

Mango – The King of Fruits

Mango, the 'King of Fruits', is an economically significant fruit in different areas of the globe. In addition to its great tropical taste, mangoes encapsulate nutrients and make eating healthy and pleasant sensory experience. Though mango cultivation is recorded from more than 120 nations, simply more than 60% of global mango output comes from India, China, Thailand, Indonesia and Mexico. Major part of produce is eaten as fresh mangoes, however, hundreds of its processed products are also being commercially manufactured. Mangoes are low in sodium but there is sufficient amount of potassium, phosphorus and calcium in the fruit. Apart from nutritional advantages for human health, mangiferin and lupeol, natural bioactive chemicals in mango have shown many health boosting features including antitumor-promoting action.

MANGO is one of the most significant fruits produced in the tropics and sub-tropics of the globe. The mango tree is not only adored as a sacred item but also is treasured due to its great economic potential since all its components are deemed useful and are utilized for different reasons. It is a source of food, fuel and fodder, mainly in the traditional Asian nations. The mango fruit provides a livelihood for millions of people throughout the world. But the King of Fruits is also experiencing numerous difficulties owing to continuously shifting climate and increasing biotic stressors under diverse agro-ecologies. It is becoming an export crop commodity for many nations leading to worldwide export market rivalry.

Fascinating history of distribution

The mango has a fascinating history of domestication and distribution as the sea transportation was exceedingly important before the early twentieth century. *Mangifera indica* is thought to have been originated in the Indo-Burma area. The mango has an interesting history of domestication and spread since the sea transportation was extremely significant before the early twentieth century. Traders, explorers and monarchs were captivated by Indian mangoes and their efforts over the past several centuries established mango as a crop in tropics and sub-tropics. Mango was brought to Malay Peninsula by the 'Tamils' and imported from Indo-china Peninsula.

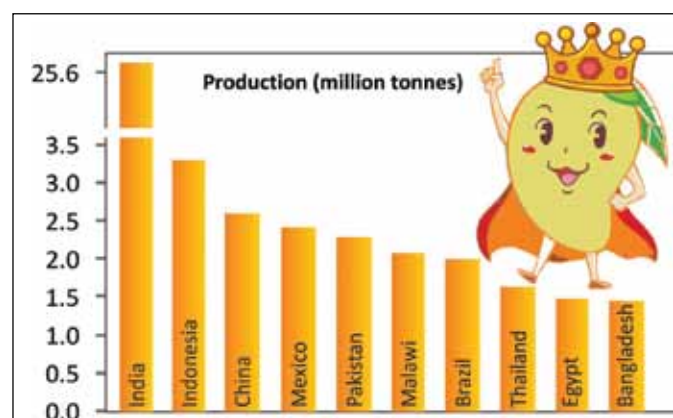
Mango is going to various areas of the globe where it was not produced previously and currently being cultivated in approximately 140 nations. In western hemisphere, in some of the industrialized nations, modern ways of cultivation were adopted for mango cultivation, mostly based on temperate fruit production.

Deeply associated with culture

Prominence of mango in Indian mythology and

religious rituals are part of the long history of the nation. Ancient hindus regarded mango highly not only for religious or emotional reasons but also they fully understood its significance in the economic and cultural life of the community. The sanskrit term 'Amra' (mango) indicates that it is the product of multitudes. The hindi term 'Aam' denotes the masses or the people. Inflorescence and leaves are utilized by Hindus in different rituals and for the worship of 'Saraswati', Goddess of knowledge and arts.

The impact of mango on Indian culture is widely recognized since in ancient India, man and woman connected their names with mango. The woman who gave mango to Lord Buddha was herself called as 'Amradarika'. Name of ragas (scores of music) like Amra-takeswara and Amra-panchma are based on this fruit. In India, mango cultivation is almost as ancient as Indian civilisation. Indian art also acknowledges the ultimate value of mango. 'Barhut Stupa' of 110 BC, 'Ajanta' and 'Ellora', give evidence of its antiquity as being outstanding instances are sculptures of that period.



India is the world leader in the production of mangoes

In Malaysia and Indonesia, the Sanskrit or Tamil name for mango indicates that it was brought from India to Peninsular Malaysia and eastern Asia. Praise of this fruit reached its peak when a Turkman saint and poet, Amir Khusroo praised mango in his poetry. The *Ain-i Akbari*, an encyclopaedic book of the Moghul emperor Akbar provides a comprehensive description of mango and its variations. Akbar is renowned for plantation of a huge orchard of one lakh mango trees, the 'Lakh Bhag' near Darbhanga, of which remnants are still surviving.

An economically important crop

Until the middle of the twentieth century, mango was regarded as a significant economic crop in Asian nations only. Later on mango farming spread and now continues to develop in fresh sub-tropical and tropical regions. It has become a significant export commodity in non-traditional mango producing nations where the substantial percentage of their fruit production is exported. Analysis of FAOSTAT, 2014 statistics show that Mexico is the top exporter of mango with approximately 17% of the national output.

The development of Floridian mango cultivars made it adaptable to broad variety of agro-ecologies and responsible for the growth of additional production regions. Indubitably, when it comes to mango production, Asia has a significant share. The top five nations producing mangoes are from Asia. Additionally, Bangladesh and Philippines are on the list of top 10 countries.

Changing varietal preference in International Markets

Red-peel cultivars dominate the worldwide mango export market because of their eye-appeal but in Asian nations customers choose the fruits on the basis of total knowledge of the variety. Naturally, this is due to population established preferences for particular local yellow and green colour types. The excellent local cultivars are offered at a premium price but they don't find place in the international market because of their yellow or yellow green hue even at the ripe stage. Gradually, the situation is changing and yellow skin mangoes are now recognized in the US market because of their quality.

'Ataulfo', a yellow coloured variety has garnered increasing attention of customers in the US. At least this variety has played a part in breaking red peel variety preference in the market. This modification may assist in opening way for the outstanding Indian cultivars in the United States, not highly favoured due their yellow or greenish peel. Breeding efforts for creating new mango varieties in India include red peel colour too, as one of the key goals. Thus many of the newly created types are red in colour.

A nutritionally rich fruit

Mango fruit is rich in carbohydrates, minerals, dietary fibre (pectin), vitamin C, and vitamin A (β -carotene) and several other phytochemicals of mango help to sustain good health. Mango serves as a source of vitamin A for millions living in the world's different sub-tropical, semi-arid, and tropical areas, especially in nations where vitamin A deficiency (VAD) is common. In many

countries, mango is distributed in plenty in rural regions of industrialized nations.

Mango fruit pulp has very little lipid content and may be regarded as fat free. Seeds are rich in lipids and fatty acids composition is similar with cocoa butter. Mango fat may have an important role in the cosmetics, pharmaceutical and food industries. Mango is a rich source of vital minerals such as calcium, iron, magnesium, phosphorus, potassium, zinc, copper, manganese, and selenium required for human health. The fruits are low in sodium.

Store house of bioactive compounds

Mango has been related to numerous pharmacological benefits, including, antidiabetic, antioxidant, anti-viral and anti-inflammatory properties. Various effects have also been reported, including antibacterial, antifungal, anthelmintic, antiparasitic, anti-HIV, antibone resorption, antispasmodic, antipyretic, antidiarrheal, immunomodulation, hypolipidemic, antimicrobial, hepatoprotective and gastroprotective.

The compound, mangiferin, a predominant bioactive ingredient isolated from different parts of mango tree has been extensively studied both *in vivo* and *in vitro* for pharmacological effects like antioxidant activity, antidiabetic, antitumor, lipometabolism regulating, cardioprotective, antihyperuricemic, neuroprotective, antioxidant, anti-inflammatory, antipyretic, analgesic, antibacterial, antiviral and immunomodulatory effects. It has been shown that Zvnamite®, a mango leaf extract rich in the natural polyphenol and mangiferin, enhances sprint exercise performance when given in combination with luteolin or quercetin. Lupeol, a natural pentacyclic triterpene present in mango fruit has gained attention in recent past which has shown strong anti-inflammatory, anti-arthritic, antimutagenic and antimalarial action. Lupeol has also been shown to have antitumor-promoting effect.

Numerous usage

Mango is extensively utilized in culinary, cosmetics and pharmaceutical industry, straight from root to the top of the tree. The fruit is utilized at all phases of development. Premature fruit is used for the production of chutneys, curries, cold drinks, pickles, etc. whereas ripe fruits are used for puree, squash, nectar, beverages, mango leather, fruit bars, canned and frozen mango slices, and sweets. Mango stones are used for growing seedlings, oil, fibre and as animal feed. The kernel is a rich source of carbohydrates, calcium and fat and starch which may be generated for industrial uses. Goats and cattle are fond of eating mango leaves while branches and wood are used for fuel, lumber alongside usage of bark for extraction of tannins and gums.

Invaluable processed products

Mango is a unique crop, utilized for processing at raw and mature crop stage. The method has been developed for different goods viz. canned and frozen slices, pulp, jelly, squash, tea, nectar and ready-to-serve (RTS) drinks. There are a large number of traditional mango products processed at home or cottage industry level. Mangoes are used for several hundred dishes and

used with pulses, buttermilk, yoghurts, soups, meat, fish curry, spices, etc. Mango pulp and pickles are the most exported commodities from India. Research on innovative processing techniques for retaining nutritional and sensory properties has taken place in the recent years.

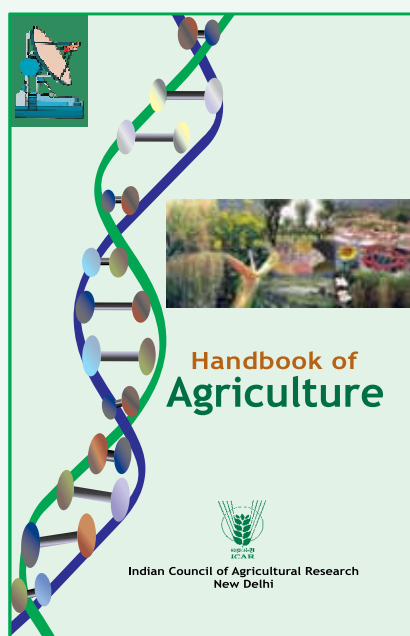
Large variation in mango pickles can be attributed to the recipes used in different parts of the world. In India, several varieties, specific to region are known for making specialized pickles. Appimedi pickle famous from western

Ghats of Karnataka is made of tender mango mainly grown in forests and also on the riversides. Mango pulp and pickles are the most exported commodities from India.

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