

## IN-VITRO ANTHELMINTIC ACTIVITY OF AERIAL ROOTS OF *FICUS BENGHALENSIS*

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### ABSTRACT

*Ficus benghalensis* L. (Moraceae) is traditionally used in Indian system of medicine. Anthelmintic activity was evaluated using worms as experimental models. Test sample of *Ficus benghalensis* aerial roots extracts was prepared at the concentration 10, 25, 50mg/ml in normal saline solution. Standard drug used Albendazole (20mg/ml). Time for death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50° c). Phytochemical constituents such as Phenolics, tannins, saponins, mucilage and alkaloids may be responsible for the anthelmintic activity. It may be concluded that methanolic extract of *Ficus benghalensis* possesses significant anthelmintic property.

**KEY WORDS:** *Ficus benghalensis*, Albendazole, Anthelmintic, Phytochemical

### 1. INTRODUCTION

Helminth infections are among the most widespread infections in humans, distressing a huge population of the world. Infections with helminthes or parasitic worms affect more than two billion people worldwide. In region of rural poverty in the tropics, where prevalence is greatest simultaneous infection with more than one types of helminthes is common. Although the majority of infections due to helminthes are generally restricted to tropical regions and cause enormous hazard to health and contribute to the prevalence of undernourishment, anaemia, eosinophilia and pneumonia. Parasitic diseases cause ruthless morbidity affecting principally population in endemic areas. The gastrointestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes diseases.<sup>1,2,3</sup> The World health Organisation (WHO)

estimated that 80% of the population of developing countries rely on traditional medicines, mostly plant drugs for their primary health care needs. The use of medicinal plant is growing worldwide because of the increasing toxicity and allergic manifestations of the synthetic drugs<sup>1</sup>. Hence there is an increasing demand towards natural anthelmintics<sup>4</sup>.

*Ficus benghalensis* L. (Moraceae) is traditionally used in Indian system of medicine. Phytochemical constituents such as Phenolics, tannins, saponins, mucilage and alkaloids may be responsible for the anthelmintic activity<sup>5,6</sup>. According to Ayurveda, it is astringent to bowels useful in treatment of ulcers, vomiting, vaginal complaints, fever, inflammations, and leprosy<sup>7</sup>.

### 2. MATERIAL AND METHODS

**2.1 Plant Material:** Aerial roots of *Ficus benghalensis* were collected from Narhe,

Pune district in January 2011. Plant material was authenticated at the Botanical survey of India, Pune. (BSI/WRC/TECH./2011/, V. no: BIAF14).

**2.2 Extraction:** The shade dried aerial roots of about 1 kg were subjected for size reduction to coarse powder. The powder was macerated in 1.5 litres of methanol (70%) in a separating funnel for 48 hrs at room temperature. The liquid phase was decanted and filtered through cotton wool. Thereafter, the liquid extract was evaporated to dryness using a rotary evaporator. The solid extract obtained was refrigerated at 4°C until required. The percent yield was 3.8 %. Methanolic extract of *Ficus benghalensis* revealed the presence of the phenolics, tannins, saponins, and alkaloids.

**2.3 Animal:** Healthy adult Indian earthworms, *Pheretima postuma*, due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings<sup>8, 9, 10</sup> were used in the present study. All earthworms were of approximately equal size (3-5 cm). They were collected from local moist place, washed with water and kept in water.

**2.4 Drugs and chemicals;** Albendazole procured from Akum drug and pharmaceuticals Ltd. used as reference standard. Methanol and saline solution procured from Vijay chemicals, Pune.

**2.5 Method:** The animals were divided into five groups containing six earthworms in each group. Test sample of extract was prepared at the concentration 10, 25, 50 mg/ml in normal saline solution. Standard drug used as Albendazole (20mg/ml). Different extracts and standard solutions were poured in petridishes. Group-I serves as control and receives normal saline solution. Group-II receives 10mg/ml of extract. Group-III receives 25mg/ml of extract. Group-IV receives 50mg/ml of

extract, Group-V serves as standard and receives Albendazole 20mg/ml<sup>11</sup>.

Observations made for time for paralysis when no movement of any earthworm could be observed except when the worms are shaken vigorously. Time of death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C) followed by fading away of color of worm. All the results were recorded and expressed as mean  $\pm$  SEM.

**2.6 Stastical Analysis:** The data were analysed using One way analysis of variance (Anova) and  $p < 0.05$  considered as statistical significance. Results were expressed as Mean  $\pm$  SEM.

### 3. RESULT

Methanolic extract of the *ficus benghalensis* at the concentration of 10 (Group-II), 25 (Group-III) and 50 (Group-IV) mg/ml produced anthelmintic activity in dose dependent manner (Table no.1). Group-II (10mg/ml), it shows less activity ( $p < 0.01$ ) as compared to Group-III and Group-IV. At a dose of 50 mg/ml concentration giving shortest time of paralysis (P) and death (D). Methanolic extract of aerial roots of *Ficus benghalensis* at concentration of 50 mg/ml caused paralysis in 13.07min and death in 24.27min. The reference drug Albendazole (20mg/ml) showed the same at 8.10 min and 17.04 min respectively. Methanolic extract of the *ficus benghalensis* at a dose of 50mg/ml showed significant anthelmintic activity.

### DISCUSSION

Some of the traditionally used herbs have scientifically proved a potent anthelmintic activity by using suitable experimental models. From the result of methanolic extract of the aerial roots of *Ficus benghalensis* show an anthelmintic activity

when compared to the standard drug. Preliminary phytochemical studies on *Ficus benghalensis* revealed the presence of the phenolics, tannins, saponins, mucilage and alkaloids. Some of these phytoconstituents may be responsible to show a potent anthelmintic activity. As the aerial roots are cheap and easily available it could be a key ingredient of herbal formulation.

### CONCLUSION

The traditional use of aerial roots of *ficus benghalensis* shows anthelmintic activity. The current activity has been compared with standard (Albendazole). This shows significant potency when compared with Albendazole suspension. The current investigation leads to conclusion that the aerial roots of *ficus benghalensis* have potent anthelmintic activity when compared with the conventionally used drug. Further studies using *in vivo* models and to isolate active constituents from extract are required to carry out and established the effectiveness and pharmacological rational for the use of *ficus benghalensis* as an anthelmintic drug.

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**Table 1-** Evaluation of Anthelmintic activity of methanolic extract of aerial roots of *Ficus benghalensis*

Group	Concentration (mg/ml)	Time required to paralyze.(min)	Time required to death of worms (min)
Group-I (Control)	-	-	-
Group-II (Extract)	10	41.00±0.200**	81.07±0.070**
Group-III (Extract)	25	25.1±0.050 <sup>###</sup>	51.14±0.040 <sup>###</sup>
Group-IV (Extarct)	50	13.07±0.070***	24.27±0.070***
Group-V (Albendazole)	20	8.04±0.040	17.10±0.100

Anthelmintic activity of methanolic extract of *ficus benghalensis*. \*\*  $p < 0.01$ , Group-V vs. Group-II

whereas <sup>###</sup> $p < 0.001$ , Group-V vs. Group-III, \*\*\*  $p < 0.001$  Group-V vs. Group-IV.

Values are considered as mean ± S.E.M. (n=5).