DOI: 10.56511/JIPBS.2014.v1.i01.pp17-20

JIPBS

Journal of Innovations in Pharmaceuticals and Biological Sciences

www.jipbs.com

Original Article

In-Vitro Anti-Helminthic Activity of Figs extract of Ficus benjamina; A potential Hope

Rajinder Singh*[1], Radhey S. Dhuria[1]

[1]Department of Pharmaceutical Sciences, Guru Nanak Dev University, Amritsar, Punjab, India.

Abstract

Objective: Modern anti-helmintics 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-helmintic activity and the present study was design to investigate the anti-helmintic 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-helmintic activity of extracts was comparable to standard Piprazine citerate, and could be effective against parasitic helminths of humans and animals.

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

***Corresponding Author: Rajinder Singh,** Department of Pharmaceutical Sciences, Guru Nanak Dev University, Amritsar, Punjab, India. Mobile No. 09417258188, Email: rajindersab@gmail.com

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. Helminths 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-helmintic drugs target the helminth parasitic worms (helminths) and expel them from the body, either by stunning or

©JIPBS, All rights reserved

Innovational Publishers
www.innovationalpublishers.com

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

Acknowledgments

The authors are gratefully acknowledging the management of Department of Pharmaceutical Sciences, Guru Nanak Dev University, Amritsar, Punjab, India. for providing the research facility and financial support

References

1. World Health Organization- Global Report for Research on Infectious Diseases of Poverty, 2012. Accessed on 10/04/2013.
2. Nisha PV, Shruti N, Swamy KS, Kumari M, Vedamurthy AB, Krishna V and Hoskeri JH. Anthelmintic activity of *Pyrostegia venusta* using *Pheretima posthuma.* International

Innovational Publishers
www.innovationalpublishers.com

Journal of Pharmaceutical Sciences and Drug Research 2012; 4: 205-208

3. IKECHUKWUOGU G. In-Vitro Anthelmintic Potentials of Bambusa vulgaris (L.) Leaf Extracts Using Adult African Earthworm (Eudrilus eugeniae) from Southern Nigeria Indian. Journal of Novel Drug delivery 2012; 4:306-310
4. Ravindra GM, Shailaja GM and Anita AM. *In vitro* Screening of *Cleome viscosa*. Extract for anthelmintic activity. Journal of Pharmaceutical Biology 2007; 10:766-768.
5. Semwal A and Farswan MS. In-Vitro Anthelmintic Activity of *Diplazium esculantum* (Retz.) Swiss Rhizome Extract. Journal of Pharmacognosy and Phytochemistry 2012; 1:85-88
6. Coles GC. Nematodecontrol practices and ant helmintic resistance on British sheep farms. Journal of Veterinary Research 1997; 141:91- 93
7. Kumar R, Elumalai A and Eswaraiah MC. AN UPDATED REVIEW ON ANTHELMINTIC MEDICINAL PLANTS. Journal of Pharmaceutical and Scientific Innovation 2012; 1:32-34.
8. Temjenmongla and Yadav A, Anti cestodal efficacy of folklore medicinal plants of naga tribes in North East India, African Journal of Traditional, Complementary and Alternative Medicines 2005; 2:129-133.
9. Mousa O, Vuorela P, Kiviranta J, Abdel WS, Hiltunen R and Vuorela HJ. Bioactivity of certain egyptian ficus species. Journal of Ethnopharmocology 1994; 41:71–6.
10. Parveen M, Ghalib RM, Mehdi SH, Rehman SZ and Ali M. A new triterpenoid from the leaves of Ficus benjamina (var. comosa). NaturalProduct Research 2009; 23: 729–736.
11. Ghosh T, Maity TK, Bose A and Dash GK. Anthelmintic activity of Bacopa monierri, Indian . Journal of natural Product 2005; 21:16-19.
12. Chandan HS, Tapas AR and Sakarkar DM. Anthelmintic activity of extracts of Coriandrum sativum linn in Indian earthworm. International Journal of Phytomedicine 2011; 3:36-40.
13. Al-Mofleh IA, Alhaider AA, Mossa JS, Al-Sohaibani MO, Rafatullah S and Qureshi S. Protection of gastric mucosal damage by Coriandrum sativum L. pretreatment in wistar albino rats. Environment Toxicology And Pharmacology 2006; 22:64-69.