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Comparative *in vitro* Anthelmintic activity of *Ficus benghalensis, Ficus carica & Ficus religiosa*

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Abstract: Aqueous extracts of fruits of some commonly occurring plants of genus *Ficus* (*F. benghalesis, F. carica & F. religiosa*) compared for their invitro anthelmintic activity in order to estimate the most potent of them. All the extracts were found not only to paralyze (Vermifuge) but also to kill (Vermicidal). Results revealed that aqueous extract of fruits of *F. benghalensis* is more potent in the test worms (*Pheretima Posthuma*) than aqueous extracts of fruits of *F. religiosa* and *F.carica*.

Keywords: Anthelmintic activity, *Ficus benghalensis, Ficus carica, Ficus religiosa, Pheretima posthuma.*

Introduction:

Medicinal plants have served through the ages, as a constant source of medicaments for the exposure of variety of diseases. The history of herbal medicine is as old as human civilization. The plants are known to provide a rich source of botanical anthelmintics, antibacterials and insecticides.[1, 2]

There are more than 800 species and 2000 varieties of *Ficus* genus, most of which are native to old world tropics. *Ficus benghalensis* (Banyan tree), *Ficus Religiosa* (Pipal tree) and *Ficus carica* (Anjir tree) are some of the commonly occurring trees of this genus belonging to family *Moraceae*.[3, 4, 5] *F. benghalensis, F. religiosa* and *F. carica* were reported to have anthelmintic potential. Various extracts of roots of *F. benghalensis* were found not only to paralyze (Vermifuge) but also to kill the earthworms (Vermicidal).[6] Stem and bark extracts of *F. Religiosa* proved lethal to *Ascaridia galli* in vitro.[7] Methanolic extract of bark of *F. Religiosa* was 100% lethal to *Haemonchus contortus* worms.[8] The latex of some species of *Ficus* (*Moraceae*) i.e. *F. inspida* and *F. carica* was also reported to have anthelmintic activity.[9] Based on this an attempt has been made to compare and evaluate the anthelmintic potency of aqueous extracts of fruits of *F. benghalensis , F. religiosa* and *F. carica.*

Materials & Methods:

Plant Material

Fresh fruits of *F. benghalensis, F. religiosa* and *F. carica* were collected from Raipur district, Chatttisgarh, India. These Plants material were authenticated at the Department of Botany, Govt. Science College, Raipur. These fresh fruits were then crushed and used to obtain aqueous extracts.

Preparation of Extract

Aqueous Extract (by decoction method)

200 G of fruits of *Ficus benghalensis, Ficus carica* & *Ficus religiosa* were boiled separately with 1500 ml of double distilled water for 1h. Then they were kept at room temperature for 24h and then filtered through the muslin cloth. The filtrate then obtained was then concentrated to thick slurry and then residue was again boiled for 1h and filtered. The filtrate thus obtained was added to the thick slurry of first step. The resultant solutions thus obtained were boiled again to get thick concentrated extracts. These are then dried and used as powders. The percentage yields were found to be 5.46%, 6.5%, 1
0.24% for *Ficus benghalensis, Ficus carica* & *Ficus religiosa* respectively.

Experimental Animals

Indian adult earthworms (*Pheretima posthuma*) were used to study anthelmintic activity. The earthworms were collected from moist soil and washed with normal saline to remove all fecal matter. The earthworms of 3-5 cm in length and 0.1- 0.2 cm in width were used for all experimental protocol. The earthworm resembles both anatomically and physiologically to the intestinal roundworms parasites of the human being, hence can be used to study the anthelmintic activity.[10]

Drugs and Chemicals

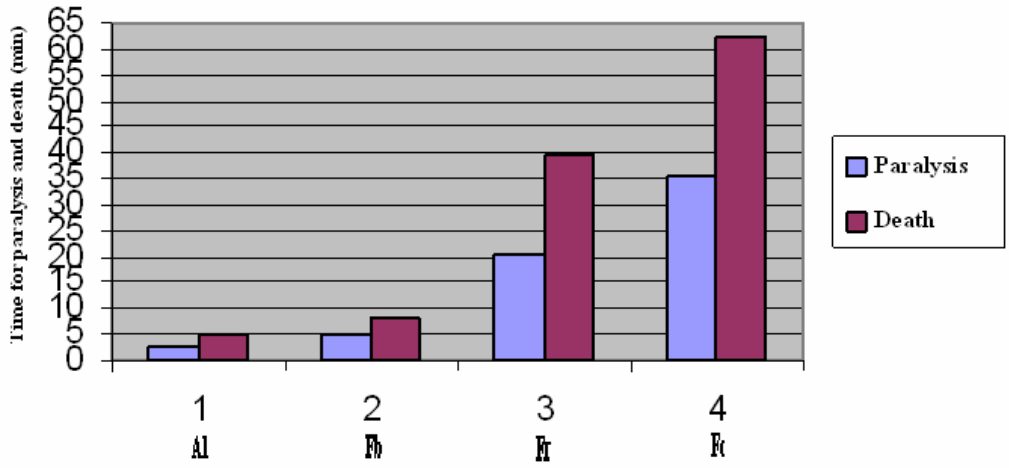
Albendazole (Glaxo Smithkline Pvt. Ltd.), Dimethyl Formamide, DMF, (Thomos Baker Chemicals Pvt. Ltd.) were used during the experimental protocol.

Anthelmintic Activity:

For the anthelmintic activity of aqueous extract of fruits of *F.benghalensis, F.religiosa* and *F. carica*, Indian earthworms (*Pheretima Posthuma*) of 3-5 cm in length and 0.1-0.2 cm in width were used. The animals were divided in to five groups containing six earthworms in each group. All the extracts and standard drug solution were freshly prepared before starting the experiments. Extracts and the standard drug solution were freshly poured in different petridishes. All the earthworms were washed in normal saline before they were released into 10 ml of respective formulation as follows: Vehicle (5% DMF in normal Saline), Piperazine hydrate (37.5 mg/ml), aqueous extract (37.5 mg/ml) of *F. benghalensis, F. religiosa* and *F. carica*. Observations were made for the time taken to paralyze (Paralysis was said to occur when the worms did not revive even in normal saline) and death (death was concluded when the worms lost their motility followed with their body colors fading away). All the results were expressed as a mean ± SEM of six animals in each group.

Result and Discussion:

Preliminary phytochemical analysis showed the presence of carbohydrates, flavanoids, aminoacids, steroids, saponins and tannins like phytoconstituents. Some of these phytoconstituents are responsible for anthelmintic activity. It is evident from the observations made in figure I *F. benghalensis*, *F. religiosa* and *F. carica* had shown anthelmintic activity. Aqueous extract of fruits of *F. benghalensis* shows paralysis at 5.30 min and death at 8.00 min. Aqueous extract of fruits of *F .religiosa* shows paralysis at 20.20 min and death at 39.42 min, Whereas Aueous extract of *F. carica* shows paralysis at 35.54 min and death at 62.23 min. The standard drug Albendazole Shows paralysis at 2.30 min and death at 5.15 min.



Al= Albendazole, Fb= *Ficus benghalensis*, Fr= *Ficus carica*, Fc= *Ficus carica*

Figure 1: Anthelmintic activity of aqueous extracts of fruits of *F. benghalensis F. religiosa* and *F. carica*.

Discussion:

It is evident from the findings of the present study that aqueous extracts of fruits of *F. benghalensis* posses potent anthelmintic activity when compared to that of aqueous extracts of fruits of *F. religiosa* and *F. carica*. *F.carica* was found to be least potent of them. Further studies using in vivo models are required to carryout and establish the effectiveness and pharmacological rationale. Moreover, phytochemical studies are also needed to lay down recommendation on scientific ground.

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