



## EVALUATION OF ANTHELMINTHIC ACTIVITY OF LEAVES OF QUISQUALIS INDICA

D. S. K. Sarma\*, Dr. R. Srinivasan, D. Rajesh Kumar, D. Nagajyothi, V. Prabhavathi,  
M. Santhi Bai

Siddhartha Institute of Pharmaceutical Sciences, Jonnalagadda, Narsaraopet.

Article Received on  
01 Feb 2015,

Revised on 21 Feb 2015,  
Accepted on 13 Mar 2015

\*Correspondence for  
Author

D. S. K. Sarma

Siddhartha Institute of  
Pharmaceutical Sciences,  
Jonnalagadda,  
Narsaraopet.

### ABSTRACT

Anthelmintics are the drugs used to eradicate or reduce the number of helminthic parasites from intestinal tract or tissue of humans and other animals. The Anthelmintic activities of different leaf extracts of *Quisqualis Indica* were evaluated separately on adult Indian earthworm (*Pheritima posthuma*). It was found that methanolic extract and aqueous extract of *Quisqualis Indica* showed anthelmintic activities at a concentration of 60 mg/ml of each. The reference standard was Albendazole (60 mg/ml). The methanolic extract of *Quisqualis Indica* showed better result compared to aqueous extract.

**KEYWORDS:** Anthelmintics, *Quisqualis Indica*, Albendazole and

*pherithema Posthuma*.

### INTRODUCTION

**Historical resume of development of work on Indian medicinal plants:** The earliest mention of medicinal use of plants is to be found in the “Rig-Veda” or the Hindu system of medicine, which is one of the oldest repositories, having been written between 4500-1600 B.C. the classical manuscript, “**Ayurveda**”, written sometime during 200-600 B.C deals with different aspects of medicines and medicinal plants. The eight divisions of Ayurveda were followed by two important works: namely, “Sushruta” and “Charaka samhita” written during 1000 B.C. the former deals with comprehensive account on therapeutics and the later contains a remarkable description of *Materia-Medica* as it was known ancient Hindus.<sup>[1]</sup>

**Recent Developments of Exploitation of Indian Medicinal plants:** The total export of medicinal plants inclusive of opium from India had increased from Rs.20.6 Crores in 1972-73 to R.S 31.4 crores in 1974-75 about 10-15% more during 1980-1981 and so on.

**Anthelmintic:** Anthelmintic are the drugs used to eradicate or reduce the number of helminthic parasites (worm) from intestinal tract or tissue of humans and other animals.<sup>[2]</sup>

### Types

#### (a) Castodes

\* Tape worms: *Taeniasainata*, *Tania sodium*, *Hymenolepis Nana*,

#### (b) Nematodes

\*Round worms (nematodes): *Ascaris*, *Lumbricoides*,

\*Thread worms: *Enterobius Vermicularis*

\*Hook worms: *Alkyl stoma duodenals*, *nectar Americans*.

\*Whip worms: *Trichuris*, *trichuria*

\*Guinea worm: *Dracunculus*, *medinensis*.<sup>[2,3]</sup>

### Classification of anthelmintics

#### (1) Broad spectrum anthelmintics

(a) Drug effective in round worm, thread worm, Hook worm, tape worm and flukes e.g.:  
Mebendazole

(b) The drugs effective in round worm, thread worm, and hook worms e.g.:  
Thiabendazole, Pyrantel pamoate, Albendazole.<sup>[4]</sup>

#### (2) Narrow spectrum anthelmintics

(a) Drug effective in round worm and thread worm e.g: Piperazine, tetramisole, ivermectin

(b) Drug effective in hook worm infections e.g.: bethenium, thymol.

(c) Drug effective in filariais e.g.: diethyl laerbamazin

(d) Drug effective in tape worms eg: Niclosamide, cheleroquine,

(e) Drug effective in flukes eg: Praziquantel and bithionol.<sup>[5,6]</sup>

## MATERIALS & METHODS

### Extraction of the plant material

The plant material was identified and authenticated by Dr.P.Satyanarayana Raju. M.Sc,M.Phil,PhD. Botanist Survey of India.

The commonly employed technique for collecting active substance from the plant material is called "Extraction", which is defined as the process of isolation of soluble material from an insoluble residue which may liquid or solid, by the treatment with a solvent. This process of extraction was controlled by mass transfer.<sup>[1]</sup>

The leaves of plant were collected and dried.

Then extracted in soxhlet extractor by using methanol and water for 24 hrs.

**A) Methanolic extract of *Quisqualis indica*:** About 10 grams of the dry powder extracted first with 20 ml of Methanol 60-80 degree Centigrade by continuous hot percolation method using soxhlet apparatus. After completion extraction, the methanolic extract was filtered and concentrated to dry mass by vacuum distillation. A green color residue was obtained.

**B) Aqueous extract of *Quisqualis indica*:** About 10 grams of the dry powder extracted first with 20 ml of aqueous 100 degree Centigrade by continuous hot percolation method using soxhlet apparatus. After completion extraction, the aqueous extract was filtered and concentrated to dry mass by vacuum distillation. A brown color residue was obtained.

**Methods:** Total ash, acid insoluble ash, water soluble ash, extractive values were determined separately for air dried powdered leaves of this plant as per the official method.

Fluorescence Analysis and phytochemical screening were performed as per the official method.

## PHARMACOLOGICAL ACTIVITY

### Procedure for Anthelmintic Activity

The anthelmintic activity was evaluated on adult Indian earthworms by the reported methods with slight modification. Six groups of approximately equal sized Indian earthworms consisting of six earthworms in each group were released in to 50 ml of each sample as follows: vehicle (1% CMC), albendazole (60 mg/ml), methanolic and aqueous extract (60 mg/ml) of *Quisqualis Indica*. 1% CMC was used as vehicle. Observations were made for the time taken to paralysis and/or death of individual worms. Paralysis was said to occur when the worms do not revive even in normal saline water. Death was concluded when the worms lose their motility followed with fading away of their body color.

**Animals:** Healthy adult Indian earthworms, *Pheretima posthuma* (Annelida, Megascolecidae) were used for evaluating the anthelmintic activity due to this anatomical and

physiological resemblance with the intestinal roundworm parasites of human beings. All earthworms were of approximately equal size. They were collected from local place, washed and kept in water.

**Groups: Anthelmintic activities of methanolic extracts of leaves of *Quisqualis Indica*.**

**On Indian Earthworm *Pheretima posthuma*.**

Each group is represented as mean  $\pm$  standard deviation (n = 6).

Group 1 – Control (1% CMC) at conc. of 60 mg/ml,

Group 2 – Standard drug - Albendazole – 60 mg/ ml (in 1% CMC)

Group 3 – Methanolic extract of *Quisqualis Indica* , at conc. of 60 mg/ml. (in 1% CMC)

Group 4 – Aqueous extract of *Quisqualis Indica*, at conc. of 60 mg/ml. (in 1% CMC)

**RESULTS**

**Table: 1. Physico chemical parameters of *Quisqualis indica***

S.NO	PARAMETERS	VALUES %
1	Total Ash values (%)	6.0%
2	Acid insolubleAsh(%)	1.2%
3	Water soluble extractive (% w/w)	16%
4	Alcohol soluble extractive (%w/w)	12.05%
5	Loss on drying	10%

**Table: 2. Preliminary phytochemical screening of *Quisqualis indica***

S.NO	TYPE OF CONSTITUENTS	METHANOLIC EXTRACT	AQUEOUS EXTRACT
1	Volatile oil	-	-
2	Carbohydrates	+	+
3	Flavonoids	+	-
4	Tannins	+	+
5	Alkaloids	+	+
6	Glycosides	+	-
7	Fixed oils	-	-
8	Proteins and amino acids	+	+
9	Gum and mucilage	-	-
10	Terpinoids	-	-
11	Saponins	-	-
12	Lipids	+	+

(+) Indicates present

(-) Indicates absent

**Table: 3. The fluorescence analysis of leaf powder of *Quisqualis indica***

1.	Powder	Green
----	--------	-------

2.	Powder+1N sodium hydroxide in methanol	Greenish yellow
3.	Powder + 1N sodium hydroxide in water	Green
4.	Powder 50% Hydrochloride	Dark green
5.	Powder +50% sulphuric acid	Brownish yellow
6.	Powder + 50% nitric acid	Brick red
7.	Powder + petroleum Ether	Light Green
8.	Powder + chloroform	Green
9.	Powder + Nitric acid	Brick red
10.	Powder + 5% Ferric chloride solution	Blackish green
11.	Powder + 5% iodine solution	Reddish brown
12.	Powder + Methanol	Dark green
13	Powder+(Nitric Acid+Ammonia)	Light green

**Table: 04. Anthelmintic activity for two different extracts of *Quisqualis indica***

GROUP	CONCENTRATION	Time taken for paralysis(mins)	Time taken for death(mins)
Control	No sample	No effect	No effect
Aqueous extract	60 mg/ml	44 ± 0.2	49± 0.2
Methanolic extract	60 mg/ml	31 ±0.3	35 ± 0.2
Albendazole	60 mg/ml	20 ±1.2	23 ± 0.2

P Value<0.01when compared to control group.

## DISCUSSION

The result on various tests for physio chemical parameters like ash value, extractive value, loss on drying will help in the correct identification of this plant for future work were indicated in table.1.

Preliminary phyto chemical screening for differnt extracts (methanol, aqueous)of *Quisqualis indica* was tested and it was mentioned in table.2.

The *Quisqualis indica* leaves powder on treatment with various chemical reagents which gives a different colours and it was mentioned in table.3.

The data on anthelmintic activity for different extracts was performed and produced paralysis ranging from loss of motility to loss of response to external stimuli,which gradually progressed to death.The methanolic extract at a doseof 60mg/ml produced paralysis at a time of 31±0.3 min while death was observed at 35 ±0.2 min. The aqueous extract at a dose of 60mg/ml produced paralysis at a time of 44 ±0.2 min while death was observed at 49 ±0.2 min. The standard drug (Albendazole) at a dose of 60mg/ml produced paralysis at a time of 20 ±1.2 min while death was observed at a time of 23 ±0.2 min.

**CONCLUSION**

The present study was carried out to evaluate pharmacognostical, phytochemical and anthelmintic activities of two different extracts of *Quisqualis indica*. Methanolic extract of *Quisqualis indica* showed better anthelmintic activity when compared to aqueous extract.

**REFERENCES**

1. Trease and Evans Text book of pharmacognosy' 16<sup>th</sup> edition, 35.
2. R.S Satoskar, S.D. Bhandarkar Nirmala N.Rege, "Pharmacology and pharmacotherapeutics", 21st edition, 1073-10741
3. K.D.Tripathi, Jaypee,. Essentials of Medical pharmacology, 6<sup>th</sup> edition, 872-873.
4. Rang and Dale's pharmacology 6<sup>th</sup> edition, 712-717, 795, 323.
5. Elements of pharmacology Derasari and 17<sup>th</sup> edition Gandhi, B.S.Shah. Prakashan A.O 214-221.
6. A Text book of Pharmacology, Padmaja Udaykumar, 2nd edition, 427- 432.