



Ethnobotanical Leaflets



The Mango: Asia's King of Fruits

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The genus *Mangifera* is one of the 73 genera belonging to the family Anacardiaceae in the order Sapindales. The greatest number of *Mangifera* species are found in the Malay Peninsula, the Indonesian archipelago, Thailand, Indo-China and the Philippines. Edible fruit is produced by at least 27 species in the genus, primarily species found in Southeast Asia. The mango's scientific name is *Mangifera indica*. Asia has held the mango with high esteem and has been considered to be the 'king of fruits'. Other areas of interest are the Borobudur Buddhist temple where sculptures were erected to depict the mango tree as a concept of royalty.

The center of origin and diversity of the genus *Mangifera* is now firmly established as being in Southeast Asia. However, the origin of *Mangifera indica* has been a matter of speculation for years. Fossil records provided few clues. *Mangifera indica* is believed to have first appeared during the quaternary period. Some believe the mango originated from several related species, primarily located in the Malay Archipelago. Others believe that the mango originated in India and spread outward from there to southeast Asia and then to the New World and Africa.

The Fruit and Nutritional Value

The mango fruit is a large, fleshy drupe, containing an edible mesocarp of varying thickness. Fruit color is genotype-dependant and range from green, greenish-yellow, yellow and red blush. The exocarp is thick and glandular. The mesocarp can be fibrous or fiber-free with flavor ranging from turpentine to sweet. The endocarp is woody, thick and fibrous. No part of the fruit is wasted. The seed is used for extraction of the starch 'amchur', and the peels have been used as a source of anacardic acid. The mango wood is of low quality and the bark of the tree is an important source of tannins for curing leather. Mango fruit contains amino acids, carbohydrates, fatty acids, minerals, organic acids, proteins and vitamins. During the ripening process, the fruit are initially acidic, astringent and rich in ascorbic acid. Following fruit set, starch accumulates in the mesocarp. Free sugars, including glucose, fructose and sucrose generally increase during ripening giving the fruit a turpentine to sweet tasting flavor varying with species. The fruit is picked from the tree prior to ripening for export to other market places

throughout the world. The fruit will turn colors during the ripening stage even after its removal from the tree. Mangoes are an important component of the diet in many less developed countries in the tropics and subtropics. In regions of the world that have experienced low living standards and serious nutrition deficiencies, the mangoes attractiveness and flavor have also enhanced the quality of life.

Production

The production of the mango has increased by nearly 50 percent. Much of this new production occurs outside the traditional centers of mango culture. DeCandolle (1884) estimated that mango cultivation appeared to have begun at least 4000 years ago. The history of plant domestication in mainland southeast Asia has involved the introduction of plants by people migrating to other lands and through trade. In the early years of domestication, mango trees probably yielded small fruit with a thin flesh. Mangoes are now widely available as fresh fruit and in the form of frozen and processed products, not only in the tropics and subtropics, but also year round in North America, Japan and Europe. Cape Sable in Florida was first introduced with the mango plant in 1833. Since its' introduction many geneticist have developed new varieties. This is little help in preventing the various pest and diseases that perpetrate the mango crops.

Pest and Diseases

There are many pest and diseases that affect various parts of the mango plant. The whole tree is susceptible to a wide range of enemies. This can ultimately lower crop production if the enemy is not identified and stopped before causing permanent damage to the tree. Anthracnose (*Colletotrichum gloeosporioides*) is the most important disease of mango in Florida. This anthracnose fungus attacks flowers, young fruits, leaves and twigs. The development of this disease is encouraged by rains or heavy dews. Repeated applications of systemic fungicides are the only effective treatment for anthracnose in the field. Post harvest control of anthracnose is accomplished by treatments employed to the fungal infection with hot water alone or with the inclusion of various fungicides.

The mango seed weevil (*Sternochetus mangiferae*) is an important pest of the mango. The flesh of ripe fruit is damaged when the weevils emerge from the seed. There are several control measures for the mango seed weevil; they include resistant cultivars, cultural controls, chemical controls, and biological controls. Many enemies of the mango plant inhabit various geographical areas of the world.

Wild Species

Wild mangos are potentially valuable in breeding programs. Some species have important horticultural implications as they demonstrate many desirable characteristics. The *Mangifera* species have their center of diversity and origin in southeast Asia. Asia has experienced great economic development in recent years. Vast areas have been completely or partially deforested either for expanding farmland, tropical hardwoods, or expanding populations. This has caused great genetic erosion within many plant species and genera. *Mangifera* species, like many other tropical fruit trees, are canopy and emergent trees of the

tropical rain forest. These trees do not grow in continuous stands, but are widely scattered in the rain forest. Mangoes in the wild flower erratically and reproduce from large seeds that deteriorate rapidly from the moist climate. The wild mangos are vulnerable and in danger of extinction.

The International Plant Genetic Resources Institute (IPGRI) conducted a ecogeographical study of known *Mangifera* genetic resources. Based on their report a project was initiated to collect wild mangoes on the island of Borneo and the Malay Peninsula. These two areas had the highest concentrations of the *Mangifera* species. The genetic improvement of the mango has been depended on the utilization of the genetic variability found within a single species, *Mangifera indica*. A sampling strategy should be started to meet the urgent needs for researchers to improve the mango through breeding. Sources of resistance to mango malformation, anthracnose, powdery mildew, gall midge and other enemies are urgently needed.

The green revolution has brought about many varieties of mango that possess better crop production; larger fruit and number of fruit per tree. With the loss of natural habitat for *Mangifera indica*, a counter green revolution has developed in an effort to save the common mango from extinction. Saving this genetic material is a vital step in preserving the mango for future generations to enjoy and preventing the ultimate destruction of a valuable asset in the market places of the world.

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