



THE MIRACULOUS GAC FRUIT

Arathi Balan

Department of Fruit Science,
College of Agriculture, Vellayani

INTRODUCTION

Gac fruit is an extraordinary tropical marvel, renowned for its eye-catching reddish-orange color when fully ripe. This unique fruit, known by names like heavenly fruit, Chinese cucumber, and cochinchin gourd, belongs to the Cucurbitaceae family and is scientifically classified as *Momordica cochinchinensis*. It is called as 'Madhurapaval' in Malayalam, 'Fak Kao' in Thailand, 'Teruah' in Malaysia, 'Mak Kao' in Laos, and 'Moc Niet Tu' in China.

Native to the rich landscapes of Southeast Asia, the Gac fruit is primarily cultivated in countries such as Vietnam, China, Thailand, and various regions of India. Its cultivation is limited due to its specific growing conditions, contributing to its exotic and rare status. The fruit's vibrant appearance, combined with its impressive nutritional profile, has made it increasingly sought after in recent years. The fruits are commercially cultivated in China, Vietnam, Thailand, Cambodia, Laos, Myanmar, Malaysia, the Philippines, and Indonesia. It is mostly used to make dishes along with rice like sticky rice cakes,

dumplings etc. The " Xoi Gac " is a red-coloured dish made out of gac fruit with rice at the onset of New Year in Vietnam. According to their culture, red is said to offer longevity and good fortune in the upcoming year.

In Thailand, even ice creams are prepared by using the pulp. Leaves as well as immature fruits are used for culinary purposes. The roots contain saponins and are used in soap preparations. There is a huge demand for the fruits, seeds and value-added products in the current market. The fruits cost 1500/- per kilogram, whilst the fruit oil is sold for about 20,000/- in the market. The ripened fruits are used to prepare jam, juices, and are even used as natural colourants. The fruits also find use in the preparation of gac seed oil, fruit powder, fruit paste and frozen gac aril. Gac extracts are also marketed in encapsulated forms or even as a blend in juices. In addition to these, cosmetics such as face gel, face cream, and can also be prepared from the fruit because of its anti-ageing properties.

GAC FRUIT-THE NUTRITIONAL POWERHOUSE

Recent researches have shown that Gac fruit contains a variety of bioactive compounds that may have a major impact on human health. The fruit is beneficial in Chinese traditional medicine. It also helps with anti-ageing, anti-cancer, and memory improvement. The aril inside the fruits, surrounding the seeds is the portion that is highly nutritious in nature. Even though the taste of the pulp is not appealing, the phytochemicals present in them make it more valuable. The fruits are consumed along with honey and sugar usually or even with other added flavours as they are little bitter in taste.



Scientific studies have proven that aril is rich in higher levels of lycopene than that present in carrots and has a high amount of beta-carotene. The presence of high antioxidants is noticed in the gac fruit and hence is called 'super fruit'. The fruit contains bioactive compounds like lutein and phenolics. Not only the fruits, but even the leaves and seeds are rich in various compounds and thus possess medicinal properties. The highest amount of phenolic content is observed in the arils and the least in the seeds. The pulp and peel are rich in flavonoids whereas the seeds are rich in trypsin inhibitors which are the major factor for its medicinal activity. The

highest content of flavonoids was observed in the peel. The occurrence of fatty acids such as oleic, palmitic, and linoleic acids were noticed in Gac aril, stearic acid being the most abundant of them. The presence of unsaturated fatty acids in Gac fruit was shown to be higher in concentration. All these compounds have miraculous health benefits for humans and hence are used in treating various eye diseases, mastitis, arthritis, haemorrhoids diarrhoea and dysentery, liver and spleen disorders, wounds and bruises, microbial infections, skin diseases and swelling.

MORPHOLOGICAL DESCRIPTION

The gac vine is a vigorous climber that grows to approximately 20m long. Due to its dioecious nature, separate male and female plants are needed in order to fruit successfully. The female flowers are light yellow and the male flowers are white coloured. They are 5-10cm in length, exhibiting asynchronous flowering pattern, borne solitary or in clusters. The fruit is spiny outside with orange-coloured dense flesh inside. The mesocarp or the yellow-coloured pulp is highly rich in carotenoids but they are mostly found used as feed for cattle. While the arils are spongy and red coloured. Around 15-20 brown to black-coloured seeds are present in a single fruit. The pulp, peel and seed constitute the most part of the fruit while aril is present lower in proportion. The fruits produced in India are mostly oblong in shape. They can also be round or ovoid. The fruit weighs around 1-2 kg. Wide variations have been observed in the fruit shape, fruit weight, spines hardness and density of the spines.



CULTIVATING GAC FRUIT- A BEGINNER'S GUIDE

A pandal and ample sunlight are all that a gac vine needs to thrive; it doesn't need special care nor does it need a lot of land to grow. A well-drained soil with good air circulation is essential. The vines are commonly planted in the home gardens for a very short season. Like passion fruit vines, it can also be cultivated on terraces too. Before planting, compost and manure can be applied. Compost and manure treatments are both good organic sources of the key nutrients N, P, and K.

Raising pandals or horizontal trellis and allowing the vines to trail on them is the most typical form of training practiced. Whereas they are also cultivated in greenhouse conditions and also hydroponically just like cucumbers in temperate countries. Being dioecious in nature, the ratio of male to female plants must be at least 1:10 respectively while planting. It takes two to three months for the vine to flower. Even while insects naturally carry out pollination, it is still advisable to use manual pollination techniques for optimum fruiting and production by placing the pollens on the female flower stigma. Only 40% of attempts at natural pollination would become successful.

Seeds of gac fruit take about 1.5 to 2 months to germinate. Therefore, a farmer must have patience to cultivate the fruit throughout its early phases if starting from a seed. The seeds are sown in grow bags filled with FYM and coir pit for germination. It takes 7 months for the plant to fruit from the day of sowing. Cuttings from female plants can also be used to propagate the vines. Grafting is a difficult but effective process that would allow the use of undesired male gac plants. Grafting of female scion material onto the main branch of a male plant is an alternate technique of propagation. Multiplication through root tubers is also practiced. The fruiting season of the vine begins in December - January. The tiny little fruits begin to form in two days, following fertilization. The fruit passes through four distinct phases of color as it ages. From parrot green, yellow, and orange to matured fruits with reddish skin. Fruit eventually matures in 60-80 days from the day of pollination. The approximate harvest from a single plant for a season are 40-60 fruits. The vines are pruned and maintained for the better harvests in the next year.

CONCLUSION: EMBRACING THE GAC FRUIT REVOLUTION

Gac is an unfamiliar crop, as no commercial cultivation is being practiced in India. There is only a limited awareness existing among farmers, consumers and other potential users. The benefits and advantages of the crop is immense in terms of its medicinal as well as nutraceutical properties. Farmers, nowadays are increasingly getting interested in gac fruit cultivation after knowing its potential and financial returns from their production. It is been popularized as a functional food due to its nutritional benefits. The fruits even have a high value for processing to prepare various value-added products and also in traditional medicines.