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## Phytochemical and anthelmintic activity of *Alpinia galanga* Linn

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### Abstract

Plants have been one of the important sources of medicines even since the dawn of human civilization. *Alpinia galanga* L. (Family-Zingiberaceae) It is well known official drug throughout the country as a holistic gift of nature for medicinal, culinary and cosmetic use. It has been found to possess various therapeutic activities, viz. anti-inflammatory, analgesic, antiallergic, antifungal, antidiabetic, antibacterial, antiulcer, immunostimulating, anti-cancer, anti-oxidant, anti-amoebic, anti-dermatophytic and many more. For different concentrations (100, 60, 40, 20mg/ml) of each extract (aqueous extract) were studied in activity which involved the determination time of paralysis (vermifuge) and time death (vermicidal) of the worms Piperazine adipate in the same concentration as the extract was included as standard reference and normal saline (0.9% NaCl) water with 1% CMC as control. The extract exhibited significant anthelmintic activity at a concentration of 100mg/ml in this case it was found that aqueous extract gives better activity compared to the standard. Results showed that *Alpinia galanga* rhizome extract gives better anthelmintic activity at all the tested doses.

**Keywords:** *Alpinia galanga*, anthelmintic activity, Piperazine adipate, vermifuge and vermicidal

### Introduction

Medicinal plants and their derivatives are widely used in traditional cultures all over the world and they are becoming increasingly popular in modern society as natural alternatives to synthetic chemicals. In the last few decades there has been an exponential growth in the field of herbal medicine [1]. It is getting popularized in developing and developed countries owing to its natural origin and lesser side effects.

*Alpinia galanga* Linn is also known as Greater galangal in English and Kulanjan in Hindi. Most of the South Indian physicians of traditional Ayurveda and Siddha medicine system use *Alpinia galanga* Linn to treat various kinds of disease including diabetes mellitus [2-4]. Its root stocks are tuberous and slightly aromatic, Leaves are oblong-lanceolate, acute, glabrous, green above, paler beneath, with slightly callous white margins, sheaths are long and glabrous, ligule are short and rounded. Flowers greenish white, in dense flowered, 30 cm panicles; bracts ovate-lanceolate. calyx tubular, irregularly 3-toothed. Corolla lobes oblong, claw green, blade white, striated with red, rather more than 1 cm long, broadly elliptic, shortly 2-lobed at apex, with pair of subulate glands at the base of the apex with a pair of subulate glands at the base of claw. Fruit the size of the small cherry, orange red. The rhizome of the plant is used as carminative, digestive tonic, anti-emetic, anti-tumor, Anti-helmintic [5-8], anti-diuretic, anti-ulcerative, anti-dementia. The extract of rhizome shows anti-tubercular activity, hypothermia, bronchial catarrh, tonic, stomachic and stimulant.

### Materials and methods

#### Collection of plant material

Fresh *alpinia galanga* rhizomes were collected in medicinal garden in our college campus and they were washed with distilled water twice. Then they were cut into small pieces.

#### Preparation of extracts

600g of dried rhizomes were suspended in 2lits of distilled water. Extraction was done at 80°C by using soxhlate apparatus for 1 hour 30 minutes. Followed by filtering of the extracts using what man filter paper no 1. Extract was then concentrated at 80°C for 3hours to form a semisolid form and they were transferred into sterile wide mouthed bottles and refrigerated until used.

#### Phytochemical screening

The phytochemical study was carried out by using standard procedures [5, 6].

### Collection of worms

Indian Adult earth worm (*Pheretima posthuma*) were collected from moist soil of the vermiculture plant, Sathupally, Khammam District, Telangana. All the collected worms are washed with normal saline to remove all the faecal matter and used for the anthelmintic study. The earth worms of 3-5 cms in length and 0.1-0.2 cms in width were used for all the experimental protocol.

### Sample preparation

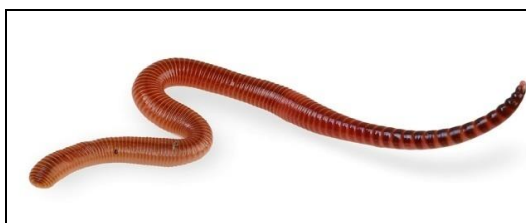
Test sample for *in vitro* study were prepared separately by dissolving and suspending the stored plant extracts were redissolved at concentrations of 20, 40, 60, and 100mg/ml were suspended in 2% v/v tween80 in normal saline solution and used for screening the anthelmintic activity. Standard Piperazine adipate was used with the same concentrations. All the solvents are freshly prepared before commencement of the experiment



Alpinia rhizomes



Alpinia plant



Adult Earth worms

## Results and discussion

### Phytochemical screening

**Table 1:** Phytochemical screening of *Alpinia galanga* Aqueous extract of rhizomes

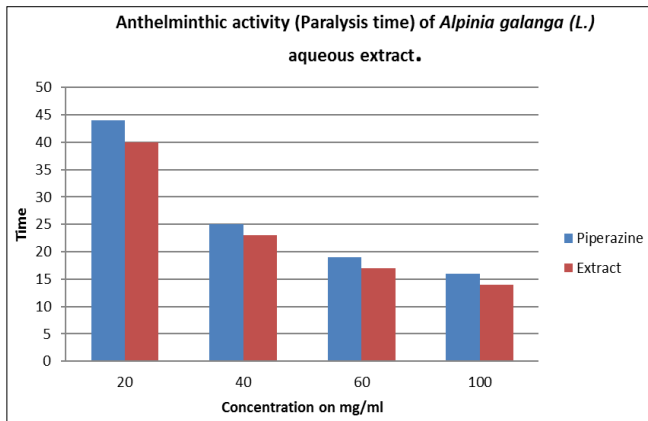
Name of phytoconstituent	Aqueous extract
Alkaloids	-
Carbohydrates	-
Amino acids	+
Tannins	+
Steroids	-
Saponins	-
Flavanoids	+
Glycosides	-
Mucilages	-
Terpenoids	+

Preliminary phytochemical screening of the aqueous extract of *A. galanga* reveals the presence of Amino acids, Flavonoids and Terpenoids. Different doses of the extracts

were screened for their activity mainly due to the presence of flavonoids respectively.

**Table 2:** Anthelmintic activity (Paralysis) of *Alpinia galanga* Linn Rhizome extract

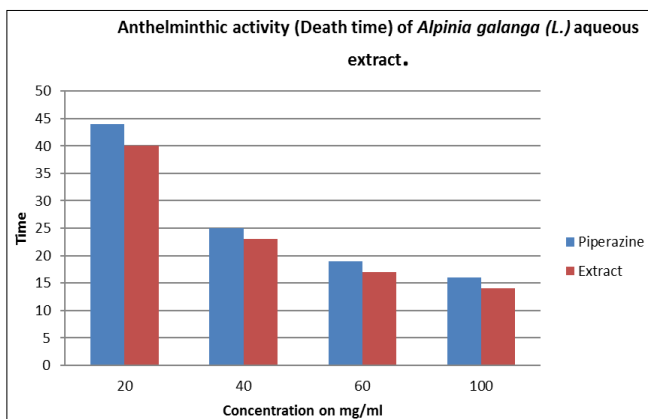
Type of extract	Dose (mg/ml)	Time taken
Rhizome extract	20	31
	40	18
	60	12
	100	5
Piperazine adepate	20	33
	40	16
	60	14
	100	8
Control	-	-



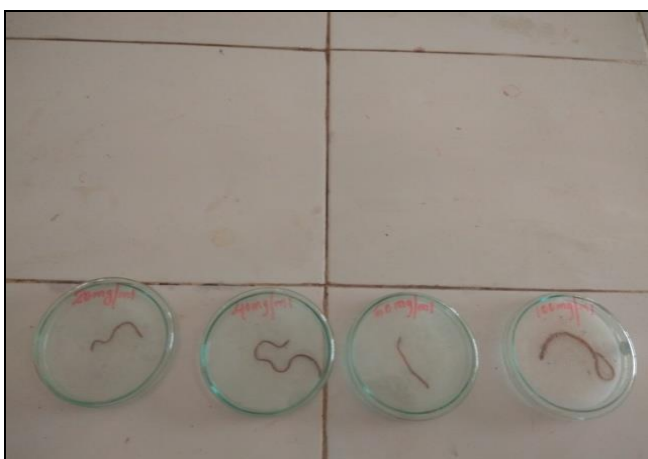
**Fig 1:** Anthelmintic activity (Paralysis) of *Alpinia galanga* Linn Rhizome extract

**Table 3:** Anthelmintic activity (Death) of *Alpinia galanga* Linn Rhizome extract

Type of extract	Dose (mg/ml)	Time taken
Rhizome extract	20	40
	40	23
	60	17
	100	14
Piperazine adepate	20	44
	40	25
	60	19
	100	16
Control	-	-



**Fig 2:** Anthelmintic activity (Death) of *Alpinia galanga* Linn Rhizome extract:



**Fig 3:** Anthelmintic activity at different concentrations:

Tannins are one of such potential chemical constituent responsible for the anthelmintic activity which has ability to bind with the free proteins present in the gastrointestinal tract of earthworm and cause death. Aqueous extract has significant anthelmintic activity when compared to standard Piperazine adepate. The paralysis and death time of aqueous extract was 31,18,12,5 and 40,23,17,14 minutes respectively at concentrations 20, 40, 60 and 100mg/ml for the rhizome extract and these are 33,16,14,8 and 44,25,19,16 minutes respectively at concentrations 20, 40, 60 and 100 mg/ml for Piperazine adepate.

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