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STUDYING THE CHEMICAL PROPERTIES OF *MORINGA OLEIFERA* LEAF AND COMPARING THEM WITH CAPSULES

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ABSTRACT

This study evaluated the Chemical investigation and assurance of a few mineral components of dry *Moringa oleifera* leaf and Capsules of *Moringa oleifera* leaf powder. The comes about appeared that the fiery debris, carbohydrate, fat, unrefined filaments, dampness and protein substance of dry *Moringa oleifera* were 0.95, 36, 15, 16.3, 12.1 and 25.1% separately. The Calcium (Ca), Iron (Fe), Zinc (Mg), Cadmium (Cd) and Lead (pb) substance were 80, 478, 810, 0.015 and 0.0006 parts per million (ppm), individually. Capsules of *Moringa oleifera* assessment were by and large comparable.

KEYWORDS

Moringa leaf, Capsules, *Moringa oleifera* and Chemical analysis.

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INTRODUCTON

Moringa Oleifera has a place to the monogeneric family of bushes and trees, called Moringaceae[1]. The tree started from Agra and Qudh within the Northwestern locale of India, South of the Himalayan Mountain. The tree has spread to nearly all tropical belt regions since it is dry season- safe[2]. Too, the takes off, natural products, blossoms and juvenile cases are consumable and they shape portion of conventional diets in numerous nations of the tropics and sub-tropics[3]. The oil gotten from the seeds is pale yellow, sweet and consumable. It is nearly unscented and has an calculable teste[4]. *Moringa oleifera* may be a profoundly important plant, disseminated in numerous tropical and subtropical nations. It has an amazing run of restorative employments with tall wholesome

esteem. Distinctive parts of this plant contain a profile of critical minerals, and are a great source for protein, vitamins, B carotene, amino acids and different phenolics. Moringa plant gives a wealthy and uncommon combination of zeatin, qurcetin, kaempferol and many other phytochemicals. It is additionally a really imperative plant for it,s therapeutic esteem. Different parts of the plant such as clears out, roots, seeds, bark, natural product, blooms and juvenile units etc are cardiac and circulatory stimulants, have antitumour, antipyretic, antitiepileptic, anti-inflammatory, antiulcer, antispasmodic, antihypertensive, cholesterol bringing down, antioxidant, antidiabetic, antibacterial and antifungal properties[5]. In this study, nutritional analysis and heavy metal accumulation in dried *moringa oleifera* and Capsules were investigated using standard analytical techniques.

MATERIAL AND METHODS

Plant materials

The leaves of *Moringa oleifera* were collected from a home garden in Misurata, Libya

Sample preparation

The leaves of *Moringa oleifera.* Were shade-dried for three (3) days and were subsequently ground to a powder using a household blender. Moringa capsuleswere purchased fromthe pharmacy in misurata city.

Chemical analysis

Total nitrogen (N) was determined using the micro-kjeldahl method[6]. The crude protein was obtained by multiplying N by the conversion factor of 6.25 (%p = TN x 6.25). The moisture, fat, fiber and ash content of the sample was determined using the method of[7]. Total carbohydrate content was determined by difference as follows: 100 – (% ash + protein + fat + moisture). The mineral contents (elements) of Moringa oleifera leaves: The Calcium (Ca), Iron (Fe), Zinc(Zn), Cadmium(Cd), and Lead (Pb), were determined by Atomic absorption spectrophotometer (Agilent US) as described the methods by[8]. The values of mineral elements were reported in parts per million (ppm).

RESULTS AND DISCUSSION

Chemical composition of *Moringa oleifera* and Capsules

The chemical composition of dry *Moringa oleifera* and Capsules for their moisture content, crude protein, ash, crude fiber and total carbohydrates are shown in Table No.1 Figure No.2. The results of the proximate composition (Table No.1) revealed that leave of *Moringa oleifera* are good sources for Ash, carbohydrate, fat, crude fibers, moisture, proteins. It contained 0.95, 36, 15, 16.3, 12.1 and 25.1% (on dry weight basis), respectively. Also, the leaves in capsule contained high amounts, Ash, carbohydrate, fat, crude fibers, moisture, proteins. Which were 0.90, 35.1, 14.5, 15, 11.9 and 24.5% respectively.

Mineral composition of *Moringa oleifera* and Capsules

Data concerning minerals content are shown in Table No.2 Figure No.3, data revealed to great extent the presence of nearly most of different minerals. The results singed to high concentrations Calcium (Ca), Iron (Fe), Zinc (Mg), and low concentrations Cadmium (Cd) and Lead **(**Pb) in dried leaves and Capsule leaves of Moringa. Where concentrations of the aforementioned minerals were 80, 478, 810, 0.015 and 0.0006ppm, respectively. Also for Capsule leaves were 76, 475, 811, 0.001, 0.0007ppm.

Discussion

These results are in agreement with these reported by[9] who found that the leaves of Moringa are particularly rich in protein (24.2± 0.9%) and moisture (14.8 ± 0.2%), fat (4.5± 0.1%), fiber (17.3± 0.2%), ash (3.8 ±0.2%) carbohydrates (50.4± 0.2%)[9]. Also, Busani *et al*, (2011), stated that the percentages (%) of proteins, moisture, fat, fiber, ash of dried leaves were 30.29, 9.53, 11.40, 6.50, 7.64 respectively[10]. Similar research by[11] who show that proteins, moisture, fiber, ash and carbohydrates were (26.79 ± 1.8%), (5.48 ± 2.3%), (18.67 ± 0.8%), (7.92 ± 0.9%), (35.90 ± 1.2%). Similar research by Anthonia *et al* who show that proteins, moisture, fiber, ash and carbohydrates were 16.15, 11.76, 9.68, 10.64, 45.43%[12]. Finally, through data tabulated in Table No.1, it could be clearly concluded that Moringa are rich in many significant

components such as protein and carbohydrates. The mean Fe content in the sample was (478-475mg/L) which was comparable to similar studies done with reported Fe values of 505mg/L,107.48ppm, 103.75mg/L, 318.81ppm and 870mg of Fe respectively in dried Moringa leaves[9,12-15,]. Thus, Iron which is commonly deficient in many plant-based diets was found in abundance in these cited works. Zn Result from this analysis showed levels of zinc (810-811mg/L) a similar researches also reported the level of zinc in dried Moringa leaves as 148.54mg, 60ppm and 57.34ppm respectively[12-14]. Zinc is essential for the synthesis of DNA, RNA, insulin and function of several enzymes, zinc is also required for cell reproduction and growth especially the sperm cells[16].

For the case of Ca, dried Moringa leaves had Ca content of (80-76mg/L) which was comparable to that obtained by other researchers in similar studies with Ca values of 98.67mg, 2003mg, 3.65%, 2.47ppm, 1.91 and 3.4% respectively[4,10,12,13,17,18]. Thus, Dried Moringa leaves are available as a good source of Ca to farm animals or humans. The dried Moringa leaves contained Cd, which is considered to have low value of (0.015-0.001mg/L), a similar study reported a Cadmium was not detected in the dried Moringa leaves[9]. Lead was also found in the leaves of Moringa at very low value of (0.0006-0.0007mg/L). The value reported by[9] was very higher (352 ± 2.36mg/L) than the value obtained in this study[9]. A similar study reported a Pb level of 2.96mg/L in dried Moringa leaves investigated[12]. The analysis of minerals showed that the Moringa leaves were good sources for oleifera.

Table No.1: Chemical composition of *Moringa oleifera* and Capsule leaves

S.No	Test Name	*Moringa Olivera*	
		Capsule leaves	**Dried leaves**
1	Ash (%)	0.90	0.95
2	Carbohydrate (%)	35.1	36
3	Fat (%)	14.5	15
4	Fiber (%)	15	16.3
5	Moisture (%)	11.9	12.1
6	Protein (%)	24.5	25.1

Table No.2: Mineral composition of *Moringa oleifera* and Capsule leaves

S.No	Test name	*Moringa Olivera*	
		Dried leaves	**Capsule leaves**
1	Calcium (mg/l)	80	76
2	Iron (mg/l)	478	475
3	Zinc (mg/l)	810	811
4	Cadmium (mg/l)	0.015	0.001
5	Lead (mg/l)	0.0006	0.0007

Figure No.1: *Moringa leaf*

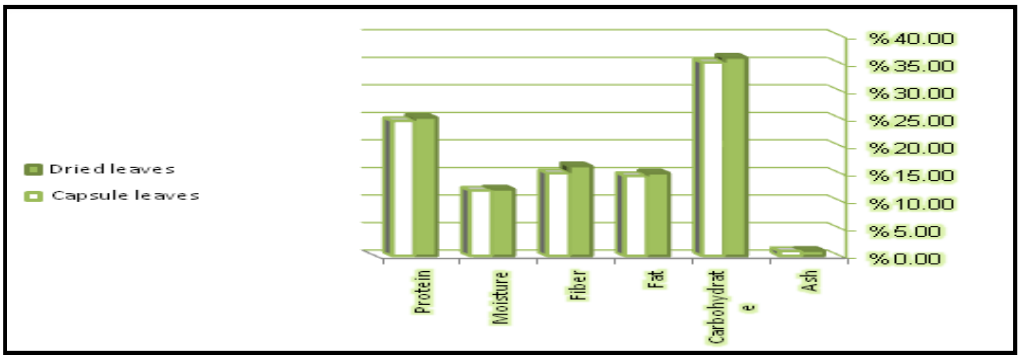

Figure No.2: Chemical composition of *Moringa oleifera* and Capsule leaves

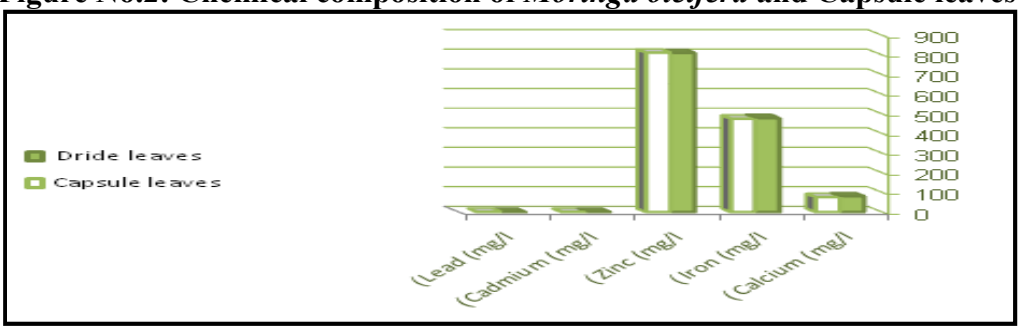

Figure No.3: Mineral composition of *Moringa oleifera* and Capsule leaves

CONCLUSION

Dry Moringa leaf is wealthy in basic supplements and is reasonable in nourishment supplementation. Moringa plant is dry spell safe and develops all the year circular. Thus it can serve as an financially supplement -rich choice within the battle against micronutrient lacks and lack of healthy sustenance. Dry *Moringa oleifera* leaf extricate can serve as an elective to lipton tea. Its wholesome esteem outperforms lipton tea and this makes it reasonable for newborn children, pregnant ladies and nursing moms.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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