



## ***In vitro* anthelmintic activity of Fenugreek seeds extract against *Pheritima posthuma***

Chandrashekhar D. Khadse\*, Rajendra B. Kakde,

MES, College of Pharmacy, Sonai, Tal. Newasa, Dist. Ahmednagar-414105 M.S. India  
Department of Pharmaceutical Sci., RTM, Nagpur University, Nagpur, M.S. India

### **ABSTRACT**

Crude extracts of *Trigonella foenum-graecum* (Leguminoceae) were evaluated for in-vitro anthelmintic activity on the Indian adult earthworms *Pheritima posthuma*. The seed extracts of *Trigonella foenum-graecum* had shown a dose dependant inhibition of spontaneous motility (Paralysis) of earthworms. It has been observed that alcoholic extract (60mg/ml) has shown anthelmintic activity, which was compared with albendazole as reference drug. Therefore the seeds could be categorized under anthelmintic herbal drugs and could become a potent key ingredient of such herbal formulation.

**Keywords:** Anthelmintic activity, *Trigonella foenum-graecum*, *Pheritima posthuma*, Fenugreek.

### **INTRODUCTION**

Plant *Trigonella foenum-graecum* belongs to the family Leguminoceae and it is popularly known as Fenugreek (Warrior, 1995). It is native to the area from the Eastern Mediterranean to Central Asia and Ethiopia, and much cultivated in India and China (Morton, 1990). Plant seeds and leaves are used not only as food but also as an ingredient in traditional medicines (Wallis, 2005). It has been mentioned in Ayurveda and Siddha that these plants are used to treat fever, dysentery and heart diseases, while in Unani system, this plant is used as an aphrodisiac, diuretic, emmenagogue and tonic (Nadkarni, 1982). Antihelmintics are those agents that expel parasitic worms (helminthes) from the body, by either stunning or killing them. Helminthes infections are commonly found in community and being recognized as cause of much acute as well as chronic illness among the various human beings as well as cattle's. More than half of the population of the world suffers from various types of infection and majority of cattle's suffers from worm infections (Chaturvedi et al., 2009). Intestinal infections with worms can more easily treated than those the infections occurs in other locations in the body, because the worms need to be killed by the drug and the drug need not be absorbed when given by oral route. Carbon tetra chloride extract of fenugreek seeds, when administered orally, has shown to reduce plasma glucose and water intake and in-

crease liver glycogen in STZ-induced diabetic rats (Zahedi Asl S et al., 2007). The seeds has been reported to contains Diosgenin, Trigonelline, Gitogenin, Vicenins-I & II, Vitexin, Quercetin, Luteolin, Kaempferol,  $\beta$ -Sitosterol etc., moreover the endosperm of the seeds is rich in galactomannan (Trease & Evans, 2002, Kalia, 2005, Rangari, 2004). Because of increasing anthelmintic resistance and impact of conventional anthelmintic on the environment, it is important to look for alternative strategies against gastrointestinal nematodes. Use of herbs could be one of the major options to control these pathologies. The literature survey reveals that seed is used to treat various types of gastrointestinal problems (Bhattacharjee, 2004). Therefore an attempt has been made to evaluate anthelmintic activity of seeds on adult earthworm *Pheritima posthuma*.

### **MATERIAL AND METHOD**

#### **Preparation of extract**

The seeds are procured from the local market of Sonai, Ta. Newasa, Dist. Ahmednagar and identified from Department of Botany, Science College Sonai, Ta. Newasa, Dist. Ahmednagar and voucher specimen no. DARTRIG86 of drug is kept in the Department. Seeds are dried at about 50°C in hot air oven for overnight then pulverized to course powder, extracted by soxhlation using alcohol (90%v/v) and by hot maceration method using water. Both extracts were dried at 40-60 °C.

#### **Evaluation of anthelmintic activity**

*Pherithema posthuma* is commonly known as earthworms were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being) from water

---

\* Corresponding Author  
Email: khadsecd@gmail.com  
Contact: +91-9921357845  
Received on: 24-01-2010  
Revised on: 25-06-2010  
Accepted on: 28-06-2010

**Table 1: Anthelmintic activity of alcoholic and aqueous extract of *Trigonella Foenum-graecum* seeds**

Treatment	Concentration used in mg/ml	Time taken for paralysis (min)	Time taken for death (min.)
Control (Normal Saline)	-	-	-
Water extract	20	2.39±0.09	7.88±0.72*
	40	2.13±0.52	7.30±0.48*
	60	1.96±0.62	6.85±0.14*
Alcoholic extract	20	1.90±0.81	4.88±0.42**
	40	1.46±0.58	4.02±0.73**
	60	1.05±0.67	3.67±0.15**
Albendazole	20	1.83±0.78	5.05±0.32
	40	1.30±0.65	4.18±0.46
	60	1.18±0.32	3.20±0.95

Values are Mean ± S.D analyzed by Dunnett's test \* = p<0.01, \*\* = p<0.05

logged area nearby Sonai, Ta. Newasa Dist. Ahmednagar. Anthelmintic activity was carried out on adult earthworm, *Pherithema posthuma* (Mali et al., 2008). Ten groups were made, each containing six adult earthworms of approximately equal size. The solutions of alcoholic extract, aqueous extract and albendazole were made in the concentrations of 20, 40, 60 mg/ml in normal saline as vehicle. Groups of earthworms were released into 10 ml of desired formulations as made above, and one group was treating as control in normal saline. The observation was made for the time taken to cause paralysis and death of individual worms. Paralysis was said to occur when the worms did not move even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colours.

## RESULTS

Ethanol and aqueous extracts were used to evaluate anthelmintic activity has shown dose dependant activity. The Mean ± S.D. values (statistical analysis) were calculated for each extracts. The result of anthelmintic activity on earthworm phertima prosthuma was given in table-I, reveal that, the different concentration used for both aqueous and alcoholic extracts has shown paralysis and death of earthworms and it was compared in the same concentration with albendazole as reference drug. Alcoholic extract in the concentration of 60 mg/ml has taken less time to cause paralysis, and little more time to cause death of earthworms as compared with same concentration of reference drug.

## DISCUSSION

Some of the traditionally used herbs have scientifically proved a potent anthelmintic activity by using suitable experimental models. Alcoholic and aqueous extracts from the roots of the plant *Baliospermum montanum* Muell. had shown significant anthelmintic activity at concentration of 100mg /ml with reference to piperazine citrate (10mg/ml) as a standard drug by using adult earthworms *P. posthuma* and *Ascardia galli* as experimental model (Mali et al., 2008). Polyherbal

formulation containing aqueous and ethanolic extracts of *Plumbago zayanica* (leaves), *Hyocymus niger* (roots), and *Abultion indicum* (leaves) has shown anthelmintic activity using adult earthworms *P. posthuma* as experimental model (Chaturvedi et al., 2009). The present study reveals that seeds of *Trigonella Foenum-graecum* showed mark and potent anthelmintic activity. Alcoholic extract had shown promising result as anthelmintic activity and water extracts has also shown activity up to lesser extent. As seeds are cheap, easily available in the local market, therefore seeds of this plant could be categorized under Anthelmintic herbal drugs and could become a key ingredient of Anthelmintic herbal formulation.

## CONCLUSION

From the above result it is concluded that alcoholic extract of seeds of *Trigonella Foenum-graecum* have a potent anthelmintic activity when compared with conventionally used drug. It is comparable with standard drug. Further studies using in vivo model are required to find out and to establish effectiveness and pharmacological rationale for the use of seeds as anthelmintic drug. Further studies to isolate active constituent from extracts to establish(s) mechanism of action is required.

## ACKNOWLEDGMENTS

Authors would like to thanks to Prof. Deshmukh V.K., Principal, MES, College of Pharmacy, Sonai, for providing the required facilities during this project. Also thankful to Prof. V.E. Daradale, Head of Department, Science College, Sonai, for authentication of plant species.

## REFERENCE

- A.K. Nadkarni, Indian Materia Medica, Popular Prakashan pvt. Ltd., Bombay, 1982, pp. 1240-1243.
- A.N. Kalia. Text book of Industrial Pharmacognosy. CBS publisher and distributors, 2005, pp. 223
- Chaturvedi M., Dwivedi S., Dwivedi A., Barpete P.K., Sachan R. Formulation and Evaluation of Polyherbal

- Anthelmintic Preparation, Ethnobotanical Leaflets 2009, 13: 329-331.
- J.F. Morton. Mucilaginous plants and their uses in medicine. J.Ethnopharm.1990,29: 215 - 266
- P.K. Warrior, V.P.K. Nambiar, Indian Medicinal Plants, Orient Longman, 1995, pp.131.
- Ravindra G. Mali, Shailaja G. Mahajan Anita A. Mehta. In Vitro Screening of *Cleome Viscosa*. Extract for Anthelmintic Activity, Pharmaceutical Biology 2007, 10: 766-768
- S.K. Bhattacharjee, Hand book of Medicinal Plants, Pointer Publisher, Jaipur, 2004, pp. 354-355.
- T.E.Wallis. Text book of Pharmacognosy, CBS Publication and Distributor New Delhi, 2005, pp. 224-225.
- Trease and Evans. Pharmacognosy, Elsevier, a Division of Reed Elsevier India Pvt. Ltd, New Delhi, 2002, pp. 292-293.
- V.D.Rangari. Pharmacognosy and Phytochemistry part-II. Career Publications Nashik. 2003, 87-88
- Zahedi Asl S, Farahnaz S, Ghasemi A, Zaree B, The Effect of Carbon Tetrachloride Extract of *Trigonella Foenum Graecum* Seeds on glycogen Content of Liver in Streptozotocin-Induced Diabetic rats. International Journal of Endocrinology and Metabolism 2007, 2: 70-75