

Spondias dulcis L. (Golden apple) - A Humid Unexploited Fruit Crop

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INTRODUCTION

Golden apple (*Spondias dulcis* L.) is an unexploited tropical fruit tree with edible fruit and a fibrous pit. It belongs to the family Anacardiaceae which encompasses many different important tropical fruit trees such as mango (*Mangifera indica* L.) and cashew (*Anacardium occidentale* L.) and it is native to Polynesia. It is also known as golden apple (Fruit resembles apple with bright colour), hog plum, amberella and Spanish plum. In India, it is known as Amra (Hindi), Adavi mamidi (Telugu), Amra Kai (Tamil), Ambazhanga (Malayalam), and Amte kai (Kannada). Both mature unripe and ripe fruits are sold in the local markets during July-August and ethnic communities use them for variety of purpose (Bohra *et al.*, 2017).

Amra is a fruit with high nutritive value. 100 grams of edible fruit contains about 45 k calories of energy. Total solids vary from 14.53–40.35 *per cent*, moisture 59.65–85.47 *per cent*, protein 0.50–0.80 *per cent*, fat 0.28–1.79 *per cent*, sugar 8.05–10.54 *per cent*, total titratable acidity 0.47 *per cent*, crude fiber 0.85–3.60 *per cent*, and vitamin C content 42 mg/100 g of raw pulp (Mohammed, 2011). According to Koubala *et al.*, (2012), the fruit of *Spondias* contains a significant quantity of pectin (2.13 *per cent*). As a result, this fruit lends itself well to processing into jam. Aside from being high in vitamin C and phenolics, the pulp can be a rich source of natural antioxidants, which can help prevent illnesses caused by oxidative stress (Fu *et al.*, 2011). According to Morton (1961), eating fresh golden apple fruit can help with cardiovascular disease, indigestion, and haemorrhoids. The fiber content of Ambarella fruit is high. Pectic polysaccharides from *S. cytherea* fruit pulp have been demonstrated to stimulate peritoneal macrophages, making them vital for injury healing (Iacomini *et al.*, 2005).

Hog-plum is a fruit of mixed taste of sweet and sour which is familiar in botany as Droop, has gained much importance in modern medicine for their pharmacological values. As a blood purifier, it is highly effective in the treatment of bacillary dysentery and TB infection. Furthermore, it is beneficial in the treatment of scurvy, rickets, and other difficult disorders. It lowers cholesterol levels, lowers blood pressure, and has anticancer properties. It includes a significant quantity of Vitamin C (Bhuiyan, 2013).

Botanical description

Golden apple is a one-of-a-kind fruit that belongs to the drupe family, with a thin leathery pericarp, juicy mesocarp and hard endocarp containing a single seed. It is a fast-growing tree that can reach a height of 60 feet (18 meters) in its native habitat, but not more than 30 to 40 feet (9 – 12 meters) in other locations. It is a majestic ornamental with deciduous pinnate leaves that range in length from 20 to 60 cm. The bark is light greyish brown in color and almost smooth, with four to five tiny buttresses.

Flowers are white and smaller in size, and are borne on a terminal panicle that appears before the leaves. Male, female, and perfect flowers are present. Vegetative flushing and flowering usually occur at the same time. Flowering typically begins in July and continues through December, with fruit appearing from November to July depending on climatic conditions.

After four years of growth, the plant will begin to bear fruit and will continue to do so for another 40 years or longer; the fruit will develop in six to eight months (Bauer *et al.*, 1993). Fruits weigh 50–60 grams and are borne in bunches of a dozen or more on a lengthy peduncle. The ellipsoid or globose drupe changes color from bright green to bright orange or golden yellow as it ripens, with a thin but tough skin that is typically russeted. While the fruit is hard, the flesh is crisp, juicy, and somewhat acidic, with a pineapple-like scent and flavor (Morton,

1987). Because of the strong spines of the endocarp, the mesocarp of overripe fruits turns mushy and musky in flavor and scent, making it difficult to slice (Mohammed *et al.*, 2011). Generally, single fruit contains 1 to 5 seeds.

Harvesting and post-harvest management

Hog plum is a climacteric fruit. Hence, harvesting should be done at uniform stage of maturity and handled carefully to reduce bruising during harvesting and packaging. Harvesting should be done at color break stage i.e., fruit color turns into yellow, it is done by using hand or harvest shears to cut the peduncle. Fruits should be pre cooled to remove the field heat within 30 - 45 minutes of arrival using water at 7-10°C. To keep the fruit in mature green stage the recommended storage temperature is 10-12°C and 90- 95 *per cent* relative humidity. Fruits can be ripened by being held at room temperature for 2 – 4 days or treated with ethrel 500 ppm at 22° C and 90- 95 per cent relative humidity for 24 to 36 hours (Mohammed *et al.*, 2011).

Value addition or processing

Soft ripe fruit pulp can be eaten as fresh, pickles, salads, curries and juices can be prepared from green mature fruits, ripe fruits used for jams, jellies, juices and canned. We can get or sale fresh Hog Plum at a price of 20 – 40 rupees per one kilogram in Indian market. Fruits at the mature-green, semi-ripe and ripe stages of maturity are used in both fresh and processed forms and are a major export fruit and foreign exchange earner for many Caribbean islands.

CONCLUSION

Spondias (hog plum and big hog plum), underutilized Anacardiaceae family members, are widely grown in India for its tasty fruits. Fruits can be consumed raw, cooked, or processed into high-value products. Unripe fruits can be used to flavor sauces, soups, and stews, or processed into jelly, pickles, chutney, or relishes. It may serve a critical role in rural people's nutrition, nutraceuticals, and economics, although receiving little study

attention. Fruits are high in vitamin A, vitamin C and iron, according to reports. The fruits are used to cure cardiac problems, urinary problems, wounds, sores and burns, as well as for digestion. The bark is used to treat dysentery and diarrhoea, as well as to prevent them. As a result, harnessing these two species, *Spondias pinnata* (hog plum) and *Spondias dulcis* (great hog plum), has a lot of potential for improving the socioeconomic position of rural and tribal people.

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