ANTHELMINTIC ACTIVITY OF AERIAL PARTS OF MELOTHRIA HETEROPHYLLA LOUR.

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ABSTRACT:
Petroleum ether (60-80°C), chloroform, ethyl acetate, ethanol and aqueous extract of aerial parts of *Melothria heterophylla* Lour. were evaluated separately for anthelmintic activity on adult Indian earthworms (*Pheretima posthuma*), using albendazole and piperazine citrate as reference standards. The results indicated that the ethanol extract of *M. heterophylla* Lour (EEMH) was more potent than the other four extracts of it.

INTRODUCTION

*Melothria heterophylla* Lour. (family - Cucurbitaceae) popularly known as kudari is a scandent herb with tuberous roots found throughout India ascending upto 2,100 m in the hills. It is used by the tribals of Orissa for its stimulant, invigorating and purgative properties. The juice of the leaves has anti-inflammatory activities.

In the present study, the anthelmintic activities of petroleum ether (PEMH), chloroform (CEMH), ethyl acetate (EAMH), ethanol (EEMH) and aqueous extract (AEMH) of *M. heterophylla* Lour of the aerial parts were investigated.

MATERIALS AND METHODS

Plant material
The aerial parts of *M. heterophylla* Lour were identified by Botanical Survey of India, Shibpur, Howrah, West Bengal. A voucher specimen has been preserved in our laboratory for future reference (AD1). After authentication, fresh aerial parts were collected in bulk from young matured plants from Mayurbhanj District of North Orissa; washed, shade dried and then milled to coarse powder by a mechanical grinder.

Preparation of plant extract
The powdered plant materials were extracted in succession with petroleum ether (60-80°C), chloroform, ethyl acetate, ethanol and distilled water using soxhlet apparatus. The solvent was then removed under reduced pressure, which gave colored residues for petroleum ether (PEMH, yield 4.38 %), chloroform (CEMH, yield 2.276%),...
ethyl acetate (EAMH, yield 0.461%), ethanol (EEMH, yield 5.30%) and aqueous extract (AEMH, yield 14.39%) respectively. The completely dried individual extract was suspended in 1% gum acacia in normal saline (vehicle) for investigation of anthelmintic activities.

**Evaluation of anthelmintic activity**

The anthelmintic activity was evaluated on adult Indian earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings. The method of Mathew et al and Dash et al was followed for anthelmintic screening. Eighteen groups, each consisting of six earthworms of approximately equal size were released into 50 ml of desired formulation.

Each group was treated with one of the following: vehicle (1% gum acacia in normal saline), piperazine citrate (15 mg/ml), albendazole (10 mg/ml) and extracts (10, 25 & 50 mg/ml) in normal saline containing 1% gum acacia. Observations were made for the time taken to paralyse and/or death of individual worms 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 colour.

**RESULTS AND DISCUSSION**

The results are illustrated in Table 1. The perusal of the data reveals that the PEMH and AEMH did not exhibit significant anthelmintic activity at a concentration of 10 & 25 mg/ml. However, at the dose of 50 mg/ml concentration of both the extract showed marked degree of anthelmintic activity. The CEMH, EAMH and EEMH showed significant anthelmintic activity compared to PEMH and AEMH. The anthelmintic effect of CEMH, EAMH at 50 mg/ml and EEMH at 25 mg/ml concentration is comparable with that of the effect produced by the reference standards albendazole (10 mg/ml) and piperazine citrate (15 mg/ml).

The present study also reveals that the ethanol extract of *M. heterophylla* Lour was more potent than any other extract of it, even though every extract was endowed with anthelmintic property. So the activity reveals concentration dependent nature of all the five different extracts. Potency of these extracts were found to be inversely proportional to the time taken for paralysis/death of the worms.

Further study regarding the isolation and characterization of the active principle responsible for anthelmintic activity are currently under progress.

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Table 1: Anthelmintic activity of aerial parts of *M. heterophylla* Lour.

| SL. No | Compound and vehicle | Concentration mg/ml | Time taken for Paralysis (min) | Time taken for Death (min) |
|--------|----------------------|---------------------|-------------------------------|-----------------------------|
| 1      | Control (1% gum acacia in normal saline) | -                   | -                             | -                           |
| 2      | Albendazole          | 10                  | 34.60±0.65                    | 63.80 ± 0.76                |
| 3      | Piperazine           | 15                  | 18.52±0.29                    | -                           |
| 4      | PEMH                 | 10, 25, 50          | - 135 ± 1.25                  | - 167.50 ± 1.75             |
| 5      | CEMH                 | 10, 25, 50          | 139.5 ± 2.21                  | 252.6 ± 2.05                |
| 6      | EAMH                 | 10, 25, 50          | 135.6 ± 2.35                  | 237.8 ± 2.0                 |
| 7      | EEMH                 | 10, 25, 50          | 132.4 ± 2.20                  | 182.5 ± 3.05                |
| 8      | AEMH                 | 10, 25, 50          | 324.4 ± 3.50                  | 184.2 ± 3.20                |

Results are expressed as Mean ± SEM from six observations. PEMH, CEMH, EAMH, EEMH, AEMH: Petroleum ether, chloroform, ethyl acetate, ethanol and aqueous extract of *M. heterophylla* Lour respectively.
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