

PAPAYA

The papaya (from Carib via Spanish), papaw or pawpaw is the fruit of the plant *Carica papaya*, in the genus *Carica*. It is native to the tropics of the Americas, and was first cultivated in Mexico several centuries before the emergence of the Mesoamerican classic cultures.

It is a large tree-like plant, with a single stem growing from 5 to 10 meters (16 to 33 ft) tall, with spirally arranged leaves confined to the top of the trunk. The lower trunk is conspicuously scarred where leaves and fruit were borne. The leaves are large, 50–70 centimeters (20–28 in) diameter. The tree is usually unbranched if unlopped. The flowers are similar in shape to the flowers of the *Plumeria* but are much smaller and wax-like. They appear on the axils of the leaves, maturing

into the large 15–45 centimeters (5.9–18 in) long, 10–30 centimeters (3.9–12 in) diameter fruit. The fruit is ripe when it feels soft (like a ripe avocado or a bit softer) and its skin has attained amber to orange hue.



Cultivation

Originally from southern Mexico, particularly Chiapas and Veracruz, Central America and northern South America, the papaya is now cultivated in most tropical countries, such as Brazil, Bangladesh, Pakistan, India, Indonesia, South Africa, Sri Lanka, Vietnam, Philippines and Jamaica. In cultivation, it grows rapidly, fruiting within 3 years. It is, however, highly frost sensitive.

The papaya fruit is susceptible to the papaya fruit fly. This wasp-like fly lays its eggs in young fruit.

In the 1990s, the papaya ringspot virus threatened to wipe out Hawaii's papaya industry completely. Two varieties of papaya, Sunup and Rainbow, that had been genetically modified to be resistant to the virus, were introduced into Hawaii. By 2010 80% of Hawaiian papaya was genetically modified. Today there is still no conventional or organic method of controlling the ringspot virus. In 2004, non-genetically modified and organic papayas throughout Hawaii had experienced hybridization with the genetically modified varieties.

Uses

Papaya can be used as a food, a cooking aid, and in medicine. The stem and bark are also used in rope production.

Gastronomy. The ripe fruit is usually eaten raw, without skin or seeds. The unripe green fruit of papaya can be eaten cooked, usually in curries, salads and stews. It has a relatively high amount of pectin, which can be used to make jellies.

Green papaya is used in Thai cuisine, both raw and cooked.

The black seeds are edible and have a sharp, spicy taste. They are sometimes ground up and used as a substitute for black pepper.

In some parts of Asia the young leaves of papaya are steamed and eaten like spinach. In parts of the world papaya leaves are made

into tea as a preventative for malaria, though there is no real scientific evidence for the effectiveness of this treatment.

Cooking. Green papaya fruit and the tree's latex are both rich in an enzyme called papain, a protease which is useful in tenderizing meat and other proteins. Its ability to break down tough meat fibers was used for thousands of years by indigenous Americans. It is included as a component in powdered meat tenderizers.

Medicine. Papaya is marketed in tablet form to remedy digestive problems.

Papain is also applied topically (in countries where it grows) for the treatment of cuts, rashes, stings and burns. Papain ointment is commonly made from fermented papaya flesh, and is applied as a gel-like paste. Harrison Ford was treated for a ruptured disc incurred during filming of Indiana Jones and the Temple of Doom by papain injections.

Women in India, Bangladesh, Pakistan, Sri Lanka, and other countries have long used green papaya as a folk remedy for contraception and abortion. Enslaved women in the West Indies were noted for consuming papaya to prevent pregnancies and thus preventing their children from being born into slavery. Medical research in animals has confirmed the contraceptive and abortifacient capability of papaya, and also found that papaya seeds have contraceptive effects in adult male langur monkeys, possibly in adult male humans as well. Unripe papaya is especially effective in large amounts or high doses. Ripe papaya is not teratogenic and will not cause miscarriage in small amounts. Phytochemicals in papaya may suppress the effects of progesterone.



Medicinal potential.

The juice has an antiproliferative effect on in vitro liver cancer cells, probably due to its component of lycopene or immune system stimulation.

Papaya seed could be used as an antibacterial agent for *Escherichia coli*, *Staphylococcus aureus* or *Salmonella typhi*, although further research is needed before advocating large-scale therapy.

Papaya seed extract may be nephroprotective (protect the kidneys) in toxicity-induced kidney failure.

