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RESEARCH ARTICLE

INVESTIGATION OF *IN VITRO* ANTHELMINTIC ACTIVITY OF *FICUS ELASTICA* LEAVES

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ABSTRACT

The World Health Organization estimates that a staggering two billion people harbor parasitic worm infections. The increasing of anthelmintic drug resistance and the high cost of anthelmintic drugs led to the development of herbal medicine as an alternative source of anthelmintic. In the current study, *in-vitro* experiments were conducted to determine the possible anthelmintic effects of *Ficus elastic (FE)* Linn which are traditionally used for treatment of various diseases. The main aim of this study is to investigate the anthelmintic activity of *Ficus elastica* using earth-worms (*Pheritima posthuma*). Intestinal worms affect a host of individuals resulting in malnutrition, intellectual retardation, stunted growth and cognitive deficits. The leaves of the plant were taken for anthelmentic activity against Indian earthworm *Pheritima posthuma*. The Methanol and Ethanol extract of the *Ficus elactica* were evaluated for their anthelmintic activity against metronidazole (10mg/ml) as a reference and distilled water as a control group and the results were expressed in terms of time for paralysis and time for death of worms.

KEY WORDS: - *Ficus elastica* Linn. anthelmintic activity, metronidazole, *Pheritima posthuma,* Death time, Paralysis time.

INTRODUCTION:

Drugs which acts locally to expel the worms from the gastro-intestinal tract or systemically to eradicate adult helminths or developmental stages that invade organs and tissues known as Anthelmintics drugs[1] and all these medicines are widely used to destroy parasites that live in the body of human and other animal. As per World Health Organization (WHO) statistics and reports there are more than two billion people harbor parasitic worm infections[2]. In areas of high prevalence, simultaneous infection with more than one type of helminthes is common. The worm infestations are also a major cause for concern in veterinary medicine, affecting domestic pets form animals[3]. Inhabitants of tropical or subtropical, low income countries are most at risk; children often become infected with one or more species almost as soon as they are born and may remain infected throughout their lives[4].The helminthiasis is a worm infestation and highly prevalent disease particularly in third world countries due to poverty, illiteracy, lack of adequate sanitary facilities and pure water supply[5]. The main problem with antihelmintics is that many of these drugs have been used for a long time and this over time parasites have developed drug resistance[6]. Most of the existing anthelmintics drug e.g. levamisole produce a side effects such as abdominal pain, loss of appetite, vomiting, nausea, diarrhea and headache[7]. Much importance has been replaced by phytomedicine or Phytoconstituents for now day due to their outstanding advantages than synthetic drugs. These advantages are least side effects, low cost and least drug resistance. Thus phytomedicine has become a good alternative to synthetic anthelmintics[8].

Ficus elastica Linn. (Moraceae) is a widely spread evergreen tree up to 30-40 metres (98–130 ft) height with a stout trunk up to 2 meters (6.6 ft) diameter.. The leaves of *F. elastica* are 10-35 cm (3.9–14 inch) long and 5–15 centimeters (2.0–5.9 inch) broad, with broad shiny oval, smooth edges and blunt pointed tips. The leaves are thick and about a foot long with deep green colour. This plant is known locally as "India-rubber tree"[9].

MATERIALS AND METHODS:

PLANT COLLECTION:

The leaves of *Ficus elast*ica were collected from the herbal garden of GRKIST (Pharmacy), Jabalpur, District of Madhya Pradesh, India and identified and authenticated by Dr. Santram Lodhi (HOD) Pharmacognosy Dept. GRKIST (Pharmacy). The plants Leaves were cleaned well and dried under shed at room temperature for extraction.

PREPARATION OF PLANT EXTRACTS:

About 25 gm of dried leaves of *Ficus elastica* were weight and powdered by subjected to size reduction and passed through sieve no. 40. The crushed mass of leaves was then ready for extraction. Then leaves powder was extracted with Methanol and Ethanol by maceration at room temperature for 14 days with occasional shaking. After then filtered and press the marc and collect the filtrate in beaker. Methanolic extract (ME) and Ethenolic

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extract (EE) of leaves were concentrated for further study of anthelmintic activity.

COLLECTION OF WORMS:

Healthy adult Indian earthworms *Pheritima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings were used in the present study. All the earth worms were of approximately equal size to 4-8 cm length were obtained from the damp, cool, and covered area of the gardens of the local area. The worms were washed and transferred into a glass bottle with some quantity of water and authenticated.

ANTHELMINTIC ACTIVITY:

Anthelmintic activity was performed according to the method[10]. The adult Indian earth worm *Pheretima pothuma* as it has anatomical and physiological resemblance with the intestinal round worm parasites of human beings. Earth worm was placed in petridish containing three different concentrations each of ethanolic extract of *ficus elastic* (EEFE) and methanolic extract of *ficus elastic* (MEFE). Each petridish was placed with 4 worms and observed for paralysis and death time of individual worms. The time for paralysis was noted when no movement of any sort could be observed except when the worm was shaken by force, the time death of worm was recorded after ascertaining that worm neither moved when shaken nor when given external stimuli. In the same manner normal as control and Metronidazole was included as a reference compound. The test results were compared with standard Metronidazole (10mg/ml) treated sample.

RESULTS AND DISCUSSION:

According to table the leaves extract of *F. elastica* Linn.were used to evaluate anthelmintic activity, shows variable death time and paralysis time at different concentrations. It is close to the standard drug metronidazole (10mg/ml) activity. The activities of the crude extract increase with increasing the amount or concentration of leaves of *F. elastica* has shown paralysis and death time given in table. The Ethanolic extract of leaves having less time in paralysis and death time of earthworms compared to methanolic extract of leaves. So that, the Ethanolic extract of *F. elastica* shows significant anthelmintic activity greater than methanolic extract at maximum concentration. The results of this study are given in table-1.

CONCLUSIONS:

Antihelmintic effects of the extracts can ease the economic burden on antihelmintic therapy against *Pheritima posthuma*. The leave extracts of *Ficus elastica* having significant antihelmintic activity at high dose. The results are show in (Table 1 and Graph no-1 and 2) anthelmintic activity of Ethanolic extract of *F.elastica* was closely related to the metronidazole as standard drug for anthelmintic activity.

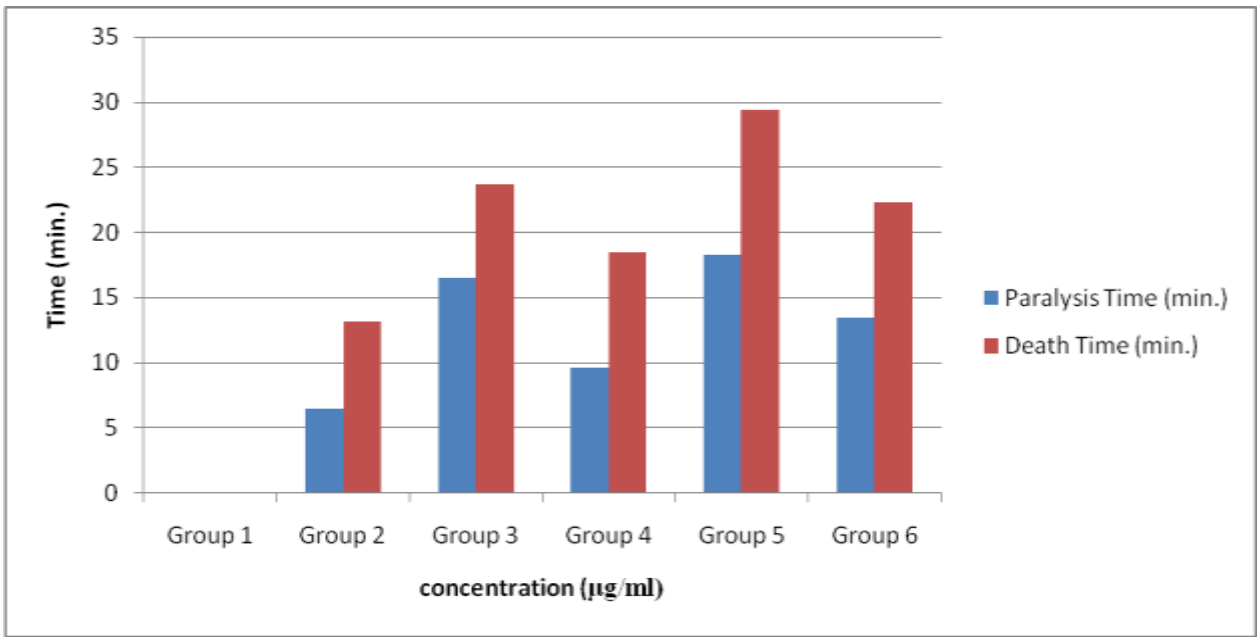
Table 1: Invitro anthelmintic activity of Ethanol and Methanolic extract of leaves of *Ficus elastica* Linn.

Sr. No.	Treatment	Group	Concentration (mg/ml)	Paralysis time (min.)	Death time (min.)
1	Normal Control	Group 1	0	0	0
2	Metronidazole	Group 2	10(mg/ml)	6.45	13.2
3	Ethanolic extract	Group 3	25	16.5	23.7
		Group 4	50	9.6	18.5
4	Methanolic extract	Group 5	25	18.3	29.4
		Group 6	50	13.5	22.3

Figure: 1 Anthelmintic activity of Ethanolic extract of *Ficus elastica*

Figure: 2 Anthelmintic activity of Methanolic extract of *Ficus elastica*

Graph No1: Presentation of anthelmintic activity of various groups.



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REFERENCES:

1. Devi K, Indumathy S, Rathinambal V, Uma S, Kavimani S, Balu V (2009). Anthelmintic Activity of Asta Churna. International Journal of Health Research, 2(1): 101-103.
2. Khurana A (2010). What Are Anthelmintic Drugs and How They Work? Available at: http://ezinearticles.com/?What-Are-Anthelmintic-Drugs-and-How-Theywork? &id=4191153. Ac-cessed on July 23, 2011.
3. Dubey R.D., S. Verma, D. Rane, V.K. Wani, A.K. Pandey, S. Paroha, 2010. Comparative Studies of Anthelmintic Activity of *Zingiber officinale* and *Cassia tora*. International Journal of Chemical and Pharmaceutical Sciences, Aug., Vol.1 (1).
4. B.N. Vedha Hari*, P. Saravana Kumar, D. Ramya Devi**,** 2011, comparative in-vitro anthelmintic activity of the latex of ficus religinosa, ficus elastica and ficus bengalensis**,** Journal of Phytology, 3(3): 26-30.
5. Dhar DN, Sharma RL, Bansal GC. Gastrointestinal nematodes in sheep in Kashmir, Vet. Parasitol, 1982; 11: 271-277.
6. Sarojini N, Manjari SA, Kanti CC, (2011). Phytochemical screening and anthelminthic activity study of Saraca indica leave extract, International Research Journal of Pharmacy, 2(5): 194-197.
7. Goodman LS, Gilman A (2001). The Pharmacological basis of Therapeutics.10th Edition, Mcgraw Hill Medical Publishing Division, New York, 1121.
8. Pawan VK, (2009). Pharmacological Evaluation and Validation of Plant based Anthelmintics. Pura. Jammu (J & K).
9. Burrill, L. H. 1966. A Dictionary of the Economic Products of the Malay Peninsula. 1: 1021. Kuala Lumpur, Malaysia: Ministry of Agriculture and Co-operative.
10. Ghosh T, Maity TK, Bose A, et al. Anthelmintic activity of *Bacopa monierri.* IJNP; 2005; 21:16-19.