The Pomegranate

Punica granatum

THE POMEGRANATE

The pomegranate has a deep association with the cultures of the Mediterranean region and Near East, where it is savored as a delicacy and is an important dietary component, revered in symbolism, and greatly appreciated for its medicinal properties. It is strange that a horticultural icon of such importance has been largely relegated to an ornamental role in the United States and much of Europe. Recent trends indicate that the health-giving and flavor-filled properties of these fruits may soon reverse this oversight.

TAXONOMIC ODDITY AND NAMING

- Botanically, the pomegranate (P. granatum) is in the subclass Rosidae, order Myrtales, which is home to a few other fruits such as the guava (Psidium sp.) and feijoa (Feijoa sp.). However, pomegranate is unusual in being one of only two species in its genus, Punica, which is the sole genus in the family Punicaceae.

- The name Punica is the feminized Roman name for Carthage, the ancient city in northern Tunisia from which the best pomegranates came to Italy. It was initially known as Malum punicum, the apple of Carthage. But Linneaus selected the current name, with the specific epithet granatum, meaning seedy or grainy. Its common name in the United States, therefore, means "seedy apple"

HISTORY OF CULTIVATION

- The pomegranate is widely considered native in the region from Iran to northern, with apparently wild plants in many forests of these areas. Others suggest that it is native to the smaller area of Iran and vicinity, and was spread by human movement to a much broader area in prehistory. In India, the fruits of the wild pomegranate have thicker rinds and extremely high acidity compared with cultivated types. They are also reported to have much smaller arils. In Central Asia, the primary difference noted is the higher acidity in wild material .The pomegranate's origin in proximity to the ancient cultures of the Mediterranean have provided a long, recorded history for pomegranate. Indeed, some have argued that the pomegranate is the "apple" of the biblical Garden of Eden, but this is disputed in a recent review .

- Pomegranate has been naturalized throughout the Mediterranean region . Edible pomegranates were cultivated in Persia (Iran) by 3000 bce , and were also present in Jericho in modern-day Israel. By 2000 bce, Phoenicians had established Mediterranean Sea colonies in North Africa, bringing pomegranates to modern-day Tunisia and Egypt. Around the same time, pomegranates become naturalized in western Turkey and Greece.

- The pomegranate continued to be dispersed around the globe, reaching China by 100 bce. By 800 ce, the fruit was spread throughout the Roman Empire, including Spain. At the same time, it was known to be extensively cultivated in Central and southern India. By the early 1400s, the pomegranate had made its way to Indonesia . In the 1500s and 1600s, the Spanish introduced this species to Central America, Mexico, and South America the first clear evidence that the pomegranate was in the area to become the United States was in the early 1700s, when they were grown in Spanish Florida and English Georgia. By 1770, the pomegranate made its way to the West Coast and was growing in the missions of California.

APPRECIATION AND SYMBOLISM

- Both the Arabic name for pomegranate (rumman) and the Hebrew name (rimmon) are reported to originate as “fruit of paradise,” which provides abundant demonstration of its appreciation in these cultures. In startling contrast, it was considered by the Greeks to be the “fruit of the dead” and provided sustenance to the residents of Hades. These two considerations may demonstrate the amazing breadth of the pomegranate's potential consumer base. The fruit's unique flavors, with sweetness often counterbalanced by acidity, makes pomegranate easy to appreciate by most who try it. In addition to their use as a fresh fruit or fruit juice, the juice of the pomegranate also contributes distinctive character to many mideastern dishes, such as the Iranian fessenjan. As a practical contributor to the diet, these fruits were likely invaluable to early desert travelers as an easily carried, well-protected form of water

THE FRUIT.

The pomegranate fruit is berry-like with a leathery rind (or husk) enclosing many seeds surrounded by the juicy arils, which comprise the edible portion of the fruit. The aril juice sack is composed of many epidermal cells. According to cultivar, arils range from deep red to virtually colorless, whereas the enclosed seed varies in content of sclerenchyma tissue, which affects seed softness. The number of locules and arils (and enclosed seeds) varies, but may be as high as 1300 per fruit. The fruit has a prominent calyx, which is maintained to maturity and is a distinctive feature of the pomegranate fruit. The husk is comprised of two parts: the pericarp, which provides a cuticle layer and fibrous mat; and the mesocarp (known also as the albedo), which is the spongy tissue and inner fruit wall where the arils attach. Septal membranes are the papery tissue that further compartmentalizes groups of arils, but arils do not attach to this tissue. There is interest in identifying or developing cultivars that have more locules to fill the fruit interior, fewer septal membranes for easier eating, and a thinner mesocarp.

POMEGRANATE PRODUCTION

- Current global production estimates for pomegranate are unavailable. However, it is widely grown in many countries where it is well adapted. In India more than 100,000 ha of pomegranate are produced. It is considered one of the most important fruits of the tropical and subtropical areas because of low maintenance cost, good yields, good keeping quality, and ability to thrive with limited moisture. In Iran, 65,000 ha of pomegranate produces 600,000 tons of fruit annually, with about 30% of yield exported. Turkish production in 1997 was 56,000 tons/year. Italy, with ≈1500 ha, is the largest western European producer of pomegranate, and production has been increasing as a result of high market prices.

- In the United States, there are 5600 ha of commercial pomegranate, mostly in the San Joaquin Valley. The 'Wonderful' cultivar dominates almost completely, but there is interest in earlier and later cultivars to extend the market season.

POMEGRANATE PRODUCTION

In Italy

- In Italy there are non-intensive crops in Sicily, Puglia and Cesenatico. In Sicily we find the 'Horse tooth' variety with the shape of the seed, with hard or soft earthenware. Other varieties are the 'Neirana, the prophet Partanna, Selinunte, and Racalmuto', usually with a sweet or bittersweet flavor (to be eaten fresh). In the Cesena area we have 'bella di Bertinoro, belgrappolo, dolce S. Giorgio, furore rosso, giallo cesenate, Kazakistan, Lory, Malta, pievina, pinetta, as well as giant of Albania, giant of the convent, round green'. A Spanish variety widely sold in Italy is the 'Mollar', also sold as 'fantasia'. We also find the Spanish varieties of the 'Spanish ruby and Valenciana'. Instead, imported from the United States are the 'paper shell, and the wonderful', the latter very common all over the world.

MEDICINAL PROPERTIES

According to Eber's papyrus (ca. 1550 bce), the ancient Egyptians used tannin-rich pomegranate root extracts for the riddance of tapeworms. Hippocrates (400 bce) used pomegranate extractions for a wide variety of ailments, such as a plaster to reduce skin and eye inflammation, and as an aid to digestion. No discussion of ancient medical applications of plants is complete without mention of Dioscorides (40–90 ce), who indicates: "All sorts of pommegranats are of a pleasant taste and good for ye stomach" and further suggests the juice for "… ulcers, and for ye paines of ye eares, and for the griefs in ye nosthrills. Other traditional uses of pomegranate products have included treatments for contraception, snakebite, diabetes, and leprosy. Extracts of tannins (bark, leaves, immature fruit) have been used to halt diarrhea and hemorrhage, whereas dried, crushed flower buds are made into a tea as remedy for bronchitis. In Mexico, extracts of the flowers are used as a gargle to relieve mouth and throat . Interestingly, many of these uses are at least somewhat supported by recent scientific studies.

Presumably because of its association as the "fruit of love" rather than empirical observation, the pomegranate has been considered a love potion in some cultures. The prophet Mohammed advised, "Eat the pomegranate, for it purges the system of envy and hatred". Seemingly these properties represent a medicine we would all like to see widely prescribed!

Today, pomegranate juice has been shown to contain polyphenol antioxidants (primarily ellagic acid and punicalagin) that may lower risk of heart disease (Aviram et al., 2004) and may slow cancer progress (Adams et al., 2006). The antioxidant content of pomegranate juice is among the highest of any foods (Guo et al., 2003). An analysis of diverse pomegranate cultivars shows considerable diversity of antioxidant content, with 'Wonderful' among those displaying the highest levels (unpublished data).

MEDICINAL PROPERTIES

There are a myriad of international scientific researches that highlight the healthy properties of the tree and its fruits. Surely the most important product is the juice followed by the oil cold extracted from the seeds for its fatty acids. In the peel and in the membrane the content of bioactive compounds is very high: flavonoids, ellagitannins, proanthocyanidins, minerals (potassium, nitrogen, calcium, phosphorus, magnesium, sodium. Most of the bioactive compounds present on the pomegranate fruit are very strong antioxidants, capable to contrast and protect against free radicals, responsible for the natural aging process of man. These substances belong to the phenolic compounds (Anthocyanins, which give the red color to the juice), the tannins (ellagitannins, from which gallic acid and punicalagin), phenols (from which gallic acid and ellagitannins are produced), punicic acid, flavonoids, anthocyanidins, flavonoids and flavones. Natural antioxidant agents defend the genetic heritage from the risk of mutations caused by free radicals that oxidize our cells, causing aging and disease. It is very important to counteract oxidation in order to avoid the risk of degenerative diseases: atherosclerosis, Alzheimer's disease, Parkinson's, osteoarthritis... in short, these bioactive substances make it possible to reduce oxidative 'stress', which damages the body.

THE POMEGRANATE AND ITS ACTIVE PRINCIPLES

- Among the foods with the greatest antioxidant capacity, measured with the ORAC (Oxygen Radical Absorbance Capacity) scale, there is also the pomegranate, together with green tea, grapes and red fruits. It has been found that the effectiveness of the substances contained in the pomegranate is two to three times higher than that of green tea or red grapes. The edible part represents 55% of the fruit, made up of seeds, composed of: 80% water, 16% sugars, 1.5% organic acids (above all ascorbic acid, citric acid and malic acid). In the grains there are fatty acids, between 12 and 20% of their weight, polyunsaturated acids (linolenic, linoleic, punic, oleic, stearic, and palmitic) such as omega can prevent cardio-circulatory disorders and its pathologies, in how much they help to reduce LDL (bad) cholesterol. These acids, acting in collaboration with ellagic acid and punicic acid, counteract the formation of plaques on the surface of the arteries.

THE POMEGRANATE AND ITS ACTIVE PRINCIPLES

- Protects the arteries Ellagic acid is particularly effective in preventing platelet aggregation and the oxidation of LDL lipoproteins, responsible for the formation of atheromas on the arterial walls, as well as regulating dyslipidemia, i.e. the imbalance of fats in the blood, and improving the ratio of bad LDL cholesterol to good HDL cholesterol.
- Reduces hypertension and inflammation.
- At the intestinal level, especially on the colon mucosa, ellagic acid reduces the level of prostaglandins, which cause inflammation.
- Repair the cartilage, being effective in relieving the ailments related to asteoarthritis and in promoting the reconstruction of damaged cartilaginous tissues.
- Fights bacteria such as Escherichia and Salmonella.
- Useful for diabetics, as it alleviates related ailments, decreasing oxidative stress and the formation of arterial plaques, and although there is sugar in the juice, it does not produce an increase in blood sugar. Pomegranate seed oil has been shown to be effective in reducing insulin resistance, lowering circulating blood sugar, with the risk that type 2 diabetes may arise. The pomegranate antioxidants inhibit the action of enzymes that allow intestinal assimilation of glucose, decreasing what circulates in the blood.
- Against obesity.
- Against tapeworms and other ailments, since ancient times the pomegranate has been considered a powerful remedy to eliminate intestinal parasites and counteract dysentery, thanks to the tannins it is rich in.
- Helps to eradicate tooth decay, pomegranate contains substances capable of eliminating bacteria that affect tooth enamel.
- Moisturizing protection for the skin, the ellagic acid contained in pomegranate with its antioxidant action protects skin cells from damage from the sun's rays.
- Pomegranate is a natural sexual stimulant in humans, increasing hormone levels related to fertility
- In India, for example, it has always been believed that the pomegranate is able to overcome sterility. For women, the substances present in pomegranate contain phytoestrogens, which mimic the action of hormones, helping to reduce discomfort due to hormonal imbalances.
- In defense of neurons, pomegranate can provide an efficient defense of brain function thanks to its antioxidant properties and ability to improve circulation. In parturient women, pomegranate extract helps stimulate uterine contractions.
- Anti-cancer hopes. The antioxidants in pomegranate help prevent the cellular DNA changes that can lead to the birth of precancerous crazed cells, reducing the proliferation of cancer cells.

THE COSMETIC PROPERTIES

- Pomegranate seed oil is a cosmetic product with valid antioxidant properties. It is obtained by cold pressing the seeds and, if used consistently, it makes the skin more elastic and compact, especially on the face. The antioxidant and anti-aging properties of pomegranate cosmetic treatments are indicated to counteract sagging skin that often occurs on the skin of the face and neck. The masks and actions enriched with the active ingredients of pomegranate are also excellent allies to counteract couperose and relieve skin irritation. pomegranate also has firming and toning properties, contrasting cellulite with anti-water retention qualities.

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