

POMEGRANATES: A HOLY AND WHOLESOME FRUIT

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Pomegranates (*Punica granatum*) have garnered much of public attention as current research has found their consumption to have multiple health benefits. Little known to most people, the pomegranate received much attention long before the current trend, being extremely prominent in *Tanakh*, *Mishneh* and Talmud as a symbol of health and fertility, along with having a decorative function. With its religious significance and medicinal benefits, the pomegranate definitely bears a closer look.

Pomegranates play a significant role not just for Jews, but also for many other religions and cultures. They are mentioned in many stories of ancient Greek mythology. For example, in the myth of Persephone, pomegranates are involved in the Greek explanation for the seasons of the year. The myth is that Persephone is tricked by Hades, the god of the underworld, into eating three pomegranate seeds, which subsequently condemn her to reside, for the three winter months each year, in the underworld. During those months in the underworld, the world was barren as her mother, Demeter, the goddess of agriculture, mourned for the temporary loss of Persephone [1].

Pomegranates also often appear in Christian religious decorations; broken pomegranate fruit is considered a symbol of the suffering of their deity. In Islam, the Koran states that pomegranates grow in the gardens of paradise, whereas in Hinduism they are associated with the earth goddess and lord Ganesha, the god of beginnings, as well as being a symbol of fertility and prosperity [2].

With the widespread importance of pomegranates, it is no surprise that they are connected to one of the first stories of *Tanakh*. The story of Adam and Eve's eviction from *Gan Eden* focused on the *eitz hadat tov v'rah*, a tree whose fruit was forbidden to them, as its consumption imparted the ability to distinguish between good and evil. The identity of the particular species of tree is not stated in the text. Some Jewish scholars believe that the tree was the pomegranate tree [2]. It is intriguing, in light of the recently discovered medicinal properties of pomegranates, that Eve saw the fruit

as "good for eating and a delight to the eyes" (Genesis 3:6)

The pomegranate continues to appear in *Tanakh*, often being used to characterize the land of Israel as a fertile land of abundance. In Deuteronomy 8:8, when describing the good land to which G-d was bringing the Jews, the pomegranate is included in a special category of produce known as the *shevah minim*, or seven species. These seven agricultural species are the defining plants of *Eretz Yisrael* and show the wealth of the country. In Numbers 13:23, the spies sent to scout out Israel bring back pomegranates, along with grapes and figs, to confirm G-d's words that the land was rich and fruitful. While in the desert, the Jews complained that there were no pomegranates, exemplifying the barrenness of the desert (Numbers 20:5). Later in *Tanakh*, the pomegranate is also symbolic of a more unfortunate event, when in Joel 1:12, the ruin of pomegranates is used to represent the devastation that accompanied the destruction of the second temple: "The vine has dried up, the fig tree withers, pomegranate, palm and apple - the trees of the field are withered and joy had dried up among men."

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The pomegranate was used as an ornament. The hem of the *meil*, or robe of the *kohen gadol* (the high priest of the temple), was edged in pomegranates made of twisted blue, purple, and crimson yarns (Exodus 39:25). Furthermore, two-hundred pomegranates of bronze adorned meshwork of the capitals atop two pillars in the first temple built by King Solomon (Kings II 25:17). It is said that the crown worn by Solomon was designed based on the "crown" of a pome-

granate [2].

Song of Songs, in describing the allegorical relationship between two lovers, contains many references to the pomegranate, making it a romantic fruit. In 4:3, the narrator describes his beloved saying, “Your brow behind your veil gleams like a pomegranate split open.” Later in that chapter (4:13), her limbs are described as an orchard of pomegranates. These verses establish the pomegranate as a fruit which represents beauty. Additionally, the *Midrash* on Song of Songs compares the rows of seeds in the pomegranate to school children learning Torah and sitting in rows.

This preoccupation with regards to pomegranates continues into *Torah She’baal Peh*. The *Mishneh* in *Kelim* (17:1) institutes the pomegranate as a unit of measurement. In the Talmud (*Chagiga* 15b), pomegranate consumption is used as a metaphor to describe a student who chooses only the good: “He found a pomegranate, ate the fruit, and threw away the peel.” The pomegranate is again used for a symbolic purpose in *Berachot* (57a), referencing the Song of Songs, in which dreams of pomegranates are interpreted in various ways, depending on the size and state of the pomegranate: “If one sees pomegranates in a dream - if they are little ones, his business will be fruitful like a pomegranate; if big ones, his business will increase like a pomegranate. If they are split open, if he is a scholar, he may hope to learn more Torah... if he is unlearned, he may hope to perform good deeds, as it says: Thy temples are like a pomegranate split open (Song of Songs 4:3). What is meant by ‘Thy temples’? Even the illiterate among thee are full of good deeds like a pomegranate.” The Talmud also uses the beauty of the pomegranate to envision the beauty of Rabbi Yochanan: “Let him bring a silver cup from the smelter, fill it with the kernels of a red pomegranate, surround it with a crown of red roses, and put it between the sun and the shade, he will then sense in its brilliance the beauty of Yochanan” (*Baba Metziyah* 84a). Lastly, the pomegranate is mentioned in the Talmud as a fruit with many uses: as a dye (*Shevi’it* 7:3) and a test for invisible ink (*Gittin* 19b).

Pomegranates were pictured on Hasmonean coins of ancient Judea as a holy symbol and their image is currently featured on the modern Israeli *lirah* coin. Today, many Torah scrolls are stored with two decorative silver pomegranates covering the tops of their handles [3].

After seeing the prevalence of pomegranate in Jewish texts as a symbol of health, fertility and beauty, it is interesting to note current research on the health benefits of pomegranates. The pomegranate has significant amounts of antioxidant polyphenols, mostly tannins called punicalagins [4].

Pomegranate juice was measured to have an ORAC (antioxidant capability) of 2,860 units per 100 grams [5]. Antioxidants protect the body by neutralizing reactive oxygen species (ROS), or free radicals, which have devastating effects on a person’s health, as they have many detrimental effects, from wrinkles to cancer.

With regard to cancer, many studies have shown that pomegranates, or compounds derived from pomegranates, have preventative and ameliorative effects. For prostate cancer, punicalagins from pomegranates, along with urolithins, which are metabolites of the ellagic acid found in pomegranates, were found to effectively inhibit the activity and expression of CYP1B1, a key enzyme target in prostate cancer chemoprevention [6]. In another study, pomegranate juice extract induced apoptosis and inhibited cell proliferation in prostate cancer cells by regulating the insulin-growth factor (IGF) system. IGF plays a crucial role in cancer, as their increased levels lead to an increased cancer risk [7].

Pomegranate may reduce the risk of breast cancer as well. Estrogen, a female hormone that can stimulate the growth of breast cancer cells, is generated by aromatase, an enzyme which converts androgen into estrogen. More than 400,000 women die from breast cancer globally every year. About 75 percent of breast cancers are estrogen-receptor positive, meaning they are stimulated by estrogen [8]. In a study conducted by the Beckman Research Institute, pomegranate extract inhibited aromatase enzyme, implicating pomegranate’s potential in preventing estrogen-responsive breast cancers [9]. Pomegranate extract is also suggested to have a role in lowering the metastatic potential of aggressive breast cancers [10].

Oxidative stress is also relieved by pomegranate juice or extract. Hyperoxaluria is a condition where too much of a metabolic byproduct, oxalate, is noted in urine, causing oxidative stress to the kidneys and inducing stone formation. In rats with hyperoxaluria, pomegranate juice helped to reduce crystal formation and prevent damage to the cells of the renal tubule [11]. Type 2 diabetes also causes oxidative stress by hyperglycemia. This is an important contributing factor to the cardiovascular complications of diabetes. In a study of diabetes by the Yeditepe University Medical Faculty, a group of diabetics given pomegranate extract (along with other polyphenol containing compounds) showed a statistically significant lowering of LDL levels and raising of HDL levels, as compared to the control group [12].

Further studies of the effects of pomegranate on diabetes showed that the PPAR gamma, the receptor targeted by antidiabetic drugs, was activated by punicalic acid, a compound

found in pomegranates. Apparently, pomegranates may be able to act in similar ways as antidiabetic medications by improving the ability to normalize glucose and to suppress inflammation [13].

Pomegranate peel may also serve as an antimicrobial agent. Analysis of the peels showed phenols and flavonoids, both active microbial inhibitors. When tested in agar gels and in food, the peels proved to be potent inhibitors of bacteria like *Escherichia coli*, *Staphylococcus aureus*, and other food-borne pathogens [14]. Pomegranate rind extract along with copper ions exhibited moderate antimicrobial effects against methicillin-resistant *S. aureus* [15].

The list of health benefits for pomegranate continues with a study that showed that eight ounces of pomegranate juice daily for three months improved the amount of oxygen getting to the heart muscle in patients with coronary heart disease. Pomegranate extract may also help arthritis. When human cartilage cells were treated with pomegranate extract, inflammation was reduced and the enzymes that break down

cartilage became less active [16].

In my own research at Yeshiva University's Stern College for Women, with Dr. Harvey Babich, Dr. Alyssa Schuck, and Leah Solodokin, we explored the prooxidant effects of pomegranate extract *in vitro*, both on normal human gingival fibroblasts and human oral cancer cells. Pomegranate extract proved cytotoxic to the cancer cells at lower concentrations than to the normal cells, implicating the possible future role of pomegranate derived compounds in cancer prevention and treatment.

With its religious and medical importance, the pomegranate is a fruit that can be studied from every angle. As described in *Tanakh, Mishneh* and Talmud, the pomegranate is a symbol of health, fertility, and beauty. Furthermore, as noted in current biomedical research, it has many health benefits, including acting as an anti-inflammatory, an antioxidant, an antimicrobial, and a potentially anticarcinogenic agent.

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