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PLANT INSIGHT: A DETAILED REVIEW OF PLANT SOURSOP (*ANNONA MURICATA* L.)

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ABSTRACT: The soursop plant scientifically known as *Annona muricata L.* is a tropical evergreen tree belonging to the Annonaceae family. The tropical fruit-bearing soursop is used for traditional medicinal benefits. This review offers a thorough analysis of the soursop plant's pharmacological activities, phytochemical composition, and botanical characteristics. Soursop belongs to the Annonaceae family and is native to regions of South America, Asia, and Africa. The tree produces large, heart-shaped fruits with a delicate, white pulp that contains seeds and outer prickly green shell. The fruits are popular in drinks and sweets and are usually eaten raw.

INTRODUCTION: Tropical plant, species *Annona muricata L.* is well-known for its edible fruit, which possesses both some therapeutic and some toxicological properties. It is grown mostly in tropical region, of the world, from South America to Australia, Asia, and Africa [1]. Traditional medicine has utilized a variety of plant parts, such as the fruit, leaves, and seeds, for treating. *Annona muricata L.* extracts and phytochemicals have been identified as antibacterial, anti-inflammatory, anti-protozoan, antioxidant, insecticidal, larvicidal, and cytotoxic to tumor cells through the use of *in-vitro* experiments, *in-vivo* studies on *Annona muricata L.* crude extracts, and isolated compounds shows that they have anti-inflammatory, anti-stress, anti-tumoral, anti-ulcer, wound-healing, hepato-protective, and anxiolytic properties [2].

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Biological Source: It consists of dried leaves and seeds of *Annona muricata L* family *Annonaceae*.

Taxonomical Classification:

Kingdom: Plantae

Division: Spermatophyta

Subdivision: Angiospermae

Class: Dicotyledonae

Order: Polycarpiceae

Family: Annonaceae

Genus: Annona

Species: *Annona muricata L.*

Geographical Source: It is grown mostly in tropical region, of the world, from South America to Australia, Asia, and Africa.

Chemical Constituents: Acetogenin, Vitamin A, vitamin B, Alkaloids, Phenols, Secondary Metabolites such as Flavonoids, Terpenoids,

saponins, coumarins, lactones, anthraquinones, glycosides, tannins, and phytosterols and some minerals [3].

Plant: The soursop tree is an evergreen that can reach a height of 8 to 10 meters. The most tropical of the Annona species, soursop grows best in low elevations and hot, humid climates. It is thin, bushy, and has low branches [4].

The majority of its growth occurs below 1200 meters above sea level and more than 1500mm of annual rainfall. Soursop grows and produces it well at 21 to 30ºC. Soursop can grow on many soil types, but sandy to sandy loam soils of medium texture are suitable. The soil pH should be between 6.0 and 6.5. The main propagation is done by seeds [4, 5].

FIG. 1: PLANT

Leaf: The plant that produces usually has large, glossy leaves that are dark green in color. And have smooth edges, oblong or oval shapes, and can reach lengths of s 7 to 20cm [1, 5].

narrow petals. Flowers are hermaphrodite, usually fragrant, and solitary or in groups of two or four, with fascicles of three green sepals and six petals arranged in two verticals [6, 7].

FIG. 2: LEAF

FIG. 3: FLOWER

Flower: The flowers of the soursop plant are quite unique and distinctive. They are generally small, with a diameter ranging from about 2 to 3 cm. Soursop flowers have a pale green to yellowish-green color and consist of three outer, fleshy, triangular petals and three inner, smaller, more

Fruit: The soursop fruit, which is large and green fruit with a spiky, irregular surface and a size of about 8 to 12 inches in length, smooth surface and dark green color on fruit, which indicate fully matured and ripened fruit. It contains significant amounts of vitamin C, vitamin B6, folate,

potassium, and fiber is white, fibrous, and juicy. Soursop fruit is low in calories but rich in vitamins and minerals [8]. Soursop fruit can be eaten fresh by scooping out the flesh with a spoon. It is also used to make juices, smoothies, sorbets, ice creams, and other desserts [9].

Seeds: The seeds of the soursop fruit are dark brown to black in color and are 2 to 3 cm in length. It contains smooth, shiny surface and are oblong or oval-shaped. Seeds are surrounded by a white, fibrous pulp within the fruit. These seeds are not consumed due to their bitter taste [10].

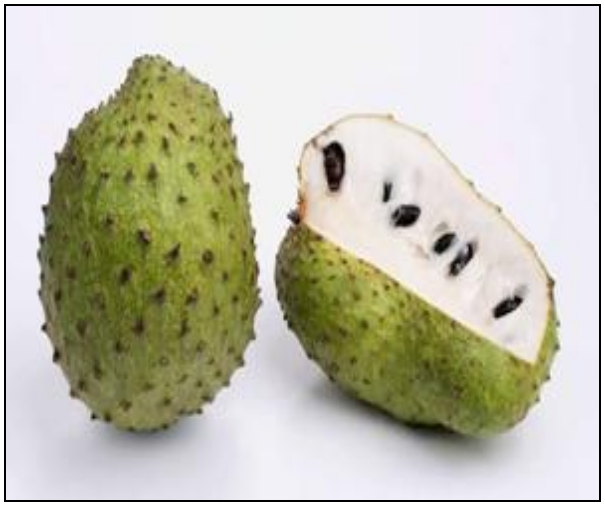

FIG. 4: FRUIT

FIG. 3: SEEDS

Microscopic Characters:

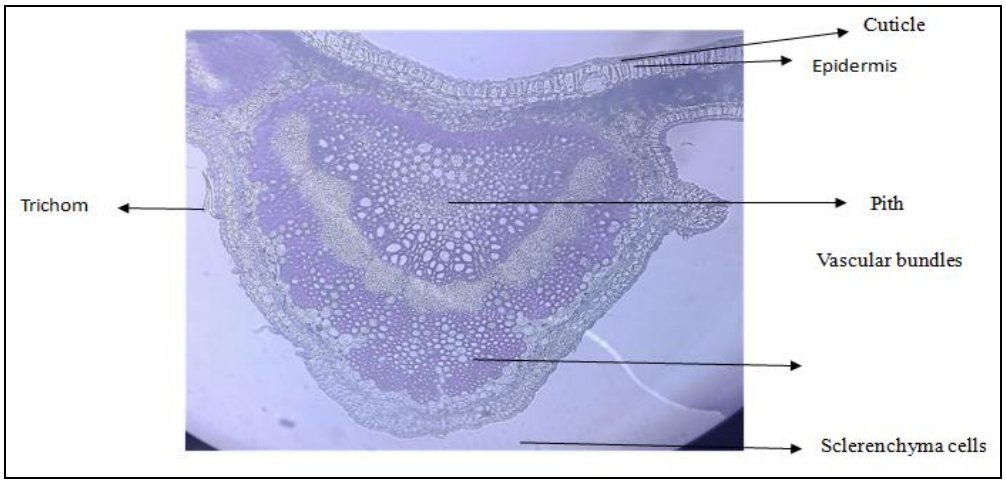

FIG. 5: CROSS SECTION OF MIDRIB

Cultivation:

Climate and Soil: Temperature required for optimum growth of soursop trees between 75°F and 85°F (24°C and 29°C) [10]. It requires a high amount with a sunlight, so it is planted in an area of high amount of sunlight.

It requires a hot and humid climate. The Ideal humidity required is 60-80%. Soursop trees require regular water supply, especially during the growing period. Soursop can be grown on many soil types, from sandy to sandy loamy. The soil pH should be between 6.0 and 6.5 [11].

Propagation: Propagation is mainly done by using seeds, grafting and, cutting. Seeds should be planted as soon as possible after removal from the fruit for better germination. Fresh seeds are collected from fully ripe fruits, removing the pulp and residues that remain in seeds [12, 13].

The seeds are directly planted in the soil, about 1cm. Moisten soil after planting the seeds until the germination occurs. After 3-5 weeks, seeds will germinate. Then it is transferred to a large area for growth. The cutting method is done by propagating the healthy stem from a mother plant [14].

Fertilizers: An adequate fertilizer supply which enhances better growth of plant. It includes organic matters, nitrogen, phosphorus, and potassium. For One-year old plant, nitrogen 40g and potassium 60g are used [14].

Harvesting: Soursop which requires 5-10 months for the formation fruits, after flowering. Determine the color produced by fruit and its size. Smooth surface and dark green color on fruit which indicates the fully matured and ripened fruit.

Avoid harvesting of fruit at unmatured state, which does not yield a sweet taste. Harvesting can be done with a knife; cut the fruit without damaging the bark or leaves. Seeds are dark brown to black in color and have a length of 2-3 cm in length. The seeds are surrounded by whit pulp from fruit [14].

Uses of Soursop Plant:

Insecticidal Activity: The primary bioactive chemicals found in soursop, including acetogenins, alkaloids, and phenolic compounds, are responsible for its insecticidal properties. These compounds have been found to exhibit insecticidal properties against a range of insect pests [3, 6, 16].

Anti-ulcer: Anti-ulcer activity is due to the presence of Alkaloid, acetogenin, Flavonoid, tannin. The anti-ulcer activity of soursop leaves, primarily focusing on their ability to protect the stomach lining from damage and promote healing.

Soursop leaf extracts have the ability to reduce the formation of gastric acid, protect the stomach lining by producing more mucin, raise the amount of mucus in the stomach, and aid in the healing of damaged gastric mucosa [3, 7, 17].

Anti-diabetic: Soursop may help regulate blood sugar levels and improve insulin sensitivity, making it potentially beneficial for managing diabetes. It has flavonoids that hydroxylate bonds and substitute at the b-ring to limit the action of α-glucosidase. This inhibition prevents the conversion of carbohydrates into glucose and decreases the absorption of glucose and hydrolysis of carbohydrates [3, 8, 18].

Anti-bacterial: Antibacterial activity of the extracts was demonstrated against both Gram-positive and Gram-negative bacteria [3, 9, 11].

Anti-protozoal: *A. muricata* ethyl acetate leaf extract showed antiprotozoal activity against *Leishmani*a spp [3, 10, 20].

Anti-malarial: The extracts from soursop leaves, seeds, and fruit possess antimalarial activity against Plasmodium falciparum, the parasite responsible for malaria. Compounds found in soursop, such as acetogenins, have been potential in malaria [3, 11, 20].

Anticancer: The anticancer activity of *A. muricata* is related to its cytotoxic activity against cancer cells. Extracts from soursop have demonstrated cytotoxic effects on various cancer cell lines. These studies suggest that soursop extracts may inhibit the growth of cancer cells and induce apoptosis (programmed cell death) in cancer cells. A study that administered 300 mg of *A. muricata* leaf water extract to patients with colorectal cancer in capsule form after breakfast reported the inhibition of colorectal cancer cell growth. The leaf water extract has inhibitory activity against colorectal cancer cells and does not affect normal cell growth [3, 20].

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CONFLICT OF INTEREST: Nil

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