



## Anthelmintic Activity of *Moringa Oleifera* Seed Oil - Validation of Traditional Use

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### ABSTRACT

Oil of *Moringa oleifera* was subjected to anthelmintic activity against Indian earthworm *Pheritima posthuma*. Oil of *Moringa oleifera* was tested and results were expressed in terms of time for paralysis and time for death of worms. Piperazine citrate (10 mg/ml) was used as a reference standard and distilled water as a control group. Oil of *Moringa oleifera* showed potent activity and comparable to the standard used.

**Keywords:** *Moringa oleifera*, Anthelmintic activity, Piperazine citrate

### 1. INTRODUCTION

Anthelmintics or antihelminthics are drugs that expel parasitic worms (helminths) from the body. They may also be called vermifuges (stunning) or vermicides (killing). An anthelmintic will destroy or expel worms from the digestive system. Helminthic infections are among the most common infection in human beings, affecting a large proportion of the world's populations. Diseases caused by helminth parasites in livestock continue to be a major productivity constraint, especially in small ruminants in the tropical and subtropical countries [1]. The whole plant of *Moringa oleifera* (Moringaceae) is used as anthelmintic agent traditionally to eradicate or reduce the number of helminthic parasites in the intestinal tract. *Moringa oleifera* is commonly known as Drumstick or Moringa and contains chemical constituents such as alkaloids, tannins, flavonoids, carbohydrates, amino acids, glycosides. Traditionally used for anemia, anxiety, asthma, blackheads, blood impurities, catarrh, chest congestion, cough diarrhea, eye & ear infections, fever and headaches. Many reports have appeared in mainstream scientific journals describing its nutritional and medicinal properties. Every part of Moringa tree is said to have beneficial properties that can serve humanity [2, 3]. Ishwar Chandra Giri *et al.*, have revealed that methanolic extracts of seeds of the plant *Moringa oleifera* possess significant anthelmintic activity at 100 mg/ml concentrations whereas chloroform extract showed moderate activity and Petroleum ether extract showed least anthelmintic activity. Results were comparable with standard drug Piperazine citrate [4]. There has not been enough emphasis on the research efforts on natural anthelmintics for the last 30 years to cope with the spreading of parasitic infections. Therefore, more research is necessary to be focused on the specificity of

anthelmintic drug. With this objective this study focuses on the validation of the traditional use of Moringa oil as anthelmintic agent.

### 2. MATERIAL AND METHODS

The methodology adopted to evaluate the anthelmintic activity of the seed oil of *Moringa oleifera* [5-7] is as described: Moringa seed oil was procured as a gift sample from the Ramona Cosmeceuticals Pvt. Ltd., Rajapalayam, Tamilnadu and the sample was identified and authenticated as the seeds oil of *Moringa oleifera* by Dr. S. Selveraj, Professor & Head, Horticulture Department, Tamilnadu Agriculture University, Ootacamund.

The Indian earthworm *Pheritima posthuma* (Annelida) was collected from Horticulture Department, Tamilnadu Agriculture University, Ootacamund.

The Moringa seed oil sample was identified as the seeds oil of *Moringa oleifera* and the Indian earth worm was identified as *Pheritima posthuma*. The identification and authentication was done by Dr.S. Selveraj, Professor & Head, Department of Horticulture, Tamilnadu Agriculture University (TNAU).

Preliminary chemical evaluation and quantitative estimation was performed for the Moringa seed oil sample and the results are shown in table-1.

#### 2.1. Calibration curve and quantification of oleic acid

25mg of oleic acid was dissolved in 25ml ethyl acetate to obtain 1mg/ml solution. From above stock solution 1 to 6ml was withdrawn and diluted to 10ml each with ethyl acetate. To

this solution Zinc dust powder and Phenyl Hydrazine (an aldehyde detecting reagent) was added. The above diluted samples were subjected to analysis by using UV-Spectrophotometer (shimadzu-1700) at 515.5nm, the reading are tabulated and calibrated. The sample oil 5 ml was diluted to 10ml of ethyl acetate. To this solution Zinc dust powder and Phenyl Hydrazine was added and subjected to analysis.

## 2.2. Anthelmintic Activity

As per the reference article (Qureshi Md. Shamim *et al.*) the earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human beings. Indian adult earthworms (*Pheretima posthuma*) were used for the anthelmintic study. Four groups of approximately equal sized Indian earthworms consisting of six earthworms in each group were released into 10 ml of extract and oil. Group one for control, receive only distilled water; Group two serve as standard, receive standard drug Piperazine citrate (10mg/ml) ; Group three for Moringa oil and Group four for Oleic acid .Observations were made for the time taken to paralysis and death of individual worms. Paralysis was said to occur when the worms did not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colours and the results are shown in table-2.

## 3. RESULTS AND DISCUSSION

Moringa oil at a concentration of 25mg/ml and 50 mg/ml showed death time of 30min and 24min and oleic acid (25mg/ml) showed death time of 33min Dose dependent activity confirms the potent anthelmintic activity of *Moringa oleifera* seed oil . 72% Oleic acid in the oil of *Moringa oleifera* seeds was quantitatively estimated by UV spectral analysis .The study supports and validates the traditional use of Moringa seed oil and further confirms that the oleic acid present in Moringa seed oil may also contributes to the traditionally claimed anthelmintic activity .

Table 1: Standardization of *Moringa oleifera* seed oil

Parameter	Value Obtained
Density(gm/ml)	0.895
Refractive Index (at 40°C)	1.457
Viscosity (mPa.s)	45.1
Saponification Value (mg of KOH/g oil)	188
Peroxide Value (meq of oxygen/Kg oil)	65.6
Iodine Value (g of Iodine/100g oil)	1.83
% of oleic acid	72

Table 2: Anthelmintic study of *Moringa oleifera* seed oil- Comparative study

Treatment	Conc. (mg/ml)	Paralysis time (min.)	Death Time (min)
Vehicle	-	-	-
Piperzine Citrate	10	22±1.5	40±1.5
Oleic acid	25	23±0.5	33±0.5
Moringa oil	25	21±0.5	30±0.5
	50	16±1.1	24±1.1

## 4. ACKNOWLEDGEMENT

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## 5. REFERENCES

- Ching Chung Wang. *Journal of Medicinal Chemistry*, 1984; **27(1)**:1.
- Qureshi Md. Shamim, Patel J, Venkateshwar RA, Syed Safiullah, Mohapatra P. *Research J Pharmacology and Pharmacodynamics*, 2010; **2(2)**:183-186.
- Fahey JW. *Trees for Life*, 2005; **1**:5.
- Srinivasu U, Amrutia Jay N, Katharotia Reena J. *International Research Journal of Pharmacy*, 2011; **2(8)**:130-131.
- Rastogi T *et al*, *Asian J Research Chem*, 2009; **2(2)**: 181.
- Ghosh T, Maity TK, Bose A, Dash GK, *Indian J Nat Prodct*, 2005; **21**:16-19.
- Mali RG, Mahajan SG Mehta AA. *Phcog Mag*, 2007; **3(10)**: 73.