



Determination of mineral element composition and bioactive agents of ethnologic leaves extract of *moringa oleifera*

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Abstract

A study was conducted to determine some mineral elements and bioactive agent present in the leaves of moringa that were actually responsible for its medicinal roles. The mineral were determined as the AOAC 2000 method while the photochemical screening was done using the methods of Trease and Evans 1989, Sofowora 1993 and Harborne 1973. The result shows that the leaves of *Moringa oleifera* contain high of Ca, 682.6g, magnesium, 380.2g and phosphorus, 160.5g (values). The bioactive agent present in high concentration include flavonoids, Tannins, phenols and Terpenoids. The investigation correlate the use of these leaves of this plants in treatment disease such as dental caries, Ulcer, Snake bite, headache etc, Fahey, *et al.*, (2001).

Keywords: ethnologic, flavonoids, oleifera, Determination

1. Introduction

The beginning of human history witnessed the use of medicinal plants for their therapeutic values. The use of this herbal plants increase alongside with the growth of human civilization. At present medicinal plant usage had become one of the most potent source of treatment (Okigbo 2009 Okugbo *et al* 2008). *Moringa oleifera* leaves is one of such medicinal plant that had been widely used at present.

Moringa Oleifera is a short deciduous perennial tree, growth to a high of 10m tall, they are slender with dropping branches. Every parts of two plant had been found usually (the roots, bark, stems, pods and leaves). The plant *moringa oleifera* had potential to improve nutrition, boost food security, foster rural development and support sustainable land care, while the plant had been used as forage for livestock, adjuvant, antihelmintic (Makkar *et al.*, 1996)^[6]. The plant is slender, stems are brittle with corky bark, the leaves are feathery, pale green, compound and tripinnate (30 – 30cm) with pinny small leaflets. *Moringa oleifera* had been consumed by human due to its rich source of vitamin A B C D E and K. and vital mineral.

Medicinal plants have been known and use since ancient time by people for managing ailments all over the world, of which the plant *moringa oleifera* is inclusive.

Moringa Oleifera is a one of them widely used local herb, belong to the family of Moringaceae and the genus *Moringa* is a short slender, deuduous perennial tree, grows to a drooping branches. The stem is slender with are brittle with bark. The leaves are feathery, pale green, compound and tripinnate (30 – 60cm long) with pinny small leaflets.

The *moringa* leaves had been consumed by human due to its rich source of vitamins A, B, C, D, E K and vital minerals.

The plants had also been used medicinally in the treatment of the following ailments.

2. Materials and Methods

2.1 Chemical and reagents

The chemicals and reagents used in this study were of analytical products of May and Baker England.

2.2 Plant Material

Fresh leaves of *moringa Oleifera* were obtained from Anyigba in Dekina Local Government Area of Kogi State, Nigeria and Identified in by late Patrick Ekwonah of the department of Botany Kogi State University, Anyigba.

2.3 Preparation of Plant Extract

The leaves of *moringa oleifera* were and obtained dried in the sun for four weeks. The dried leaves were crushed using mortar and pestle and grinded into powder, using a grinding engine. A 500g of powdered leaf were extracted using Soxhlet extractor method using 90% methanol.

2.4 Phytochemical screening of the extract of *moringa oleifera*.

The sample of *moringa oleifera* extracted was tested to identify the presence of Alkaloid, flavonoids terpenoids, steroids tannins, saponins glycosides and total phenol content, following standard procedures. (Trease and Evans 1989, Harborne 1973 and Sofowora 1993)^[11, 10].

2.5 Proximate analysis

The moisture content, ash and carbohydrate was determined by method decrease by AOAC 2000 while the protein, crude fibre and fats were determined by method described by Pearson, 1976^[8].

2.6 Determination of mineral elements present in *moringa oleifera* extract

The mineral element (Ca, Na, K, Zn) were determined by the method of AOAC 1990.

2.7 Micro nutrient analysis

A 5.0g of the sample of *moringa Oleifera* was used for the macronutrient analysis; by inserting on a crucible and burn into ash using a muffle furnace. Hel was added to the ash, boiled and the solution made up to 100ml with distilled water. Iron and calcium was determined by atomic absorption spectrophotometer while phosphorus was by

vanaldomolybolate calorimetric method. (Pearson 1976^[8]). Used the method of absorption spectrophotometer with the following elements, Zn, Mn, Na, K and Mg.

3. Result and Data Analysis

3.1 The yield of the extract of moringa *Oleifera* was 50g which represent 10%

3.2 Result of phytochemical screening.

Table 1

Test	Inference
Alkaloids	+
Flavonoids	(++ +)
Glycoside	+
Saponins	+
Steroids	+
Tannins	(++ +)
Terpenoids	(++ +)
Total Phenol	(++ +)

3.3 Proximate macronutrient composition of powdered leave extract of moringa *Oleifera*.

Table 2

Macronutrient	Dry mater
Water	78.2 ± 2.3
ASH	3.4 ± 0.5
Crude fibre	24.5 ± 4.2
Fat	2.30 ± 3.2
Carbohydrate	27.5 ± 5.2
Protein	6.5 ± 0.8

Values are expressed in ± SD of 3 determinants

3.4 Mineral Element composition of moringa *Oleifera* leave extract

Table 3

Micronutrient	Dry mater (w/w)
Iron	13.50 ± 3.8
Magnesium	380.2 ± 5.3
Phosphorus	160.5 ± 1.5
Calcium	682.6 ± 3.5
Zinc	12.40 ± 1.8
Sodium	52.6 ± 0.7
Manganese	1.05 ± 2.6
Values are expressed of 3 determinants	as mean ± SD

Discussion

The extract gotten from the leaves of *Moringa Oleifera* was appreciable (8.5%). The phytochemical screening indicate the abundant present of Flavonoids, Phenols, Tannins and Terpenoids. These bioactive agents were responsible for the medicinal values of *Moringa Oleifera*.

Flavonoids have been found to affect enzymes that are involved in chemical mediators of inflammation and metabolism of Arachidonic acid (Oweyele *et al* 2005). Flavonoid prevent oxidative cell damage, anticancer, antiviral and antinlatelets (James *et al* 2003)^[5]. Food rich in phenols have been attributed to decrease risk of inflammatory and other related diseases (Huxley and Neil, 2003, Sadik *et al* 2003)^[9].

The proximate macronutrient indicate a high amount of crude fibre, carbohydrate and water contents which made

the plant useful as fodder for animals.

The microelement analysis indicate the high presence of calcium, magnesium and phosphorus. Calcium had been found to be implicated in bones and teeth formation while magnesium and phosphorus are important in the formation of plant protein.

Conclusion

The research on *Moringa Oleifera* indicate this plant to have biological potential when had placed this plant in the limelight in the field of pharmaceuticals.

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