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Proximate Analysis, Mineral and Phytochemical Composition of *Euphorbia Hyssopifolia*

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Abstract: *Euphorbia hyssopifolia is a herbaceous plant found in Nigeria and is used as a purgative both in the eastern and northern parts of the country. Extracts of the leaves are used in the treatment of constipation or inducement of purging to control weight and/or shape. Despite its toxicity and clinical use, analyses of its proximate and mineral composition, as well as the phytochemical analysis revealed other possible applications of the plant. Proximate analysis showed high moisture content of 83.00%, crude fat 3.20%, ash content 3.80%, crude fiber 2.15%, protein 0.88% and carbohydrate content of 6.98%. Analysis of mineral composition revealed the presence of some minerals in mg/g such as calcium 0.042, sodium 0.002, potassium 0.002, magnesium 0.003, lead $1.890x10^{-3}$, iron $0.034x10^{-3}$, and manganese 0.133mg/g. Phytochemical screening revealed the presence of alkaloids, flavonoids, carbohydrate, vitamin A, reducing sugars, saponnins, glycosides and steroidal aglycone. The quantitative analysis showed that the leaves contained 281.25±3.84mg/100g of flavonoids, 402.18±10.38mg/100g of sugars, 216.67±8.57mg/100g of alkaloids, 182.60±6.27mg/100g of steroids, 3.96±0.51mg/Kg of saponnins, 30.71±2.32mg/Kg of tannins, 0.002±0.00mg/100g of cyanide and 0.4026±0.30% of proteins. These results showed that Euphorbia hyssopifolia is endowed with many active principles, minerals and organic matter that can be found useful in medicinal/therapeutic activities as well as possible application in nutrition and pharmacology.*
Key words: *Euphorbia hyssopifolia, proximate composition, phytochemicals, minerals elements.*

I. Introduction

Plants have been used as sources of food and medicine. The most ancient approach to curing sicknesses and diseases is herbalism (Apata, 1979). The plant *Euphorbia hyssopifolia* is commonly found in the tropical and sub-tropical regions of Africa and in America (Adedapo *et al.,* 2004). It produces caustic latex, which constitute a health hazard to humans and livestock (Abo, 1994). The toxic effects of *Euphorbia hyssopifolia* have a diuretic and purgative action. It is known to have medicinal effect for inflammation of the respiratory track, while for asthma, it has a reputation for inducing bronchial relaxation (Adedapo *et al.,* 2004). The plant is taken as tea for colds, indigestion and for back pains and sometimes taken as a tonic (Abo, 1994).

Medicinally and even toxic plants have the potentials of helping in the search for more potent and less toxic medicinal agents when thoroughly investigated. Although many plants have been credited with curative and/or toxic attributes in Nigeria and many other African countries, only few are of proven status and even less are clinically useful (Ojewole, 983). The investigation into the proximate and mineral composition as well as the phytochemical screening will serve as a prelude to the mechanism of action and other possible applications of the material. This study is important primarily due to the common use of this plant crude extract in rural communities of the South-east areas of Nigeria in inducing emptying of the bowel and in checking weight and treatment of constipation.

II. Materials And Methods

Fresh leaves of *Euphorbia hyssopifolia* were harvested from the vegetation around Ebonyi State University, PRESCO Annex, Abakaliki, Ebonyi State. There were thoroughly washed, dried and ground while chemicals of high analytical grade were used in the research.

III. Methods:

PROXIMATE ANALYSES: This is the evaluation of the nutritional value and organic content of the plant materials. This will be achieved by the measure of percentage proximate composition which includes the quantification of the amount of protein, lipid, carbohydrate, moisture, fiber and ash using the Official methods of analyses of AOAC (1980).

PHYTOCHEMISTRY: Phytochemistry is concerned with the enormous variety of organic substances that are elaborated and accumulated by plants and deals with the chemical structure of these substances, their metabolism, natural distribution and biological function (Harborne, 1973). Some of these plants have some anti-nutritional factors which are toxic and can cause impaired absorption of essential nutrients there in (Kaul, 1975).

Quantification of phytochemicals involves the use of various methods in determining the amount of bioactive compounds in the plant material (Kabir, 2005). Phytochemical tests were carried out to determine the presence or otherwise, the absence of alkaloids, flavonoids, glycosides (such as cardiac, cyanogenic, anthrancene and O- and C-glycosides and steroidal aglycone), saponnins, and tannins. Standard phytochemical methods were employed in these analyses (Harborne, 1973; Kelvin and Butler, 1999).

MINERAL ANALYSIS: Various photometric and titrimetric methods shall be used in the quantification of these essential nutrients. Such mineral elements include Calcium (Ca), Iron (Fe), Copper (Cu), Manganese (Mn), Phosphorus (P), Manganese (Mn) and so on.
Mineral analyses shall be carried out using Buck Scientific Atomic Absorption/Emission Spectrophotometry (AAS) and Molybdemun blue method for phosphorus.

IV. Result

Table 1: Result of proximate composition.

PROXIMATE COMPOSITION (%)	
Moisture	83.00±0.24
Crude fat	3.20±0.03
Ash content	3.80±0.02
Crude fiber	2.15±0.04
Protein	0.88±0.01
Carbohydrate	6.98±0.02

Table 2: Mineral analysis of *Euphorbia hyssopifolia*.

MINERAL CONTENT IN mg/g	
Calcium	0.042
Sodium	0.002
Potassium	0.002
Magnesium	0.003
Lead	$1.890x10^{-3}$
Iron	$0.034x10^{-3}$
Manganese	0.134

Table 3: Quantitative phytochemical analysis on *Euphorbia hyssopifolia*.

PHYTOCHEMICAL	CONCENTRATION IN mg/Kg
Flavonoids	28.125±3.84
Alkaloids	21.667±8.57
Steroids	18.260±6.27
Cyanides	0.0002±0.00
Saponnins	3.96±0.51
Tannins	30.71±2.32
Sugars	40.218±10.38
Proteins	0.4026±0.30%

V. Discussion And Conclusion

Generally, the nutritional quality of food materials may be evaluated by biochemical analysis of the food for proximate composition. Mineral elements also are needed in minute quantities for the proper functioning of the human system, health growth and development. Proximate analysis as shown in table 1 revealed that it had high moisture content of 83.00%, crude fat 3.20%, ash content 3.80%, crude fiber 2.15%, protein 0.88% and carbohydrate content of 6.98%. The moisture content showed the storage of the leaves can be achieved by careful reduction in moisture content to avoid microbial growth and deterioration. The carbohydrate content as well as lipid and protein showed that the leaves may not serve as a good source of dietary energy since a large quantity must be consumed to furnish a reasonable amount of dietary nutrients to satisfy nutrition. The level of ash (minerals) and plants secondary metabolites indicated that the plant may serve a medicinal and therapeutic function rather than dietary requirement.

Analysis of mineral composition revealed the presence of some minerals in mg/g such as calcium 0.042, sodium 0.002, potassium 0.002, magnesium 0.003, lead $1.890x10^{-3}$, iron $0.034x10^{-3}$, and manganese 0.133mg/g. The result revealed a high concentration of calcium compared to other minerals. These minerals play significant roles in several biological processes. Bone growth and turnover are influenced and regulated by the metabolism of Ca, phosphate and Mg; Fe is important in the formation of haemoglobin. Mg and K are also involved in inducement of calmness (Burtis and Ashwood 2003).

Phytochemical screening revealed the presence of alkaloids, flavonoids, carbohydrate, vitamin A, reducing sugars, saponnins, glycosides and steroidal aglycone. The quantitative analysis showed that the leaves contained 281.25±3.84mg/100g of flavonoids, 402.18±10.38mg/100g of sugars, 216.67±8.57mg/100g of

alkaloids, 182.60±6.27mg/100g of steroids, 3.96±0.51mg/Kg of saponnins, 30.71±2.32mg/Kg of tannins, 0.002±0.00mg/100g of cyanide and 0.4026±0.30% of proteins. Alkaloids have analgesic effects while flavonoids act as antioxidants in biological systems. Other properties of flavonoids include protection against allergies, inflammation, free radicals, microbes, ulcers, hepatoxins, viruses and tumors (Okwu and Ndu, 2006). Morphine alkaloids are powerful pain relievers and narcotics (induces sleep or drowsiness). Atropine, cocaine and other alkaloids are known stimulants of the central nervous system. (Teguja and Omak, 1993). Tannins prevent urinary tract infection by preventing bacteria from adhering to the walls. Tannins have been shown to be useful in the management of HIV infection and herpes. Combination of tannin and anthocyanins can breakdown cholesterol in the bloodstream and in atherosclerotic plaques. Tannins, along with vitamin C help build and strengthen collagen (Okuda *et al*., 1991). Saponins serve as natural antibiotics, which help body to fight infections and microbial invasions. They also enhance the effectiveness of certain vaccines, lower cholesterol and knock out some tumor cells, particularly lung and blood cancers (Okwu and Ndu, 2006).

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