Anthelmintic Activity of *Momordica Cymbalaria* Hook.F

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Summary

Fruits of *Momordica cymbalaria* Hook. F were dried, powdered and extracted with petroleum ether, chloroform, methanol and water in Soxhlet extractor. Anthelmintic activity of these extracts was evaluated on Indian adult earthworms, *Pherentima posthuma*. Results showed that the petroleum ether, chloroform and methanol extracts took less time to cause paralysis and death of the earthworms. It can be concluded that anthelmintic activity of the fruit *Momordica cymbalaria* is due to the active principles present mostly in the petroleum ether, chloroform and methanol extracts.

Key words : *Momordica cymbalaria*, anthelmintic activity, *Pheretima posthuma*

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Introduction

Diseases caused by helminth parasites in livestock continue to be a major productivity constraint, especially in small ruminants in the tropics and subtropics (1). In the developing countries, with the exception of those countries in the southern hemisphere, the greatest impact is probably found in the costs of control, particularly in the case of the helminth parasitoses. In the Developing countries, the greatest impact of parasitic diseases is in direct and potential productivity losses (2). Many researches show that some plants not only affect the nutrition of animals, but also have antiparasitic effects (3). For example, plants that contain condensed tannins, a class of phenolic secondary metabolites, have these effects.

Momordica cymabalaria Hook. F. belongs to the Cucurbitaceae family. The plant is a perennial herbaceous climber either allowed to trail on the ground or to climb on supports with the aid of tendrils. It is found in the south Indian states of Andhra Pradesh, Karnataka, Madhya Pradesh, Maharastra and Tamil Nadu as a weed. Flowering occurs during October; fruits are harvested from November to January. The yield of each plant is 1.25 to 1.5kg. The tender fruits closely resemble those of a small variety of bitter gourd Athalakkai is used as a vegetable by the rural people of South Tamil Nadu and North Karnataka, India (4). However the work on pharmacological profile of the plant is very less. In ancient literature it is found that various parts of the plants were used for abortificient, wooping cough purposes, opening boils, enriching digestive function, blood and nervous disorders, piles, constipation, toxicities and internatal urogenital disorders in women. The phytochemicals reported in this plant are tannins, alkaloids, phenols, proteins, amino acids, Vitamin C, carbohydrate and ß-Carotene (4). The fruits of this plant reported anti diabetic and antihyperlipedimic activities (5). The tubers were reported as antiovulatory activity (6)

Materials and methods

Plant materials

The fruits of *Momordica cymbalaria* Hook F. was collected in November 2006 from Hanamkonda, Andhrapradesh, India. The fruit material was taxonomically identified by Dr. Raju S.Vastavya, Taxonomist, Department of Botany, Kakatiya university, Warangal. The fruits were dried under shade with occasional shifting and then powdered with a mechanical grinder and stored in an airtight container.

Drugs and chemicals

The following drugs and chemicals were used. Drugs: Albendazole (BANDY, Mankind Pharma Ltd., New Delhi), Nitazoxamide (NITACURE, Alembic Ltd., Vadodara), Chemicals:Petroleum ether (60-80oC) A.R. (SD FINE, Mumbai), Chlorform A.R. (SD FINE, Mumbai), Methanol A.R (SD FINE, Mumbai), Dimethyl formamide (DMF) (SD FINE, Mumbai)and saline water (Claris Lifesciences Ltd.,Ahmedabad).

Preparation of extracts

The powder obtained was subjected to successive soxhlet extraction with the solvents with increasing order of polarity i.e. Pet. Ether (60-80°), Chloroform (59.5-61.5°), methanol (64.5-65.5°) and water. Yield 3.29, 6.19, 11.70, and 15.71% respectively.

Animals

Indian adult earthworms (*Pheretima posthuma*) collected from moist soil and washed with normal saline to remove all faecal matter were used for the anthelmintic study. The earthworms of 3-5cm in length and 0.1-0.2 cm in width were used for all the experimental protocol due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human beings (7)/(8).

Anthelmintic activity

All the extracts of *M.cymbalaria* were dissolved in minimum amount of DMF and then volume is adjusted to 10 ml with saline water. All drugs and extract solutions were freshly prepared before starting the experiment. Six groups of six earthworms each were released into 10 ml of desired formulations as follows; vehicles (5% DMF in normal saline), Albendazole (20 mg/ml), Nitazoxamide (20 mg/ml), petroleum ether, chloroform, methanol and aqueous extract of *M.cymbalaria* (20mg/ml, each) in normal saline containing 5% DMF. Observations were made for the time taken to paralysis and death of individual worms. 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 colors (9).

Results and discussion

The data revealed that petroleum ether and methanolic extracts of *M.cymbalaria* showed significant anthelmintic activity at 20 mg/ml concentrations. Results are comparable with standard drugs Albendazole and Nitazoxamide, at same concentration best anthelmintic activity (Table 1). In order to find out active constituents from *M.cymbalaria*, which are responsible for the activity, are polar or nonpolar compounds, successive extracts of *M.cymbalaria* like petroleum ether, chloroform, methanol and aqueous. The results shows that chloroform extracts of *M.cymbalaria* took the least time to cause paralysis and death of earthworms followed by petroleum ether, methanol and aqueous respectively. Results of preliminary phytochemical tests suggest that petroleum ether extract contain sterols, triterpenes and fatty substances; chloroform extracts contains , triterpenes, sterols, glycosides, methanol extract contains alkaloids, sterols, triterpenes, flavanoids, glycosides, tannins, and aqueous extract contains vitamins, flavanoids. It can be concluded that active constituents present in all the extracts responsible for anthelmintic activity. This indicates that the anthelmintic principles are nonpolar compounds.

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Table 1. Anthelmintic activity of *Momordica cymbalaria*
Results are expressed as mean±SEM from six observations; Control worms were alive up to 24 hrs of observation. All the extracts and standard drugs were given at 20 mg/ml concentration.
PEMC: Petroleum ether extract of *Momordica Cymbalaria*
CEMC: Chloroform extract of *Momordica Cymbalaria*
MEMC: Methanolic extract of *Momordica Cymbalaria*
AEMC: Aqueous extract of *Momoridca Cymbalaria*

Treatment	Time of paralysis (min)	Time of death (min)
PEMC	3.12±0.01	2.46±0.13
CEMC	3.55±0.02	2.59±0.12
MEMC	3.01±0.01	2.34±0.33
AEMC	4.07±0.22	5.38±0.98
Albendazole	2.55±0.07	1.99±0.33
Nitazoxamide	2.56±0.11	1.45±0.51

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