



ANTHELMINTIC ACTIVITY OF THE ROOTS OF *Rotula aquatica Lour.*

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ABSTRACT

Rotula aquatica Lour belongs to family borogenaceae known in Ayurveda as pashanbed. It was collected from the Ganges of river Netravati Mangalore District, authenticated and dried under sun, powdered and extracted with various solvents by successive Soxhlet hot extraction process with increasing order of polarity. On phytochemical investigation, the petroleum ether extract and alcoholic extracts have shown alkaloids and flavone glycosides. So the drug is screened for anthelmintic activity on adult earthworms *Pheretima posthuma*, using albendazole as standard drug. Both petroleum ether and alcoholic extract have shown significant anthelmintic activity compared to standard drug albendazole.

KEYWORDS: alcoholic extracts, phytochemical, *Pheretima posthuma*, anthelmintic activity.

INTRODUCTION

Rotula aquatica Lour. belongs to family Borogenaceae, known as pashanbed in Ayurveda, it is widely distributed in India from Kumoun to Assam and western to southern India. In Ayurveda, *Rotula aquatica Lour* has been reported to be used as diabetics [1], antilithic effect [2], cardiotoxic activity [3], antiurolithiatic activity [4] and is used in stone bladder [5]. The plant contains Baunerol [6], steroid alkaloids [7] which showed antimutagenic effect. Allantoin [8] found in root which is responsible for diuretic activity. The aqueous extract of the root of *Rotula aquatica Lour* showed antioxidant activity. It also contains sterol, rhabdiol [9] which is found to be active to induce diuresis [10].

MATERIAL AND METHODS

Plant Material

The roots of *Rotula aquatica Lour* were collected from the Ganges of river of Netravati Mangalore District. It is identified and authenticated by Dr. Harish botanist, Alva pharmacy Alva education foundation, Alva's health centre complex Moodbidri. The roots are dried under sun for seven days and powdered.

Preparation of Extract

The powdered plant material was extracted with successive Soxhlet hot extraction process with petroleum ether, benzene, chloroform, acetone, methanol and alcohol. The solvent was then distilled under reduced pressure, which gave greenish black coloured residues. The extract was suspended in 1% gum Acacia in normal saline at 5, 10, 25, 50 mg/ml concentrations. Albendazole 5 mg/kg body weight acts as standard [11].

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 [12, 13, 14]. The method of Mathew et al [15] and Dash et al [16, 17] was followed for anthelmintic screening. Thirteen groups, each consisting of six earthworms of approximately equal size were released into 50 ml of the extract suspended in 1% Acacia gum.

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Each group were treated with one of the following : vehicle 1% gum acacia in normal saline , albendazole 10 mg/ml and extract contains 5,10,25,50 mg/ml in normal saline containing 1 % gum Acacia. Observation was 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 lost their motility followed with fading away of their body colour and finally death. The results were recorded as shown in table 1.

Results and Discussion

The data reveals that the petroleum ether extract was not shown anthelmintic activity at a concentration of 5mg/ml, whereas the ethanolic extract showed paralysis and death at similar concentration. The other test concentrations of both the extracts showed marked degree of anthelmintic activity. The anthelmintic effect of petroleum ether extract at 50 mg/ml concentration is comparable with that of the effect produced by the standard drugs albendazole. The ethanolic

extract showed the effect beyond 25mg/ml concentration that is comparable with the standard Albendazole.

The present study reveals that the ethanolic extract was more effective than the petroleum ether extract, even though both the extracts were endowed with anthelmintic property. The activity reveals concentration dependent nature of the different extracts. The activity of the extracts was found to be inversely proportional to the time taken for paralysis / death of the worms and is due to the presence of alkaloids and flavone glycosides present in the extracts.

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Pet.ether Extract (5mg/ml)



Pet.ether Extract (10mg/ml)

Pet.ether Extract(25mg/ml)

Pet.ether Extract(50mg/ml)



Ethanolic Extract (5mg/ml)



Ethanolic Extract (10mg/ml)



Ethanolic Extract (25mg/ml)



Ethanolic Extract (50mg/ml)

Table-1. Anthelmintic Activity of *Rotula Aquatica Lour.* Extract.

Treatment	Time taken for Paralysis (min)	Time taken for death (min)
Vehicle(1%GumAcacia)		
Albendazole	34.15 ± 0.85	40.45 ± 0.15
Pet ether extract		
5mg/ml	125.50 ± 2.38	No death -
10mg/ml	85.17 ± 0.75	95.17 ± 0.87
25mg/ml	55.66 ± 0.55	65.83 ± 0.54
50mg/ml	39.00 ± 0.20	43.50 ± 0.51
Ethanolic extract		
5mg/ml	78.05 ± 1.08	82.15 ± 0.05
10mg/ml	62.15 ± 1.15	68.11 ± 0.12
25mg/ml	53.33 ± 2.03	55.01 ± 0.15
50mg/ml	37.10 ± 1.01	40.01 ± 0.15

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