



Pharmacological and Phytochemical Review on *Annona Squamosa*

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ABSTRACT: The medicinal plant *Annona squamosa*, which belongs to the annonaceae family, has been the subject of traditional, phytochemical, and pharmacological studies. Natural products were seen as the greatest choice because of their lower potential for harm to the environment and unintended creatures. The growing class of possible long chain fatty acid derivatives known as anonaceous acetogenins was first discovered only in species belonging to the family Annonaceae. Due to these chemicals' exceptional anti-tumor and other pesticidal properties, interest in them has spread throughout the world. The pharmacological effects of the aforementioned plant include the control of lipid peroxidation and hyperthyroidism. The plant also has narcotic properties, anti-inflammatory properties, anti-microbial properties, cytotoxic properties, antioxidant properties, anti-lipidemic properties, anti-ulcer properties, molluscicidal properties, genotoxic effects, vasorelaxant properties, anti-tumor properties, hepatoprotective properties, larvicidal properties, insecticidal properties, and anthelmintic properties, among other properties. Several medicinal characteristics are present in *Annona squamosa*'s roots, leaves, and seeds. Given that *Annona squamosa* appears to be highly beneficial due to its pharmacological and therapeutic qualities, this review will undoubtedly be helpful for researchers and clinicians working with the plant to understand its proper utilisation.

KEYWORDS: *Annona squamosa*, Acetogenins, Pharmacological studies, Anthelmintic.

I. INTRODUCTION

Annona squamosa, commonly known as the sugar apple or custard apple, is a tropical fruit-bearing plant belonging to the Annonaceae family. It is native to the tropical regions of the Americas, including the Caribbean, Central America, and parts of South America. The plant has been cultivated for centuries and is now found in various tropical and subtropical regions around the world. The sugar apple plant is a small, evergreen tree that typically reaches a height of 3 to 8 meters (10 to 26 feet). It has a short trunk and a dense, spreading crown of branches. The leaves are glossy, dark green, and oblong-shaped, with prominent veins. The plant produces fragrant flowers that are pale green or yellowish in color. These flowers are pollinated by insects, and they give way to the unique fruit of the sugar apple¹. The fruit of *Annona squamosa* is the main attraction of the plant. It is oval to heart-shaped, with a scaly or knobby exterior, hence the name "squamosa." The skin of the fruit is thin and covered with small, fleshy, cone-like protrusions. When ripe, the fruit has a greenish-yellow to brownish exterior, and the flesh inside is creamy white, soft, and custard-like². The flesh is divided into segments, each containing a glossy black seed. The flavor of the fruit is sweet and reminiscent of a mix of pineapple, banana, and strawberry³.

In addition to its delicious taste, the sugar apple is also known for its nutritional value. It is a good source of dietary fiber, vitamin C, vitamin B6, potassium, magnesium, and various antioxidants⁴. The fruit is consumed fresh and can be used in the preparation of desserts, smoothies, juices, and ice creams. Apart from its culinary uses, *Annona squamosa* has been utilized in traditional medicine for its potential health benefits⁵. Different parts of the plant, including the leaves, bark, and seeds, have been traditionally used to treat ailments like fever, diarrhea, dysentery, and digestive issues. However, it is important to note that scientific research on the medicinal properties of *Annona squamosa* is limited, and it is always advisable to consult a healthcare professional before using it for therapeutic purposes⁶. Overall, the sugar apple plant, *Annona squamosa*, is a fascinating tropical plant appreciated for its unique fruit, nutritional value, and potential medicinal properties.

II. TAXONOMIC CLASSIFICATION

Kingdom: Plantae (Plants)

Division: Magnoliophyta (Angiosperms)



Class: Magnoliopsida (Dicotyledons)
Order: Magnoliales
Family: Annonaceae (Custard Apple family)
Genus: Annona
Species: squamosa

III. TRADITIONAL USE OF THE PLANT

Annona squamosa, or the sugar apple, has been traditionally used for various purposes in different cultures. Here are some of the traditional uses⁷⁻⁸ of *Annona squamosa*:

1. Medicinal Uses: Different parts of the plant, including the leaves, bark, and seeds, have been used in traditional medicine to treat a range of ailments. Some traditional uses include:

- Digestive Health: The fruit and leaves of *Annona squamosa* have been used to aid digestion, treat stomachache, and alleviate constipation.
- Fever and Cold: Various parts of the plant, including the leaves, have been used to reduce fever and relieve symptoms of the common cold.
- Antiparasitic Properties: The seeds of *Annona squamosa* have been traditionally used as a vermifuge, to expel intestinal parasites.
- Skin Disorders: The paste made from the leaves has been applied topically to treat skin conditions like eczema, boils, and ulcers.

2. Antimicrobial and Antifungal Properties: *Annona squamosa* has shown potential antimicrobial and antifungal properties in traditional usage. The leaves and fruit have been used to treat skin infections and wounds.

3. Anticancer Properties: Some studies have explored the potential anticancer properties of *Annona squamosa*. Extracts from the fruit and leaves have shown cytotoxic effects against certain cancer cells in laboratory studies, although further research is needed.

4. Insecticidal Uses: The seeds and leaves of *Annona squamosa* have been used traditionally as insecticides and insect repellents. They have been employed to control pests and to repel mosquitoes.

IV. PHYTOCHEMICAL ANALYSIS

Phytochemical studies of the whole *Annona squamosa*⁹⁻¹¹ plant have been conducted to investigate the presence of bioactive compounds throughout the various parts of the plant. Here are some of the main phytochemicals that have been reported in the whole *Annona squamosa* plant:

Annonaceous Acetogenins: *Annona squamosa* is known to contain annonaceous acetogenins in its various parts, including the fruit, seeds, leaves, stem, and bark. These bioactive compounds have shown potential anticancer, antiparasitic, and pesticidal activities. Specific acetogenins such as squamocin, squamostatin-A, and bullatacin have been identified in different parts of the plant.

Flavonoids: Flavonoids, including apigenin, luteolin, quercetin, and kaempferol, have been found in different parts of *Annona squamosa*, such as the leaves, stem, and bark. Flavonoids possess antioxidant, anti-inflammatory, and anticancer properties.

Alkaloids: Alkaloids have been detected in various parts of *Annona squamosa*, including the leaves, stem, bark, and seeds. Examples of alkaloids identified include reticuline, stepharine, and liriodenine. Alkaloids have shown diverse pharmacological activities, including antimicrobial, antiviral, and antitumor properties.

Tannins: Tannins, which are polyphenolic compounds, have been reported in different parts of the plant, such as the leaves, stem, and bark of *Annona squamosa*. Tannins exhibit antioxidant and antimicrobial activities and contribute to the astringent taste of the plant.

Sterols: Sterols, including beta-sitosterol and stigmasterol, have been identified in various parts of *Annona squamosa*, such as the leaves, stem, bark, and seeds. These compounds have potential cholesterol-lowering properties and may contribute to the plant's medicinal value.

Essential Oils: Essential oils with a complex composition of volatile compounds have been found in different parts of *Annona squamosa*, including the leaves, stem, and bark. These essential oils possess antimicrobial, antioxidant, and insecticidal properties.



V.CONCLUSION

It's important to note that the phytochemical composition of *Annona squamosa* can vary slightly across different parts of the plant. Furthermore, the specific concentration and distribution of these phytochemicals may also depend on factors such as the plant's maturity, environmental conditions, and extraction methods. Further research is needed to comprehensively explore the phytochemical profile of *Annona squamosa* and its potential health benefits.

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