ORIGINAL RESEARCH

ANTHELMINTIC ACTIVITYOF CRUDE EXTRACT OF *ZINGIBER OFFICINALE* (ZINGIBERACEAE)

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ABSTRACT:

The crude extract of Zingiber *officinale* was evaluated for establishing the claim of its anthelmintic potential and has shown good anthelmintic activity. Both the concentration 2.5mg/ml and 5mg/ml of crude extract of *Zingiber officinale* showed paralysis time 61.66±0.8, 50.66±0.88 min and death time 216.33±0.88 , 182.66± 0.57 minutes respectively.

KEY WORDS: Anthelmintic, Ginger, Adult Indian earth worm.

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INTRODUCTION:

Helminthes are the most common infections in man, affecting a large proportion of the World's population. Parasitic diseases may cause severe morbidities[1,2]. Development of resistance to most of commercially available anthelmintic became a severe problem worldwide[3]. The rhizomes of ginger are used for the treatment of inflammation as a household remedy on empirical basis[4].The efficacy of ginger is attributed to its aromatic, carminative and absorbent properties[5]. The scientific name of ginger plant is *Zingiber officinale* which is cultivated in Asia, Ceylon, Belgium, Indonesia, France, and in South India and Bengal [6] and has been used in Europe since a very long time ago. *Zingiber officinale Linn.* (Zingiberaceae), commonly known as "Adrak", is an herbaceous rhizomatous perennial plant, reaching up to 90 cm in height under cultivation. Rhizomes are aromatic, thick lobed and pale yellowish in color. Leaves are long and 2-3 cm broad with sheathing bases, simple, alternate, distichously narrow, oblong and lanceolate. The blades are gradually tapering to a point. The herb develops several lateral shoots in clumps which begin to dry when the plant matures. Inflorescence is solitary, lateral radical, pedunculate, oblong and has cylindrical spikes. Flowers are rare, rather small, calyx superior, gamosepalous, three toothed and open splitting on one side. lanceolate connate greenish segments[6].The medicinal properties of ginger include disinfectant anti-arthritic[7,8], anti-migraine and hypocholesterolaemic [9], anti-thrombotic[10,11], anti-inflammatory[11], hypolipidaemic [12], hypocholesterolaemic , anti-nausea properties, anti-diabetic antipyretic, antimicrobial, antischistosomal, antioxidant, hepatoprotective, diuretic, hypotensive[13]. So, the present study attempts to evaluate anthelmintic activity of crude extract of *Zingiber officinale* against *Pheretima posthuma* earthworm.

MATERIALS AND METHOD:

Collection of Plant material:

The rhizomes of ginger were collected from Uluberia, Howrah district of West Bengal in the month of October 2017 and authenticated by Dr. R. K. Dasgupta, Associate Professor, Dept. Of Pharmacognosy, Bharat Technology,Uluberia.

Preparation of extracts:

The rhizomes of ginger were dried under shade, powdered and subjected to successive solvent hydro alcoholic extraction (60-40%; Ethanol-Water) using Soxhlet extractor. Extract was vacuum dried and stored at 4^{o}C for further use[14].

Evaluation of Anthelmintic Activity

Collection of earth worm

Indian earthworm P. posthuma were collected from the water logged area of soil, Uluberia (Howrah Dist.), West Bengal. Indian adult earthworms (Pheretima posthuma) were used to study anthelmintic activity. They were washed with normal saline to remove all fecal matter. The earthworms of 5-8 cm in length and 0.2-0.3 cm in width were used for all experimental protocol[14].

Anthelmintic Assay:

The Anthelmintic assay was carried as per the method of (Aswar,M. et al., 2008,) with minor modifications. Suspensions of the samples were prepared by triturating the samples with 0.5% tween 80 and distilled water. The resulting mixture was than stirred for 30 min. The resulting suspensions were diluted to make concentrations (2.5mg/ml and 5mg/ml). These suspensions were used for anthelmintic activity. The standard drug Albendazole was also used in suspension form . Suspension of distilled water and tween 80 (0.5%) were used as control.

The worms were divided into groups containing five earthworms in each group. 20 ml of samples,

standard and control were poured in different petridishes. All the earthworms were washed in normal saline solution before they were used. Five worms (same type) in each were placed in it. Time for paralysis was noted when no movement observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water (50°C)[15]. The mean paralyzing time and death time were calculated and summarized in Table 1.

Statistical Analysis

All the results were expressed as mean ± Standard Error Mean (SEM). Statistical analysis was done by using one way ANOVA followed by Dunnett's 't' test.

RESULT AND DISCUSSION:

Ginger is widely used in the treatment of different ailments in the Indian system of medicine. *Zingiber officinale* rhizomes are rich for phytoconstituents. It mainly contains up to 3% of volatile oil, a mixture of 24 constituents containing mono-terpenoid fraction (β-phelladrene, cineol, and citral). And sesquiterpenoids (β- sesqui-phellandrene, bisabolene and farnesene), with (-)-zingiberene. It also contains 5-8% resinous matter, starchand mucilage. It is reported to have antioxidant, analgesic and antipyretic properties. Ginger oil has been shown to prevent skin cancer in mice. Gingerol, an active constituent of ginger oil has demonstrated to kill ovarian cancer cells[16]. Based on the traditional uses and scientific reports, plant extract was selected to evaluate anthelmintic activity.

Table 1: Anthelmintic activity of volatile of cardamom

Concentrations	Time in Minute	
	Time taken for Paralysis	Time taken for Death
Sample 2.5mg/ml	61.66±0.88*	216.33±0.88*
Sample 5.0mg/ml	50.66±0.88*	182.66± 0.57*
Albendazole 2.5mg/ml	51.66±0.88*	185.66± 0.66*
Albendazole 5.0mg/ml	47.33 ± 0.33*	168.0 ± 0.57*

#Control sample was observed for 12 hours but has shown no paralysis.

The result was expressed as Mean ± SEM. Statistical analysis was carried out using one way ANOVA followed by the student-t Test. P<0.05 was considered statistically significant.(n=3). * = p<0.01

Both the concentration 2.5mg/ml and 5mg/ml of crude extract of *Zingiber officinale* showed paralysis time 61.66±0.8, 50.66±0.88 min and death time 216.33±0.88 , 182.66± 0.57mins respectably. Anthelmintic acidity showed by 5mg/ml of crude extract iss comparable to the the standard drug Albendazole which showed paralysis time 51.66±0.88, 47.33 ± 0.33mins at concentrations2.5mh/ml and 5mg/ml respectively. The anthelmintic property of ginger is may be due to the presence of active constituents present in it.

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