



## Preparation and Evaluation of Polyherbal Syrup Containing Extracts of leaves of *Moringa Oleifera* and the rhizomes of *Curcuma longa* Linn.

Wagh Jyoti G.<sup>1</sup>, Abhilasha Mittal<sup>2</sup>, Amit Lunked<sup>3</sup>, Veerkar Prachi V<sup>1</sup>,  
Raj Kumari<sup>4</sup>, Divya Pathak<sup>5</sup>, Bipin Verma<sup>6</sup>

<sup>1</sup> MES College of Pharmacy, Sonai, Tal. Newasa, Dist. Ahmednagar, 414105.

<sup>2</sup> NIMS Institute of Pharmacy, NIMS University, Jaipur Delhi Highway (NH-11C),  
Jaipur – 303121, Rajasthan, India

<sup>3</sup> Sitabai Thite College of Pharmacy, Shirur.

<sup>4</sup> ITS College of Pharmacy, Delhi-Meerut Road, Murad Nagar, Ghaziabad, Uttar  
Pradesh 201206, India

<sup>5</sup> IIMT College of Medical Sciences, Department of Pharmacy, IIMT University,  
Meerut, O- Pocket, Ganganagar

<sup>6</sup> Government Polytechnic, Dwarahat Almora, Uttarakhand

**Corresponding author: Dr. Abhilasha Mittal**

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### Abstract

A Polyherbal formulation, syrup is in clinical use for its anthelmintic activity for last few decades. However, no systematic study on its therapeutic/pharmacological effect is reported. The current research work was under taken to evaluate the anthelmintic property of some herbs and compare with the marketed formulation. The present study was to attribute the pharmacological effects to individual constituent as the formulation is of polyherbal nature. Prepared *Curcuma longa* and *Moringa oleifera* syrup show synergistic effect that's why formulated syrup is more effective than marketed albendazole syrup. Stability studies also concluded that the drug release profile or other parameters did not alter significantly after the accelerated stability studies. The study indicates that Polyherbal syrup i.e. *Curcuma longa* and *Moringa oleifera* will offer an option which is more convenient, effective and cost effective as compared to the marketed formulation.

**Keywords:** Polyherbal syrup, anthelmintic activity, *Moringa oleifera*, *Curcuma longa*

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### Introduction:

A region of the body gets infected by parasitic worms such as pinworms, roundworms, or tapeworms in helminthiasis, a macroparasitic illness that affects both humans and animals. Worms frequently inhabit the gastrointestinal tract, but they can also enter the liver, lymphatic system, or other organs

by burrowing. The parasitic helminth infection is increasing mortality and morbidity all over the world. This comprises the cestodes, trematodes, and intestinal nematodes. Because it is the primary source of environmental pollution and transmission, the illness is unevenly distributed in low-income nations, where it is most severely impacted and carries the largest risk of morbidity. [1]

One of the crucial plants used as food and traditional medicine is *Moringa oleifera*. Previous research has shown that the plant's leaves, seeds, roots, barks, and flowers contain a variety of bioactive substances with nutritional and therapeutic benefits. Additionally, this plant has been used to cure a variety of parasite diseases, including leishmaniasis, trypanosomiasis, schistosomiasis, dracunculiasis, and filariasis. [2] In Hindi, "Haldi" refers to the perennial plant *Curcuma longa* Linn. (Zingiberaceae), which has broad, oblong leaves on a short stalk. It produces brownish-yellow, frequently branching, ovate, pyriform, or oblong rhizomes that are either cylindrical or oval. It serves as an analgesic, an expectorant, an antibiotic, an antioxidant, and a flavoring ingredient. The rhizomes are used as a home medicine for inflammation on an empirical basis. It is frequently grown in South India, Bengal, Belgium, Indonesia, Ceylon, and France. [3,4]

The most crucial way to provide medications for systemic effects is through the oral route. Parenteral administration of drugs is not often utilized for self-administration, with a few exceptions. The majority of medications used to have systemic effects are probably given orally. [5] The oral route was also preferred for the administration of ayurvedic herbal preparations. The creation of oral herbal formulations continues to be difficult in contemporary pharmaceuticals. Traditional medicine uses a variety of time-tested medicinal plants that are effective for a wide range of illnesses. For the development of the polyherbal syrup in the current investigation, the leaves of *Moringa oleifera* and the rhizomes of *Curcuma longa* Linn were used.

## **Materials and methods:**

### **Collection of Plant Materials:**

The the leaves of *Moringa oleifera* and the rhizomes of *Curcuma longa* Linn were collected from the from local villages of rahuri, India during June-july 2023 and then authenticated and confirmed by authenticated in the "B.P.H.E Society Ahmednagar College, India.

### **Preparation of Extract:**

The procured plant materials were washed thrice in running water, and cleaned thoroughly. They were then dried under shade for a week or so. Once they were completely dried, they were ground into coarse powder and stored in air tight containers and preserved for the further processing. About 200g of coarsely powdered parts of the plant was extracted with Ethanol at 60- 70°C. Qualitative analysis for various phytoconstituents in the dried powder and extracts of the plant parts of *Moringa oleifera*, *Curcuma longa*, was carried out.

### **Experimental Model:** [6,7,8]

Adult earthworm (*Phertima prosthuma*) were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being) from moist soil, obtained from Rahuri, India and washed out of sand. Two groups of approximately equal size earthworms (8+1 cm) consisting of six earthworms in each group were used for the present study.

### Standard Drug:

Marketed ABZ syrup was selected for comparative study with prepared formulation. The time required to kill the earth worm was recorded and compared with each other, and on this basis best formulation were selected.

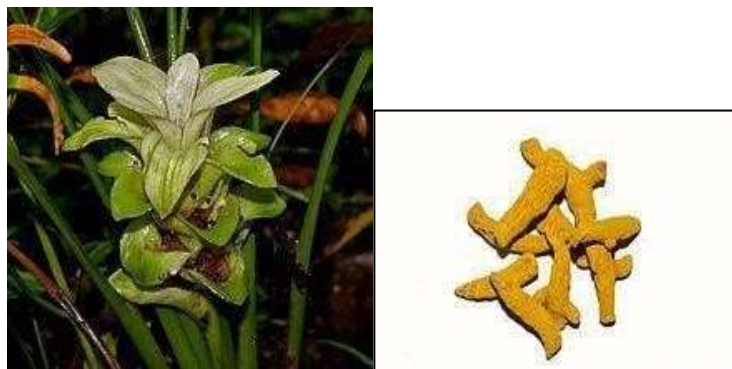
### Formulation of Polyherbal syrup:

Following ingredients were selected to develop the desired formulation.

Sr. No.	Ingredients	F1	F2	F3
1.	Moringa oleifera	30 mg/ml	60 mg/ml	90 mg/ml
2.	Curcuma longa	3 mg/ml	6 mg/ml	9 mg/ml
3.	Sucrose	66.67 gm	6.667 gm	6.667 gm
4.	Propylene glycol(g)	5	100	150
5.	Glycerin(g)	5	100	150
6.	Sucralose(g)	1.5	1.5	1.5
7.	Hydroxy propyl cellulose (g)	1	1	1
8.	Menthol (g)	0.5	0.5	0.5
9.	Orange Oil	1 ml	1 ml	1 ml
10.	Sodium citrate(g)	1	1	1
11.	Distilled Water q.s	100 ml	100 ml	100 ml



**Fig1: Moringaoleifera Flower**



**Fig 2: *Curcuma longa***

Anthelmintic study of Final formulation:

The 10 ml of herbal extracts 0.1 N HCL was take into beaker and diluted with solvent was transferred to 100 mL beaker containing 20 mL of 0.1 N HCl and kept aside for 2 h. This solution was then diluted up to 900 mL using phosphate buffer (pH 6.8). The final concentration in the solution was calculated to be 50 mg/mL. From these, 10 mL of diluted aqueous decoction

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Results:

Three different formulations were prepared by using *Moringa oleifera* and *Curcuma longa* extract. From the results in Table 1 we can conclude that F2 batch was take lesser time to paralysis as well as to kill the earth worm so this batch was selected to formulate polyherbal anthelmintic syrup.

Table 1: Anthelmintic activity of different formulations.

Sr. No.	Batches	Time Taken for paralysis (min)	Time Taken for death (min)
1	F1	22 min 5 Sec	30 min
2	F2	9 min 15 sec	15 min
3	F3	17 min	29 min 10 sec

The polyherbal formulation (F2) of *Moringa oleifera* and *Curcuma longa* showed significant anthelmintic activity as compared with marketed ABZ formulation. The results of anthelmintic activity of polyherbal syrup on earthworms were given in Table 2.

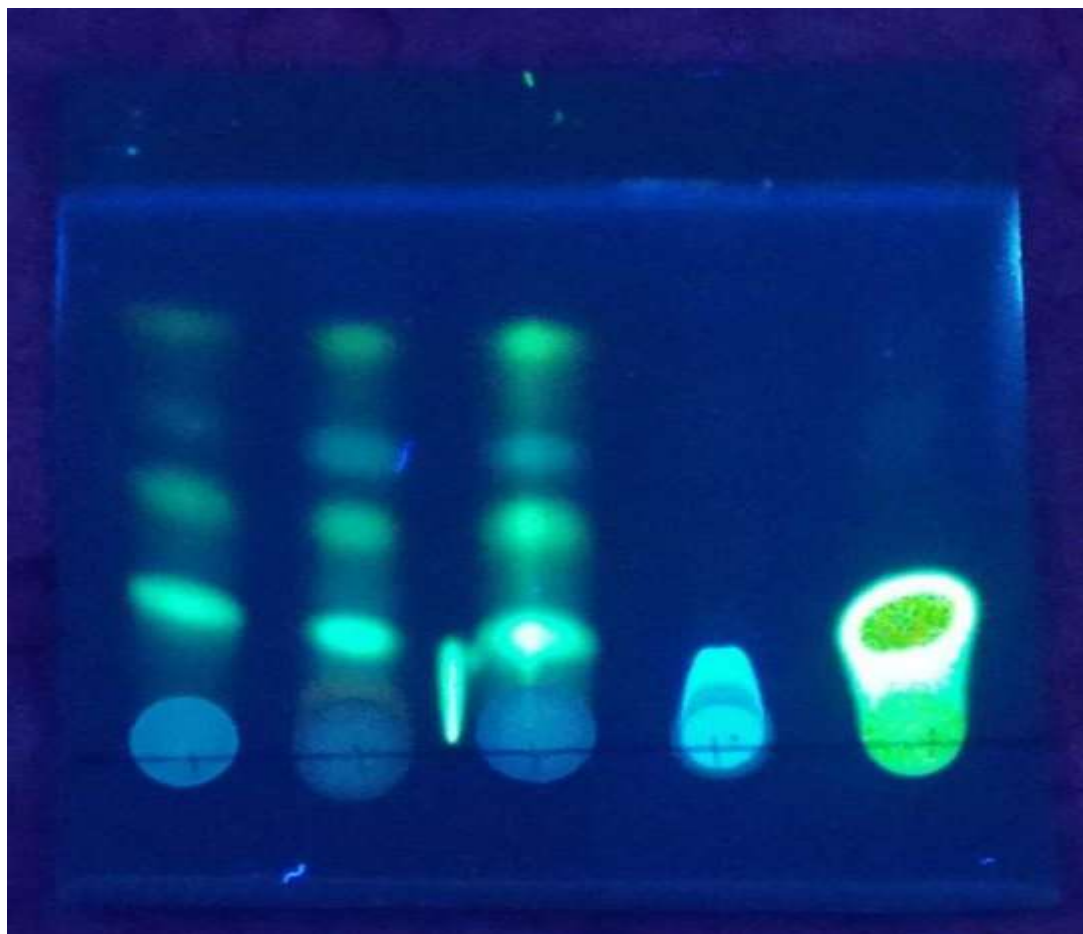
Table 2: Anthelmintic activity of polyherbal syrup vs marketed formulation

Sr. No.	Formulation	Time Taken for paralysis (min)	Time Taken for death (min)
1	Formulated polyherbal anthelmintic syrup	9 min 15 sec	15 min
2	Marketed anthelmintic syrup	15 min 10 sec	27 min 30 sec

It was concluded that from present study that polyherbal syrup with *Moringa oleifera* and *Curcuma longa* showed marked and potential anthelmintic activity than marketed formulation. Therefore, it was further concluded that the mixture of *Moringa oleifera* and *Curcuma longa* may leads to precipitation which will effectively kill the worms and serves as better anthelmintic preparation.

#### **HPTLC Analysis of *Curcuma longa* and *moringa oleifera*- Chromatographic separation method**

This method is based on densitometry measurement at 254 nm for Lecithin and 366 nm for Curcumin in fluorescent mode, which has increased the sensitivity of measurements and avoided the use of derivatizing reagent. The spectral pattern study has suggested the RF as an important parameter. The finger printing of with anolide in the biomass of medicinally important herb *Curcuma longa* & *Moringa oleifera* suggested multiuse of the method. The present analysis signifies methanolic extract as a rich source of curcumin and lecithin compared to other extracts.. The most of the anthelmintic herbal drug formulation contains natural drug. The present validated HPTLC method may have importance in forensic and clinical pathology. The method has also significance in pharmaceutical and phyto pharmaceutical industry as it is cost-effective rational approach for in-process quality control of plant raw materials.

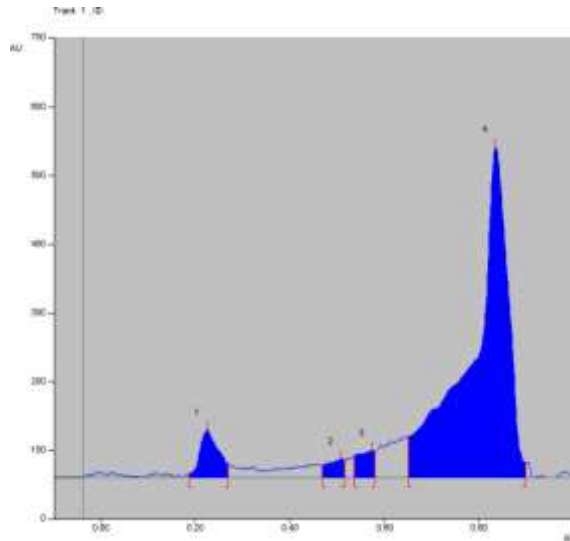


**Figure 3: Quantitative HPTLC analysis of sample and standard.**

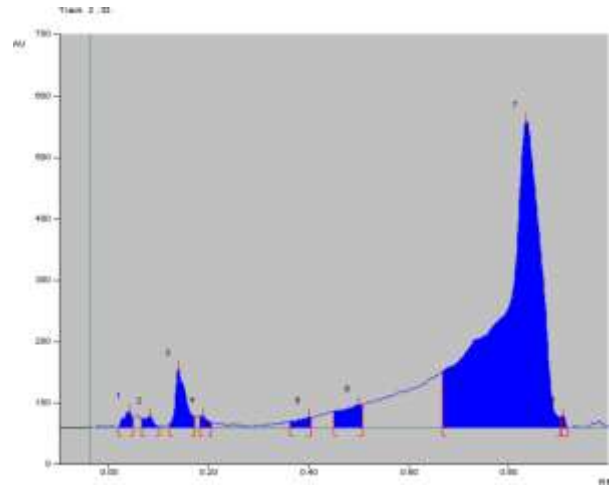
**Sample:** *Moringa oleifera* extract,  
*Curcuma longa* extract,  
Syrup sample,  
Standard Lecithin,  
Standard beta hydroxyl curcumin.

**Determination of sample using developed an validated HPTLC method:**

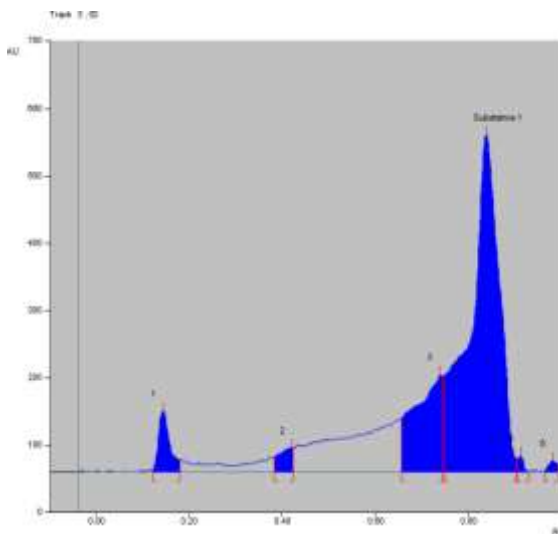
254 for Lecithin and 366 for Curcumin



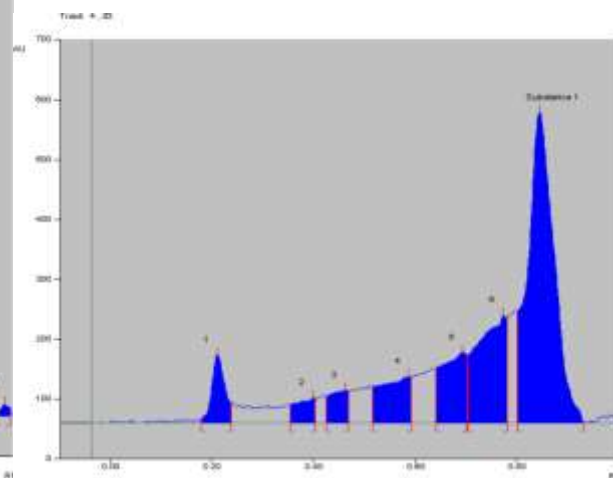
**Fig 4: Track 1 std. (5ug/ml) Lecithin**



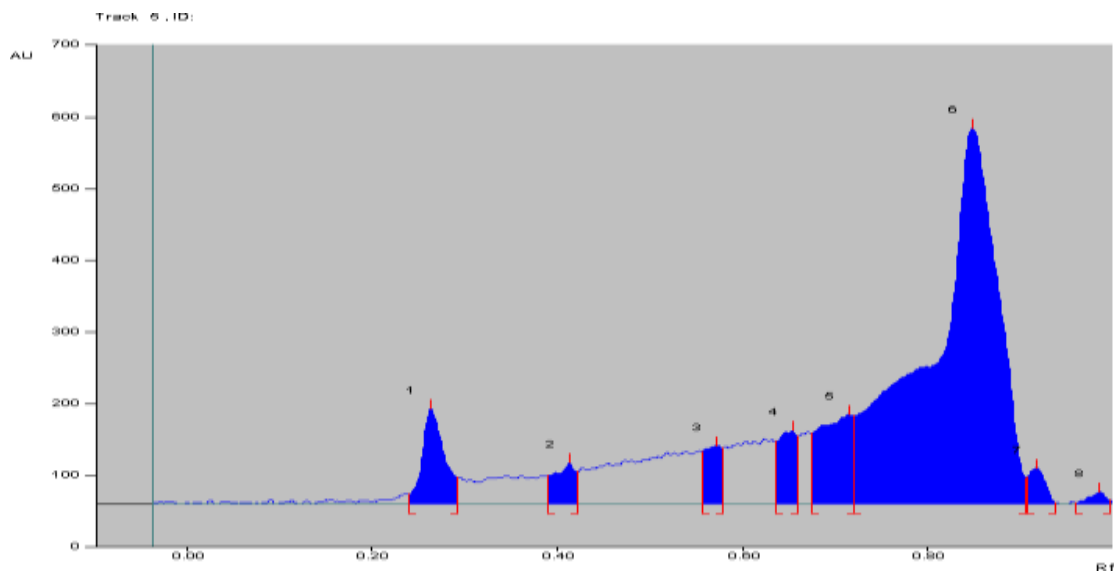
**Fig 5: Track 2 std. (5ug/ml) beta hydroxy Curcumin**



**Fig 6: Track 3 sample syrup (5ug/ml)**



**Fig 7: Track 4 *Curcuma longa* extract (5ug/ml)**



**Fig 8: Track 5 *Moringa oleifera* (5ug/ml)**

**Table 8.8: validated HPTLC method results**

Sample	Concentration	HPTLC Fingerprinting of sample
Sample -1	0.15 ± 0.040	Detected
Sample -2	0.83 ± 0.019	Detected
Sample -3	0.65 ± 0.020	Detected

The HPTLC finger printing of the polyherbal ethanoic extracts showed the above tabulated

**Discussion:**

Based on the reports of limiting side effects and development of resistance to conventional anthelmintic therapy herbal formulation was selected. A polyherbal formulation, syrup is in clinical use for its anthelmintic activity for last few decades. However, no systematic study on its therapeutic/pharmacological effect is reported. The current research work was under



taken to evaluate the anthelmintic property of some herbs and compare with the marketed formulation. Another aim of the study was to attribute the pharmacological effects to individual constituent as the formulation is of polyherbal nature. The anthelmintic activity of the decoction containing Curcuma longa and Moringa oleifera compare to marketed formulation (albendazole syrup).

Based on above results, we prepared the Curcuma longa and Moringa oleifera show synergistic effect that's why formulated syrup is more effective than marketed albendazole syrup.

The study indicates that Polyherbal syrup i.e. Curcuma longa and Moringa oleifera will offer an option which is more convenient, effective and cost effective as compared to the marketed formulation.

Further studies will be conducted to study the potential of resistance development of the designed formulation.

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