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Short Communication

ANTHELMINTIC ACTIVITIES OF *GLYCOSMIS PENTAPHYLLA* AND *SPONDIAS PINNATA*

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ABSTRACT

Extracts from Glycosmis *pentaphylla* roots, and stem heart wood and bark of Spondias *pinnata* when tested *in vitro*, showed potent Anthelmintic activity on the earthworm, Pheretima posthuma. Methanolic extract of G. *pentaphylla* was more active than its chloroform extract ($p<0.001$), while stem heart wood Methanolic extract of S. *pinnata* was also more potent than the bark extract.

Keywords: Glycosmis *pentaphylla*, Spondias *pinnata*, Anthelmintic activity.

INTRODUCTION

Helminthic infections are now being recognized as cause of much chronic ill health and sluggishness amongst the tropical people. More than half of the population in the world suffers from worm infection of one or the other. Glycosmis *pentaphylla* (Retz.) DC (Rutaceae) [1], roots and Spondias *pinnata* (Linn. F.), (Anacardiaceae) [2] stem heart wood and bark collected from tribal area of srungavarapu kota, vizianagram (Andhrapradesh), India. Identified by Dept. of Botany, Andhra University, India. A voucher specimen was deposited in the Andhra University herbarium.

G. *pentaphylla* commonly called as orange berry, juices of leaves used in fever, liver complaints, and as a vermifuge [1]. Spondias *pinnata* (Linn. F.) as astringent, antiscorbutic, diarrhea and dysentery [2].

Previously isolated constituents:

Arborinine, carbazole alkaloids (glycozolicine, 3-formyl carbazole, glycosinine), mupamine, from G. *pentaphylla* [3-5]. β-Amyrin, oleanolic acid and amino acids(alanine, leucine) from S. *Pinnata* [6]. In the present study, we have evaluated the anthelmintic activity of both the plants.

MATERIALS AND METHODS

Tested material:

Chloroform (0.95%) and methanol (1.47%) extract from G. *pentaphylla* roots, methanolic extract from stem heart wood (6.73%) and bark (6.65%) of S. *pinnata*.

Studied activity

Anthelmintic activity was evaluated for both Glycosmis *pentaphylla* and Spondias *pinnata* separately. The activity was tested according to method discussed in detail by Kailasaraj and Kurupa [7]. Pheretima posthuma (Earthworm obtained from Horticulture Department) of nearly equal size (9+1cm) were selected for present study due to its anatomical and physiological resemblance with round worm parasites of human beings [8, 9].

Six earthworms of nearly equal size were placed in each Petri dish at room temperature. The time taken to complete paralysis and death were recorded. The mean paralysis time and mean lethal time for each sample were recorded.

Statistical Analysis

The results were analyzed for statistical significance using one-way ANOVA followed by student t-test. Difference at $P<0.001$ was considered significant.

RESULTS AND CONCLUSION

Chloroform and Methanolic extracts of G. *pentaphylla* roots (Table 1) and the Methanolic extracts from stem heart wood and bark of S. *pinnata* (Table 2) showed concentration-dependent Anthelmintic activity against earthworms. G.

pentaphylla showed significant effects ($p<0.001$) at the tested concentrations (10-

Table 1 Effects of G. *pentaphylla* root extracts on earthworm

Extracts (min) (mg/ml)	Paralysis time (min) Chloroform extract	Death time (min)	Paralysis time (min) Methanol extract	Death time
10	227±2.40	336±7.57	94±0.46	143±2.84
20	184±2.67	216±11.91	82±1.56	99±8.98
40	128±1.75	204±12.82	58±2.80	87±4.96
80	49±1.03	173±9.98	41±1.81	67±2.60
	Piperazine hydrate Paralysis time (min)			Death time (min)
20	21±1.21			83±4.15

Each value represents mean ±SEM (N=3). $P<0.001$ significantly different compared with reference compound, Piperazine hydrate, student's *t*-test.

Table 2 Effects of the S. *pinnata* stem heart wood and bark extracts on earthworm

Extracts (mg/ml)	Paralysis time (min) Stem heart wood	Death time (min)	Paralysis time (min) Bark	Death time (min)
10	59±2.04	1485±38.87	_	_
20	30±0.73	1121±13.90	206±8.85	2050±112.65
40	23±0.72	926±41.62	84±0.53	1217±70.07
80	18±0.35	133±3.75	20±0.48	123±2.07
100	15±0.94	81±5.42	14±0.83	59±5.02
	Piperazine hydrate Paralysis time (min)			Death time (min)
20	18±0.02			99±13.98

Each value represents mean ±SEM (N=3), -no activity.P<0.001 significantly different compared with reference compound, Piperazine hydrate, student's *t*-test.20mg/ml) as determined by the paralysis time and death time (Table 1). The methanol extract was more effective in causing death of worms at all concentrations than chloroform extract at 99.99% significant level, and also effective (p,0.001) at 10-20mg/ml in causing paralysis. Reported in Table 1

The S. *pinnata* bark extract was more effective at lower concentrations (20-40mg/ml) in causing paralysis and death of earthworms than stem heart wood extract (p, 0.001, Table 2). The stem heart wood extract was inactive at the least concentration of 10mg/ml. At concentrations of 80mg/ml and 100mg/ml, bark and stem heart wood extracts of S. *pinnata* were equipotent (p,0.001) only in paralyzing the worms, while the bark extract was significantly more potent than the stem heart wood extract in the death time. Reported in Table 2

Nevertheless, activities of extracts of the two plants investigated on the earthworms were lower than that of the reference compound, piperazine hydrate. This report is the first documentation on the anthelmintic activity of G. *pentaphylla* and S. *pinnata*. It may be worthwhile to test the compounds previously isolated from these two plants for Anthelmintic activity.

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REFERENCES:

1. The useful plants of India; National institute of science communication; CSIR, New Delhi, (2000) p.240.
2. The useful plants of India ; National institute of science communication; CSIR, New Delhi, (2000) p.595.
3. Quader M. A., Nutan M. T. H., et al. Fitotherapia 70(3), (1999) 305-307.
4. Jash S. S., BiswasG. K. et al. Phytochemistry. 31(7), (1992) 2503-2505.
5. Kamaruzzman S. R. and Chakraborty D. P. Phytochemistry. 28(2), (1989) 677-678.
6. Ram. P. Rastogi., Mehrotra B.N. Compendium of Indian medicinal plants, PID, New Delhi (1993) p.643.
7. Kailashraj R., Krupa A., Indian J. Pharm. 74, (1962) 64-65.
8. Thorn G. W., Adams R. D., Baunwald E., Isselbacher K. J., Petersdorf R. G., "Harrison's Principle of Internal Medicine", Mc-Graw Hill Co., New York, (1977) p.1088.
9. Vigar Z., "Atlas of Medical Parasitology" P. G. Publishing House, Singapore. (1984) p.216.

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