



## A Review on the Antioxidant Function of Apricot

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### ABSTRACT

Apricots are classified as stone fruits and are rich in powerful antioxidants—special compounds that safeguard cells from damage. Antioxidants, which can be either synthetic or naturally occurring, work by inhibiting oxidation, a chemical process that can lead to the formation of harmful free radicals. Apricots offer a wide variety of antioxidants, including vitamins, minerals, and plant-based compounds. These antioxidants play a significant role in reducing inflammation within the body, thereby supporting and strengthening the immune system. This, in turn, helps lower the risk of illnesses, including cancer. This review highlights the latest advancements in understanding the antioxidant mechanisms of the essential health-promoting antioxidants found in apricots. It also examines how different processing and storage methods can affect the antioxidant levels in apricots. Due to their robust antioxidant properties, apricots are considered one of the most health-beneficial fruits, making them a valuable addition to a healthy diet. Current research underscores that apricots are a rich source of phytochemical antioxidants, vitamins, and other bioactive compounds, all of which contribute to various health benefits, including skin health, cardiovascular support, and more.

### INTRODUCTION:

Apricots, known by the scientific name *Prunus armeniaca*, are small, round, and golden-orange fruits that belong to the Rosaceae family, the same family as peaches, plums, and cherries. While their name suggests an Armenian origin, historical records trace apricots back to both Central Asia and China, where they have been cultivated for over 4,000 years. The fruit's cultivation has spread to regions with Mediterranean-like climates, such as Turkey, Iran, Italy, Spain, and the United States, particularly in California. Apricots thrive in these temperate areas, where summers are warm and winters are mild, producing a delicious fruit with slightly fuzzy skin, juicy flesh, and a stone-like seed inside. Due to their versatility and high nutritional value, apricots are cherished both as a fresh fruit and in dried form, with significant uses in traditional medicine, culinary applications, and the cosmetic industry.

### SOURCE AND CULTIVATION OF APRICOTS:

Apricot trees are deciduous, typically growing to a height of 8 to 12 meters, with broad, heart-shaped leaves and white or pink blossoms. They flourish in regions with a Mediterranean climate, where the summer's warmth helps develop their characteristic sweet flavor, while the cold winters provide the necessary dormancy period for the trees. Apricots are harvested from late spring to early summer, depending on the variety and region. The fruit can be consumed fresh or dried, with dried apricots offering a concentrated source of nutrients due to the removal of water content. Apricot kernels, found within the pit, are also used in various traditional remedies and for extracting apricot oil. However, the kernels contain amygdalin, which can release cyanide, and thus, must be used with caution. Apricot trees prefer temperate climates with cold winters and warm summers. They require well-drained, fertile soils and are moderately drought-tolerant. The trees are self-fertile but benefit from cross-pollination, leading to better fruit set and yield.

### CHEMICAL COMPOSITION OF APRICOTS:

Apricots are rich in bioactive compounds that contribute to their nutritional and medicinal properties. These include vitamins, minerals, antioxidants, and phytochemicals that make apricots a nutrient-dense food.



## VITAMINS:

**Vitamin A:** Apricots are a particularly rich source of beta-carotene, a precursor to vitamin A, which is vital for maintaining healthy vision, immune function, and skin health. Just 100 grams of apricots provide about 64% of the recommended daily intake (RDI) of vitamin A.

**Vitamin C (Ascorbic Acid):** This water-soluble antioxidant is essential for collagen synthesis, immune function, and the protection of cells from oxidative stress. Apricots contain moderate levels of vitamin C, contributing to their role in skin health and immune support.

**Vitamin E (Tocopherol):** Known for its powerful antioxidant properties, vitamin E protects cell membranes from damage caused by free radicals, supporting skin health and protecting against inflammation.

## MINERALS:

**Potassium:** Apricots are an excellent source of potassium, an electrolyte crucial for maintaining fluid balance, nerve transmission, and muscle contractions. Potassium also plays a role in regulating blood pressure, which makes apricots beneficial for heart health.

**Iron:** Iron in apricots is essential for the production of hemoglobin, which transports oxygen in the blood. This makes apricots a helpful food for individuals with anemia or those needing more iron in their diet.

**Magnesium and Phosphorus:** These minerals are involved in energy production, bone health, and the proper functioning of the cardiovascular system. Apricots contribute small but important amounts of these minerals.

## ANTIOXIDANTS:

**Flavonoids:** Apricots contain flavonoids like catechins, quercetin, and rutin, which possess strong antioxidant properties. These compounds help to neutralize free radicals, reducing oxidative stress and lowering the risk of chronic diseases such as cancer, cardiovascular disease, and neurodegenerative disorders.

**Polyphenols:** The polyphenolic compounds in apricots, including gallic acid and chlorogenic acid, provide anti-inflammatory and cardioprotective benefits, further contributing to the fruit's role in promoting health.

**Carotenoids:** Beta-carotene, lycopene, and lutein are major carotenoids in apricots, contributing not only to their vibrant orange color but also to their role in protecting vision and skin against damage from ultraviolet (UV) rays.

**Dietary Fiber:** Apricots are high in dietary fiber, with most of it being soluble fiber like pectin. Fiber supports digestive health by promoting bowel regularity and preventing constipation. It also aids in controlling cholesterol levels and managing blood sugar, contributing to the prevention of heart disease and diabetes.

**Fatty Acids:** Apricot kernel oil contains essential fatty acids, including oleic acid and linoleic acid. These fats have moisturizing properties, making apricot oil a common ingredient in skincare products. Oleic acid also supports cardiovascular health by improving lipid profiles and reducing inflammation.

## EXTENSIVE USES OF APRICOTS:

**Fresh and Dried Apricots:** Fresh apricots are commonly eaten as a snack, added to salads, or used in desserts such as cakes, pies, and fruit salads. They can also be made into apricot jam or preserves. Dried apricots are a concentrated source of nutrients and are popular in trail mixes, cereals, or as a healthy snack. Their natural sweetness makes them a substitute for sugar in various recipes.

**Apricot Oil:** Extracted from the kernels, apricot oil is used in cooking, particularly in Middle Eastern and Mediterranean cuisines. Its mild flavor and health benefits make it a popular choice for salad dressings and sauces.

**Digestive Health:** The fiber in apricots promotes healthy digestion and regular bowel movements, helping to prevent constipation and other gastrointestinal issues. Traditional medicine often uses apricots to treat digestive complaints. Apricots are recommended for individuals with digestive issues, including constipation, due to their high fiber content. They support the healthy movement of food through the digestive tract and promote regular bowel movements.



**Eye Health:** The high levels of beta-carotene in apricots make them beneficial for vision. Beta-carotene is converted to vitamin A in the body, which is essential for preventing night blindness and other vision-related issues. Apricots are rich in carotenoids, particularly beta-carotene, which helps in maintaining good vision and protecting the eyes from age-related macular degeneration and cataracts.

**Heart Health:** The potassium, fiber, and antioxidants in apricots help maintain heart health by reducing blood pressure, lowering cholesterol, and preventing oxidative damage to the arteries. Consuming apricots can help in lowering high blood pressure and cholesterol levels, thereby reducing the risk of cardiovascular diseases. Their potassium content also aids in regulating heart rhythm and promoting healthy blood circulation.

**Skin and Hair:** Apricot oil is widely used in cosmetic products due to its high vitamin E and essential fatty acid content. It moisturizes and nourishes the skin, improves skin elasticity, and helps to treat conditions like dry skin, eczema, and acne. Apricot oil is also applied to the hair for hydration and shine. Topical application of apricot oil can improve skin conditions like eczema and dermatitis due to its moisturizing and anti-inflammatory properties. It also helps in reducing the signs of aging, such as wrinkles and fine lines.

**Traditional and Alternative Medicine:** In traditional Chinese medicine, apricots are believed to help replenish bodily fluids, relieve thirst, and treat coughs. The kernels are sometimes used to treat asthma and respiratory conditions, though they must be used with caution due to the presence of amygdalin, which can release cyanide when metabolized.

**Anemia:** Apricots, especially dried ones, are useful in treating anemia due to their iron content, which helps in increasing hemoglobin levels and improving oxygen transport in the blood.



## LITERATURE REVIEW:

- 2023, Bousselma A., Tahraoui H., Abdessemed D., et al. Antioxidant and Biological Activities of Fresh and Dried Apricots Extracts Obtained by Cold and Ultrasonic Extraction. *Kemijau industriji*, pp.193-200. Apricots dried fruits showed high antioxidants and other biological properties like good antibacterial and antioxidant potential, and the use of bio-solvent, such as methanol, which is easily available in high purity, highly safe, and completely bio-degradable.
- 2023, Makrygiannis, I.; Athanasiadis, V.; Chatzimitakos, T.; Bozinou, E.; Mantzourani, C.; Chatzilazarou, A.; Makris, D.P.; Lalas, S.I. Exploring the Chemical Composition and Antioxidant Properties of Apricot Kernel Oil. *Separations*, 10, 332. <https://doi.org/10.3390/separations10060332>. The oil extracted from apricot kernels is rich in oleic and palmitoleic acids, which exhibit health benefits. As regards the volatile compounds of the oil, 2-methyl propanal, benzaldehyde, and benzyl alcohol were detected as the main compounds. Benzaldehyde was also found to be the main component of the essential oil of the kernel. Furthermore, the oil exhibited low antioxidant activity, as demonstrated by its ability to scavenge free radicals.
- 2023, Semwal P. C, Semwal A, Bhatt S. P, Parashar T, Ankur A, Jakhmola V, Kumar S. Apricot- A New Source of Chemically Active Constituents: A Medicinal Overview. *Biomed Pharmacol J*; 16(2). Apricot has rich in minerals including catechin & chlorogenic acid. Taste and aroma compounds include sucrose, glucose, organic acids, terpenes, aldehydes and lactones. The dried Apricot containing more quantity of vitamins & minerals in comparison with raw Apricot. It has very good medicinal value because of its chemical composition. Apricot contains a several minerals like Zn, Ca, Cu, Fe, Mg, Na, Mn, P, and K, whose amount varies between raw apricot & dried apricot. It also a very good source of fat-soluble vitamins (e.g.-A, E, K) & water-soluble vitamins (e.g. -B1, B2, B3, B5, B6, B9, C). Apricot kernel is also a very good source of oil and fiber as well as of dietary protein. It has some following important medicinally uses: Good for Eyes (Due to Vitamin A & beta-carotene), It is rich source of antioxidants & minerals, It helps in constipation (Due to high fiber), It helps in anaemia (due to iron value of apricot), It helps asthma patient. It is



good for skin disorders because it has antioxidant properties & also containing most useful vitamins (Vit E) for skin, It also helps in weight loss & bone strengthen.

- 2022, Lima EMF, Matsumura CHS, da Silva GL, Patrocínio ICS, Santos CA, Pereira PAP, Hassimotto NMA, Pinto UM, da Cunha LR. Antimicrobial and Antioxidant Activity of Apricot (*Mimusopsis comersonii*) Phenolic-Rich Extract and Its Application as an Edible Coating for Fresh-Cut Vegetable Preservation. *Biomed Res Int.*; 2022:8440304. The crude extracts of the pulp and seed of *M. comersonii* showed *in vitro* antimicrobial activity, being effective in controlling several bacteria of relevance in food microbiology. The edible coatings incorporated with phenolic-rich extract of *M. comersonii* pulp prevented enzymatic browning in fresh-cut apples and *baroa* potatoes and improved the shelf life of the tested horticultural products. In addition, the edible coating was also able to reduce up to 2 log CFU/g of aerobic mesophiles of apples after 15 days of storage. It demonstrates the importance of research related to food preservation with edible coatings added with natural compounds. This work is a starting point towards future applications of apricot extract in the food industry.
- 2022, Al-Soufi MH, Alshwyeh HA, Alqahtani H, Al-Zuwaid SK, Al-Ahmed FO, Al-Abdulaziz FT, Raed D, Hellal K, Mohd Nani NH, Zubaidi SN, et al. A Review with Updated Perspectives on Nutritional and Therapeutic Benefits of Apricot and the Industrial Application of Its Underutilized Parts. *Molecules*; 27(15):5016. apricots have many benefits in the medical field as it contains many antioxidants, anti-inflammatory, antidiabetic, hepatoprotective, antimicrobial and antiviral properties that could benefit the medical field. This is an updated review about the significance of apricot as the most widely produced fruit in the world, as well as the various applications for its waste in the food and functional food industries.
- 2021, Rampáčková E, Göttingerová M, Gála P, Kiss T, Ercişli S, Nečas T. Evaluation of Protein and Antioxidant Content in Apricot Kernels as a Sustainable Additional Source of Nutrition. *Sustainability*; 13(9):4742. Apricot kernels are a nutritionally interesting source of proteins, which are the second most abundant component of their weight. The average value of total protein content of 32 cultivars with different origin was 22.26% and the values ranged from 14.56% to 28.77%. The data of protein content were supplemented with total phenolic and total flavonoid contents and antioxidant activity in apricot kernels. Despite the knowledge about nutritionally interesting substances in apricot kernels, this study is unique in terms of comparing the content values in the kernels of specific apricot cultivars with various origins. However, it was confirmed that the results correspond to the already measured average values.
- 2020, Gomez-Martinez H., Bermejo A., Zuriaga E., Badenes M.L., Polyphenol content in apricot fruits. *Science Direct journal*; 277, 109828. The set of apricot accessions analyzed showed different contain in the polyphenols compounds. The content was genetic and environment dependent. Concentration of polyphenols in apricot peel is 10 fold higher than flesh, since this fruit is consumed with peel in the different ways, fresh and dried, this trait is relevant for increasing the apricot consumption.
- 2020, Aziz M., et al. Exploring the effect of Apricot addition on nutritional, antioxidant, textural and sensory characteristics of Cookies Apricot Supplemented functional cookies. *Ital. J. Food Sci.*; 32. Apricot is one of the nutritious fruit, which is consumed either fresh or dried all around the globe. It not only improves the overall acceptability but also improves the nutritive value of the products without adding much to the cost of the product.
- 2019, Stryjecka M, Kiełtyka-Dadasiewicz A, Michalak M, Rachoń L, Głowacka A. Chemical Composition and Antioxidant Properties of Oils from the Seeds of Five Apricot (*Prunus armeniaca* L.) Cultivars. *J Oleo Sci*;68(8):729-738. The antioxidant capacity of the apricot kernel oils, measured using the FRAP assay, ranged from 1.07 to 1.38 mM Fe<sup>2+</sup>/L, while total polyphenols and β-carotene content were 0.85-1.22 mM gallic acid/L and 42.3-66.8 μg/g, respectively. The results indicate that among the cultivars tested, the 'Somó' cultivar grown in Poland provides the most oil, with the highest antioxidant activity. The results of our study demonstrate that apricot seeds are a potential source of oil that can have both dietary and cosmetic applications.
- 2019, Asteer V. Abd-Elnoor. Effect of Home- processing on the antioxidant properties of apricot products. *Asejaiqjaise*; 40, 629-39. Apricots are rich in fiber and mineral, the most important of which are potassium and phosphorus. Puree and jam had the highest total phenolics and total flavonoids content compared to raw apricot, boiled and juice. In addition, puree, and jam had the highest total antioxidant activities compared to other products. There were no significant differences in the carotenoids content among raw, boiled, puree, jam and Juice of apricot. This research provides detailed analysis to examine the effects of different methods of apricots' home processing on the antioxidant potential of different apricot products.



## **AIM AND OBJECTIVES:**

### **AIM:**

This review is undertaken with the aim of bringing together knowledge on the antioxidant action of apricots and their possible health benefits.

### **OBJECTIVES:**

1. Determination of the types and concentrations of antioxidants in apricots.
2. The existing research regarding the possible health benefits of apricots in regard to the oxidative stress, cardiovascular health, and chronic diseases will be reviewed.
3. Identification of the gaps in the present knowledge base and indication of future directions for further research into the antioxidant properties and health benefits of apricots.

### **SCOPE OF STUDY:**

Having already performed a well-rounded evaluation of the antioxidant activity in apricots (*Prunus Armeniaca*), narrowed our attention to explore other health benefits provided by this fruit packed with nutrients.

#### ➤ **Apricot Nutritional Profile**

Study the entire set of vitamins, minerals and other essential nutrients found in fresh, dried and processed apricots to understand them.

#### ➤ **Antioxidant Compounds**

Identify and characterize more specifically the major antioxidant compounds in apricots, including carotenoids, flavonoids and phenolic acids when available. Explore their potential health benefits also.

#### ➤ **Therapeutic Applications**

Perform extensive experimental researches, as involving in vitro, animal and clinical trials with regard to human beings are needed to clarify how apricot consumption can be affordable for maintaining healthy heart or keeping immune system work properly up-to-date.

#### ➤ **Bioavailability**

Study the bioavailability and metabolism of apricot bioactive compounds in order to understand their absorption, distribution as well utilization within human body;

#### ➤ **Apricot Cultivar Variations**

The objective of this review is to provide an overall examination for diversities in the nutritional and phytochemical profiles among various apricot cultivars contrastively based on potential health benefits.

#### ➤ **Food Product Development**

Evaluate the capacity of developing next generation apricot extract or powder enriched functional foods and explore under which particular situations can be an optimal approach to influence its physiological benefits.

### **PLAN OF STUDY**

Next, we discuss through a structured approach the antioxidant potential of the apricots, which provides them with a probable scope of conferring health benefits.



❑ **Comprehensive Literature Review:** We are going to search comprehensively in the scientific databases and journals with the aim of retrieving all relevant research/information regarding the antioxidant aspects and health benefits of apricots to ensure a general perspective on the evidence.

❑ **Data Extraction Carefully:** We will scrutinize the research works selected and closely retrieve key information, including methods from which the findings were acquired, derived results, and conclusions in a very systematic way. This will be assured once all records of all information are organized.

❑ **Detailed Synthesis and Analysis:** All the extracted data and findings are integrated to pave a way for the identification of what the literature reveals concerning patterns, trends, or contradictions in apricot antioxidant research. This critical in-depth analysis will further assist us to arrive at an understanding of the state of the art.

❑ **Review Article Preparation:** At this phase, all the acquired knowledge from a thorough review of the literature, data extraction, and analysis will be synthesized to finally write a complete review article. The draft will supersede the key takeaways and put forward the important implications for future research and the use of apricot antioxidants.

## RESULTS

Studies have shown time and again that apricots are: -

### ❖ Rich source of antioxidants and anti-inflammatory properties

Antioxidants and bioactive compounds in apricots could reduce oxidative stress and inflammation.

### ❖ Heart Health Advantages

Apricots are also known to lower blood pressure and improve cholesterol levels, as well as other heart-related markers.

### ❖ Immune System Support

High in vitamin C and carotenoids, apricots boost immune function to help fight off infections.

### ❖ Anticancer Effects

Some preliminary research shows that eating apricots might reduce the risk of certain types cancer, but more studies are necessary.

### ❖ Skin Health Promotion

Antioxidants and vitamins in apricot can keeps skin firm, glowing & protects against sun damaged housing.

## CONCLUSION

Apricots have emerged as a notable source of phytochemical antioxidants, vitamins, and other bioactive compounds, which together contribute to a range of health benefits. Current research highlights their role in providing antioxidant protection, promoting skin health, and supporting cardiovascular function. Regular consumption of apricots has been associated with enhanced heart health, improved immune function, and a potential reduction in the risk of certain cancers. Additionally, the skin-protective properties of apricots, along with their ability to support collagen synthesis, suggest that they may be a valuable component of an anti-aging and overall health-focused regimen. While further research is needed to fully understand the mechanisms behind these benefits and to determine the most effective therapeutic applications, the existing evidence supports the inclusion of apricots as part of a holistic approach to diet and lifestyle. This versatile fruit has the potential to contribute significantly to overall well-being and healthy aging.

## FUTURE RECOMMENDATION

### ❑ Curable Effects

A study of the research into apricot benefits revealed that, most particularly, they could be used to beneficial effects in conditions which are typically considered treatable:



**I. Cardiovascular Disease** – There have been some studies that suggest apricots, because of their antioxidant and anti-inflammatory properties may help prevent atherosclerosis-related cardiovascular events by improving the endothelial function, enhancing blood pressure control or any other associated dysfunction. These are reversible effects because they can be controlled and reversed by following a good diet and lifestyle habits.

**II. Type 2 Diabetes** – Apricots are rich in polyphenols such as chlorogenic acid and carotenoids which may aid insulin sensitivity, thus helping to control blood glucose levels. Promising results with animal studies and these effects are considered to be curable since can they be controlled by diet as well as medications.

**III. Certain Types of Cancer** – The antioxidant and anti-inflammatory effects of apricot phytochemicals may also help decrease cancer rate, as well as lower the risk associated with the progression of certain types of this disease — breast cancer, prostate carcinogenesis, or colorectal malignancies. Although more experimental research is required, they're your typical remedied varieties of cancer in a scenario diagnosed not to mention treated during the early steps.

#### ❑ Non-Curable Effects

Research on apricots for health conditions that are still deemed un-curable such as specific cancers or neurodegenerative diseases is at early stage. Still, the compounds present in an apricot just might slow a disease from progressing and lead to higher quality of life for patients, developing adjunct therapies that complement existing treatments. The types of things that will not be cured there are just a few examples, some non-curable conditions which needs further research regarding apricots.

**I. Advanced Cancers** – For those cancers that as studies show most of apricots prevention feature against them, it is also possible that the beneficial effects from antioxidant and anti-inflammatory properties in antimetastatic activity or even to increase chances for patients with metastases could be considered; however, such are not curable by present cancer drugs.

**II. Neurodegenerative Diseases** – Apricot constituents like the antioxidant potential and anticholinesterase activity could be a reference for an explanation that slows down Alzheimer or Parkinson disease, as they are not treatable at present. Output from this review should be followed with further research on these applications.

Future research for non-curable conditions should focus on improving the quality of life in patients and slowing disease progression by examining any potential adjunctive therapy derived from apricots as reported for some cases, such as cancer.

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