

Momordica charantia



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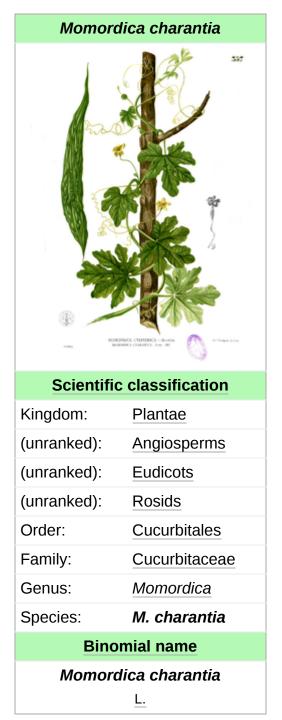
Momordica charantia, known as bitter melon, bitter gourd, bitter **squash**, or **balsam-pear**, [1] is a tropical and subtropical vine of the family Cucurbitaceae, widely grown in Asia, Africa, and the Caribbean for its edible fruit. Its many varieties differ substantially in the shape and bitterness of the fruit. Bitter melon also has names in other languages which have entered English as loanwords, e.g. kuguā (\square) from Chinese, **nigauri** (\square) from Japanese, **gōyā** (\square 000)[2] from Okinawan, kaipakka/paavakka (000000/0000000) in Malayalam, kakarakaya (000000) in Telugu, Hāgala (0000) in Kannada, pākal (الاستان) in Tamil and karela (الاستان) or kareli (الاستان) and in Hindustani (Hindi and Urdu), coming from Sanskrit. In Bengali, it is known as **uchche** (00000). Those from the Caribbean island of Jamaica commonly refer to the plant as **cerasee**. In Brazil this plant is called **Saint Cajetan's Melon** (melão-de-são-caetano). In Guyana the plant is referred to as corilla. In the Philippines it is called ampalaya or amargoso.

Bitter melon originated in India and was introduced into China in the 14th century. [3] It is widely used in East Asian, South Asian, and Southeast Asian cuisine.

Description

This herbaceous, tendril-bearing vine grows up to 5 m (16 ft) in length. It bears simple, alternate leaves 4–12 cm (1.6–4.7 in) across, with three to seven deeply separated lobes. Each plant bears separate yellow male and female flowers. In the Northern Hemisphere, flowering occurs during June to July and fruiting during September to November.

The fruit has a distinct warty exterior and an oblong shape. It is hollow in cross-section, with a relatively thin layer of flesh surrounding a central seed cavity filled with large, flat seeds and pith. The fruit is most often eaten green, or as it is beginning to turn yellow.



At this stage, the fruit's flesh is crunchy and watery in texture, similar to <u>cucumber</u>, <u>chayote</u> or green <u>bell pepper</u>, but bitter. The skin is tender and edible. Seeds and pith appear white in unripe fruits; they are not intensely bitter and can be removed before cooking.

Some sources claim the flesh (rind) becomes somewhat tougher and more bitter with age, but other sources claim that at least for the common Chinese variety the skin does not change and bitterness decreases with age. The Chinese variety are best harvested light green possibly with a slight yellow tinge or just before. The pith becomes sweet and intensely red; it can be eaten uncooked in this state, and is a popular ingredient in some Southeast Asian salads.

When the fruit is fully ripe, it turns orange and mushy, and splits into segments which curl back dramatically to expose seeds covered in bright red pulp.



Ripe fruit

Varieties

Bitter melon comes in a variety of shapes and sizes. The <u>cultivar</u> common in China is 20–30 cm (7.9–11.8 in) long, oblong with bluntly tapering ends and pale green in color, with a gently undulating, warty surface. The bitter melon more typical of India has a narrower shape with pointed ends, and a surface covered with jagged, triangular "teeth" and ridges. It is green to white in color. Between these two extremes are any number of intermediate forms. Some bear miniature fruit of only 6–10 cm (2.4–3.9 in) in length, which may be served individually as stuffed vegetables. These miniature fruit are popular in Bangladesh, India (common name 'Karela'), Pakistan, Nepal and other countries in South Asia. The sub-continent variety is most popular in Bangladesh and India.



Culinary uses

Bitter melon is generally consumed cooked in the green or early yellowing stage. The young shoots and leaves of the bitter melon may also be eaten as greens.

In <u>Chinese cuisine</u>, bitter melon (<u>Chinese</u>: \square , pinyin: $k\check{U}gu\bar{a}$ or kugua) is valued for its bitter flavor, typically in <u>stir-fries</u> (often with pork and <u>douchi</u>), soups, dim sum, and <u>herbal teas</u> (See <u>Gohyah tea</u>). It has also been used in place of <u>hops</u> as the bittering ingredient in some beers <u>in China</u> and Okinawa. [5]



A small green bitter melon (front) and a scoop of Okinawan stir-fried gōyā chanpurū (back)

Bitter melon is very popular throughout India. In North Indian cuisine, it is often served with yogurt on the side to offset the bitterness, used in curry such as *sabzi* or stuffed with spices and then cooked in oil.

In <u>South Indian cuisine</u>, it is used in the dishes <u>thoran/thuvaran</u> (mixed with grated coconut), <u>mezhukkupuratti</u> (stir fried with spices), theeyal (cooked with

roasted coconut) and pachadi (which is considered a medicinal food for diabetics). Other popular recipes include preparations with curry, deep fried with peanuts or other ground nuts, and Pachi Pulusu, a soup with fried onions and other spices. In Karnataka, which is known as Hāgalakāyi (0000000) in Kannada language similarly in Tamil Nadu, it is known as paagarkaai or pavakai (00000000) in Tamil, [6] a special preparation called *pagarkai pitla*, a kind of sour *koottu*, variety is very popular. Also popular is kattu pagarkkai, a curry that involves stuffing with onions, cooked lentil and grated coconut mix, tied with thread and fried in oil. In the Konkan region of Maharashtra, salt is added to finely chopped bitter gourd, known as karle (00000) in Marathi, and then it is squeezed, removing its bitter juice to some extent. After frying this with different spices, the less bitter and crispy preparation is served with grated coconut. In Kannada it is known haaqalakaayi.It's known as Karate(Konkani:0000000) in Goa, it's valued for its health benifits and used widely in Goan cuisine.

In northern India and Nepal, bitter melon, known as *tite karela* (IIIIIII) in Nepali, is prepared as a fresh pickle. For this, the vegetable is cut into cubes or slices, and sautéed with oil and a sprinkle of water. When it is softened and reduced, it is crushed in a mortar with a few cloves of garlic, salt and a red or green pepper. It is also eaten sautéed to golden-brown, stuffed, or as a curry on its own or with potatoes.

In Sri Lanka it is known as *karavila* (00000) in <u>Sinhala</u>, and is an ingredient in many different curry dishes (e.g., Karawila Curry and Karawila Sambol) which are served mainly with rice in a main meal. Sometimes large grated coconut pieces are added, which is more common in rural areas. Karawila juice is also sometimes served there.

Bitter gourd pods boiled, drained, no salt

Nutritional value per 100 g (3.5 oz)			
Energy	79 kJ (19 l	kcal)	
Carbohydrates	4.32 g		
Sugars	1.95 g		
Dietary fiber	2 g		
Fat	0.18 g		
Protein	0.84 g		
Vitamins	Quantity %DV [†]		
Vitamin A equiv.	6 μg	1%	
beta-Carotene	68 μg		
lutein zeaxanthin	1323 μg		
Thiamine (B ₁)	0.051 mg		
Riboflavin (B ₂)	0.053 mg	4%	
Niacin (B ₃)	0.28 mg	2%	
Pantothenic acid (B ₅)	0.193 mg	4%	
Vitamin B ₆	0.041 mg	2%	
Folate (B ₉)	51 µg	13%	
Vitamin C	33 mg	37%	
Vitamin E	0.14 mg	1%	
Vitamin K	4.8 µg	4%	
Minerals	Quantity %DV [†]		
Calcium	9 mg	1%	
Iron	0.38 mg		
Magnesium	•	4%	
Manganese	0.086 mg	4%	
Phosphorus	36 mg	3%	
Potassium		11%	
Sodium	6 mg	0%	
Zinc	0.77 mg	7%	
Other constituents	Quantity		
Water	93.95 g		
Link to USDA Database entry (http s://ndb.nal.usda.gov/ndb/search/list? qlookup=11025&format=Full)			
[†] Percentages estinus US recommendation			

In Pakistan, known as *karela* (کریلا) in <u>Urdu</u>-speaking areas, and Bangladesh, known as *korola* (االمالة) in Bengali, bitter melon is often cooked with onions, red <u>chili powder</u>, <u>turmeric</u> powder, salt, <u>coriander</u> powder, and a pinch of cumin seeds. Another dish in Pakistan calls for whole, unpeeled bitter melon to be boiled and

then stuffed with cooked minced beef, served with either hot <u>tandoori</u> bread, <u>naan</u>, <u>chappati</u>, or with <u>khichri</u> (a mixture of lentils and rice).



A soft drink made from bitter melon

Bitter melon, known as $g\bar{o}y\bar{a}$ ([[[]]]) in Okinawan, and *nigauri* ([[]]) in Japanese (although the Okinawan word $g\bar{o}y\bar{a}$ is also used), is a significant ingredient in Okinawan cuisine, and is increasingly used in Japanese cuisine beyond that island. It is popularly credited with Okinawan life expectancies being higher than the already long Japanese ones.

In <u>Indonesian cuisine</u>, bitter melon, known as *pare* in <u>Javanese</u> and <u>Indonesian</u> (also paria), is prepared in various dishes, such as *gado-gado*, and also stir fried, cooked in coconut milk, or steamed. In Christian areas in Eastern Indonesia it is cooked with pork and chile, the sweetness of the pork balancing against the bitterness of the vegetable.

In <u>Vietnamese cuisine</u>, raw bitter melon slices known as $m u \acute{o} p d \check{a} n g$ or $kh \acute{o} qua$ in <u>Vietnamese</u>, eaten with <u>dried meat</u> floss and bitter melon soup with <u>shrimp</u> are popular dishes. Bitter melons stuffed with ground pork are served as a popular

summer soup in the south. It is also used as the main ingredient of "stewed bitter melon". This dish is usually cooked for the $\underline{T\acute{e}t}$ holiday, where its "bitter" name is taken as a reminder of the bitter living conditions experienced in the past.

In <u>Thai cuisine</u>, the Chinese variety of green bitter melon, *mara* ([[][]]) in <u>Thai</u>, is prepared stuffed with minced pork and garlic, in a clear broth. It is also served sliced, stir fried with garlic and fish sauce until just tender.

In the <u>cuisine</u> of the Philippines, bitter melon, known as *ampalaya* in <u>Tagalog</u>, and *parya* in <u>Ilokano</u>, may be stir-fried with ground beef and <u>oyster sauce</u>, or with eggs and diced tomato. The dish *pinakbet*, popular in the <u>Ilocos</u> region of <u>Luzon</u>, consists mainly of bitter melons, eggplant, okra, string beans, tomatoes, lima beans, and other various regional vegetables all stewed together with a little *bagoong*-based stock.

In <u>Trinidad and Tobago</u> bitter melons, known as *caraille* or *carilley*, are usually sautéed with onion, garlic and <u>scotch bonnet pepper until almost crisp</u>.

In Mauritius bitter melons are known as 'margose' or 'margoze'.

Traditional medicinal uses

They are in use since a very long time in Hindu medicine or <u>Ayurveda</u>. Bitter melon has been used in various Asian and African <u>herbal medicine</u> systems for a long time. [7][8][9] In Turkey, it has been used as a folk remedy for a variety of ailments, particularly stomach complaints. [10] In <u>traditional medicine</u> of India different parts of the plant are used as claimed treatments for <u>diabetes</u> (particularly <u>Polypeptide-p</u>, an <u>insulin</u> analogue), and as a <u>stomachic</u>, <u>laxative</u>, antibilious, <u>emetic</u>, <u>anthelmintic</u> agent, for the treatment of <u>cough</u>, respiratory diseases, skin diseases, wounds, ulcer, gout, and rheumatism. [11]

Momordica charantia has a number of purported uses including cancer prevention, treatment of diabetes, fever, HIV and AIDS, and infections. [12] While it has shown some potential clinical activity in laboratory experiments, "further studies are required to recommend its use". [12] In 2012, the <u>germplasm</u> and chemical constituents, such as momordicin within several varieties of the gourd were being studied. [13]

For fever reduction and relief of menstrual problems, there is no scientific research to back these claims. [12] For cancer prevention, HIV and AIDS, and treatment of infections, there is preliminary laboratory research, but no clinical studies in humans showing a benefit. [12] In 2017 the <u>University of Peradeniya</u> researchers revealed that bitter gourd seeds can be potentially used to destroy cancer cells and was successfully administered to patients in <u>Kandy General Hospital</u> [14] Cancer Unit.

With regard to the use of *Momordica charantia* for diabetes, several animal studies and small-scale human studies have demonstrated a <u>hypoglycemic</u> effect of concentrated bitter melon extracts. [15][16][17] In addition, a 2014 review shows



A close up view of an Indian bittergourd.

evidence that *Momordica charantia*, when consumed in raw or juice form, can be efficacious in lowering blood glucose levels. [18] However, multiple reviews have found that *Momordica charantia* does not significantly decrease fasting blood glucose levels or A1c, indicators of blood glucose control, when taken in capsule or tablet form. [18][19] *Momordica charantia* may be beneficial in diabetes, however the effects seem to depend on how it is consumed. [18] More studies need to be performed in order to verify this effect. [18] The Memorial Sloan Kettering Cancer Center concludes that bitter melon "cannot be recommended as a replacement therapy for insulin or hypoglycemic drugs". [12]

Adverse effects

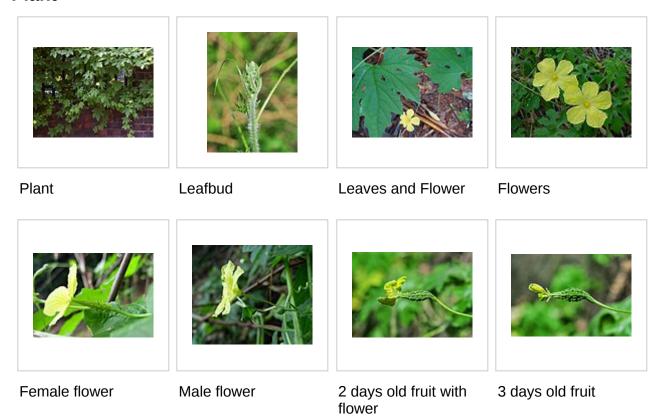
Reported side effects include diarrhea, abdominal pain, fever, hypoglycemia, urinary incontinence, and chest pain. Symptoms are generally mild, do not require treatment, and resolve with rest. [19]

Pregnancy

Bitter melon is contraindicated in pregnant women because it can induce bleeding, contractions, and miscarriage. $\frac{[12]}{}$

Gallery

Plant









10 days old fruit

Immature fruit

Immature fruit

Unripe fruits







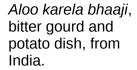
Seeds

Bitter melon plant growing in a container.

Commercial crop of bitter melon is grown on trellises made out of plastic netting.

Dishes and other uses







Bitter gourd dish with sauce



Bitter gourd cleaned and sliced for cooking



Bitter gourds being fried in <u>Kaohsiung</u>, Taiwan









An Indonesian-style bitter gourd dish, cooked with <u>sambal</u>, onion, and red bird'seye chili peppers

Filipino ampalaya con carne with egg, La Familia of Baliuag, Bulacan

Bitter gourd food supplement capsules

Okinawan style *goya* <u>chanpuru</u> (IIIIIIIIIIIIII), a stir-fried dish



Bitter gourd fry with potato

See also

- Momordica cochinchinensis (gac)
- Momordica cymbalaria
- Momordica foetida

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External links

■ *Momordica charantia* (http://www.westafricanplants.senckenberg.de/root/index.php?page_id=13& preview=true&searchTextMenue=Momordica+charantia&search=Wikitemplate) in West African plants – A Photo Guide. (http://www.westafricanplants.senckenberg.de/)

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