

In vitro evaluation of anthelmintic activity of anterdhum padhati mashi and bahirdhum padhati mashi of green *Cocos nucifera* Linn. (Palmae) husk.

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ABSTRACT

The aim of present study was to evaluate anthelmintic potential of anterdhum Padhati Mahi (APM) and Bahirdhum Padhati mashi (BPM) using *Pheretima posthuma* and *Ascardia galli* as test worms. Various concentrations (10 – 100 mg/ml) of APM and BPM were tested in the bioassay, which involved determination of time of paralysis (P) and time of death (D) of the worms. Piperazine citrate (10 mg/ml) was included as standard reference and distilled water as control. The results of present study indicated that APM and BPM significantly demonstrated paralysis, and also caused death of worms especially at higher concentration of 100 mg/ml, as compared to standard reference Piperazine citrate. In conclusion, the Mashi as an anthelmintic have been confirmed.

Keywords: *Ascardia galli*, *Kalpravriksha*, *Pheretima posthuma*, Piperazine citrate,.

Editor: Mueen Ahmed KK, Phcog.Net

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INTRODUCTION

Cocos nucifera Linn. (Family: Palmae, English: Coconut Palm) is extensively cultivated in southern India and Ceylon. Every Part of the tree is being used for some purpose like food, fuel or timber hence it is called as kalpravriksha (1). Recent results show that aqueous extracts from husk of *Cocos nucifera* present antimicrobial, antiviral (2) and antileishmanial properties. The coconut milk was tested for antiparasitic activity in mice and showed efficacy against *Syphacia obvelata*, *Aspiculuris tetraptera* (3) and *Vampirolepis nana* (4). The liquid extracted from the coconut husk fiber has analgesic, antioxidant (5) and antiproliferative activity against lymphocytes (6). By chromatographic methods coupled to mass spectroscopy techniques has been demonstrated that drug contain catechin and epicatechin together with condensed tannins (2). Coconut husk mashi has antimicrobial, diuretic and analgesic activity. Parasitic

diseases caused by helminthes lead to significant health hazards to animals resulting in enormous economic impact. While a number of anthelmintics are currently available, all are encountering resistance. Mashi shows presence of tannins and tannins shows anthelmintic activities (7).The objective of this work was to evaluate in vitro the anthelmintic activity of anterdhum padhati mashi (APM) and bahirdhum padhati mashi (BPM) obtained from green coconut husk fiber against *Pheretima posthuma* and *Ascardia galli*.

MATERIAL AND METHODS

Plant material

Cocos nucifera Linn. husk was collected by A. M. Baheti from Pune region and identified by Pharmacognosy Department of MAEER's Maharashtra Institute of Pharmacy, Pune. [Voucher specimen (hp/Cocos/01)]

Preparation of the anterdhum padhati mashi (APM)

Husk was packed in between two earthen pots (Sharav samput), which were sealed by Multtani matti. It was subjected to Gajaputa (heating into kund filled with cow dung cake) in Gajaputa kund for 50 min. When Gajaputa became swangsheet (cool), sharav was taken out of kund and Mashi was collected. 100 gm of the husk gave 31.89 gm of APM Mashi

Preparation of the bahirdhum padhati mashi (BPM)

Husk was collected and dried under shade. Green coconut husk were heated in earthen pot at 145-1550C. With continuous stirring till the white fumes ceases to come out. 100 gm of the husk gave 6gm of BPM Mashi (The burnt black powder).

Worms collection

Indian earthworm *Pheretima posthuma* of about 5-7 cm long were collected from logged area of soil, Adawad, Dist: Jalgaon (MS) and *Ascaridia galli* (Nematode) worms were obtained from freshly slaughtered fowls (*Gallus gallus*).

Preparation of test sample

Samples for in-vitro study were prepared by dissolving 2.5 gm of each Mashi in 25 ml of distilled water to obtain a stock solution of 100 mg/ml. From this stock solution, different working dilutions were prepared to get concentration range of 10, 50 and 100 mg/ml.

Anthelmintic assay

The anthelmintic assay was carried as per the method of Ajaiyeoba E.O. et al (8) with minor modifications. The assay was performed on adult Indian earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings (9-12). Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro (13-16). *Ascaridia galli* worms are easily and plentifully available from freshly slaughtered fowls and its use, as a suitable model for screening of anthelmintic drug was advocated earlier (17-19). 50 ml formulations containing three different concentrations, each of mashi (10, 50 and 100 mg/ml in distilled water) were prepared and six worms (same type) were placed in it. This was done for both types of worm. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Piperazine citrate (10 mg/ml) was used as reference standard while distilled water as the control.

RESULTS AND DISCUSSION

As shown in Table 1, anterdhum padhati mashi (APM) and bahirdhum padhati mashi (BPM) exhibited anthelmintic activity in dose-dependant manner giving shortest time of paralysis (P) and death (D) with 100 mg/ml concentration, for both types of worms. The BPM caused paralysis of 15 min and time of death of 34 min while

Table 1: Anthelmintic activity of anterdhum padhati mashi (APM) and bahirdhum padhati mashi (BPM)

Sample	Concentration mg/ml	Time taken for Paralysis (P) and Death (D) of worms in minute			
		<i>P. posthuma</i>		<i>A. galli</i>	
		P	D	P	D
Piperazine citrate	10	24 ± 0.6	56 ± 0.4	17 ± 0.6	31 ± 0.7
APM	10	28 ± 0.5	57 ± 0.7	21 ± 0.2	41 ± 0.6
APM	50	23 ± 0.6	39 ± 0.8	13 ± 0.3	36 ± 0.4
APM	100	17 ± 0.3	40 ± 0.2	14 ± 0.1	24 ± 0.3
BPM	10	26 ± 0.3	58 ± 0.6	22 ± 0.5	40 ± 0.4
BPM	50	20 ± 0.8	45 ± 0.2	18 ± 0.3	32 ± 0.1
BPM	100	15 ± 0.7	34 ± 0.5	11 ± 0.2	21 ± 0.6

All values represent Mean ± SEM; n=6 in each group. Control worms were alive up to 24 hrs of observation.

APM revealed paralysis of 17 min. and time of death of 40 min. respectively against the earthworm *P. posthuma*. The reference drug Piperazine citrate showed the same at 24 and 56min, respectively.

Ascaridia galli worms also showed sensitivity to the APM and BPM significantly higher concentration of 100 mg/ml. The BPM caused paralysis at 11 min. and time of death of 21 min. APM showed paralysis at 14 min and the time of death were 24 min. Piperazine citrate exhibited similar effects at 17 and 31 min. respectively. BPM and APM shows presence of tannins which are polyphenolic compounds. Some synthetic phenolic anthelmintics e.g. niclosamide, oxyclozanide, bithionol etc., are reported to interfere with energy generation in helminth parasites by uncoupling oxidative phosphorylation (20).

It is possible that tannins contained in the mashi produced similar effects. Another possible anthelmintic effect of tannins is that they can bind to free proteins in the gastrointestinal tract of host animal (21) or glycoprotein on the cuticle of the parasite (22) and may cause death.

CONCLUSION

Mashi showed anthelmintic activity. BPM showed good *invitro* anthelmintic activity than APM.

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