

Antihelmintic Activity of Methanolic Extract of Leaves of *Glycosmis Pentaphylla*

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ABSTRACT:

The plant *Glycosmis pentaphylla* corr. belongs to the family Rutaceae. This plant has great medicinal value and is widely distributed in India. The antihelmintic effect of methanolic extract of leaves of *G. pentaphylla* was evaluated on adult Indian earthworm (*Pheritima posthuma*) at doses of 10-80 mg/ml. The extract produced a significant ($P < 0.05$) dose dependant action and inhibition of spontaneous motility (paralysis) and death of earthworms. The results of pharmacological tests performed in the present study suggest that the methanolic extract of *Glycosmis pentaphylla* possess antihelmintic effect and these findings seem to justify the use of plant in traditional Indian medicine in the treatment of helminthic infestations.

KEY WORDS: *Glycosmis pentaphylla*, Rutaceae, Antihelmintic activity, *Pheritima posthuma*

INTRODUCTION:

Helminthic infestations are now being recognized as a cause of chronic ill health and sluggishness amongst the children. More than half of the population in the world suffers from worm infestations of one or other. Helminthes also affect domestic animals and livestock causing considerable economic loss. Traditional system of medicine reports the efficacy of several natural products eliminating helminthes. [1]

The plant *Glycosmis pentaphylla* Corr. belongs to the family Rutaceae. This plant is thorn less shrub or small tree [2]. The plant is native to south-eastern Asia and north-eastern Australia. In India the plant is found in various states like Assam, Arunachal,

Meghalaya, Nagaland and Mizoram [3]. This plant is used in indigenous medicine for cough, jaundice, inflammation, rheumatism, anemia and helminthic infestations [4].

A bibliographic survey showed that *G. pentaphylla* is traditionally used against various ailments, but till date it has not been scientifically explored for its anti-helminthic potential. Therefore, in present study our efforts were devoted to explore this plant scientifically for its antihelminthic potential.

MATERIAL AND METHODS:

Plant material

The plant material (leaves) of *Glycosmis pentaphylla* Corr. were collected from the campus of Dibrugarh University, Assam (India) and it was positively identified and authenticated from botanical survey of India, Shillong. A voucher specimen (DU/PSc/HRB-2/08) was deposited in the Herbarium of the institute.

Extraction

The leaves of *G. pentaphylla* were dried in the shade, powdered (100g) and extracted with methanol using soxhlet apparatus (Yield: 18.88%).

Animals

Indian adult earthworms, *Pheritima posthuma*, resemble both anatomically and physiologically to the intestinal roundworm parasites of human beings hence these were used to study antihelminthic activity. [5,6,7] The earthworms of 3-6 cm in length and 0.1-0.3 cm in width were used for all experimental protocols. The earthworms collected from the moist soil of the campus of Jaipur College of Pharmacy, Jaipur (Rajasthan), India and were washed with normal saline to remove the faecal matter.

Evaluation of Antihelminthic activity

The antihelminthic activity was evaluated on adult Indian earthworm. The earthworms were divided into seven groups; each group containing six earthworms. The group first served as control which was treated with vehicle (5% DMF in normal saline). The second, third & fourth groups served as standard which were treated with albendazole at various concentrations (15, 30, 60 mg/ml). The fifth, sixth & seventh groups were served as test which were treated with methanolic extract of *G. Pentaphylla* leaves at various concentrations (15, 30, 60 mg/ml) respectively. The time taken by worms to paralysis and death was observed. Time for paralysis was noted when no movement could be observed with a slight pin prick method. Death was ascertained by applying

external stimuli which stimulate and induce movements in worms as well as fade of the body color was noted.

Statistical analysis

Results obtained in the present investigation were expressed as mean SEM. The data were analyzed using Student's t-test and results were considered significant when $P < 0.05$.

RESULTS AND DISCUSSION:

The methanolic extract of *G. Pentaphylla* leaves produced a significant antihelmintic activity in dose dependent manner. Results are shown in Table-1.

Table 1: Effect of methanolic leaves extract of *G. pentaphylla* on *Pheritima posthuma*

Groups	Concentration (mg/ml)	Time taken (minutes)	
		For paralysis	For death
Control	5% DMF in normal saline	-	-
Albendazole	15	30.46±0.04	62.44±0.06
	30	21.32±0.04	48.44±0.03
	60	16.14±0.02	36.12±0.02
Methanolic Leaves extract of <i>Glycosmis pentaphylla</i>	15	44.26±0.03	78.36±0.05
	30	36.16±0.02	70.24±0.03
	60	14.56±0.04	30.52±0.02

Values are mean ±SEM, $P < 0.05$

At lower concentrations (15 & 30 mg/ml), the methanolic extract produced paralysis as well as death but the time taken for these actions were found to be more than the time taken by standard drug. But at higher concentration (60 mg/ml), the methanolic extract demonstrated paralysis as well as death of worms in a less time as compared to albendazole.

Tannins and saponins were shown to possess antihelmintic activity. [1,8] Tannins are found to bind with free proteins in the gastrointestinal tract of the host animal or glycoprotein on the cuticle of the parasite and cause death. [9] These facts suggest that

tannins and saponins may be present in the methanolic extract of *G. Pentaphylla* leaves and the extract showed the antihelmintic effect by one of the above mentioned mechanisms.

The results from the present investigation demonstrated the antihelmintic activity of methanolic extract of *G. Pentaphylla* leaves which justify the use of this plant in traditional Indian medicine system for helminthic infestations.

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