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EVALUATION OF THE PROXIMATE AND SOME SLECTED MINERAL ELEMENTS COMPOSITION OF *SOLANUM SCABRUM* MILL LEAF.

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ABSTRACT

The current study focused at determining the proximate and mineral value of *solanuin scabrum* Mill using the standard analytical methods in order to assess the numerous potentials of the plant leaf. The proximate analysis showed the percentage moisture content, ash content, crude protein, crude lipid, crude fibre and carbohydrate of the leaves as 56.77, 5.97, 12.07, 5.40, 1.65 and 18.29% respectively. Elemental analysis in mg/100g indicated that the leaves contained calcium (14.45), iron,(0.6), magnesium (0.38), zinc (1.20), chromium (0.97), selenium (0.56) and phosphorus (0.03). The results obtained in this study suggest it is rich in protein, carbohydrate and elemental nutrients analyzed but could have short shelf life because of its high moisture content. It could therefore serve as source of some of these elemental nutrient analyzed in the diet for normal and in nutrient deficiencies.

KEYWORDS: proximate analysis, *solanuin scabrum, mineral elements.*

1.0 INTRODUCTION

Traditional societies have already exploited edible wild plant to provide adequate nutrition, food security and income generation (Omoti and Okyi 1987, Anika *et al*, 2006,). These wild plants serve as an indispensible constituent of vitamins and certain hormone precursors in addition to providing protein and energy. (Onyenuga and Fetuga 1995, Fleurent, 1979, Edmonds and Chweya, 1997). They form cheap and best source of food.

Most developing countries depend on starch based foods as the main stay for the supply of both energy and protein. This is partially responsible for protein deficiency which prevail among the populace especially children as recognized by foods and agricultural organization (Ladegi *et al.*, 1995). In Nigeria and most other tropical countries of Africa where the daily diet is dominated by starchy foods, vegetable sources of important proteins, vitamins vegetable (Okafor, 1983).

Many of the local vegetables plants are under-exploited as a result of inadequate scientific knowledge about their nutritional and medicinal potentials.

Solanum scabrum Mill also known as garden huckle berry is an ephemeral herb originated from north American and is naturalized in many countries. In African, it is cultivated as a leaf vegetable for food and for dye from the berries (Manoko *et al*, 2002). It is the most intensively cultivated species for leaf cropping within the *Solanum nigrum* complex and as such has undergone genetic selection by farmer for leaf size and other characteristics (Manoko, *et al* 2002).

Occasionally, the leaves and seed (berries) are used as vegetable in soup, yam and cocoyam porridges in some parts of Nigeria particularly among the Igbo's and Efik-Ibibio people of South-Eastern Nigeria. Apart being used for human consumption, the leaves serves as fodder and browse for domestics' herbivorous animals.

Despite the use of this plant for such many purposes, there is little information on the nutritional and mineral elements composition of *Solanum scabrum* Mill leaves as an edible vegetable.

The aim of the study is to evaluate the proximate and some selected mineral composition of *Solanum scabrum* Mill leaves so as to partially assess its nutritional importance.

2.0 MATERIALS AND METHOD

2.1 PLANT SAMPLE COLLECTION AND PREPARATION

The fresh matured *S. scabrum* leaves were procuredharvested from a farm in Awo-Idemili Orsu L.G.A. Imo State and authenticated by a taxonomist from botany Department, Nnamdi Azikiwe University, Awka.

The plant sample was washed and dried at 60^0C for 24 hours, ground and stored in airtight container at room temperature.

Moisture (%) in the sample was determined by a gravimetric method (AOAC, 2002). Total ash content was determined as total inorganic matter by incineration of a sample at 600°c (AOAC, 2002). Crude protein was determined by the kjeldahl method as described by AOAC (2002). Crude fat was estimated by employing solvent extraction using a soxhlet extraction unit (AOAC, 2002). Estimation of carbohydrate by subtraction method of AOAC (2002).

Mineral element determination was carried out using the filtered sample solution loaded to the atomic absorption spectrophotometer (Varian AA 240, Victoria, Australia). The standard curve for each mineral was prepared by running samples of known strength. The mineral contents of the samples were estimated by using the respective standard curve prepared for each element (AACC, 2000).

3.0 RESULTS

Table 1: Proximate analysis of *solanum scabrum* Mill Leaf

Parameter	% composition of sample
Protein	12.07 ± 0.55
Ash	5.97 ± 1.11
Lipid	5.40 ± 0.56
Crude fibre	1.65 ± 0.84
Moisture	56.77 ± 1.15
Carbohydrate	18.29 ± 0.61

Data represented in mean ± SD of triplicate determination for each parameter.

Table 2: Mineral composition of *solanum scabrum* Mill.

Minerals	Mg/100g composition of sample
Calcium	14.45 ± 0.05
Iron	0.60 ± 0.10
Magnesium	0.38 ± 0.02
Phosphorus	0.03 ± 0.01
Zinc	1.20±0.03
Chromium	0.97±0.01
Selenium	0.56±0.02

Data represented in mean ± SD of triplicate determination for each mineral.

4.0 DISCUSSION

Most leafy vegetable are generally not good sources of carbohydrate even though carbohydrate are pivotal nutrients required for adequate diet (Emebu and Anyika, 2011), The vegetable species studied here is a poor sources of carbohydrates because it did not meet recommended daily allowance value of carbohydrate.

According to Anika *et al.*, (2006) non-starchy vegetables are the riches sources of dietary fibre. Adequate intake of fibre can lower the serum cholesterol level and hence the risk of coronary heart disease, hypertension, constipation, diabetes colon and breast cancer. *S. scabrum* was found to possess a relatively good amount of fibre and can offer such health benefit mentioned above.

Plant food with more than 12% of its caloric value from protein is considered good source of protein (Jimoh *et al.*, 2010), this shown that *S. scabrum* could be considered a good source of vegetable protein.

Moisture also makes the leaves perishable and susceptible to spoilage by microorganisms during storages (Nnamani *et al.*, 2009). High moisture content in *S. scabrum* would enhance the growth of microorganisms and reduce its shelf life. Ash content is an index of mineral deposit in the food materials. Low ash content in the leaves therefore; suggest a low despite of mineral elements. *S. scabrum* showed minimal fat content which could imply low content of lipid base vitamins and other metabolites.

Minerals are important for vital body functions such as acid, base and water balance. Iron is an important constituent of hemoglobin, myoglobin, cytochromes, iron-sulphur proteins and other metalloenzymes (Onwordi *et al.*, 2009). Therefore, this may be probably why some people use this plant leaves in build-up hemoglobin (blood), especially when they are recovering from sickness (Adeniyi *et al.*, 2012). Magnesium and chromium ions are known hormone activators in type 2 diabetes, their presence in the studied plant can be beneficial in management of diabetes. Calcium is an essential mineral constituent of bone, its deficiency triggers osteoporosis and osteomalacia. Its high content in *S. scabrum* could mean is a good source for building strong bones, teeth and fight bone loss later in life. Phosphorus is an essential mineral primary used for growth and repair of body cells and tissues. It is also required for a variety of biochemical processes including energy production and pH regulation and also bone and teeth health. It is finally found to contain zinc and selenium which are cofactors of many enzymes found in the body especially the anti-oxidant enzymes such as SOD and Glutathione peroxidase for fight against oxidants. In conclusion, *S.scabrum* leaves contains certain quantities of the basic nutrients analyzed and may play a crucial role in alleviating health disorders associated with nutritional deficiencies. Further studies are required to fully profile the mineral and vitamin content of *S. scabrum.*

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