Antioxidant Activity of Nabeez Water from Ajwa Palm Date Fruits (Phoenix dactylifera L) as a Favourite Drink of the Prophet Muhammad SAW

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Abstract. Nabeez water is a kind of infused water from Ajwa palm date fruits that are consumed by Muslim societies in Indonesia especially when Ramadan, unfortunately, its ability to scavenging free radicals have never been studied. The aim of the study was to determine the antioxidant activity of Nabeez water by DPPH methods. Infused water from Ajwapalm date fruits were made with maceration for 24, 48 and 72 hours with three times replication. The stability contact time result was 60-100 minutes, and maximum wavelengths result was 516 nm. IC50 calculation results showed that at the 24-hour maceration IC50 value was 223.6 ppm, while at 48-hours maceration was 369 ppm, and at 72-hours maceration was 2530 ppm. It can be concluded that the best antioxidant activity achieved at of 24-hour maceration. Keyword: Antioxidant activity, Ajwa Dates Palm, Nabeez water.

1. Introduction

Industrial development triggers the emergence of complex environmental problems, one of which is the result of free radicals that have an impact on human health [1]. Free radicals are said to be one of the factors causing chronic and acute diseases, such as degenerative diseases[2]. What is quite alarming is the fact that 80% of deaths in developing countries are the caused by degenerative disease [3]. Efforts are needed to address the high mortality rate due to this degenerative disease. One effort to prevent the development of degenerative diseases is the use of antioxidants[4]–[6].

Antioxidant compounds have benefits such as inhibiting several degenerative diseases, reducing the risk of cardiovascular disease and increasing the body's immune system [7]. Some of the antioxidants that are often used are butylhydroxyacisol (BHA), butylhydroxytoluene (BHT), terierbutylhydroxyquinone (TBHQ). Unfortunately, this synthetic type of antioxidant if used long term will have a negative impact because of its carcinogenic/cancer-causing properties (Amarowicz, Naczk, and Shahidi, 2000), several studies then began to examine the source of natural antioxidants, such as research conducted by Dungir, Katja, & Kamu (2012) showed that mangos teen peels contained antioxidant content, research from Malangngi, Sangi, and Paendong (2012) also showed that there were antioxidant compounds contained in avocado seed extract[10]. However, there are some disadvantages of this antioxidant related to the taste that is not good and the processing steps are not simple so people are reluctant to use it.
Al-Qur'an tells about this date fruit at Surah Maryam when she was about to give birth to the Prophet Isa. "Then Jibril called to him from a low place. Do not be afraid / moping, surely your Lord has made a tributary below you and shake the base of the date palm tree towards you, surely the tree will abort the ripe fruit to you "(Al-Qur'an, Surah Maryam verses 24-25). This Word, can be proven through science and technology related to the goodness of consuming dates before birth can actually accelerate the process of normal birth. Tests on mice conducted by Agustina, Purnamasari, & Lusiana (2017) show that the administration of date extracts increases the release of the hormone oxytocin which can help speed up the birth process [12].

The goodness of the date palm, especially the Ajwa date has also been reported by Jabir and Abu Said, the Prophet Muhammad SAW said that Ajwa date comes from heaven, it is an antidote to poisons, and a kind of manna fungus whose water is an eye drug [13]. That was linier with the findings from Assirey (2015) show that dates have a nutritional content that is high in sugar with the type of glucose and fructose, rich in protein and fat, and high potassium [14]. This implies that there is a content in Dates that has potential as a medicine. Prophet, who is a role model for Muslims, likes to drink water from ajwa Dates marinade roomates is Often Referred to as Nabeez water. Habits of the Prophet Muhammad SAW certainly have good wisdom for humans, unfortunately, there has been no scientific research that uncovered the potential of this Nabeez water. Therefore, Researchers are interested to prove scientifically through science and technology related to the potential of Nabeez water as a natural antioxidant that has a good taste and is Easily served to the public so that it is expected to be an alternative in efforts to reduce the high mortality rate due to degenerative diseases, one of which is the caused by free radical. there has been no scientific research that uncovered the potential of this Nabeez water. Therefore, Researchers are interested to prove scientifically through science and technology related to the potential of Nabeez water as a natural antioxidant that has a good taste and is Easily served to the public so that it is expected to be an alternative in Efforts to reduce the high mortality rate due to degenerative diseases, one of which is the caused by free radical. there has been no scientific research that uncovered the potential of this Nabeez water.

By conducting scientific tests the potential of Nabeez water is expected to be Able to provide a solution to the need for natural antioxidants in counteracting free radicals so as to have a continued impact on improving the health of humanity, as well as being the basis for strengthening the value that Islam is Rahmatan lil'alamin, Because the teachings of the Prophet Muhammad have a beneficial effect not only for Muslims but for all humans. The purpose of this study was to Determine the antioxidant potential of Ajab water palm (Phoenix dactylifera L). Mu'nisa, Hala, and Muflihuna (2017) said that antioxidant activity of the palm fruit ajwa represented by IC50 value Nabeez dose of water to produce a 50% capture of the radical DPPH [15].

2. Methodology

In this study will use samples of palm varieties ajwa imported from Madinah via Agent Fatimah Az-Zahra, powders DPPH,%, methanol pro analytic, distilled water, a solution of FeCl3 1M, lead acetate, chloroform, concentrated H2SO4, NaOH 50%, Ascorbic Acid, HCl. The tools used in this study is a UV-Vis spectrophotometer (Thermo Orion brands), analytical balance, beakers, test tubes, beaker, glass funnel, stir bar, flask, electric heating, pipette volume. The method used was based onRekha et al(2012) with some modifications[16].

Preparation of DPPH started by weighing 2 mg DPPH and dissolved in 10 mL of methanol pa up to obtain DPPH stock solution with a concentration of 200 ppm. DPPH solution of 200 ppm and then diluted to 0.002% by dissolving 1 mL stock solution of DPPH in methanol pa to reach a volume of 10 mL. The solution was covered with aluminum foil and should always be made new.

Preparation of the water nabeez is made by mixing 1 ajwa palm fruit (without separated from the seeds) with 1L distilled water into the flask maceration. Dilution is done by varying the concentration of 20, 50,100, 150, 200 ppm based on the method of Katja, Suryanto & frenly Wehantouw (2009) with some modifications. Each solution was performed maceration for 24 hours, 48 hours, 72 hours, 96
3. Result and Discussion

3.1 Antioxidant Activity Test Optimization Results

The maximum wavelength is measured to determine the wavelength has the highest uptake. Sample measurements must be made at the maximum wavelength in order to maximize sensitivity and minimize errors [19]. Interval of DPPH wavelength range from 515 nm [20] – 516 nm [21]. Schwarz, et., al (2001) have tested the antioxidant at a wavelength in a wide range of plant extracts using DPPH 20 ppm and has the results of maximum wavelength was 516 nm, while Blois (1958) [22] found in 517 nm. This difference occurs due to differences in the experimental conditions (Molyneux, 2004) [23].

![Figure 1. Determination \( \lambda_{\text{max}} \)](image)

3.2 Determination of the Operating Time (OT)

Operating time was conducted to determine the exact time required for completely reacted. Measurement of operating time is intended to minimize errors in the measurement of antioxidants. OT
determination was done by measuring the absorbance of DPPH solution which has been treated with a solution of Nabeez water at different concentrations.

![Graph showing absorbance over time for different concentrations of Nabeez water](image)

**Figure 2.** Determination Operating Time

Results of measurement of operating time showed that stable absorbance started 60 minutes-100 minutes, so that the next test will be measured antioxidant activity in the span of 60 minutes-100 minutes.

### 3.3. Antioxidant Activity Results

Tests on water samples antioxidant activity Nabeez dates ajwa done at a wavelength of 516 nm with a span of contact between the sample with DPPH is 70 minutes. This is based on the results of the optimization of the operating time and the measurement of the maximum wavelength. Antioxidant compounds will react with the free radical DPPH (1,1-diphenyl-2-pikihidrazil) formed DPPH-H (1,1-diphenyl-2-pikrihidrazin). Antioxidants donate hydrogen atoms to the radical DPPH to complete the lack of electron and radical-antioxidant form more stable [24]. Control solution is used to determine the absorbance of DPPH radical before it is reduced by the sample. The difference between the absorbance of DPPH that has been reduced by absorbance control samples is sissa DPPH radicals were read on a UV-Vis spectrophotometer. The greater the difference, the greater the antioxidant activity of the sample. Catching a hydrogen atom conjugated double bond resulted in DPPH is reduced resulting in decreased intensity of color and a decrease in absorbance. This can occur if the capture of one electron by antioxidants that led to the electron opportunity to resonate. DPPH compound resonance can be seen in Figure 3. The amount of antioxidant activity characterized by IC50, namely the concentration of the sample solution required to inhibit 50% of DPPH free radicals.
3.4 Antioxidant Test Results With 24 hours Maceration

Testing the water antioxidant Nabeez ajwa palm fruit is done by adding as much as 2 mL samples with a concentration of 20 ppm, 50 ppm, 100 ppm, 150 ppm and 200 ppm (Dungir, Katja, & You, 2012). Solutions with various concentrations were then added with 20 ppm of DPPH as much as 2 mL samples were then incubated for 30 min [16] and observed its absorbance values via UV-Vis spectrophotometer, and the replication is performed 3 times. Antioxidant test results with a 24-hour soaking period are presented in Table 1.

Based on Table 1, linear regression analysis with the relation between concentration of water extracts and DPPH absorbance soaking percent regression equation $y = 0.1625x + 13.666$. From the calculations, IC50 value was 223.6 ppm.

3.5 Antioxidants Test Results with 48 Hours Maceration

Testing the water antioxidant Nabeez ajwa palm fruit is done by adding as much as 2 mL samples with a concentration of 20 ppm, 50 ppm, 100 ppm, 150 ppm and 200 ppm [9]. Solutions with various concentrations were then added with 20 ppm of DPPH as much as 2 ml samples were then incubated for 30 min [16] and observed its absorbance values via UV-Vis spectrophotometer, and the replication is performed 3 times. Antioxidant test results with a 24-hour soaking period are presented in Table 2.
Table 2. Results of Antioxidants Activity (48 hours maceration)

| No. | Concentration (ppm) | 1st Replication A | % I  | 2nd Replication A | % I  | 3rd Replication A | % I  | Average Inhibition % |
|-----|---------------------|------------------|------|------------------|------|------------------|------|----------------------|
| 1   | 20                  | 0.168            | 18.049 | 0.167            | 18.537 | 0.167            | 18.537 | 18.374               |
| 2   | 50                  | 0.169            | 17.561 | 0.167            | 18.537 | 0.167            | 18.537 | 18.211               |
| 3   | 100                 | 0.162            | 20.976 | 0.161            | 21.463 | 0.160            | 21.951 | 21.463               |
| 4   | 150                 | 0.149            | 27.317 | 0.149            | 27.317 | 0.148            | 27.805 | 27.480               |
| 5   | 200                 | 0.133            | 35.122 | 0.132            | 35.610 | 0.131            | 36.098 | 35.610               |
| Blank |                   | 0.205            |     | 0.205            |     | 0.205            |     |                      |

Based on table 2, linear regression analysis with the relation between concentration of water extracts and DPPH absorbance soaking percent regression equation $y = 0.0971x + 14.13$. From the calculations, the value of IC50 was 369 ppm.

3.6 Antioxidants Test Results with 48 Hours Maseration

Testing the water antioxidant Nabeez ajwa palm fruit is done by adding as much as 2 mL samples with a concentration of 20 ppm, 50 ppm, 100 ppm, 150 ppm and 200 ppm [9]. Solutions with various concentrations were then added with 20 ppm of DPPH as much as 2 ml samples were then incubated for 30 min [16] and observed its absorbance values via UV-Vis spectrophotometer and the replication was performed 3 times. Antioxidant test results with a 72-hour soaking period are presented in Table 3.

Table 3. Antioxidant Test Results (72 hours maceration)

| No. | Concentration (ppm) | 1st Replication A | % I  | 2nd Replication A | % I  | 3rd Replication A | % I  | Average Inhibition % |
|-----|---------------------|------------------|------|------------------|------|------------------|------|----------------------|
| 1   | 20                  | 0.185            | 9.756 | 0.189            | 7.805 | 0.190            | 7.317 | 8.293                |
| 2   | 50                  | 0.184            | 10.244 | 0.184            | 10.244 | 0.184            | 10.244 | 10.244               |
| 3   | 100                 | 0.183            | 10.732 | 0.183            | 10.732 | 0.183            | 10.732 | 10.732               |
| 4   | 150                 | 0.182            | 11.220 | 0.182            | 11.220 | 0.182            | 11.220 | 11.220               |
| 5   | 200                 | 0.181            | 11.707 | 0.181            | 11.707 | 0.181            | 11.707 | 11.707               |
| Blank |                   | 0.205            |     | 0.205            |     | 0.205            |     |                      |

Based on data table 3, linear regression with the relation between concentration of water extracts and DPPH absorbance soaking percent regression equation $y = 0.0163x + 8.74484$. From the calculations, the value of IC50 was 2530 ppm.
Fig. 5 showed that the best antioxidant activity of nabeez water was achieved at 24-hours maceration. If we summarize the results of antioxidant testing represented by IC50 values, we can conclude that the longer the immersion time, the lower the antioxidant power, this can be seen from a sharp increase in the value of IC50. This result can be related to the alcohol content that is starting to form. Test results using alcoholmeter showed that on the third day alcohol began to form by 1% and this is thought as the factor that reduced the antioxidant activity of Nabeez water.

4. Conclusion
Results of this study can be concluded that Nabeez water from ajwa date palm fruits has potential as an antioxidant with IC50 values in soaking for 24 hours, 48 hours, 72 hours. IC50 calculation results showed that at the 24th hour soaking IC50 value was 223.6 ppm, while at 48 hours soaking, IC50 value was 369 ppm, and at 72 hours soaking the IC50 was 2530 ppm. It can be concluded that the best antioxidant activity with variations of 24-hour, 48-hour, and 72-hour immersion was at 24-hour maceration.

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