



Waterapple (*Syzygium aqueum*): A Forgotten Super Fruit

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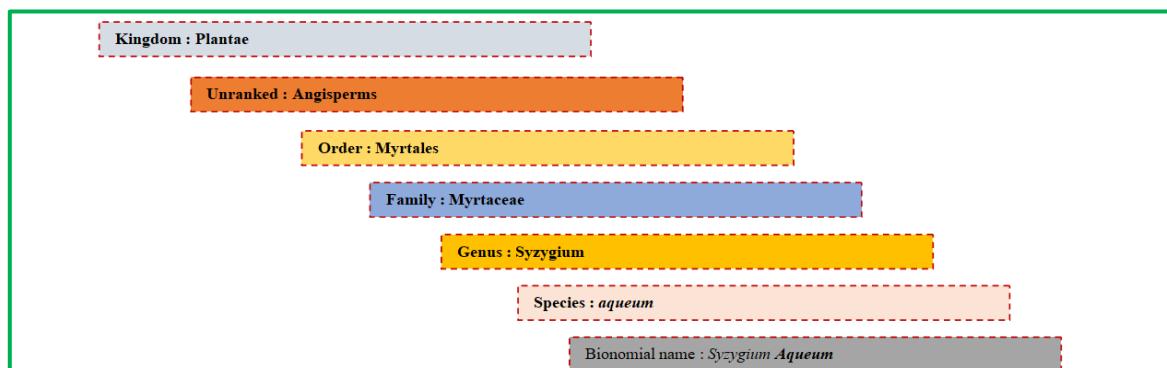
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Humans have been used medicinal plants from a very long time to treat various diseases. Currently, various medicinal plants have been scientifically reported to be able to help humans in overcoming various health problems (Aung *et al.*, 2023). Medicinal components from plants plays an important role in the treatment of various health diseases. They were the sole source of active constituents capable of curing the various disease and helps in maintaining the physiological condition. Medicinal plants not only important for the treatment of diseases but also as potential material for maintaining good health and conditions (Uddin *et al.*, 2022). Over the past few decades, the field of herbal medicine has experienced exponential growth. Herbal remedies have been used to treat and cure a variety of illnesses and physiological anomalies. Therefore, for millennia, natural items have been a significant source of pharmaceuticals. With over 140 genera and 3,800–5,800 species, Myrtaceae is the eighth-largest family of medicinal plants (Sushma *et al.*, 2021). In the Myrtaceae family, *Syzygium* is the sixteenth largest genus of flowering plants. It is commonly grown for its vibrant, tasty, and meaty fruits. One of the most valuable medicinal plant species in the Myrtaceae family is *Syzygium aqueum* also known as 'water apple'. Many people prefer the fruits of the *S. aqueum* shrub (Aung *et al.*, 2020). *S. aqueum* is rich in various bioactive components distributed all plant parts. These includes phenolic compounds, flavonoids, tannins, terpenoids and essential oils. The plant possesses a variety of biological activities and has been used extensively in traditional medicine. The fruit is used to treat liver problems, the dried powdered form is used to heal mouth ulcers, and the fresh leaves have been used to reduce the agony of childbirth. While the bark decoction is effective for thrush, the root preparation has been utilized to lessen swelling and irritation. Numerous biological effects, including antioxidant, anti-inflammatory, hepatoprotective, and antinociceptive activity, have been documented for diverse plant sections.

Taxonomical classification



Botanical Description

A tropical fruit tree is the watery rose apple. A temperature range of 25 to 32 °C is ideal for improved growth rate, increased yield, and higher-quality produce. Rose apples thrive in a variety of environments, including sandy and limestone soils with little organic matter, despite the fact that deep, loamy soil is frequently thought to be ideal for them. Maintaining soil moisture content, which is crucial for this crop, requires a steady supply of water. After two to five years of planting, depending on the variety, trees begin to give fruit. The tree of *S. aqueum* is cultivated well in heavy and fertile soils and insensitive to frost. It grows up to a height of 8-10m with branching near the base. Leaves are 4.5-23cm long, 1.5-11cm wide and oblong to elliptic. The leafstalk is 1-5mm long. Flowers are yellowish-white or pinkish and are 2-3cm long. The flowering pattern of these plants involves terminal or axillary cymes, typically blooming from February to March, with fruit maturation occurring between May and June. The fruits are small, bell-shaped, and watery, with a pale rose or white color, glossy skin, and a subtle fragrance. They usually measure around 1 inch long and ½ inch wide. There are two varieties - one with white fruits and the other with red or pale rose-colored fruits. Propagation methods include seeds, budding, and air-layering. The fruit pulp is crunchy and watery, while the hard wood is often used for handicrafts. Leaves are consumed raw or dried, and unripe green fruits are used in pickles, jelly, syrup, and sauces. In Southeast Asia, the fruits are eaten in salads or enjoyed fresh.

Geographical Distribution

The species originated in tropical Asia and spread to north Queensland. It is widely grown in the Pacific Islands, Southeast Asia, and India. *S. aqueum* appears to be growing wild in the Philippines' Mindanao, Basilan, Dinagat, and Samar provinces. Occasionally, Trinidad and Hawaii grows it. *S. aqueum* is mostly found in Malaysia, Pakistan, and Sri Lanka. Up to an elevation of 1500 meters, it is most likely to occur in moist deciduous forests in India. In warmer regions like Andhra Pradesh, Assam, Karnataka, Kerala, Orissa, Maharashtra, West Bengal, Punjab, Rajasthan, and Tamilnadu, it typically grows. Additionally, it is grown in the Philippines, Myanmar, Afghanistan, and other parts of southern and southeast Asia. (Palanisamy and Manaharan, 2015).

Health Benefits of Water Apple

Fights Free Radical Damage: Rose Apple is renowned for its high Vitamin C content, which serves to counteract the damage caused by free radicals, pollutants, and toxins implicated in health conditions like heart disease, cancer, and arthritis. Free radicals arise in the body due to exposure to radiation, tobacco, smoke, and the metabolic breakdown of food. White blood cell generation and activity are supported by vitamin C, which also acts as an antioxidant to reduce oxidative damage and enhance optimal performance. It is also said to strengthen the immune system, which helps prevent colds.

Reduce Risk of Stroke: The abundance of Vitamin C in Rose Apples contributes to reducing the risk of stroke and various health conditions, including inflammation, oxidative damage, cardiac issues, atherosclerosis, high blood pressure, and endothelial dysfunction. By countering the development of plaque in the body, Vitamin C plays a crucial role in minimizing the likelihood of strokes and heart attacks.

Prevent Diabetes: Research indicates that the consumption of Rose Apple leads to a reduction in blood glucose levels by enhancing the activities of key carbohydrate metabolic enzymes, including glucose-6-phosphate dehydrogenase, hexokinase, and glucose-6-phosphatase.

Prevent Constipation: The dietary fibres present in Rose Apple aid in promoting regular bowel movements and alleviating constipation, thereby supporting overall digestive health. Additionally, these fibres contribute to maintaining a healthy weight and reducing the risk of heart disease and diabetes.

Skin Health: Rose Apple provides ample amounts of Vitamin A and C, crucial for mitigating oxidative stress induced by factors like poor diet, stress, and pollution. These vitamins not

only combat oxidative damage but also promote skin health by reducing dryness and diminishing wrinkles.

Conclusion

Waterapple diverse range of phytochemical elements was discovered through the collection of data on the plant from the various publications. Antioxidant, hepatoprotective, anti-inflammatory, antidiabetic, cosmeceutical, antibacterial, anticancer, and antiproliferative actions are among the pharmacological qualities displayed by the plant's many sections. The article offers information on the pharmacological characteristics, traditional usage, nutritional value, geographic distribution, botanical description, and health advantages of *S. aqueum*. It emphasizes how the plant's many bioactive chemicals, which have been used since ancient times without a complete grasp of their chemical makeup, may be used to identify lead medications.

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