

Original Research Article

Anthelmintic activity of extracts of *Coriandrum sativum* linn. In indian earthworm

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Abstract

Coriandrum sativum Linn. (CSL) is popularly known as coriander in India belongs to family Apiaceae. The objective of the present work was to evaluate the in-vitro anthelmintic potency of the ethanolic extract and carbon tetrachloride extract of *Coriandrum sativum* Linn. plant using Indian earthworms (*Pheretima posthumad*). The various concentrations (50, 100, and 150 mg/ml) of the ethanolic extract and carbon tetrachloride extract were tested in-vitro for anthelmintic potency by determination of time of paralysis and time of death of worm. Piperazine citrate (15mg/ml) used as standard. The result of present study indicates that the *Coriandrum sativum* Linn. potentiate to paralyze earthworm and also caused its death after some time. The shortest time of paralysis was observed at higher dose (150 mg/ml) of both ethanolic extract and carbon tetrachloride were found to 28 min and 45 min respectively. The results of the study are comparable to standard Piperazine citrate. The result showed that ethanolic extract of *Coriandrum sativum* Linn. took less time to cause paralysis of the earthworm than that of carbon tetrachloride extract *Coriandrum sativum* Linn.. Thus the present study demonstrate that the *Coriandrum sativum* Linn. as an anthelmintic has been confirm as the ethanolic and carbon tetrachloride extracts of whole plant displayed activity against the earthworm used in study.

Key word: CSL, Paralysis, death of earthworm.

Introduction

Anthelmintics or antihelminthics are drugs that expel parasitic worms (helminths) from the body, by either stunning or killing them. The WHO estimates that a staggering two billion people harbor parasitic worm infections. Parasitic worm also infect livestock and crops affecting food production with a resultant economic impact. Despite this prevalence of parasitic infections, the research on anthelmintic drug is poor. As per WHO, only few drugs are frequently used in the treatment of these parasite infections.[1] Parasitic helminthes affects animals and men, causing

considerable hardship and stunted growth. Most diseases caused by helminthes are of a chronic; debilitating nature they probably cause more morbidity and greater economic and social deprivation among humans and animals than any single group of parasites.[2] The major control strategy adopted against helminthes parasite is the use if anthelminths.

Coriandrum sativum L. (Umbelliferae/Apiaceae), popularly known as coriander, sambhar, dhania and medicinally believed to have several therapeutic properties: hypoglycaemic, anti-

inflammatory and hypolipidaemic analgesic and sedative, anxiolytic, antimutagenic, antihypertensive, diuretic, antioxidant, antimicrobial, and carminative, antispasmodic and relaxant.[3,4]

Materials and Methods

Plant:

The fresh plants of *Coriandrum sativum* were collected in the month of September 2010 from the local market of Paratwada village, Maharashtra, India. The plant was authenticated by Dr. A. Chaturvedi of Botany Department; RTM Nagpur University, Nagpur, India. A voucher specimen (No: 9559) was deposited at Herbarium, Department of Botany, RTM Nagpur University Nagpur.

Experimental animals:

All the experiments were carried out in Indian adult earthworms (*Pheretima posthumad*) collected from moist soil and washed with normal saline to remove all fecal matter were used for anthelmintic activity.

Material:

Ethanollic and carbon tetrachloride extracts of *Coriandrum sativum* Linn. plant, Piperazine citrate (GSK. Ltd, Mumbai).

Method

Preparation of Extracts of *Coriandrum sativum* Linn. plant :

The collected plant of *Coriandrum sativum* was dried under shade and undergone crushing in electric blender to form powdered and subjected to extraction by using Soxhlet's extractor. The percent yield of ethanolic extract was 14.4 % w/w and carbon tetrachloride extract yield 11.8 % w/w. Both the extracts were concentrated by evaporation at room temperature and were used for pharmacological studies.

Administration of Extract:

The suspension of both extract of *Coriandrum sativum* different concentration (50-150 mg/ml) were prepared by using 0.2% v/v of Tween 20 as

a suspending agent and final volume was made to 10 ml for respective concentration of *Coriandrum sativum* plant. Piperazine citrate (15mg/ml) was used as standard. Eight groups of approximately equal size worms consisting of six earthworms individually in each group were released into 10 ml of desired concentration of drug and extracts.

Administration of Piperazine citrate:

Piperazine citrate (15mg/ml) was used prepared by using 0.2% v/v of Tween 20 as a suspending agent.

Experimental Design

Eight groups of approximately equal size worms consisting of six earthworms individually in each group were released into 10 ml of desired concentration of drug. The anthelmintic assay was carried out as per the method⁶ with minor modification.[7,8] The animals were divided into eight group containing six earthworms each different concentration of extracts and standard drug solution were poured in different Petri dishes. Observations were made for the time taken for paralysis (Paralysis was said to occur when worm did not revive in normal saline) and death (Time for death of worms was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50⁰c), followed with their body colors fading away)[9,10]. For evaluation of anthelmintic activity of *Coriandrum sativum* plant, group I was control, group II received standard drug (Piperazine citrate), group III, IV & V received ethanolic while group VI, VII & VIII received carbon tetrachloride extracts of *Coriandrum sativum* plant respectively. All the results were expressed as Mean \pm S.D. of six animals in each group.

Result and Discussion

Helminthiasis or infections with parasitic worms are pathogenic for human beings. Immature forms of the parasites invade human beings via the skin or gastrointestinal tract (GIT) and evolve into well differentiated adult worms that have characteristic tissue distribution. Anthelmintics

are drugs that may act locally to expel worms from the GIT or systemically to eradicate adult helminthes or development forms that invade organs and tissues[11,12].

The ethanolic and carbon tetrachloride extracts of *Coriandrum sativum* plant were found to show anthelmintic activity when compared to standard drug. Ethanolic extract of *Coriandrum sativum* plant of concentration (50, 100, and 150 mg/ml) showed paralysis at 87.00, 42.33 and 32.33 min and death at 191.66, 146.00 and 88.33 min while carbon tetrachloride extract of *Coriandrum sativum* plant of concentration (50, 100, and 150 mg/ml) paralysis at 97.33, 72.00 and 48.66 min and death at 215.00, 152.00 and 109.66 min. The standard drug, Piperazine citrate showed paralysis at 21.66 min and death after 72.33 min at 15mg/ml concentration. From the above result, it is clear that ethanolic and carbon tetrachloride extract of *Coriandrum sativum* plant have significant anthelmintic activity in dose dependent manner when compared with standard anthelmintic drug. Data in the figure 1 reveals that the ethanolic extracts of *Coriandrum sativum* plant took the less time to cause paralysis of the earthworm than that of carbon tetrachloride extract. It can be concluded that the active constituents responsible for anthelmintic activity present in the ethanol and carbon tetrachloride extract of *Coriandrum sativum* plant. Thus from

results the *Coriandrum sativum* as an anthelmintic have been confirm as a plant extract displayed activity against the worm used in present study. The possible mechanism of the anthelmintics activity of *Coriandrum sativum* cannot be explained on the basis of our present results. However, it may be due to its effect on inhibition of glucose uptake in the parasites and depletion of its glycogen synthesis[13,14] while there need further study to isolate and revealed the active compound contained in the crude extract of *Coriandrum sativum* as well as to establish mechanism(s) of action.[15]

Conclusion

From the results it conclude that, both extracts of *Coriandrum sativum* (ethanolic and carbon tetrachloride) demonstrate to possess dose dependant anthelmintic activity when compared to piperazine citrate. The results also revealed that the ethanolic extracts of *Coriandrum sativum* plant took the less time to cause paralysis of the earthworm than that of carbon tetrachloride extract thus it conclude that ethanolic extracts of *Coriandrum sativum* possess potent anthelmintic activity compared to carbon tetrachloride extract. From results the *Coriandrum sativum* as an anthelmintic have been confirm as a it displayed activity against the worm used in present study.

Table 1: Anthelmintic Potency of *Coriandrum sativum* plant.

Treatment	Group	Concentration (mg/ml)	Time of paralysis (min) (Mean±S.D.)	Time of death (min) (Mean±S.D.)
Control	I	-	-	-
Piperazine citrate(Std.)	II	15	21.66± 6.18	72.33±2.054
Ethanolic Extract of <i>Coriandrum sativum</i>	III	50	87.00±3.0	191.66±2.51
	IV	100	42.33±3.21	146.00± 2.0
	V	150	32.33±4.50	83.33±3.05
Carbon tetrachloride extract of <i>Coriandrum sativum</i>	VI	50	97.33±1.15	215.00±3.60
	VII	100	72.00±3.0	152.00±4.0
	VIII	150	48.66±4.04	109.66±3.05

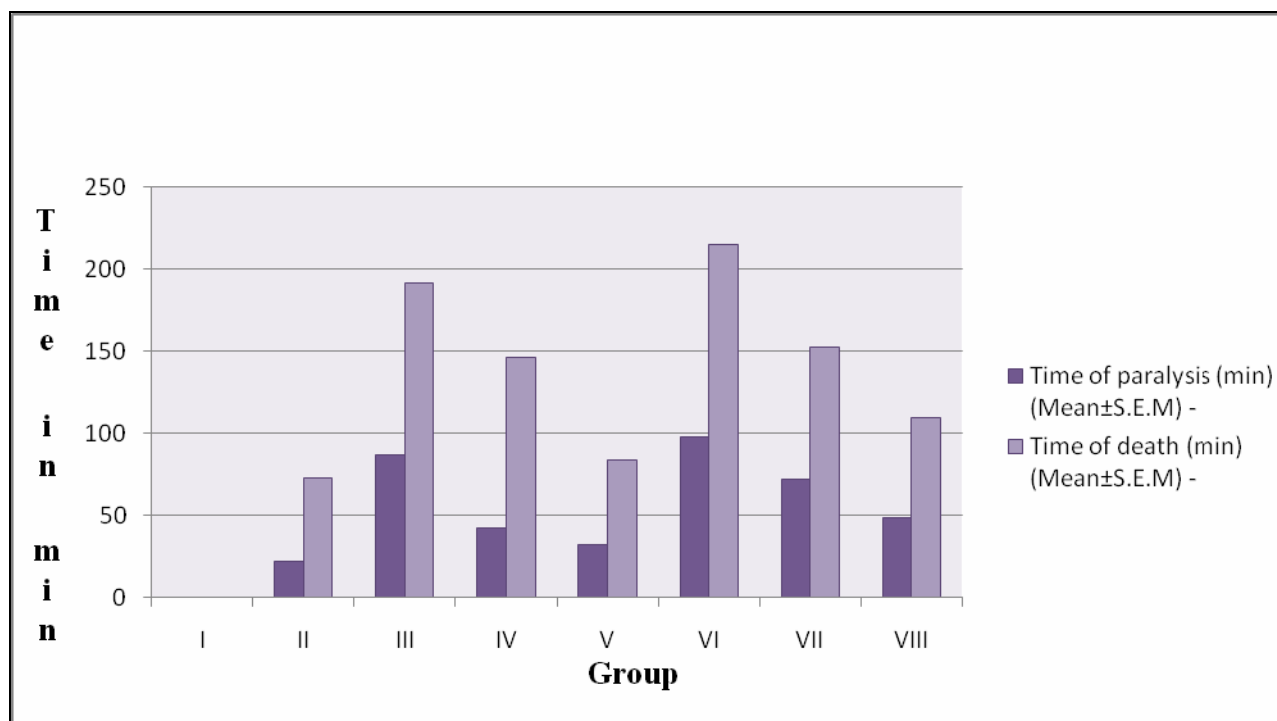


Fig.1: Anthelmintic activity of extract of *Coriandrum sativum* plant in Indian Earthworm.

Group I – control group; group II- standard piperazin citrate group; group III, IV & V – ethanolic extract of CSL having 50, 100, 150 mg/ml resp.; group VI, VII & VIII- carbon tetrachloride extract of CSL having 50, 100, 150 mg/ml resp.

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