Anthelmintic Activity of Leaves of Ficus Racemosa

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INTRODUCTION

*Ficus racemosa* Linn. (Moraceae) is a popular medicinal plant in India, which has long been used in Ayurveda, the ancient system of Indian medicine, for various diseases/disorders including diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary diseases. In the traditional system of medicine various plant parts such as bark, root, leaves, fruits and latex are used in dysentry, diarrhoea, diabetes, stomachache, piles and as carminative and astringent and also as antioxidant and anticancer agent ¹

The preliminary phytochemical examination ²,³ of *Ficus racemosa* leaves showed the presence of carbohydrates, tannins , saponins and flavonoids. However, no systematic study on anthelmintic activity has been reported in the literature. In this context the present study is focused to evaluate the anthelmintic activity of *Ficus racemosa*

MATERIAL AND METHODS

Leaves of *Ficus racemosa* were collected from local region of Viravada near to Pithapuram of East Godavari district, Andhra Pradesh, in winter season and dried under shade. The Taxonomist Dr. P. Shivakumar, Department of Botany, Government Science College, Suram - palem, and Andhra Pradesh identified the plant. A voucher specimen AIPS. 021 are preserved in our research laboratory for future reference.

Preparation of the Extract

The collected leaves were shade dried, coarsely powered and the powder was exhaustively extracted with aqueous and methanol using soxhlet apparatus. The solvent was then removed under reduced pressure using rotary flash evaporator. It was further concentrated and dried in the desiccator for further studies. The dried extracts were suspended in 1% tween 80 in normal saline (vehicle) and used for anthelmintic activities.

Evaluation of Anthelmintic Activity

Chemicals

Methanol, saline water and distilled water.

Standard Drug

The reference standard drug used in this experiment is piperazine citrate (Piperazine citrate syrup IP, ANTEPAR, 30ml, Manufactured by GlaxoSmithKline Pharmaceuticals Limited). It causes hyperpolarization of muscle by its GABA agonistic action opening Cl⁻ channels that causes relaxation and depresses responsiveness to contractile action of acetylcholine thereby flaccid paralysis occurs. The worms recover if placed in a piperazine free medium.

Test Organisms

Indian adult earthworms (*Pheretima posthuma*; Annelida, Megascolecidae) collected from moist soil near to college campus and washed with normal saline to remove soil matter and kept in normal saline. The earthworms of 6-8 cm in length and 0.2-0.3cm in width were selected for the study. *Pheretima posthuma* were used for present experiment because of their anatomical and physiological resemblance with intestinal roundworm parasite of the human being.

Method

Preparation of Concentrations

The test and standard concentrations were prepared just before starting the experiment.

ABSTRACT

Aqueous and methanolic extracts of leaves of *Ficus racemosa* Linn. (Moraceae) were evaluated separately for anthelmintic activity using Piperazine citrate as reference standard. The results indicated that aqueous extract was more potent than the methanol extract.
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**Standard Concentration (20mg/ML)**

2ml of syrup was withdrawn from piperazine citrate syrup (750 mg/5ml) and was diluted with 13ml with normal saline.

**Test Extracts Concentrations**

Same procedure for both aqueous and alcoholic extracts. 20 mg/ml, 40 mg/ml, 60 mg/ml and 80 mg/ml concentrations were prepared by dissolving 200 mg, 400 mg, 600 mg and 800 mg quantities of extract separately in 10 ml volumetric flask with normal saline.

**Procedure For Anthelmintic Activity 4,5,6**

Anthelmintic activity of extract was detected by exposing the adult *Pheritima posthuma* to different concentrations of test extract and standard drug. 10ml of test extract concentrations and standard concentration were taken in separate Petri dishes. Normal saline was taken as control. Nearly equal sized earthworms were selected and each one was placed in all Petri dishes. All Petri dishes were kept at room temperature.

Observations were made for time taken to complete paralysis and death for individual worms. Each worm was frequently applied with external stimuli which stimulates and induce movement in earthworms, if alive. 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). Experiment was carried out three times and average values were taken. The results of the anthelmintic activity are given in the below table.

| Table 1. Anthelmintic activity of different extracts of the leaves of Ficus racemosa Linn. |
|-------------------------------------------------|-----------------|-----------------|-----------------|
| Substance Tested                               | Concentration (mg/ml) | Time taken for paralysis (min) | Time taken for death (min) |
| Control (normal saline)                        | ----               | ----             | ----             |
| Piperazine citrate (standard)                  | 20                | 13              | 72              |
|                                                | 40                | 19              | 37              |
|                                                | 60                | 16              | 32              |
|                                                | 80                | 14              | 19              |
| Test Aqueous Extract                           | 20                | 22              | 40              |
|                                                | 40                | 19              | 37              |
|                                                | 60                | 16              | 32              |
|                                                | 80                | 14              | 19              |
| Test Methanol Extract                          | 20                | 45              | 55              |
|                                                | 40                | 26              | 40              |
|                                                | 60                | 24              | 35              |
|                                                | 80                | 14              | 20              |

**RESULTS AND DISCUSSION**

Indigenous drug systems can be a source of variety of new drugs, which can provide to eliminate worms, but their claimed reputation has to be verified on scientific basis.

From the results shown in table, the predominant effect of Piperazine citrate on the worm is to cause a flaccid paralysis that result in expulsion of the worms by peristalsis. Piperazine citrate act by increasing chloride ion conductance of worm muscle membrane produces hyperpolarization and reduced excitability that leads to muscle relaxation and flaccid paralysis. It was observed that both extracts showed a remarkable dose dependent anthelmintic activity against *Pheritima posthuma*. Both the extracts showed paralysis of worms in a time nearer to that of Piperazine citrate, while showed death of worms in a less time compared to Piperazine citrate especially at higher concentration of 80 mg/ml. Aqueous extract took the least time to cause paralysis and death of the worms than the methanol extract. The observation of result show that the anthelmintic activity of aqueous extract is more potent compared to ethanol extract. It is quite apparent from the studies that the aqueous extract possesses significant anthelmintic activity. It would be interesting to isolate the constituents responsible for the anthelmintic activity.

**REFERENCES**


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