AgriCos e-Newsletter
ISSN: 2582-7049
AgriCos e-Newsletter
Open Access Multidisciplinary Monthly Online Magazine
Volume: 05 Issue: 01 January 2024 Article No: 26

Star Apple - Ornamental Fruit Crop

Dhanyashree S G and G S K Swamy
College of Horticulture, Bengaluru, Karnataka

SUMMARY

Chrysophyllum cainito L. is a tropical tree belonging to the family *Sapotaceae*. It is native to Central America. It is well distributed at low and medium altitudes from the south of Mexico to northern Argentina and Peru. The tree is spreading and ornament looking with richly coloured foliage. Fruits are eaten fresh or pulp can be preserved to prepare various products. The fruit has been found to contain antioxidants, minerals which increases opinion of its nutritional value. Extracts from the leaves, stem bark, fruits, peel, pulp, or seed of *C. cainito* are used in traditional medicine for curing diabetes and fighting against bacterial, fungal, and viral infections.

INTRODUCTION

Star apple (*Chrysophyllum cainito* L.), called caimito and golden leaf tree and also called as milk fruit because of its white and milky juice. The seeds of *C. cainito* is in the centre which has the appearance like star when cut transversely, giving the fruit its common English name "star apple." This tree species is commonly found in Mexico, Argentina, Peru , the Pacific side of Guatemala , Vietnam, India, China, Malaysia and other countries where the altitude is low to medium . Star apple is commercially grown in Australia and Mexico (Morton, 1987). It is of minor commercial importance in the United States as compared to other *Sapotaceae* fruits despite its tasty flavour. The star apple is an evergreen tree that grows up to 15m with a short trunk of diameter 60 cm. The crown is dense, broad and the bark exudates white gummy latex. It is a spreading and very ornamental looking tree, with graceful branches and richly coloured foliage that provide shade and beauty to the environment. Star apple tree is propagated through seeds but this can also be done through grafting (Alvarez *et al*. 2004). The leaves are elliptic to oblong and are glossy above and coated with silky hair beneath that is golden in colour with average length from 7.5-15.7 cm and the width of 5.3-8.0 cm. The flowering starts in the month of June to December and harvesting is from late December to March or April. The flowers are clustered in the leaf axils and range from a green-yellow colour to purple and white.

Growing Conditions

The star apple grows successfully on almost any type of soil. For best performance, a deep, fertile and well-drained soil is preferred. A slightly acidic soil condition (pH 5.5-6.0) is desirable. The caimito is a hardy plant and thrives well on almost all types of climatic conditions. It thrives best in warm and humid places at low and medium altitudes.

Star Apple Fruit Characteristics

Star apple is an apple size fruit, commonly round, sometimes ovate, heart-shaped or conical, with a smooth and waxy skin. The fruit colour may be red-purple, dark-purple, or pale-green . A star shape appears in its cross section. Fruits are astringent at immature stages. The fruit is characterized by its soft flesh that is yellowish green in colour, with a mild sweet flavour. The pulp is white or creamy white, with numerous small, shiny, dark brown seeds embedded in it (Morton, 1987 and Orwa *et al*. 2009). Fruits are 5-10 cm long, 5-7 cm in diameter and weighs 140- 260 g or more. Each fruit has three to 10 seeds that are flattened; each seed has a pointed tip, smooth, brown , white scar (Inyama *et al*. 2015) .The seeds were 1.7- 2.3 cm in length, 1.1-1.5 cm in width and 0.6-0.9 cm in thickness. Pulp is sticky with a white latex and astringent when unripe, the fruit should not be picked when unripe. Fruits should be picked only when mature, which will then turn sweet with a pleasant flavour around the seeds. Star apple's sweetness ranged from 8-12 °Brix. The fruit contained the moisture of 78.4-85.7 % .Caimito fruit has 51-70% edible portion and the tough rind is inedible.

Nutritive Values of Star Apple

It is good source of minerals which are needed for electrolyte balance, neurotransmission, development of strong teeth and bones. Traditional practicians and patients have used the tree and its fruit as folk medicine.

Unripe fruit are consumed to cure intestinal problems but if taken in excess can cause constipation. Fruits are known for antioxidants (Fernandez *et al*. 2008), antidiabetic (Doan *et al*. 2018), anti-inflammatory (Meira *et al*. 2014), anticancer , and antihypertensive properties . Each 100 g of fruit has 0.72–2.33 g of protein, 14.65 g of carbohydrates, and between 8.45 and 10.39 g of total sugars. Moreover, the fruit also contains several minerals, vitamins, and amino acids (Yahia *et al*. 2011).

Harvest Season

The star apple is a non-climacteric fruit (Yahia, 2004) . Fruits are usually harvested from late winter to early spring. Fruits must mature on the tree before they can be harvested and maturation takes about 180 days (Pino et al., 2002). Fully mature fruit present dull skin and are soft to the touch. Fruits are harvested manually by hand picking. An adult tree, in favourable conditions, might produce from 90 to 113 kg or more fruits per year (Álvarez et al., 2004).

Postharvest Handling of Star Apple

Star apple fruit are mainly consumed as fresh or chilled to improve the flavour however, sometimes the pulp can be preserved in jellies. It is cut in half and the flesh is spooned out, discarding the seed cells and core. The seed kernels may be used to prepare a drink to imitate milk of almonds, nougats and other confectionary products. Frozen pulp of star apple may be used to make ice cream and sherbets (Morton, 1987). In order to maintain a good quality, fruit must be kept at 3-6°C and 90% RH. Under these conditions fruit present a shelf life of three weeks (Morton, 1987 and Yahia, 2004). Decoctions of the leaves are used as a treatment for cancer and diabetes . Seeds are taken as a powder and as a tonic to stop diarrhea, bleeding or gonorrhea. The latex is used as a vermifuge (Morton, 1987). The bark is considered as tonic and stimulant. The reddish-brown wood is suitable for construction purposes.

TREE

LEAVES

FLOWERS

FRUITS

REFERENCES

Alvarez, B. R. J., Graterol, C., Quintero, I., Zambrano, J., Materano, W. and Maffei ,M., (2004), Evaluacion de algunos metodos y practicas de propagacion en caimito *Crisophyllum cainito* L. *Rev. Fac. Agron.*, 21(Supl. 1): 47-53.

Doan, H. V., Riyajan, S., Iyara, R., and Chudapongse, N., 2018 ,Antidiabetic activity, glucose uptake stimulation and α-glucosidase inhibitory effect of *Chrysophyllum cainito* L. stem bark extract, *BMC Complement. Altern. Med*.,18(1): 267.

Fernandez- Panchon, M. S., Villano, D., Troncoso, A. M. and Garcia-Parrilla, M. C., 2008, Antioxidant activity of phenolic compounds: from in vitro results to in vivo evidence. Critical Reviews in *Food Sci. and Nutr*., 48(7): 649- 671.

Inyama, C. N., Mbagwu, F. N. and Duru, C. M., 2015, Morphological relationship among three *Chrysophyllum* species and their taxonomic implication, *Med. Aromat. Plants.*, 4(10).

Meira, N. A., Klein Jr., L. C. and Rocha, L. W., 2014, Anti-inflammatory and anti-hypersensitive effects of the crude extract, fractions and triterpenes obtained from *Chrysophyllum cainito* leaves in mice. *J. Ethnopharmacol*., 151(2): 975–983.

Morton, J.,(1987), 'Star Apple' in Morton J, Fruits of Warm Climates, Miami, FL, 408-410.

Orwa, C., Mutua, A., Kindt, R., Jamnadass, R. and Anthony, S., 2009, Agroforestry Database: a tree reference and selection guide version 4.0. Available from http://www. worldagroforestry.org/sites/treedbs/treedatabases.asp (accessed 25 January 2010).

Pino, J., Marbot, R. and Rosado, A., 2002, Volatile compounds of star apple (*Crysophyllum cainito* L.) from Cuba. *Flavour Fragr. J.*, 17: 401-403.

Yahia, E. M. and Gutierrez-Orozco, F., 2011, Star apple (*Chrysophyllum cainito* L.), in *Postharvest Biology and Technology of Tropical and Subtropical Fruits*, E. M. Yahia (Ed.) Woodhead Publishing, London, UK, 392–398.

Yahia, E. M., 2004, 'Sapodilla and related fruits', in United States Department ofAgriculture, *Agric. Handbook* No. 66 Available from http://www.ba.ars.usda.gov/hb66/index.html (accessed 2 July 2010).