

“Evaluation of Invitro Anthelmintic Activity of Aqueous Extract of Ficus Religiosa”

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ABSTRACT

The present research work is about phytochemical investigation and anthelmintic activity of *Ficus religiosa* leaves. Standardization of crude drug extracted from plant plays an important role in identifying the quality and purity of drugs. Phytochemical constituents are extracted by aqueous extract from *Ficus religiosa* leaves belongs to the family Moraceae. This research find highlights that aqueous extracts of *Ficus religiosa* leaves had the highest number of phytochemicals. The aqueous extract of *Ficus religiosa* leaves holds the greatest potential to treat various human diseases and has profound medical applicability. In-vitro anthelmintic activity was evaluated by taking adult Indian earthworms, *Pheretima posthuma* having anatomical and physiological resemblance with intestinal roundworms. The earthworms were washed in normal saline solution before they were placed in to 10ml of respective formulation. To observe anthelmintic activity, all the investigations were carried out by aqueous extract with different concentrations of 10, 20, 50mg/ml, significant activity like time of paralysis and time of death were noted. At highest concentrations of 50mg/ml, a significant anthelmintic activity was observed and compared with piperazine citrate (10, 20, 50mg/ml as standard reference and distilled water as control. Herbal drugs and synthetic drugs were equally effective in helminthic infestations but aqueous extract of Indian medicinal plants exhibits potentiality and have significant anthelmintic activity.

KEY WORDS: *Ficus religiosa* leaves, Phytochemical screening, *Pheretima posthuma*, Piperazine citrate.

I INTRODUCTION

The use of medicinal products and supplements has increased exceedingly over the past decades, not less than 80% of world

population are depends on medicinal plant products for their primary health. In many developing countries, major proportion of the population are depends on traditional practitioners and using medicinal plant products in order to get their health in good conditions [1]. It belongs to family Moraceae and genus *Ficus*. It derived its botanical name from two words i.e. ‘*Ficus*’ a Latin word for ‘fig’ and ‘*Religiosa*’ refers to ‘religion’ indicating its importance in Hindu and Buddhist religions. All parts of this tree are rich in phytochemicals and are used in various food and medicinal preparations. The ripe fruits of *F. religiosa* are edible and rich source of proteins and minerals and. Fruits are rich in phytochemicals like flavonoids, terpenoids, and glycosides etc. which are known to cure diseases like asthma and digestive disorders. The leaves contain phytochemicals such as flavonoids, terpenoids, tannins etc., which are effective in curing ailments like hiccups, vomiting, gonorrhoea etc[2]. The bark contains phytochemicals like tannins, saponins, flavonoids etc. which show beneficial effects in health conditions such as diarrhea, dysentery, inflammation, bacterial infections, bleeding and paralysis. Various phytochemical constituents with medicinal properties to cure various health illnesses have been revealed every day by researchers[4]. Parasitic infections are common in the tropical regions that infect humans. Parasitic diseases disable their hosts and render them incapable of leading normal life and certain cases they cause mortality of the affected human hosts. Bioactive plant metabolites are cheap, cost effective and easily affordable drugs against parasitic infections. Helminthiasis is one of the most common diseases that widespread to human beings and animals due to poor management. To treat parasitic infections in man and animals, a large number of medicinal plants are being used[5]. The assay was carried out on adult Indian earthworm, *Pheretima posthuma* due to its

anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. Because of easy availability, *Pheretima posthuma* were used for evaluation of anthelmintic activity in vitro, the present research work deals with evaluation of phytochemical screening and of anthelmintic activity of *Ficus Religiosa* leaves[7].

II MATERIAL AND METHODS

Collection of the Plant Material:

Ficus Religiosa leaves were collected from the college ground, Mother Teresa Pharmacy College, Sathupally, Khammam, Telangana.

Preparation of *Ficus Religiosa* leaf powder:

Plant leaves are collected and air dried because to prevent it from direct sunlight impact to minimize undesirable chemical reactions of plant metabolites. Dry conditions are crucial to prevent the formation of artifacts as a result of microbial fermentation and subsequent degradation of the plant metabolites. Hence in the present study, leaves are dried in shade and then powder with a mechanical grinder. The powder was passing through sieve number 44 and stored in an airtight container for further studies.

Extraction procedure:

Fresh plant material was collected; shade dried and powdered in a mixer grinder. 10g of each plant material was put into 50ml of solvents, then extracted by using soxhlet extraction at 40°C temperature. The solvent was removed from the sample by evaporating at 40°C using a water bath. Then The extract was stored in a air tight container and used for further studies. (Susy Tjahjani et al., 2014)

Phytochemical Screening:

The phytochemical screening establishes regarding the presence of different compounds possessing therapeutic effects. The aqueous extract of *Ficus Religiosa* leaves were used for screening the presence of carbohydrate, glycosides, flavonoids, steroids, tannins, saponins, phenol and terpenoids according to standard procedures.

Anthelmintic activity of *Ficus Religiosa* leaves:

Preparation of earthworms:

Indian earthworm *Pheretima posthuma*, were used to observe the anthelmintic Activity (Annelida) were collected from the water logged areas of soil at Sathupally. The earth worm *Pheretima posthuma* are one of the most crucial soil invertebrate that promoting soil fertility. Their feeding and burrowing activities helps in breakdown of organic matter and release nutrients

and improve aeration, drainage and aggregation of soil. The average sizes of *Pheretima posthuma* were 7-9 cm with weight 0.8-2.25g were used for all experimental work. They were washed with normal saline to remove all the fecal matter surrounding their body. The earthworms resembled the intestinal roundworm parasites of human beings both anatomically and physiologically and hence were used to study the anthelmintic activity.

Experimental method:

These worms were separated into the different groups containing five earth worms in each group. The plant extract was dissolved in minimum quantity of 2% v/v Tween 80 and the volume was made up to 10 ml with normal saline for making the concentration of 10, 20 and 50mg/ml. All the plant extract concentrations and the standard drug solution were freshly prepared before conducting the experiments. All the earthworms were washed with normal saline solution before they were released into 10ml respective formulation, vehicle (2% v/v Tween 80 in normal saline), and Piperazine Citrate (10, 20 and 50 mg/ml) and plant extract (10, 20 and 50 mg/ml) the anthelmintic activity was prepared. 10ml formulations containing three different concentrations of aqueous extract (10, 20 and 50 mg/ml) were prepared and taken in different petri plates and five earthworms were placed in the solutions. Observations were noted for the time taken to paralysis and death of individual worms. Paralysis was noted when the worms do not revive even in normal saline and death was concluded when the worms lost their motility followed with fading away of their body color. Time for death of worms were observed after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water at 50°C stimulated and induced movements if the worm was alive.

III RESULTS AND DISCUSSION

Preliminary phytochemical screening of plants was predominant to the detection of bioactive principles which is a new source of therapeutically and industrially valuable compounds that may lead to the discovery of new drugs. In the present study, the presence of phytochemicals were screened with the aqueous extracts of the *Ficus religiosa* leaves and the results are shown in Table 1. Crude extracts and medicines are manufactured based on the principles of natural compounds even by pharmaceutical companies, may lead to large scale exposure of humans to natural products. Presence or absence of important

bioactive compounds in an extracts were identified by color reactions with specific chemicals, this procedure is simple for preliminary prerequisite before going to phytochemical investigation. Hence, in the present work, the crude extracts obtained by aqueous solvents were screened for the

presence of phytochemicals. The aqueous extract shows the presence of steroids, saponins, flavonoids, phenols and terpenoids. Saponins have health benefits such as lower cholesterol, antimicrobial, anti-inflammatory and anticancer properties.

Preliminary phytochemical screening of *Pithecellobium dulce* leave

Test	Aqueous extract
Alkaloids	-
Steroids	+
Tannins	+
Saponins	+
Phenols	+
Flavonoids	+
Terpenoids	+
Glycosides	+
Proteins	-

+ indicates the presence of the phytochemical;

- indicates the absence of the phytochemical

Phenolic compounds have biological and pharmacological properties such as anti-inflammatory, antioxidant, and antimutagenic and anticarcinogenic activities. Flavonoids are secondary metabolite having various pharmacological properties such as anti-oxidative, anti-fungal, anti-inflammatory and diuretic actions. This research finding highlights that aqueous extract of *Ficus religiosa* leave had the highest number of phytochemicals . Hence, aqueous extract of *Ficus religiosa* leaves holds the great potential to treat various human diseases and has profound medical applicability. The mechanism for anthelmintic activity of plant extracts are due to

presence of secondary metabolites bind to free proteins in the gastrointestinal tract of host animal and glycoprotein on the cuticle of the parasite. The result of anthelmintic activity of *Ficus religiosa* on earthworm was shown in Table-2 reveals that, different concentrations used have shown paralysis and death of worms and it was compared in the same concentration with Piperazine citrate. This standard drug may cause hyperpolarization of worms muscle by GABA agonistic action opening Chloride ion channels that cause relaxation and depresses responsiveness to contractile action of Acetylcholine. By increasing chloride ion conductance of worm muscle membrane initiates hyperpolarization and reduced excitability that led to muscle relaxation and flaccid paralysis.

Anthelmintic activity of Methanolic extract of *Ficus Religiosa* leaves:

Groups	Dose in Concentration (mg/ml)	Time of paralysis(min)	Time of death (min)
Control	-	-	-
Aqueous extract	10	20.23±4.26	24.15 ± 2.25
	20	15.15± 2.58	18.06±2.76
	50	8.27 ± 2.16	10.38 ± 2.50
	10	11.16 ± 1.05	13.12 ± 2.59

Standard drug	20	9±2.35	11.22 ± 1.34
	50	6 ± 0.27	8.49 ± 0.28

The aqueous extract of *Ficus Religiosa* leaves and standard drug solution not only illustrate paralysis, but also causes death of worms especially at higher concentration of 50 mg/ml, in very less time was shown in Fig 1,2.

Anthelmintic activity of methanolic extract:



Anthelmintic activity of standard drug:



In addition, Tannins or their metabolites have an undeviating effect on the possibility of the pre-parasitic stages of helminthes and other phytochemical constituents might be responsible for an anthelmintic activity include flavonoids and terpenoids. This present research work shows the presence of different phytochemical constituents like triterpenoids, steroids, glycosides, anthraquinone, flavonoids, with biological activity that can be valuable therapeutic index. The plant extracts can be used for further isolation of compounds for their anthelmintic activity.

IV CONCLUSION

The presence of phytoconstituents, such as phenols and flavonoids in plants, indicates the possibility of antioxidant activity and this activity will help in preventing a number of diseases through free radical scavenging activity. Since the plant *Ficus religiosa* leaves has been used in the treatment of different ailments, the medicinal roles of this plant could be related to identify bioactive compounds. The present analyses suggest that *Ficus religiosa* leaves contain potentially health-protective phytochemical compounds with a potent source of natural antioxidants and antibacterial activities that may be clinically promising. The present results will form the basis for collection of

new plant species for further investigation in the potential discovery of new bioactive compounds. Further studies are need for in-vitro model are required to find out and to establish effectiveness and pharmacological rationale for the use of plant leaves as anthelmintic drug. Biological parameter can be concluded that the plant *Ficus religiosa* leaves has significant anthelmintic activity.

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