

## Guava (*Psidium guajava*) Morphology and Taxonomy, Uses and Composition

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### Abstract

Guava, a highly prolific fruit crop, it is globally renowned. Botanically classified as a berry belonging to the myrataceae family and *Psidium* genus, guava is often hailed as the "Queen of fruits" due to its rich nutrient profile. It is recognized for its high protein and fiber content, as well as its lack of cholesterol. Similar to other fruits, guavas are a concentrated source of essential vitamins and minerals. The vitamin C concentration in guava is four times higher than that of oranges and 6-7 times greater than other citrus fruits, while its protein content is three times higher and fiber content four times greater than pineapples. The abundant presence of macro and micronutrients in guava contributes to its numerous health benefits, including the maintenance of ocular health, regulation of thyroid function, and other positive effects.



### Taxonomy classification

Division	:	Spermophyta
Sub-division	:	Angiosperm
Class	:	Dicotyledons
Order	:	Myrtales
Sub-order	:	Myrtineae
Family	:	Myrtaceae
Genus	:	Psidium
Species	:	guajava

### Morphology of guava

The better understanding morphology of guava to better knowledge of plant parts like Roots, stem, tree size , leaves, flowers and fruits. Tree and stem :- The guava tree is a small, medium size tree or shrub with multiple branches arises from the stem, that can reach a height of 2 to 7 meters. Its bark is smooth, thin, and copper-colored, and it sheds off easily. Underneath the outer layer of bark is a greenish skin that becomes visible when the outer bark is removed. The trunk of the tree can grow to a diameter of 25 cm when the tree reaches to full maturity. The twigs of the tree are four-sided (quadrangular) and curve.



### Leaves

The scientific name for guava leaves is *Psidium guajava*. Guava leaves are characterized by their opposite phyllotaxy, leathery texture, and elliptical to oval shape. They typically measure 7-15 cm in length and 3-5 cm in width. The leaves have prominent parallel veins that originate from the midrib and extend towards the edges.



**The stages of guava leaf based on their characteristics below: -**

- ✚ **Young leaves:** These are newly sprouted leaves that are small, tender, soft, and light green. They are actively growing and developing, in initial stages the guavas leaf colour is red to copper colour due to presence of more Anthocyanin After maturity of leaves the Anthocyanin colour are degrade and formation of chlorophyll pigmentation.
- ✚ **Mature leaves:** These leaves have reached their full size and are a darker shade of green. They are rigid and have distinct veins, and the leaves textures are goes to hardness, formation of more chlorophyll pigments on the leaves.
- ✚ **Senescent leaves:** These are older leaves that display signs of aging such as yellowing, browning, and wrinkling. Eventually, they drop off the plant.
- ✚ **Shedding leaves:** As leaves age and complete their life cycle, they naturally detach from the plant and fall to the ground. This process supports the guava tree's renewal and growth. For better understanding these stages is essential for monitoring the health and progress of the guava plant, as they reflect various aspects of leaf development and replacement in the plant's life cycle.
- ✚ **Flowers:** The guava plant produces flowers either singly or in groups of two or three on the new growth of the current season, at the junctions of the leaves. Typically, the branches that bear flowers are a few centimeters long and have four to five pairs of leaves (Dasrathy, 1951). When a flower forms and sets on the branch, the terminal bud stops growing until the next growing season (Gardener *et.al*, 1952). The



flowering bud on the guava plant is a combination of different types, and the flowers appear on the sides of the flowering shoot. Both the main shoot and side can bear flowers, as observed by various researchers. It has been noted that not all parts of the shoot produce buds, and they may appear sporadically along the branch (Shrivastav, 1962a). The flowering period of guava plants can last between 25 to 45 days, depending on factors such as the specific cultivar, the season, and the location where the plant is grown.

- ✚ **Fruits:-** Guava fruit is typically round, ovoid, or pear-shaped, measuring 5–10 cm in diameter and weighing between 50–200 g, depending on the variety. The outer layer of the fruit, known as the exocarp, is thin, light yellow with a touch of pink.



Directly beneath the exocarp is the mesocarp, the fleshy part of the fruit. The mesocarp is granular and can be thick white, yellowish, or dark pink in color, extending up to 3–12 mm. It is juicy, acidic, and flavorful. Further inside the fruit is the central pulp, known as the endocarp. The endocarp is juicy, slightly darker in color, and contains stony yellowish seeds. The pulp itself is 6 mm in diameter and can contain anywhere from 112–535 seeds. Within the pulpy endocarp are two types of cell wall tissues: stone cells and parenchyma cells. Stone cells, made of lignified woody material, give the fruit its characteristic gritty texture and are resistant to enzymatic digestion. Guava fruit has a relatively short shelf life of about 3–5 days at room temperature due to its high respiration rate and intense metabolism (Azzolini *et al.*, 2005).



### Uses and composition

Guava fruit is most enjoyed when fully mature and freshly harvested from the tree. The ripe fruit's shell can be utilized to create delicious salads and puddings. Preservation of guava can be achieved through canning, either as halves or quarters, with or without seeds. The Allahabad seedless white guava variety is particularly well-suited for canning as halves (Siddappa, 1982). Guava jelly, known for its attractive purplish-red color, delightful taste, and aroma, is a popular product. The sour wild guava variety is especially suitable for making jelly. High-quality nectar can be produced from guava, with hybrids generally outperforming commercial cultivars (Baramanray *et al.*, 1995). The EEA 18-40 variety is noted for producing the best puree in terms of flavor, color, and

Nutrients	Per 100 g
Calories	68 kcal
Protein	2.55 g
Total Lipids	0.95 g
Carbohydrates	14.23 g
Moisture	88.1 g
Total dietary Fibre	2.4 g
Calorific value	285 kJ
• Calcium	18 mg
• Iron	0.26 mg
• Sodium	2 mg
• Potassium	417 mg
• Zinc	0.23 mg
• Selenium	0.6 mcg
Thiamine	0.067 mg
Riboflavin	0.04 mg
Niacin	1.084 mg
Iron	0.6 mg
Vitamin A	624 IU
Carotene beta	374 mcg
Vitamin C	228.3 mg
Vitamin E alpha-tocopherol	0.73 mg
Vitamin K phylloquinone	2.6 mcg

Source USDA National Nutrient Database for Standard Reference Legacy (2007)

aroma (Pinera *et al.*, 1997). Ripe guavas are also utilized in the production of ice cream, sherbet, cheese, and toffee. Dehydrated guava slices can be created through air drying, in composition guava is rich source of Vit C and pectin.

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