

Original Research Article

Proximate contents of Bambara Groundnut *Vigna subterranean* (L.) Verdc) grown in Madobi, Kano state-Nigeria

Abstract

Introduction: Evaluating the proximate composition of locally utilize crop with nutritional and raw material potentials of health and industrial benefits is timely gesture. **Aim:** The study is to determine the proximate contents of Bambara Groundnut (*Vigna subterranea* (L.) Verdc) grown in Madobi LGA, Kano state-Nigeria. **Design and Methodology:** samples were collected from different locality of the LGA to constitute composite sample out of which representative sample was drawn for proximate composition evaluation according to standard methods of AOAC. **Result:** The Bambara groundnut grown in the study area show the mean percentage (%); protein (18.83±0.49), lipids (7.05±1.82), fiber (5.74±1.09), carbohydrate (63.37±2.57), moisture (12.59±1.14) and ash (3.52±0.22). The result indicates that Bambara groundnut grown in Madobi LGA could be an excellent source of protein, lipid, carbohydrate and mineral elements. **Conclusion:** it may therefore be concluded that Bambara groundnut grown in Madobi LGA may have the nutritional potentials that could alleviate nutritional problems in the society and world in general when properly explore.

Key words: Bambara groundnut, Madobi, proximate composition.

Introduction

Bambara groundnut (*Vigna subterranea* (L.) Verdc. or *Voandzeia subterranea* (L.) Thouars) is one of the most valuable food crops in Africa and other parts of the world and has been identified as the third most important grain legume in semi-arid Africa. It is resistant to high temperature and

is suitable for marginal soils where other leguminous crops cannot be grown. In addition, it makes very little demand on the soil and has a high nutritive value. For these reasons it is not prone to the risk of total harvest failure even in low and uncertain rainfall regions. Due to its high protein value, it is a very important crop for poor people in Africa who cannot afford expensive animal protein (Baryeh, 2001). It is a nutritionally balanced seed containing essential amino acids such as isoleucine, leucine, lysine, methionine, phenylalanine, threonine and valine (Ihekoronye and Ngoddy, 1985; Alhassan  *al.*, 20013). Large seeds are preferred over smaller ones, e.g. for use as snack; smaller seeds are ground into flour for use in various recipes.

Bambara groundnut is a leguminous plant, often considered an inferior food eaten by peasants, described as being ‘poor man’s meat’. They never assumed the importance of a staple food as did the cereal crops of wheat, rice, maize, or barley. Yet, they played an important synergistic role with staple foods both in meeting nutritional requirements and fertilizing the soil (Young, 1991). Of all foods, legumes most adequately meet the recommended dietary guidelines for healthful eating. They are high in carbohydrate and dietary fiber, mostly low in fat, supply adequate protein while being a good source of vitamins and minerals (Messina, 2000). The importance of grain legumes in the world is high due to their significance in human and animal nutrition. Legume seeds can also become an industrial basic material with a wide range of non-food applications (Kozłowska *et al.*, 1998). This work is aimed at determining the proximate content of Bambara groundnut grown in Madobi, Kano state-Nigeria.

Sample collection and preparation

The sample of Bambara Ground nut (*Vigna subterranea*(L.)Verdc) used in this research was collected from different farmers in Madobi town of Kano state Nigeria, to constitute a composite sample. Representative sample was dried and the seeds were removed from the hulls and brought

48 to the Biochemistry laboratory, Bayero University Kano. The sample was ground to powder and
49 stored in plastic container.

50 **Determination of proximate composition**

51 The proximate composition of Bambara groundnut were analyzed using the methods describe 
52 AOAC (2005)

53 **Result and discussion**

54 The proximate contents are presented in table 1. The parameters determined are; moisture, ash,
55 protein, lipid, fiber and carbohydrate. The result showed that Bambara groundnut is an excellent
56 source of protein, fiber and carbohydrate. The amount of fiber determined is of interest (table 1).

57 **Table 1: Proximate contents of Bambara groundnut grown in Madobi town, Kano state - Nigeria**

Parameters	% proximate contents
Moisture	12.59±1.14
Ash	3.52±0.22
Protein	18.83±0.49
Lipid	7.05±1.82
Fiber	5.74±1.09
Carbohydrate	63.37±2.57

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59 *The estimated values are MEAN ± SD, n = 5.*

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62 **Discussion**

63 The moisture content of the Bambra ground nut grown in Madobi LGA found in this study
64 agrees with that obtained by Duplex *et al*(2004), who established a moisture content of 10.55 –
65 11.11% in flour of four cultivars of Bambara groundnut, and that of Yetunde *et al* (2009) who

found moisture content of 11.09% in Bambara groundnut. The ash content of 3.52 ± 0.22 had also agreed with that of Ahmed *et al* (2010) (3.63%). The results also showed that Bambara groundnut produced in the study area contain appreciable amount of protein, the protein composition obtained is similar to those obtained by Ferial and Azza (2011) (17.70 ± 0.44) and Duplex *et al* (2004) ($18.83 \pm 0.30\%$). In terms of lipid composition the result obtained ($7.05 \pm 1.82\%$) support those obtained by Duplex *et al* (2004) (7.71%); Nwodo and Obinna (2011) (7.35 ± 0.02) and contradicts Dillon (1985) that the fat content of most grain legumes did not exceed 3g/100g. Bambara groundnut may be the best among legumes in terms of fats content and may provide right amount of fat in the diet. The fiber content of (5.74 ± 1.09) is similar to those obtained by Yetunde *et al* (2009) (5.12%) while carbohydrate composition obtained (63.37 ± 2.57) was similar to that obtained by Duplex *et al* (2004) (67.55 ± 1.44). The results indicates that Bambara groundnut is an excellent source of protein, lipid carbohydrate and dietary fiber, people that cannot afford animal protein can therefore use it as a source of protein. Nwodo and Obinna (2012) reported that Bambara groundnut is an important food source that can be exploited particularly in the developing countries where there is shortage in animal protein and under nutrition. The combinations of plant proteins can provide adequate and balanced mixture of essential amino acids.

The amount of fiber and carbohydrates observed in this study was also appreciable. Though dietary fibers cannot be digested by human beings, they have useful roles in providing roughage that aids digestions (Eva, 1983). Dietary fibers reduce the risk of cardiovascular diseases caused by high cholesterol level, by decreasing cholesterol levels in the body. Some types of soluble fibers bind to bile acids in the small intestine, making them less likely to enter the body this in turn reduces cholesterol levels in the blood (Anderson *et al.*, 2009). Viscous

soluble fibers may also attenuate the absorption of sugar, reduces sugar response after eating, normalizes blood lipid levels and, once fermented in the colon, produce short-chain fatty acids as byproducts with wide-ranging physiological activities. Insoluble fiber is associated with reduced diabetes risk, but the mechanism by which this occurs is unknown (Weickert and Pfeiffer, 2008). One type of insoluble dietary fiber, resistant starch has been shown to directly increase insulin sensitivity in healthy people (Robertson *et al.*, 2003; Robertson *et al.*, 2005), in type 2 diabetics (Zhang *et al.*, 2007), and in individuals with insulin resistance, possibly contributing to reduced risk of type 2 diabetes and also reduces the risk of development of obesity (Johnston *et al.*, 2010; Maki *et al.*, 2012; Robertson *et al.*, 2012). The role of dietary fiber in energy intake regulation, reducing the risk of obesity is related to its unique physical and chemical properties that aid in early signals of satiation and enhanced or prolonged signals of satiety.

Base on this study, Bambara groundnut may be used by people with diabetes and obesity, by virtue of its protein, and fiber contents. The relatively high carbohydrate content may not have significant in fact due to the fiber content, which can weaken the absorption of sugar, reduces its (sugar) response and increase insulin sensitivity. More research should therefore be carried out in order to determine the glycemic index of whole Bambara groundnut and as recipe. THE FINDING MAY therefore change the neglecting attitude toward Bambara groundnut to improve production, utilization and industrialization.

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