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IN VITRO ANTHELMINTIC ACTIVITY OF *CATUNAREGAM SPINOSA* (THUMB) TIRVENG

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ABSTRACT

Methanolic extract from the fruits of *Catunaregam spinosa* (Thumb) Tirveng was investigated for the anthelmintic activity against adult Indian earthworm Eisinia Fetida. Various concentrations (25, 50, 100 mg/ml) of each extract were tested in the study in terms of time for paralysis and time taken for death of worms. Albendazole was included as reference standard and distilled water as control. Therefore, the fruits could be categorized under anthelmintic herbal drugs and could become a potent key ingredient of herbal formulation.

INTRODUCTION

The World Health Organization (WHO) estimated that 80% of the populations of developing countries rely on traditional medicines, mostly plant drugs for their primary health care needs. The use of medicinal plant is growing worldwide because of the increasing toxicity and allergic manifestations of the synthetic drugs. Helminth infections are among the most common infections in man affecting a large proportion of world's population. *Catunaregam spinosa (Thumb) Tirveng* is known as Mainphal. The plant is indigenous to India. It is found in waste places and jungles all over India extending northwest to the Bias river and ascending to outer Himalayas to 4000 fts. The plant is deciduous thorny shrub growing throughout India up to an altitude of 1350 meters in the hills [1.] It is commonly known as Madana (Sanskrit), Emetic nut (English), Gelaphal (Marathi), and Mainphal (Hindi). The fruits of *Catunaregam spinosa (Thumb) Tirveng* used as anthelmintic traditionally [2]. Literature survey reveals that there are no reports on systematic and scientific study of anthelmintic activity of fruits has been reported, an attempt has been made to evaluate the anthelmintic potential of fruits of *Catunaregam spinosa (Thumb) Tirveng.*

MATERIALS AND METHODS

Collection and authentication of plant material:

The fresh fruits of plant *Catunaregam spinosa (Thumb) Tirveng* were collected in the months of July- August from the local market of Mahabaleshwar, Maharashtra, India and authenticated by the authority of the Botanical Survey of India, Pune and assigned voucher specification no. (BSI/WRC/Tech./2009).

Drugs and Chemicals:

The drug Albendazole (Cipla pharmaceutical Ltd) was procured as gift sample and all other chemicals were of analytical grade.

Preparation of extract:

The fruits were dried in air and reduced to a very fine powder. Then the powder was subjected to maceration with methanol (60%v/v) for 24 hrs at room temperature. The extract was concentrated and the solvent was completely removed. They were freeze dried and stored in the refrigerator for further use.

Anthelmintic activity:

Anthelmintic activity was carried as per the method reported by Ajaiyeoba *et al* [3] with minor modifications. The assay was performed on adult Indian earth worm *Eisinia Fetida* due to its anatomical and physiological resemblance with the intestinal round worm parasite of human beings [4-6]. Because of easy availability, earthworm has been widely used for the initial evaluation of anthelmintic compounds *in vitro* [7-10] 50 ml of formulation containing 3 different concentrations, each of crude Methanolic extracts (25, 50, 100 mg/ml in distilled water). All the extracts and standard drug solution were freshly prepared before starting the experiments. Mean time for paralysis (in min) was noted when no movement of any sort could be observed except when the worm was shaken vigorously; time for death of worms (in min) was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50^{o}C). Albendazole (40 mg/ml) was used as reference standard [11].

TABLE 1: ANTHELMINTIC ACTIVITY OF METHANOLIC EXTRACTS OF FRUITS OF PLANT *CATUNAREGAM SPINOSA (THUMB) TIRVENG.*

Treatment drug	Concentration used	Time taken for paralysis (min)	Time taken for death (min)
Distilled water (control)	5 ml	---	---
Methanolic extract	25 ml	100.12± 0.014	108.50 ± 0.014
	50 ml	28.58 ± 0.014	39.16 ± 0.014
	100 ml	13.00 ± 0.014	22.06 ± 0.014
Albendazole (standard)	40 ml	03.30 ± 0.014	6.45 ± 0.014

RESULTS AND DISCUSSION

From the result both Methanolic and aqueous extract of the fruits of *Catunaregam Spinosa (Thumb) Tirveng* show an anthelmintic activity when compared to the standard drug. Crude extract at the concentration of 25, 50 and 100 mg/ml produced anthelmintic activity in dose dependent manner giving shortest time of paralysis (P) and death (D) 100 mg/ml concentration. Methanolic extract of fruits of *Catunaregam spinosa (Thumb) Tirveng* at concentration of 100

mg/ml caused paralysis in 13 min and death in 22 min against Albendazole 3.3 min and 6.45 min respectively. Phytochemical analysis of the crude extracts revealed the presence of tannins as one of the chemical constituents. Tannins were shown to produce anthelmintic activities [13].. Some synthetic phenolic anthelmintics are shown to interfere with energy generation in helminth parasites by uncoupling oxidative phosphorylation [15]. It is possible that tannins contained in the extracts of fruits of *Catunaregam spinosa (Thumb) Tirveng* produced similar effects. Another possible anthelmintic effect of tannins is that they can bind to free proteins in the gastro intestinal tract of host animal or glycoprotein on the cuticle of the parasite and cause death.

CONCLUSION

It is concluded that the traditional claim of fruits of *Catunaregam spinosa (Thumb) Tirveng* as an anthelmintic has been confirmed as the extracts shown activity against Eisinia fetida. Further studies are necessary to isolate and reveal the active compounds contained in the crude extracts of fruits of *Catunaregam spinosa (Thumb) Tirveng* responsible for activity and to establish the mechanism of action are required.

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