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Psidium guajava A Fruit or Medicine – An Overview

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Guava (*Psidium guajava*) is known as Peruka or Paravata in samskrit. In ayurveda it is considered as tridosha nashaka, and indicated in atyagni. Its leaves, bark, fruits and roots are used in treatment of cough, fever, diarrhea, constipation, bad breath, gum problems and numerous other health problems. It is hepatotonic and thus good for liver, digestive system, heart and intestine. Guava can also be eaten by diabetics and those suffering from kidney and liver related problems. Guava contains dietary fiber, protein, calcium, phosphorus, potassium, copper, iron, vitamin A, vitamin b1, vitamin C, vitamin b2, vitamin b3 and folic acid. It is rich in antioxidant and protects cell damage. With this richness guava serves as both food supplement and also very useful medicine.

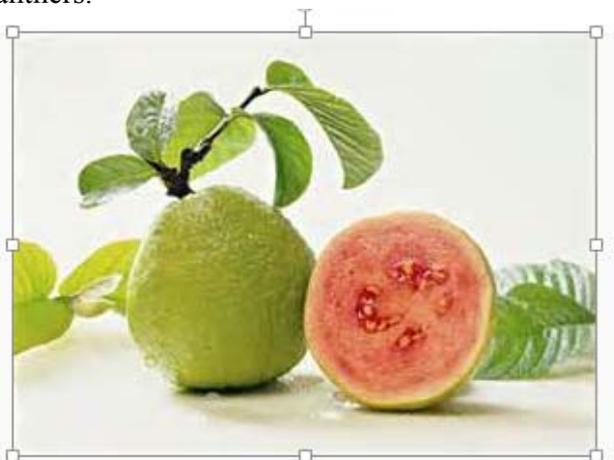
Keyword: *Psidium guajava*, Guava, Antioxidant

1. Introduction

Guavas are plants in the genus *Psidium* of the myrtle family (Myrtaceae). There are about 100 species of tropical shrubs and small trees in the genus. They are native to Mexico, the Caribbean, Central America and the northern part of South America. Now they are found in all the tropical, and in some subtropical, regions because their edible fruits. The most common guava is Apple Guava (*Psidium guajava*); it is so common that the word guava usually refers to this species. This is one kind of beery fruit. But there are may be others kinds of guava like red kinds of guavas called Marroon guava. Each 100 gm of guava have 200 gm vitamin C.

Guava trees are small shrubby evergreen trees, with a lot of strong branches. Smooth bark which occasionally flakes off is a characteristic of this tree. The leaves are slightly aromatic when crushed. White flowers appear towards the end of small branches, either as single or in a small cluster. Each flower bears numerous white

needle-like stamens, which accommodate creamy anthers.



Guava fruit, usually 4 to 12 centimetres (1.6 to 4.7 in) long, are round or oval depending on the species. The outer skin may be rough, often with a bitter taste, or soft and sweet. Varying between species, the skin can be any thickness, is usually green before maturity, but becomes yellow, maroon, or green when ripe.

Guava fruit generally have a pronounced and typical fragrance. Guava pulp may be sweet or sour, tasting something between pear and strawberry, off-white ("white" guavas) to deep pink ("red" guavas), with the seeds in the central pulp of variable number and hardness, depending on species. The fruits are fleshy, sweet and emanate a slight but pleasant odor. The fruit contains fiber, proteins, carbohydrates, calcium, phosphorous, iron, vitamin A, vitamin B₃, B₄, etc. Mature trees of most species are fairly cold-hardy and can survive temperatures slightly colder than 25 °F (-4 °C) for short periods of time, but younger plants will likely freeze to the ground [3]. Guavas are also of interest to home growers in temperate areas. When grown from seed, guavas can bear fruit as soon as two years, or as long as eight years

2. Nutritional Values

GUAVAS	
Nutritional value per 100 g (3.5 oz)	
Energy	285 kJ (68 kcal)
Carbohydrates	14.32 g
- Sugars	8.92 g
- Dietary fiber	5.4 g
Fat	0.95 g
Protein	2.55 g
Vitamin A equiv.	31 µg (4%)
- beta-carotene	374 µg (3%)
Thiamine (vit. B ₁)	0.067 mg (6%)
Riboflavin (vit. B ₂)	0.04 mg (3%)
Niacin (vit. B ₃)	1.084 mg (7%)
Pantothenic acid (B ₅)	0.451 mg (9%)
Vitamin B ₆	0.11 mg (8%)
Folate (vit. B ₉)	49 µg (12%)
Choline	7.6 mg (2%)

Vitamin C	228.3 mg (275%)
Vitamin K	2.2 µg (2%)
Calcium	18 mg (2%)
Iron	0.26 mg (2%)
Magnesium	22 mg (6%)
Manganese	0.15 mg (7%)
Phosphorus	40 mg (6%)
Potassium	417 mg (9%)
Sodium	2 mg (0%)
Zinc	0.23 mg (2%)
Lycopene	5204 µg

3. Botany

P. guajava is a large evergreen shrub or small tree that grows up to 15 m in height. It is native to and widely distributed in Mexico and Central America and is common throughout all warm areas of tropical America and the West Indies. Today, the plant is cultivated from Asia to the west coast of Africa, with varieties originally introduced over the past 300 years from the United States.

4. History

Tea made of guava leaves are considered as medicinal. The tender leaves of the plant have been used as a tonic to treat digestive conditions such as dysentery and diarrhea in the indigenous medical systems of Brazil and Mexico. Mexican medicinal data document the treatment of acute diarrhea, flatulence, and gastric pain by using a guava leaf water decoction for oral administration 3 times daily. A decoction of tender leaves has been prescribed as a febrifuge and a spasmolytic. In Bolivia and Egypt, guava leaves have been used to treat cough and pulmonary diseases; they have also been used to treat cough in India and as

an anti-inflammatory and haemostatic agent in China.

Guava bark has been used medically as an astringent and to treat diarrhea in children, while the flowers have been used to treat bronchitis, eye sores and to cool the body. The fruit has been used as a tonic and laxative and also for treatment of bleeding gums. The plant has been used in Africa and Asia to prevent and treat scurvy. It is used to treat hypertension in western Africa. Ethnomedicinal reports document use of the plant in treating malaria.

Guavas are rich in dietary fiber, vitamins A and C, folic acid, and the dietary minerals, potassium, copper and manganese. Having a generally broad, low-calorie profile of essential nutrients, a single common guava (*P. guajava*) fruit contains about four times the amount of vitamin C as an orange [4].

However, nutrient content varies across guava cultivars. Although the strawberry guava (*P. littorale* var. *cattleianum*) has about 25% of the amount found in more common varieties, its total vitamin C content in one serving (90 mg) still

provides 100% of the Dietary Reference Intake for adult males^[5].

Guava contains Both carotenoids and polyphenols like (+)allocatechin^[6], guaijaverin, leucocyanidin and amritoside^[7] – the major classes of antioxidant pigments – giving them relatively high potential antioxidant value among plant foods.^[8] As these pigments produce the fruit skin and flesh color, guavas that are red-orange have more pigment content as polyphenol, carotenoid and pro-vitamin A, retinoid sources than yellow-green ones^[9].

Guava leaves are used in folk medicine as a remedy for diarrhea^[15] and, as well as the bark, for their supposed antimicrobial properties and as an astringent. Guava leaves or bark are used in traditional treatments against diabetes^[16, 17, 8]. In Trinidad, a tea made from young leaves is used for diarrhea, dysentery and fever^[19].

5. Plant Chemicals

Guava is rich in tannins, phenols, triterpenes, flavonoids, essential oils, saponins, carotenoids,

lectins, vitamins, fiber and fatty acids. Guava fruit is higher in vitamin C than citrus (80 mg of vitamin C in 100 g of fruit) and contains appreciable amounts of vitamin A as well. Guava fruits are also a good source of pectin - a dietary fiber. The leaves of guava are rich in flavonoids, in particular, quercetin. Much of guava's therapeutic activity is attributed to these flavonoids. The flavonoids have demonstrated antibacterial activity. Quercetin is thought to contribute to the anti-diarrhea effect of guava; it is able to relax intestinal smooth muscle and inhibit bowel contractions. In addition, other flavonoids and triterpenes in guava leaves show antispasmodic activity. Guava also has antioxidant properties which are attributed to the polyphenols found in the leaves.

Guava's main plant chemicals include: alanine, alpha-humulene, alpha-hydroxyursolic acid, alpha-linolenic acid, alpha-selinene, amritoside, araban, arabinose, arabopyranosides, arjunolic acid, aromadendrene, ascorbic acid, ascorbigen, asiatic acid, aspartic acid, avicularin, benzaldehyde, butanal, carotenoids, caryophyllene, catechol-tannins, crataegolic acid, D-galactose, D-galacturonic acid, ellagic acid, ethyl octanoate, essential oils, flavonoids, gallic acid, glutamic acid, goreishic acid, guafine, guavacoumaric acid, guaijavarin, guajiverine, guajivolic acid, guajavolide, guavenoic acid, guajavanoic acid, histidine, hyperin, ilelatifol D, isoneriucoumaric acid, isoquercetin, jacoumaric acid, lectins, leucocyanidins, limonene, linoleic acid, linolenic acid, lysine, mecocyanin, myricetin, myristic acid, nerolidiol, obtusin, octanol, oleanolic acid, oleic acid, oxalic acid, palmitic acid, palmitoleic acid, pectin, polyphenols, psidiolic acid, quercetin, quercitrin, serine, sesquiguavene, tannins, terpenes, and ursolic acid. Eugenol.

- (Begum, S., *et al.* "Triterpenoids from the leaves of *Psidium guajava*." *Phytochemistry* 2002; 61(4): 399-403.)

6. Guava Uses and Pharmacology: Its Main Official Parts are Fruit, Leaves And Bark.

i. Diarrhea

Guava leaf extracts decreased spasms associated with induced diarrhea. Reduced defecation, severity of diarrhea, and intestinal fluid secretion reductions. Activity is generally associated with the ability of quercetin and its derivatives to affect smooth muscle fibers via calcium antagonism, inhibit intestinal movement, and reduce capillary permeability in the abdominal cavity. Leaf and bark extracts are bactericidal against a range of pathogens causative of diarrhea

ii. Cardiac

Arjunolic acid and presence of flavonoids acts as cardio protective. This also keeps lipids in normal range hence again it is a cardio protective agent.

iii. Uterine Tonic

Due to an estrogenic effect of the flavonoids or to anti-inflammatory effects of guava leaves it can be used in dysmenorrhoea.

iv. Antimicrobial anti Helmenthic Activity

Leaf and bark extracts associated with flavonoids, such as morin glycosides, quercetin, and quercetin glycosides acts against a wide range of gram-positive and gram-negative human pathogens including *Escherichia coli*, *Vibrio cholera*, *Giardia lamblia*, and *Shigella* species, as well as *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

v. Antioxidant

Aqueous extracts from *P. guajava* have antioxidant or radical-scavenging activity. Most of the activity is associated with the polyphenols; however, the guava extracts also contain antioxidants, such as ascorbic acid and carotenoids.

vi. Cancer

Leaf extracts, leaf oil, guava seed, and whole plant extracts have been evaluated for potential chemotherapeutic applications. Activity against various human cancer cell lines has been

demonstrated including prostate, colon, and epidermal cancers, as well as leukemia and melanoma.

vii. Cns Effects

Quercetin induced a reduction in acetylcholine-evoked release. The mechanism of action may be associated with an interaction with presynaptic calcium channels. In animal models, *P. guajava* extracts exhibited dose-dependent antinociceptive effects in chemical and thermal tests of analgesia in mice. In another study, the antinociceptive effect of *P. guajava* extracts was similar in potency to the nonsteroidal anti-inflammatory drug mefenamic acid and 10 times less potent to the opioid analgesic morphine.

Guava is now a successful and a commercialized fruit very frequently used in food industry. Guava is richly used in Soft drinks, Jams, Jellies, Flavored tea, Ice creams, Fruit salads which are very popular today.

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