

## ECHO Asia Seed Fact Sheet

Scientific name – *Momordica cochinchinensis*

English common name – Gac, spiny bitter-cucumber, Chinese bitter-cucumber, sweet gourd, giant spine gourd

Asian common names – (from Multilingual Multiscript Plant Name Database  
<http://www.plantnames.unimelb.edu.au/Sorting/Momordica.html#cochinchinensis>) -

- Chinese: Mu bie 木鳖
- Hindi: Kakur, Kantola Kakrol
- Japanese: Mokube tsushi
- Khmer: Makkao
- Laotian: Khaawz
- Malay: Pupia, Teruah, Torobuk
- Nepalese: Jhuse karela झुसे करेला
- Sinhalese: Tumba karavila
- Tagalog: Buyok buyok
- Thai: Phak khao (Fak khao) ฟักข้าว, Khika khrua
- Vietnamese: Dã gấc



Variety –

- **Local- Chiang Mai**

General description and special characteristics – Gac is a large, climbing, perennial vine that can grow up to 20 feet, with 3-5 lobed dark green leaves. The fruit is ovate, 4-5 inches long, with small spines. The fruit is green until ripe, when it turns bright orange or red. When the fruit is cut, the flesh is ½ inch thick and pale yellow. The numerous seeds are embedded in an orange-red pulp. Gac seeds are dark grey-brown to black, 2.3 X 1.8 cm, nearly flat, and finely granular with about four short blunt teeth projecting on each side.

Crop uses (culinary) – The fruit is eaten in curries or as a vegetable when green and not fully grown. The leaves are eaten as well. The seeds or the ripe fruit are commonly prepared as a dish called xoi gac, in which the aril (orange-red pulp) and seeds are cooked in glutinous rice, giving the rice their color and flavor. The fruit can also be found in juices and dietary supplements marketed inside and outside of Asia.

Crop uses (medicinal) – The green fruit have a bitter flavor, often attributed to medicinal properties, although it is medicinally inert according to some sources. In Vietnam, the seed membranes are used to aid in the relief of dry eyes and to promote healthy vision. In China, the seeds are employed for a variety of internal and external purposes. Research on crude water extract from the fruit has shown it to contain a protein that has potential anti-tumor activity. Many of the health benefits of gac comes from the high nutrient content. It has up to 70 times the lycopene of tomatoes and 10 times the beta-carotene of carrots or sweet potatoes, making it an excellent resource for Vitamin A deficiency.

Other uses – The tuberous root froths in water, and may be used in place of soap for washing and to kill head lice. The oil in the seeds may be used in the formulation of paint and varnishes.

Seasons of production – Gac has only one season of production, making it less abundant than other fruits. This probably accounts for why the fruit is not as well known or commercially grown in the rest of the world.

Length of production and harvest period – Gac has a relatively short harvest season which peaks in December and January. Harvest begins about 8 months after planting and lasts about 2 months. Sometimes gac plants will not flower the first year, or they will flower and not set fruit.

Pollination – Gac plants are dioecious, meaning each plant has either male or female flowers. This characteristic means about 10 plants will be required to ensure a good combination of male and female plants with mature flowers at the same

time. Pollination is by insects, although hand pollination is not difficult. Its ability to cross with other *Momordica* species is unknown, but it is thought to be unlikely.

Plant spacing – Recommended planting space is about 1.5 meters on all sides between plants.

Production methods – Trellising is highly recommended to keep leaves and fruits from rotting in contact with soil. Since harvest is typically finished by February, the vines can be cut back to about 1 meter at that time. Gac plants have a tuberous root system and will rejuvenate easily, even if cut back to the ground. This cutting will also stimulate new growth that will produce a higher yield.

Gac plants may yield 30-60 fruits per plant, each weighing 1-3 kg, although some varieties are smaller.

Known environmental conditions for production – In nature, gac grows mainly in mid-altitude and low areas and on the edges of forests or rivers. As a tropical vine, it loves heat and moisture, but because of the tuberous root it can survive in areas that are periodically dry or cold, as long as there is no ground frost. The above-ground plant will suffer or hibernate, but will revitalise when temperatures rise. However, if the growing season is too short, the fruit may not have enough time to form completely.

Known soil requirements – Gac prefers a well-drained, sandy loam soil, but will grow in areas with heavy clay or other poorer soils.

Known pests – Rats and birds are common predators for gac fruits. Gac, like its relative bitter melon, can also be susceptible to leaf spot (caused by *Pseudoperonospora cubensis*), bacterial wilt (caused by *Pseudomonas solanacearum*), fruit fly (*Dacus cucurbitae*) and nematodes (*Meloidogyne incognita*).

Seed saving – Seeds should be extracted from ripe orange or yellow-orange fruits. The orange-red pulp (aril) of the seed can be removed by soaking in water overnight or in bleach (bleach:water 1:10 solution) for just a few minutes. The thickness of the gac seed cover protects the seed from the bleach. Seeds should then be dried and stored under cool and dry conditions.

#### References -

Herklots, G.A.C. 1972. *Vegetables in South-East Asia*. George, Allen & Unwin, LTD. London.

"*Momordica cochinchinensis*." Ecocrop. Food and Agriculture Organization (FAO). Web.

<http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=7797>

"*Momordica* L." PROSEA. Plant Resources of Southeast Asia. Web.

[http://proseanet.org/prosea/eprosea\\_detail.php?frt=&id=342](http://proseanet.org/prosea/eprosea_detail.php?frt=&id=342)

"The Amazing Gac Plant (*Momordica cochinchinensis* )."Seedman.com. Web. <http://www.seedman.com/gac.htm>

"What is Gac?" Web. <http://www.gac-seeds.com/>