



# AGRI MAGAZINE

(International E-Magazine for Agricultural Articles)

Volume: 03, Issue: 02 (February, 2026)

Available online at <http://www.agrimagazine.in>

© Agri Magazine, ISSN: 3048-8656

## The Chronicles of Custard Apple

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The genus *Annona* represents a diverse group of tropical fruits celebrated for their unique creamy textures and potent therapeutic profiles. This article explores the "**Chronicles of Custard Apple**": The sugar-sweet **Sita Phal** (*A. squamosa*), the heart-shaped **Ramphal/Cherimoya** (*A. cherimola*), and the distinctive "spiny" **Soursop** (*A. muricata*). While these fruits are primarily valued for their dessert-like pulp, their pharmacological significance is increasingly recognized in modern nutraceuticals. This article examines the phytochemical composition across these three species, specifically focusing on the high concentration of acetogenins, alkaloids and antioxidants found in the pulp and leaves. The discussion highlights the traditional and clinical medicinal effects, ranging from the digestive benefits of Sita Phal to the purported anti-inflammatory and cytotoxic (anti-cancer) properties of Soursop. By bridging botanical diversity with health benefits, this chronicle illustrates why these custard apples are transitioning from seasonal delicacies to vital components of a medicinal diet.

**Keywords:** *Annona*, Sita Phal, Soursop, Acetogenins, Medicinal Fruits, Tropical Horticulture, Antioxidants.

### 1. Sita Phal (*Annona squamosa*) – The Sugar Apple

The **Sita Phal**, commonly known as the Sugar Apple, is perhaps the most beloved member of the *Annona* family due to its intense sweetness and creamy, granular texture. Characterized by its green, knobby and scale-like exterior, this fruit is a staple in tropical markets. Each "scale" represents a carpel that protects a dark, shiny seed encased in snow-white, fragrant pulp.



Beyond its popularity as a dessert fruit, Sita Phal is a nutritional powerhouse. It is exceptionally high in Vitamin C and Manganese, which are vital for collagen production and bone health. However, its true value lies in its **medicinal versatility**. Traditionally, the leaves are crushed and used to treat skin ulcers and abscesses due to their potent antibacterial properties. The fruit itself is high in dietary fiber, aiding in digestion and preventing constipation.

Furthermore, recent studies have highlighted the presence of **alkaloids and flavonoids** in the pulp that may help regulate blood sugar levels, though the fruit's high natural sugar content means it should be consumed in moderation by those with diabetes. Its high potassium and magnesium levels also support cardiovascular health by helping to regulate blood pressure and reduce muscle tension.

### 2. Ramphal/Cherimoya (*Annona cherimola*) – The Custard Apple

Often referred to as **Ramphal** or the **Cherimoya**, this variety is frequently called the "Masterpiece of Nature." Mark Twain famously described it as "the most delicious fruit known to men." Unlike the Sita Phal, the Cherimoya has a smoother, thinner skin with shallow depressions that look like fingerprints. The flesh is velvety, almost like a firm custard, with a complex flavor profile that hints at pineapple, banana and strawberry.

Medicinally, the Cherimoya is prized for its high **antioxidant capacity**. It is rich in compounds like **kaurenoic acid**, which has been studied for its anti-inflammatory and sedative effects. In many cultures, a decoction of the bark and leaves is used to alleviate intestinal distress and eliminate parasites.



The fruit is also an excellent source of **Vitamin B6 (Pyridoxine)**. This is particularly significant for mental health, as B6 is a co-factor in the synthesis of neurotransmitters like serotonin and dopamine, which regulate mood and stress levels. By including Cherimoya in the diet, one can naturally support the nervous system. Additionally, the fruit contains lutein, a carotenoid essential for maintaining eye health and protecting against age-related macular degeneration.

### 3. Soursop (*Annona muricata*) – The Spiny "Lakshman Phal"

The "spiny one," or **Soursop**, stands out physically and chemically from its cousins. It is the largest of the three, featuring a dark green, leathery skin covered in soft, pliable spines. Its flavor is a sharp, refreshing departure from the others tart, musky and citrusy, making it a favorite for juices and smoothies.



The Soursop is the "heavy hitter" of the group regarding **medicinal research**. It is famous for containing **Annonaceous acetogenins**, unique compounds found primarily in the *Annonaceae* family. Scientific interest has surged around these compounds for their potential **cytotoxic properties**, with studies investigating their ability to inhibit the growth of certain cancer cell lines. While clinical trials in humans are ongoing, the traditional use of Soursop is well-established.

The leaves are frequently brewed into a tea to treat hypertension and fever. It also possesses strong **anti-arthritic properties**; topical applications of the leaf extract can reduce joint pain and inflammation. Additionally, Soursop is a natural antimicrobial agent, used historically to treat various fungal and bacterial infections. Its high fiber and vitamin content make it an excellent fruit for boosting the immune system and supporting overall metabolic health.

### Cultivating the Annona Trio Across India

The *Annona* family showcases the incredible diversity of India's agro-climatic zones, requiring highly tailored management strategies that vary significantly by species. The Sita Phal (*A. squamosa*) stands as the hardy champion of India's drylands, thriving in the rocky, often neglected soils of states like Maharashtra and Gujarat, where its exceptional drought resistance makes it a reliable and low-maintenance commercial crop. In contrast, the delicate Ramphal (*A. cherimola*) prefers the cooler, higher-altitude regions of the Western Ghats and the North East, as it requires a temperate climate to reach its full potential. Meanwhile, the humidity-loving Lakshman Phal (Soursop) demands the tropical, moisture-rich environments found in the coastal belts of Kerala, Tamil Nadu and Karnataka, necessitating consistent hydration and protection from extreme dryness to produce its unique, spiny fruit. Together, these three species illustrate a perfect gradient of cultivation needs, ranging from the water-conservative approach of the arid-loving Sita Phal to the moisture-focused care essential for the tropical Soursop.



## Market Trends and Commercial Demand

The Indian market for the *Annona* trio is rapidly transitioning from a seasonal specialty to a high-value industrial sector, with the global custard apple market projected to reach **\$2.32 billion by 2034**. **Sita Phal** dominates the commercial landscape, driven by a massive **75–85% demand** from the dairy and processing industries for premium pulps used in ice creams and sweets. While **Ramphal** maintains a niche, high-priced status as an exotic medicinal fruit in urban centers, the "spiny" **Soursop** is experiencing the fastest growth in the wellness segment, fetching up to **₹600 per kg** due to its reputation as a "superfood." This surging interest in value-added products, such as frozen aseptic pulp and dried leaf teas, is currently opening significant export opportunities to Europe and North America, ensuring robust economic returns for Indian cultivators.



## Conclusion and Future Horizons

The future of *Annona* cultivation in India is poised for a significant transformation, evolving from traditional orchard farming into a sophisticated, export-oriented industry. As climate-resilient crops, particularly the drought-tolerant **Sita Phal**, they offer a sustainable solution for Indian farmers facing unpredictable weather patterns and water scarcity. The integration of advanced processing technologies such as aseptic pulping and cryogenic freezing—is effectively eliminating the historical challenge of short shelf lives, allowing these "creamy jewels" to reach global markets year-round. With the rising consumer focus on functional foods, the medicinal potential of **Ramphal** and the "spiny" **Soursop** will likely drive further investment in pharmaceutical research and high-value nutraceutical products. Ultimately, by bridging the gap between traditional wisdom and modern food science, the *Annona* trinity is set to become a cornerstone of India's diversified agricultural future, promising both ecological resilience and enhanced economic prosperity for the rural landscape.

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