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## RESEARCH ARTICLE

### Nutritional and phytochemical constituents of moringa leaves from sudan.

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#### Abstract

MoringaOleifera is a perfect example of multi purposes tree and is important food commodity which has had attention as natural nutrition of tropic area. In this present study nutritional and phytochemical contents of the dried leaf powder of MoringaOleifera were determined. The nutritional investigation revealed the presence of Vitamin A 22.9 mg/100g, Vitamin C 60.3 mg/100g, Carbohydrates 45.0mg/100g, Protein 7.5%, Fats 0.35% and fibre 3.9%.For nutrients determination Calcium 1600mg/100g, potassium 260mg/100g, Magnesium 255mg/100g, Zinc 3mg/100g, Manganese 40mg/100g, Copper 0.5 mg /100g and Iron 135mg/100g. Some essential amino acid were investigated, Histidine 650mg/100g, Leucin 2000mg/100g, Lysine 1400mg/100g and cistine 120mg/100g. The photochemical identification in the leaf powder included Glycosides, Flavonoids, Phenol, Alkaloid and Tannins.

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#### Introduction:-

Moringa is the sole genus in the flowering plant family Moringaceae, is made up of 13 species, the species most common called MoringaOleifera<sup>[1]</sup>. MoringaOleifera, known as Moringa originates from Agra and Oudh in northern eastern region of India and now cultivated across whole tropical and subtropical belt<sup>[1]</sup>. It is referred due its multitude of useful purposes<sup>[2]</sup> "Molher's best friend" The leaves of MoringaOleifera have been reported to be available source of both macro and micronutrients, rich source of  $\beta$ - carotene, Protein, Calcium, Potassium and act as a good source of natural antioxidants such as flavonoids, phenol and carotenoids<sup>[3]</sup>. MoringaOleifera is a soft wooded tree whose fruits, roots and leaves have been advocated for traditional, medicine and industrial uses<sup>[4]</sup>. The flowers can be eaten or used to make tea and provide good amounts of both Potassium and Calcium<sup>[5]</sup>. The iron content of the leaves is very good and prescribed for anemia in the Northern Nigeria and Philippines<sup>[6]</sup>, also leaves are one of the excellent source of protein with low fat and carbohydrates. The antibiotic properties of Moringaoleifera has been attributed to the phytochemical contents such as isothiocynates<sup>[7]</sup>.

#### Objective:-

To investigate phytochemicals and nutritional properties of dried leaves powder of MoringaOleifera.

#### Material and Method:

##### Preparation of sample solution:-

The fresh leaves of Moringaoleifera were collected from Khartoum East, Sudan

##### Nutritional determination:-

100g of dried leaves were homogenized to fine powder and soaked in 500cm<sup>3</sup> distilled H<sub>2</sub>O for 24 hrs before extraction. Thereafter it was filtered through muslin cloth. The filtrate was concentrated using rotatory evaporator and stored at 10<sup>0</sup>C for further used. Vitamin determinations were made following the methods for vitamins A, C and amino acids required for healthy human growth<sup>[8]</sup>.

Vitamin C was determined by using titrimetric method and spectrophotometric method made with a double beam 1800 ultra violet – visible spectrometer provide with matched 1.0 cm quartz cell (SHIMADZU JAPAN). Minerals were determined using Atomic Absorption Spectroscopy (A.A.S), While Potassium and Calcium determined by Flame Emission Spectroscopy (FES).

**Photochemical screening.** 10cm<sup>3</sup> of the filtrate was subjected to qualitative tests using standard procedures as described by <sup>[9,10]</sup>.

## Results and Discussion:-

**Table 1:** Concentration of some nutrients and minerals from Moringa leaves.

(a) Nutrients	Concentration(mg/100mg) dried leaves powder
Vitamin A(mg/100g)	22.9
Vitamin C(mg/100g)	30.0
Carbohydrates(mg/100g)	45.0
Protein%	8.0
Fat%	0.35
Fibre%	3.9
(b) Minerals	Concentration(mg/100mg) dried leaves powder
Calcium	1600
Potassium	200
Magnesium	255
Zinc	3.0
Manganese	40
Copper	0.3
Iron	120

**Table 2:** Concentration of some essential amino acid from Moringa leaves.

Essential amino acid	Concentration(mg/100mg) dried leaf powder
Histidine	650
Leucin	2000
Lysine	1400
Cistein	120
Phytochemical species	
Glycoside	✓
Flavinoid	✓
Phenol	✓
Alkaloid	✓
Tannins	✓

The nutrient values of dried Moringa leaves were presented in Table 1. The leaves powder of Moringa is rich in calcium, magnesium, and potassium but the average carbohydrate content is low. The study was proved that Moringa leaves provide low fat and the fibre content. The protein content of fresh Moringa leaves averaged 8.0%. These food stuff with high protein content are recommended for patient with high protein deficiency symptoms. In Sudan the fresh leaf of Moringa is used as vegetable in soup and the dry leaf powder is sold on the open markets, the dry leaf is rich in vitamins A and C this help to protect the body against degenerative diseases as well as strengthen the immune system <sup>[11]</sup>. The determination of vitamin C was used with both titrimetric and spectrophotometric methods gave same result. The titrimetric method <sup>[12]</sup> is oxidation reduction reaction and based on decolorizes of 2,6- dichlorophenolindophenol, in this method glacial acetic acid was used to prevent the oxidation of vitamin C. It is reported that Moringa leaf contains more vitamin C than oranges <sup>[13]</sup>.

The amino acids profile of the sample analyzed showed the presence of some essential amino acids in Table 2. The phytochemicals, tannins, alkaloid, phenol, flavinoid and glycoside were detected in the present study, which are common in various antibiotics and medicinal importance.

## Conclusion:

Moringa Oleifera is a soft wooded tree, the nutritional contents including metals, vitamins, essential amino acids and phytochemicals of the leaf powder were determined. The study showed that the leaf is a good nutrient source to be used as supplements for foods.

### References:

1. N.Sankyan, A.Sharma, C. Ahriseth, A. Chaun and S.Kulshrestha, "Determination and comparison of vitamin C. content from Moringaoleifera by different method" Himachelpradesh India.2250- 2257(2013), 57-68
2. H.W.Fisher "Moringaoleifera" Toronto, Canada (2012) 1,4,6.
3. S.P.Mishra, P.Singh and S.Singh " Processing of Moringaoleifera leaves for human consumption" India 2277-1808(2012)-29.
4. H.Delisle. S.Bakari. Provitamin A content of traditional green leaves from Niger Cahiers6 (6) (1997) .553-560
5. P.Talhaliani and A.Kar Pharmacological Research 41(3) (2000) 319-323.
6. S.Subadra. and J. Monica. International Journal of Food Science and Nutrition.48(6) (1997),3.
7. J.W.Fahey, A.T.Zakmann and .P.Talaly. Phytochemisry 56(1), (2002) 50-51.
8. AOAC. Asseociation of Official Analytical Chemistry, Official Method of Analysis (21<sup>st</sup> edition) (1991) Washington DC, USA.
9. G .E. Trease and W.C. Evans Pharmacognosy 12<sup>th</sup> edition (1983). Bailler Tindall London. E.A.Sofowra University of Ife press. Nigeria (1994) 1-23
10. Bansa and S.O. Aeyemo, African Journal of Bitotechnology6 (15) (2007) 1785-1787.
11. A. O. Reis, S.B.Dos.Santos, L.A.Nascimento, N.O. Liveira, P. M. Ventora, P. Continho, M.F. Soares and A.S.Lima "Extraction of Scorbic Acid"
12. Aracjau- Sergipe Brasil P.2.
13. J. Fuglie: New use of Moringa studied in Nicaragua (2000).
14. <http://www.ecotec.org/network/modules.php>.