



RESEARCH ARTICLE

**Comparative Study on Anthelmintic Activity of *Musa Acuminata* (Peel, Leaf) and
Ricinus Communis (Stem, Seed)**

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Manuscript No: IJPRS/V6/I2/00032, Received On: 20/04/2017, Accepted On: 29/04/2017

ABSTRACT

The present study was undertaken to evaluate and compare the anthelmintic properties of plants methanolic extracts. Helminth infestation occurs through one or more intestinal parasitic larvae like *Ascaris*, whipworm, hookworm, tapeworms etc. This is a serious problem encountered in most of the developing countries, predominantly seen in tropical and subtropical zones. Morbidity and mortality rates are increasing year after year. Methanolic extracts of *Musa acuminata* (peel, leaf) and *Ricinus communis* (seed, stem) were tested for anthelmintic potential. In the anthelmintic activity determination, methanol extract (10, 20, 30mg/ml) of *Ricinus communis* stem showed shortest time of paralysis (14 ± 0.61 , 12 ± 0.72 , 09 ± 0.89 minutes) and death time (24 ± 0.25 , 20 ± 0.82 , 15 ± 0.91 minutes) respectively when compared to the standard albendazole. Therefore the selected extracts have potential use in helminth infestation diseases. *Ricinus communis* stem has significant anthelmintic activity than other extracts.

KEYWORDS

Anthelmintic activity, Albendazole, Helminths, *Musa acuminata*, *Ricinus communis*.

INTRODUCTION

Helminthiasis or worm infection is one of the most prevalent diseases in the World. This disease is highly prevalent particularly in one-third of the world countries due to poor Management practices. The word Helminths has been derived from the Greek which means "worm". Helminth infections^[1] are among the most common infections in man, affecting a large proportion of the world's population. The parasites can be acquired by contact with infected Water, infected meal, infected animal. In developing countries, they pose a large threat to public health and contribute to the prevalence of malnutrition, anemia, Eosinophilia and pneumonia.

Helminthiasis is a macroparasitic disease of humans and animals in which a part of the body is infested with parasitic worms such as pinworm, roundworm or tapeworm.

The world health organization WHO has estimated that 80% of the population of developing countries relies on traditional medicines, mostly plant drugs for their primary health care needs, the use of medicinal plants is growing worldwide because of the increasing toxicity and allergic manifestations of the synthetic drugs. Hence there is an increasing demand towards natural anthelmintics.

Musa acuminata belongs to the family Musaceae (banana family). The genus *Musa* is given to this plant in the honor of a Roman physician, Antonia Musa of the first century. It is also called as plantain, banana, kadali, kela and Kel. The plant is native to Southeast Asia and India including

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Pakistan and cultivated in tropical and subtropical regions.² The fruit is picked when it is unripe and rich in starch, but when it ripens the starch turns into simple sugars (sucrose, glucose, and fructose). Fruit also has an ample quantity of vitamin A, B-6, and vitamin C. *Musa acuminata* is about 30 feet high and produces green or greenish-yellow seedless fruit, so fruit develops parthenocarpically (in the absence of seed development). The name "plantain" refers to *Musa acuminata*, which requires cooking before it is eaten. An intoxicating drink can be prepared from the fruit. The leaves are cut into strips and woven into mats and bags. The plant is used in inflammation, rheumatism, gripe, diabetes and hypertension. Unripe bananas are astringent and used to treat diarrhea. The leaves are used for a cough and bronchitis. The roots can arrest hemoptysis and possess strongly astringent and anthelmintic properties. Plantain juice is used as an antidote for snakebite.

*Ricinus communis*³ belong to family Euphorbiaceae. *R. communis* is probably a native to North-Eastern Africa (i.e., Ethiopia and Somalia) and India. It is also known as Castor, endi, a mugham etc, it consists of steroids, saponins, alkaloids, flavonoids, and glycosides⁴. Its oil and seed (castor oil and castor seed) extracts have been used as an internal medicine in folk medicine for disorders like severe constipation, worm infestation, rheumatism, intestinal inflammation and also for birth control. The oil from seeds⁵ is used for external application to relieve furuncles, boils, headaches, inflammation of the middle ear, inflammatory skin disorders. In China, the medicine has been used in traditional medicine for facial paralysis, sore throat, furuncles, dry stool, inflammation of the skin and ulcers. The root of the plant has been used for relieving liver disorders and different forms of inflammation. The leaves are used as anti-inflammatory and emmenagogue (stimulate menstruation in women). Castor oil is being used as a lubricant in the candy production, as a component of flavor, as an ingredient for preparing protective coatings for tablets.

MATERIALS AND METHOD

PLANT MATERIAL COLLECTION:

The plants were collected in the month of January from Botanical garden. The plant was then identified by the vernacular names and later it was compared with herbarium of the Department of Botanist. The leaves and peel of *Musa acuminata*, seeds, and stem of *Ricinus communis* were collected and separated and then dried under shade for 10-15 days. Then the dried materials were ground and sieved to get nearly fine amorphous powder. Powdered drug was extracted separately with methanol by continuous hot percolation in Soxhlet apparatus and with water by cold maceration for 3 days respectively. The extracts were filtered and evaporated using a rotary evaporator. Dried extracts were stored at 20°C until used.

PHYTOCHEMICAL SCREENING:

After the phytochemical study it was observed that dried leaf extract of *Musa acuminata* collar contains alkaloid, steroidal lactones, tannins and dried peel extract contains alkaloids, flavonoids, terpenoids, steroids, glycosides etc, dried seed extract of *Ricinus communis* contains subjected for the presence of different phytoconstituents like alkaloid, steroid, flavonoid, tannin, glycoside etc. and dried stem extract of *Ricinus communis* contains alkaloids, flavonoids, steroids, glycosides, carbohydrates etc.

SELECTION OF WORMS:

Indian adult earthworms (*Pheretima Posthuma*) were used to carry out the anthelmintic evaluation. The earthworms were collected from the moist soil and were washed with saline water to remove soil particles. Worms were about 11 cm length and 0.3 to 0.4 cm wide was selected for the experiment. Ready availability, anatomical and physiological resemblance of *Pheretima Posthuma* made it be used initially for in vitro evaluation of the anthelmintic activity.

CHEMICALS USED:

Methanol, distilled water, saline, albendazole (standard), were used during the experiment.

EVALUATION OF ANTHELMINTIC ACTIVITY:

Anthelmintic activity was carried out on adult Indian worm (*Pheretima Posthuma*) of nearly equal size, 6 in each group. Different concentrations (10, 20, 30 mg/ml) of the extracts and reference (albendazole) were prepared. 15ml of the ethanolic extracts was added to each Petri plates containing earthworms observations were made for the time taken to paralyze and time for the death of individual worms. Paralysis was set to occur when the worms do not revive even when introduced into normal saline. Death was concluded when worms lost their motility, followed by fading away of their body color.

RESULTS AND DISCUSSION

Both the plant extracts showed significant anthelmintic activity at all tested doses when compared to a reference standard (table 1) as a

vermifuge and vermicide Potency of the extract was inversely proportional to time for paralysis and death of worms. Methanolic extract of *Musa acuminata* peel at 30mg/ml concentration shown paralysis at 17 minutes and death at 35 minutes and Methanolic extract of *Musa acuminata* leaf at 30mg/ml concentration shows paralysis at 16 minutes and death at 30 minutes, whereas methanolic extract of *Ricinus communis* stem at 30mg/ml concentration shown paralysis at 09 minutes and death at 15 minutes and methanolic extract of *Ricinus communis* seed at 30mg/ml concentration shown paralysis at 11 minutes and death at 26 minutes against earthworm *pheretima Posthuma*. The reference drug *Albendazole* exhibit 02 minutes paralysis time and 13 minutes death time at 30mg/ml concentration. Anthelmintic activity of both the extracts may be due to the presence of alkaloids, tannins, steroids etc.

Table: Anthelmintic Activity of Methanolic Extracts of *Musa Acuminata* (Peel, Leaf) and *Ricinus Communis* (Seed, Stem)

Sr. No.	Group	Concentration (mg/ml)	Paralysis Time (min)	Death Time (min)
01	Standard	10	06 ±0.25	20 ±0.45
		20	03 ±0.50	17 ±0.50
		30	02 ±0.50	13 ±0.25
02	M. acuminata peel extract	10	22 ±0.25	40 ±0.81
		20	19 ±0.82	37 ±0.31
		30	17 ±0.91	35 ±0.69
03	M. acuminata leaf extract	10	20 ±0.90	39 ±0.61
		20	18 ±0.52	35 ±0.72
		30	16 ±0.61	30 ±0.89
04	R. communis stem extract	10	14 ±0.61	24 ±0.25
		20	12 ±0.72	20 ±0.82
		30	09 ±0.89	15 ±0.91
05	R. communis seed extract	10	16 ±0.81	33 ±0.90
		20	14 ±0.31	30 ±0.52
		30	11 ±0.69	26 ±0.61

CONCLUSION

Finally, it can be concluded that all extracts of leaves and seeds show significant anthelmintic activity. *Ricinus communis* stem has shown

greater anthelmintic activity compared to other extracts.

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HOW TO CITE THIS ARTICLE

Sony, R.C., Shravani, K., Afreen, F., Ravikumar, K., Sindhu, D.M. (2017). Comparative Study on Anthelmintic Activity of *Musa Acuminata* (Peel, Leaf) and *Ricinus Communis* (Stem, Seed). *International Journal for Pharmaceutical Research Scholars (IJPRS)*, 6(2), 28-31