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**ANTHELMINTIC STUDIES OF BARK OF SCLEROPYRUM PENTANDRUM  
(DENNST) MABB**

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**ABSTRACT**

*Scleropyrum pentandrum* (Dennst) Mabb of *santalaceae* family is a small tree of evergreen forests in different parts of the world. It is common to sandy soil of divine forests of coastal Kerala, Peninsular India, Western Ghats, South and Central Sahyadris. Traditionally *Scleropyrum* is important in different biological activities and tribal community of different region of the world is 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. Literature review of this plant proves the necessity of scientific evaluation as very less work has done so far with *Scleropyrum pentandrum*. Further study is needed to isolate and elucidate its medicinally active components. Also necessary studies are needed to evaluate each compound for its pharmacological identities.

**KEYWORDS**

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

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**INTRODUCTION**

*Scleropyrum pentadrum* (Dennst) Mabb (*syn: Scleropyrum wallichianum* Am.) belongs to the family *santalaceae*. The plant grows up 6 to 7 meters and is normally found on sandy soil, and in semi and dry evergreen forests. Ayyanar M and Ignachimuthu S reported that the plant is commonly called *malayammachi* and *malayamkki* in Kozhikkode and Naikkuli in Kasargod of Kerala and *mulkirayan* in Tirunelveli of Tamilnadu<sup>1</sup>. Debritto A J and Mahesh R in 2007 reported the whole plant parts were applied externally to treat skin irritation by Kani tribal settlement,

Agasthyamalai biosphere reserve, Tirunelveli South India<sup>2</sup>. In 2010 Rajith N P *et al* published the stomach ailment use of crushed *Scleropyrum pentandrum* roots by Kurichyas tribal community in Kannur district, Kerala<sup>3</sup>. In 2005 Sapura Mohammed reported the contraceptive activity. 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 of *Scleropyrum pentandrum* root. Sapura Mohammed reported that the paste of stem bark and leaf can be applied externally to treat skin diseases<sup>4</sup>. Stem is used as galactagogue<sup>5</sup>. Gale *et al*, (2007) presented the cyclo oxygenase inhibiting, anti malarial and anti TB activities of *Scleropyrum pentandrum*<sup>6</sup>. Venugopal *et al*, in 2011 carried out the anticaryogenic and cytotoxic activity on methanolic extract of *S. Pentandrum* leaves<sup>7</sup>. 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)<sup>8</sup>.

Fruits and seeds of *Scleropyrum pentandrum* also called kirinda is consumed by Paniya, Kattunaika and Kuruma tribes of Wynad district, Kerala, India<sup>9</sup>. Prasad S K and Raveendran K reported the synonym of *Scleropyrum pentandrum* in Malayalam as irumulli and is used as a mechanical barrier (fencing) in dried or live condition<sup>10</sup>. 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<sup>11,12</sup>.

Sampat *et al* reported the anthelmintic activity of the bark extracts of *Tamarindus indica*<sup>13</sup>. Bark are usually collected in spring or early summer, when cambium is active and get turn easily from stem, sometimes it is collected in other season. If there is a rainy season, it is during that period that the bark

is most easily collected<sup>14</sup>. Powdered bark always possess sieve tube and cellulose parenchyma, cork, fibers, sclereids, starch, calcium oxalate, and secretory tissue and frequently present in small amount, chlorophyll and aleurone grains are absent<sup>15</sup>. Helminth infections are among the commonest infections in man, affecting a large proportion of the world's population. In developing countries worms of different species possess a major threat to public health and contribute to the prevalence of malnutrition, anemia, eosinophilia, and pneumonia. Anthelmintics are drugs that either kill or expel infesting helminthes<sup>16</sup>.

## MATERIAL AND METHODS

### Plant Materials

Collection of plant and extraction of barks of *S.pentandrum* were collected 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 and the herbarium is deposited at Botany department, Calicut University, Kerala (No: 107864). After collection, the plant samples were air dried under shade at room temperature and grounded. The sample was extracted by maceration using 90% ethanol. The obtained crude aqueous and alcoholic extracts and the non extracted powders were evaporated to dryness and used for the anthelmintic activity studies.

### Preparation of extracts

The fresh barks of *Scleropyrum pentandrum* were collected from the same location in a large scale. The collected barks were dried avoiding direct sun light to protect the metabolites of the bark. The dried and powdered bark of *Scleropyrum pentandrum* was extracted by soxhlet method with alcohol and water. This extracts and the powdered crude drug were used for the anthelmintic activity study.

## Anthelmintic Activity

### Animals

Animals Adult earthworms (*Pheretimaposthuma*) and Roundworm (*Ascaridiagalli*) were used to evaluate anthelmintic activity *in vitro*. Earthworms were collected from domestic regions of Koduvally, Calicut. The roundworms were obtained from intestine of freshly slaughtered fowls. Infested intestines of fowls were collected from the local slaughter house near JDT Islam College of Pharmacy 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

Mali R G, *et al* carried out the anthelmintic activity with Piperazine citrate (Glaxo Smithkline) as standard drug during this experimental protocol<sup>17</sup>. Test samples of the extract were prepared at the concentrations, 25, and 50 mg/ml in distilled water. Six worms of *Pheretimaposthuma*, and *Ascaridiagalli* of approximately equal size (same type) were placed in different Petri dish containing 25ml of above test solutions of extracts. Satish B Kosalge and Ravindra A used Piperazine citrate (50mg/ml) as reference standard and distilled water as control. The same procedure was adopted for both the types of worms. The test solutions and control solution.

All solutions were prepared freshly before starting the experiments<sup>18</sup>. Observations were taken as paralysis and death. If the worms are not moved except when the worms were shaken vigorously is taken as the paralysis. When they are immobile even after they are shaken vigorously and dipped in warm water of 50° C is considered as death.

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

### Statistical analysis

Results obtained were evaluated by unpaired 't' test. The values of  $p < 0.5$  for the test were considered statistically significant.

## RESULTS AND DISCUSSION

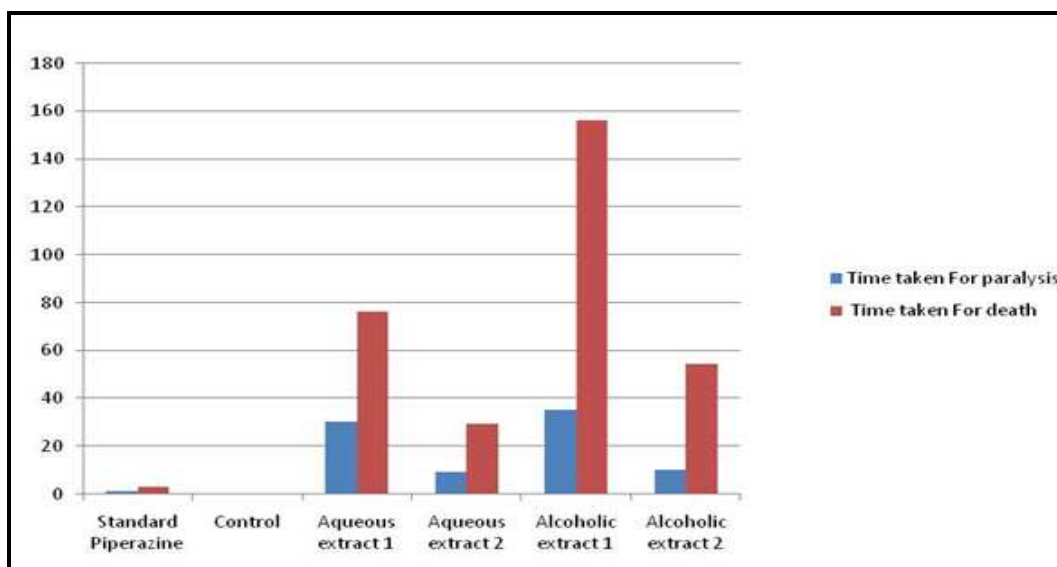
Aqueous extracts of 50 mg/ml concentration of *Scleropyrum pentandrum* exhibited a maximum anthelmintic activity compared to the alcoholic extracts of either 25mg/ml concentrations of or 50mg/ml concentrations of *Scleropyrum pentandrum*.

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

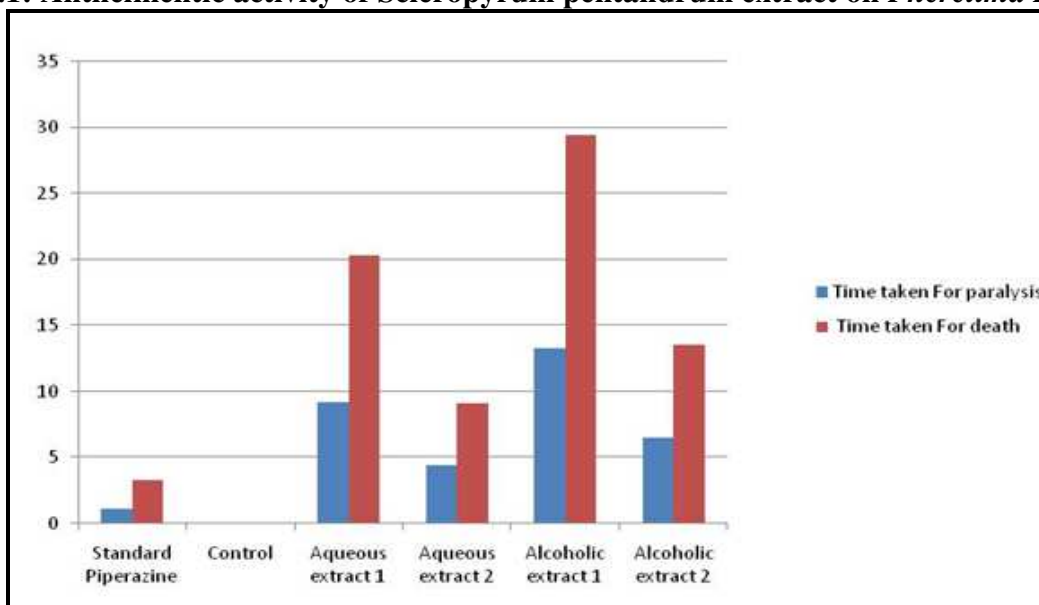
S.No	Treatment		Time taken in minutes	
			For paralysis	For death
1	Standard Piperazine	50mg/ml	1.41±.17	3.32±.21
2	Control	Distilled water	0	0
3	Aqueous extract	25mg/ml	30.19±.26	76.23±.29
4	Aqueous extract	50mg/ml	9.32±.20	29.34±.24
5	Alcoholic extract	25mg/ml	35.24±.27	156.18±.32
6	Alcoholic extract	50mg/ml	10.17±.17	54.42±.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	25mg/ml	9.23±.18	20.35±.22
4	Aqueous extract	50mg/ml	4.43±.19	09.14±.21
5	Alcoholic extract	25mg/ml	13.28±.22	29.42±.26
6	Alcoholic extract	50mg/ml	6.54±.15	13.52±.19



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



**Plot No.2: 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 carried out with *Pheretimaposthuma*, and *Ascaridiagalli* were found to give concordant results with the extracts. Further studies must be conducted to establish the anthelmintic activity of the bark extract by different techniques and different standards. Our future aim is to isolate the chemical constituents responsible for the anthelmintic activity of bark of *Scleropyrum pentandrum*.

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## CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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