

Mango



Description.

Mango trees grow up to 35–40 m (115–131 ft) tall, with a crown radius of 10 m (33 ft). The trees are long-lived, as some specimens still fruit after 300 years. In deep soil, the taproot descends to a depth of 6 m (20 ft), with profuse, wide-spreading feeder roots; the tree also sends down many anchor roots, which penetrate several feet of soil. The leaves are evergreen, alternate, simple, 15–35 cm (5.9–13.8 in) long and 6–16 cm (2.4–6.3 in) broad; when the leaves are young they are orange-pink, rapidly changing to a dark, glossy red, then dark green as they mature. The flowers are produced in terminal panicles 10–40 cm (3.9–15.7 in) long; each flower is small and white with five petals 5–10 mm (0.20–0.39 in) long, with a mild, sweet odor suggestive of lily of the valley. There are over 400 varieties of mango, many of which ripen in summer while some give double-crop.^[4] The fruit takes three to six months to ripen.

The ripe fruit varies in size and color. Cultivars are variously yellow, orange, red or green, and carry a single flat, oblong pit that can be fibrous or hairy on the surface, and which does not separate easily from the pulp. Ripe, unpeeled mangoes give off a distinctive resinous, sweet smell. Inside the pit 1–2 mm (0.039–0.079 in) thick is a thin lining covering a single seed, 4–7 mm (0.16–0.28 in) long. The seed contains the plant embryo.

The mango is a juicy stone fruit belonging to the genus *Mangifera*, consisting of numerous tropical fruiting trees, that are cultivated mostly for edible fruits. The majority of these species are found in nature as wild mangoes. They all belong to the flowering plant family *Anacardiaceae*. The mango is native to South and Southeast Asia, from where it has been distributed worldwide to become one of the most cultivated fruits in the tropics.



☞ Unripe mangoes on a mango tree



☞ A mango tree in full bloom

Food

Mangoes are generally sweet, although the taste and texture of the flesh varies across cultivars, some having a soft, pulpy texture similar to an overripe plum, while others firmer, like a cantaloupe or avocado and some may have a fibrous texture. For consumption of unripe, pickled or cooked fruit, its skin can be consumed but has potential to cause contact dermatitis of the lips, gingiva or tongue in susceptible people.

Cuisine



The "hedgehog" style is a form of mango preparation.

Mangoes are widely used in cuisine. Sour, unripe mangoes are used in chutneys, athanu, pickles,^[20] side dishes, or may be eaten raw with salt, chili, or soy sauce. A summer drink called Aampanna comes from mangoes. Mango pulp made into jelly or cooked with red gram dhal and green chillies may be served with cooked rice. Mango lassi is popular throughout South Asia,^[21] prepared by mixing ripe mangoes or mango pulp with buttermilk and sugar. Ripe mangoes are also used to make curries. Aamras is a popular thick juice made of mangoes with sugar or milk, and is consumed with bread, rice or pooris. The pulp from ripe mangoes is also used to make jam called mangada. Andhra Aavakaaya is a pickle made from raw, unripe, pulpy and sour mango, mixed with chilli powder, fenugreek seeds, mustard powder, salt and groundnut oil. Mango is also used in Andhra to make Dal preparations. Gujaratis use mango to make chunda (a grated mango delicacy)

Mangoes are used in preserves such as moramba, amchur (dried and powdered unripe mango) and pickles, including a spicy mustard-oil pickle and alcohol. Ripe mangoes are often cut into thin layers, desiccated, folded, and then cut. These bars are similar to dried guava fruit bars available in some countries. The fruit is

also added to cereal products such as muesli and oat granola. Mangoes are often prepared charred in the American state of Hawaii.

Unripe mango may be eaten with bagoong (especially in the Philippines), fish sauce or with dash of salt. Dried strips of sweet, ripe mango (sometimes combined with seedless tamarind to form mangorind) are also popular. Mangoes may be used to make juices, mango nectar, and as a flavoring and major ingredient in ice cream and sorbetes.

Mango is used to make juices, smoothies, ice cream, fruit bars, raspados, aguas frescas, pies and sweet chili sauce, or mixed with chamoy, a sweet and spicy chili paste. It is popular on a stick dipped in hot chili powder and salt or as a main ingredient in fresh fruit combinations. In Central America, mango is either eaten green mixed with salt, vinegar, black pepper and hot sauce, or ripe in various forms. Toasted and ground pumpkin seed (called pepita) with lime and salt are the norm when eating green mangoes. Some people also add soy sauce or chili sauce. The energy value per 100 g (3.5 oz) is 250 kJ (60 kcal), and that of the apple mango is slightly higher (79 kcal per 100g). Mango contains a variety of phytochemicals and nutrients.

Mango peel and pulp contain other compounds, such as pigment carotenoids and polyphenols, and omega-3 and -6 polyunsaturated fatty acids.

Although not confirmed scientifically, mango peel pigments may have biological effects, including carotenoids, such as the provitamin A compound, beta-carotene, lutein and alpha-carotene, polyphenols such as quercetin, kaempferol, gallic acid, caffeic acid, catechins, tannins, and the unique mango xanthonoid, mangiferin, which are under preliminary research for their potential to counteract various disease processes. Phytochemical and nutrient content appears to vary across mango cultivars. Up to 25 different carotenoids have been isolated from mango pulp, the densest of which was beta-carotene, which accounts for the yellow-orange pigmentation of most mango cultivars.^[33] Peel and leaves also have significant polyphenol content, including xanthonoids, mangiferin and gallic acid.^[34]

The mango triterpene, lupeol, is an effective inhibitor in laboratory models of prostate and skin cancers.^{[36][37][38]} An extract of mango branch bark called Vimang, isolated by Cuban scientists, contains numerous polyphenols with antioxidant properties in vitro^[39] and on blood parameters of elderly humans.^[40]

Major flavor chemicals of "Alphonso" mango from India

The flavor of mango fruits is constituted by several volatile organic chemicals mainly belonging to terpenes, furanones, lactones and ester classes. Different varieties or cultivars of mangoes can have flavor made up of different volatile chemicals or same volatile chemicals in different quantities.^{[43][44]} In general, New World mango cultivars are characterized by the dominance of δ -3-carene, a monoterpene flavorant; whereas, high concentration of other monoterpenes such as (Z)-ocimene and myrcene as well as the presence of lactones and furanones is the unique feature of Old World cultivars.^{[44][45][46]} In India, the country of origin and diversification of mango, Alphonso (mango) is one of the most popular cultivars. In Alphonso mango, the lactones and furanones are synthesized during ripening; whereas, terpenes and the other flavorants are present in both the developing (immature) as well as ripening fruits.^{[47][48][49][50]} Ethylene, a ripening-related hormone well known to be involved in ripening of mango fruits, causes changes in the flavor composition of mango fruits upon exogenous application as well.^{[51][52]} In contrast to the huge amount of information available on the chemical composition of mango flavor, the biosynthesis of these chemicals has not been studied in depth; only a handful of genes encoding the enzymes of flavor biosynthetic pathways have been characterized to date.^{[53][54][55][56]}

Potential for contact dermatitis

Contact with oils in mango leaves, stems, sap, and skin can cause dermatitis and anaphylaxis in susceptible individuals.^[57] It contains mangiferin, resinous acid, mangiferic acid, and the resinol called mangiferol. Those with a history of poison ivy or poison oak contact dermatitis may be most at risk for mango contact dermatitis.^[58] Cross-reactions between mango allergens and urushiol, a chemical in poison ivy and poison sumac that can cause dermatitis, have been observed.^[59] Urushiol is also present in mango leaves and stems. During its primary ripening season, it is the most common cause of plant dermatitis in Hawaii.^[60] After contacting it, reactions may not be immediate. Eyelids, face, or other parts of the body may even swell because of this. It irritates the skin and may even blister the skin. Also, burning of the mango wood, leaves, etc. should be avoided because fumes could be dangerous.^[citation needed]

Production and consumption

The Food and Agriculture Organization of the United Nations estimates worldwide production at nearly 38,600,000 tonnes (42,500,000 short tons) in 2011 (table

below). India is the biggest producer of mangoes with nearly 40% of world's production.



A basket of ripe mangoes from Bangladesh



Ripe Sindhri mangoes from Sindh, Pakistan



Cultivars

Main article: List of mango cultivars



Alphonso mangoes named after Afonso de Albuquerque, who introduced the fruit to the Goa region, western coast of India.



Close-up of the inflorescence and immature fruits of an Alphonso mango tree

Many hundreds of named mango cultivars exist. In mango orchards, several cultivars are often crossed to improve pollination. Many desired cultivars are monoembryonic and must be propagated by grafting or they do not breed true. A common mono-embryonic cultivar is Alphonso, an important export product, considered as "the king of mangoes".^[63]

Cultivars that excel in one climate may fail elsewhere. For example, Indian cultivars such as Julie, a prolific cultivar in Jamaica, require annual fungicide treatment to escape a lethal fungal disease known as anthracnose in Florida. Asian mangoes are resistant to anthracnose.

The current world market is dominated by the cultivar Tommy Atkins, a seedling of Haden that first fruited in 1940 in southern Florida, U.S. It was initially rejected commercially by Florida researchers.^[72] For example, 80% of mangoes in UK supermarkets are Tommy Atkins. Despite its fibrous flesh and only fair taste,^[citation needed] growers worldwide have embraced the cultivar for its exceptional productivity and disease resistance, shelf life, transportability, size and appealing color.

Alphonso, Benishaan and Kesar mango varieties are popular varieties in India's southern states, while the Chaunsa variety, among others, is popular in the northern states and Pakistan.

Guatemala markets sell a variety called 'mango de leche' which is more resinous outside and inside.

Generally, ripe mangoes have an orange-yellow or reddish peel and are juicy for eating, while exported fruit are often picked while underripe with green peels. Although producing ethylene while ripening, unripened exported mangoes do not have the same juiciness or flavor as fresh fruit.

Like other drupaceous fruits, mangoes come in both freestone and clingstone varieties.

Gallery



A nearly ripened purple mango