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Comparative study of Anthelmintic activity between aqueous extract of *Areva Lanata* and *Rotula aquatica lour.*

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ABSTRACT:

Aerva lanata and Rotula aquatica Lour both plants widely distributed throughout India. This study was undertaken to in-vitro comparative study for anthelmintic effect of aqueous extract of Rotula aquatica Lour and Areva Lanata on adult earth worm's pheritma posthuma, using piperazine citrate 15 mg/ml as standard drug. The study involved the determination of the time of paralysis and time taken for death of the worms. Dose dependent activity was observed in different concentration (25, 50, 75 mg/ml) of aqueous extract of Rotula aquatica lour and Aerva lanata. The result shows that the aqueous extract of Aerva Lanata is more effective from aqueous extract of Rotula aquatica when compared to standard drug piperazine citrate (15mg/ml).

KEYWORDS: *Aerva lanata, Rotula aquatica Lour, Anthelmintic activity, Piperazine citrate.*

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INTRODUCTION:

Anthelmintic are drug that either kill (vermin-cides) or, reduce the number of helminthes parasites in the intestinal tract or tissues of the body. Normally helminthes are a class of eukaryotic parasites, helminthes (worms) can be divided into three groups: cestodes, or tapeworms; nematodes, or roundworms; and trematodes, flukes[1]. The World health Organization reveals that over two billion people are suffering from parasitic worm infections. It is estimated that by the year 2025, about 57% of the population in developing countries will be influenced. Anthelmintic from the natural sources may play a key role in the treatment of these parasite infections. There is a need of effective anthelmintic have led to the proposal of screening medicinal plants for their Anthelmintic activity[2].

The plant *Rotula aquatica* belongs to the family Boraginaceae reported to contain baunerol[3], steroids alkaloids and allantoin[4]. The root extract of *Rotula aquatica* showed anticancer antimitotic activity[5]. A decoction of root of *Rotula aquatica* showed diuretic activity[6] due to the presence of allantoin and it is also used as a laxative, treatment of piles and in vineral disease. The alcoholic extract of *Rotula aquatica* (Boraginaceae) also reported affect against ethylene glycolinduced urolithiasis in albino rat[7].

The plant *Aerva lanata* belogs to family Amaranthaceae reported to contain different activity of different extract. Ethyl acetate and alcoholic extracts of *Aerva lanata* whole plant was showed antimicrobial activity[8]. *Aerva lanata* was screened for its diuretic and hepatoprotective activity[9]. The alcoholic extracts were prepared from leaves, stem and roots for screening. All the extracts were found to have significant diuretic activity, while hepatoprotective activity was found in case of leaf and root extracts only [9].

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Areva lanata also reprted to contain anti-inflammatory activity [10] and antidiabetic activity [11].

Literature survey reveals that there are no reports on comparative study on aqueous extract for anthelmintic activity. Hence, this lead us to comparative study for anthelmintic activity of aqueous extract of *Rotula aquatica* and *Aerva lanata*.

MATERIALS AND METHODOLOGY:

Plant Material:

Root of *Rotula aquatica lour* and *Aerva lanata* was collected and authenticated by Dr. S. N. Dwivedi, Head of the department of botany Janata Post Graduate College A. P. S. University Rewa-486002 M. P. India. The whole plant is then dried, powdered and stored in airtight containers for further use.

Drug and chemicals:

The drug piperazine citrate purchased from commercial sources and all other chemicals were of analytical grade.

Preparation of Extract:

The powdered material of both crude drugs was subjected to soxhlet extraction with various solvents ranging from non-polar to polar. The solvents used were Petroleum ether, benzene, chloroform, alcohol and then both of powdered drugs macerated with distilled water. Each time before extraction with next solvents the marc was air-dried. All the extracts were concentrated by distilling the solvent at low temperature. They were then weighed and percentages of different extractive values were calculated with respect to air-dried substance.

Aqueous Extract (maceration method):

Powdered material of the root of *Rotula aquatica* and *Aerva lanata* was kept for maceration with 500 ml of distilled water for 24 hours during successive extraction. The extract was double filtered by using muslin cloth and whatman filter paper no. 1 and the extract concentrated then dried on water bath. Then different concentration of aqueous extract (25, 50,75mg/ml) were prepared for further study.

Phytochemical procedure:

The preliminary phytochemical screening of *Rotula aquatica lour* and *Aerva Lanata* was carried out in order to ascertain the presence of its constituents by utilizing standard conventional protocols.

Anthelmintic activity:

Anthelmintic activity was carried as per the method reported by Bimlesh Kumar *et al*[2] with minor modifications. The assay was performed on adult Indian earth worm *Pheritima posthuma* due to its anatomical and physiological resemblance with the intestinal round worm parasite of human beings. Different concentrations of each aqueous extract (25, 50,75 mg/ ml in normal saline) were prepared and six worms were placed in it. All the extracts and the standard drug solution were freshly prepared before starting the experiments. Mean time for paralysis (in min) was noted when no movement of any sort could be observed except when the worm was shaken vigorously; time for death of worms (in min) was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Piperazine citrate (15 mg/ml) was used as reference standard.

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Table: 1 Anthelmintic activity of aqueous extract of *Rotula aquatica* and *Aerva lanata*

Treatment	Concentration used	Time taken for Paralysis (min)	Time taken for death (min)
Piperazine citrate	15 mg/ml	15.18± 0.1641	26.95±0.1565
Aqueous extract of *Rotula aquatica*	25 mg/ml	28.60± 0.2989	36.98±0.3763
	50 mg/ml	21.02± 0.2286	30.35±0.4403
	75 mg/ml	16.95± 0.3575	22.33± 0.5445
Aqueous extract of *Aerva Lanata*	25 mg/ml	26.17 ±0.4341	34.63±0.3528
	50 mg/ml	18.30±0.2503	29.38±0.4277
	75 mg/ml	12.23±0.3084	16.32±0.4175

Value are expressed as mean ± SEM (n=6)

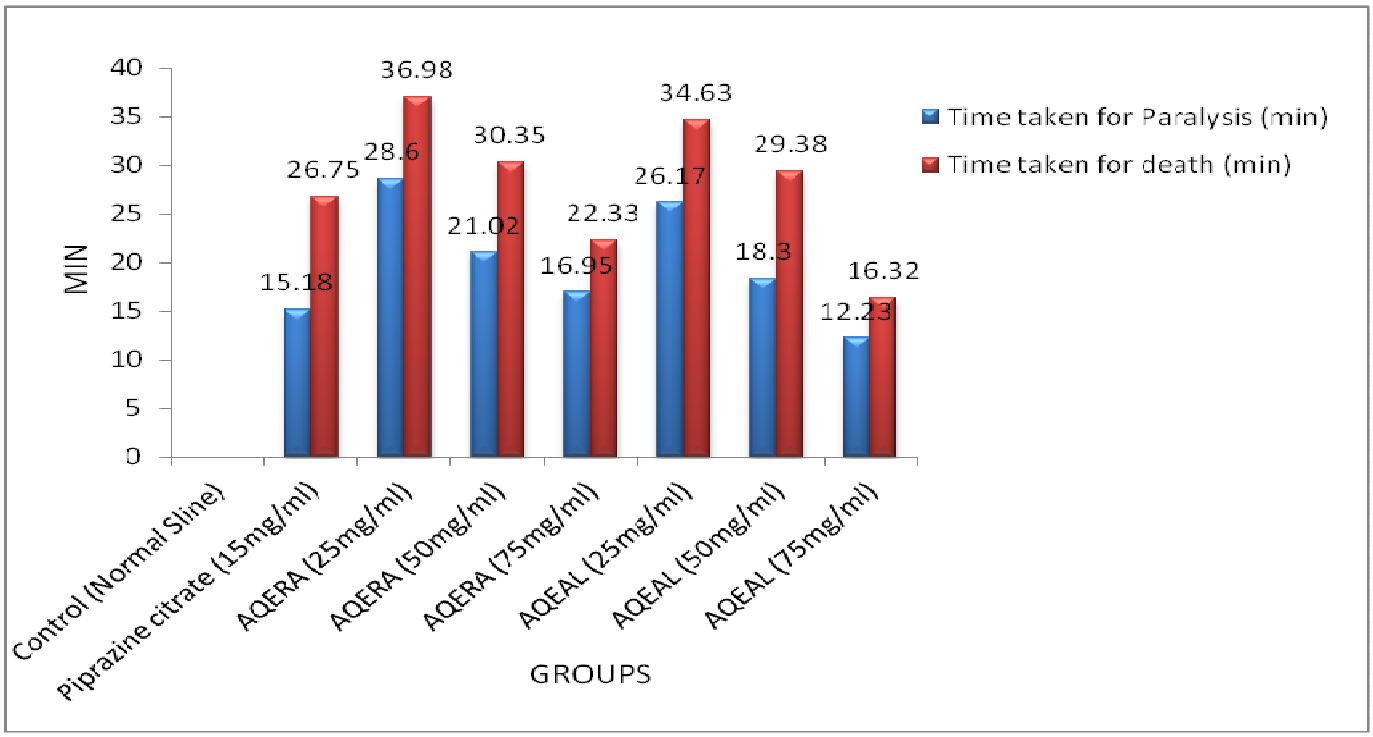

Figure: 1 Anthelmintic activity of aqueous extract of *Rotula aquatica* and *Aerva Lanata*.

Group I- Control (Normal saline), Group-II Standard (Piperazine citrate), Group-III Aqueous Extract of *Rotula aquatica* (AQERA 25 mg/ml), Group-IV Aqueous Extract of *Rotula aquatica* (AQERA 50 mg/ml), Group-V Aqueous Extract of *Rotula aquatica* (AQERA 75 mg/ml), Group-VI Aqueous Extract of *Aerva lanata* (AQEAL 25 mg/ml), Group-VII Aqueous Extract of *Aerva lanata* (AQEAL 50 mg/ml), Group-VIII Aqueous Extract of *Aerva lanata* (AQEAL 75 mg/ml).

RESULT AND DISCUSSION:

Preliminary phytochemical screening studies on *Rotula aquatica* and *Aerva lanata* revealed the presence of carbohydrate, tannins and flavonoids. Some of these phytoconstituents may be responsible for anthelmintic activity. The result shows that the aqueous extract of *Aerva lanata* showed more potent anthelmintic activity from

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aqueous extract of *Rotula aquatica* when compared to standard drug (Table:1and Figure:1). At the concentration of 75 mg/ml both the aqueous extract showed effective activity as compared to the standard drug. In case aqueous extract of *Rotula aquatica* at concentration of 75 mg/ ml caused paralysis in 16.95 min and death in 22.33 min, while at concentration 50 mg/ml extract showed paralysis in 21.02 min and death in 30.35 min and concentration 25mg/ml showed paralysis in 28.60 min and death in 36.98 min against *Pheritima postuma*.

In case of *Areva lanata* 75mg/ml showed paralysis in 12.23 min and death in 16.32 min, while the reference drug piperazine citrate 15mg/ml showed the paralysis in 15.18 min and death in 26.95 min. The predominant effect of piperazine citrate on the worm is to cause a flaccid paralysis that result in expulsion of the worm by peristalsis.

Finally result reveals that the aqueous extract of *Aerva lanata* found more effective from aqueous extract of *Rotula aquatica* at different concentration against helminth.

CONCLUSION:

In conclusion, the data (Table: 1 and Figure: 1) reveals that aqueous extract of *Aerva lanata* at different concentration was more effective from the other aqueous extract of *Rotula aquatica* against Pheritma postuma. Further studies are necessary to isolate the active compound in the crude extract of *Aerva lanata* which is responsible for activity.

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