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Evaluation of Proximate, Anti-Nutrient and Some Mineral Composition of *Phoenix Dactylifera*

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Abstract:- This present study evaluated the proximate, anti-nutrient and some mineral composition of the flesh and seeds of Phoenix dactylifera L. Moisture, ash, lipid, protein and total sugar were determined using methods described by Association of Official Analytical Chemists (2006).Calcium, Zinc and Iron were analyzed using Atomic Absorption Spectrophotometer. Oxalate was determined using the method described by Hussain et al.(2010), total phytate was determined using the method described by Olaleye *et al*.(2013), tannins were determined using method described by Pearson(1976). The result showed that the fruit flesh has moisture content, protein, ash, fat, crude fiber and carbohydrate of 8.16 ±2.46, 4.76±0.80%, 2.83± 1,75%, 1.50± 0.50%, 0.00± 0.00%, 82.7± 1.30% while that of the seeds are 6.00± 1.00%, 733± 0.75%, 1.83± 0.76%, 12.60±, 1.25%, 1.33± 0.57%, 70.70± 2.40%, respectively. Phytate and tannins in the fruit flesh are 0.30± 0.10% and 0.083± 0.00% while that of the seeds are 0.18± 0.05 and 0.087± 0.00% respectively. Oxalate was not detected in both samples. The Iron, calcium and zinc content of the fruit flesh are 612.8± 1.25mg/Kg, 72.1±0.76mg/Kg and 38.8±0.76mg/Kg while that of the seeds are 522.6± 0.76mg/Kg, 56.6± 0.76mg/Kg and 12.5± 1.00mg/Kg respectively. The findings suggest that both flesh and seeds of Phoenix dactylifera are suitable for consumption.

Keywords:- *Date Palm, Proximate Analysis, Mineral Composition, Anti-Nutrient Composition.*

I. INTRODUCTION

Phoenix dactylifera commonly known as date belong to the family Aracaceae. They are long lived monocotyledonous species and one of the tallest domesticated trees. The fruits of date are nutritious and rich in carbohydrates, dietary fiber, minerals and amino acids (Al-Shahib, Marshall, 2003).Fruits are natural sources of nutrients that are essential in our diet to avert several diseases. They are packed with vitamins and minerals that are needed by humans and animals for their growth (Sadiq *et al*.2013).

The fruits of date are important diet rich in various nutrients consumed throughout the world as dried fruit or other forms (Ahmed 1995, Eid-Noura *et al.,* 2013). Date fruit is an important part in the diet and treatment of obesity and are the most important sources of energy and food in date fruit producing and nonproducing areas (Foroogh, 2009).

Ossi, Ndukwe (2008), stated that it is very important to consider our locally available fruits and to determine their nutrient composition in order to increase the production of such fruits, determine their anti- nutritional constituent to evaluate their suitability for consumption. Therefore, the aim of this study was to evaluate the proximate, anti-nutrient and some mineral composition of the fruit and seeds of date.

II. MATERIALS AND METHODS

- *Plant Material*

Date palm fruits purchased from Amausa location Owerri, Imo State were identified as *Phoenix dactylifera* (Dabino in Hausa) by a botanist.

- *Preparation Of Sample*

The Matured dried date fruits were collected and the flesh was separated from the seeds by dividing the fruits into parts. The fleshy part of the fruit was labeled sample A and the seeds labeled sample B. Both samples were further dried at room temperature for 48 hours. The samples were ground, i and stored in a container.

- *Proximate Components Determination*

The moisture , ash, lipid, fiber, protein and total sugar were determined using methods described by Association of Official Analytical Chemists(2006).

- *Determination of Minerals (Ca, Zn And Fe)*

Calcium, zinc and iron were analyzed using Atomic Absorption Spectrophotometer with standard air-acetylene flame.

- *Calculation*

Values on dry weight basis

$$\text{AAS Reading in Mg/L} = \frac{\text{vol. of digest (l)}}{\text{Weight of dried sample in Kg}}$$

- *Determination of Anti-Nutritional Factor (Phytate, Tannins and Oxalate)*

Phytate, tannin and oxalate content of the fruit and seeds were determined using methods of Olaleye *et al.* 2013, Pearson(1976) and Hussain *et al.* 2010 respectively.

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III. RESULTS

The results of the proximate, anti-nutrient and some mineral components are represented in the tables below;

Proximate Composition	**Mean** ±SD **Sample A (%) Date palm fruit flesh**	**Mean** ±SD **Sample B (%) Date palm seeds**
Moisture	8.16±2.46[a]	6.00 ±1.00[a]
Protein	4.76 ±0.80[a]	7.33 ±0.75[b]
Ash	2.83 ±1.75[a]	1.83 ±0.76[a]
Fat	1.50 ±0.50[a]	12.6 ±1.25[b]
fiber	0.00 ±0.00[a]	1.33 ±0.57[b]
Carbohydrate	82.7 ±1.30[a]	70.7 ±2.40[b]

Table 1
Mean ± SD of 3 determinations.

Mineral Composition	**Mean** ±SD **Sample A (%) Fruit Flesh (mg/Kg)**	**Mean** ±SD **Sample B (%) Fruit Seed (mg/Kg)**
Iron	612.8±1.25[a]	522.6 ±0.76[b]
Calcium	72.1±0.76[a]	5.66 ±0.76[b]
Zinc	38.8 ±0.76[a]	12.5±1.00[b]

Table 2
Mean ± SD of 3 determinations

Anti-nutrient Composition	**Mean** ±SD **Sample A (%) Fruit(mg/Kg)**	**Mean** ±SD **Sample B (%) Seed(mg/Kg)**
Phytate	0.30±1.10[a]	0.18±0.05[a]
Tannin	0.083±0.00[a]	0.087±0.00[a]
Oxalate	0.00 ±0.00[a]	0.00 ±0.00[a]

Table 3
Mean ± SD of 3 determinations

IV. DISCUSSION

The fruit flesh and seeds of dates were evaluated for their proximate, anti- nutrient and some mineral composition. Table 1 shows the result of moisture content in the date fruit is 8.16± 2.46% while that of the seed is 6.00± 0.100%. These values are slightly higher than 1.16± 0.16% by Shaba *et al.*(2015). The result of Sadiq *et al.*(2013) also shows slightly lower content of 3.50±0.05% and 4.03± 0.06% for date fruit and seed respectively. These differences may be due to environment under which the experiments were undertaken. The protein content of the sample A and B were 4.76± 0.80% and 7.33± 0.75% respectively. This result shows that the samples have high protein content when compared to 1.21± 0.07% by Shaba *et al.*2015. However, Sadiq *et al.*(*2013*) shows protein of 17.15± 0.15% and 122.6± 0.13% respectively. The ash content of sample A and B are 2.83± 1.75% and 1.83± 0.76 respectively. This result is similar with 1.50± 0.17% and 2.00± 0.10% for fruit flesh and seed by Sadiq *et al.* (2013). The fat content of sample A and sample B are 1.50± 0.50% and 12.6± 1.25% respectively. The result of date seed is higher when compared to 4.50± 0.09% by Sadiq *et al.(*2013).

The crude fibre content were 0.00± 0.00% and 1.33± 0.5% for sample A and sample B respectively which is lower than 0.5 and 1.50± 6.00% by Sadiq *et al.*(2013). It is also lower than 2.26± 0.07% by Shaba *et al.*(2015). The carbohydrate content were 82.7± 1.30 % and 70.7±2.40% for sample A (fruit flesh) is higher in this study when compared to 75.85 by Sadiq *et al.*(2013) while the carbohydrate content is lower than 79.50± 0.19% seed by Sadiq *et al.*(2013).

Table 2 shows Iron, Calcium and Zinc content of *Phoenix dactylifera* fruit are 612.8± 1.25mg/Kg 72.1± 0.76 mg/Kg and 38.3± 0.76mg4/Kg respectively while that of the seed are 522.6± 0.76 mg/Kg 56.5± 0.76 % and 12.5± 100mg/kg respectively. The fruit flesh and seed can serve as good sources of minerals that are essential for normal body function of man and other animals.

The phytate content of the fruit flesh and seed were 0.30± 0.10% and 0.18± 0.05 respectively. The tannin content were 0.083± 0.00 and 0.087± 0.00 respectively. Oxalate was not in both samples.

V. CONCLUSION

Dates fruits are very important food item. The proximate, anti-nutrient and some mineral composition of dates fruit flesh and dates seeds were evaluated in this study. It could be concluded from the study that both dates flesh and seeds are rich in carbohydrate, protein, fats. T Iron, calcium and zinc. However, the level of phytate and tannin are low. This study indicates that both samples are non-toxic and suitable for human use.

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