

## **AN *IN VITRO* EVALUATION OF ANTHELMINTIC ACTIVITY OF *HEDYCHIUM SPICHATUM* RHIZOMES AND *CUCURBITA MAXIMA* SEEDS ON *PHERITIMA POSTHUMA* MODEL : A COMPARATIVE STUDY**

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### **Abstract**

Ethanollic extracts of *Hedychium spichatum* rhizomes and *Cucurbita maxima* seeds were taken for *In vitro* comparative studies on Anthelmintic activity against *Pheritima posthuma*. Different concentrations (25, 50, 100 mg/ml) of both the extracts were used for the activity. Different Albendazole concentrations (25, 50, 100 mg/ml) were used as a reference standard and normal saline (0.9% NaCl) was used for control treatment. The result was expressed in terms of time in minutes to report paralysis time and death time of earthworms. The data obtained from the study indicates towards the anthelmintic activity, supporting folk use of both the plants when compared to standard. The results also established, a more potent candidature of *Cucurbita maxima* as compare to *Hedychium spichatum*.

**Key words:** *Hedychium spichatum*, *Cucurbita maxima*, Anthelmintic activity, Albendazole.

### **Introduction**

From the ancient period of time, the indigenous drugs are used in Indian Medicinal system to treat different

ailments and therapeutic benefits. Our traditional system of medicine was claiming from the time of immemorial that the different part of the plants are used in different types of diseases along with anthelmintic, anti-inflammatory, antimicrobial activity etc. Kavirajes and Hakims for century past and still are using no. of medicinal plants to treat helminthiasis. During recent years medicinal chemistry have made a optimistic approach especially in synthetic chemistry, but for the sake of therapeutic effect up to the level and non toxic treatment for the helminthiasis the research of plant derived drug therapy is mostly needed.[1]

Rhizomes of *Hedychium spicatum*, commonly known as Gandhapalashi or Kapur –kachari, belongs to the family Zingiberaceae, has been reported for its folkore use in ailment of inflammatory and hyperglycemic conditions.[1] The plant has also been evaluated for its cytotoxic activity by Reddy PP et al.[2]. The survey published by Akhtar M. et al reported the use of *Hedychium spicatum*

as anthelmintic in the Indo –Pak region. [3] [4].

*Cucurbita maxima*, commonly known as Pumpkin (Kaddu), belongs to the family Cucurbitaceae. Seeds of *Cucurbita maxima* have been reported for diuretic and taenicidal activity. Chopra R.N. et al. has been stated about the anthelmintic uses of *Cucurbita maxima* seeds.[1]. Other species of Cucurbitaceae family viz. *C. maxicana* (Srivastava and Singh, 1967), *C. moshata* (Xiao, 1986) and *C. pepo* (Sharma 1971) have been proved for the anthelmintic activity in different *In vitro* models.[5]

However, Zafar Iqbal et al. performed study on other plants of Zingiberaceae and Cucurbitaceae family (*Zingiber officinale*, *Cucurbita mexicana*) in different anthelmintic models [6], but *Hedychium spicatum* and *Cucurbita maxima* have not evaluated scientifically for the same.

In the light of above facts the study has been designed to evaluate *Hedychium spicatum* and *Cucurbita maxima* for their anthelmintic activity against *Pheritima posthuma* model.

## Materials and Methods

### Collection of plants

The plant *Hedychium spicatum* was collected from the fields of Kusumha village (Kushinagar, Uttar Pradesh). The plant was authenticated by National Botanical Research Institute (NBRI), Lucknow and the specimen no. is 97377. The seeds of *Cucurbita maxima* was collected from the area of Deoria Khas

(Deoria, Uttarpradesh). The plant was authenticated by National Botanical Research Institute (NBRI), Lucknow and the specimen no. is 97374

### Collection of Earthworms

Earthworms were collected from Tendua, Gorakhpur and was identified and deposited in Dept. of Pharmacy, ITM, GIDA, GKP, India

### Preparation of Extracts

Shade dried small pieces of *Hedychium spicatum* and shade dried powder of the seeds of *Cucurbita maxima* were subjected for hot percolation by Soxhlet apparatus using ethanol as a solvent.

### Procedure

The anthelmintic activity was performed according to the method of Ghosh et al. on adult Indian earthworm *Pheritima posthuma*. [7] [8]. Albendazole, the standard drug, was diluted with normal saline to obtain 25, 50, 100 mg/ml concentrations and poured into petridishes. Ethanolic extracts of both the plants were diluted with normal saline to obtain 25, 50, 100 mg/ml concentrations. Normal saline (0.9% NaCl) alone served as solvent control. All these dilutions were poured into the petridishes accordingly. 6 groups of earthworms (n=6) were taken for the study. Earth worms, nearly equal sizes (about 8cm), were placed in each petridish at room temperature. Time for paralysis was noted down when no movement of any sort could be

observed except when the worms were shaken vigorously. Time for death of worms was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C).

The paralysis time and lethal time in terms of minutes for each was recorded.

### Results and Discussion

In vitro anthelmintic activity was performed and the paralysis time and lethal time in terms of minutes for each was recorded. Statistical evaluation of the data was done by one way ANOVA. The results were expressed as mean  $\pm$  SD using Graph Pad InStat 3. (n=6).

The result shows that for 25mg/ml concentration the Standard (Albendazole) has showed best activity for death time (124.83 $\pm$ 6.99 min) and ethanolic extract of *H.spicatum* and *C.maxima* has showed death time of 146 $\pm$ 2.828 min and 137.83 $\pm$ 5.307 min. respectively. Also, for 50mg/ml concentration the Standard (Albendazole) has showed the highest activity against the worms (95.5 $\pm$ 4.84 min) and ethanolic extract of *H.spicatum* and *C.maxima* has showed death time of 137.5 $\pm$ 9.75 min and 124.33 $\pm$ 4.32 min

respectively. For 100mg/ml the Standard (albendazole) has showed least death time of 73.83 $\pm$ 4.167 min and ethanolic extract of *H.spicatum* and *C.maxima* has showed death time of 96.66 $\pm$ 3.266 min and 79 $\pm$ 2.82 min respectively. The paralysis and death time of both the plants along with standard is given in the table no. 1. From the study is observed that both the plants ethanolic extracts has shown significant effect at higher concentration.(100mg/ml).

*C.maxima* has shown better activity than *Hedychium spicatum* in higher concentration(100mg/ml) comparing to standard Albendazole (100mg/ml).The comparison of death time of both the plants in different concentration with respect to standard has given in the graph no. 1

### Conclusion

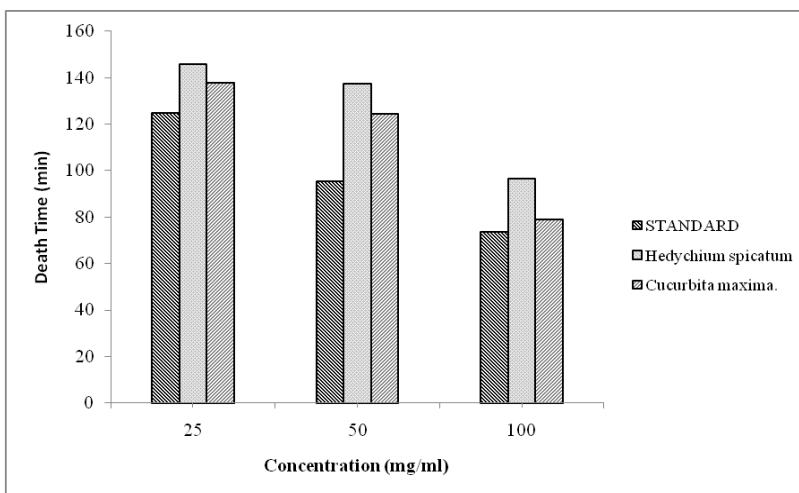
The present study enabled us to conclude the potential use of Ethanolic extracts of both the plants as a anthelmintics against *Pheritima posthuma* in vitro model .The extensive research is needed to determine the individual component responsible for anhelminthic activity and molecular mechanism responsible for the same.

**Table No.1** In vitro Anthelmintic effect of *Hedychium spicatum* and *Cucurbita maxima* against *Pheritima posthuma*

| Sl No. | Treatment  | Concentration | Paralysis Time (min) | Death Time (min) |
|--------|--|---------------|----------------------|------------------|
| 1      | Albendazole(Std )                                | 25 mg/ml      | 55.66±4.59           | 124.83±6.99      |
|        |  | 50 mg/ml      | 43.33±4.32           | 95.5±4.84        |
|        |  | 100 mg/ml     | 34.66±3.327          | 73.83±4.167      |
| 2      | <i>Hedychium spicatum</i><br>(ethanolic extract) | 25 mg/ml      | 78.16±3.656          | 146±2.828        |
|        |  | 50 mg/ml      | 62.33±4.131          | 137.5±9.752      |
|        |  | 100 mg/ml     | 44±4.382             | 96.66±3.266      |
| 3      | <i>Cucurbita maxima</i><br>(ethanolic extract)   | 25 mg/ml      | 75.33±2.805          | 137.83±5.307     |
|        |  | 50 mg/ml      | 55.83±2.858          | 124.33±4.32      |
|        |  | 100 mg/ml     | 38.66±4.502          | 79±2.82          |

± SD Value, n=6, p< 0.01

**Graph No. 1** Comparative studies of Death time of both the plants with the standard



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## WATER REQUIREMENT, DEFICIT IRRIGATION AND CROP COEFFICIENTS FOR PEPPER

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