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MINERAL AND PROXIMATE COMPOSITION OF *Launaea taraxacifolia*

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ABSTRACT
Mineral and proximate contents of leaf of *Launaea taxaracifolia* were analysed using the Association of Official Analytical Chemist (AOAC) method and Atomic Absorption Spectrophotometry and Flame Photometry respectively. This study is aimed at evaluating(using distilled water as solvents) the nutrient composition and minerals present in the leaf of *L. taxaracifolia.* The results of the proximate analysis of the leaf of *L. taraxacifolia* yielded 24.18% for moisture, 13.55% for proteins, 2.50% for crude fat, 18.22% for ash, 9.55% for crude fiber and 32.00% for carbohydrates. The mineral analysis of the leaf plant yielded calcium- 15 50mg/kg, magnesium- 25.11mg/kg, iron- 4.51mg/kg, zinc- 0.10mg/kg, copper- 0.20mg/kg ,phosphorus- 0.20mg/kg, manganese- 0.21mg/kg, Sodium- 96.97mg/kg and potassium- 359.50mg/kg. The presence of some essential minerals and proximate values prove that it is really an alternative source of medicine.

Keywords: *Launaea taraxacifolia*, Proximate, Mineral, Alternative medicine.

Introduction

Launaea taraxacifolia is a wild plant that grows singly or in clusters on rocky soil, banks, waste places. It also grows on small fields nearby homes for family consumption. The leaves are eaten fresh as a salad or cooked as sauces. The cooked form of the leaves is also sold by women on several West African countries markets mainly in Benin and Nigeria (Adebisi, 2004; Dansi, *et al.,* 2012)

Medicinal plants are increasingly gaining acceptance even among the literates in urban settlements, probably due to the increasing inefficacy of many modern drugs used for the control of many infections such as typhoid fever, gonorrhea, and tuberculosis as well as increase in resistance by several bacteria to various antibiotics and the increasing cost of prescription drugs, for the maintenance of personal health (Levy, 1998; Van den Bogaard *et al.*, 2000; Smolinski *et al*., 2003). Unfortunately, rapid explosion in human population has made it almost impossible for modern health facilities to meet health demands all over the world, thus putting more demands on the use of natural herbal health remedies. Even in areas where modern medicine is available, the interest on herbal medicines and their utilization have been increasing rapidly in recent years. Medicinal plants are important sources of pharmaceuticals.

Modern medicine recognizes herbal practices as a form of alternative medicine, as its practice is not strictly based on evidence gathered using the scientific method. Modern medicine, does, however, make use of many plant-derived compounds as the basis for evidence-tested pharmaceutical drugs, and phytotherapy works to apply modern standards of effectiveness testing to herbs and medicines that are derived from natural sources (James, 2000).

Many rural communities have great faith in traditional medicine, particularly the inexplicable aspects as they believe that it is the wisdom of their fore-fathers which also recognizes their socio-cultural and religious background which orthodox medicine seems to neglect (Adesina, 2014). However, Proper formulation and dosage are necessary for a safe use of herbs as medicine.

There are many phytochemicals and each works differently. Some of the possible actions are via antioxidants, hormonal action,and stimulation of enzymes, interference with DNA replication, antibacterial effect and physical action (Papp, *et al.,* 2007). Naturally grown herbs and plants also have plenty of phytonutrients which are extremely valuable for our body and good health. The most important and valuable phytonutrients include natural minerals (like zinc, iron, calcium, copper and other elements) and vitamins (including vitamins A, B group, C, D, E, PP and others) (Bongoni, *et al.,* 2013).This study is aimed at evaluating the proximate and mineral composition present in *L. taraxacifolia.*

MATERIALS AND METHODS

L. taraxacifolia leaves were obtained from an open land at Isihor in Ovia-North East Local Government Area of Edo State, Nigeria and identified in the Department of Pharmacognosy, University of Benin city, Nigeria. The leaves of the plant were rinsed in water, cut into smaller pieces for easy drying. The dried plant parts were ground using a milling machine and the powdery sample was packed into a polythene bag prior to further analysis.

Preparation of Extract

Aqueous extract of the leaves *L. taraxacifolia* was processed according to the description of Harbone (1973) 150g of the macerated plant leaves sample of *L. taraxacifolia* was soaked in 1.7L of distilled water for 72hours. The soaked leaves was then filtered using a muslin cloth and concentrated using a rotary evaporator at 50^{o}C and stored in air tight container in a refrigerator until subsequent use.

Proximate Analysis

The proximate composition (moisture, fat, protein, ash, crude fibre and carbohydrate) of powdery samples of *L. taxaracifolia* were determined according to standard procedures outlined by the Association of Official analytical Chemist (AOAC, 1984).

Determination of Moisture Content

5g of the fresh samples was weighed in a crucible. The crucible was weighed and placed in an oven at 105^{0}C for 3h, until a constant weight for the samples were gotten. Moisture percentage was then calculated as follows:

$$moisture\ percentage = \frac{intial\ weight - final\ weight}{weight\ of\ sample\ used} \times 100$$

Determination of Crude Fat Content

The empty round bottom flask was weighed (initial weight).10g of the sample was placed inside a soxhlet extractor and n-Hexane used as extracting solvent. After the extraction process was completed, the round bottom flask was dried in an oven, and then the final weight was measured using a digital weighing balance. The percentage crude fat was calculated as shown below;

$$crude\ fat\ percentage = \frac{intial\ weight - final\ weight}{weight\ of\ sample} \times 100$$

Determination of Ash Content

The crucible was weighed and 5g of sample was placed in it, and then later placed in a muffle furnace at 600^0C for 6h. The ash obtained was allowed to cool and then it was weighed. Ash content was then calculated as follows;

$$Percentage\ Ash = \frac{intial\ weight - final\ weight}{weight\ of\ sample} \times 100$$

Determination of Crude Protein Content

The crude protein content of the samples was determined using the Microkjeldahl method of AOAC (1984), which involved protein digestion and distillation. The percentage crude protein was calculated from the %nitrogen as follows:

$$\%crude\ protien = \%N \times F$$

Where; F (conversion factor) is equivalent to 6.25.

Determination of Crude Fibre Content

The crude fibre was determined using the method of (AOAC, 1990) (method 14: 020). The percentage crude fibre was calculated as per the formula:

$$Percentage\ crude\ fibre = \frac{weight\ after\ drying}{weight\ of\ sample} \times 100$$

Determination of Mineral Elements Content

Mineral elements estimation indicates the amount of inorganic elements present in the sample. The determination was carried out using standard procedures (AOAC, 1990). The mineral elements determined were; iron (Fe), zinc (Zn), manganese (Mn), calcium (Ca), magnesium (Mg), sodium (Na), potassium (K), phosphorous (P) and copper (Cu) and this was done by spectrophotometric methods, using flame emission spectrophotometer for sodium (Na) and potassium (K) and atomic absorption for the others.

RESULTS AND DISCUSSION

Table 1: Proximate Analysis of *L. taraxacifolia*

Moisture %	Protein %	Crude Fat %	Ash %	Crude Fiber %	Carbohydrate%
24.18±0.00	13.55±0.13	2.50± 1.61	18.22± 0.12	9.55± 0.00	32.00± 0.22

Table 1 reveals results of the proximate analysis of the leaves *L. taraxacifolia* yielded the values 24.18± 0.00% for moisture, 13.55± 0.13% for proteins, 2.50± 1.61% for crude fat, 18.22±0.12% for ash, 9.55± 0.00% for crude fiber and 32.00±0.22% for carbohydrates. This value for carbohydrate is similar to the results obtained by Adinortey, (2012) (moisture-22.18%, fat- 6.50%, carbohydrate-30.56%, and crude fiber-37.3%),while the values for crude fat and crude fibre are close to the results obtained by Uzoekwe, (2015) Moisture-4.00%, protein- 5.00%, crude fat-0.31%, ash-3.75%, crude fiber-7.51% and carbohydrate-8.87%). The results obtained indicate that the leaves of *L taraxacifolia* is a good source of carbohydrate, minerals (ash) and proteins, but not a very good source of energy (low fat content).

Table 2: Mineral Composition Analysis

PARAMETERS	*L. taraxacifolia* leaves (mg/kg)
Calcium	15.50± 0.11
Magnesium	25.11± 1.00
Sodium	96.97± 0.17
Potassium	359.50± 0.22
Iron	4.51±0.15
Zinc	0.10± 0.00
Copper	0.21± 2.00
Manganese	0.21± 1.43
Phosphorous	0.20± 0.00

Table 2 depicts that *L. taraxacifolia* leaves were found to have high quantities of potassium, sodium and magnesium. Iron, zinc, copper, manganese and phosphorous were present but not in very high concentration. Calcium, magnesium, sodium and potassium which are present in high concentrations (15.50± 0.11mg/kg, 25.11±1.00mg/kg, 96.97± 0.17mg/kg and 359.50± 0.22mg/kg respectively) are essential minerals for life, they are important in the formation of bones and teeth as a cofactor for enzymes and a component of ATP, DNA, RNA and cell membranes. Keeping the right potassium balance in the body depends on the amount of sodium and magnesium in the blood (Oshodi, 2003).

CONCLUSION

The results of the present study revealed that the leaves of *L. taraxacifolia* has appreciable amount of macronutrients and micronutrients. These results indicate that the leaves of *L. taraxacifolia* contained essential

nutrients which can compete favourably well with other conventional edible leaves.

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