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Anthelmintic activity of alcoholic and aqueous extract of *Vateria Indica* Linn

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ABSTRACT

The present investigation was undertaken to evaluate the anthelmintic activity of Ethanolic and aqueous extract of Vateriaindica (stem bark) using Indian earthworm Phretimaposthuma.Different concentrations viz. (50, 25 and 12.5 mg/ml) of each Ethanolic and aqueous extracts were used for bioassay, involve determination of time of paralysis (T_P) and time of death (T_D) of the worms. 1% gum acacia in saline solution and Mebendazole (15mg/ml) were used as control and standard respectively. The result of present study indicates that the crude Ethanolic extract of Vateriaindica significantly demonstrated paralysis, and death of worms a concentration 50mg/ml compared to standard reference Mebendozole.

Key words: Vateria indica, , anthelmintic activity, Mebendazole, earth worm.

INTRODUCTION

Helminthic infections is one of the frequently affecting infections to human being ,which largely affecting the world population.Thease infections are routinely found in developing countries and become a potential threat to the public health by causing the prevalence of anaemia, malnutrition in growing children etc. [1].

There are several helminthes which infect the intestine viz. Cestodese. Tape worms – *Tiniasolium*,Nematodese. hook worms –*Ancylostomaduodenale*, round worm- *Ascarislumbricoids*, and trematodes/flukes– *Schistosomamansoni and schistosomahematobolium*. The infestation from these parasitic infections may cause severe morbidity like lymphatic filariasis, onchocerciasis and schistosomiasis and can affect most populations situatedin endemic areas with major economic and social related consequences and millions of livestock cause considerable economic losses in domestic and farmyard animals.Most of the world's population relive to a greater extent on easily available traditional medicineand consume several plants or plant derived products to fight helmethic infections, particularly from the tropical developing countries like India. [2].

Vateriaindica(Linn).Dipterocarpaceae is a perennial woody plant. A slow-growing species, Endemic and found primarily in the South west coast evergreen forests, upto an altitude of 750 m, and also occasionally in secondary evergreen dipterocarp forest in the states of Karnataka, Kerala & Tamil Nadu[3].

Dipterocarpaceaeous plants have been known to have an abundance of stilbene oligomers that have a blocking unit of resveratrol. *Vateriaindica*(Linn).is distributed in India and Sri Lanka, the resin obtained from the plant has been used as a traditional medicine for sore throat, chronic bronchitis, rheumatism, and diarrhea [4**]**. The stem of the genus *Vateria* is known to produce biological active compounds such as oligostilbenoids and monoterpenes.

MATERIALS AND METHODS

Plant material

Vateria indica (Linn) Stem bark was collected from Manipal and around of Manipal, Karnataka, India during the month of August-September 2011. The plant was authenticated by Dr. Gopala Krishna Bhat, botanist, taxonomist ,PoornaPrjna College , UdupiKarnataka. A voucher specimen (PP 584)has been deposited in the department of Pharmacognosy, Manipal College of Pharmaceutical sciences, Manipal India

Preparation of Ethanolic and aqueous extract

The stem barks of *Vateria indica* were shade dried, coarsely powered and about 100g of crude powder drug was extracted with ethanol by hot extraction process (Soxhlet). After completion of the extraction the solvent was recovered by distillation *in vacuo.* The aqueous extraction of *Vateria indica* was prepared by maceration process with 100g of the stem bark power using chloroform: water (1:99) for seven days, after completion of the extraction, filtered, concentrated *in vacuo* .

The test samples were prepared at the concentration 50mg/ml, 25mg/ml and 12.5mg/ml in normal saline containing 1% gum acacia. Suspension normal saline containing 1% acacia and 15mg/ml Mebendazole used as control and standardrespectively.

Worm collection and authentication

Phretimaposthuma(Indian earthworm, phylum: Annelida) were obtained from Vermiculture lab Manipal. It was identified at the department of Pharmacognosy, Manipal University, Manipal, Karnataka.

Antihelmintic activity:

The anthelmintic assay was carried as per the method of Mathew *et al.*,and Dash *et al.*[5,6,7]with little modifications ,using adult Indian earthworm *Pheritimaposthuma* due toresemblance anatomically and physiologically with the intestinal round worm parasite which are responsible to causes infestation in human being [8,9].Because of easy availability, earthwormshave been widely used for the initial evaluation of anthelmintic activity*in vitro*[10,11].Five groups of approximately equal size Indian earthworms consisting of four in each group were released in 50 ml of desired solutions containing different concentrations of crude extract (50, 25, and 12.5mg/ml) and standard Mebendazole (15mg/ml) in normal saline containing 1% gum acacia.Suspension of only normal saline containing 1% gum acacia was served as control. The time of paralysis ($\mathbf{T_P}$) was noted when no movement of could be observed except when the worms were shaken vigorously. Time for death ($\mathbf{T_D}$) was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50 ^{0}C).

Statistical analysis

The data are expressed as Mean $\pm$ SD and analyzed by using one way analysis of variance (ANOVA), followed by post hoc sheffe's test using SPSS computer software version 10. The values were considered significant when $p<0.05$.

RESULTS AND DISCUSSION:

The Ethanolic extract of *Vateria indica* Linn. (Stem bark) exhibit anthelmintic activity in dose dependent manner. The Ethanolic extract of *Vateriaindica*at dose of 50 mg/ml cause paralysis in 44.39 $\pm$ 0.820min ,while death in 49.51 $\pm$ 1.05 min and aqueous extract of *Vateriaindica* at the dose of 50mg/ml cause paralysis in 46.56 $\pm$ 0.367 min and death in 51.25 $\pm$ 0.933 min respectively against*Phretimaposthuma*as compared to the reference standard Mebendazole 15mg/ml showed the same at 20 min and 29min respectively.Mebendazole cause the degenerative alteration in the tegument and intestinal cells of worm by binding to the tubuline protein and inhibits it is polymerization or assembly into microtubules. It also causes degenerative changes in the ER and mitochondria of the germinal layer, alter the production of ATP, which is the energy required for the survival of the helminth. Due to diminished energy production, the parasite is immobilized and eventually dies [12].

Table 1: Anthelmintic activity of Ethanolic and aqueous extract of *Vateriaindica* Linn (stem bark)

Test substance	Concentration in mg/ml	Time taken for paralysis in min.	Time taken for death in min.
Vehicle	-	-	-
Mebendazole	15 mg/ml	20.06 ± 0.050	29.01 ±0.58
Ethanolic extract	50mg/ml	44.39 ± 0.82	49.51 ± 1.05
	25 mg/ml	48.95 ± 0.523	60.02 ±1.35
	12.5 mg/ml	69.30 ± 0.911	82.22 ±1.48
Aqueous extract	50 mg/ml	46.56 ± 0.367	51.25±0.933
	25 mg/ml	69.09±0.43	79.89 ±0.307
	12.5 mg/ml	71.92 ±0.357	118.64 ±2.037

All the value are expressed as mean± SD (n = 4)

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