AMERICAN JOURNAL OF PHARMTECH RESEARCH

Journal home page: http://www.ajptr.com/

Anthelmintic activity of leaves extracts of *Anacardium Occidentale* and *Mangifera Indica* (anacardiaceae).

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ABSTRACT

Helminthes are the most common infections in man, affecting a large proportion of the world's population. Study includes alcoholic extracts of *Anacardium occidentale*, *Mangifera indica* and combination of *Anacardium occidentale* and *Mangifera indica* leaves extracts (1:1) were evaluated for their anthelmintic activity using *Pheretima posthuma* model. Three concentrations (10, 20 and 50 mg/ml) of each extracts were used for this study which involved the determination of time of paralysis and time of death of the worms. Extracts obtained from both leaves not only paralyzed but also killed the earthworms. Among the two drug extracts, *Mangifera indica* showed maximum vermifuge and vermicidal activity at the concentration of 50 mg/ml. Combination of alcoholic extracts of *Anacardium occidentale* and *Mangifera indica* also showed a significant anthelmintic activity. Observations were comparable with the standard drug at concentration of 20 mg/ml. On the basis of the observations, it was concluded that both *Anacardium occidentale* and *Mangifera indica* leaves extracts have a potential anthelmintic property.

Keywords: Anthelmintic activity, *Anacardium occidentale, Mangifera indica, Pheretima posthuma.*

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Received 23 September 2013, Accepted 27 September 2013

Please cite this article in press as: Kamath KK *et al.*, Anthelmintic activity of leaves extracts of *Anacardium Occidentale* and *Mangifera Indica* (anacardiaceae . American Journal of PharmTech Research 2013.

INTRODUCTION

Indian medicinal plants are recognized to have great potential for preparing clinically useful drugs that, they can be used by allopathic physicians. In the present context, with the available talent in the country like pharmaceutical chemists, biotechnologist and interested allopathic physicians, made significant effort towards identification of an "active principle" of medicinal plants to treat human and animal infections is priority[1]. In this study anthelmintic activity of leaves extracts of *Anacardium occidentale* and *Mangifera indica* (Anacardiaceae) was carried out.

Helminthes are the most common infections in man, affecting a large proportion of the world's population. Parasitic diseases may cause severe morbidities including lymphatic filariasis, onchocerciasis, and schistosomiasis. Development of resistance to most of commercially available anthelmintic drugs became a severe problem worldwide[2, 3]. *Anacardium occidentale* and *Mangifera indica* leaves are rich in phytoconstituents like alkaloids, tannins, saponins, flavonoids, and terpenes. These drugs are widely used in the treatment of different ailments in the Indian system of medicine[4].

Anacardium occidentale, (*Anacardiaceae*) is commonly known as "Cashew". Leaves are petiolated, 4 to 22 cm long and 2 to 15 cm broad, Leaf base is attached the stem, simple leaf with one leaf blade, shape of leaf is obcordate, margin is sinulate with obtuse apex, symmetrical base, surface is greenish glabrous, unicostate parallel venation, the leaves consist of one mid rib running from apex to the petiole, the veins and vein-lets run parallel to one another on each side. The arrangement of leaves on stem are alternate, all leaves make a spiral path on the axis[5].

Physicochemical and preliminary phytochemical characteristics of *Anacardium occidentale*, plant was reported to have anti-fungal, antioxidant and anti-inflammatory activities. Phytochemical tests reveal the presence of carbohydrates, proteins, saponin glycosides, flavonoids, alkaloids, tannins and phenolic compounds in ethanol and aqueous extract of leaves[6].

Mangifera indica, (*Anacardiaceae*) leaves are alternately arranged, long and narrow shaped, 6 to 25 cm in length, 2 to 8 cm in breadth and leathery in texture, petiolated, Leaf base is attached the stem, simple leaf with one leaf blade, shape of leaf is lanceolate, margin is entire, apex is acute, with symmetrical base, surface is glabrous, unicostate with parallel venation, The mid rib running from apex to the petiole, the veins and veinlets run parallel to one another on each side. Leaves make a spiral path on the axis. Young leaves are reddish brown but gradually become dark green[5].

Mangifera indica which is a common horticulture and medicinal plant, which is used traditionally to treat various infections. Ether and ethanolic leaf extracts were obtained by sequential extractions. The chemical tests showed that the ether extract had saponins, steroids and triterpenoids, while the ethanol extract had alkaloids, anthracenosides, coumarins, flavonones, reducing sugars, catechol and gallic tannins, saponins, steroids and triterpenoids[7].

MATERIALS AND METHODS:

Plant materials

Leaves of *Anacardium occidentale* and *Mangifera indica* were collected from coastal region of Mangalore and authenticated by Professor of Botany, Doctor K. Gopalkrishna Bhat, Udupi (Karanataka) 576101.

Drug and chemicals

The following drugs and chemicals were used: Piperazine citrate (Glaxo), Sodium chloride (Himedia), Ethanol (Rankem).

Preparation of extract and phytochemical screening

The collected plant material (Leaves) of *Anacardium occidentale* and *Mangifera indica* were collected and washed thoroughly with water, air dried for 2 weeks at 35-40°C and powdered in to coarse powder. Extraction was done by using Soxhlet apparatus with 70% ethanol as solvent. The extracts were concentrated using rotary evaporator, dried and stored in air tight containers[8, 9]. Phytochemical screening was carried out on *Anacardium occidentale* and *Mangifera indica* leaves extracts which revealed the presence of alkaloids, saponins, flavonoids, terpenes and steroids[9].

Collection of Test organism

Adult earthworms (*Pheretima posthuma)* collected from the garden of the department and washed with normal saline. The earthworms of 3.5 cm in length and 0.1-0.2 cm in width were used for all the experiment due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human beings[10, 11].

Anthelmintic activity

The ethanolic extracts *Anacardium occidentale* and *Mangifera indica* were suspended in normal saline to prepare 10, 20 and 50 mg/ml concentrations. Piperazine citrate (20 mg/ml) was used as the standard drug. All the extracts and drug solution were freshly prepared before starting the experiment. Eleven groups with six earth-worms in each were placed into 10 ml of desired formulations as following: vehicle (normal saline), Piperazine citrate (20 mg/ml), and three sets

of three different groups were treated with extracts of respective concentration. Observations were made for the time until the paralysis and death of an individual worm. The paralysis was said to occur when the worms were not able to move. Death was concluded when the worms lost their motility followed with fading away of their body colors[10, 11]. Results are shown in Table 1.

RESULTS AND DISCUSSION:

The Preliminary phytochemical analysis showed the presence of alkaloids, flavonoids, terpenes and steroids in the extracts of *Mangifera indica and Anacardium occidentale*. *Mangifera indica* extract at the concentration of 10 mg/ml showed the time of paralysis and death at 11 min and 35 min respectively. For concentration of 20 mg/ml, the paralysis and the death time was found 7.6 min and 28.5 min respectively. At the concentration of 50 mg/ml, time was 5.4 min for paralysis and 12.1 min for death. While in *Anacardium occidentale* extract at the concentration of 10 mg/ml, the time of paralysis and death was found to be 13.2 min and 40.2 min respectively. At concentration of 20 mg/ml, it was 9.1 min for paralysis and 21.4 min for death. For concentration at 50 mg/ml, the time of paralysis and death was 7.3 min and 16 min respectively.

Table 1: Anthelmintic activity of Saline, Piperazine citrate, leaves extracts of *Mangifera Indica* and *Ancardium Occidentale* alone and combination (1:1).

Leaves extracts	Conc. (mg/ml)	Time taken for paralysis(min)	Time taken for death(min)
Vehicle control (Saline)	-	-	-
Piperazine citrate (Std. Drug)	20	9.0±0.2	15.2±0.5
Mangifera Indica	10	11.0±1.3	35.0±2.1
	20	7.6±0.9	28.5±1.7
	50	5.4±0.4	12.3±0.9
Anacardium occidentale	10	13.2±1.4	40.2±1.4
	20	9.1±0.2	21.4±1.8
	50	7.3±0.3	16.0±0.9
Mangifera Indica + *Anacardium occidentale (1:1)*	10	12.8±1.6	26.3±1.9
	20	8.7±0.7	17.6±0.7
	50	6.1±0.3	15.2±0.4

In case of combination of both the plant extracts 1:1 *(Anacardium occidentale* : *Mangifera indica),* the time of paralysis and death was 12.8 min and 26.3 min respectively at concentration of 10 mg/ml. At concentration of 20 mg/ml, the time of paralysis and death was 8.7 min and 17.6 min respectively and at 50 mg/ml concentration, the time of paralysis and death was 6.1 min and 15.2 min respectively. The observations with piperazine citrate showed that time of paralysis and death was 9.0 min and 15.2 min respectively for concentration at 20 mg/ml. It was observed that

both mango as well as cashew leaves alcoholic extracts showed a remarkable anthelmintic activity. Amongst the both extracts, *Mangifera indica* showed better activity compared with *Anacardium occidentale.* Anthelmintic activity of *Anacardium occidentale* was enhanced in the presence of *Mangifera indica*.

CONCLUSION:

The predominant effect of Piperazine citrate on the worm is to cause a flaccid paralysis that result in expulsion of the worm by peristalsis. The extracts demonstrated paralysis as well as death of worms at a time comparable to Piperazine citrate at higher concentration. The anthelmintic activity of *Mangifera indica* and *Anacardium occidentale* may be due to the synergetic effect of active phyto-constituents i.e. alkaloids, Taninins, saponins, flavonoids, terpenes, steroids, present in the extracts. So it can be concluded that leave extract of *Anacardium occidentale* and *Mangifera indica* shows the anthelmintic activity

ACKNOWLEDGEMENT:

The authors are highly thankful to Sri CA A. Raghavendra Rao, President, Srinivas Group of Colleges, Mangalore. The authors are also thankful to Srinivas College of Pharmacy, Mangalore, India for providing necessary facilities to carry out this research work.

REFERENCES:

1. Nandagopal B, Sankar S, Ramamurthy M, Sathish S, Sridharan G. Could the products of Indian medicinal plants be the next alternative for the treatment of infections. Ind. J. Med. Micro, 2011; 29:93-101.
2. Rohini S, Mehta A, Mehta P, Shukla K. Anthelmintic Activity of rhizome extracts of *Curcuma longa* and *Zingiber officinale* (Zingiberaceae). Inter J P and Pharma Sci. 2011; 3(2):236-237.
3. Tagboto S, Townson S, Antiparasitic properties of medicinal and other naturally occurring products. Adv. in Parasitol. 2001; 50:199-295.
4. Godfrey SB, Aloysius L, Nathan M, David BK, Paul W, Jasper O, et.al The activity of *Mangifera indica* L. leaf extracts against the tetanus causing bacterium, *Clostridium tetani.* Afri J of Eco. 2007; 45(3):54–58.
5. Sardana, Morphology of plants-parts, a text book of Pharmaceutical Biology, 2nd edition 2007; 40-51.
6. Jaiswal Y, Vinayak N, Tatke P, Gabhe S, Vaidya A. Pharmacognostic and Preliminary Phytochemical Investigations Of Anacardium *Occidentale (*Linn.) Leaves. Inter J P and

Pharma Sci. 2012; 4(3):29-36.

7. Godfrey SB, Aloysius L, Nathan M, David BK, Paul W, Jasper O, et.al The activity of Mangifera indica L. leaf extracts against the tetanus causing bacterium, Clostridium tetani. Afri J of Eco. 2007; 45(3):54–58.

8. Evans WC, Trease and Evans Pharmacognosy. 13th Ed. English, Language Book Society, Baillere Tindall London: 1999; 327-536.

9. Mukharjee P.K. Quality control of drugs, First edition Business Horizon New delhi, 2002:183-221.

10. Ravindra DB, Manish SK, Sandeep BP, Rupali VH. In vitro anthelmintic activity of roots of *capparis zeylanica linn.* J of Adv. P Edu. & Res. 2011; 2:154-158.

11. Niranjan S, Ranju G, Uma SS, Umesh KS, Amit J. Anthelmintic activity of *Platycladus orientalis* leaves extract. Inter. J of Parasitology Res. 2010; 2(2):01-03.