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ANTHELMINTIC ACTIVITY OF METHANOLIC AND AQUEOUS EXTRACTS OF *PSIDIUM GUAJAVA* LINN

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ABSTRACT

Helminthes are recognized as a major problem to livestock production throughout the tropics. Parasitic helminthes affect human being and animals by causing considerable hardship and stunted growth. Most diseases caused by helminthes are of a chronic and debilitating in nature. The parasitic gastroenteritis is caused by mixed infection with several species of stomach and intestinal worms, which results weaknesses, loss of appetite, decreased feed efficiency, reduced weight gain and decreased productivity.² Although some synthetic drugs are available to control such kind of infections but due to their high cost and untoward effects, the development of more effective and safe drugs from reasonably less expensive natural sources is our main consideration. This can rationally be approached through the study of indigenous traditional plant remedies. We here in explore scientifically the anthelmintic potential of three traditionally used medicinal plants of India and substantiate the folklore claims. In present communication methanolic and aqueous extracts of plant of *Psidium guajava* Linn. Were investigated for their anthelmintic activity against *Pheretima posthuma* and *Ascaridia galli*. Various concentrations were used in the bioassay, which involved paralysis and death time of the worms. Both the extracts showed significant anthelmintic activity.

Keywords: Anthelmintic, *Ascaridia galli*, *Pheretima posthuma*, *Psidium guajava* Linn, Piperazine citrate

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1.0 INTRODUCTION

Psidium guajava Linn is commonly known as amrood & is grown in India. It belongs to family Myrtaceae. *psidium guajava*¹. (guava) is an evergreen shrubs native to tropical america that has naturalized in south east Asia The guava leaf extract has been reported to possess a wide spectrum of activities against a variety of human ailments^{3,4}. Aqueous leaf extract contains tannins, while methanolic extract is enriched with anthocyanins, alkaloids, flavonoids, tannins and steroids/terpenoids Purpose of the study is to evaluate anthelmintic potential of plant *Psidium guajava* linn.

2.0 MATERIALS AND METHODS

2.1 Plant material

The plant *Psidium guajava* linn. were collected from krishi vigyan kendra district of Sultanpur in July 2008 and authenticated by Dr N.B Singh, Dept. of Botany, Kamla Nehru institute of technology sultanpur Uttar Pradesh.

2.2 Preparation of extracts

The plant of were shade dried, powdered and subjected to successive solvent extraction petroleum ether (60-80%) chloroform, ethanol in soxhlet extractor and cold maceration of the successive marc in water. Extracts were vacuum dried. The preliminary phytochemical

investigation was carried out of methanol and aqueous extracts.

2.3 Animals

Indian adult earthworms (*Pheretima posthuma*) were collected from water logged areas and *Ascardia galli* (nematode) worm were obtained from freshly slaughtered fowls (*Gallus gallus*).Both worm types were identified at the Department of Pharmacology, kamla Nehru institute of management & technology (faculty of pharmacy) sultanpur.

2.4 Evaluation of anthelmintic activity:

The anthelmintic assay was carried as per method of Ajaiyeoba with minor modifications. The anthelmintic activity was evaluated on adult Indian earthworm *Pheretima posthuma* worm due to its anatomical and physiological resemblance with the intestinal round worms parasites of human beings *Ascardia galli* (nematode) worms are easily available in slaughtered fowls and it can be used as a screening model for anthelmintic drugs as advocated earlier. Three different concentrations, each of crude alcoholic and aqueous extract (10, 50,100 mg/ml in distilled water) were prepared and six worms (same type) were placed in it. This was done for both type of worms Observation were made for the time taken to cause paralysis and death of the individual

worms. Mean time for the paralysis (P) in min was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; time of death (D) in min was recorded after ascertaining the worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Piperazine citrate (10mg/ml) was included as reference compound^{6,7}.

3.0 RESULTS AND DISCUSSION

Preliminary phytochemical screening of plant of *Psidium guajava linn* showed the presence of diterpenoids, flavonoids, steroids, tannins and resins. As shown in table-I, methanolic and aqueous extract exhibited anthelmintic activity in dose-dependent manner giving shortest time of

paralysis (P) and death (D) with 100 mg/ml concentration. The alcoholic extract of *Psidium guajava linn* caused paralysis of 9.68 min. and time of death of 31.5 min. while aqueous revealed paralysis of 8.66 and 32.31 min. respectively against the earthworm *Pheretima posthuma*. The reference drug Piperazine citrate showed the same at 18.83 and 60.33 minutes, respectively. *Ascaridia galli* worms also showed sensitivity to the methanolic and aqueous extract of *Psidium guajava linn*. The methanolic extract caused paralysis in 10.42 min, death in 31.71 min and the aqueous extract displayed P and D in 9.11 and 31.25 min, respectively, at higher concentration of 100 mg/ml. Piperazine citrate did the same at 15.17 and 41.67 min.

TABLE I: Anthelmintic Activity of Ethanolic And Aqueous Extracts of Plant of *Psidium Guajava* Linn.

Test subs	Concentration (Mg/ml)	Time taken			
		paralysis (P)	Death(D)	paralysis (P)	Death(D)
control	-	-	-	-	-
Alcohol extract	10	25.45±0.55	64.0±0.35	28.62±0.39	47.21±0.52
	50	18.0±0.51	44.8±0.41	19.0±0.50	34.38±0.39
	100	9.68±0.43	31.5±0.42	10.42±0.46	31.71±0.53
Aqueous extract	10	28.27±0.48	66.86±0.64	21.72±0.62	50.1±0.59
	50	19.67±0.70	51.65±0.17	12.32±0.32	37.21±0.32
	100	08.66±0.32	32.31±0.65	9.11±0.29	31.25±0.33
	10	18.83±0.60	60.33±0.49	15.17±0.47	41.67±0.76

Results are expressed as mean ± SEM from six observations

4.0 DISCUSSION

Piperazine citrate by increasing chloride ion conductance of worm muscle membrane produces hyper polarization and reduced excitability that leads to muscle relaxation and flaccid paralysis. The leaf extract of *Psidium guajava* *limm.* not only demonstrated paralysis, but also caused death of worms especially at higher concentration of 100 mg/ml in shorter time as compared to reference drug Piperazine citrate. Phytochemical screening of the extracts revealed the presence of alkaloids, saponins, flavonoids, triterpenes, tannins and steroids. Tannins were shown to produce anthelmintic activities chemically tannins are polyphenolic compounds. It is possible that tannins contained in the extracts of *Psidium guajava* *limm.* produced similar effects. Reported anthelmintic effect of tannins is that they can bind to free proteins in the gastrointestinal tract of host animal or glycoprotein on the cuticle of the parasite and may cause death. Further studies are in process to identify the possible phytoconstituents responsible for anthelmintic activity.

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