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Rozeena Parvez

Ph.D., Scholar, Department of Food Science and Technology, Department of Warner College of Dairy Technology, Sam Higgin Bottom University of Agriculture Technology and Sciences (SHUATS), Allahabad, Uttar Pradesh, India

Ankita Gautam

Assistant Professor, Warner College of Dairy Technology, SHUATS, Allahabad, Uttar Pradesh, India

John David

Dean, Professor, Warner College of Dairy Technology, SHUATS, Allahabad, Uttar Pradesh, India

Study on antioxidant activity and health benefits of Ajwa dates

Rozeena Parvez, Ankita Gautam and John David

Abstract

The aim of study was to determine the nutritional composition of Ajwa Dates (*Phoenix dactylifera*). Ajwa Dates one of the famous variety in Saudi Arabiya and other countries. Ajwa dates have been many health and nutritive benefits properties. Recent studies show that Ajwa date extracts are beneficial for ischaemic cardiac disease. In Ajwa dates have anti-inflammatory, anti-oxidant and Anti-Atherogenic properties. Dates are always used as a source of high nutrient value all over the world. They are available in many different varieties and types. Every single date's varieties have been different properties. Studies shown that dates contain 46-87% of carbohydrates, 2.1 -5.9% protein and 0.3-0.5% fats, 6.4-11.5% dietary fiber in supplementary to being rich in minerals and vitamins provide them necessarily a complete meal.

The mechanisms of these effects include inhibition of degradation of endogenous antioxidants like Nitric Oxide, inhibition of lipid peroxidation and therefore reduction in free radical formation. Studies show that different Ajwa varieties have different Nitric Oxide inhibitory activity. One study showed that extract from Ajwa, Either in ethyl Acetate, Methanolic.

Keywords: Antioxidant, nutritional composition, phoenix dactylifera, vitamins

Introduction

Dates are the sweet and chewy fruit of the date palm tree (*Phoenix dactylifera*). Dates have been the major food of the Middle East for thousands of years. Dates are found in especially Arab counties. Muslims generally break their fast by eating dates. Modern science has proved that dates are useful of a nutrition, healthy diet. They contain sugar, fat and proteins and important minerals vitamins. Ajwa dates are a soft and fruity smoothie date variety with a fine texture. They are cultivated in Madina Tayyiba in Saudi Arabia. Ajwa dates are the most famous variety of dates in among Arab counties.

Arabia and North Africa suggests that dates have been consumed in the area for over 8,000 years. Dates have since been exported to many countries such as Pakistan, India, Italy, and South America and even thought the western coast of North America. The taste has been soft, sweet and smooth, juicy with a "melt in your mouth". Dates are now popular all over. Dates are used for a natural sweetener in smoothies, juices, nutrition bars, and baked products like cakes and muffins. You can buy also top varieties that are stuffed with almonds or peanut butter and specialty products like date molasses a sweet sticky syrup that can be drizzled on pancakes or porridge. (Sahih Muslim 2046 (Book 23, Hadith 5079)

The date trees can grow 12 inches per year up to a height of 100 feet. To produce a large amount of dates, they are usually manually pollinated. Trees either male or female. The male tree has carried is pollen and dusted over the female trees and they are allowing them to produce fruit. The dried Ajwa date is a very dark brown colour rich in many nutrients. It remains quite soft and juicy and also retains its sweet and fruity flavour. These are some of the reasons that Ajwa dates are most sought after around the world.



Corresponding Author:

Rozeena Parvez

Ph.D., Scholar, Department of Food Science and Technology, Department of Warner College of Dairy Technology, Sam Higgin Bottom University of Agriculture Technology and Sciences (SHUATS), Allahabad, Uttar Pradesh, India

The taste is not the only benefit you get from Ajwa dates. Ajwa dates can even be thought of as a power pack of nutrients. For its size it contains a lot of beneficial nutrients and vitamins. Ajwa dates found protein and carbohydrates, dietary fibre and healthy fats. They are higher Oiconsisting with vitamins A, B6, C, E and K. They also contain carotenoids it's a part of the vitamin A family and useful for eyesight. Other vitamins contained include folate, niacin, thiamine and riboflavin. Ajwa dates contain calcium, potassium, magnesium, phosphorus, sodium, iron, zinc, copper, manganese and selenium. [Sahih Muslim, Book #023, Hadith #5083]

Nutritional Composition

Dates can be said termed as a power pack of nutrients despite in each date. One of the most interesting date's nutrition facts is that they are highly rich in fiber and some of the minerals like, potassium, calcium and magnesium. 100 gm of dates can contain 75 gm carbohydrates, 8 gm dietary fiber, 2 gm proteins and 0.39 gm fats. In addition to these, dates are an excellent source of carotenoids, which are the precursor of vitamin A. 100 gm of dates also contain about 10 IU vitamin A, 0.4 mg vitamin C, 2.7 mcg vitamin K, 0.05 mg vitamin E, 19 mcg folate, 0.05 mg thiamine, 0.066 mg riboflavin, 1.27 mg niacin and 0.165 mg vitamin B6. As far as the mineral content of dates are concerned, 100 gm of dates can provide you approximately 39 mg calcium, 656 mg potassium, 43 mg magnesium, 62 mg phosphorus, 2 mg sodium, 1 mg iron, 0.29 mg zinc, 0.2 mg copper, 0.26 mg manganese and 3 mcg selenium. [Sahih Bukhari, Book #71, Hadith #664 (also 663, 672)]

Table 1: Nutritional Composition

| Principle | Nutrient Value (100gm) | % OF RDA |
|----------------|------------------------|----------|
| Energy | 277kca | 14% |
| Carbohydrare | 74.97g | 58% |
| Protein | 1.81g | 3% |
| Total Fat | 0.15g | <1% |
| Cholestesterol | 0mg | 0% |
| Dietary Fiber | 6.7g | 18% |
| Vitamin A | 149iu | 5% |
| Vitamin K | 2.7mg | 2% |
| Sodium | 1mg | 0% |
| Potassium | 696mg | 16% |
| Calcium | 64mg | 6.5% |
| Iron | 0.90mg | 11% |

Health Benefit of Ajwa Dates

Its contents of nutritious substances, vitamins and minerals. Ajwa dates have benefits that are more than skin deep for one's overall well. Least 15 minerals in dates including selenium an element they are help to prevent cancer and important in immune function. Protein containing 23 types of amino acids some are not present in the most popular fruits, such as oranges, apples, and bananas. Unsaturated fatty acids are palmitoleic, oleic, linoleic, and linolenic acids. The study concluded that dates could be considered a nearly ideal food with a wide range of essential nutrients and potential health benefit. Potassium for your heart, B-vitamins, tannins, these are just a few of the many nutrients in dates making them one of the healthiest foods in the world.

Dietary fiber in dates helps for digestion to move waste smoothly pass through your colon and helps prevent LDL (bad) cholesterol absorption by binding with substances and it contain cancer-causing chemicals. The iron is a component of

hemoglobin in red blood cells. It prevents the balance of oxygen in the blood. Potassium and electrolyte help control your heart rate and blood pressure. B-vitamins contained in carotenes lutein and zeaxanthin absorb into the retina to maintain optimal light-filtering functions and prevent against macular degeneration.

Here are some of the Medicinal benefits

- 1. Improves Digestive Health, Relieves Constipation:** Ajwa dates found in fiber help to clean out the gastrointestinal system the colon to work fast at greater levels of efficiency. Ajwa dates like reduces risks of bowel inflammation (colitis), colon cancer, and haemorrhoids.
- 2. Boosts Heart Health:** Consist high fiber in addition to increase colon health fibre is also known to boost heart health.
- 3. Anti-Inflammatory:** Ajwa dates are rich in magnesium and known for its anti-inflammatory benefits. Ajwa dates have some of the highest anti-inflammatory properties similar to commercial drugs like aspirin or ibuprofen.
- 4. Reduced Blood Pressure:** Magnesium has been shown to help lower blood pressure and Ajwa dates are full of this mineral.
- 5. Reduced Stroke Risk:** Researchers says stroke risk was reduced by 10% for every 100mg of magnesium a person consumes per day in daily life routine and balance of perfect diet.
- 6. A Healthy Pregnancy and Delivery:** Consuming Ajwa dates in late pregnancy helps with labour progression and less need for artificially inducing labour and/or caesarean section [3].
- 7. Boosting Brain Health:** Sufficient vitamin B6 levels are containing with improved brain performance and better test scores.
- 8. Bone Health and Strength:** The perfect amounts of minerals found in Ajwa date that gives good food for strength bones and fighting off painful and weakening diseases like osteoporosis.
- 9. Intestinal Disorders:** The natural nicotine content in dates is thought to be beneficial for curing many kinds of intestinal disorders.
- 10. Anaemia:** Ajwa dates have a dark colour when dried out to their high mineral content. There are very high levels of iron give them a perfect dietary supplement for people suffering from anaemia and its give immersive result.
- 11. Energy Booster:** Ajwa dates are highly found in natural sugars like glucose, fructose, and sucrose. And they are the complete snack for an immediate boost of energy. In Aiwa dates found in sugar are more beneficial important for those with type 2 diabetes.
- 12. Maintaining healthy weight:** Dates should be included as a part of a healthy diet. They contain of sugar, proteins and many essential vitamins.

Nervous System Health: The vitamins present in Ajwa dates make it an ideal boost to nervous system health and functionality. Potassium is a primary ingredient in promoting to a healthy and responsive nervous system, and it's also improved the speed and alertness of brain activity human body. (Milk Barrett 2013)

Proximate Analysis of Ajwa date

Proximate Analysis is a technique which is used for the

Establishment of closely connected components together. It conventionally comprised determinations of the amount of

protein, fat, moisture, ash, carbohydrates and fiber being approximate by analysis. Proximate Analysis of Dates Ajwa.

Table 2: Nutritional Composition of Ajwa Dates

| Proximate analysis | Ajwa date (T ₀) | Ajwa date (T ₁) | Ajwa date (T ₂) | Ajwa date (T ₃) |
|--------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Moisture% | 9.49% | 9.98% | 9.21% | 9.84% |
| Ash% | 1.73% | 1.23% | 1.87% | 1.99% |
| Fat% | 2.48% | 2.69% | 2.14% | 2.76% |
| Protein% | 1.86% | 1.97% | 1.34% | 1.95% |
| Fiber% | 51.39% | 51.67% | 51.40% | 51.49% |
| Carbohydrates% | 84.44% | 84.13% | 85.44% | 83.76% |

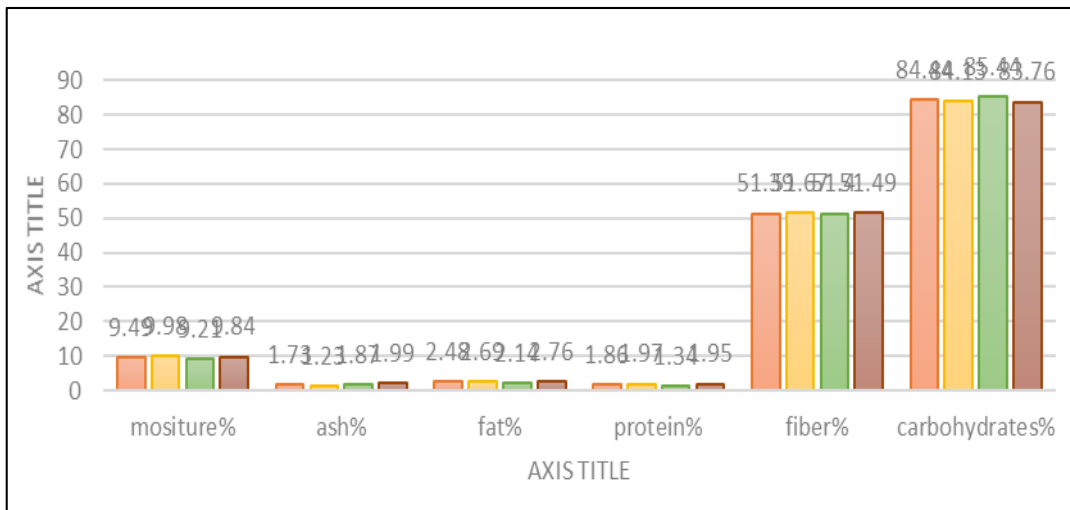


Fig 1: Graphical representation of Nutritional composition of ajwa dates

Antioxidant Activity

DPPH free Radical scavenging activity Antioxidant screening was done by DPPH method. DPPH inhibition index was calculated for ajwa date. Free radicals are generated in the body as byproducts of normal metabolism and whenever it exposes to radiation and some environmental pollutants. They are extremely reactive, that they can recompense cellular components and are involve in a variety of diseases. Free radicals normally neutralized by systematic systems in the human body that comprise the antioxidant enzymes (superoxide dismutase, catalase, and glutathione peroxidase). Antioxidants are familiar to neutralize the harmful out-turn of free radicals and other reactive chemical species that are

always generated by human body and it promote for better health. Antioxidant performed as a radical scavenger, electron donor, peroxide decomposer synergist, hydrogen donor and metal chelating agents. Antioxidants are essential as they are ready to give up their own electrons to free radicals.

Table 3: % age of DPPH inhibition index of ajwa dates

| %DPPH inhibition index | Ajwa dates |
|------------------------|------------|
| T ₀ | 20.80% |
| T ₁ | 19.89% |
| T ₂ | 19.98% |
| T ₃ | 20.75% |

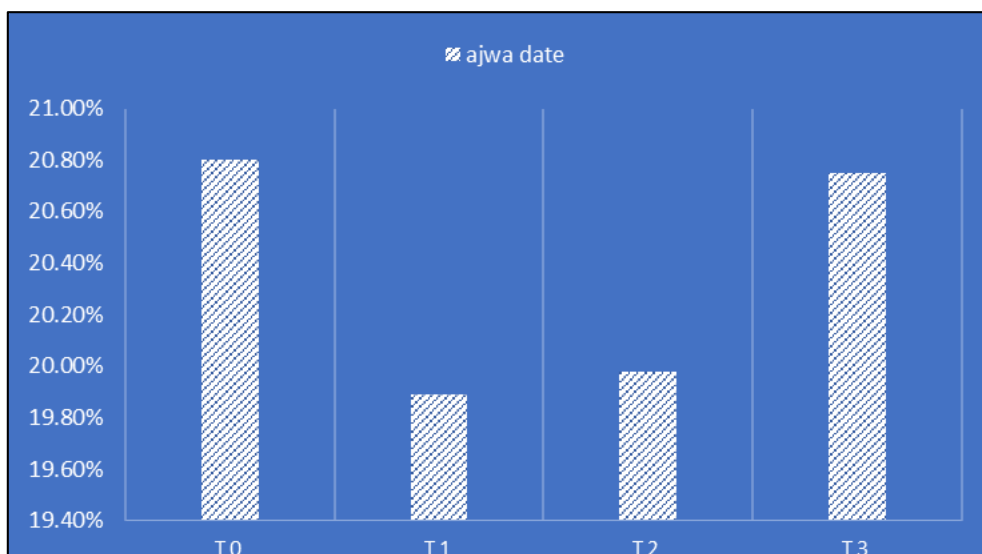


Fig 2: Graphical representation of % age of DPPH inhibition index of ajwa dates

Determination of the Antioxidant Activity

The antioxidant activity was investigated using the stable free radical DPPH assay, according to the method described by Brand-Williams *et al.* (1995) with modifications. Different dilutions of the methanolic extracts were prepared for each ripening stage. A method used to determine the antioxidant capacity is to utilize the stable 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical which use to decolorize when it combines with the hydrogen from a free radical scavenging antioxidant. Antioxidant screening was done by DPPH method. 0.004 g of DPPH (2, 2-Diphenyl-1-picrylhydrazyl) was dissolved in 100 ml of Ethanol and shake well till solubility and then this solution was added to different concentrations of samples as 0.1, 0.3, 0.5 ml sample with 3 ml of solution and color discharging was observed. This solution was observed under UV visible spectrophotometer with reference to blank and the calculation were made accordingly.

Result and Discussion

The current study concludes that ajwa have more nutritive value than the rest of the date varieties. Date Fruits are mostly consuming in Arab areas for a daily routine as a part of essential diet. It can also prevent lead induced heamotoxicity side effects of methylprednisolon male and female infertility. It can also help cerebroprotective, neuroprotective and haemopoietic activity. Phoenix dactylifera can be contain for number of complications if further evaluated and isolated. Dates also increase level of estrogen, testosterone, RBCs, Hb, PCV, reticulocytes and platelet count these are important nutrient for human body Ajwa dates (Phoenix dactylifera) family to belong Arecaceae dates leaves and barks, pits, fruits and pollens have anticancer, antioxidant, hepatoprotective, antidiabetic, antihypertensive, anti-inflammatory, antiproliferative, antimutagenic antidiarrheal, antibacterial, antifungal and antiviral potential (Rahmani A, Alzohairy M. 2011) [5]

Conclusion

Ajwa date fruits considered in this study should serve as a good source of natural antioxidant and higher amount of nutritive benefits and it would be desirable to consume them at the ripe stage in order to achieve the maxima nutritional and functional properties with benefits to human health.

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