

Comparative Analysis of the Nutritional Contents of Avocado Pear (*Persea Americana*) and African Pear (*Dacryodes Edulis*)

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Abstract

Pear, a medium-sized tree which is cultivated for its fruit belongs to the genus *pyrus* and family *Roseaceae*. It is second in popularity only to the apple among deciduous fruits of the world and has many varieties. Proximate analysis of nutrient composition of two of its varieties, *Persea Americana* and *Dacryodes Edulis* were carried out chemically by adopting the conventional methods from A. O. A. C. (2000). Varied percentages of the following nutrients, fat, protein, ash, moisture, vitamin E & C, calcium, magnesium and fiber etc were obtained. Both varieties of pear have similar chemical constituents although in varying compositions, serve as food to man and play important role in life processes. The result obtained show that *PERSEA AMERICANA* has lower mineral content than *DACRYODES EDULIS*

Keywords: Nutritional content, *Persea Americana*, *Dacryodes Edulis*

Introduction

Pear is a medium-sized tree widely cultivated for its fruit. It is a very popular tree among the deciduous fruit of the world and belongs to the genus *Pyrus* of the sub-family *pyroideae* of the rose family (*Roseaceae*). It is classed botanically as pomes which develop from a compound inferior ovary with seeds encased within a cartilaginous wall, the core.

According to Lopez et al (1996), there are different varieties of pear such as; *Persea Americana*, *Dacryodes Edulis*, *Phyllanthus*, *Prunus persica* etc. *Persea Americana* and *Dacryodes Edulis* are largely consumed by man making it imperative for the nutritional contents to be widely known. The realization of the nutritional value of these two varieties of pear is capable of guiding people in their consumption as its nourishing capability to the body system cannot be overemphasized.

Chen, Morrell, Ashworth, Cruz and Clegg, (2008) stated that *Persea Americana* is a tropical fruit which originated from Southern Mexico, the West Indies and part of Central America. It is a dense ever green and branched tree that grows to 60ft or more with leathery and oval shaped leaves which remain on the tree for 2-3yrs. Injury to the branches cause secretion of ducitol, a white powdery sugar at scars. The flesh of *Persea Americana* is deep green near the skin becoming yellowish nearer the single large inedible ovoid seed. It is hard when harvested and softens to a buttery texture. The fruits grow in terminal clusters and vary in colour from green to purple when ripe. It serves as diet where access to other fatty foods is limited. The fruit is not sweet but rich and subtly flavoured with creamy texture. It is used as substitutes for meat in sandwiches and salad due to its high fat content.

Ajibesin (2011) opined that *Dacryodes Edulis* is one of the important local fruit of west and Central Africa. It is one of the fruits of domestication programme for indigenous fruit and medicinal trees. It is characterized by orthotropic type branches that grow vertically upwards. The fruit range

from 4-8cm long by 3.06cm and the edible succulent part is 0.3- 1.2cm thick. The plant has long been used in the traditional medicine of some African countries to treat various ailments such as wound, skin diseases, dysentery and fever. The extracts and secondary metabolites have been found to show biological activities such as antimicrobial, antioxidant and anti sickle-cell disease.

Okwu, & Nnamdi,(2008) observed in their work that *Persea Americana* grows on a wide range of soil types, but requires good drainage as it does not withstand water logging. Areas with high wind are undesirable due to fact that the wood is brittle, the flowers and fruits may be damaged. The optimum soil pH for the cultivation of pear is between 6.2 and 6.5. High level of ammonium ions and an increased amount of soil organic matter help to combat *phytophthora* (disease of avocado).

According to Sugiyama, Sato, and Yamashita, (1982), the preferential habitat of *Dacryodes Edulis* is a humid tropical forest. It adapts well to variation in humidity and temperature. Both *Persea American* and *Dacyodes Edulis* are widely consumed hence the need for the study.

Materials and Methods

Proximate analysis of nutrient composition of *Persea Americana* and *Dacryodes Edulis* were determined using the conventional methods from A. O. A. C. (2000).

Fresh and ripe Avocado pear and African pear were used for the analysis. The fleshy succulent part of ripe Avocado pear was blended and used while the raw ripped Avocado pear was first de-seeded and then blended into a homogenous mixture. Varied quantities of these samples were taken for each determination.

Table 1:Experimental values of nutritional contents of *PERSEA AMERICANA* and *PERSEA AMERICANA*

Nutritional contents	Avocado pear	African pear
Fat	15g	18g
Protein	3g	2g
Crude Fiber	2.5mg	1.7mg
Moisture	71%	69%
Vitamin E	200mg/100g	205mg/100g
Vitamin C	15mg/100g	8mg/ 100g
Phosphorus	52mg/100g	695.5mg/100g
Calcium	10mg/100g	350mg/100g
carbohydrates	7.8mg/100g	10.5mg/100g
Potassium	455mg/100g	550.7mg/100g
Magnesium	29mg/100g	286.2mg/100g

Results and Discussion

Results of the analysis show that *PERSEA AMERICANA* contains higher value of 3g protein than *DACRYODES EDULIS* which has 2g. Its Vitamins E and C content are 200mg/100g and 155mg/100g. *DACRYODES EDULIS* has 205mg/100g and 8mg/100g of vitamins E and C respectively. On the other hand, the fat content of both species are quite high with 15g and 18g for *PERSEA AMERICANA* and *DACRYODES EDULIS* respectively. The crude fiber contents are 2.5mg/100g and 1.7mg/100g respectively for *P. Americana* *D. Edulis*. The fruits are also rich in Calcium, Potassium Phosphorus and Magnesium which are essential minerals.. The most abundant mineral in *D. Edulis* is phosphorus

(695.5mg/100g), followed by potassium (550.7mg/100g), calcium (350mg/100g) and magnesium (286.2mg/100g). *P. Americana* on the other hand contains more of potassium (455mg/100g), phosphorus 52mg/100g, magnesium (29mg/100g) and calcium (10mg/100g)

These nutrients analyzed are very vital to the body for proper growth and development. Vitamin E has antioxidant properties preventing the propagation of free radicals in tissue. Being fat-soluble, vitamin E is incorporated into cell membranes which protects them from oxidative damage. It also plays a role in neurological function and gene expression. Vitamin C helps the connective tissues, bones and dentine to resist infection. It also prevents scurvy and is very essential in growth of teeth and blood formation. Proteins help to form antibodies that fight against diseases, form new cell materials for growth of worn out tissues. It also aids in regulation of body function. The studied species has high fat content much of which are unsaturated. Fat provides higher energy and acts as good insulators to the body, although much of the dangerous fat can lead to obesity, high blood pressure and also to arteriosclerosis.

Calcium is needed in the body for growth of healthy bones, teeth, blood and the nervous system. Potassium is an important mineral and electrolyte that helps maintain fluid balances in the body. It helps regulate the heartbeat and is needed for muscle contraction and nerve impulses. Phosphorus is needed to build bones and teeth and is also a part of cell membranes. Magnesium is a vital component of a healthy human diet. Low levels of magnesium in the body have been associated with the development of a number of human illnesses such as asthma, diabetes and osteoporosis. Taken in the proper amount magnesium plays a role in preventing both stroke and heart attack.

Both varieties of pear have similar constituents although in varying compositions. Both serve as good food and play vital roles in life processes. Moderate intake of African pear helps in blood clotting, proper functioning of the heart, nervous system and normal contraction of muscles as well as maintenance of body fluid due to its rich content of calcium. The protein content of *D. Edulis* as shown in table 1 is 2g and thus will serve in ameliorating protein deficiency. The fibre content will aid in enhancing the quality control of extracted oil.

Carbohydrate composition of both species is moderate for the fruit pulp and will meet a good supply of calories. The experimental values of the nutrient contents of *PERSEA AMERICANA* and *DACRYODES EDULIS* compare closely with the WHO standard.

Recommendation

The American Heart Association (AHA) recommends a diet that has at least five servings of fruits and vegetables, contains up to 30% of calories from fats (mostly unsaturated). *PERSEA AMERICANA* helps to meet the AHA requirement, it provides good unsaturated fat, has low carbohydrate and thus good for diabetics and others who must watch their carbohydrate intake. Both species provide essential vitamins and minerals and thus are recommended for adequate consumption. More of the trees should be planted to increase their availability and reduce cost.

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