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Anthelmintic potential of aerial part of *Clerodendrum phlomidis linn.*

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ABSTRACT

Clerodendrum phlomidis. Belonging to family Verbaneceae is an evergreen parasitic plant grown on different host plant throughout India. Present study is carried out to investigate and prove ethno medicinal value of the plant. *C. phlomidis* showed antifungal activity against plant and human pathogens but it is more effective in plants. It was tested by poison plate Technique. Authenticated plant leaves were taken for the study includes extraction of aerial part using different solvents and evaluation of anthelmintic activities. Coarse dried aerial parts of the plant were extracted successively by soxhlet using petroleum ether, chloroform, ethyl acetate and methanol as solvents according to their increasing polarity. Dried extracts were tested for anthelmintic activity using *Pheretima posthuma* as a species of earth worm and compare the paralysis time and death time with standard drug albendazole. Ethyl acetate and methanol extracts shows comparable anthelmintic activity with standard drug albendazole. Methanol and ethyl acetate extracts were tested by different chemical tests. It shows presence of tannins, flavonoids, and terpenoids. These phytoconstituents may be responsible for the said activities.

Keywords: *Clerodendrum phlomidis Linn*, Earthworm, anthelmintic, phytoconstituents.

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INTRODUCTION

Clerodendrum phlomidis (Verbaneceae) known as Arni Hindi. It is distributed More or less throughout India, Ceylon, and Malay, Peninsula. The sandals rub the plant over their bodies in dropsy and also give it to their cattle to cure them of diarrhea and worms, or when the stomach swells [1]. The decoction of roots is used as a demulcent in gonorrhea. The juice of leaves is used as bitter tonic [2] and also given in neglected syphilitic complaints [3] the plant has been found to possess hypoglycemic activity [4]. The ethanol extract of *C. phlomidis* Linn. A leaf shows most of the pharmacological activities characteristic of minor tranquilizers [5]. It is used in Amrita Nectar tablets (Amrita nectar tablets containing 38 herbs) the effects of aqueous & alcoholic extract of Amrita nectar tablet on rat liver microtonal lipid per oxidation are good[6]. Ethanol extract of leaves of *C. phlomidis* Linn (MECP) showed significant inhibitory activity against castor oil induced diarrhea and PGE2 induced enter pooling in rats. The extract also showed a significant reduction in gastrointestinal motility in charcoal meal test in rats [7]. The ethyl acetate and hexane extracts of leaves of *C. phlomidis* showed antifungal activity against plant and human pathogens but it is more effective in plants. It was tested by poison plate Technique [8].

MATERIALS AND METHODS

Plant material

The aerial parts of the *Clerodendrum phlomidis* were collected from the foothill of Annavasal, Pudukkottai (DT), and Tamilnadu in the month of June2010. The collected plant was identified and authenticated by a botanist Dr. P.Jayaraman, Director, Plant Anatomy Research Centre, Chennai. A voucher specimen (PARC/2010/574.) The collected aerial part were washed, and dried in the sun for about a Week. After drying the plant materials were kept in an oven at 40ºC to ensure completes drying. The dried plant parts were finally ground into coarse powder (2.5kg) and preserved in an airtight container for future use.

Preparation of extracts

Dried and coarsely powdered aerial parts (500 gm) of *Clerodendrum phlomidis* was subjected to extraction in Soxhlet extractor using petroleum ether, chloroform, ethyl acetate and methanol successively. The extracts were concentrated by vacuum distillation and then dried in open air [10].

Animals

Indian adult earthworms (*Pheretima posthuma*) collected from moist soil and washed with normal saline to remove all the faucal matter, were used for the anthelmintic study. The earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used for all the experimental

protocol due to its anatomical and physiological resemblance with the intestinal roundworm parasites human beings [11].

Drugs and chemicals

The following drugs and chemicals were used. Drugs: Albendazole (BANDY, Mankind Pharmacy Ltd., New Delhi), Chemicals: Methanol A.R (PCL, Pune), DMF (PCL, Pune), Saline water (Claris Life sciences Ltd., Ahmadabad),

Anthelmintic activity [12]

All the extracts of *Clerodendrum phlomidis* were dissolved in minimum amount of DMF and the volume was adjusted to 10 ml with saline water. All drugs and extract solutions were freshly prepared before starting the experiment.

In each case, six earthworms were released into 10 ml of desired formulations as follows; vehicles (5% DMF in normal saline), Albendazole (20 mg/ml), or extracts of aerial part of *Clerodendrum phlomidis* (40 mg/ml, each) in normal saline containing 5% DMF. Observations were made for the time taken to paralysis and death of individual worm. Paralysis was said to occur when the worms were not able to move even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colors as our previous method.

RESULTS AND DISCUSSION

It is evident from the experimental data that, the Ethyl acetate and methanol extracts of the *Clerodendrum phlomidis* showed significant anthelmintic activity at 40 mg/ml. Results were comparable with the standard drugs, Albendazole, at concentration 20 mg/ml. (Table no.1) reveals that ethyl acetate and methanol extracts of aerial part of *Clerodendrum phlomidis* showed better anthelmintic activity. These extracts required the least time for causing paralysis and death of the earthworms followed by other extracts. As shown in (Table no. 1) aerial part of *Clerodendrum phlomidis* displayed intrinsic anthelmintic properties with 40 mg/ml giving a shortest time of paralysis and death.

The function of the anthelmintic drugs like Albendazole is to cause paralysis of worms so that they are expelled in the feaces of man and animals. The extracts not only demonstrated this property, they also caused death of the worms, especially at 40 mg/ml as compared with the Albendazole. In conclusion, these plants have been confirmed to display anthelmintic activities.

Ethyl acetate and methanol extracts shows overall potency for anthelmintic activity. Methanol and ethyl acetate extracts were tested for presence of phytochemicals with different

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tests and shows presence of tannins, flavonoids, and terpenoids (Table no. 2). These phytoconstituents may be responsible for the said activities.

Table no. 1: Anthelmintic Potential of Aerial part of *Clerodendrum phlomidis Linn.*

Group	Sample	*Time taken for paralysis(min)	*Time taken for death(min)
I	Control	No paralysis (upto25min)	No death(upto25min)
II	Albendazole(10mg/ml)	3.14	10.46
III	PEL(40mg/ml)	No paralysis (upto25min)	No death(upto25min)
IV	CHL(40mg/ml)	15.00	23.00
V	ETL(40mg/ml)	4.33	6.92
VI	MEL(40mg/ml)	2.36	3.12

*Results are expressed as Mean from eight observations; Control worms were alive up to 24 hrs of observation. Extracts of aerial part of *Clerodendrum phlomidis* used for the study were designated as PEL, CHL, and ETL, MEL for petroleum ether, chloroform, ethyl acetate and methanol respectively.

Table no. 2: Chemical Tests for extracts [9]

S.no	Chemical test	Extracts	
		Ethyl acetate	Methanol
1	**Test for Sterols**		
	a. Salkowaski Test	–	+
	b. Liebermann Test	–	+
2	**Test for Anthraquinones & Naphthaquinones**		
	a. Borntrager test	–	–
	b.Modified borntrager test	–	
	c. Juglone test	–	–
			–
3	**Test for Alkaloids**		
	a. Dragendroff's Test	–	–
4	**Test for Triterpenoids**		
	a. Liebermann-Burchard Test	–	–
5	**Test for Flavonoids**		
	a. Shinoda test	+	+
6	**Test for Tannins**		
	Ferric chloride	–	+
	Match stick	–	+
7	**Test for Carotenoids**		
	a. Carr price reaction	–	–

Note: '—' = negative test, '+' = Positive test

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