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REVIEW ON IMPORTANCE AND BENEFITS OF EATING DATES IN WEAKNESS AND TREATING MENTAL HEALTH

Shagufta Farooqui ^{* 1}, Akshay Ingle ¹, Nisha Kendre ¹ and Sidheshwar S. Patil ²

School of Pharmacy ¹, SRTMU, Nanded - 431606, Maharashtra, India.

Maharashtra College of Pharmacy ², Nilanga - 413521, Maharashtra, India.

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Correspondence to Author:

Shagufta Farooqui

Designation: Research Scholar,
School of Pharmacy, SRTMU,
Nanded - 431606, Maharashtra, India.

E-mail: Shaguftafarooqui95@gmail.com

ABSTRACT: Dates commonly known to be khajur in urdu (*Phoenix dactylifera* L.). Dates fruit is one of the best foods which possesses immense nutritional values. Date flesh is low in fat and protein but rich in sugars, mainly fructose and glucose. Dates have low cholesterol level and contain very little fat. It consists of proteins and various kinds of vitamins such as B1, B2, B3, and B5, and A1 and C. Dates are loaded with potassium and contain little sodium, which goes a long way in keeping your nervous system in order. The potassium helps to reduce cholesterol and keeps the risk of a stroke. Mainly if women eat dates after delivery and girls during their menstruation so it will ultimately reduce their weaknesses. From the time it was discovered, which was thousands of years ago, dates were known to have healing powers. And while science has proved that for sure, according to history, the date palm is known to have come from what is now Iraq, Egyptians were known to have made wine with dates a lot earlier.

INTRODUCTION: Dates palm, widely referred to as *Phoenix dactylifera* L. is one of the earliest (5500–3000 BC) farmed variety of palm trees that possess economic, nutritional, ornamental, and environmental values ¹. It is associated with the family of Arecaceae (Palmae) and is produced as sweet berries with high sugar content that is above 50% ². Historically, Romans and Greeks used the date tree as a sign of triumph, while for the Christian and Hebrew tradition, it was observed as a sign of peace ³. Etymologically, the word “Phoenix” is coined from the Phoenicians, who were part of the first to characterize this plant on their trips. *Dactylifera* is coined from *dactylus* which means “date” from the Greek word *dactylos* and *fero* for “date bearing” ⁴.

Date fruit is regarded as a pivotal crop that is extensively farmed in the Middle East and Africa ⁵. These regions are responsible for the exportation of date products worldwide ⁶. From records, five dominant countries (Iran, United Arab Emirates (UAE), Algeria, Saudi Arabia, and Egypt) reported an increase in date fruit production from 710,000 to 1,352,950 metric tonnes as of 2010 ⁷. In 2016, it was reported that its global production had increased to over 8,619,600 metric tonnes ⁴. Date palm is monocotyledonous and can be grown to a height of 1500m on good soil ⁸.



FIG. 1: DATES FRUIT

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The date palm (*Phoenix dactylifera L.*) is one of the oldest cultivated plants of humankind and has been used as food for 6000 years⁹. There are more than two hundred varieties¹⁰ of dates available worldwide. It is the main crop in Egypt, Saudi Arabia, and Middle Eastern countries. It is thought that the native origin of dates is around the Persian Gulf, and has been cultivated from Mesopotamia to prehistoric Egypt as early as 4000 BCE. Due to the old historical prospective of date, the exact date of

origin is very difficult to identify¹¹. Most likely, it originated 4000 BC from the ancient Mesopotamia area (Southern Iraq) or western India¹².

1. Health Benefits of Dates: A date palm fruit is an important component of the diet in most hot and semi-arid regions of the world. It is found to contain carbohydrates (total sugars 44% - 88%), fats (0.2% - 0.4%), proteins (2.3% - 5.6 %), fibers (6.4% - 11.5%), minerals and vitamins¹⁴.

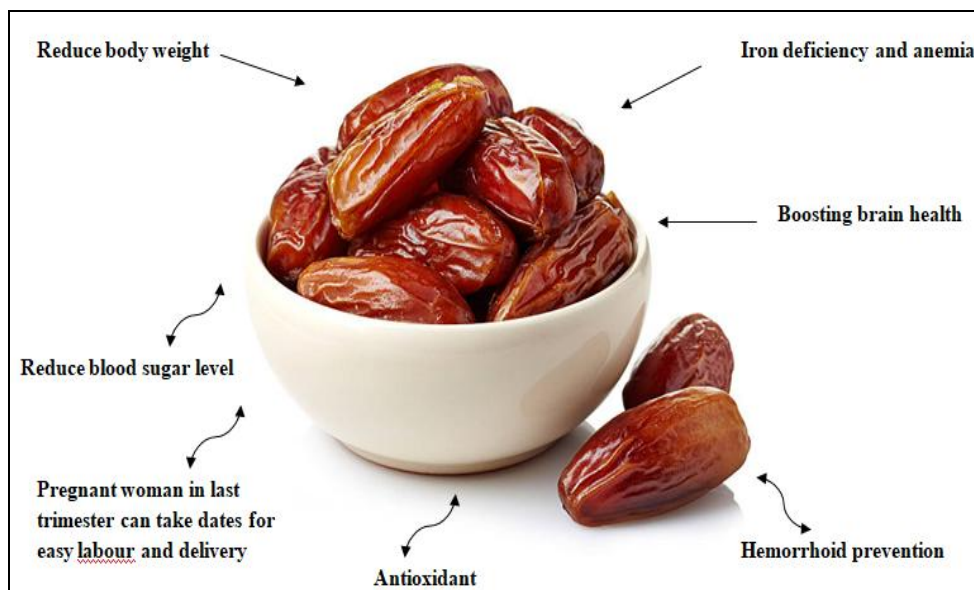


FIG. 2: HEALTH BENEFITS OF DATE FRUITS

Carbohydrates in dates are mostly in the form of fructose and glucose, which are easily absorbed by the human body. Interestingly, dates contain high concentrations of protein when compared to other cultivars of fruits such as apples, oranges, bananas, and grapes (0.3%, 0.7%, 1.00%, and 1.00% proteins, respectively), as was reported by Al Showiman¹⁵. Twenty-three different amino acids were found in date's proteins, many of which are not found in the most popular fruits¹⁶. There are more than 2000 different varieties of fresh dates¹³. Many fresh varieties are available throughout 8 months of the year. Packed, dry dates keep well without the addition of preservatives for at least 8 months, the high sugar content acting as an effective preservative.

2. Religious Significance of Date Palms and Date Fruit¹⁷: All the three major Islam, Biblical religions, Judaism and Christianity have given high priority and significance to the date palm and its fruit because of Prophet Abraham's love and

affection for the date palm. Islam has, however, given the highest priority to dates. The dates' nutritional significance and health benefits have also been mentioned in the Muslim's Holy Book "Al-Qur'an (The Koran). Date palm and date fruit have been mentioned in 20 verses of 17 Surahs (Chapters) in The Holy Qur'an. Date has been honored as one of the blessings of paradise (Qur'an, 55:68). Allah (SWT) in Qur'an recommends Maryam (mother of Prophet Isa alaihis salam) to eat this fruit.

"The pains of labour drove her to the trunk of a date palm. She [Maryam] said, "Oh if only I had died before this time and was something discarded and forgotten!" A voice called out to her from under her, "Do not grieve! Your Lord has placed a small stream at your feet. Shake the trunk of the palm towards you and fresh, ripe dates will drop down onto you. Eat and drink and delight your eyes" (Al-Qur'an, 19:23-26, Surah Maryam). Prophet Muhammad (peace be upon him) has urged

Muslims to eat dates, maintain date orchards, and mention that dates can cure many 363 diseases/disorders. According to a “Hadith,” the sayings of Holy Prophet Muhammad (peace be upon him), “he who eats seven Ajwa dates every morning will not be affected by poison or magic on the day he eats them” (Al-Bukhari, 2008). Aisha (may allaha pleased by her) reported the prophet (PBUH) said “Indeed in dates there is a cure (Muslim 14/3 and Ahmed 6/15). In Judaism, date is regarded as one of the seven holy foods/seeds, the others being, barely, wheat, lentils, beans, garlic, and onion. In Genesis, the Hebrew word for date palm is “Tamar,” which was often used to describe a beautiful woman and was regarded as a Jewish symbol of grace and elegance. Date palm leaves are used as a “lulav” (a closed frond of a date palm tree) in the Jewish holiday of “Sukkot” the Feast of Booths. Numerous references about date palm and its fruit in the Bible testify its manifold virtues. The New Testament Scriptures describe the spreading of Christianity throughout the lands of palm trees. Date palm leaves are also used for Palm Sunday in Christian religion.

3. Nutritional Values of Dates: Dates are abundant sources of carbohydrates, with sucrose, maltose, glucose, and fructose, which constitute >80% of its dry matter. Features such as compositions and sugar content differ with variety and fruit maturation¹⁸. Dates varieties of Red soft, Tempo 2, and Tempo 3 have an initial moisture content of 59.2%, 59.9%, and 64.5% (wet basis), respectively. However, during the drying season, a gradual decline in moisture contents of date fruits is usually observed¹⁹.

The Deglet Noor variety has higher sucrose, but lower simple sugar (fructose and glucose) concentrations than Allig dates fruits²⁰. In a study carried out by Al-Farsi and Lee²¹, ten date seed varieties were investigated, and it was observed that total carbohydrate content was highest in Fard, Khunaizy, and Gash-Gaafar. In another study on total carbohydrates of ten date varieties, it was observed that Bumi possessed the highest amount (81.4%), followed by Suqaey (79.7%) and Khodari (79.4%), while Labanah possessed the least amount of 71.2%²².

TABLE 1: NUTRITIONAL VALUES OF DATES

Sugar and carbohydrates	Vitamins	Minerals	Amino acids	Dietary fibers	Carotenoids	Anthocyanins, Phenolics, And Antioxidants
Fructose, glucose and sucrose	B6, B9, B2, and B3 A, D, E, and K A B1 B2 B3 B6 B9 Vit C	Mg Na Ca P K Mn Fe Zn Cu Se	Glutamic, aspartic, lysine, leucine, and glycine are the predominant amino acids in fresh dates, whereas glutamic, aspartic, glycine, prolin, and leucine are the in dried dates.	Cellulose, hemicelluloses, pectin, and lignin	Lutein, β -carotene, and neoxanthin Hydrocarbon carotenoids such as lycopene, neurosporene, gamma-carotene, delta-carotene, alpha-carotene, beta-carotene, phytofluene and phytoene	Anthocyanins, phenolics, and antioxidants (ORAC, FRAP, and DPPH)

Dates have also been described to be good sources of essential amino acids²³. These amino acids, including histidine and arginine are pivotal in the proper physiological functioning of the human body^{24, 25}. Alanine (78–105 mg/100 g DW), glycine (83–102 mg/100g), proline (86–113 mg/100g), arginine (37–93 mg/100g), asparagine (127–225 mg/100g) and glutamate (158–265 mg/100g) were observed as the major essential amino acids while tryptophan contained the least (13–46 mg/100g) in ten dates studied²⁶. Another investigation revealed that amino acids profile of

fresh dates were reported to contain glycine (65 $\mu\text{mol/g}$ FW) as the most plentiful amino acid, next to it was proline (16 $\mu\text{mol/g}$ FW), alanine (9.2 $\mu\text{mol/g}$ FW) and lysine (7.3 $\mu\text{mol/g}$ FW) while cysteine (0.001 $\mu\text{mol/g}$ FW) occurred as the least abundant²⁷.

4. Nutraceutical Potentials of Date Fruit: Generally, dates are excellent source of chemical compounds like phenolic acids, tannins, flavonoids, phytosterols, and carotenoids. The presence of these compounds in varying proportions could

promote their nutraceutical potentials. These nutraceutical potentials include antimicrobial activities, antioxidant capacities, anticancer, etc. They are explored and summarized in this section.

1. Antioxidant Activities: Antioxidants play a pivotal role in food systems, human body cells and tissues by protecting against oxidative damage of toxic molecules called free radicals²⁸. Those free radicals are closely related to known diseases such as cancer, heart disease, Parkinson's and Alzheimer's disease²⁹. In a food system, reactive oxygen species and free radicals are responsible for lipid oxidation in food products during processing and storage, forming the toxic reaction products and undesirable off-flavor³⁰. To tackle this problem, chemical formulated antioxidants e.g propyl gallate (PG), butylated hydroxyl toluene (BHT), butylated hydroxyl anisole (BHA), and tertiary butyl hydro quinone (TBHQ) are applied as antioxidants against lipid peroxidation³¹.

However, chemical formulated antioxidants have been reported to induce cancer.³² Thus, natural antioxidants from food sources are mostly preferred. Dates are good source of antioxidant like tannins, carotenoids, sterols and polyphenols³³. Boudries *et al.*³⁴ observed the availability of carotenoids, majorly β -carotene and lutein in the fruit's oil fraction³⁵. These carotenoids are common precursors of vitamin A and active antioxidants. Antioxidant potentials varies with different dates cultivars, date type and origin. In addition, ripening stage of dates varies in antioxidants from one location to another³⁶.

Therefore, it is expedient to consider these variations when selecting date fruit as a nutraceutical. In this context, the antioxidant capacities of some date varieties are reported³⁷. For instance, Ajwa dates extracts showed 91, 70 and 88% inhibition against lipid peroxidation using aqueous, methanolic and ethyl acetate as the extraction mediums³⁸. Dates variety from Oman (a Southeast Asian country) such as Khasab, Khalas, and Fard were reported to possess phenolic concentrations which ranged between 217–343 mg of ferulic acid equivalent/100 g³⁹. Seeds from date varieties in Oman showed high antioxidant activity (580–929 μ mol of Trolox equivalents/g fresh weight)⁴⁰.

2. Orthodox Medicine and Traditional Therapeutic Applications: Traditionally, dates are used as a prophylactic and therapeutic ingredient since ancient times in different nations like Morocco, Iraq, India, Algeria, Iran, and Egypt⁴¹. In south-eastern Morocco, dates were used for the treatment of diabetes and hypertension according to historical facts⁴². In another instance, kernels from dates were linked to reducing skin wrinkling and anti-aging in women⁴³.

According to Zaid and De Wet⁴⁴, dates have been suggested to help in the hardening of infant gum. In addition, dates can also assist in reducing dry cough, mild fever, headaches, and lethargy when cooked with cardamom and black pepper⁴⁴.

In traditional medicine, the consumption of dates was recommended for people with jaundice ailments as well as pregnant women. Its extensive application for the traditional cure of liver and malaria infection in the Arab Peninsula has been denoted]. Demulcent, diuretic, expectorant, restorative and laxative properties have been linked to date⁴¹. It is widely known that there was less availability of scientific research to experimentally prove the medicinal effects of date palm in ancient times, however, recent investigations are beginning to validate these claims to show their therapeutic mechanism.

3. Effects of Dates on Pregnancy, Lactation, and Reproductive System: The most common medicinal use of dates and their products is a tonic, especially for women close to delivery and at the postpartum stage. The consumption of dates by women before and after delivery can act as a tonic to strengthen the uterine muscles. Dates help in activating the delivery process and may also prevent postdelivery bleeding due to the presence of some constricting substances.

The typical example given for such use is the case of Virgin Mary's delivery as mentioned in the Holy Quran when she was recommended to eat dates to relieve her delivery pains (Al-Qur'an, 19:23–26). The potassium, glycine, and threonine content of dates are thought to activate the production of milk hormone (prolactin). Small quantities of oxytocin have also been detected in dates. Therefore, dates can act as lactagogue if used in a woman's daily

meal plan during her lactation period. Dates mixed with milk and cinnamon are considered aphrodisiac as they can activate sexual desire. In the Middle East, it is common to consume about 10 to 30 dates daily as part of their normal diet.

Studies have shown that DE increased the sperm count in guinea pigs and enhanced spermatogenesis by increasing the concentration of testosterone, follicle-stimulating hormone, and leutinizing hormone in rats⁴⁵. Dates can help solve the infertility problems in males. Date palm pollen grains have been shown to regulate the sexual hormonal balance in rats⁴⁶. The date pollens yield an estrogenic principle, estrone, that has been shown to have a gonadotropic effect in young rats⁴⁷.

4. Antianalgesic, Antipyretic, and Protection against Colds, Sore Throat, and Fever: Date products in an infusion, decoction, syrup, or paste are administered as a treatment for sore throat, colds, bronchial catarrh (inflammation of mucus membranes). Although no clinical data are available in the literature for such claims, the antioxidant and anti-inflammatory properties of dates⁴⁸ could be regarded as the main contributing factor to such effects. The traditional recipe that is considered an effective expectorant consists of a mixture of 50 g dates, 50 g fig, 50 g hibiscus, and 50 g raisins boiled in 1 L of water. This mixture is recommended to be taken three times daily to control throat and chest infections. Decoction of dates and fenugreek is recommended in the treatment of bronchial asthma. Date pastes with margarine are considered to act as an analgesic and antipyretic. They are therefore applied externally on the abscesses as well as on the poisonous bites to avert the poisonous effect. Pastes prepared from powdered seeds are given to relieve the ague (malarial fever). Date pastes in water are also believed to act as antihistaminic to control allergies when externally applied to the skin. Zinc is regarded as an active ingredient inducing allergic inhibition. Soaps prepared with powdered date seeds are used for the treatment of skin allergy and Acrodermatitis enteropathica (AE). AE is a rare inherited autosomal metabolic recessive disorder that results from poor absorption or uptake of zinc and can be resolved by oral supplementation of zinc⁴⁹.

5. Antidiabetic Properties: Current medications used for the management of diabetics are effective but possess some negative side effects such as disruption of genetic and metabolic pathways⁵⁰. Thus, extracts from a natural plant that can elevate insulin generation and retard intestinal glucose intake are used presently in diabetes management⁵¹. Meanwhile, dates are rich sources of active compounds such as flavonoids, phenols, steroids, and saponins that can function as an antidiabetic ingredients. These compounds possess free-radical scavenging abilities, as shown in several diabetic rat experiments⁵². Ajwa date extracts, when consumed, could assist in lowering oxidative stress and stabilize the proper functioning of the kidney and liver⁵². This could be partly because phenolic compounds in dates retard α -glucosidase, therefore controlling glucose intake in the kidneys and small intestines⁵³. Thus, the antidiabetic property of dates can be utilized for medical applications.

6. Treat Alzheimer's disease: *Phoenix dactylifera* (Arecaceae) a cousin of lily, is cultivated primarily as a fruit. *P. dactylifera* (PD) is found to possess useful medicinal properties, such as anti-viral, gonadotropic and anti-tubercular. The present study was undertaken to investigate the effect of *P. dactylifera* fruit (Date) on cognitive functions in mice. A total of 180 young mice divided in 36 groups were employed in the present study. PD fruit was administered orally in three doses (5, 10, 20 mg w/w) for seven successive days to different groups of mice. The learning and memory parameters were assessed using an elevated plus maze and passive avoidance apparatus. PD fruit showed significant improvement in the memory of animals as reflected by increased step-down latency and decreased transfer latency. It also reversed the amnesia caused by scopolamine (0.4 mg/kg, i.p.) and diazepam (1mg/kg, i.p.). Furthermore, PD fruit significantly reduced the central (brain) cholinesterase activity in mice. Since diminished cholinergic transmission appears to be responsible for the development of dementia in Alzheimer patients, PD fruit may prove to be a useful medicine on account of its multifarious beneficial effects. PD fruit appears to be a promising candidate for improving memory, and it could be worthwhile to explore the potential of this fruit (Date) clinically in the management of Alzheimer's disease⁵⁴.

Phytochemicals Contents of Date Fruits:

Phytochemicals are products of plant chemicals that are therapeutic in action when consumed as medicinal drugs or as components of daily diets⁵⁵. As observed in most fruits, bioactive compounds like carotenoids, polyphenols, majorly phenolic acids and flavonoids, sterols, and tannins are observed in varying quantities in dates^{56, 57}. The

proportion and concentration of these components enormously vary with respect to some parameters such as stage of fruit picking, date variety, postharvest processing, storage, soil conditions, and geographical origin of the dates^{58, 59}; some of these bioactive compounds in dates are explored and reported in this section.

TABLE 2: FUNCTIONAL APPLICATION OF DATES IN FOOD PRODUCTS

Dates part	In-vivo and in-vitro experiments conducted	References
Seed	Antioxidant capacities and lowered oxidative disintegration	[60]
Seed extract	Nephron-protective effect against kidney damage	[61]
Aqueous extracts from seed	Lowered CCl ₄ induced hepatotoxicity	[60]
Seed powder	Showed antioxidant and anti-inflammatory	[62]
Methanolic and water extracts from edible part	exhibited antioxidant and anti-inflammatory effect	[63]
Syrup	Lowered CCl ₄ induced liver injuries	[63]
Aqueous extracts	Reduced mutagenic effect	[62]
Aqueous extract	hepatoprotective activity	[64]
Aqueous extracts	antioxidant, anti-inflammatory, hypolipidemic, cardio protective and anti-apoptotic ability	[65]
Hot water extract from matured fruit	invigorate the cellular immune system	[66]
Extracts	Anti-cancer effect	[67]

CONCLUSION: The presented review shows that dates may be considered a nutritious food and can play a major role in human nutrition and health because of their wide range of nutritional functional components and serving as an important healthy food in the human diet. Also, date seeds are rich sources of dietary fiber and natural antioxidative compounds that could potentially be used as a supplement of fiber and antioxidants in the nutraceutical, pharmaceutical, and medicine industries. Dates also possess phytoconstituents that will enhance cognitive functions and be used to treat weakness because of their rich carbohydrates content. Ultimately dates, fruits, and seeds possess antioxidants property, so if we eat dates every day, it will reduce the chances of occurrence of disease in the human body.

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