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Evaluation of Anthelmintic Potential of *Cressa cretica* Whole Plant Extract

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Keywords:Anthelmintic activity, *Cressa cretica*, *Pheretima Posthuma*, Albendazole**ABSTRACT**

The aim of this study was to compare the anthelmintic potency of methanolic and aqueous extracts of *Cressa cretica* whole plant by using Indian earthworms (*Pheretima posthuma*). For in-vitro testing of anthelmintic potency by measuring the duration of paralysis and worm death, the extracts were used at different concentrations of 25, 50, and 100 mg/ml, respectively. As a standard, albendazole was used. According to the findings of this research, *Cressa cretica* has the ability to paralyze earthworms and also cause their death after a period of time. The shortest paralysis period was observed at 100 mg/ml of *Cressa cretica* methanolic extract, which was 13.63 ± 0.53 and 14.75 ± 3.98 minutes, respectively. The study's findings were similar to those of regular Albendazole. The current study's findings show that the methanolic extract took less time to paralyze the earthworm than the aqueous extract. The traditional claim of *Cressa cretica* as ananthelmintic has been proven in this research, as methanolic and aqueous extracts of the whole plant showed activity against the earthworm used in the experiment.

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INTRODUCTION

Helminthic infections are now recognized as a significant cause of chronic disease and sluggishness in tropical populations. More than half of the world's population is infected with one or more types of worms [1]. Parasitic gastroenteritis is caused by a mixed infection with multiple types of stomach and intestinal worms, resulting in fatigue, appetite loss, decreased feed quality, weight loss, and decreased productivity. While some synthetic drugs are available to treat such infections, due to their high cost and side effects, we are focusing our efforts on developing more effective and safe drugs from relatively less costly natural sources. The analysis of indigenous traditional plant remedies can be used to rationally address this [2].

Cressa cretica (Linn), a member of the Convolvulaceae family, is an erect, small, dwarf shrub that grows in sandy or muddy saline habitats with the species *Suaeda maritima*, *Salicornia europaea*, *Salsola soda*, *Limonium vulgare* and *Crypsis aculeate*, and is commonly known as Rudravanti in Hindi and Bengali, Rudanti in Sanskrit and Uppusanaga in Tamil [3-4]. *Cressa cretica* is a salt-tolerant plant that grows along the coast. *Cressa cretica* is an Ayurvedic medicine that is antibilious, antitubercular, and expectorant, according to reports [5]. The herb is used as an alterative, anthelmintic, stomachic, tonic, and aphrodisiac, as well as to enrich the blood and treat constipation, leprosy, asthma, and urinary discharges [6]. In Bahrain, the plant

has long been used as an expectorant and antibilious agent. There has been no systematic research on its anthelmintic function. As a result, the anthelmintic ability of *Cressa cretica* methanolic extract was evaluated in this study.

MATERIALS AND METHODS

For the study, the entire plant of *Cressa cretica* (Convolvulaceae) was collected from FRLHT Bangalore and authenticated by a taxonomist from Teerthanker Mahaveer University in Moradabad. A voucher specimen was submitted to the Department of Pharmacognosy, Teerthanker Mahaveer College of Pharmacy, Moradabad. 4 kg of fresh whole plant was collected, dried under the sun for 10 days, and mechanically reduced to a medium coarse powder before being deposited in an airtight container.

Preparation of Extract

Solvent Extraction

250g of coarse powder from the whole plant of *Cressa cretica* was extracted with 1800 ml of solvents in increasing order of polarity, beginning with petroleum ether, chloroform, ethyl acetate, methanol, and water, using a soxhlet apparatus. Each solvent was used for approximately 60 hours of extraction. Using a rotary evaporator, all of the extracts were evaporated to dryness and collected as a semi-solid mass.

Administration of Extract

Using 0.5 percent w/v of CMC as a suspending agent, suspensions of methanolic and aqueous extracts of *Cressa cretica* of various

concentrations were prepared, with the final volume set at 10 ml for each concentration.

Drugs and Chemicals

Albendazole (Glaxo Smithkline), Petroleum ether (60-800C), Chloroform, Ethyl acetate, Methanol (Rankem), Carboxy methyl cellulose (Loba Chemie) were used in the experimental work.

Evaluation of Anthelmintic Activity

Indian adult earthworms (*Pheretima posthuma*) were selected for the investigation of anthelmintic activity. The earthworms were collected from damp soil and thoroughly rinsed to remove both soil and feces. Due to their easy availability, anatomical and physiological similarity with human intestinal roundworm parasites, earthworms with a diameter of 4-6 cm and a width of 0.1-0.2 cm were chosen for the desired experimental work. They are commonly used for the initial evaluation of anthelmintic compounds in vitro [7-8]. All of the earthworms were divided into eight classes, each containing two earthworms in eight petridishes of similar size. The first group is given just 0.5 percent CMC in distilled water, the second group is given albendazole (20 mg/ml) suspended in 0.5 percent CMC, and the remaining test groups are given 25 mg/ml, 50 mg/ml, and 100 mg/ml concentrations of methanolic and aqueous extracts of *Cressa cretica* suspended in 0.5 percent CMC [9-10]. Before being released into their respective petridishes, all earthworms were washed in water. The time it took to become paralyzed and die was registered. Table 1 displays the findings, which

were expressed as the mean \pm SEM of two earthworms in each category.

RESULTS AND DISCUSSION

The anthelmintic activity of *Cressa cretica* methanolic and aqueous extracts was compared to that of the standard drug albendazole (Fig.1). The time course of anthelmintic activity produced by methanolic extract of *Cressa cretica* whole plant (at doses of 25, 50, and 100 mg/kg) concentrations resulted in potent anthelmintic activity, according to the findings. When compared to the aqueous extract, the methanolic extract had a more significant effect on worm paralysis at all concentrations when compared to the normal. Paralysis was observed at 21.67 \pm 1.10, 18.58 \pm 1.00, and 13.63 \pm 0.53 minutes for the methanolic extract at 25 mg/ml, 50 mg/ml, and 100 mg/ml concentrations, and death was observed at 24.23 \pm 1.25, 19.83 \pm 1.08, and 14.75 \pm 3.98 minutes for the methanolic extract. At doses of 25 mg/ml, 50 mg/ml, and 100 mg/ml, the aqueous extract induced paralysis in 25.76 \pm 1.16, 20.70 \pm 0.45, and 16.62 \pm 0.45 minutes, respectively, while death occurred in 28.99 \pm 1.36, 22.00 \pm 1.34, and 19.09 \pm 0.23 minutes. Albendazole (20 mg/ml) caused paralysis after 11.65 \pm 0.51 minutes and death after 13.67 \pm 0.36 minutes. At concentrations of 25, 50, and 100 mg/ml, the methanolic extract of *Cressa cretica* was found to be more active against Indian earthworms than the aqueous extract at comparable concentrations. The findings were compared to the standard drug, Albendazole (20 mg/ml), and the anthelmintic effects of extracts were found to be competitive to the

standard drug. The findings of this study provide a quantitative foundation for explaining *Cressa cretica*'s traditional folkloric use as a potent anthelmintic agent, allowing the plant to be used in the treatment of

helminthic infections. However, further bio-guided isolation of plant compounds is needed to confirm the compounds are responsible for the observed anthelmintic behavior.

Table 1: Effect of *Cressa cretica* methanolic & aqueous extracts on Indian Earthworms (*Pheretima posthuma*)

Test Substance	Concentration (mg/ml)	Time Taken for Paralysis (P) and Death (D) in minutes \pm SEM	
		<i>Pheretima posthuma</i>	
		P	D
<i>Cressa cretica</i> Methanolic extract	25	21.67 \pm 1.10	24.23 \pm 1.25
	50	18.58 \pm 1.00	19.83 \pm 1.08
	100	13.63 \pm 0.53	14.75 \pm 3.98
<i>Cressa cretica</i> Aqueous extract	25	25.76 \pm 1.16	28.99 \pm 1.36
	50	20.70 \pm 0.45	22.00 \pm 1.34
	100	16.62 \pm 0.45	19.09 \pm 0.23
0.5% CMC	-	-	-
Albendazole	20	11.65 \pm 0.51	13.67 \pm 0.36

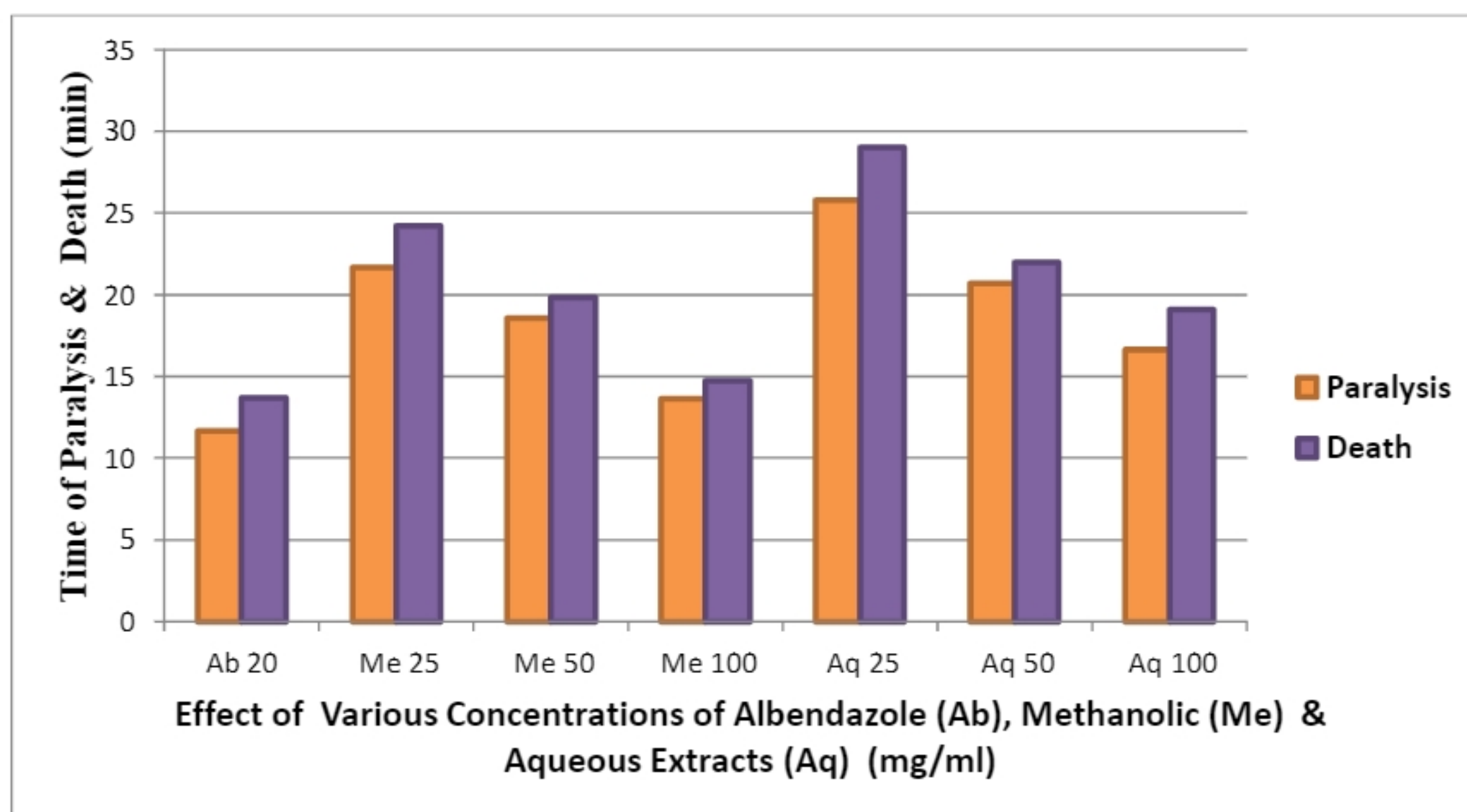


Figure 1: Anthelmintic activity of different extracts of *Cressa cretica*

CONCLUSION

When compared to Albendazole, both *Cressa cretica* extracts demonstrated dose-dependent anthelmintic activity, according to the findings. The findings also showed that the methanolic extract of the *Cressa cretica* whole plant took less time than the aqueous extract of the plant to paralyze the earthworm. As a result, the conventional use of *Cressa cretica* as an anthelmintic has been validated, as the whole plant extract showed action against the worms used in the analysis. More research is required to determine the mechanism of action that is responsible for this activity.

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