

# POMEGRANATE FRUIT: THE INDISPENSIBLE FOR GOOD HEALTH AND HUMAN LONGEVITY

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**Abstract:** The pomegranate belongs to the Kingdom; Plantae, Order: Myrtales, Family: Lythraceae, Genus; Punica, Species: *P. granatum* and botanical name *Punica granatum*. This is a fruit-bearing deciduous shrub or small tree that grows between 5 and 8 m (16 and 26 ft) tall. The pomegranate, or *Punica granatum*, is a shrub that produces a red fruit. Categorized as a berry, the pomegranate fruit is about 5-12 cm (2-5 inches) in diameter. It is red, round and looks kind of like a red apple with a flower-shaped stem. The pomegranate is a fruit that contains hundreds of edible seeds called arils. They are rich in fiber, vitamins, minerals and bioactive plant compounds, but they also contain some sugar.

The skin of the pomegranate is thick and inedible, but there are hundreds of edible seeds called arils within. The arils are what people eat, either raw or processed into pomegranate juice. Ruby red, delicious and nutrient rich pomegranates pack a mighty punch in safeguarding your health. Pomegranate contains a unique and powerful antioxidant called punicalagin, the most abundant antioxidant in pomegranate, responsible for more than half of the antioxidant activity of pomegranate juice. It is known for its irreplaceable health and medicinal benefit as a fruit compared with the likes of cranberry, grapes, pumpkins etc. with convincing effects on the cardiovascular, gastrointestinal, reproductive, renal system and general well-being of human system.

**Key Words:** Pomegranate, In vivo fertilization, Punicalgins and Punicic, cholesterol, diabetes, cancers, inflammation, antioxidants, phytochemicals, oxidation, dyslipidemia, High density lipids(HDL), low density lipids(LDL). Prostate specific antigen PSA.

## 1.0 INTRODUCTION:

The pomegranate originated in the region of modern-day Iran and has been cultivated since ancient times throughout the Mediterranean region and northern India. It was introduced into Spanish America in the late 16th century and California by Spanish settlers in 1769.

Pomegranate was one of the earliest cultivated fruits, and has been prominent throughout history in art, culture, and religion, from the story of the seasons in Greek mythology to Romeo and Juliet to the Bible.

Pomegranate is ubiquitous in Middle Eastern cooking and its super food status, unique flavor and texture has made it increasingly popular in the U.S. Pomegranate contains hundreds of tiny, crisp arils; each aril is a seed encased in a juicy pulp, a tasty mix of sweet and tart flavors.

Today, it is widely cultivated throughout the Middle East and Caucasus region, North Africa and tropical Africa, the Indian subcontinent, Central Asia, the drier parts of Southeast Asia, and parts of the Mediterranean Basin. It is also cultivated in parts of California and Arizona. In recent years, it has become more common in the commercial markets of Europe and the Western Hemisphere.

## 2.0 METHODOLOGY:

Empirical data was gathered from specialised laboratories for in vivo reproductive analysis, radiology, urology, cardiovascular departments of accredited and regulated health facilities. Random oral interviews were made and recorded from indigenes who have eaten the pomegranate fruit between 2 to 15 weeks and who could testify to the effect it had on their health.

## ***2.1 Sample Choosing***

Sampling is the process of selecting a portion of the population in quantitative studies, the representation of the sample enhances generalization of the findings (Polit & Beck2004; 291). The sampling methods are classified into probability and non-probability sampling method. A convenient sampling technique which is non-probable was used to sample the population of the study.

## ***2.2 Instrumentation***

The writer used a tape recorder for the very few individuals who were happy to share their views on the benefits derived from eating pomegranate fruit. Participants were made aware of the recording and the dialect used was a local Ghanaian language which helped them to express their words well.

## ***2.3 Data Collection Procedure***

About 70 % of the data was attained by going for empirical records from accredited health centers and laboratories and 30% was obtained from the field on only those who have eaten pomegranate fruit specifically because they had a devastating health condition like atherosclerosis, dyslipidemia, strokes, erectile dysfunctions cancers of the prostate, breast, skin etc.

## ***2.4 Data Analysis***

Data was analysed using descriptive, qualitative and quantitative methods. Much attention was given to the empirical data obtained and from the field recordings and views from participants

## **3.0 DISCUSSIONS & ANALYSIS:**

Pomegranate juice has been analyzed to have greater antioxidant capacity than red wine, grape juice, cranberry juice, green tea or acai juice. Drinking pomegranate juice measurably reduces oxidative stress (the toxic effects of free radicals) in healthy humans. Much research has shown that pomegranate's potent antioxidant capacity provides protection against heart diseases, cancers and cognitive impairments.

### ***3.1 Limitations of the study***

1. On the field about 30% of the participants were unwilling to talk especially when they were told is a study been conducted, most also feared their voice been recorded
2. There were time constraint since the writer is a health practitioner and was always at work and only went to the field on his leisure time
3. Since the pomegranate fruit was imported to Ghana, it was costive and only the middle level to rich families could afford them
4. There was lack of funding to import more of the fruits to give targeted group for frequent monitoring and reporting

### ***3.2 NUTRITIONAL COMPOSITION***

Pomegranates have an impressive nutrient profile:

One cup of arils (174 grams) contains:

Energy 346 kJ (83 kcal)

Carbohydrates 18.7 g

Sugars 13.67 g

Dietary fiber 4 g

Fat 1.17 g

Fiber: 7 grams.

Protein: 3 grams.

### **Vitamins**

Vitamin C: 30% of the RDA.

Vitamin K: 36% of the RDA.

Folate: 16% of the RDA.

Potassium: 12% of the RDA.

Thiamine (B1) (6%) 0.067 mg

Riboflavin (B2) (4%) 0.053 mg

Niacin (B3) (2%) 0.293 mg

Pantothenic acid (B5) (8%) 0.377 mg

Vitamin B6 (6%) 0.075 mg

Folate (B9) (10%) 38 µg

Choline(2%) 7.6 mg

Vitamin E (4%) 0.6 mg

### **Minerals**

Calcium (1%) 10 mg

Iron (2%) 0.3 mg

Magnesium (3%) 12 mg

Manganese (6%) 0.119 mg

Phosphorus (5%) 36 mg

Potassium (5%) 236 mg

Sodium(0%) 3mg

Zinc (4%) 0.35 mg

A critical study of the nutritional values per serving of pomegranate shows that there is no specific tropical fruit or vegetable that could be compared to it with the exception of mushroom which is the most talked about by nutritionists of its value. Below are values the nutritional values of mushroom thus 5 servings per container, 84g/3oz ; saturated fats, cholesterol, trans fat, 0%, sodium 15%, total carbohydrate 3g, 1%, dietary fiber 1g, 3%, proteins 3g,

Vitamin D 0%,calcium 0%, potassium 300mg,6%, iron 2%, vitamin k 0%,vitamin A 0%, vitamin C 2%, vitamin E 0%,thiamin 4%, riboflavin 17%, niacin 13%, vitamin B6 4%, vitamin B12 0%, folate 3%, pantothenic acid 10%, calcium 0%,iron 2%, magnesium 2%, phosphorous 6%,zinc 2%,copper 11%,manganese 2%,selenium 9% . Mushroom couldn't match it because of the process it goes through before it becomes edible, bad cooking practice may destroy most of its phyto nutrients and very few may be retained so it end up helping the

gastrointestinal tract in the form of fiber and roughages to help peristalsis, it does little to the oxidation process that goes on in the blood stream.

### 3.3 Two most Potent antioxidants/phytochemicals in Pomegranates

Many studies have shown that they have incredible benefits for your body, and may lower the risk of all sorts of diseases. They contain a range of beneficial plant compounds, unrivaled by other foods; there are two unique substances in pomegranates that are responsible for most of their health benefits.

These are Punicalgins and Punicic Acid.

**Punicalagins ;** Punicalagins are extremely powerful antioxidants found in the juice and peel of a pomegranate. They are so powerful that pomegranate juice has been found to have three times the antioxidant activity of red wine and green tea. Punicalagin is an ellagitannin, a type of phenolic compound. It is found in forms alpha and beta in pomegranates (*Punica granatum*), in *Terminalia catappa* and *Terminalia myriocarpa*, and in *Combretum molle*, the velvet bushwillow, a plant species found in South Africa. These three genera are all Myrtales and the last two are both Combretaceae.

Punicalagins are the largest molecule found intact in rat plasma after oral ingestion and were found to show no toxic effects in rats that were given a 6% diet of punicalagins for 37 days. Punicalagins are also found to be the major component responsible for pomegranate juice's antioxidant activity.

Punicalagin is water-soluble and has high bioavailability. They are known to hydrolyze into smaller phenolic compounds such as ellagic acid in vivo where one potential mechanism is hydrolysis across the mitochondrial membrane of cultured human colon cells. It is a highly active carbonic anhydrase inhibitor, Pomegranate extract and powder is typically made from the peel, due to its high antioxidant and punicalagin content.

**Punicic Acid ;** Punicic acid, also known as pomegranate seed oil, is the main fatty acid in the arils and possess about 65% of all oils in pomegranate. It is a type of conjugated linoleic acid with potent biological effects. Punicic acid (also called trichosanic acid) is a polyunsaturated fatty acid, 18:3 (n-5). It is named for the pomegranate, (*Punica granatum*), and is obtained from pomegranate seed oil. It is also found in the seed oils of snake gourd. Punicic acid is a conjugated linolenic acid or CLnA; i.e. it has three conjugated double bonds. It is chemically similar to the conjugated linoleic acids, or CLA, which have two. In lab rats, it was found that punicic acid was converted to the CLA rumenic acid (9Z11E-CLA). In vitro, it shows anticancer activity against prostate cancer cells. OLETF rats, a strain which becomes obese, remained relatively lean when punicic acid was added to their feed. (Tsunami T, Kawakami Y, Abe R (1 August 2006). *Conjugated linolenic acid is slowly absorbed in rat intestine, but quickly converted to conjugated linoleic acid. J Nutr.*

### 4.0 FINDINGS:

Empirical data on research work done on pomegranate by other health science and nutrition experts place it higher than any other tropical fruit. The writer will like to add the seasons of cultivation which usually is in September to March in every year.

These are the only seasons to enjoy your fresh pomegranates; however the seeds may be stored throughout the season in sealed containers and kept in freezing compartments of our fridges. Further study by the writer saw that those who are on medications to manage their cardiovascular conditions had no contraindications with the pomegranate fruit. It could be eaten with any orthodox or herbal medication.

In addition, all those who kept on taking the fruit within 2 weeks had tremendous improvement in general well-being but more studies need to be done on it to ascertain the quantity of fruits needed for the various health conditions of individuals.

Also the writer saw that the seeds of the fruit also aids in digestion and peristalsis of the gastrointestinal tract because of its roughage and fiber content, however more research and engagements need to be done to know whether infants and children under 5 years should be allowed to be eating pomegranate fruit.

Most of the participants were only eating one pomegranate fruit per week because of its expensiveness in Ghana. It is not grown in Ghana and is only imported in the country so those who were able to eat at least 5 of the fruits per week were the middle level to the affluent.

## 5.0 RESULTS

### 5.1 *The Anti-cancer effects of pomegranate fruit:*

Pomegranate has anti-inflammatory effects that may protect against cancer and other chronic diseases.

Pomegranate has anti-angiogenic properties, meaning that they may help to prevent growing tumors from acquiring a blood supply, preventing those tumors from receiving the nutrients that would allow them to grow larger.

Pomegranate is one of the few foods (mushrooms are another) that contain natural aromatase inhibitors. This means that they inhibit the production of estrogen, which can reduce breast cancer risk.

After treatment for prostate cancer, two studies have shown that pomegranate juice or supplements slowed the increase in PSA.

### 5.2 *The cardiovascular system benefit of pomegranate:*

Heart disease is currently the world's most common cause of premature death; it is a complicated disease, driven by many different factors. *Pomegranate May Lower Blood Pressure*; High blood pressure (hypertension) is one of the leading drivers of heart attacks and strokes.

In one study, people with high blood pressure had a significant reduction after consuming 150 ml (5 oz) of pomegranate juice daily for 2 weeks.

Other studies have found similar effects, especially for systolic blood pressure (the higher number in a blood pressure reading).

**Bottom Line:** Regular intake of pomegranate juice has been shown to lower blood pressure levels in as little as 2 weeks.

Punicic acid, the main fatty acid in pomegranate, may help protect against several steps in the heart disease process.

In a study in 51 people with high cholesterol and triglycerides, 800 milligrams of pomegranate seed oil per day for 4 weeks was shown to significantly lower triglycerides and improve the triglyceride: HDL ratio.

Another study looked at the effects of pomegranate juice in people with type 2 diabetes and high cholesterol. They noted significant reductions in LDL cholesterol, as well as other improvements.

Pomegranate juice has also been shown, in both animal and human studies, to protect the LDL cholesterol particles from oxidation, one of the key steps in the pathway towards heart disease.

**Bottom Line:** Several human studies have shown that pomegranate can have benefits against heart disease. It improves the cholesterol profile and protects LDL cholesterol from oxidative damage.

Pomegranate phytochemicals reduce LDL oxidation (a contributor to atherosclerotic plaque development).

### 5.3 *Pomegranate phytochemicals have anti-dyslipidemia effect*

In a study of patients with severe carotid artery blockages, after one ounce of pomegranate juice daily for one year, there was a 30 percent reduction in atherosclerotic plaque. In striking contrast, in the participants who did not take the pomegranate juice atherosclerotic plaque increased by 9 percent.

#### ***5.4 Brain Health of the Fruit; Guards Memory and Brain Function;***

There is some evidence that pomegranate can improve memory.

In one study in surgical patients, 2 grams of pomegranate extract prevented deficits in memory after the surgery.

Another study in 28 elderly individuals with memory complaints found that 237 ml (8 oz) of pomegranate juice per day significantly improved markers of verbal and visual memory.

There is also some evidence from studies in mice that pomegranate can help fight Alzheimer's disease.

**Bottom Line:** Some evidence shows that pomegranate can improve memory in the elderly and post-surgery, and studies in mice suggest that it can protect against Alzheimer's disease

Pomegranate supplements taken before and after surgery prevented the postoperative memory dysfunction associated with coronary artery bypass or heart valve surgery.

In those with mild memory complaints, individuals drinking pomegranate juice daily performed better on a memory task compared to placebo and displayed increased brain activation measured by functional MRI.

Removing the edible arils from the pomegranate is easy when you know how to do it. The easiest way is to cut it around the diameter, split it into two and then pound the back with the back of a large serving spoon. The flavor and health benefits of pomegranate make the effort well worth it.

#### ***5.5 Pomegranate Has Impressive Anti-Inflammatory Effects;***

Chronic inflammation is among the leading drivers of many killer diseases.

This includes heart disease, cancer, type 2 diabetes, Alzheimer's disease and even obesity.

Pomegranate has potent anti-inflammatory properties, which are largely mediated by the antioxidant properties of the punicalagins. Test tube studies have shown that it can reduce inflammatory activity in the digestive tract, as well as in breast cancer and colon cancer cells

One study in diabetics found that 250 ml of pomegranate juice per day for 12 weeks lowered the inflammatory markers CRP and interleukin-6 by 32% and 30%, respectively.

#### ***5.6 Pomegranate May Help Fight Prostate Cancer;***

Prostate cancer is the most common type of cancer in men.

Laboratory studies have shown that pomegranate extract can slow down cancer cell reproduction, and even induce apoptosis (cell death) in cancer cells.

The PSA (prostate specific antigen) is a blood marker for prostate cancer.

Men whose PSA levels double in a short period of time are at increased risk of death from prostate cancer. Interestingly, a human study found that 237 ml (8 oz) of pomegranate juice per day increased the PSA doubling time from 15 months to 54 months, which is huge.

A follow-up study found similar improvements using a type of pomegranate extract called POMx . There is preliminary evidence that pomegranate juice can be useful in men with prostate cancer, potentially inhibiting cancer growth and lowering the risk of death.

#### ***5.7 Pomegranate May Also be Useful against Breast Cancer;***

Breast cancer is the most common type of cancer in women.

Pomegranate extract has been shown to inhibit reproduction of breast cancer cells, and may even kill some of them. However, this is currently limited to laboratory studies. More research is needed. Laboratory studies have shown that pomegranate extract can help fight breast cancer cells, but human studies are needed to confirm this.

### ***5.8 Pomegranate May Lower Blood Pressure;***

High blood pressure (hypertension) is one of the leading drivers of heart attacks and strokes.

In one study, people with high blood pressure had a significant reduction after consuming 150 ml (5 oz) of pomegranate juice daily for 2 weeks.

Other studies have found similar effects, especially for systolic blood pressure (the higher number in a blood pressure reading).

**Bottom Line:** Regular intake of pomegranate juice has been shown to lower blood pressure levels in as little as 2 weeks.

### ***5.9 Pomegranate May Help Fight Arthritis and Joint Pain;***

Arthritis is a common problem in Western countries and also prevailing in Africa.

There are many different types, but most of them involve some form of inflammation in the joints.

Given that the plant compounds in pomegranate have anti-inflammatory effects, it makes sense that they could help treat arthritis.

Interestingly, laboratory studies have shown that pomegranate extract can block enzymes that are known to damage joints in people with osteoarthritis.

It has also been shown to be beneficial against arthritis in mice, but there is very little evidence in humans so far.

**Bottom Line:** Studies in animals and isolated cells have shown that pomegranate extract may be beneficial against several forms of arthritis, but human research is needed.

## **6.0 POMEGRANATE JUICE MAY HELP TREAT ERECTILE DYSFUNCTION;**

Oxidative damage can impair blood flow in all areas of the body, including erectile tissue.

Pomegranate juice has been shown to be beneficial in increasing blood flow and erectile response in rabbits.

In a study of 53 men with erectile dysfunction, pomegranate appeared to have some benefit, but it was not statistically significant.

**Bottom Line:** Pomegranate juice has been linked to reduced symptoms of erectile dysfunction, but more research is needed.

### ***6.1 Pomegranate Can Help Fight Bacterial and Fungal Infections;***

The plant compounds in pomegranate can help fight harmful micro-organisms.

For example, they have been shown to be beneficial against some types of bacteria, as well as the yeast *Candida albicans*.

The anti-bacterial and anti-fungal effects may also be protective against infections and inflammation in the mouth. This includes conditions like gingivitis, periodontitis and denture stomatitis.

**Bottom Line:** Pomegranate has anti-bacterial and anti-viral properties, which may be useful against common diseases of the gums.

## 6.2 Pomegranate May Improve Exercise Performance;

Pomegranate is rich in dietary nitrates, which have been shown to improve exercise performance.

In a study of 19 athletes running on a treadmill, 1 gram of pomegranate extract 30 minutes before exercise significantly enhanced blood flow.

This led to a delay in the onset of fatigue, and an increase in exercise efficiency.

More studies are needed, but it seems like pomegranate may be beneficial for physical performance, similar to beetroot juice.

## 7.0 RECOMMENDATIONS:

According to the writer, the high antioxidant and phytochemical value of the pomegranate fruit makes it a human system friendly so should be added to our daily food servings

Over weight and obese individuals should add pomegranate to their everyday food since it can regulate and improve their metabolism rate

More research needs to be done to develop resistant species of the fruit that could be grown everywhere in the world regardless of the climate conditions so that it becomes a fruit for all season.

Due to its many and higher vitamins value, it may boost the immune system and this could prevent diseases.

It has a regulated alkaline medium that could help prevent urinary tract infections since bacteria and fungi can't live in such environments.

Its higher vitamin value and moderate protein will improve the skin, nails and hair for women into beautification so they should try it and stop the steroids.

Patients are risk or diagnosed of cancers should try eating pomegranate fruit because of its anti-inflammatory effects and properties while reporting effects to their physicians.

## 8.0 CONCLUSION:

Pomegranate should be part of our everyday set of meals because of its medicinal properties. Nutrition experts, public health practitioners, farmers, Agriculture experts should all take part, in the mass education on the general public to consume more of the fruit. Many may have them in their backyard gardens or communities but since they may not know its high antioxidant and phytochemical value in the help of cancers, heart diseases etc, they may not attach any seriousness to its consumption.

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