

The effects on human health and the bioactive components of the dates seed and oils

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Abstract

The date fruit is one of the oldest plants known to man. There are many studies that show that the waste of the date fruit and its bioactive components and functional properties can be used in a variety of food products. In addition, the benefit of the date fruit on human health has attracted consumers to this fruit. In this study, the bioactive components of the dates seed and oil have been examined, and many functional food studies and their effects on human health have been given information.

Keywords: bioactive components, dates, human health

1. Introduction

The dates are one of the oldest cultural plants known. The dates growing in the palm tree in the Areaceae family (palmaceae) have been consumed as food for about 6000 years. *Phoenix dactylifera* L. the types of dates of the species have different flavors, images and colors. It is different in terms of its physical properties [1].

In the breeding of dates trees, the ambient temperature must be above 20°C. The ozing usually occurs around 35°C. For the ripening of the date, it is necessary to be warm and dry at night during the warm day. Some climatic factors must be appropriate to achieve high efficiency and quality in the event of a hurray. These are climatic factors such as rain, humidity, light, high temperature and wind. The dates trees are resistant to dry areas and their fruit is high energy, with 16 different amino acids, fiber content, mineral is a vitamins-rich product [2].

The rate of sugar in junk is 44-88%. Calcium, magnesium, iron and vitamins are also found in the dates fruit. On the meat section of the date, the oil is between 0.2 and 0.5%. There are at least 15 types of mineral in the date fruit. Potassium (K), bor (B), calcium (CA), cobalt (Co), copper (Cu), Fluor (F), iron (Fe), magnesium (mg), manganese (MN), phosphorus (P), Sodium (NA), selenium (SE) and zinc (Zn) are some of them. Also, the date fruit is a fruit rich in potassium minerals [2].

The largest production since Egypt is done in countries such as Saudi Arabia, Pakistan, Iran and Libya, given the total amount of production in the world. In our country, our coastal regions, which are warm at night and warm during the day, are grown in the Aegean and Mediterranean region [3].

The dates are 6.10–11.4% of the total weight of fruit. A lot of research shows that seeds are a good source. The dates are higher than those reported at different levels of phenolic, antioxidants and diet fiber, even in those consumed with persimmon. Dates include 5–10% humidity, 4–7% protein, 6–12% oil, 1% ash and 75–81% carbohydrates and diet fibers. The dates seeds are in the range of potassium 229–400 mg/100 g, magnesium 51–82 mg/100 g and calcium 28–62 mg/100g, and the dates are rich in macro elements [4,5]. It was also found that by making coffee from the date seed and examining these coffee samples, it could be used as a source of mineral matter. The calcium content is between 599.26 and 1472.06 mg/kg [6], while the potassium content is between 2589.86 and 3585.23 mg/kg.

The dates seed contains some acids such as fatty acids oleic, lauric, myristic, palmitic and linoleic acid. Many studies show that the most found fatty acid is oleic acid [7,8,9].

The date fruit is rich in phytochemicals. Vembu et al. (2012) examined the phytochemical analysis of dates and found some results. Based on these results, the alkaloid detected gambing, tanene, flavonoid, phenolic compounds and quinones. The phytoosteroids that date fruit contains most of the oil-soluble phytochemicals are found in the date fruit with a large amount of phenolic compound. Furthermore, phenolic compounds found in the date fruit are known to have a higher effect on the antioxidant when compared to the effect of ascorbic acid [10].

2. History

2.1. Origin

A date is a fruit that grows in the world, especially in the dry and half-dry areas of the world. The date may be one of the oldest plants ever grown and has more than 6,000 years of history [11]. The earliest harvest of dates from northeast Africa to the northwest of Fırat and Dicle and is a growing plant [7]. The Phoenicians encouraged the planting of a chem tree around the Mediterranean. The possible reason for encouraging the spread of the dates tree is that the date fruit can provide the host with fast energy and can be protected for a long time. Soldiers are the perfect food for people like merchants traveling long distances during military service [11].

Around 100 million different kinds of dates are made in the world. When we look at the breeding ground, it covers the drought regions of the world, from India to Morocco, east, from India to west. The distribution of the junkies by region is Saudi Arabia, UAE, Bahrain, Iran, In Asia, such as Iraq, Oman, Kuwait, Pakistan, Yemen and Turkmenistan, these countries are the highest in the rankings with 60 million tons of production; Africa, Algeria, Egypt, Morocco, Mauritania, Libya, Mali, Niger, Sudan, Countries such as CAD, Tunisia and Somalia are second in the production of 32 million tons and the breeding of dates [2].

The dates fruit is mainly grown in South Europe, India and Pakistan in some parts of the Middle East, North Africa, Central and South America [11]. It is known that it was raised in the coastal regions of the Aegean and the Mediterranean in our country [3].

Worldwide dates have increased from 1,809,091 tons in 1962 to 6,924,975 tons in 2005. In 2010, the global production volume reached 7.53 million tons and approximately 8.17 million tons in 2017 [12].

2.2. Properties

The dates tree (*Phoenix dactylifera* L.) is a monokotiledon plant belonging to the Arecaceae family with 200 species.



Figure 1. Date tree (*Phoenix dactylifera* L.) [12]

Dates tree (*Phoenix dactylifera* L.) affected by climatic factors and the area to be raised needs to be hot, while the dates trees are affected by the climate but also have a variety of cold resistant types, but these dates rarely produce fruit [2] Dates can be grown in very hot and dry climates and are relatively resistant to salt and alkaline soils. Dates require a long, dense summer with little rain and very low humidity for the duration from dust to harvest, but plenty of ground water near surface or watering. An old saying says that the dates tree grew "with its feet in the water, its head in the fire" [13].

The dates trees can grow from 12.7 to 27.5°C on average, show durability up to 50°C and are tolerant of short periods of rotation at temperatures down to -5°C. The temperature required for the growth of the dates tree ranges from 21 to 27°C over the period of time from the ozing period to the ripening period of the fruit [13].

The dates are a Palmaceae-owned diploid ($2n=2x=36$), a multi-year, single-jaw plant. The dates are two-prone, which means they have separate female and male trees. The flower salts of the female and male trees differ in morphology. Both are surrounded by a hard, fibrous blanket (pathe) that protects flowers from heat and sunlight in the early stages of flower development [13].



Figure 2. Male (left) and female (right) flowers of the dates tree [13]

The dates tree is approximately 23 m high. The body of this tree is covered with the straw remains of falling leaves. The glowing and fluff leaves, which are approximately 5 m long from the top of the body, make the tree appear majestic [3].

Phase, 54.8% in the khalal phase was found at 15% in the last maturation phase, and as the results show, moisture content has decreased in the maturation stages of the dates. In the period of the period of tamr, which is used dry, in particular during the period of ramadan, the period of ramazan is more consumed and in some cases it is consumed fresh [1].



Figure 3. Different stages of maturity of date [14]



Figure 4. Immature dates fruit [8]

2.3.Dates components

The amount of carbohydrates, fat, protein and fiber of the date varies in the following ranges, respectively; carbohydrates are at the highest rate of 44-88%. The protein is between 2.3% and 5.6%, the oil is between 0.2% and 0.5%, and the diet fiber is between 6.4% and 11.5%. Tang et al. (2013), the ratios of date components are as follows: Total sugar ratio was found between 52.6% and 88.6%. In addition, the sugar ratios, which make up the majority of the carbohydrate content, were found as follows. In addition, sugar rates, which make up most of the carbohydrate content, were found as follows. In the range of 13.6% to 36.8%, the glucose was detected between 17.6% and 41.4%, while the sucrose was detected between 0.05% and 3.39%. The other components are 8.09% to 20.25%, protein 1.1% to 2.6%, oil between 0.1% and 0.14%, ash 0.1% to 1.9% and mineral 41.74 to 1198.2 $\mu\text{g}/100\text{ g}$ [15]. The high amount of sugar in the junk is the same as fructose and glucose (44-88%), fructose and glucose amounts are approximately [1].

In his study, El-Sohaimy and Hafez (2010) found 2.1% ash in the persimmon fruit, 5.2% pulp, 3.0% protein, 73.0% carbohydrates, and 2.9% lipid content. It has been reported that the carbohydrate has created a large portion of it as content, such as glucose, fructose and sucrose [16].

The amount of carbohydrates found in the scrap increases as the fruit approaches maturity level. The carbohydrate content of the date varies according to the type of dates and the variation of the maturity phase, and the carbohydrate quantity reaches the final stage of the highest level of respect, Tamar [10]. The increased carbohydrate level during the maturation phase also brings to the condition that the water in the date is reduced. But in maturation, the protein is reduced from 5.6% to 2.3%, from 0.5% to 0.2%, and ash is reduced from 3.7% to 1.7%, and the carbohydrate level is inverted [10].

The protein was 3.0% in the work performed by El-Sohaimy and Hafez [16]. In this study, the amino acid composition of the date fruit was also examined and a large amount of Histidin, Valin, Glyrylic Aspartic acid, Losin, Prolin and Arginin were found in the HPLC's device, A small concentration of Treonin, Metionin, Izolosin, Cool, Tirozin, The concentration of phenylfields and Lizin is very small (Table 1) [16].

Table 1: Amino acid content of the dates extruded [17]

Amino asit	Kons. (u g/ml)	Amino asit	Kons. (u g/ml)
Aspartik asit	106.247	Valin	66.425
Treonin	21.364	Metiyonin	12.082
Serin	27.786	İzölösin	41.333
Glutamik asit	147.538	Lösin	57.894
Prolin	491.798	Lisin	33.689
Glisin	103.286	Arginin	364.478
Alanin	1.942	Histidin	210.789

The date fruit has 2.5 times more potassium minerals than the banana fruit, which is rich in potassium, and is rich in potassium [5].

Al-Sohaimy and Hafez [16] examined the vitamin content of the date fruit and the results were reported in Table 2.

Table 2. Vitamin content of the dates extruded [16]

Parametre	mg/100g
Vitamin A	0.04
Vitamin B1	0.08
Vitamin B2	0.05
Nikotinik Asit	2.20

3. Date seed and oil

Date is nucleus of the about 5.6–14.2%. The dates core contains higher amounts of oil and protein than the dates fruit. It can be considered to use cores in foods to create potential fibers and antioxidant sources. This feature of the core can be used as a additive to improve the functionality of foods [1].

The dates core is the waste of many dates that can be converted into products such as dates, dates water, dates syrup and dates powder. The diet fibers of the date seed are also potential applications [17] for the oil extruded or the date seed used in oven formulations.

**Figure 5:** Dates (Phoenix dactylifera L.) Seed [17]

In his study, Ambigaipalan and Shahidi [18] investigated the effect of the dust and hydrysates on the physical properties of the muffler. They prepared the muffins by adding the date seed powder to the formula (2.5%) or the dates seed powder (2% and 5%). The composition of the dates seed powder hydrolicine significantly ($p < 0.05$) improved moisture content and the texture of the muffins. The cooking features and muffin height were not affected by the baking seed dust or the hydrolicate imposition. The date powder hydrolyclic would be quite acceptable for the textures and flavors of the cake containing it. The color of the baking soda-enriched cupcakes was dark brown and had a lower sensory reception. Total diet fiber and ash increased in muffin content with the grande dust substitute. Both date seed dust and hydrolicate demonstrated significant ($p < 0.05$) radical sweeping activity against DPPH and hydroxyl radicals. In the study Ambigaipalan and Shahidi [18], the components of the date seeds are provided in Table 3.

Table 3. Components of the dates seed [18]

Components	Quantity(100g)
Protein	5.1 g
Oil	9.0 g
Dietary fiber	73.1 g
Phenolic acids	3942 mg
Antioxidants	80,400 μmol

The dates are considered mostly waste, while they are used as animal food [18].

In the study conducted by Gaballah, persimmon (Phoenix dactylifera L.) The possibility of using the core essential oil as bait additive for the water products section was evaluated by research on the development and effectiveness of this trout, in which it can be used in the rainbow trough (*Oncorhynchus mykiss*). The dates are also indicated by studies in which the dates have high value added components that can be extruded [19].

Ardekani et al., Iranian date seed cultivars have a relatively high antioxidant activity and potent radical scavengers and can be used for medicinal and commercial purposes. Gallic acid, p-hydroxybenzoic acid, m-coumaric acid, vanillic acid, caffeic acid, p-coumaric acid, ferulic acid, protocatechic acid, and o-coumaric acid have been identified in date seeds [20].

In one study [21], new chocolate varieties, Deglet Nour date kernels from Tunisia, were enriched with soluble and insoluble dietary fibers. Traditional chocolate variants were characterized by deallet Nour date seeds (DNDS), the dates core soluble fiber concentration (DSSFC) and the non-dissolved fiber concentrate (DSIFC), high levels of diet fiber (80–90%), which were oil-removed at levels 1, 2, 3, 4 and 5%. Enriched with 5% DSSFC, offering the highest (oil binding capacity) OBC (304.62%) compared to control (102%). No significant difference was recorded between DSIFC and DSSFC participation levels. Compared to control the tightness, chewability and adhesion of the prepared chocolate varieties ($P < 0.05$), the sensory evaluation was accepted by panelists of all chocolate creams, which are enriched with DSIFC and DSSFC. The formulated chocolate spread had the best tissue characteristics compared to control with DSSFC [21].

Essa and the back. (2022) the study was conducted by the production of dissolved diet fiber (SDF) and new composite gel forms from gelatin and mechanical and functional properties of gelatin-SDF gel. These gels were used to make low-fat hamburgers. Compared with control groups (10% and 20% oil), the chemical composition, technical parameters and textural and sensory properties of SDF-gelatin composite gel were evaluated. The results were reported to be tissue analysis, inflation rate, water retention capacity and freeze-defrosting stability, and the potential for composite gels to provide unique functional gels that are useful for formula product development. The addition of merged gels has increased the moisture, ash, protein, NA and CA content of the burger. It also had a significant effect on the L^* (brightness), a^* (red) and b^* (yellow) parameters. This gel softened the burger and chewed it, increasing its

flexibility. The internal polymer network (IPN) gels made from SDF and gelatin were effectively used as a oil supply for meat production with increased health benefits [22].

The definition of the oil is the result of three fatty acids joining a glycerin molecule. The meat portion of the date fruit contains 0.2 to 0.5% oil, while its seeds contains 7.7 to 9.7% oil. It is not used as a lubricant because it is not rich in the oil content of the date. But the date seed oil is used by the Middle East countries [8].

Sawaya et al. (1984) found that oleic acid (44.25%) was the most important fatty acid in date seed oil in date seed fatty acid analysis. Stearic acid (2.80%) and capric acid (2.78%) were available in low quantities. These results are generally consistent with Dowson's and atten (1962), Mehran and Filsoof [9].

Table 4. Distribution of the dates seed oil acid [8]

Oil	Distribution (%)
Linoleik asit	7.16 ± 1.75
Miristik asit	2.41 ± 0.09
Palmitik asit	23.76 ± 1.06
Stearik asit	2.67 ± 0.41
Oleik asit	38.95 ± 2.64
Linolenik asi	0.74 ± 0.29

Al-Shahib and Marshall (2003) investigated the oil content and fatty acid profile of 14 different types of date seeds from countries such as Egypt, Iran, Iraq and Saudi Arabia. They found oil content between 5% and 9% in their work. Fatty acids are available as a series of saturated and unsaturated acids in both the meat part of the fruit and the seed, the seed contain 14 types of fatty acid, but only eight of these fatty acids are found in very low concentration in the fruit section. Contains unsaturated fatty acids, palmitoleic, oleic, linoleic and linolynic acids. The oleic acid content of the seeds varies between 41.1% and 58.8%, and according to this result, it is estimated that the dates seed can be used as a source of oleic acid [7].

Habib et al. (2012) analyzed and compared the profiles of vitamins, carotenoids and fatty acids grown in seed oil of 18 leading palm cultivars grown in the UAE. The results showed significant differences between the different varieties for their fatty acids, carotenoids, vitamin E and vitamin K content. The results showed significant differences between different types of oil acids, carotenoids, vitamin E and vitamin K content. It also revealed that the main oil acid in the dates seed oil was oleic acid (49.50%), followed by miracids (14.52%) and linoleic acid (10.23%) [19].

Take Juhaimi and the back. in the study (2018), significant differences were observed between 12 different types of dates. Differences in chemical properties of seed oils have been detected, depending on the types of dates. In particular, the dates oil contains relatively high oleic and indicates

that in the results of the work, the date seed oils are important for the combination of oil acid and significant amounts of tosoferol content. In addition, the data presented in this study, Adwi, Allig, and Deglet Nour date fruits can be considered a rich source of antioxidants, which is often associated with the presence of phenomena such as gallium acid. HPLC also confirmed that galleon acid in all types of dates is the dominant phenolic acid. As a result, Adwi has the potential to be used as Allig and Deglet Nour dates, bioactive components, a source of nutritional or alternative natural antioxidants [36].

According to a study by Basuni and Al-Marzooq (2010), date seed oil was used to make mayonnaise and this product was compared with commercial mayonnaise derived from seed oil. The results showed that mayonnaise containing date seed oil has superior sensory properties [20].

The inspection of non-soapless date seed oils can help with their industrial applications. For this reason, waste products such as seed can serve as a food source of oil from the date of industry. The results show that the dates seed oil is a strong potential source for the use of essential oil acids in cosmetic and pharmaceutical applications, as well as healthy food oil [19].

4. Bioactive Components of the date seeds and Oil

Bioactive compounds are defined as secondary metabolites that exist naturally in food or are exposed during processing, which are not very necessary to be taken into the body by diet, which have a preventive effect on some chronic diseases and cancer types due to their biological activities, which are outside the main nutrients in foods [23].

There are some bioactive compounds found in both of the dates and dates seed and they are some antioxidants, such as ascorbic acid, total flavonoids, total phenolics and carotenoids [6]. In the study by Atasoy (2019), he produced coffee from the date seeds and the coffee samples produced were ash, moisture, mineral, dry, protein, examination of the oil and total carotenoids, bioactive (anti-oxidant activity and total phenolic agent) properties and the effect of several different temperature applications on the phyrochemical (oil acid and phenolic) components have been studied. The dates cores are scorched at different temperature temperatures (180°C, 200°C and 220°C) and in 20 minutes.

The humidity of the samples was 3.58 to 7.04%, ash was 0.91 to 1.04%, and dried-up content was 92.96 to 96.42%. At the same time, the amount of protein for the samples varies between 8.84% and 14.09%. In addition, 16 different phenolic substances were found in all of the coffee samples, including Siringic acid, 3.4 Dihidroksibenzoic acid, Quercetin, 1.2 Dihidroksibenzene, Galic acid and (+) - Katesin is designated dominant [6].

In the examinations, it was found that dates contain many bioactive compounds such as phenolic compounds, anthocyanins, procyanidins, sterols, and flavonoids, and these compounds have beneficial effects on human health. Total phenolic compounds in dates range from 172 to 246 g/100 g. Date fruit contains many different vitamins, for example, ascorbic acid (2.4–17.5 mg/100 g), thiamine (0.08–0.13 mg/100 g) and riboflavin (0.13–17). ,5 mg/100 g) are some of them [24].

4.1. Carotenoids

Carotenoids are a group of natural tetraterpenoid pigments commonly found in plants, algae, fungi and bacteria. carotenoids, which are more than 600 different types of compounds, give fruit vegetables colors such as yellow, red and orange. there are approximately 60 types of carotenoids in the human diet. The most commonly known carotenoids in fruits and vegetables are: B-caroten, α -caroten, lutein, β -cryptosterone, it's litho and zealacendo [25].

Carotenoids have a significant impact on human nutrition and health as well as central functions in plants. It provides the diet resources of Provitamin A. B-cryptoxin, α -caroten and β -caroten are substances that demonstrate provitamin a activity [26].

There is a significant amount of carotsolenoid pigment and a very dense yellow color in the kernel oil. Hsu and Yu (2002) reported that the date seeds oil was yellow than soy bean oil, sunflower oil, olive oil and corn oil. However, the color of the date seeds oil changes from green to yellow to brown [20].

In a study, the 18 types of dates examined were found to be the most common carotenoids β -carotene in all the core oil (1.18 mg and 2.68 mg/100 gram) [19].

In another study, coffee was produced from the date seeds. The dates core coffees, which are roasted at different temperatures, have an antioxidant capacity of between 06.66% and 47.58%, resulting in a carotsolenoid quantity of 0.14 to 1.59 μg and a total amount of phenolic agent in the range of 525.35 to 595.83 mg GAE/100g [6].

4.2. Flavanoids

Flavonoids are low natural compounds of molecular weight that are beneficial to human health and found in plants. Because it has a yellow color, it is derived from the Latin word 'flavus', which means 'yellow' and is named 'flavonoid'. The 15 C-atomized 2-feni benzopiron (diphenyl propane) structure (C6-C3-C6) displays. Due to the different skeletal structures, there are types such as biflavonoid, flavonol, flavonol, kalkon, flavon [23].

Flavonoids are large quantities and commonly found compounds in plants. It's the secondary metabolites of plants. They use primary metabolites for their vital needs, and they are derived from these metabolites [27].

The flavonoid skeleton is connected to 15 carbon skeletons containing two phenolic rings connected by a chain with a heterosyclic (C) ring. Sometimes this three-carbon chain can be open. The flavonoid frame determines the characteristics of flavonoids by this heterosyclic ring [27].

Aksoylu et al. (2021), using various levels of inulin (10, 20, 30, 40, and 50%) as a drying aid, hot at 60°C for 24 hours. It is aimed to produce free flowing date powder by air drying. The effects of different inulin rates were investigated on the physiochemical properties of the dates dust. He evaluated the suitability of this prebiotic carbohydrate to be used as an agent to help dry the dates of the carbohydrate. The addition of the Inulin provided high fluidity and date dust. On the other hand, the content of bioactive compounds, including total phenolics, flavonoids, and concentrated tannins of the date dust, decreased significantly as the concentration of the inula increased from 10% to 50% ($P < 0.05$), according to this, higher content levels of inulin deferrous decreased DPPH-radical inhibition capacities. TFC of inulin containing dates 14.21 mg QE/100g to 29.91 mg QE/100g. it has changed between and has been determined to decrease significantly. In addition, significant correlation has been detected between bioactive content and antioxidants.

This research results in up to 50% inuline participation in free flow dates with enhanced prebiotic content and can be used as a sugar supplement in different food products [28].

4.3. Phenolic acid

Al Harti and the back. (2015), the study conducted by the study examined the antioxidant activity and physiochemical properties of four types of dates found in the Umman region. The DPPH method was used to study antioxidant activity, and the Folin-Ciocalteau method was used to determine the total phenolic content and the HPLC method for determining phenolic acid components. As a result of HPLC analysis, it was detected as galic acid, which is dominant than phenolic acids. In different proportions, phenolic acids such as p-gambling acid, syringic acid cafeic acid, and vanilla acid were also reported to be detected. The total phenol content of all four dates varies between 32.24 and 35.84 mg of cafeic acid equivalent/100 g of fresh weight. In addition, the antioxidant activity varies between 28.78% and 70.62% depending on the concentration of the dates [29].

4.4. Tocopherols

Tokoferoles are known as the main cleaner of oxygen radicals in membranes, and the most active form is α -tokoferis. The chain breaker functions as an antioxidant [30].

In a study, oil from two dates (*Phoenix dactylifera* L.), the varieties of Deglet Nour and Allig collected from Tunisia (*Phoenix dactylifera* L.) phenolic compounds are compared in terms of tokoferol and sterol profiles. The total phenomena considered the main source of the oil oxidation resistance range from 520.81 to 220.32 mg/kg for Allig for Deglet Nour. High performance liquid chromatography (HPLC) revealed eight defined pins, the major component. Hydroxycyrosol for Deglet Nour (10.21%) and thyrosol for Allig (8.10%). The total sterol content for the Deglet Nour and Allig was 3500 and 3000 mg/kg respectively. The sterol indicator is b-sitosterol and the total steroids in the Deglet Nour and Allig date seed oils were calculated as 83.31% and 78.66% respectively. A-tokoferol was the dominant component in both dates seed oils (24.97–38.85%) [31].

Reddy and the back. (2017), in his study, they examined the physical properties of the dates seed dust and its oil. 4 different operations have been performed on the dates cores.

These are the control group, (brewing) wetting, wetting + roasting and scorching process. It has been determined that the dust of the dates core is rich in protein and fiber. In the dust of the dates core, 10.7% of oil, 5.5 g/100g protein and 57.24% of diet fiber (52.7% of non-dissolved diet fiber) were detected when viewed from other components.

Dust from the date seed is obtained and oil is created using the Soxhlet method. After the inspection sample, the most oil efficiency is only detected in the dust of the chipping core that has been scorched. The oil generated by the Soxhlet method was reported to be rich in phenol and tocoferol content when the unsaturated fatty acids were examined [6].

Habib et al. (2012) 18 palm kernel oil, vitamin E (1.01 mg to 1.86 mg/100 g, α -tocopherol; 0.61 mg to 0.98 mg/100 g, α -tocopheryl acetate; 0.40 mg and 0.70 mg/ It showed significant concentrations between 100 g γ -tocopherol) and vitamin K1 (0.10 mg and 0.19 mg/100 g) [19].

4.5. Phytosterols

It contains 250 and more types of plant sterols, also known as phytosterols. The difference between this phytosterol and cholesterol is that they contain an extra methyl or ethyl group and a double bond in their structure. The most common phytosterols, which are found in very small amounts in foods such as corn and wheat in nature, are campesterol, stigmasterol and sitosterols. Among the phytochemicals found in palm oils, it contains the most phytosterols [25].

5. Effects Of Date Seed And Oil On Human Health

The dates and seeds have been used as medicines in traditional treatment from ancient times to date, and have a large treatment field in India and Egypt countries today. It is known that the date has a positive effect on around 70 kinds of diseases, including diseases such as cancer, which is the important disease of our age. Also, the results of the research on dates are known to contain significant amounts of antioxidant components of the persimmon fruit. Thanks to its powerful antioxidant feature, it is thought to be helpful in preventing most diseases [10].

There are many studies that show that the amount of sugar increases as the date fruit grows.

However, the sugar is very high, but the glycemic index is low. Glycemic index values of Khalas, Bahri and mA'an have been analyzed. The glycemic index values of these types have resulted in 35.5, 49.7 and 30.5. In another study, glisemic index values were looked at for Rutab, Rutab-yogurt and Tamer yogurt samples and the yogurt with Rutab 47.2, Rutab-yogurt 37.3 and Tamer ended in yogurt 28.9 [5]. These studies show that ripe dates have the lowest glycemic index.

The date prevents particularly venous congestion, allowing the heart to work healthily. One of the most important benefits of date is that it has an effect on memory enhancement. The dates contain a kind of vitamin a, β -caroten. The amount of β -caroten that is converted into Retinal in the intestines when the contents of the date are consumed is 15.6 mg. Most recent research has shown useful effects on preventing memory loss if β -caroten is consumed regularly [31].

It's a very rich vitamin a for the health of the eyes and the nerve of the eyes. In addition, the persimmons that contain a large amount of calcium and phosphate can prevent bone diseases by ensuring that bones are preserved in general [32].

In fruits and vegetables, phytochemical laws are used as follows; angiotensin-I converter enzyme (ACE) inhibitors and a peptidil-dipeptide hydase are related to the regulation of periferik blood pressure by the renin-angiogenesis system. There has been an increase in the search of natural ACE inhibitors from agricultural products and byproducts, as synthetic ACE inhibitors cause side effects such as skin spills, cough and allergic reactions. Because the dates seeds contain a significant amount of protein (5.1 g/100 g), and therefore the peptide activity with high antioxidant and ACE inhibitor can be produced from the seed for use as functional components [32].

Antibacterial agents and biological inhibitors of the antibacterial reactions of the antioxidants in the body benefit from the presence of more natural antioxidants. For example, β -caroten, flavonoids and selenium have antiinflammatory properties. Phenolic compounds that stimulate cellular immunity to protect against various infections and antibacterial activity have been detected in the dates fruit. In addition, dates flavonoids have antifungal activity against microscopic mushrooms.

As a result, the dates fruit is a good source for a variety of antioxidants, which are the ingredients for balanced nutrition. Also, date fruit and seed rich in several nutrients and phytochemicals [33-37].

Chronic diseases in humans may depend on the excessive consumption of high-fat, low-fiber and refined foods specific to diet in Europe and the United States. These diseases start to emerge in developing countries because they tend to adopt similar lifestyles and eating habits. We can also predict that dates may have other health and medical benefits that are not yet known. Date may have a very versatile role in diet health [7].

6. Conclusion

In summary, it is known that the dates core and oil are a health-critical functional food.

Inspection of the date seed oils can help with their industrial applications. It is shown by studies using the dates seed oil from many countries. Data related to the combination of dates seed oil and its physiochemical properties have already been studied and these results indicate that the date seed oil can be used in pharmaceutical, cosmetic and food areas. Thus, the date seeds (*Phoenix dactylifera* L.) use as a new oil source can be important in potential nutrition, functional and economic terms. These dates can help as a potential source of natural antioxidants, such as phenols, tocoferols and steroids, where they do not provide a high fat yield. Therefore, this work and previous work strengthen the possibility that the dates core oil should be included in cosmetics, pharmaceuticals and food products. In the study, the dates grasshoppers investigated the effect of dust and hydrates on the physical properties of the muffler, and as a result of this study, the dates seed dust and hydraulics were reported to be considered as a functional food component in famous goods. The high water and oil binding of the diet fiber of the dates seed has demonstrated functional properties and can be used in the chocolate industry as a supplemented supplement for food added.

Compliance with Ethics Requirements. Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human or animal subjects (if exist) respect the specific regulation and standards.

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