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ANTHELMINTIC STUDIES OF FRUITS OF *SCLEROPYRUM PENTANDRUM* (DENNST.) MABB

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ABSTRACT

Scleropyrum pentandrum (Dennst.) Mabb from *santalaceae* family is a small tree of evergreen forests of different world region. It is common to sandy soil of Peninsular India, Western Ghats, South and Central Sahyadri and divine forests of coastal Kerala. Traditionally *Scleropyrum* is important for its different biological activities. Tribes of different region of the world are exploring the benefit. This study explains the anthelmintic activity of the bark of the *Scleropyrum pentandrum*. The aqueous extract, alcoholic extract and the crude drug were tested for the anthelmintic activity. Further study is necessary to isolate and elucidate its medicinally active components. Also studies are needed to evaluate each compound for its pharmacological identities.

KEYWORDS

Anthelmintic activity, *Scleropyrum pentandrum*, Fruits, *Pheretima posthuma* and *Ascaridia galli*.

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INTRODUCTION

Scleropyrum pentandrum. (Dennst.) Mabb (syn: *Scleropyrum wallichianum* Am.) belongs to the family *santalaceae*. The plant grows to a maximum height of 6 to 7 meters and is normally found on sandy soil, as well as in semi and dry evergreen forests. It is commonly called *malayammachi* and *malayamkki* in Kozhikkode and Naikkuli in Kasargod of Kerala and *mulkirayan* in Tirunelveli of Tamilnadu¹. The whole plant parts are applied externally to treat skin irritation in Kani tribal settlement, Agasthyamalai biosphere reserve, Tirunelveli South India². The crushed roots are given for curing stomach ailments in Kurichyas

tribal community in Kannur district, Kerala³. The roots are boiled and the decoction is taken as a contraceptive by semalai people. It is believed that women will become barren after consuming the decoction. Paste of stem bark and leaf is applied externally to treat skin diseases⁴. Stem is used as galactagogue⁵. Gale *et al*, (2007) presented the cyclo oxygenase inhibiting, anti-malarial and anti Tubercular activities of *Scleropyrum pentandrum*⁶. Anticaryogenic and cytotoxic activity of methanolic extract of *S. Pentandrum* leaves were carried out by Venugopal *et al*, (2011)⁷. The extract was found to be having anticaryogenic activity. Five unprecedented furan-2-carbonyl C-glycosides and two phenolic diglycosides were isolated from leaves and twigs of *Scleropyrum pentandrum* by Tripetch Kanchanapoom *et al* (2012)⁸.

Fruits and seeds of *Scleropyrum pentandrum* also called kirinda is consumed by Paniya, Kattunaika and Kuruma tribes of Wynad district, Kerala, India⁹. It is also called dirumulli and is used as a mechanical barrier (fencing) in dried or live condition¹⁰. Ajithbabu T K *et al* (2013) carried out the anatomical and phytochemical studies and reported the presence of Carbohydrate, Phenols, Flavanoids, alkaloids, Tannins, Glycosides, Sterols, Terpenoids in the alcoholic extract of the plant *Scleropyrum pentandrum*. The anti-inflammatory activity and qualitative and quantitative microscopy studies also reported^{11,12}.

The fruits are collected depending upon the part of fruits used. They are collected either ripe or half ripe, but full grown¹³. The proper time for the collection is the period during which it contain highest active chemical constituents. At the same time it should retain its optimum quality and better appearance even after drying¹⁴. Leaves, flowers and fruits should not be collected when covered with dew or rain. Any slugs should be rejected. Even with hand picking, it is difficult, certainly expensive, to get leaves, flowers or fruits entirely free from other parts of the plant¹⁵.

The literature review of *Scleropyrum pentandrum* was found to be very less, as much study on this plant has not done.

EXPERIMENTAL

Plant Materials

Collection and extraction of fruits of *S. pentandrum* were done from the sacred groves of Poyilkavu Durga Devi temple situated at the coastal area of Calicut, Kerala. The plant specimen was identified at Centre for Medicinal Plants Research, Kottakkal and Dr. A. K. Pradeep, Assistant professor, Department of Botany. The herbarium is deposited at Botany department, Calicut University, Kerala (No:107864). After collection, the fruits were air dried under shade at room temperature and grounded.

PREPARATION OF EXTRACTS

The fresh ripped fruits of *Scleropyrum pentandrum* were collected from the same location in a large scale. The collected fruits were washed thoroughly to remove sand. It is dried by avoiding direct sun light to protect the metabolites of the leaf. It was then powdered and subjected to soxhlet extraction with alcohol and water. This extracts and the powdered crude drug were used for the anthelmintic activity study. Anthelmintic activity Animals Adult earthworms (*Pheretima posthuma*) and Roundworm (*Ascaridia galli*) were used to evaluate anthelmintic activity *in vitro*. Earthworms were collected from the watery paddy fields of Poilkavu, Calicut. The roundworms were obtained from intestine of freshly slaughtered fowls. Infested intestines of fowls were collected from the local slaughter house of Vellimadukunnu, Calicut. These were washed with normal saline solution to remove all the faecal matter. These intestines were then dissected and worms were collected and kept in normal saline solution. The average size of earthworm was 4-7 cm. Average size of round worm was 4-6. Earthworm and helminths were identified and services of veterinary practitioners were utilized to confirm the identity of worms.

DRUGS AND CHEMICALS

Satish B. Kosalge and Ravindra A and Mali R G *et al* used Piperazine citrate (Glaxo Smithkline) as the standard drug in the experimental protocol. Test samples of the extract were prepared at the concentrations, 25, and 50 mg/ml in distilled water.

Six worms of *Pheretima posthuma*, and *Ascaridia galli* of approximately equal size (same type) were placed in different Petri dish containing 25 ml of above test solutions of extracts. Piperazine citrate (50 mg/ml) was used as reference standard and distilled water as control. The same procedure was adopted for both the types of worms. The test solutions and standard drug solution were prepared freshly before starting the experiments. Observations were made for the time taken for paralysis was noted. No movement of any sort except when the worms were shaken vigorously is taken as the paralysis. Time for death of worms were recorded after assuring that worms not moved when they shaken vigorously and dipped in warm water of 50° C^{16,17}.

The results were shown as in Table No.1 and 2.

STATISTICAL ANALYSIS

Results obtained were evaluated by unpaired' test. The values of p<0.5 for the test were considered statistically significant.

RESULTS AND DISCUSSION

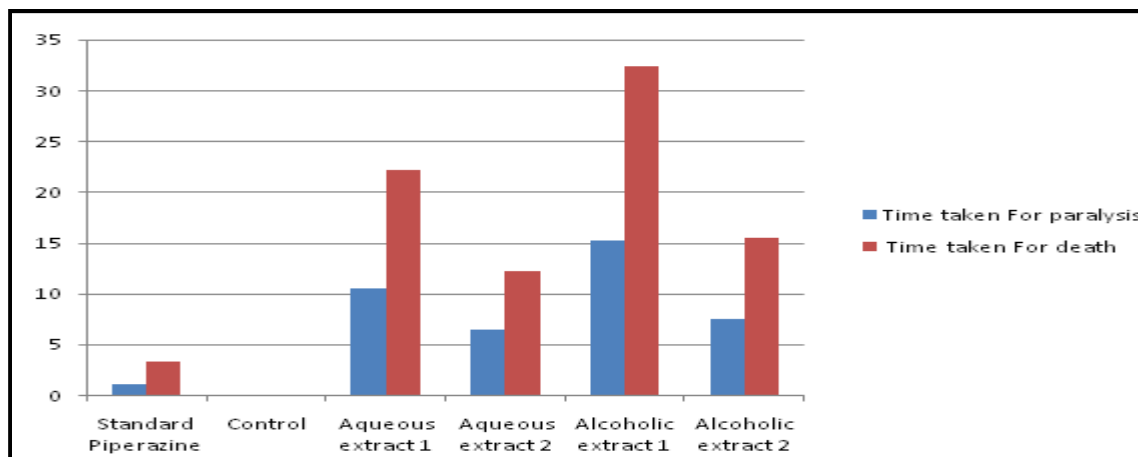
Aqueous extracts of *Scleropyrum pentandrum* fruit of 50mg/ml showed a maximum anthelmintic activity compared to its alcoholic extracts of either 25mg/ml or 50mg/ml concentrations.

Table No.1: Anthelmintic activity of *Scleropyrum pentandrum* extract on *Pheretima Posthuma*

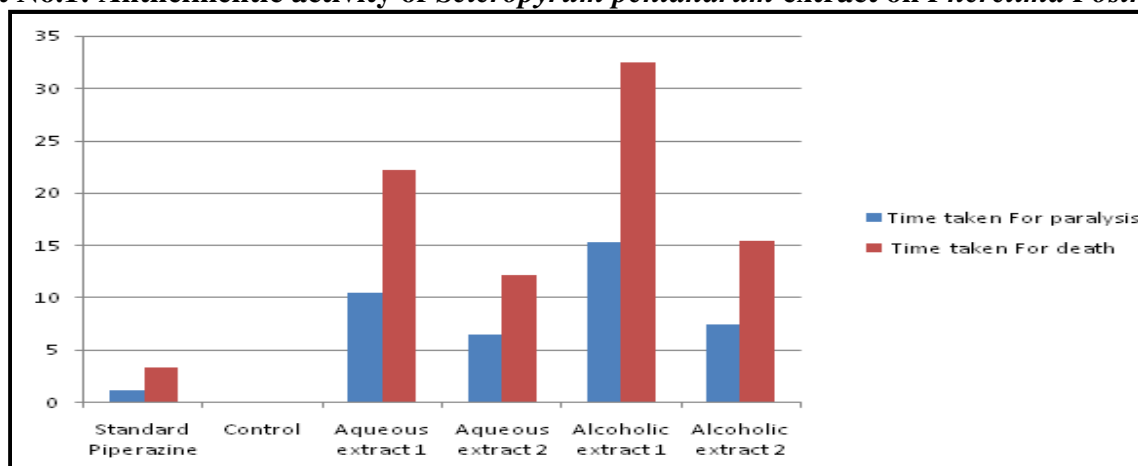
S.No	Treatment		Time taken in minutes	
			For paralysis	For death
1	Standard Piperazine	50mg/ml	1.41±.17	3.32±.21
2	Control	Distilled water	0	0
3	Aqueous extract	25mg/ml	31.18±.26	74.22±.29
4	Aqueous extract	50mg/ml	11.24±.20	31.36±.24
5	Alcoholic extract	25mg/ml	34.14±.27	154.12±.32
6	Alcoholic extract	50mg/ml	11.48±.17	54.22±.23

Table No.2: Anthelmintic activity of *Scleropyrum pentandrum* extract on *Ascaridia galli*

S.No	Treatment		Time taken in minutes	
			For paralysis	For death
1	Standard Piperazine	50mg/ml	1.1±.12	3.28±.14
2	Control	Distilled water	0	0
3	Aqueous extract 1	25mg/ml	10.43±.18	22.15±.22
4	Aqueous extract 2	50mg/ml	6.43±.19	12.14±.21
5	Alcoholic extract 1	25mg/ml	15.25±.22	32.42±.26
6	Alcoholic extract 2	50mg/ml	7.44±.15	15.42±.19



Plot No.1: Anthelmintic activity of *Scleropyrum pentandrum* extract on *Pheretima Posthuma*



Plot No.1: Anthelmintic activity of *Scleropyrum pentandrum* extract on *Ascaridia galli*

CONCLUSION

The aqueous extract of the drug at 50mg/ml is found to be more effective than the alcoholic extracts. Both methods are found to be giving similar results with the extracts. Further studies must be conducted to establish the anthelmintic activity of the leaf extract by different techniques and different standards. Our future aim is to isolate the chemical constituents responsible for the anthelmintic activity.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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