

## Comparitive Study of Anthelmintic Activity of *Vitex negundo*, *Moringa oleifera*, *Tamarindus indica* on Indian Earthworm *Phertima posthuma*

Saroj Kumar Raul\*, Gopal Padhy, Mrudula Dhavala, B Shravani

Maharajah's College of Pharmacy, Phoolbaugh, Vizianagaram

The present study was under taken to evaluate anthelmintic activity of ethanolic extract of leaves and roots of vitex negunda and leaves of moringa olifera and roots of tamarindus indica on Indian earthworm pheritima posthuma. Various concentrations (10, 25, 50 mg/ml) of extracts were tested and results were expressed in terms of time of paralysis and time of death of the worm .piperazine citrate (10mg/ml) is used as reference standard and saline water as control group.

**Key words:** Anthelmintic Activity, Pheritima Posthuma, Piperazine Citrate, Vitex Negunda, Moringa Olifera, Tamarindus Indica.

### INTRODUCTION

Medicinal plants used in India is an important therapeutic sources for treatment of variety of elements and has been found to be immense global important. India is perhaps the largest producer of medicinal herbs and rightly called the botanical garden of the world. Medicinal herbs have been used for thousands of years in the indigenous system of medicine like ayurveda, siddha and unani

Helminthiasis is the most common infection in man affecting a large proportion of world population. Parasitic diseases may cause severe morbidities including lymphatic filariasis and onchocerciasis. Development of resistance to most of the commercially available antihelminthiasis became a severe problem worldwide.

### PLANT DESCRIPTION

**Vitex negundo** of family Lamiacea, commonly known as the five-leaved chaste tree, is a large aromatic shrub with quadrangular, densely whitish, tomentose branchlets. It is widely used in folk medicine, particularly in South and Southeast Asia. Its leaves are digitate, with five lanceolate leaflets, sometimes three. Each leaflet is around 4 to 10 cm (1.6 to 3.9 in) in length, with the central leaflet being the largest and possessing a stalk. The leaf edges are toothed or serrated and the bottom surface is covered in hair. The numerous flowers are borne in panicles. 10 to 20 cm (3.9 to 7.9 in) in length. Each is around 6 to 7 cm (2.4 to 2.8 in) long and is white to blue in color. The petals are of different lengths, with the middle lower lobe being the longest. Both the corolla and calyx are covered in dense hairs.

**Moringa oleifera** is the most widely cultivated species of the genus Moringa, which is the only genus in the family Moringaceae. English common names include moringa, benzolive tree, and West Indian Ben. The tree itself is rather slender, with drooping branches that grow to approximately 10 m in height. In cultivation, it is often cut back annually to 1 meter or less and allowed to re-grow so that pods and leaves remain within arm's reach. It is distinguished by leaves usually tripinnate leaves 12-18mm long, petioles yellow and white without red streaks and the tree is medium sized.

**Tamarindus indica** is commonly known as *Tamarind* tree and belongs to family Fabaceae is one of the most important multipurpose tropical fruit tree species in the Indian subcontinent. . It is used traditionally in abdominal pain, diarrhea and dysentery, helminthes infections, wound healing, malaria and fever, constipation, inflammation, cell cytotoxicity, gonorrhoea, and eye diseases. It has numerous chemical values and is rich in phytochemicals, and hence the plant is reported to possess antidiabetic activity, antimicrobial activity, antivenomic activity, antioxidant activity, antimalarial activity, hepatoprotective activity, antiasthmatic activity, laxative activity, and anti-hyperlipidemic activity. It is of moderate to large in size, evergreen tree, up to 24 m in height and 7m in girth. The latest morphologic and molecular analyses and continued study will clarify the exact positioning of *Tamarindus* in relation to its putatively related genera.

### MATERIALS AND METHODS

The methodology adapted to evaluate the anthelmintic activity of leaves and roots of Vitex negundo, leaves of Moringa Olifera, roots of Tamarindus indica.

#### Plant Material:

The plant material is collected from the Local area of Phool Baugh, Vizianagaram, Andhra Pradesh. They were identified and confirmed from the Department of Botany in Maharajah's Autonomous College, Vizianagaram, Andhra Pradesh

#### Collection of Worms:

The Indian earthworm Pheritima Posthuma are collected from water logged areas of Visakhapatnam and identified from the Department Of Zoology, Andhra University, visakhapatnam.

#### Preparation of Extract:

The collected materials were washed thoroughly in water cut into small pieces and air dried for three weeks at 35-40. Extraction was done by using soxhlet apparatus with 90% ethanol. The extract was then concentrated under reduced pressure, dried powdered and stored in air tight container.

#### Preparation of Test Samples:

Sample for in vitro study were prepared by adding Tween 80 as suspending agent in 2.5gm of each extract in 25ml of saline

---

#### Corresponding Author:

Saroj Kumar Raul, Maharajah's College of Pharmacy, Phoolbaugh, Vizianagaram

Received 02-01-2012; Accepted 24-02-2011

water to obtain a stock solution of 100mg per ml. from the stock solution different working dilutions were prepared to get concentrations of 10mg/ml, 25mg/ml, 50mg/ml.

### 5. Anthelmintic Activity:

The Anthelmintic activity was performed according to the methodology followed by Ajaiyeoba *et.al*, 2001[6] on adult Indian earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance with human intestinal roundworm parasite. Earthworms were divided into 3 groups; consisting of 6 earthworms in each group and were released into 20ml of the desired formulation. Group I serve as control and receive only distilled water, Group II serves as standard and receives standard drug Piperazine citrate (10mg/ml), Group III serves as the alcoholic extract of different concentrations.

Observations were done for the time taken for the paralysis and death of individual worms. Paralysis was said to be occurred when there no movement of any sort could be observed except that the worms were shaking vigorously. Death was said to be occurred when the worms lost their motility followed with fading of their body color.

### RESULTS AND DISCUSSION

As shown in the Table below the data revealed that leaves extract of *Moringa olifera* at the concentration of 10 mg/ml showed the time of paralysis and death at 26.40 min. and 79 min. respectively. For concentration of 25mg/ml, the paralysis and the death time was found 14.5 min. and 65.0min. Respectively. At the concentration of 50mg/ml, time was 10.20 min. for paralysis and 55.0 min. for death. While in *Vitex negundo* leaves extract at the concentration of 10mg/ml, the time of paralysis and death was found to be 124.0min. And 532 min. respectively. At concentration of 25 mg/ml, it was 84.0 min. for paralysis and 445.0 min. for death. For concentration at 50mg/ml, the time of paralysis and death was 32.60 min. and 310.4 min. respectively. In case of, *Vitex negundo*(roots) the time of paralysis and death was 140 min. and 520 min. respectively at concentration of 10 mg/ml. At concentration of 25 mg/ml, the time of paralysis and death was 90.5 min. and 460.2 min. respectively and at 50 mg/ml concentration, the time of paralysis and death was 34min. and 340.5 min. respectively. And in the plant *Tamarindus indica* roots extract the time of paralysis and death was 105.4min. And 140.5min. at concentration 10 mg/ml. At concentration, 25 mg/ml the paralysis and the death time was 86.5min. and 110.2min. At concentration 50 mg/ml the paralysis and death time was 65.5 and 82.4min. The observations with piperazine citrate showed that time of paralysis and death was 22.4min. and 46.5min. respectively for concentration at 10 mg/ml). It was observed that both *Moringa olifera* as well as *vitex negundo* leaves extracts showed a remarkable anthelmintic potential against intestinal parasitism. Amongst the both extracts, *Moringa olifera* showed better activity.

Test substance	Concentration mg/ml	Time taken for paralysis(P)in min	Time taken for death (D) in min
Vehicle	-	-	-
P.C	10mg/ml	22.4±1.5	46.5±2.4
<i>Moringa olifera</i> (Leaves)	10	26.4±1.2	79.0±1.5
	25	14.5±1.5	65.0±1
	50	10.2±1.2	55±1.4
<i>Vitex negundo</i> (Leaves)	10	124.0±1.4	532±1.5
	25	84.0±1.2	445.0±2
	50	32.6±1.0	310.4±2
<i>Vitex negundo</i> (roots)	10	140±1.5	520±1.4
	25	90.5±1.3	460.2 ±1
	50	34±1.2	340.5±1.5
<i>Tamarindus indica</i> (roots)	10	105.4±1.5	140.5±2
	25	86.5±1.2	110.2±1.5
	50	65.5±2	82.4±1

All values represent Mean ±SD, n=6 in each group

### ACKNOWLEDGEMENT

Authors are thankful to Dr. P. Udaya Shankar, Principal, Maharaja's college of pharmacy for providing the necessary facilities and support for us to carry out this work.

### REFERENCES

- Bundy DA. Immunoepidemiology of intestinal helminthic infection 1: The global burden of intestinal nematode disease. *Trans R Soc Trop Med Hyg* 1994;8:259-61
- The Ayurvedic Pharmacopoeia of India, Part I, Vol. I, Government of India Ministry of Health and Family Welfare; 2004. p.77-78.
- . Vidyarthi RD. A Textbook of Zoology. 14th ed. New Delhi: Chand and Co. Press; 1977. p. 329-31.
- . Chatterjee KD. Parasitology, Protozoology and Helminthology. 6th ed. Calcutta: In Guha Ray Sree Saraswaty Press Ltd; 1967.
- Lal J, Chandra S, Raviprakash V, Sabir M. In vitro anthelmintic action of some indigenous medicinal plants on *Ascaridia galli* worms. *Indian Physiol Pharmacol* 1976; 20:64-8.
- Ajaiyeoba.E.O, P.A and Olarenwaju O.T, Invitro Anthelmintic properties of *Buchholzia coriaceae* and *gynadra* extract. *pharm.Biol.* 2001, 39 (3). pp. 217 – 220.
- . Martin RJ. Mode of action of anthelmintic drugs. *Vet J* 1997; 154:11-34.
- Doughari, J. H. (December 2006). "Antimicrobial Activity of *Tamarindus indica*". *Tropical Journal of Pharmaceutical Research* 5 (2): 597-603.
- a.
1. Sollmann T., Anthelmintics, Their efficacy as tested on earth worms, *J. pharmacological.exp.Ther*12, 129, and 170.
3. Dash G.K, Suresh P, Ganpaty. S and Panda S.B, Evaluation of *Evolvia* alsinoids Linn for anthelmintic and antimicrobial activities, *J.Nat.Rem*, 2002, 2 (2), pp.182-185.
- Waller PJ, The future of anthelmintics in sustainable parasite control programme for livestock. *Helminthologia*. 2003; 40: 97-102.
- Mali RG, Shailaja Mahajan, Patil KS. Anthelmintic activity of root bark of *Capparis spinosa*. *Indian J Nat Prod*. 2005; 21:50-1.
- Athnasiadou S, Kyriazakis I, Jackson F, Coop RL. Direct anthelmintic effects of condensed tannins towards different gastrointestinal nematodes of sheep: In vitro and in vivo studies. *Vet Parasitol*. 2001; 99:205-19.
- V. J. Theodorides *et al.*, Anthelmintic Activity of Albendazole Against Liver Flukes, Tapeworms, Lung and Gastrointestinal Roundworm.
- Singh D, Swarnkar CP, Khan FA. Anthelmintic resistance in Gastrointestinal nematodes in livestock in India. *J Vet Parasit*. 2002; 16: 115-13.
4. Thomson DP, Geary TG. The structure and function of helminth surfaces. In: Marr eds. *Biochemistry and Molecular Biology of Parasites*. New York, Academic Press. 1995. pp 203-232.

**Source of support:** Board of Research in Nuclear Science, Government of India,  
**Conflict of interest:** None Declared