



Original Article

In-vitro anti-helminthic activity of figs extract of ficus benjamina; a potential hopeRajinder Singh*¹, Radhey S. Dhuria¹¹Department of Pharmaceutical Sciences, Guru Nanak Dev University, Amritsar, Punjab, India.**Abstract**

Objective: Modern anti-helminthics has limited the effective control of the parasites due to number of side effects and development of resistant in helminthes. This renewed the interest in screening of medicinal plants for their anti-helminthic activity and the present study was design to investigate the anti-helminthic activity of *Ficus benjamina* figs. **Material and methods:** Three concentrations (25, 50 and 100 mg ml⁻¹) of methanol and aqueous extract were investigated for activity on adult Indian earthworms (*Pheretima posthuma*). **Results:** Both the extracts show a dose dependant reduction in paralysis and death time of the worm, methanol extract was found to be more effective especially at 100mg kg⁻¹. **Conclusions:** The anti-helminthic activity of extracts was comparable to standard Piperazine citrate, and could be effective against parasitic helminths of humans and animals.

Keywords: *Ficus benjamina*, Anthelmintic activity, *Pheretima posthuma*

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1. Introduction

According to the World Health Organization infectious diseases are the main cause of death and the key agents of the afflicting worldwide [1]. These infections are usually transmitted through contaminated water/food, unwashed hands, feces or contact with contaminated objects. Helminth infections are among the most widespread infections in humans especially in Poverty-stricken and developing countries with warm moist environments and poor

sanitary conditions [2]. Although the majority of infections due to helminths are generally restricted to tropical regions and cause enormous hazard to health and contribute to the prevalence of under nourishment, anemia, eosinophilia and pneumonia [3] and its worldwide prevalence lies between 500 million to one billion annually approximately. Anti-helminthic drugs target the helminth parasitic worms (helminths) and expel them from the body, either by stunning or by killing them. Ideally an anti-helminthic agent should have a broad spectrum of

action, high percentage of cure, free from toxicity to the host & should be cost effective, but none of the synthetic drugs available in market meets these requirements [4]. Moreover as helminthes are increasingly becoming resistant to classical drugs [5], there is an urgent need for search and development of new anti-helmintic agent, preferably with novel mode of action [6]. Even the most common drugs like piperazine salt have been shown to have side effects like nausea, intestinal disturbance and giddiness[7] and the high cost of modern anthelmintics has limited the effective control of these parasites. This leads to renewed interest in screening of medicinal plants for their anthelmintic activity. The traditional medicines hold a great promise as source of easily available effective anti-helmintic agents to the people, particularly in tropical developing countries[8]. The present study was design to investigate the anti-helmintic activity of figs of plant *Ficus benjamina* belongs to family moraceae. Fruit extract of flant is reported to have antitumor and antibacterial activity [9], aqueous and alcoholic extracts reported to have have analgesic activity [10].

2. Material and Methods

Plant material

Figs of the plant *Ficus benjamina* were collected from botanical garden of Guru Nanak Dev University, Amritsar; dried under shade and crushed to a coarse Powder.

Preparation of extract

Powdered plant material was defatted with petroleum ether, followed by successive solvent extraction with chloroform, ethyl acetate, and methanol in Soxhlet extractor for 48 hours. Mark was

then boiled with water to obtain aqueous extract. Extracts were concentrated to a semisolid mass and stored in refrigerator. Methanol and water extract at the concentration of 12, 25, 50 and 100 mg/ml were investigated for anti-helmintic activity.

Drugs and chemicals

Piperazine citrate was purchased from GSK Pvt. Ltd. All the other solvents and chemicals used during experimental protocol were of analytical grade.

Animals

Adult Indian earthworms (*Pheretima posthuma*) were obtained from Dept. of Zoology, Khalsa College, Amritsar, and washed with normal saline to remove all the fecal matter. The earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used in all the experimental protocol.

Anti-helmintic activity

Methanol and aqueous extracts were explored for Anti-helmintic activity according to the method described by [11]. Adult Indian Earthworms (*Pheretima posthuma*), due to their physiological and anatomical resemblance with human beings parasites (intestinal roundworm), are used in present study [12, 13]. The worms were divided into 10 group containing six earthworms in each. Both the extracts were diluted to concentrations of 12, 25, 50 and 100 mg/ml with distilled water. Piprazine citerate (standard) was dissolved in distilled water to make 50 and 100 mg/ml. All the solutions were prepared freshly prior to the experiment. Earth worms were washed with normal saline and transfer to Petri-dishes containing of different concentrations of extracts and standard (25mg ml⁻¹).

Table No. 1. Anti-helminthic activity of methanol and Aqueous extract

Treatments	Concentration	Time for paralysis (min.)	Time for death (min.)
Vehicle	--	--	--
Methanol extract	25 mg ml ⁻¹	86.7± 13.7	141.1± 17.3
	50 mg ml ⁻¹	38.6 ± 9.3	71.6±12.3
	100 mg ml ⁻¹	13.5 ±2.8	33.4 ±4.5
Aqueous extract	25 mg ml ⁻¹	186.6± 17.6	243.7± 18.3
	50 mg ml ⁻¹	88.7 ± 6.4	120.8±10.3
	100 mg ml ⁻¹	38.3 ±4.6	93.8 ±6.5
Piperazine	25 mg ml ⁻¹	24.3± 6.1	63.5± 9.8

Observations were made for the time taken for paralysis (when no movement of any sort could be observed except when the worms were shaken vigorously) and death (worm nether move on shaking vigorously).

3. Results

Methanol extract at 25, 50 and 100mg ml⁻¹ cause paralysis and death of worms in the time around 86, 38 & 13 minutes and 141, 71 & 33 minutes respectively. On the other hand aqueous extract shows the paralysis time near about 186, 88 and 38 minutes death around 243, 120 and 93 minutes at 25, 50 and 100mg ml⁻¹. Piperazine citrate (25mg ml⁻¹) produce the paralysis the around 24 minutes and cause death around 63 minutes.

4. Discussions

The result of this study illustrates that the methanol and water extracts has anti-helminthic activity in-vitro. Both the extract reduces the time of paralysis and death in concentration dependant manner. Methanol extract cause death within 15 minutes at 100mg ml⁻¹ and found to be more potent then PC (25mg ml⁻¹) at higher

concentrations. Aqueous extract also kill the worms but was found to be less effective as it take more time than that of methanol extract (Table No. 1).

5. Conclusion

As the anti-helminthic activity of fig extract was comparable to piperazine citrate which is the standard drugs for anti-helminthic activity. Therefore, it could be effective against parasitic helminths of humans and animals and has immense potential for the development of herbal anti-helminthic agents.

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