

Preliminary Phytochemical Studies of *Annona Reticulata* for Bioactive Constituents from Stem



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Abstract

The present study was undertaken to assess the phytochemical constituents present in the stem extract of the *Annona reticulata*. Of the stem extract were prepared in the various solvents and phytochemical screening was performed using the standard methods. Phytochemical screening of the plants stem showed the presence of alkaloids, carbohydrates, Lipid, flavonoids, glycosides, phenolic compound phytosterols, tannins, saponins, sterols and triterpenes variability in different solvents. However the methanolic extracts proved to be better solvent. The constituents reported from the present study gives further idea for detailed studies on clinical and therapeutic aspects.

Keywords: Annonaceae, Stem Extract, Phytochemical Constituents, Phytochemical Screening.

Introduction

Annona reticulata belongs to the family Annonaceae, a fruit tree native to Central America and is commonly known as custard apple. The plant is small ever green tree. And is cultivated throughout India. It is considered beneficial for cardiac disease, diabetes, and cancer. It is used in epilepsy, hemicranias, jaundice, liver disorders and gastric disorders. A paste of the herb mixed with oil is good for painful swellings. Medicinal plant part is commonly rich in phenolic compounds, such as flavonoids, phenolic acids and Tannins. These constituents also commonly exhibit biological effects such as antioxidant and antimicrobial activity. In the present experimentation *Annona reticulata* stem part extracts are selected for phytochemical, analysis in understanding usage as antioxidant and antimicrobial agents Cowan, M.M. (1999).

Annona reticulata (Custard apple) is semi-deciduous tree grown up to 10 meters tall native to West Indies, acts as astringent, sweet and useful in blood complaints. It is also used as anti-dysenteric, antidiarrhoeic, anthelmintic and enlarged liver. *Annona reticulata* is referred as bullock's heart having a smooth skin fruit that becomes dull red when ripe. Less volatile substances such as alkaloids, triterpenoids, and acetogenins have been identified.

Natural remedies from medicinal plants are found to be safe and effective. Many plant species have been used in folkloric medicine to treat various ailments. Even today compounds from plants continue to play a major role in primary health care as therapeutic remedies in many developing countries (Gajalakshmi.S et al., (2011).

Medicinal plants have played a vital role in nature as a repository of treasure, since times immemorial. Modern medicines that have been sequestered in nature originate from plants (Cowan, 1999). Plant materials have always been an important source to contend many serious diseases all over the world in conventional medical system and provide solution from health related issues in developing countries like India. The human body has a definite physiological reaction when it takes chemical substances or group of compounds obtained from medicinal plants. These chemical compounds are known as secondary metabolites (Edeoga et al., 2005).

Material and Method

Collection of Plant Material

Mature and immature stem of *Annona reticulata* Linn. Used for this study, were collected from Jabalpur region and would be grown in bulk in small area for experimental purpose.

Identification of Plant Material

The plant identify by comparing it with herbarium specimen from State Forest Research Institute Jabalpur (An Autonomous institute of forest department, Govt. Of M.P.)

Preparation of Phyto-Extract

The fruits washed with clean water and dried at room temperature. The dried plant parts crushed to fine powder and stored in airtight Container.

Extraction of Plant Material with Solvents of Different Polarity

In order to perform a systematic phytochemical screening, powdered stem of plant was extracted with an array of solvents. The usual technique involved extraction of phytochemical by polar solvent directing towards non-polar solvents as like Aqueous, Methanol, Ethyl Acetate and petroleum ether methods suggested by Trease and Evans, 1983 were followed. The presence of alkaloids tested by Dragendroff test, Wagner's test and Mayer's test, while carbohydrates were tested by Molisch's test, Benedict's test & Fehling's test. Presences of protein were observed by Xanthoprotic test & Biuret test. Lipids were tested by solubility test, Glycerol test and Sudan III test. Saponins were tested by foam test. Presence of flavonoids and rasins were tested. Sterols' were tested by Salkowaskis test. Cardiac glycosides were tested by Killer-Killiani test. Triterpenes, caumerins and anthraquinone were also tested. The presence of Tannins was tested by gelatin lead acetate and ferric chloride test.

Result

Table 1.1 shows the primary phytochemicals present in the extracts of stem of *Annona reticulata*.

Table 1.1: Primary Metabolite in Stem

#	Qualitative test		<i>Annona reticulata</i> stem extract			
	Primary metabolite		Aq	MeoH	EA	PE
1.		Carbohydrate				
	a.	Molisch's test	-	-	-	+
	b.	Benedict's test	-	+	-	-
	c.	Fehling's test	-	+	-	-
2.		Protein				
	a.	Xanthoprotic	-	-	-	-
	b.	Biuret	-	-	-	-
3.		Lipid				
	a.	Solubility	-	-	-	+
	b.	Glycerol	-	-	+	+
	c.	Sudan III	-	-	+	-

The presence of starch in petroleum ether extract was established through positive Molisch's test. Reducing sugars were present in methanol extracts only as shown by positive Benedict's and Fehling's tests. However, both tests were negative for rest of the three extracts. Proteins were found negative in all four extracts of stem shown by negative Xanthoprotic and Biuret tests. Among lipids, solubility test was found to be positive for petroleum ether extract while presence of glycerol was found in ethyl acetate and petroleum ether extract. Sudan III test was positive for ethyl acetate extract only. Presence of lipid was not detected in aqueous and methanol stem extract of *A. reticulata*.

The presence of secondary metabolite in four different extracts of stem of *Annona reticulata* was shown in Table 1.2. The alkaloids were found to be present in methanolic extract as Mayer's and Wagner's tests for alkaloids were positive. Presence of alkaloid was also observed in aqueous extract by positive Wagner's test. Saponins were found in aqueous extracts only. Presence of flavonoids was established in aqueous and methanol extracts, while resins were found absent in all four extracts. Among tannins, ferric chloride test was positive for methanol extract only while all other extracts does not contains tannins. Methanolic extract showed presence of sterols with positive Salkowski test while Cardiac glycosides were found only in petroleum ether extract. Triterpenes were found only in methanol extract of stem of *A. reticulata* but Anthraquinone were absent in all extracts.

Table1.2: Secondary metabolites in stem

#	Qualitative test		<i>Annona reticulata</i> stem extract			
	Secondary metabolite		Aq	MeoH	EA	PE
1.		Alkaloids				
	a.	Mayer 'test	-	+	-	-
	b.	Dragendroff 's test	-	-	-	-
	c.	Wagner's test	+	+	-	-
2		Saponins				
	a.	Foam test	+	-	-	-
3.		Flavonoids	+	+	-	-
4.		Resins	-	-	-	-
5.		Tannins				
	a.	Gelatin test	-	-	-	-
	b.	Lead Acetate	-	-	-	-
	c.	Ferric chloride	-	+	-	-
6.		Sterols				
	a.	Salkowski	-	+	-	-
7.		Cardiac Glucosides				
	a.	Keller – Kiliani	-	-	-	+
8.		Triterpenes	-	+	-	-
9.		Anthraquinone	-	-	-	-

_ Negative, + Positive

Discussion

The preliminary qualitative phytochemical screening of the crude powder of different parts of *A. reticulata* plant was done to assess the presence of bioactive components. The presence of primary (carbohydrates, proteins and lipids) and secondary (alkaloids, saponins, flavonoids, resins, tannins, sterols, cardiac glycosides, triterpenes and Anthraquinone) metabolites were determined.

Several phytoconstituents have been identified from different parts of *A. reticulata*. Stem bark contains tannins, alkaloid and phenolic compounds. Leaves contain a wide range of chemicals like alkaloids, amino acids, carbohydrates, steroids, flavonoids, proteins, tannins, glycosides and phenolics. Root has been identified for the content of acetogenin, alkaloid, carbohydrates, proteins, flavonoids, tannins (Zaman and Pathak, 2013).

The present study showed the presence of alkaloids, saponins, flavonoids, resins, tannins, sterols and cardiac glucosides in different plant parts of *A. reticulata*. *Annona reticulata* possesses several medicinal properties such as anthelmintic, analgesic, anti-inflammatory, antipyretic, wound healing and cytotoxic effects. It is widely distributed with phytochemicals like tannins, alkaloids, phenols, glycosides, flavonoids and steroids. The study is well in line with various other studies where the active phytoconstituents have been identified in various plant parts of *A. reticulata* (Jamkhande et al., 2015).

Conclusion

The results of phytochemical studies showed that the all tested extracts (Aqueous, Methanol, Ethyl acetate, Petroleum ether,) contains alkaloids, flavonoids, phenols, and saponins. The present researches allow concluding that the all crude extracts of *Annona squamosa* leaf will exhibit significant antioxidant and antimicrobial activities. As the extracts from leaf of *Annona squamosa* shows good presence of phytochemicals further antimicrobial activities are to be conducted.

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