

Preliminary Test of Phytochemical Screening of Crude Extracts of *Moringa oleifera* Seed

¹Ogunjinmi Oluwasayo Esther and ²Oladipo-Abodunwa Taiwo

¹Chemistry Department, The Polytechnic, Ibadan. Oyo State. Nigeria

²Mathematics and Statistics Department, The Polytechnic, Ibadan. Oyo State. Nigeria.

Abstract: *Moringa oleifera* possesses high nutritional value and has been used in folklore medicine to treat various ailments related to pain and inflammation, chemical pharmacological and pharmacognostical application. The extract was gotten by adding 500ml of hexane to 120g of the grounded *Moringa oleifera* seed, follow by ethyl acetate and methanol to the recovery sample of *Moringa* seed in order of their increase polarity. The preliminary phytochemical screening of the seed was carried on the extracts, which reveals that alkaloids, Glycoside, flavonoids and Saponin were present in both the hexane and methanolic extract of *Moringa oleifera* seed. Majority of the extracts contained the secondary metabolite such as alkaloid, glycoside, flavonoid, tannins, saponin, steroid and reducing sugar which make the seed of *Moringa oleifera* to possess the biological properties.

Key Words: Phytochemical, Terrestrial plants, ailment, extract.

I. Introduction

Natural products from plants, called secondary metabolites are the end products of primary metabolites such as carbohydrates, amino acids, lipids and so on. They are synthesis large variety of chemical substances known as secondary metabolites which include *alkaloids, steroids, flavonoids, terpenoids, glycosides* etc. unlike primary metabolites, these substances are accumulated by plants, they have no apparent functions in the life of the plants and are not necessarily involve in essential metabolism of the cell. Some of these secondary metabolites have pronounced physiological effect on man, other animals and some possess therapeutic properties which have and still being utilized in the treatment and cure of both human and animal diseases. (Sesta *et al* 2006)

Natural product is a chemical compound or substance produced by a living organism found in nature that usually has a pharmacological or biological activity for use in pharmaceutical drug discovery and drug design. Nature product may be extracted from tissue of terrestrial plants, marine organism or microorganism fermented broth. A crude (untreated) extract from any one of these source typically contains novel, structurally diverse chemical compounds, which the natural environment is a rich source of (Anwar *et al.*, 2006.) chemical diversity in nature is based on biological and geographical diversity.

Moringa oleifera is one of the most widely cultivated species of the monogenic family *Moringaceae* in recent times. Thus so called "Miracle tree" is believed to originate from sub-Himalayan tracts of India, Pakistan, Bangaladesh and Afghanistan. *Moringa oleifera* tree was first introduced in Eastern Africa from India at the beginning of 20th century, it is widely distributed in different parts of the continent including Rwanda and Uganda in East Africa, Ghana in West Africa and South Africa it is a perennial softwood tree with timber of low quality, due to its rapid growing nature. It has become one of the world's most useful plants for human nutrition, traditional medicine, nutraceutical purposes, water purifying and industrial uses (Fahey, 2005; Anwar *et al.*, 2007).

Local names for *Moringa* in Nigeria

Fulani/Hausa	Zogalli, Zogalla. Gandi
Igbo	Odudu oyibo okwe oyibo
Nupe	Chigan wawa
Yoruba	Ewe igbale, idagbo monoye

The fresh leaves have been reported to contain vitamin C (Mahmood *et al.*, 2010) and vitamin A. more than those reported in carrots and oranges. The calcium content in *Moringa oleifera* is more than that in milk and also has more potassium than in banana more iron than spinach and its protein quality uses that of milk and egg (Sachan *et al.*, 2010). In addition, it has been reported that the micro-nutrients content is more concentrated in dried leaves, ten fold (10) the vitamin A of carrots, seventeen (17) times the calcium of milk fifteen (15) times the potassium of bananas twenty five (25) times the iron of spinach and nine (9) times the protein of yoghurt but the vitamin C drops to a half of that of oranges (Mahmood *et al.*, 2010)

Recently researchers have become convinced that the compounds derived from plants for instance, phenolic, flavonoid and antioxidant compounds, do more in preventing different disease. *Moringa* has been found to be a good source of polyphenols and antioxidants, the leaves of *M. oleifera* have various biological activities including anticancer activities, prevention of cardiovascular diseases, Liver disease (Kumar and Pari 2003) antitumor, nervous disorder inflammation digestive disorders, skin disorders and regulation of thyroid status (Bernett *et al.*, 2003).

The leaves are a compound leaf form, with three leaflets arranged on either side of the stem in pairs opposite each other, growing mostly at the branch tips. The leaves are 20 to 70cm long with 8 to 10 pairs of pinnae, each bearing two pairs of opposite elliptic or obovate leaflet (Paliwal *et al.*, 2011).

The fruit is a green three lobed pod that hangs down from the branches and can be 20 to 60cm in length. When dry, it opens into 3 parts. Each pod contain between 12 and 35 seeds (Adebayo *et al.*, 2011) the seeds are round, with brownish semi-permeable seed hulls.

II. Material And Method

The *Moringa* seed used for study was collected immediately after maturation from the botanical garden university of Ibadan Nigeria. The seed species parts were identified in Botanical Department of The University of Ibadan, Nigeria. The fresh fruit was harvested, packed in airtight polyethylene paper it was air dried for four weeks. The seed was manually grounded with mortar and pestle to get the powered form and was sieved for further use.

Extraction of the *moringa oleifera* seed using hexane, ethyl acetate and methanol

About 120g of the grounded *moringa oleifera* seed was soaked with 500ml of normal hexane, in a round bottom flask for 7 days follow by ethyl acetate and methanol according to their order of polarity. The solvent was then decanted and concentrated at about 37°C using quick fit. After the concentration the remaining hexane extract was exposed to fresh air to ensure that the remaining solvents evaporated into the atmosphere.

Phytochemical screening of crude extracts of *Moringa oleifera* seed

Alkaloid: 0.5g of the extract was warmed with 2ml of H₂SO₄ for 2 minutes, filtered and was treated with Wagner reagent, which give a reddish brown precipitate coloration. Tannins: 0.5g of the crude extract was boiled in 10ml of water in a test tube and then filtered. A few drops of 5% ferric chloride (FeCl₃) was added and then observed from brownish green or a blue black coloration. Flavonoids: 0.5g of the extract was dissolved in 3ml dilute NaOH, deep green turned lighter with warm persist which indicated the presence of flavonoid. Glycoside: 1ml of extracted in a test tube, 1ml cone H₂SO₄ was added, the mixture was heated in boiling water for 15 minutes fehling solution was then added and the resulting mixture was heated to boiling. A brick-red precipitate indicates the presence of glycosides. Saponin: 0.5g of the extracts was shaken with about 5ml of distilled water and then heated to boil; frothing shows the presence of saponin Resin: 2ml of the extract was added with 2ml of copper acetate solution, the resulting solution was shaken using electric shaker and allowed to separate. A deep green colour was seen followed with persisted frothing. Steroid: Addition of 0.5g of the extract with 2ml of concentrated H₂SO₄ in a test tube. A red colour indicates the presence of a steroidal ring.

III. Result And Discussion

Table1: Phytochemical screening of *Moringa oleifera* seeds of hexane, ethyl acetate and methanol extracts

Extracts	Alkaloid	Glycoside	Flavonoid	Saponin	steroidal ring	Tannin	Reducing sugar
MOHE	+	+	+	+	+	-	-
MOEE	-	+	+	-	+	+	+
MOME	+	+	+	+	+	-	-

Key

MOHE *Moringa oleifera* hexane extract

MOEE *Moringa oleifera* ethyl acetate extract

MOME *Moringa oleifera* methanolic extract

+ Positive

- Negative

In the phytochemical screening of *moringa oleifera* seed of the hexane and methanolic extracts reducing sugar and tannin were found to be absent whereas in ethylacetate extract, only alkanoid was absent.

More so, Glycoside, flavonoid and steroidal ring were present in all the extracts. Meanwhile, tannin and reducing sugar present in hexane and methanolic extracts but absent in the ethylacetate extract.

Alkaloid, Glycoside, Flavonoid and Saponin were present in all the extracts. Also steroidal ring was present in all the extract of *Moringa* seed

Therefore, majority of the extracts contained the secondary metabolite such as alkaloid, glycoside, flavonoid, tannins, saponin, steroid and reducing sugar which make the seed of *Moringa oleifera* to possess the biological properties.

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