

IN VITRO ANTHELMINTIC ACTIVITY OF CRUDE EXTRACTS OF RIPE AND UNRIPE SEED AND PEEL EXTRACT OF MALUS DOMESTICA

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ABSTRACT

The most common digestive system infections are helminth infections. It affect more than two billion people worldwide.^[4] In region of rural poverty in the tropics where prevalence is greatest simultaneous infection with more than one type of helminthes is common. Parasitic diseases cause ruthless morbidity affecting principally population in endemic areas. The gastro-intestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes diseases. The current study reveals the potential of herbal drug in crude form used in helminthes infection or against heminth. The hydroalcoholic extract of peel and seed of

Malus domestica (Apple) was taken against Pheritima at dose level of 0.25,0.5.1.0 mg/ml concentration. The results are compared with the standard drug Piperazine (0.25 & 0.5 mg/ml) and albendazole (0.25mg/ml) concentration and it was found that the extract is having significant potential against helminthes infection.

INTRODUCTION

An apple is a sweet, edible fruit produced by an apple tree (*Malus domestica*). Apple trees are cultivated worldwide as a fruit tree, and is the most widely grown species in the genus *Malus*. The tree originated in Central Asia, where its wild ancestor, is still found today. Apples have been grown for thousands of years in Asia and Europe, and were brought to North America by European colonists. Apples have religious and mythological

significance in many cultures, including Norse, Greek and European Christian traditions. Apples are a rich source of various phytochemicals including flavonoids (e.g., catechins, flavanols, and quercetin) and other phenolic compounds (e.g., epicatechin and procyanidins) found in the skin, core, and pulp of the apple they have unknown health value in humans.^[1] Use of medicinal plant is growing worldwide because of the increasing toxicity and allergic manifestations of the synthetic drugs. There are literally thousands of different types of worms in the animal kingdom. They generally have long, slender bodies with no separate limbs. Worms live in a variety of habitats: some worms live in the earth such as earthworms, others live in water such as the Leeches and others live in a human host such as tapeworms. The worms that live in humans or in animals are known as parasites. They eat the food supplies of their host and cause a wide range of conditions and symptoms that range from mild to severe. Parasites live in or on another organism called the host organism. They use the half-digested food that is found in their host's intestines as their own food supply. Parasites use host organisms for their nutrients and thrive in environments where they have a ready supply of food.^[2] However the apple seeds & peels are having plenty of catechins, flavonoids, cynidins, etc, which shows a great amount of therapeutic potential. In this lieu antihelmintic activity on seeds and peel of *Malus domestica* was evaluated.

MATERIAL AND METHODS

Collection of Plant Material

The *Malus domestica* seeds & peel were collected and were cleaned and dried in sun then powdered. The drug powder was packed in an air tight container.

Preparation of Hydro alcoholic extract^[3]

100gm of the powdered drug was soaked with a little of distilled water for the aqueous extract & a little of methanol for methanolic extract & ethanol & water in a ratio of 50:50 for hydro alcoholic extract respectively in a stainless steel closed container. After an hour 200 ml of water was added to the moistened drug and it was allowed to macerate for 7 days with occasional shaking. After a week the liquid was filtered with the help of a muslin cloth and the drug material was pressed to liberated more menstrum form the marc. Both the extracts were mixed and the liquid evaporated to get a brown colored aqueous extract. The percentage yield was calculated for the extract which was later used for the study.

Collection of Earthworm

The earthworms were collected from department of Agriculture, Dev Bhoomi Institute of Pharmacy & Research, Dehradun (Uttarakhand). They were 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 the present experimental protocol. The earthworm resembles both anatomically and physiologically to the intestinal roundworm parasites of human beings hence, they were used in the anthelmintic activity.^[4]

Evaluation of anthelmintic activity^[5]

Anthelmintic activity of the extracts was determined using method (Tuse, 2011). In this method adult earthworms (*Eudriluseugeniae*) were collected (due to their anatomical & physiological resemblance with the intestinal round worm's parasite of human beings) and then washed to remove adhering material. Petridish of equal sizes were taken then cleaned and dried. Seven Petridis were arranged in a row. 20 ml normal saline was poured in 1 No. Petridis, 20 ml of Piperazine hydrate solution containing 0.25 & 0.5 mg/ml concentration were poured in 2 No. and 3 No. petridish respectively. 20 ml solution of extract 0.25, 0.5 & 1.0 mg/ml were taken in 4, 5, 6 No. petridish respectively (Test). And 0.52 ml of ablendazonle solution kept in petridish no.7. Seven earthworms of equal sizes were introduced in each Petri dish and time was noted. The time taken for paralysis (motion less) and complete death of earthworm were recorded. Death of earthworm was confirmed by dipping it in hot water (50°C).

RESULT

Table 1: Result of anthelmintic activity of *Malus domestica*.

S.No.	Treatment	Concentration	Time taken for paralysis(minute)	Time taken for death(minute)
1	control	-----	No paralysis	No death
2	albendazole	0.25mg/ml	40min (+_2)	65min (+_2)**
3	Piperazine citrate	0.25mg/ml	50min (+_2)	120min (+_2)
		0.5mg/ml	42min(+_2)	80min (+_2)**
4	Hydro alcoholic peel and seeds extract of apple	0.25mg/ml	85 min(+_2)	100min(+_2)
		0.50mg/ml	60 min(+_2)	90min(+_2)
		1mg/ml	53 min(+_2)	56min(+_2)**

DISCUSSION AND CONCLUSION

The anthelmintic activity of hydroalcoholic extract was comparable with that of Piperazine citrate & Albendazole (Std.) This drug is effective in a broad range of helminth infections including round worms, hookworms, whipworms and pinworms. It may be due to its effect on inhibition of tubulin polymerization, glycogen synthesis and glucose uptake in the parasites leading to a lethal depletion of energy reserves in the helminthes. However the presence of plentiful amount of flavonoids in seeds and peel of *Malus domestica*^[6], the extract shows good potential against helminthes. However activity was not found so much significant as compared to standard drugs. This study suggests that the plants used to treat intestinal worm infections showed significant anthelmintic activity. The experimental evidence obtained in the laboratory model provides a rationale use of this plant as anthelmintic.

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