

Short Communication

PROXIMATE AND ELEMENTAL ANALYSIS OF BAOBAB (*Adansonia digitata*) SEED.

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ABSTRACT

The seeds of baobab used in the preparation of local condiments were analyzed to establish the proximate compositions and the mineral elements present. Proximate analysis showed that the seed has very high protein content (45.57%) and moderately high content of carbohydrates (34.20%) with good fat content (7.07%), fiber content (4.80%), moisture content (4.53%) and ash content (3.83%). The most abundant mineral in the seed flour is potassium (162.50mg/100g, followed by phosphorous (38.50mg/100g), calcium (25.00mg/100mg), magnesium (10.00mg/100g) and iron (6.67mg/100mg). The least abundant are sodium (2.00mg/100g), zinc (1.00mg/100g) and manganese (0.50mg/100g). Thus, major minerals present in the seed include potassium, phosphorous and calcium, thereby suggesting that baobab seeds could contribute greatly to the overall daily intake of these elements.
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Key Words: Baobab, Proximate composition, Mineral elements.

INTRODUCTION

Baobab (*Adansonia digitata*) belongs to the family, *Bombacaceae* and sub-family of *Malvaceae*. It is commonly found in frost-free areas that receive low rainfall particularly in areas of South Africa, Botswana, Namibia, Mozambique, in arid and semi arid zones of America and Asia where 44 species have been reported (Becker *et al.*, 1984). In Nigeria, *Adansonia digitata* specie is found mostly in the Northern part where both leaves and pulp are

used for human consumption. It provides forage for wild life and domestic animals. Its fruit consists of a hard, woody outer shell with a white powdery substance inside that covers the hard, black kidney-shaped seeds. The off-white powdery substance is soaked in water to provide a refreshing drink. The seed capsule does not split open, instead it hangs on the tree until it get blown off by wind or collected by monkeys, baboons or people who all enjoy the soft powdery substance that covers the seeds. The seeds are generally not eaten by animals and are discarded, thus affecting dispersal.

Majority of sub-Saharan African countries including Nigeria are faced with food shortages. The solution to the food problem should be sought through a combination of the available resources. Food and agricultural scientists are beginning to screen wild animals and under exploited native plants for potential sources of food in an attempt to widen the narrow food base (Vietmeyer and Janick, 1996). Working on the prospects of utilizing such lesser known and neglected plants, research reports have revealed that quite a large number have useful qualities either for direct use as animal feed ingredient or as a raw material for seed protein extraction (Ezeagu, 2005). Previous reports on *Adansonia digitata* seeds indicate that it is a good source of energy, protein and fat (Osman, 2004). However, this kind of work has not been carried out in Kano metropolis. Therefore, this research work is aimed at carrying out proximate and elemental analysis of *Adansonia digitata* seeds sourced from various locations in Kano metropolis.

MATERIALS AND METHODS

Sample collection and preparation:

Baobab seeds were collected from Tudun – wada, Kano-Nigeria. The pulp was removed by washing the seeds with several changes of water, sun dried and milled using pestle and mortar. Powder obtained was used for the analysis.

Methods of Analysis

Total ash and lipid content were determined using the method of Pearson and Cox (1976). Crude fiber, crude carbohydrate and moisture content were determined using the method of the Association of Official Analytical Chemists (AOAC, 1980 and AOAC 1990). Determination of crude protein was carried out using Kjeldahl (1883) method. Determination of mineral elements was carried out using Atomic absorption spectrum (AOAC, 1995).

RESULTS AND DISCUSSION

Result of proximate analysis of *Adansonia digitata* seeds is presented in Tables 1 and 2. Moisture content 4.53% is low compared with tiger nut seeds (*Cyperus esculentus*) which is 9.47% (Monago and Unwakwe, 2009). This suggests that the seed will have a long shelf life (Oyenuga *et al.*, 1968), since the low moisture content could prevent microbial spoilage and pest attack during storage. Ash content 3.83% in this seed shows that it could have a reasonable quantity of mineral elements for building healthy body and proper functioning of body tissues. Crude protein 45.57% is higher than that of tropical tree seeds, such as breadnut 19.25% (Oshodi *et al.*, 1999), *Bombacopsis glabra* 16.56% (Olaofe *et al.*, 2006), benniseed 22.5% (Oshodi *et al.*, 1999) and locust bean 24.1% (Adeyeye and Aye, 2005). The crude fat 7.07% is within the range for most legumes, which range between 2.10% in groundnuts to 7.60% in kidney beans and was found to be much lower than *Parkia biglobosa* seeds (Ihekoronye and Ngoddy, 1985). The low crude fat of the seed could give the seed an extra advantage over some seeds and could show that it is a good source of fat which provides energy. The considerable amount of crude fiber in this seed, 4.80% shows that it is a source of dietary fiber, which is essential for good bowel movement and could help in preventing obesity, diabetes, cancer of the colon and other ailments of the gastrointestinal tract of human. The crude carbohydrate 34.2% could be a good source of energy and thus a useful supplement in animal feed formulation and human diet.

Result of the elemental content of *Adansonia digitata* is presented in Table 2. The values indicate high amounts of minerals required by the body with potassium having highest value (162.50mg/100g). This is consistent with the observation of Olaofe and Sanni, (1988) who reported potassium to be the most abundant mineral in Nigerian agricultural products. High amount of potassium, calcium and magnesium (as macro elements) could help to lower the blood pressure (Ranhotra *et al.*, 1998). Several clinical studies have shown potassium, calcium and magnesium to be effective pressure lowering agents (Osborne and Voogt, 1978, Zewel, 1977) hence consumption of this seed may help achieve this purpose. The iron content of the seed was 6.67mg/100g which shows that it is rich in iron.

This is very important for the formation of hemoglobin and normal functioning of the central nervous system (Vyas and Chandra, 1984). This suggests that baobab seeds could contribute greatly to the overall daily intake of these elements.

Table 1: Proximate composition of *Adansonia Digitata* seeds.

Seed	% Proximate composition
Ash	3.83±0.15
Moisture	4.53±0.39
Crude protein	45.57±1.15
Crude fat	7.07±0.45
Crude fibre	4.80±0.24
Carbohydrate	34.20±0.99

Values are mean ± standard deviation of triplicate measurements.

Table 2: Elemental Composition of *Adansonia Digitata* seeds.

Elements	Concentration(mg/100g)
Potassium(K)	162.50
Phosphorous(P)	38.50
Calcium(Ca)	25.00
Magnesium(Mg)	10.00
Iron(Fe)	6.67
Sodium(Na)	2.00
Zinc(Zn)	1.00
Manganese(Mn)	0.50

Values are mean ± standard deviation of triplicate measurements.

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