


Figure 5: Phytochemical analysis of secondary metabolites of *A. reticulata* fruit pulp using n-hexane extract

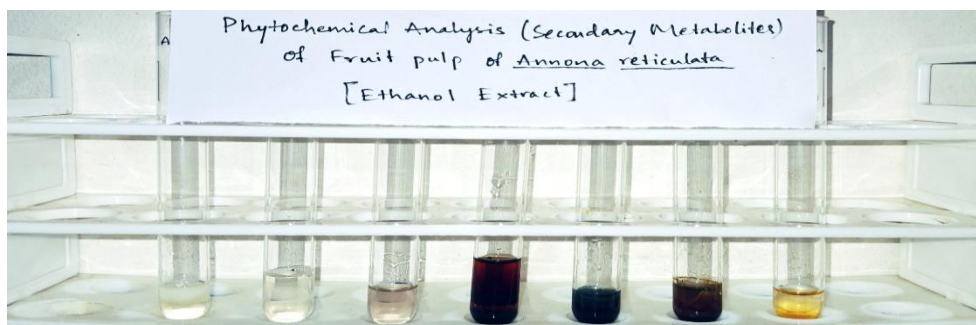


Figure 6: Phytochemical analysis of secondary metabolites of *A. reticulata* fruit pulp using ethanol extract

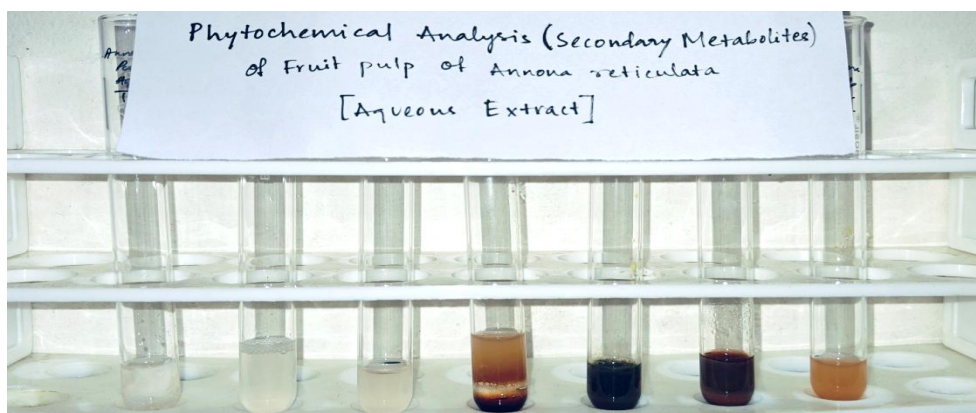


Figure 7: Phytochemical analysis of secondary metabolites of *A. reticulata* fruit pulp using aqueous extract

The results are presented in [Table 2](#). The n-hexane extract showed the presence of tannins, saponins, reducing sugars, and alkaloids ([Figure 5](#)). The ethanol extract contained tannins, saponins, flavonoids, terpenoids, phenolic compounds, reducing sugars, and alkaloids ([Figure 6](#)). The aqueous extract showed the presence of tannins, saponins, phenolic compounds, reducing sugars, and alkaloids ([Figure 7](#)). The results indicate that the pulp of *A. reticulata* is rich in primary and secondary metabolites ([Tables 1-2](#)). Other researchers have reported the medicinal uses of leaf ([Patil et al., 2009](#)), bark ([Bhalke and Chavan, 2011](#)), root ([Suresh et al., 2012](#)), stem ([Reddy et al., 2011](#)) and seeds ([Royal, 2012](#)) but less or no report on medico-food values of fruit pulp of *A. reticulata*. Therefore, present study provides a base line data for further works in this aspect.

Conclusion

The medico-food analysis of *Annona reticulata* fruit pulp revealed the presence of various primary metabolites, including carbohydrates, starch, lipids, proteins, and amino acids. Additionally, the pulp was found to contain a range of bioactive compounds, including tannins, saponins, flavonoids, terpenoids, phenolic compounds, reducing sugars, and alkaloids. The presence of these bioactive compounds suggests that *A. reticulata* fruit pulp possesses potential food and medicinal properties. The study highlights the importance of *A. reticulata* fruit pulp as a source of phytochemicals. Further studies are needed to isolate and characterize the bioactive compounds present in *A. reticulata* fruit pulp.

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