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A STUDY ON INVITRO EVALUATION OF ANTIHELMINTIC ACTIVITY OF ETHANOL AND ETHYLACETATE EXTRACTS OF AVERRHOA CARAMBOLA LEAVES AGAINST PHERITIMA POSTUMA

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ABSTRACT
Helminthic infections are among the most wide spread infection in humans that cause severe morbidity. It is one of the most serious problems in the developing countries. Traditional plant based remedies continue to be an important therapeutic aid for treating parasitic infections. As Gastrointestinal worms are hardy, currently available antihelmintic drugs and the high cost of conventional antihelmintics make medicinal plants to be evaluated as alternative sources of antihelmintic drugs. In this study ethanol and ethyl acetate extracts of Averrhoa carambola leaves were conducted to evaluate the potential antihelmintic effect of the extract. Antihelmintic activity against the earthworm Pheritima postuma was tested at concentrations of 10 mg/ml, 20 mg/ml of both extracts. The results were expressed as paralysis time and death time of the worms. Ethanol at 20 mg/ml concentration showed better antihelmintic activity compared to standard drug and other extract.

KEYWORDS: Averrhoa carambola, antihelmintic activity, parasite infection, pheritima postuma.

1. INTRODUCTION

Star fruit (Averrhoa carambola) is a commonly consumed fruit in both tropical and other countries. It is cultivated in many parts of the world (extensively in the South-East Asian Region) to harvest its fruit. It has several nutritional and medicinal uses. Star fruit is considered a rich source of natural antioxidants and minerals The star fruit may be eaten raw or be used in the preparation of juices, salads, or pickles. It is considered as a herb in several countries. As it helps with removing rust, it may be used for cleaning utensils. On the other hand, there are case reports and case series in the literature describing nephrotoxicity and neurotoxicity related to star fruit ingestion In this review, we have summarized the main nutritional benefits of star fruit and outlined the observed effects on different physiological processes. The beneficial pharmacological properties of star fruit and factors influencing a potential safe limit of consumption have been discussed.[1-4]

Image no. 1: Star fruit.

Scientific Classification
Kingdom : Plantae
Subkingdom : Tracheobionta
Super division : Spermatophyta
Division : Magnoliophyta
Class : Magnoliopsida

Subclass : Rosidae
Order : Geraniales
Family : Oxalidaceae
Genus : Averrhoa Adans
Species : Averrhoa carambola

Vernacular Names
Latin : Averrhoa carambola
English : Starfruit, Chinese gooseberry
Hindi : Kamrakh, Karmal
Bengali : Kamranga
Gujarati : Kamrakh
Tamil : Thambaratham
Telugu : Ambanamkaya
Malayalam : Caturappuli

AIMS AND OBJECTIVES

- Selection and collection of Averrhoa carambola plant for antihelmintic activity.
- The leaf extract of Averrhoa carambola was collected by soxhlation technique using Ethanol and Ethyl acetate as solvents
- Evaluation of antihelmintic activity Ethanol and Ethyl acetate extracts of Averrhoa carambola leaves.
- The results were compared with positive control group for paralysis time and mortality of earthworm.

2. MATERIALS AND METHODS

Collection of Averrhoa carambola leaves

The leaves were collected from the remote areas of Karimnagar district.

Plant authentication:

The plant was taxonomically identified and authenticated as Averrhoa carambola by Dr.A.H. Naqvi, Department of Botany, SRR Govt. Degree college, Karimnagar, Telangana.

Various extractions of drug

The dried powered of leaf material of Averrhoa carambola was extracted with Ethanol and Ethyl acetate using Soxhlet apparatus. After exhaustive extraction the collected Ethanol extracts and Ethyl acetate extracts were subjected to evaporation to obtain the pure extract.

Soxhlet Extraction

The plant material is placed inside a thimble made from thick filter paper, which is loaded into the main chamber of the Soxhlet extractor. This extractor is placed on to adistillation flask containing solvent. The Soxhlet is then equipped with a condenser, and the solvent is heated to reflux. The warm solvent vapor travels up a distillation arm and floods into the chamber through the thimble. When the chamber is almost full, it gets automatically gets back emptied by a siphon side arm back down to the distillation flask. This cycle may be allowed to repeat many times so that the entire contents of the crude drug gets extracted to and round bottom flask desired compound gets concentrated in the distillation flask. Then the solvent extracts are filtered and saved.[5-6]

3. RESULTS

PHYTOCHEMICAL SCREENING

The Ethanol extract contains Alkaloids, Triterpenoids, Tannins, Flavonoids, Glycosides. The Ethyl acetate extracts contains Flavonoids, Alkaloids, Carbohydrates, Aminoacids and Protein, Tannins.

ANTIHELMINTIC ACTIVITY

The anthelmintic activity was evaluated on adult Indian earthworms by Mathew et.al method. For preliminary evaluation of anthelmintic activity test samples of the extract was prepared at the concentration of 10, 20 mg/ml in Tween 80 (1%) solution diluted with normal saline and 6 worms Pheretima posthuma of 8-10cm were placed in petridish containing 20 ml of above test solutions of extracts. Albendazole (10, 20 mg/ml) was used as reference standard and normal saline with Tween 80 (1%) is used as negative control. All the test solutions and standard solutions were prepared freshly before starting the experiment. Observations are made for the time taken for paralysis when movement was lost or no movement. Worms should not relieve even in normal saline. Time for death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water and fading of color of worms.

Table No. 1: Antihelmintic Activity Of Star Fruit.

Plant Extract	*Concentration (mg/ml)*	Time Of Paralysis In Minutes	Time Of Death In Minutes
Tween80	*1%*	160	170
Albendazole	*200*	85	90
	400	80	85
Ethanol	*200*	38	43
	400	32	40
Ethyl acetate	*200*	60	70
	400	40	48

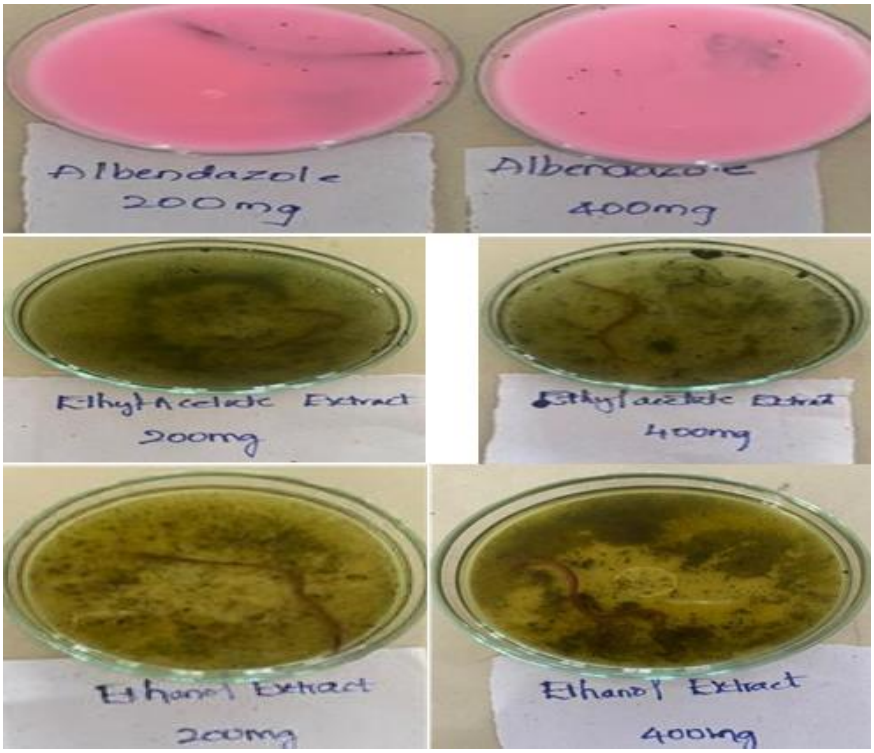

Image No. 2: Antihelmintic Activity of Star Fruit.

4. DISCUSSION

In the present study it was observed that, All the extracts have shown positive response to certain degree of antihelmintic activity. The activity is well comparable with the standard drug albendazole as postive control. tween80 (1%) was used as negative control. The ethanol extract had shown significant activity compared to other extract and standard drug where it took 32mins for paralysis and 40mins for death for 400mg/ml concentrations. Ethyl acetate extract also exhibited good activity by paralyzing the worm by 40mins and killing by 48 mins for 400mg/ml. Phytochemical screening revealed the presence of alkaloids, tannins and phenols which may be responsible for antihelmintic activity.

5. CONCLUSION

It is revealed that the ethanol and ethyl acetate extracts obtained from the leaves of Averrhoa carambola possess antihelmintic activity, but the ethanol extract showed enhanced antihelmintic activity when compared with the ethyl acetate extract and standard drug, Albendazole. In order to confirm the above results, the in vivo studies have to be conducted.

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