

A Potential Wild Relatives of Cultivated Guava

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Guava (*Psidium guajava* L.) is one of the important fruits of tropical region of world and known as a apple of tropics. Guava is native to Tropical America stretching from Mexico to Peru and has spread to most of tropical and sub-tropical countries of the world. Tropical America is the centre of origin as well as centre of Diversity of guava as it is commercially cultivated and wildy found over there. It is introduced in India by the Portuguese during 17th century and has been cultivated in India since early 17 century and one of the common fruits in India.

Guava (*Psidium guajava* L.) belongs to the family Myrtaceae which has been more than 80 genera and 3,000 species distributed throughout the tropics and subtropics. *P. guajava* is diploid in nature as $2n = 22$ however, seedless variety found to have a somatic complement of 33 chromosomes, which appeared to be the first record of triploidy. All cultivated varieties of guava in India belongs to *Psidium guajava* are either diploid $2n=2x =22$ or triploid $2n=3x =33$ but mostly diploid guava are commercially cultivated, except the seedless types which are triploids. Fruit type of guava is berry and edible portion are thalamus and pericarp.

Genetic Resources

The greatest diversity of species is from central and southeastern Brazil, but there are also a good number (about 15) from northern South America, quite a few from the West Indies, a handful from continental North America and a scattering of peripheral species from the Andes and southern Brazil. Numerous species described from central and southeastern Brazil has not been adequately studied since his time. There are several other high yielding clones are found all over the world except *Psidium guajava* which either be used in breeding programs for developing commercial varieties. These species vary greatly with respect to their quality and yield potentials. Fruit size, shape, seed number (seed/fruit) and sweetness are greatly differing from one variety to another variety. The fruit colour varies from yellowish white to deep pink

or red. The flavor has been described sweet, musky and acidic and slightly to highly aromatic. Although it is able to survive under hardy environment condition and soil condition as well as resistant to several important disease like wilt caused by *Fusarium oxysporum*, *Fusarium solani* etc. all commercial cultivars are mostly highly susceptible for this disease and it is become serious threat for guava growers. *Psidium molle* Bertol, *Psidium guineense* Sw. and Philippine guava are resistant to this disease. The seedless trait is related to many factors, of which self-incompatibility and chromosomal abnormalities were considered to be the major ones.

Species

Description of *Psidium* species is scattered as a member of the pimentoid sub-tribe of the Myrtaceae having a C-shaped or uncinat embryo, hard or bony seeds and the calyx are splitting between the lobes at anthesis. Except for a few species that have become widespread through cultivation, most species of the genus occur as native 3 Breeding Guava (*Psidium guajava* L.) 89 plants.

Based on shape of fruit *Psidium pyriferum* and *Psidium pomiferum* are the two group of guava that is pear and round shape, respectively. *Psidium guajava* is the mostly cultivated species of genus *Psidium* however, some other species are also important which are;

Psidium guineense

The plants are like shrub or small tree. The leaves are green in colour, broad, oblong oval, acute or obtuse, 8.12 cm long with lower surface pubescent. Red hairs are found on the mid veins. Generally, 8-10 pairs of primary veins are found in one leaf, corolla is of creamy colour with 5-7 in number, stamens are 150-185 in number, stigma is medium in size with 3-8 chambers in ovary. Flowering comes throughout the year. Average fruit weight is about 6 g and Vitamin C content is about 24.7/100g of pulp with poor quality fruits. It is also known as guinea guava.

Psidium cattleianum* var *lucidum

Tree is small in stature more than strawberry guava in Hawai island, look like shrubs with smooth bark. *Psidium cattleianum* var *lucidum* is octaploid. Height of tree is upto 12 m, leaves are obovate elliptic, glabrous and small in shape. Fruit are obovate to round with light yellow flesh colour. Flesh of fruit is thin; pulp is soft with numerous seeds. Plant is generally propagated by seeds. It is also known as cattle guava or lemon guava.

Psidium cattleianum* var *longipes

Tree is small in stature (3-6m height). It is cold tolerant guava species which bear small size, scarlet red skinned fruits of round shape and about diameter 2.5 cm. Fruit has sweet flavour and good aroma. It is also known as a strawberry guava because of the sweet aroma like strawberry. Lack of muskiness of common guava, it is preferred among certain tribals.

Psidium molle Bertol

This species is tetraploid in nature. Small tree with shrub like stature having obovate leaves which are redish velvety on lower surface and green at upper surface. Apex of leaf is pointed, lower part of leaves is velvety in appearance. 6-8 pairs of primary veins are found in one leaf. Petals are 5-11, stamens are 196-239 and stigma is long with big ovary of 3-5 chambers. Fully ripe fruit are pale yellow in colour, white fleshed with numerous seed and average fruit weight 13g. The flavour of fruit is acidic contains 70mg/100g of pulp. It is also known as a Brazilian guava.

Psidium friedrichsthalianum niedenzu

Tree is tall having height ranges from 7-10m. Tree branches are slender and smooth. Leaves are oval or oblong/oval, smooth almost glossy above and pubescent below. Small size fruit with globose shape having sour taste. Fruit are good for making jelly because of high acidity. It is also known as a Chienese Guava or Costa Rican Guava.

Psidium montanum Swartz

Plants are just like shrubs attains 1.5 m height, flat round branches, branchlets are 4-angled; leaves oblong to oval, glabrous, fruits are round, flesh white with more number of seeds. It produces fruits of poor quality and high acid content. It is generally found in mountain of Jamaica. This species is tolerant to guava wilt.

Psidium acutangulum DC

Tree size is tall with height of 8-13 feet above ground level. Its branchlets are quadrangular and winged near the leaf base. It is cultivate in low to medium elevations of Amazonia and from Peru to Colombia, Bolivia, Venezuela and Guianas. The fruit are round, pear shaped or ellipsoid, pale yellow in colour. The taste of fruit is highly acidic but well flavoured. The fruit contain a few hard triangular seeds.

Psidium pumilum

Tree is like pyramidal in shape, leaves are light in colour, small in size, non-pubescent, having 13-17 pairs of primary veins. Petals 7, smooth and creamy colour which drop

immediately after anthesis, stamens are 252-327 in number, small stigma with medium size of ovary having 4-5 chambers. It flowers twice in a year. It takes about 130 days for attaining the maturity of fruits. Average fruit weight is about 19g and average vitamin C contents are 171mg/100g of pulp. It is also known as chinese guava.

Psidium cujavalis

The fruit size is small to medium, average weight is 30-50g and sour in taste. Plant growth characters and flowering habit of the plant is just like *Psidium guineense*.

Psidium polycarpum

Average fruit weight is about 200-250g. Flavonoid patterns show close affinity between *P. guajava* and *P. molle*. The growth characters are similar to *Psidium guajava* except the shape of the fruit is pyriform.

Future Thrust

These species have unique abilities in term of resistance from certain biotic and abiotic factors along with pleasant flavour, shape and colour. These species Are the potential donor parent from future breeding programs and can be used as recurrent parent/non-recurrent parent to develop above said characteristics.