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Research Article

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Anti-Helminthic Activity of *Plumeria pudica* Leaves

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ABSTRACT

The contemporary exploration is on the Plumeria pudica leaves for Anti-helminthic activity. The part choosen for the activity is leaves of Plumeria pudica was gather from Vaageshwari College of Pharmacy, Timmapur, Karimnagar, the gathered leaves were subjected to cleaning for foreign matter and kept for shade drying to remove the excess moisture from leaves which leads to contamination then it was grounded in the mixer to get the fine powder which pass from the mesh no 40, the powder kept for soxlation with the series of solvents depending on their increasing polarity petroleum ether, ethyl acetate, chloroform and methanol as solvents. The fundamental identification tests done for all the extracts which show the presence of various secondary compounds carbohydrates, alkaloids, glycosides, terpenoids, phenols, tannins, flavonoids, steroids, proteins, and amino acids. These extracts were transmitting for their antihelminthic activity against Indian earthworm Pheretima posthuma by using various extracts. These extracts showed the dose related incapacity and expiration (death) of earth worms. From all the extracts kept for soxhlation methanol shows the better activity compared to standard drug.

Keywords: *Plumeria pudica*; Anti-helminthic; Soxhlation; *Pheretima posthuma*

INTRODUCTION

The helminth is the term obtained from the Greek language it gives the inference as worm. The problem caused with this worms/helimenths is termed as helimenthiasis and they are of different types and transmitted from different sources [1]. There are many numbers of species on the earth which affect the human health by causing problem in the intestine and it causes some other related complications of health. The frequently suffering helminthiases are those with trichuriasis, ascariasis, intestinal helminths, and hookworm, followed by schistosomiasis and lymphatic filariasis (LF) [2]. These are causing so many problems to human beings related to their health and in some serious conditions which leads to death, some may cause skin diseases, blind, deformities in the babies [3]. So, these problems are more, the awareness of the medicines should be more, mostly leaving in the underdeveloped areas and countries [4].

The present *Plumeria pudica* plant is a very good old plant and about this there are lot of work has been done related to different activities such as anti-inflammatory, laxative, carminative, also possess anti-microbial activity, cytotoxic activity, anti-allergic, ascites, diuretic, anti-ulcer and useful in treating leprosy [5,6]. Plumeria contains so many species, they are mostly for decorative purpose and the plant flowers perineal. It is native to Mexico in India we see

them near the temples and empty grounds [7]. Along with the flowers and leaves other parts of plant also have good activities like bark of root is bitter, pungent, heating, laxative, carminative, used in treatment of leprosy [8,9].

REQUIREMENTS

Collection of Plant Leaves

The leaves of *Plumeria pudica* was gather from Vaageshwari College of Pharmacy, Timmapur, Karimnagar, the specimen is identified by a qualified taxonomist. The gathered leaves were subjected to cleaning for foreign matter and kept for shade drying to remove the excess moisture from leaves which leads to contamination then it was grounded in the mixer to get the fine powder which passes from the mesh no 40.

Choice of Worms

The *Pheretima posthuma* an Indian adult earthworm was selected for anti-helminthic activity as it has the same morphological features to human intestinal worms.

Management of Albendazole

Albendazole (10 mg/ml) suspension was made by using 1% v/v of Tween 80 as a suspending agent.

Preparation of Tween 80 (1% v/v)

The suspending agent is prepared by dissolving the 1 ml of Tween 80 in 100 ml distilled water or 0.9% NaCl.

Preference of Worms

Adult Indian earth worm *Pheretima posthuma* was choosen for present method as it has close features with the worms in human beings.

Preparation of Extracts

The powder kept for soxlation with the series of solvents depending on their increasing polarity petroleum ether, ethyl acetate, chloroform and methanol. The extraction is done by accurately weighed 50 g of powder is prepared into thimble and extracted at the suitable temperature depending on the boiling point of the choosen solvents and the extraction is continued for 6 h with each solvent in a order of polarity. After the completion of the extraction the solvent is removed and kept for drying to get the extract.

Pharmacognostic and Physicochemical Evaluation

The pharmacognostic and physicochemical evaluation of the plant is already done and the results are also studied.

Phytochemical Evaluation

The obtained extract done for identification of the secondary metabolites and the extracts contain different phyto constituents in different solvent extracts and mostly it contains the alkaloids, glycosides, steroids, phenols, tannins, carbohydrates, flavonoids, proteins, and amino acids.

Administration of Extract

As the plant extracts are mostly insoluble in water, we have choosen here the Tween 80 as the suspending agent to dissolve the extract and also which acts as the control. The suspension of different extracts of *Plumeria pudica* leaves of different concentrations (10, 20 mg/ml) were prepared using 1% v/v of Tween 80 as a suspending agent. 20 ml for each concentration was prepared as the worm should float in the suspension (200 mg in 20 ml for 10 mg concentration and 400 mg in 20 ml for 20 mg concentration). Albendazole was used as a standard. Two worms are taken in each extract, control, standard and placed in the petriplates.

Anti-helminthic Activity

Hypothetical worms: *Pheretima posthuma* were selected for anti-helminthic activity. The worms were collected from the fields near to the college and they were cleaned for removal of dirt and greasiness. Earthworms 2-4 cm in length and 0.3-0.5 cm in width were used for the study for the better results all should be in the same size.

EXPERIMENTAL DESIGN

The anti-helminthic activity was performed on adult Indian earthworm *P. posthuma* as it has physical and physiological same with the intestinal roundworm parasites of human beings. *P. posthuma* was placed in Petri plates containing two separate concentrations (10 mg/ml and 20 mg/ml) of petroleum ether, ethyl acetate, chloroform and methanol extract of leaves of *Plumeria pudica*. Each Petri dish was placed with 2 worms and observed for paralysis or death. Time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously or in hot water at 50°C or with external stimuli with the forceps the time of the death of worm (min) was recorded after ascertaining that worms neither moved when shaken nor when given external stimuli. The test results were compared with reference compound Albendazole (10 mg/ml) treated samples [10].

RESULTS

From the results, it is observed that *Plumeria pudica* shown potent anti-helmintic activity while the P. posthuma has taken a long time for death (190 min–110 min) of worms. The earthworm selected for the anthelmintic activity was most sensitive to the different solvent extracts, namely petroleum ether, ethyl acetate, chloroform and methanol. Leaves extract of as *Plumeria pudica* can be seen in Table 1. The anthelmintic activity result revealed dose-dependent paralysis is ranging from loss of motility to loss of response to external stimuli, which eventually progressed to death at 10 mg/ml and 20 mg/ml concentrations, paralysis, was observed, respectively, at 110 min and 90 min and death at 130 min and 120 min in methanol extracts. The chloroform extracts of *Plumeria pudica* also exhibited dose-dependent anti-helmintic activities that caused paralysis at 135 and 115 min (at 10 mg/ml and 20 mg/ml) and death at 160 and 145 min (at 10 mg/ml and 20 mg/ ml). The ethyl acetate extracts of *Plumeria pudica* also exhibited dose-dependent anthelmintic activities that caused paralysis at 144 and 139 min (at 10 and 20 mg/ml) and death at 169 and 152 min (at 10 mg/ml and 20 mg/ ml). The petroleum ether extracts of *Plumeria pudica* also exhibited dose-dependent anti-helmintic activities that caused paralysis at 148 and 138 min (at 10 mg/ml and 20 mg/ml) and death at 167 and 156 min (at 10 mg/ml and 20 mg/ ml).The standard drug (Albendazole 10 mg/ml) shows paralysis within 40 min and time of death 70 min. The observation of result shows that the anti-helminthic activity of methanol extract is more potent compared to the other extracts. The earthworms were more sensitive to the extracts of methanol at 20 mg/ml concentrations as compared to the reference drug Albendazole (10 mg/ml). The results are furnished in Table 1, and graphs punished (Figures 1-10).

CONCLUSION

From the obtained results, it was concluded that petroleum ether, ethyl acetate, chloroform and methanol soxhlation extracts of *Plumeria pudica* leaves exhibited the dose-dependent anti-helminthic activity. Among them, methanol (20 mg/ml extract causes paralysis in 90 min death in 120 min) extracts were more effective in causing the death of the worms as well as promoting paralysis compared to standard.

Table 1. Paralysis time and death time of the standard and solvent extracts of *Plumeria pudica* leaves

Group	Treatment	Concentration (w/v) mg/ml	*Pheretima posthuma*	
			Paralysis time(mins)	**Death time (mins)**
1	Tween 80 (control)	1% Tween 80	180 ± 10	
2	Albendazole	10	40	70
3	Pet.ether extract	10	148 ± 10	167 ± 10
		20	138 ± 10	156 ± 10
4	Ethylacetate extract	10	144 ± 10	169 ± 10
		20	139 ± 10	152 ± 10
5	Chloroform extract	10	135 ± 10	160 ± 10
		20	115 ± 10	145 ± 10
6	Methanolic extract	10	110 ± 10	130 ± 10
		20	**90 ± 10**	**120 ± 10**

Figure 1. (Control) tween80

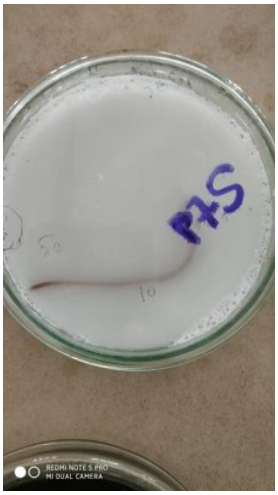

Figure 2. (Standard) albendazole

Figure 3. (10 mg/ml) pet. Ether

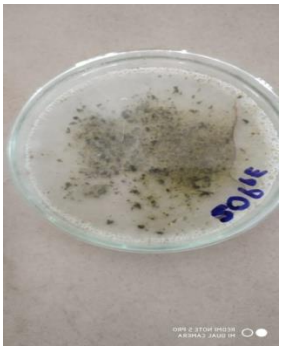

Figure 4. (20 mg/ml) pet. Ether

Figure 5. (10 mg/ml) Ethyl acetate

Figure 6. (20 mg/ml) Ethyl acetate

Figure 7. (10 mg/ml) chloroform extract

Figure 8. (10 mg/ml) chloroform extract

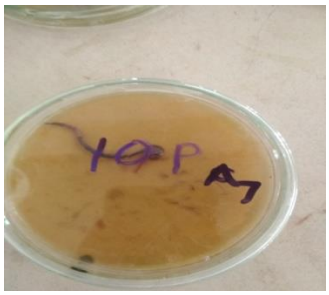

Figure 9. (10 mg/ml) methonolic extract

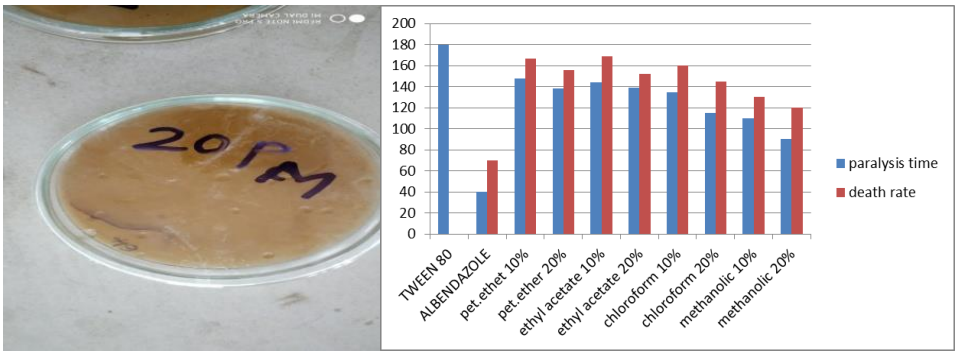

Figure 10. (20 mg/ml) methonolic extract

REFERENCES

[1] BJ Bogitsh; TC Cheng. Immune Response to Parasitic Infections. Bentham eBooks. **2014,** 2, 175-212.
[2] PJ Hotez; DH Molyneux; A Fenwick; J Kumaresan; SE Sachs; JD Sachs. *N Engl J Med*. **2007,** 357, 1018-1027.
[3] B Radhika; CH Swetha Bindu. *Int J Pharma Biol Archives*. **2018,** 9(2), 70-73
[4] M Gallagher; I Malhotra; PL Mungai; AN Wamachi; JM Kioko; JH Ouma. *AIDS*. **2005,** 19, 1849-1855.
[5] A Chatterjee; CP Satyesh. The Treatise of Indian Medicinal plants. New Delhi: National institute of science

communication, **1997.**
[6] A Vijayalakshmi. *Ira J Pharma Res*. **2011,** 10(3), 525-533.
[7] PR Ram; BN Mehrotra. Compendium of Indian Medicinal plants. New Delhi: Central drug research institute, **1994**, 674-675.
[8] KRS Surendra; K Naresh. *Int J Pharm Pharma Sci.* **2012,** 4(5), 54-57.
[9] A Vijayalakshmi; PR Kumar; S Priyadharsini. *S J Pharma Phytochem*. **2014,** 2(6), 134-139.
[10] B Radhika. *J Nat Prod Plant Resour*. **2017,** 7 (2), 40-45.