

USE OF *Prunus armeniaca L.* SEED OIL AND PULP IN HEALTH AND COSMETIC PRODUCTS

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Abstract. Apricot (*Prunus armeniaca L.*) is grown at high altitudes. Apricot is a stone fruit that can grow at an altitude of 1000-2700 m (Khursheed *et al.*, 2020). Apricot is widely used in the cosmetics industry, pharmaceutical industry and food industry. Apricots are valuable sources for functional foods and nutraceuticals. Apricot kernel and pulp are rich in polyphenols, fatty acids, carotenoids, minerals, vitamin A, ascorbic acid, thiamine, riboflavin, niacin and pantothenic acid and ascorbic acid. It also contains microelements such as Zn, Ca, Cu, Fe, Mg, Na, Mn, P and K. Apricotoil-based massage cream, moisturising cream, bleaching cream and skin mask are produced from apricot kernel pulp, contributing to recycling. In order to extract oil from apricot kernel, oils are extracted by cold press method. For the extraction of bioactive compounds from apricot kernels, various techniques such as solvent extraction, ultrasonication, enzyme assisted, microwave assisted and aqueous extraction are used. In general, our findings indicate that apricot kernels are a valuable source of oil with potential applications in food and cosmetic industries.

Keywords: Apricot pulp, skin mask, cosmetics, apricot cream, health.

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1. Introduction

It is consumed widely around the world. The homeland of apricots is China and Japan. It is also widely grown in Turkey, Australia, Southern Europe and South Africa (Singh *et al.*, 2010). Since ancient times, folk medicine has used apricot as a remedy for various diseases such as infertility, eye inflammation and spasm (Fратиanni *et al.*, 2018). As it is known, apricot fruit has an important place in human nutrition and can be consumed fresh or processed. Apricot seeds, a by-product of the apricot fruit, are a rich source of protein, vitamins and carbohydrates. It can also be used for medicinal purposes and in the creation of food ingredients. Since it is a rich source of dietary protein and fiber, it has the potential to be an economically valuable food source (Kiralan *et al.*, 2019). It is effective in medicine to prevent strokes and high blood pressure and in diseases such as immune system disorders, including adaptive immunity deficiency syndrome, multiple sclerosis, lupus and cancer.

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Apricot (*Prunus armeniaca* L.) helps in lowering blood pressure as well as fighting against various diseases such as cancer and cancer immunotherapy. Additionally, the core is famous for its various industrial applications in various industries and research fields, such as thermal energy storage, cosmetics industry, pharmaceutical industry and food industry. Apricot seeds can be used especially in the food industry to make low-fat biscuits, cookies, cakes and antimicrobial films.

Apricots (*Prunus armeniaca* L.) are valuable sources of functional foods and nutraceuticals. Recently, apricot kernels/kernels have become popular as a non-traditional source of high oleic acid oil. Different extraction techniques have been used to extract oil from apricot kernels; However, cold pressing is reported to retain higher levels of bioactive compounds in apricot kernel oil. Various techniques such as solvent extraction, ultrasonication, enzyme-assisted, microwave-assisted and aqueous extraction have been adopted for the extraction of bioactive compounds from apricot kernels (Akhone *et al.*, 2022). Cold-pressed apricot kernel oil is known as a good source of edible quality vegetable oil due to its nutritionally important fatty acids such as oleic and linoleic acids (Bhanger *et al.*, 2020).

Among various minor bioactive substances such as tocopherols, phenolics and carotenoids, amygdalin (glycosides) are detected in apricot kernel oil, which are of great value for their anticancer and anti-inflammatory properties. Apricot kernel oil is used as the main ingredient in cosmetic products, high-quality toilet soaps, lip balms and creams. Judging by the biological activity of various fractions of apricot kernel; it has been proven to be anticarcinogenic, antimicrobial and antioxidant. Apricots and their by-products may be potentially useful as complementary support in the treatment of different diseases. Traditional Chinese medicine used apricot seeds to treat asthma, bronchitis, emphysema, constipation, nausea, leprosy, leucoderma and pain (Fратиanni *et al.*, 2018). It is used for gynecological conditions including headache, tetanus, skin hyperpigmentation and unbearable pain (Siddiqui *et al.*, 2023). Getting enough potassium every day can help us maintain normal blood pressure and lower blood pressure.

1.1. Chemical contents of apricot (*Prunus armeniaca* L.) oil and seed pulp

In terms of volatile compounds of the oil, the main compounds are 2-methyl propanal, benzaldehyde and benzyl alcohol. Benzaldehyde is also found to be the main component of the essential oil of the seed. Benzaldehyde is produced during the breakdown of amygdalin. Amygdalin is a natural cyanogenic glycoside found in the seeds of some edible plants. Additionally, the oil exhibited low antioxidant activity, as evidenced by its ability to scavenge free radicals. Overall, our findings indicate that apricot kernels are a valuable oil source with potential applications in the food and cosmetic industries (Makrygiannis *et al.*, 2023). Apricot seeds and pulp are rich in polyphenols, fatty acids, carotenoids, minerals and ascorbic acid. It also contains microelements such as Zn, Ca, Cu, Fe, Mg, Na, Mn, P and K. Apricots contain many secondary metabolites and most of them act as antioxidants. Polyphenols and carotenoids represent the most abundant class of phytochemicals found in this fruit. Apricots also represent a good source of fibre, minerals (especially potassium, but also calcium, iron, magnesium, zinc, phosphorus and selenium) and vitamins such as vitamin A, ascorbic acid, thiamine, riboflavin, niacin and pantothenic acid (Fратиanni *et al.*, 2018). Apricot seeds can be used as a functional food due to their high protein content as well as components with antioxidant, anticancer and antimicrobial properties. Bitter

seeds of apricot contain a chemical substance called amygdalin. Sometimes called vitamin B₁₇, it is a naturally occurring cyanogenic glycoside. However, it can potentially treat skin diseases such as boils, acne vulgaris and dandruff, migraines, high blood pressure, chronic inflammation and some stomach disorders (Siddiqui *et al.*, 2023). Stone fruits such as plums, peaches, apricots, cherries and pomegranates constitute an important nutritional source of antioxidant phytochemicals, fibre, vitamins and minerals. These components may help reduce the risk of some oxidation-related diseases, such as cardiovascular diseases, neurodegenerative diseases and cancer (Tomás *et al.*, 2013).

2. Materials and Methods

2.1. Fatty acid profile of apricot (*Prunus armeniaca L.*) oil

Apricot kernel is a rich source of oil with great medicinal value due to the presence of saturated and unsaturated fatty acids. Fatty acids are essential components of foods and play an important role in protecting human health. Apricot kernel oil generally contains fatty acids such as palmitic acid, palmitoleic acid, stearic acid, oleic acid and linolenic acid. The oil contains high levels of unsaturated fatty acids and is a rich source of minor compounds such as sterols, tocopherols and squalene, thus it is used in the food and pharmaceutical industry. Its use is of interest. The presence of these fatty acids in oil plays a vital role. It plays an important role in providing rigidity and integrity to the cell. Due to its nutritional chemical composition and functional properties, apricot kernel oil can be used as an edible oil and in many applications such as food products formulation, cosmetics, functional and medical supplements. Fatty acids are essential components of foods and play an important role in protecting human health.

3. Results and Discussion

The seeds of the apricot sample collected in Iğdır province were broken and the fixed oil was obtained from the cold-pressed oil device. The obtained oil sample was brought to Iğdır University Research Laboratory Application and Research Center (ALUM) and its *Prunus armeniaca L.* fatty acid profile was examined with the GC-FID device. The results of the study are presented below (Figure 1). As apricots ripen, the content of aromatic apricot kernel oil in oleic acid increases, while the contents of palmitic acid and linoleic acid may either remain constant or decrease slightly (Makrygiannis *et al.*, 2023).

The composition and nutrients of apricot oil vary depending on the fruit variety, place of origin, harvest year and agricultural technical measures. Oil from these beans was obtained by cold pressing method. The information about the found fatty acids groups and their quantity is presented in the Table 1.

The oils obtained from these apricot kernels by cold pressing contain high levels of unsaturated fatty acids and are a rich source of minor compounds such as sterols, tocopherols and squalene, so their use in the food and pharmaceutical industries is of interest. Due to its nutritional chemical composition and functional properties, apricot kernel oil can be used as an edible oil and in many applications such as food products formulation, cosmetics, functional and medical supplements.

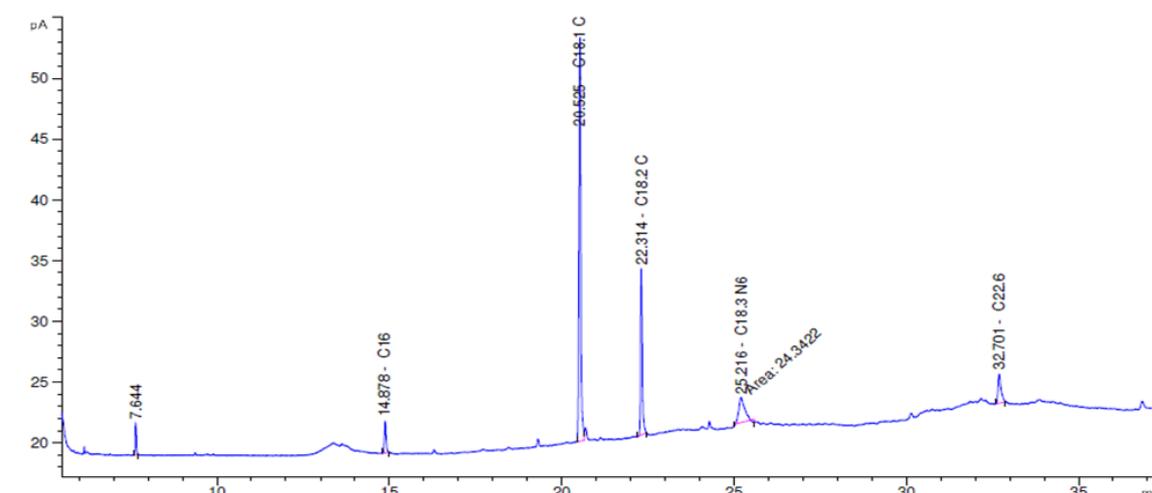


Figure 1. Apricot (*Prunus armeniaca L.*) Oil Sample Fatty Acids Composition Pictogram GC-FID

Table 1. Apricot (*Prunus Armeniaca L.*) oil sample fatty acids amounts GC-FID

S/N	Fatty Acids Found	Fatty Acid Groups	Quantity (gr)
1	C16:0 –Palmiticacid	SFA	3,96
2	C18:1 (n-9)–Oleicacid ω9	MUFA/ ω9FA	53,97
3	C18:2 (n-6)–Linoleicacid ω6	PUFA	21,72
4	C18:3 (n-6)–g-Linolenicacid ω6	PUFA/ ω6FA	10,79
5	C22:6 (n-3)–cis-4,7,10,13,16,19-Docosahexaenoic acid (DHA)	PUFA	6,45

3.2. Use of apricot (*Prunus armeniaca L.*) oil and kernel pulp in cosmetics

All these oils are widely used in the cosmetic industry. In cosmetics, fatty acids are used as moisturizers, softeners and emulsifiers (Figure 2). Due to their excellent properties, their use in creams and other cosmetic products is common. It is very easy to be absorbed through the skin. Apricot oil, obtained from apricot kernels and rich in vitamin E and fatty acids, is used extensively in cosmetic products. One of the main reasons for the production of apricot oil-based massage cream is that it is nutritious, moisturizing and easy to absorb into the skin. We can see that the apricot plant's rich component content includes vitamins A, C, K, B and organic acids (citric acid and malic acid) and that there are significant amounts of phenolic compounds in the literature.

After apricot kernel oil is obtained as a result of processing apricot kernels, pulp is released as a by-product. While these pulps should mostly be thrown away, they are evaluated and turned into value-added products. This value-added cosmetic product obtained is a skin mask. With this skin mask produced, waste, which is an important environmental problem, is recycled. Research continues for the use of waste for the cosmetics, food and pharmaceutical industries in different areas (Kasapoğlu *et al.*, 2020). Thus, it has been proven that valuable compounds such as apricot pulp are rich sources. Apricot seed essential oil is a valuable product and can be used in the cosmetic

industry (Kiralan *et al.*, 2022). It is also rich in benzaldehyde, making it a widely used source in the flavor industry.

The visual map of the studies carried out in the field of apricot and apricot kernel oil in the academic field is shown at Figure 2. Apricot, which is a fruit with a wide range of study areas in our country and internationally, is changing day by day. It also takes its place among the indispensable parts of the cosmetics, health, industrial and perfumery sectors.

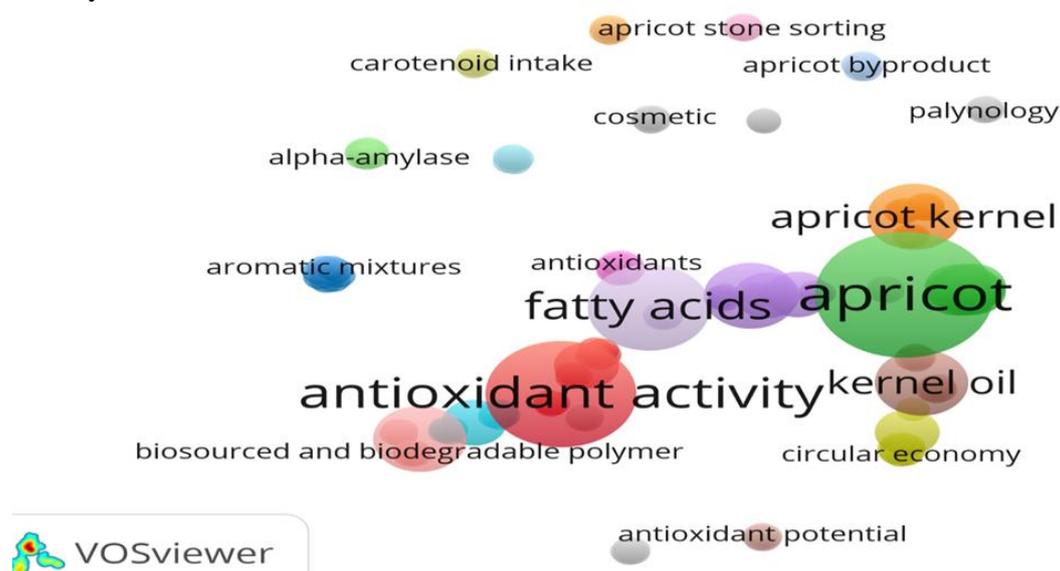


Figure 2. Apricot and Apricot Kernel Oil Study Areas



Figure 3. Countries Working Most with Apricots

4. Conclusion

The study areas of apricot fruit are spread in many countries. Spain and India, in particular, lead the way in the field of academic study. In addition, they continue their work in our country and other countries. We must accelerate our work by raising awareness both socially and academically about the intensive cultivation of apricots in our region and their transformation into value-added products. More research is needed to provide detailed information on the bioactivities and health benefits of the two compounds mentioned above and to examine whether consumption of aromatic apricot kernel oil provides other benefits.

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