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Assesment of Nurtritional Analysis of Bombax Buonopozense Found in Adamawa and Taraba States, Nigeria (Red Flowered Silk Cotton Tree)

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Abstract: Bonbax Buonoponzense popularly known as red flower cotton silk tree found in Adamawa and Taraba was used for the study. The population of the study comprised of 120 respondent 60 each from the two-study area, this was based on the availability of the red flower cotton tree found in the study area. The study adopted an experimental designed with an oral interview. The material used was the red cotton flower which was picked, dried, and grounded to obtained a powder which was used for the proximate analysis at the department of biochemistry, University of Jos. For the purpose of determining its nutritional content, the nutritional components of the plant (leaves) was determined using proximate analytical procedures. The analysis unraveled the presence of six nutrients which comprises of the following: moisture content, crude fibre, crude lipids, crude protein, NFE, and ash. Nitrogen free extracts consisting of carbohydrates, sugars and starches was found to be the highest with 18.48 followed by crude fibre with 5%, crude lipids having 3.8%. crude protein with 2.8% The least of them all was found to be moisture with a value of 2%. It was concluded that, Carbohydrates hydrolyzed the body to yield glucose, Proteins as body builders, they replace worn out tissues, and proteins are also immune booster and can help in cell division as well as growth, Fats which are important in energy production and help to regulate blood pressure of vital cell parts, and fibres which are parts of fruits and vegetable. It could be deduced therefore that Bombax buonopozense leaves could be of great health benefit if well harnessed.

Keywords: Nutrition, Bonbax, Analysis, Adamawa, Taraba

1. Introduction

Bombax buonopozense, commonly known as Gold coast Bombax or red silk cotton tree is a plant from the family *Bombacaceae*. It is mostly found in West Africa, specifically the rainforest of Northwest Sierra Leone, Eastern Gabon, Ghana and Nigeria. [5] The plant is locally known as *Akonkode* among the Akan tribe of Ghana. Red-flowered silk cotton is a tree with most of its parts known to serve medicinal and traditional purposes, besides other benefits [7] The sepals are slimy in nature; therefore, they are dried and used as ingredient in soup preparation by some natives. The sepals are known to extend the shelf life of food due to their antimicrobial properties ([1]. The leaves of the plant are also rich in phytochemicals and nutritional content; hence they are consumed as food by cooking alongside with other condiments [4]. Medicinal plants are those that contain one or more secondary metabolites in their organs and can be isolated for therapeutic purposes. Secondary metabolites are in the form of minerals, antioxidants, vitamins and phytochemicals such as the alkaloids, flavonoids, tannins, saponins, steroids, *Bombax*

aquaticum is a plant of the family of Bombacaceae. It grew up in Congo, Cameroun, Gabon, Nigeria and Madagascar Commonly it named *Kumu* in DR Congo or *Pindidia* bibamba (peanut of white people) in the south west of Congo-Brazzaville. So it was called white peanut by analogy to groundnut. The neighboring species *B. buonopozens*e is named in Nigeria *Akpu* in Igbo, *Gurjiya* in Hausa and *Ogbolo* in Yoruba (Nwagba *et al*., 2013). The tree of *Kumu* was growing as well in the wet tropical zones as in the dry tropical zones. *Bombax aquaticum* have a branching trunk, protected by a greenish smooth bark, which covers a soft and spongy wood. The branches are covered with the alternate sheets, composed of 5 to 7 oval pointed leaflets, directly inserted on the branch. The fruit is a greenish with ovoid capsule and then resembles that of the cocoa-tree.

Green leafy vegetables constitute an indispensable constituent of human diet in Africa. The varieties of leafy vegetables utilized are diverse, ranging from leaves of annuals and shrubs to leaves of trees. Leafy vegetables are generally good sources of nutrients, important protective and energy giving foods, highly beneficial for the maintenance of health and prevention of diseases as they contain valuable food ingredients which can be utilized to build up and repair the body. They are valuable in maintaining alkaline reserve in the body and are valued mainly for their high vitamin, dietary fiber and mineral contents [16].

proteins and precursors helps in the formation of secondary metabolism molecules that participate in cell signaling, gene expression and homeostasis regulation, protein phosphorylation, synthesis of hormones and antioxidant capacity [10, 15, 19]. Also, amino acids participate in various physiological processes such as skeletal muscle function and atropic conditions [11, 6].

Traditionally, the leaves, fruits, flowers, and immature pods of this tree are edible; they are used as a highly nutritive vegetable in many countries, including Nigeria. Plants play a vital role in maintaining the human health through the production of foods which provide nutrients for the body as well as medicinal purposes. These plants also serve as precursor for the synthesis of useful drugs [5]. The World Health Organization estimates that 80% of the population in Asian and African countries depends on traditional medicine and leaves for dietary constituents contributing to the protective and of nutritional value which the research tends to achieve.

2. Statement of Problem

Bombax buonopozence is a flowering plant used as soup in northern Nigeria, it is slimy in nature and looks like dry okra when cooked. This soup became neglected in recent years and is considered as an ancient soup, which makes most family's to deviate from cooking it to cooking other substitutes like dry okra and ogbono. A major setback of African herbs is the lack of adequate information on the nutritional, content. Also, lack of information on the properties of the leaves has led to no processed products from the leaves. Efforts made so far is to optimize the economic and the nutritional value of the leaves and to emphasized its, acceptability specially how the herb properties could also be utilized to supplement the medicinal needs of the consumer. This reason moved the researcher to look into the nutritional evaluation of bombax with the aim to improving the methods of preparation that can be suitable to modern times meal and be acceptable to all family's.

3. Materials and Method

3.1. Preliminary Investigation

A survey on bombax commonly known as red flower silk cotton tree is common in Adamawa and Taraba States was carried out through oral interview comprising 120 respondents 60 each of the two areas of the study. Different species of the bombax were selected for the study based on the survey conducted. This was based on the availability of the red flower cotton tree and its consumption by the people in the two areas. The different species include bombax ceina and bombax buonopozense.

3.2. Design of the Study

The study adopted two research designs in order to obtain results. The first was an oral interview method used to obtain information on the usage of bombax by the community in Adamawa and Taraba States. Secondly, experimental method was used in determining the nutrient composition of the red flowered cotton tree. (bombax tree.).

3.3. Area of the Study

The area of the study was in the southern part of Adamawa and northern part of Taraba State. The two areas in the states are located in North-east zone of Nigeria. Adamawa is made up twenty one Local Government while Taraba has sixteen respectively.

3.4. Preliminary (oral) Interview

A preliminary interview of 120 respondents (60 each from the southern and northern part of Adamawa and Taraba states). Was conducted in order to get the view of the usage of the red flowered cotton tree seed and also to find out its usage as either for soups or its medicinal. Seventy out of the 120 respondents were both farmers and consumers while the remaining 50 were traders and consumer of the products.

3.5. Materials

The fallen flowers were collected as described by the traditional practitioners from a farm land at both Adamawa and Taraba States, Nigeria. The flowers obtained were air dry and grounded into powder using wooden mortar and pestle and then label for the analysis. Finally, the results of the red flower cotton silk tree obtained from the Biochemistry lab of the University of Jos was used for the analysis.

4. Data Presentation

4.1. Proximate Analysis

Moisture content of the sample was conducted by weighing 5g of the sample and dried in a hot air oven at 100%. The weight was taken at an interval until a constant weight was obtained,

$$\% \text{ Moisture Content } = \frac{\text{dried weight}}{\text{initial weight}} \text{ x } \frac{100}{1} = \frac{0.10}{5} \text{ x } \frac{100}{1} = 2\%$$

4.2. Crude Lipid (Fat)

5g of the dried sample was weight and wrapper in a cellulose filter paper and placed in the thimble and 250ml of petroleum ether was added in the flask of the soxhlet apparatus. It was allowed to refluxed for three hours. The solvent was recovered and the crude lipid (fat) obtained.

$$\% \text{ Crude Lipid (Fat) } = \frac{\text{weight of oil}}{\text{weight of sample}} \text{ x } \frac{100}{1} = \frac{0.19}{5} \text{ x } \frac{100}{1} = 3.8\%$$

4.3. Crude Fibre

2g of the defeated sample was taken and boiled for 30 minutes with 1.25% H_2SO_4. It was filtered and boiled for another 30 minutes with water, HCl, Methylated Spirit and petroleum ether. It was then dried in the hot air oven to dry.

$$\% \text{ Crude Fibre } = \frac{\text{dry weight}}{\text{weight of sample}} \text{ x } \frac{100}{1} = \frac{0.10}{2} \text{ x } \frac{100}{1} = 5\%$$

4.4. Crude Protein

0.5g of the sample was weight and put in a kjeldahl flask and was allowed to digest till a clear solution was obtained. The solution was prepared and makeup to 50ml in volumetric flask. The sample was then distilled in the Markham steel distillation and the solution gotten was titrated with 0.02M HCl solution.

$$\% \text{ Crude Protein } = \frac{\text{M x T X 0.014}}{\text{weight of sample}} \text{x} \frac{V_1}{V_2} \text{ x } \frac{100}{1}$$

Were
M = Molarity of acid
T = Control titre or sample titre
V_1 = Volume of digest prepared (50ml)
V_2 = Volume of digest used (10ml)
W = Weight of sample used

$$\% \text{ Crude Protein} = \frac{0.01 \text{ x } 0.014 \text{ x } 10}{0.5} \text{ x } \frac{50}{10} \text{x} \frac{100}{1}$$

$$= \frac{14}{5} = 2.8\%$$

$$\% \text{ Protein} = \% \text{ NFE x Factor}$$

$$= 2.8 \text{ x } 6.6 = 18.48\%$$

4.5. Determination of Total Carbohydrate by Difference in Method

The total carbohydrate was determined by difference in method in which the % of Crude Protein, Crude Fibre, Crude Fat, Ash and Moisture content were subtracted from 100%.

% Carbohydrate = 100% - (% Moisture Content, + Ash Content, Fiber Content + Fat Content + % Protein Content).

4.6. Ash Content

2g of the sample was weight and placed in crucible and taken to a muffler furnace at 500°C for 3 hours.

$$\% \text{ Ash Content } = \frac{\text{weight of ash}}{\text{weight of sample}} \text{ x } \frac{100}{1} = \frac{0.05}{2} \text{ x } \frac{100}{1} = 2.5\%$$

Data Presentation.

Table 1. *Nutritional Analysis of bombax buonopozense.*

Moisture Content	Crude Lipids	Crude Fibre	Crude Protein	NFE	Ash
2%	3.8%	5%	2.8%	18.48%	2.5%

4.7. Data Analysis

Table 1 shows the nutrient composition of red silk cotton flower. The results shows that bombax has a moisture content of 2%, the crude lipids with 3.8% as seen in the table that shows a moderate amount of lipid in the flower. Crude fibre has 5%, and 2.8% shows the amount of crude protein. The red silk cotton flower has NFE value of 18.48% and 2.5% ash content.

4.8. Preliminary Interview Results

All the respondents of 120 in the two states each 60 from each state agree that they were very familiar with the red silk cotton flower which they mostly used as soup in the community 50% of the respondents were farmers and had those trees in their farm lands which they harvest for soup especially during dry season. The soup according to the farmers has different methods of preparation which could be either fresh, dried, or in powdered form.

5. Discussions

The data from the red silk cotton flower tree shows that the flower was rich in lipids with 3.8%, crude fibre, with value of 5% and crude protein 2.8%, ash 2.5, and NFE 18.48%. The sample is also rich in vitamin A carotene and retinol, as well as other nutrients such as cacium and minerals, this is in line with the research by [1]. Bombax buonopozense leaves contains ample amounts of macro and micro elements. Relatively, the result also revealed the proximate content of the *B. buonopozense.* Carbohydrates are hydrolyzed in the body to yield glucose, which can be utilized immediately or stored as glycogen in the muscles and liver for future use. Proteins are body builders, they replace worn out tissues, and proteins are also immune booster and can help in cell division as well as growth [13]. Fats are important in energy production. Also, fats and oils help to regulate blood pressure of vital cell parts. Moisture is a universal solvent. It dissolves other substances, carries nutrients and other materials round the body, creating the possibility for organs to perform their function effectively. Fibers are parts of fruits, grains and vegetables which can neither be digested nor absorbed by human system [9]. They reduce the levels of palm cholesterol and prevent colon cancer and cardiovascular disease.

The presence of calcium, magnesium and potassium collectively are known to reduce hypertension and reduce blood pressure as well as used in the prevention and treatment of high blood pressure [18]. Therefore, the presence of these elements in the leaf gives a positive weight to the nutritional importance of the plant.

The presence of zinc in the leaf of B. buonopozense is an indication that the plant may have some effects on the functioning of the nervous system and in male fertility [14]. So, the plant under discussion may be essential in sexual development and stimulation of the activity of vitamins and formation of red and white blood corpuscles. Iron was found to be 3.12mg. 126.04mg/Kg as reported by Ogbonna et al., [8, 3].. It is therefore an important diet in pregnant and nursing women, infants and elderly people to prevent anemia and other related diseases. According to [2, 12, 17]. It is also involved in the formation of bone as well as in enzymes involved in amino acids, cholesterol and carbohydrate metabolism.

6. Conclusion

The dried sepals of *B. buonopozense* had considerably high amount of carbohydrate, protein, lipids, ash, and Nitrogen extracts. High amount of carbohydrate, ash content, magnesium and calcium could help improve the nutritional and health benefits in the body. Drying had a significant effect on the dried sepals especially the color and moisture content of the sepals.

The proximate content of the *B. buonopozense.* was also analyzes which contained Carbohydrates which are hydrolyzed in the body to yield glucose, Proteins as body builders, they replace worn out tissues, and proteins are also immune booster and can help in cell division as well as growth, Fats which are important in energy production and help to regulate blood pressure of vital cell parts, and fibres which are parts of fruits and vegetable. The flower is also known for its medicinal contents.

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