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Mineral Composition of Seed and Leaf of *Terminalia cattappa* (Almond Tree) Tree species Collected from a Forestry Arboretum in a Teaching and Research Farm, Rivers State, Nigeria

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ABSTRACT: The Objective of this Paper was to evaluate the Mineral Composition of Seed and Leaf of *Terminalia catappa* (Almond Tree) tree Species Collected from a Forestry arboretum in a teaching and research farm, Rivers State, Nigeria after using Standard methods after acid digestion. The result in Minerals Content showed that the seed had Zinc 2.57±0.01, Iron 8.76±0.01, Potassium 152.0±1.00, Sodium 109.4±17.8, Manganese 2.10±0.25 while the leaf had Zinc 2.57±0.01, Iron 8.89±0.01, Potassium 480.5±0.50, Sodium 114.1±40.2, Manganese 52.6±1.80.Also, the result in total mineral content shows that potassium had the highest both in seed and leaf 316.3± 189.7 followed by sodium .In conclusion, the leaf had the highest mineral content as compared to the seed. There is need to establish the plantation of *Terminalia catappa* for conservation and optimum utilization of this important socio-economic tree species.

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The tree species *Terminalia catappa* is widely grown in tropical regions of the world and also used as an ornamental tree in Urban beautification, Odum *et al.* (2010) and is one of those Species under threat for extinction if not conserves (Thomas and Evans, 2019, Nnadi and Anyanwu, 2018). The Seedlings requires high light intensities for Optimum seedling growth Survival and performance (Paramasivam *et al.*, 2009). The broad leaves provide good shade for relaxation. The fruit is edible, tasting slightly acidic. The seeds are eaten raw .The wood is red and solid, and has high water resistance, used in making canoes.

The essential Mineral elements such as Potassium, Sodium, Calcium, Magnesium and Zinc are found in some leaves and Cultivated Vegetables and according to a work done by (Saupi *et al.*, 2009) that Sodium enhances and Potassium depresses blood pressure, also the Sodium and Potassium found in leaves maintains tissue excitation and the ionic balance of the human body and plays an important role in the transport of metabolites and Potassium is important for its diuretic nature. According to (Abdus scatter *et al.*, 2016) the leaves of Fluctus Species are a source of minerals like Calcium, Potassium, Sodium, Magnesium and Iron, Seeds appeared to be richer source of minerals compared to leaves though the variation in nutritional composition maybe due to edaphic and other environmental conditions in the different study areas, time of harvesting and age of the plant. Also the bio availability of these minerals can be affected by the presence of anti-nutrients and their effects reduced

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after processing such as soaking, boiling or frying (Ekop and Eddy, 2005).

There is need to determine the Mineral Content of the seed and leaf of *Terminalia catappa* as ascertain its role in enhancement of human health Therefore, the Objective of this Paper was to evaluate the Mineral Composition of the Seed and leaf of *Terminalia catappa* (Almond Tree) tree Species Collected from the Forestry arboretum in a a teaching and research farm, Rivers State University, Nkpolu/ Oroworukwo, Rivers State, Nigeria.

MATERIALS AND METHODS

Study Location: This research was carried out in the department of Food Science and Technology Laboratory in Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria

Sample Collection: The seeds and leaves of *Terminalia catappa* were collected from the Forestry Arboretum of the Rivers State University Teaching and Research Farm.

Methods: Mineral Content Determination (AOAC, 2006): The dry ashing Procedure was used for Mineral Content determination. 1g of each of the Sample was weighed into porcelain crucibles. The samples were ashed in the muffled furnace at 55^0C till the ash was white for 3hours and then transferred into dessicator for cooling and reweighed. 20ml of 20%HCL was added to the ashed sampled and transferred to a breaker. The solution was boiled on a heating mantle and then filtered using whatsman NO1 filter paper and 50ml of distilled water was added. The solution was used for individual mineral content determination using the appropriate Standards and blank, the content of the minerals; magnesium, Potassium, Sodium, Zinc and Iron were determined with atom absorption Spectrophotometer (Buck Scientific, Model 210).

The Percentage Mineral Content was calculated using equation 1;

$$\text{Metal (\%)} = \frac{\text{Cppmx Solution Volume(50ml)}}{10^4 \text{ x Sample weight}} \qquad (1)$$

Metal (mg/100g) = Metal (%) x 1000

$$\text{Metal } \left(\frac{\text{mg}}{\text{100g}}\right) = \frac{\text{Cppm x 50}}{\text{10000 x Sample weight}} x\ 1000$$

$$\text{Metal (mg/100g)} = \frac{\text{Cppm x 5}}{\text{Sample weight}}$$

Cppm = Sample ppm – Blank ppm

Cppm = (Sample ppm x Dissolution factor) - Blank ppm

Data Analysis: The data was analysed using means separation and standard error of mean.

RESULTS AND DISCUSSION

The leaves of *Terminalia catappa* had a higher minerals content as compared to the seed of the *Terminalia catappa*. Potassium was the highest (480.5±0.50) in leaf and (152.0±1.00) in the seed. For the seed of *Terminalia catappa*, the level of Mineral Contents are as follows K > Na> Fe> Zn>Mg with values 152.0±1.00, 109.4±17.8, 8.76±0.01, 2.36±0.01, 5.10±0.025 respectively while the leaf, the level of mineral Contents are as follows K > Na>Mg> Fe> Zn with values 480.5±0.50, 114.1±40.2, 52.6± 1.80, 8.89±0.01, 2.57±0.01, respectively. Magnesium and Zinc was observed to be the least in the Mineral content both in seed and leaf respectively with values of 2.10±0.25 and 2.57±0.01, respectively.

Table 1: Mineral properties of the Seed and Leaf; Mean ±Standard Error

Mineral Composition	Mean ± Standard Error	
	Seed	leaf
Zinc	2.36±0.01	2.57±0.01
Iron	8.76±0.01	8.89±0.01
Potassium	152.0±1.00	480.5±0.50
Sodium	109.4±17.8	114.1± 40.2
Magnesium	2.10±0.25	52.6±1.80

The results also show that zinc, iron, potassium, sodium and magnesium were higher in leaf as compared to the seed in these mineral contents. The results also show that Potassium and Sodium were highest in both seed and leaf and it agrees with the findings of (Matino *et al* 2002) who stated that Leaf extract from Terminalia *catappa* is a good anti-oxidant and plays an important role in inhibitory effect on Hiv-replication in the blood. Also Potassium plays an important role in synthesis of amino acids and protein (Hermans et al 2010) thereby enhancing it Medicinal and nutritional values.

Conclusion: The research shows that the leaf and Seed of *Terminalia catappa* contains minerals such as calcium, potassium, magnesium, sodium, iron and zinc, however potassium had the highest Mineral content followed by sodium and the least was in zinc.

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