

POMEGRANATE SEED OIL (PUNICA GRANATUM L.), STUDY OF PHYSICAL AND CHEMICAL PROPERTIES

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Abstract: Pomegranate seed oil, also known as Punica granatum seed oil, is a valuable natural resource obtained from the seeds of the pomegranate tree (*Punica granatum*). Pomegranate is a fruit known for its antioxidant and health benefits contained in its seeds. Pomegranate seed oil has long attracted the attention of researchers and manufacturers of cosmetic and medical products due to its amazing characteristics and potentially beneficial properties.

The main importance of pomegranate oil lies in its unique composition, including its high content of fatty acids, antioxidants, vitamins and biologically active substances. Its rich composition gives it many beneficial properties, including antioxidant and anti-inflammatory properties, the ability to improve skin conditions, and potential medical uses.

In this review, we will look at the composition and properties of pomegranate seed oil, as well as research related to its effectiveness in cosmetic and medical applications. We also discuss the potential limitations and challenges facing the use of pomegranate oil and its role in the beauty and health market. This review aims to highlight the importance of pomegranate oil as a natural resource that can enrich our lives and improve our skin and health.

Key words: Pomegranate, medicinal, oil, skin, inflammation, antioxidant, cholesterol, cardiovascular, aging.

Relevance.

The actual use of pomegranate seed oil (*Punica granatum*) is determined by a number of factors, including its numerous beneficial properties and potential applications in various fields. Here are some of the most important aspects of the current issue:

1. Cosmetics industry:

- Pomegranate seed oil is widely used in cosmetic products such as creams, masks, serums and massage products. Ego's unique properties, including antioxidants, help increase the cost of living and reduce the risk of aging.

2. Antioxidant properties:

- In modern life, where the skin is exposed to polluted environments and free radicals, the relevance of the antioxidant properties of pomegranate oil can hardly be overestimated. It helps protect the horse's cells from injury and maintain healthy skin.

3. Anti-inflammatory properties:

- Pomegranate seed oil has been proven effective in reducing inflammation. This is relevant for people with sensitive skin, as well as for treating inflammatory conditions such as acne and eczema.

4. Medical research:

- Pomegranate oil is being researched in medical fields including oncology, cardiology and dermatology. Its potential in the profile and treatment of various diseases makes it a relevant object of research.

5. Natural sources of care:

- In light of growing consumer awareness of the dangers of chemical ingredients and cosmetic products, such as pomegranate seeds, represents a natural alternative. This makes it relevant for those who prefer natural and environmentally friendly care products.

6. Healthy eating:

- In addition to cosmetic and medicinal uses, pomegranate oil may be relevant in the food industry. It is used to add vitamins and antioxidants to foods such as salads and sauces.

7. Innovation potential:

- Constant research and development of new technologies make it possible to maximize the potential of pomegranate oil, which makes it a relevant object for innovation and development. Pomegranate seed oil (*Punica Granatum Seed Oil*) contains various biologically active substances, including fatty acids, antioxidants, phytosterols and vitamins. Here is the general composition of this oil:

1. Fatty Acids: Pomegranate seed oil is rich in fatty acids, including:

- Carboxylic acid: This fatty acid is one of the key components of pomegranate oil. Mother has anti-inflammatory and antioxidant properties.

- Linoleic acid: This fatty acid helps hydrate the skin and maintain its barrier function.

2. Antioxidants. Pomegranates are rich in antioxidants, including vitamin C and vitamin E. They help protect skin cells from harmful free radicals and can reverse signs of aging.

3. Phytosterols. Phytosterols are plant compounds that have anti-inflammatory and anti-inflammatory properties. I can help you relieve inflammation and heal it.

4. Vitamins. Pomegranate contains vitamin C and vitamin E, which play an important role in strengthening and rejuvenating the skin.

5. Biologically active compounds: In addition to the main components, the sample also contains various biologically active substances, which may vary depending on the product and method of preparation.

The rich composition of pomegranate juice gives it unique properties, including antioxidant and anti-inflammatory properties, moisturizing properties and improved texture. This composition makes pomegranate seed oil a key ingredient in cosmetic products and an attractive research target for potential medicinal applications.

Pomegranate oil continues to attract the attention of scientists, producers and consumers for its many benefits and potential applications in various fields. Ego's unique properties and abilities are of great interest to his current research and commercial subjects. One of the modern areas of pharmaceutical research is the search for new types of plant raw materials to expand the range of fatty oils used for medical purposes. The main source of fatty oils is the seeds and fruits of oilseeds. In particular, pomegranate seeds are a source of fatty oil with an atypical chemical composition, in which the presence of 40-60% unidentified acid was previously detected using gas chromatography. Based on these data, it is most likely considered a conjugate acid.

In recent decades, scientific research has been carried out to study the chemical components of *Punica granatum L.* _ Pomegranate seed oil makes up 12-20% of the total mass of seeds. The oil is approximately 80% conjugated octadecatrienoic fatty acids with a high content of cis-9, trans-

11, cis-13 acids (for example, punic acid). Secondary components of pomegranate seed oil include sterols, steroids, and cerebrosides. Lignin derivatives were found in the seed matrix.

Pomegranate juice contains potassium, which plays an important role in regulating water-salt balance. Therefore, its use is not only desirable, but also necessary for kidney diseases. Pomegranate contains many pectin substances, which contribute to the timely removal of toxic substances from the body and stimulate the functioning of the urinary and reproductive system. To undergo a course of treatment for acute renal failure, it is recommended to drink a glass of pomegranate juice in the morning on an empty stomach and in the evening before bed, and between these doses, drink 1/4 glass after meals for two months. . The following alternative medicine recipes are also effective as an additional treatment for acute renal failure: infusion of birch buds and goldenrod with pomegranate juice. You will need: 2 teaspoons of ground goldenrod herb, 2 teaspoons of birch buds, 4 teaspoons of ground cinquefoil leaves, 1 glass of pomegranate juice and 2 glasses of water.

Directions for preparation and use: Pour boiling water over the herbs and let steep for 20 minutes. Strain the infusion and add pomegranate juice. Take the resulting mixture half a glass three times a day, regardless of meals.

Methods and Study: In this experiment, sixteen young female Wistar rats Albinos weighing approximately 300 to 320 grams were randomly divided into two groups: an experimental group (receiving pomegranate seed oil) and a control group. Six different wounds were created 1 cm from the midline and from each other using a 6 mm biopsy instrument. Three wounds were left open (open wound group) and three wounds were sutured with 4/0 Vicryl (closed wound group). In the main group, pomegranate seed oil was applied locally to both open and closed wounds once a day for 14 days. Healing parameters were assessed.

Histopathological examination was performed to study inflammation, neovascularization, granulation and fibroblast formation, in addition to serological analysis (immunoassay) of rat malondialdehyde, rat glutathione peroxidase and rat superoxide dismutase. To calculate blood perfusion, a PeriScan laser Doppler blood perfusion scanner was used PIM 3. At day 14, there was a statistically significant difference in the levels of inflammation and neovascularization in open wounds compared to wound type ($P < 0.05$). On day 21, the level of granulation tissue in the closed wound group was higher in the pomegranate group ($P = 0.000$). This approach has been effective in the treatment of incised wounds in rats and may be suitable for clinical treatment in humans, but large controlled studies are needed. The developed approach was applied to pomegranate seed oils prepared in laboratory conditions and tested on commercial samples. Among the oils obtained in the laboratory, pomegranate seeds of the EneHikaz variety contained the largest proportion of pomegranate acid. Among the acids, the largest share was in pomegranate acid, and the smallest in linolenic acid. These results are important for the identification of pomegranate seed oils. Among the commercial samples tested using this approach, only one showed the same content analysis as the oils obtained in the laboratory. Based on an analysis of literature data and the results of studies of the industrial production of pomegranate juice, the nutritional profile of pomegranate juice presented by RNPS includes the content of more than 30 nutritional and biologically active substances.

Results . The most significant substances in terms of providing trace elements and minor bioactive compounds in pomegranate juice are polyphenolic compounds such as flavonoids, phenolic acids and ellagitannins, as well as minerals such as potassium, magnesium and copper. The daily consumption level is indicated. The average potassium content per serving is 15% of the daily value, copper - 10%, magnesium - 5%. To do this, carbamylated darbepoetin at a dose of 50 $\mu\text{g}/\text{kg}$

is injected subcutaneously into the scapula area of white laboratory rats 24 hours before modeling renal pathology by applying atraumatic clamps to the renal pedicles for 40 minutes, followed by blood reperfusion. enter the kidneys. The use of this drug within an experimentally established period at the claimed dose provides effective prevention of ischemia-reperfusion disorders of the kidneys.

Discussion. Research (Discussion) on Pomegranate Seed Oil (Punica Seed Oil granatum) may cover various aspects including its potential benefits, limitations, research and potential prospects. Here are some key topics that can be included in such a discussion:

Potential health and wellness benefits:

Discussion The antioxidant properties of pomegranate oil and its lightness protect cells from free radicals.

Consider anti-inflammatory properties and their use in skin care and inflammatory conditions.

Cosmetic use:

Discussion of the use of pomegranate oil in cosmetic products such as creams, masks, and hair care products.

Memories of the role of the ego and the growth of textural space, hydration and life.

Medicinal use:

Considers the potential medicinal uses of pomegranate oil, including its effects on inflammatory diseases, heart disease and diabetes. Indication that complete studies are required to confirm efficacy for medical purposes. Composition and biologically active substances:

Discussion of unique components such as punic acid and phytosterols, the role and beneficial properties of pomegranate.

Mention the importance of analyzing the composition of an oil to understand its effects.

Limitations and potential side effects:

Consideration of possible allergic conditions or intolerance to pomegranate oil in some people.

Indication of the need to test the product before widespread use.

Research and future directions:

Discussion of current research and clinical studies related to pomegranate oil and its results.

The analysis of the potential prospects for further research and scientific research on this issue is based on the seed pomegranate.

Consumer Interest and Market Aspect:

Discussion of the popularity and demand for products containing pomegranate oil among consumers.

Mention of trends in the beauty and health industry related to this oil.

Thus, the practical significance of this study lies in the fact that it reveals the basic principles of the formation and development of morphometric indicators of the thymus in renal failure, which makes it possible to develop appropriate preventive measures. Pomegranate juice has long been used to treat and prevent many kidney diseases. Drinking pomegranate juice has a beneficial effect on the condition and function of the kidneys, and is especially recommended for people with acute renal failure. Pomegranate juice is distinguished by replenishing vitamin deficiencies in the body and providing it with vitamins and elements necessary for the normal functioning of all internal organs, including the kidneys.

Recommendations

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