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# Evaluation of anthelmintic activity of nuts of *Semecarpus anacardium*

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## Abstract

The anthelmintic activity of different extracts of nuts of *Semecarpus anacardium* were evaluated separately on adult Indian earthworm (*Pheritima posthuma*). It was found that petroleum ether, chloroform extract of *S. anacardium* (PESA and CESA, respectively) showed better anthelmintic activities than ethanol (EESA) and aqueous (AESA) extract of it. The anthelmintic effects of PESA and CESA at 10 mg/ml and EESA at 20 mg/ml concentration are comparable to that of the effects produced by the reference standards, albendazole (10 mg/ml) and piperazine citrate (10 mg/ml).

## Introduction

Helminthic infections are now being recognized as cause of much chronic ill health and slugginess amongst the tropical people. More than half of the population in the world suffers from worm infection of one or other. Helminthic also affect the domestic animals and livestock causing considerable economic losses. Traditional system of medicine reports the efficacy of several natural products eliminating Helminthic. Keeping this in mind, the present communication deals with the evaluation of anthelmintic activity of nuts of *Semecarpus anacardium*.

*Semecarpus anacardium* (family: anacardiaceae, bhela in Bengali, bhalia in Oriya), a small tree is distributed throughout the hotter part of India, found widely in North Australia. Various parts of this plant were used in tribal medicine for diseases like herpetic eruption, paralysis and acute rhematism (1). The fruits of *S. anacardium* called dhobi-nut is used as an indelible ink to mark laundry (2).

Extract of nuts posses anticancer activity due to its strong cytotoxic effects (3). It has also lubricant, anticorrosive and antimicrobial properties (3, 4). In the present study, we have evaluated the anthelmintic activities of petroleum ether, chloroform, ethanol and aqueous extract of nuts of *S. anacardium* (PESA, CESA, EESA and AESA, respectively) to substantiate the folklore claims.

## Materials And Method

### Plant material

The nuts of *S. anacardium* were collected during the months of April from the hill area of Simlipal, Mayurbhanj district, Orissa and were authenticated by Dr H. J. Chowdhury, Joint Director, Central National Herbarium, Botanical Survey of India, Howrah, West Bengal. The voucher specimen has been preserved in our laboratory for further references (DTA 1). After collection, nuts were washed properly.

### Preparation of plant extract

Shade-dried, powdered, sieved (40 mesh size) plant materials were extracted in succession with petroleum ether (60-80°C), chloroform, ethanol and distilled water. The extracts were evaporated to dryness. The trace amount of solvents, which might be present within the solid mass of respective extracts, was removed under vacuum. The yield of petroleum ether (PESA), chloroform (CESA), ethanol (EESA) and aqueous (AESA) extract were 15.20%, 4.75%, 6.95% and 4.30%, respectively. The individual extract was suspended in 1% gum acacia in normal saline (vehicle) for investigation of anthelmintic activity.

### Evaluation of anthelmintic activity

Anthelmintic activity was evaluated on adult Indian earthworm, *Pheritima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings (5, 6, 7). The method of Mathew *et. al.* (8) and Dash *et. al.* (9, 10) was followed for anthelmintic screening.

Each group was treated with one of the following: vehicle (1% gum acacia in normal saline), piperazine citrate (10 mg/ml), albendazole (10 mg/ml) and extracts (10 and 20 mg/ml) in normal saline containing 1% gum acacia. Observations were made for the time taken to paralyze and / or death of individual worm up to four hours of test period. Paralysis was said to occur when the worms did not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body color (9, 10, 11, 12).

## Results And Discussion

The anthelmintic activities of the title compounds on *Pheretima posthuma* is exhibited in Table 1. The perusal of the data reveals that EESA and AESA did not exhibit significant anthelmintic activity at a concentration of 10 mg/ml. However, PESA, CESA at 10 mg/ml and EESA at 20 mg/ml showed significant anthelmintic activities

which are comparable with that of the effects produced by the reference standards albendazole (10 mg/ml) and piperazine citrate (10 mg/ml). So, the activity reveals concentration dependent nature of all the four different extracts. Potency of these extracts were found to be inversely proportional to the time taken for paralysis/death of the worms.

Further studies regarding the isolation and characterization of the active principle(s) responsible for anthe - lmintic activity are currently under progress.


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**Table 1: Anthelmintic activity of nuts of *S. anacardium***

| Compound | Concentration (mg/ml) | Time (min) | |
|---|---|---|---|
| | | For paralysis | For death |
| Control ( 1% gum acacia in normal saline) | | - | - |
| Albendazole | 10 | 36.60±0.52 | 63.15±0.68 |
| Piperazine citrate | 10 | 21.58±0.36 | 138.50±2.90 |
| PESA | 10 | 36.50±0.60 | 61.25±0.65 |
| | 20 | 11.70±0.35 | 25.10±0.46 |
| CESA | 10 | 28.10±0.39 | 44.0±0.37 |
| | 20 | 17.25±0.25 | 36.50±0.60 |
| EESA | 10 | 139.5±2.10 | 242.3±2.05 |
| | 20 | 24.70±0.35 | 45.20±0.40 |
| AESA | 10 | 90.20±0.75 | 179.40±2.90 |
| | 20 | 320.35±3.40 | - |

Results are expressed as mean ± SEM from six observations. PESA, CESA, EESA, AESA: petroleum ether, chloroform, ethanol and aqueous extract of *S. anacardium* respectively.

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