

Anthelmintic potential of *Prosopis cineraria* (Linn.) druce stem barks

V.Velmurugan¹, G.Arunachalam² and V.Ravichandran¹

¹*School of Pharmaceutical Sciences, Vels University, Chennai-Tamilnadu*

²*PGP College of Pharmaceutical Sciences and Research Institute, Namakkal-Tamilnadu*

ABSTRACT

Anthelmintic activity of different extracts of prosopis cineraria (Linn) druce stem bark was evaluated against Indian earthworm. Various concentrations of the extracts were bioassayed for the determination of time of paralysis (p) and time of death (d) of the worm. Piperazine citrate at a concentration of 10 mg/ml has been used as reference standard. In our present study, the crude methanolic extract demonstrated paralysis and also caused death of worms especially at the higher concentration (50 mg/ml) compared to the standard, piperazine citrate. This study confirmed the use of plant stem barks as an anthelmintic agent.

Keywords: *Prosopis cineraria*; Anthelmintic activity; piperazine citrate.

INTRODUCTION

Prosopis cineraria is a small to moderate sized tree belongs to the family mimosaceae. It is found distributed in the regions of Arabia and various parts of India like Rajasthan, Gujarat, Haryana, Uttarpradesh and Tamilnadu. The bark is used as a remedy for rheumatism, cough, common cold, asthma and scorpion strings [1, 2]. It was reported to possess new piperidine alkaloid spicigerin, prosogerin E along with gallic acid, pautelin, luteolin and rutin [3]. Prosogerin A and B were isolated from its flowers [4]. Various pharmacological activities like analgesic and antipyretic activities have been reported for different extracts of this plant [5]. In our present study we have planned to evaluate the anthelmintic activity of different solvent extracts of *prosopis cineraria* (Linn) Druce stem bark at different concentrations against *Phretima posthuma*.

MATERIALS AND METHODS

Plant material collection

The stem bark of *prosopis cineraria* was collected from Cuddalore district of Tamilnadu in the month of October 2008 and was authenticated by Dr. M. Raghuram. Asst. Professor, Acharya Nagarjuna University, Guntur, Andhra Pradesh. The bark was air dried to a constant weight and made into coarse powder.

Preparation of extracts

About 450 g of the coarse powder was extracted with methanol followed by chloroform by continuous hot percolation method (Soxhlet apparatus). The marc was then macerated with water to get aqueous extract. All the extracts were then evaporated to dryness under reduced pressure.

Worm collection and authentication

Indian earthworm *Phretima posthuma* (annelida) were obtained from the water logged area of soil and identified at the Department of Zoology, Acharya Nagarjuna University, Guntur, Andhra Pradesh.

Anthelmintic assay

The anthelmintic assay was carried out as per the method of Ajaiyeoba [6] with necessary modifications. The assay was performed on adult Indian earthworm (*Phretima posthuma*) due to its anatomical and physiological resemblance with intestinal roundworm parasite [7-10]. Because of easy availability of earthworms, they have been used widely for the initial evaluation of the anthelmintic compounds [11, 12]. 50 ml of formulation containing different concentrations of the crude extracts (20, 40, 80 and 160 mg/ml) and 10 mg/ml concentration of piperazine citrate were prepared by triturating the samples with 15% tween 80 suspension in distilled water and the resultant mixture was stirred using mechanical stirrer for 30 min. Six earthworms of similar sizes were placed in petridish of 10 cm diameter. Suspension of 15% tween 80 in distilled water was used as control. The time of paralysis was noted when no movement of any sort could be observed except when the worm were shaken vigorously [13,14,15]. Time of death were recorded after ascertaining that worms neither moved when vigorously not when dipped in warm water [16,17].

RESULTS AND DISCUSSION

Preliminary phytochemical screening of different solvent extracts revealed the presence of flavanoids, tannins, phytosterols, carbohydrates, alkaloids, proteins and aminoacids. The different solvent extracts of *Prosopis cineraria* stem bark exhibit anthelmintic activity in a dose dependent manner. The methanolic extract at dose of 160 mg/ml caused paralysis in 25 min and death in 62 min against *Phretima posthuma* as compared to the standard drug piperazine citrate (10 mg/ml) showed the same at 23 min and 61 min respectively.

CONCLUSION

In conclusion, the anthelmintic activity of *Prosopis cineraria* stem bark have been confirmed and further studies are suggested to isolate the active principles responsible for the activity.

Table 1: Anthelmintic activity of different extracts of *Prosopis cineraria* stem bark

S.No	Group	Concentration used in mg/ml	Paralysis time (min)	Death time (min)
1	Control	-	-	-
2	MEPC	20	32.11±0.34	69.12±1.27
		40	30.12±0.28	67.51±0.46
		80	28.21±0.43	65.32±0.56**
		160	25.23±0.48	62.09±0.39***
3	CEPC	20	42.16±0.44	80.20±0.74
		40	40.22±0.49	76.27±0.61
		80	38.41±0.56	72.48±0.26
		160	35.59±0.32	70.07±0.38
4	AEPC	20	36.26±0.35	75.42±0.78
		40	34.52±0.51	73.46±0.61
		80	32.59±0.62	70.84±0.18
		160	29.34±0.82	66.05±0.53**
5	Piperazine citrate	10	23.22±0.12	61.52±0.34

Values are Mean \pm S.D analyzed by Dunnett's test ***= $P < 0.001$, **= $P < 0.01$

MEPC: Methanolic extract of *Prosopis cineraria*

CEPC: Chloroform extract of *Prosopis cineraria*

AEPC: Aqueous extract of *Prosopis cineraria*

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