



## Comparative in-vitro anthelmintic activity of various parts of *Ficus Carica linn*

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### Abstract

Many commonly available plants like *Leonatisleptifolia*, various species of *Ficus* like *Ficus benghalensis*, *Ficus religiosa* etc showed potent anthelmintic activity. The present study was aimed to compare the potencies of various parts of *Ficus carica* against earth worms as they anatomically resemble the round worms which cause helmenthiasis. Methanolic extract of leaves, stems and fruits of *Ficus carica* were compared for their in-vitro anthelmintic activity in order to determine the potencies of them. Results revealed that exposure of worms to leaf extract of *F.carica* takes 2-3 hr to cause paralysis and death of worms with various concentrations of (20,30,40 mcg/ml). The stem extract of *F.carica* shows almost equal effect with 3hrs of exposure. While the methanolic fruit extract of *F.carica* is effective at more than 3 hrs of exposure. The results were compared with mebendazole as a positive control and normal saline as a negative control. Mebendazole shows 100% effective on exposure, while worms exposed to normal saline were still alive even after 3hrs of exposure.

Keywords: *Ficus benghalensis*, helmenthiasis, Mebendazole, earth worms.

### Introduction

Helminthiasis, also known as worm infection, is any macro parasitic disease of humans and other animals in which a part of the body is infected with parasitic worms, known as helminthes.<sup>1</sup> Medicinal plants like *Ficus* species are the potent source of many pharmacological activities.<sup>2, 10</sup> The present study was aimed to investigate the potencies of various parts of *Ficus carica* against *Pheritima postuma* (Indian earth worm).<sup>11</sup>

### Materials and Methods

#### Plant Collection and Extraction

- *Ficus carica* was collected from soil of Sangareddy, Medak district, Telangana and authenticated by Prof. P.Jayaraman, Ph.D from plant anatomy research center in Tamil nadu.

- Plant was cleaned; leaves, stems and fruits are separated and are shade dried.
- Dried leaves and stems were grounded to attain a coarse powder.
- These powders were kept for soxhlation in 250 ml of methanol for 1 day individually and thus attained the methanolic extract of leaves and stems and were kept for evaporation.
- Dried fruits were grounded to attain small particles.
- These particles were macerated in 250 ml of methanol for 3 days and the attained methanolic extract of fruits was kept for evaporation.
- The obtained extracts were used to test the activity.

### Method of Extraction

The leaves, stems and fruits of *Ficus carica* were collected. These parts are washed with water for removal of dirt and dried in the shade at room temperature for a period of seven days. Dried parts were coarsely powdered.

- **Extraction of the leaves:**<sup>4</sup>

50gm of leaf powder was weighed and subjected for soxhlet extraction with 250ml of methanaol.

- **Extraction of the stems:**<sup>3</sup>

50gm of stem powder was weighed and subjected for soxhlet extraction with 250ml of methanaol.

- **Extraction of the fruit:**<sup>5</sup>

Fruiti extraction was prepared by using maceration process.

### Phytochemical screening:

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Phytochemical studies on *F. carica* revealed the presence of numerous bioactive compounds such as phenolic compounds, phytosterols, organic acids, anthocyanin few other classes of secondary metabolites from different parts of *F. carica*. Most species of *F. carica* contain phenolic compounds, organic acids, and volatile compounds. 40mcg/ml. All the times are noted and the activity is calculated.<sup>6,7,9</sup>

### Anthelmintic activity:

Earthworms (*Pheretima posthuma*) were collected. They are washed with saline solution in order to remove all the earthy matter. Properly washed and

sterilized petri plates are taken. Standard vehicle is prepared by mixing 5% Dimethyl sulfoxide in normal saline solution and placed in the petri plate. All the leaf, stem and fruit extracts are mixed with the standard vehicle and placed in three different petri plates respectively. In each petri plate 3-5 earth worms are placed and the lids of petri plates are closed partially by leaving an air space. Time of earthworms placed is noted and the activity is to be monitored. Then the time of death of earthworms are to be noted. This procedure is repeated for different concentrations of extracts i.e., 20mcg/ml, 30mcg/ml and 40mcg/ml. All the times were noted and the activity is calculated.<sup>6,7,9</sup>

### Results and Discussion

From the observations of table1, it shows that leaf extract of *ficus carica* killed all worms in 2hrs having 100% efficacy. Stem and fruit extract showed the efficacy in about 2-3hrs based on the concentration of drug. Three different concentrations of drug are been considered and compared for their efficacy.

The results were compared with mebendazole as positive control and normal saline as negative control where mebendazole shows 100% efficacy in about 1-2hrs of exposure whereas normal saline doesn't show any effect until 3hrs hence worms remain still alive.

**Table 1:** Effects of methanolic extract on the motility of worm

Conc.	Time				Efficacy
	Mebendazole (standard drug)	Leaf	stem	Fruit	
20 mcg/ml	2hrs 5min	3hrs	3hrs 11min	3hrs 23min	100%
30 mcg/ml	1hr 36min	2hrs 8min	2hrs 40 min	3hrs 4min	100%
40 mcg/ml	1hr 20min	1hr 54min	2hrs 15min	2hrs 5min	100%

From the above table, it is proved that methanolic leaf extract shows more potent activity than methanolic stem and fruit extracts. It also shows

that as the concentration of drug increases the time required for the paralysis and death of worm was decreased.

**Table 2:** Leaf extracts values for anthelmintic activity

Concentration	leaf extract(time of death)
20mcg/ml	3hrs
30mcg/ml	2hrs
40mcg/ml	1hr 54 min

**Table 3:** Stem extracts values for anthelmintic activity

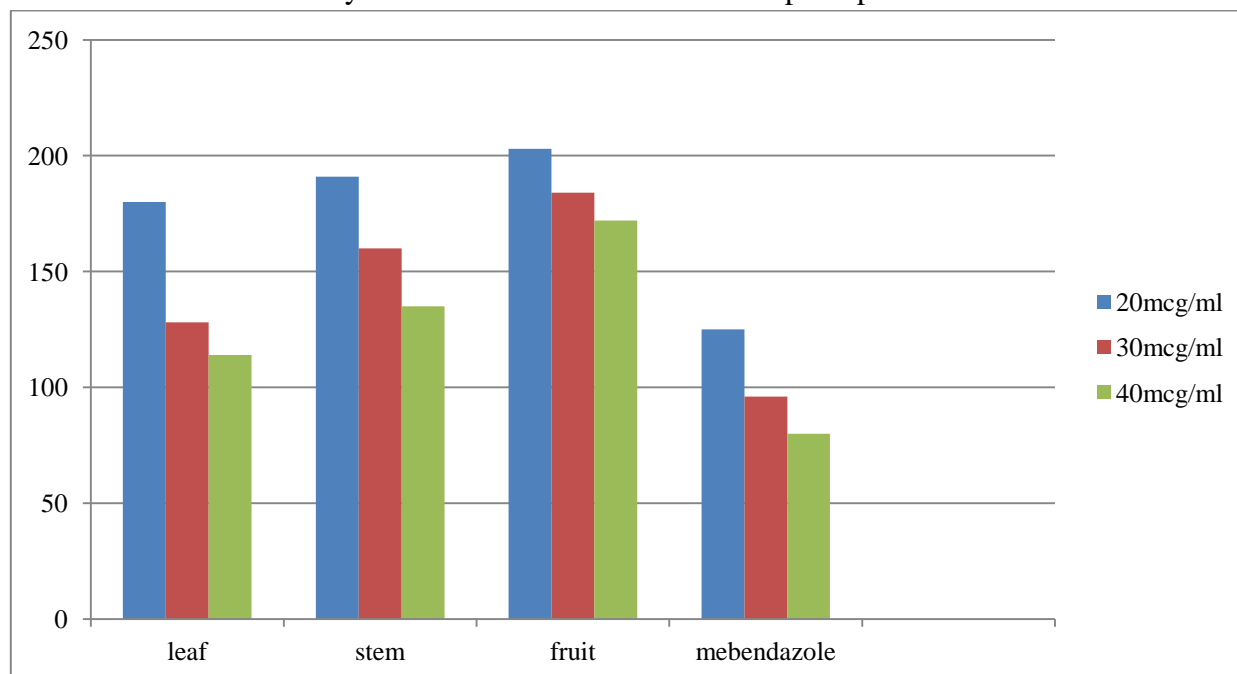
Concentration	stem extract(time of death)
20mcg/ml	3hrs 11min
30mcg/ml	2hrs 40min
40mcg/ml	2hr 15min

**Table 4:** Fruit extract values for anthelmintic activity

Concentration	Fruit extract(time of death)
20mcg/ml	3hrs 23min
30mcg/ml	3hrs 4min
40mcg/ml	2hr 52 min



**Figure 1:** Anthelmintic activity of methanolic extract of various plant parts of *Ficus carica*



**Graphical representation of antihelminthic activity of various parts of *ficus carica***

The above chart illustrates the death time of worms on y-axis in minutes and concentration of

different extracts on x-axis. Leaf extract shows quick response and the worms became immotile, paralyzed and finally dead in a shorter time compared to stem and fruit extracts (20mcg-3hrs,

30mcg-2hrs 28 min, 40 mcg-1hr 54 min). The stem showed the activity a little later than the leaf extract (20mcg-3hrs 11 min, 30 mcg-2hrs 40 min, 40 mcg-2hr 15 min). Fruit produced anthelmintic activity latest than leaf and stem is about (20mcg-3hrs 23min, 30 mcg-3hrs 4min and 40 mcg-2hrs 52min). Bottom-line of the activity is that all the three parts of the plant *Ficus carica* possess potent anthelmintic activity.

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