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## ANTHELMINTIC STUDIES OF ROOT OF *SCLEROPYRUM PENTANDRUM* (DENNST.) MABB

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### ABSTRACT

*Scleropyrum pentandrum* (Dennst.) Mabb of *santalaceae* family is a small tree of divine forests of different parts of Kerala and entire world. It is common to sandy soil of Peninsular India, Western Ghats, South and Central Sahyadris and coastal Kerala. Traditionally *Scleropyrum* is important in different biological activities. Tribal communities in different region of entire world is benefiting from this medicinal plant. This study explains the anthelmintic activity of the root of the *Scleropyrum pentandrum*. The aqueous extract and alcoholic extract were tested for the anthelmintic activity and found marked beneficial activity. Further study is needed to isolate and elucidate its medicinally active components. Also, necessary studies can be done to evaluate each compound for its pharmacological identities as much study is not done with this plant.

### KEYWORDS

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

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### INTRODUCTION

*Scleropyrum pentnadrum* (Dennst.) Mabb (syn: *Scleropyrum wallichianum* Am.) belongs to the family *santalaceae*. The plant grows to a maximum height of 7 meters and is normally found on sandy soil and in semi to dry evergreen forests of the world. It is commonly called malayammachi and malayamkki Kozhikkode and Naikkuli in Kasargod of Kerala and mulkirayan in Tirunelveli of Tamilnadu<sup>1</sup>. The whole plant or parts are applied externally to treat skin irritation by Agasthyamalai biosphere reserve Kani tribal settlement in Tirunelveli South India<sup>2</sup>. The crushed roots are used for curing stomach ailments in Kurichyas tribal

community Northern Kerala, Kannur district<sup>3</sup>. Sapura Mohammed reported the contraceptive activity of *Scleropyrum pentandrum* in 2005. Decoction of boiled roots are used as a contraceptive by semalai people. It is believed that women will become barren after consuming the decoction. Sapura Mohammed also reported that the paste of stem bark and leaf is applied externally can treat skin diseases<sup>4</sup>. Wongsatit Chuakul *et al* reported (2002) the galactagogue activity of *Scleropyrum pentandrum* stem<sup>5</sup>. Gale *et al*, (2007) studied the cyclo oxygenase inhibiting, anti-malarial and anti TB activities of *Scleropyrum pentandrum*<sup>6</sup>. Anticaryogenic and cytotoxic activity of methanolic extract of *S. Pentandrum* leaves were reported by Venugopal *et al*, (2011)<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>.

Paniya, Kattunaika and Kuruma tribal community of Wynad district, Kerala, India uses fruits and seeds of *Scleropyrum pentandrum*. They call the plant as Kirinda<sup>9</sup>. Prasad SK and Raveendran K. gave its synonym 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 etc in the alcoholic extract of the leaf of plant *Scleropyrum pentandrum*. The anti-inflammatory activity and qualitative and quantitative microscopy studies also reported<sup>11,12</sup>. Extensive literature reviews revealed that much studies have not done with *Scleropyrum pentandrum* plant and much of the bioactivities of this plant remain unexplored.

Anthelmintic drugs are used to rid the body of worms (helminths). These agents may act locally to expel the gastrointestinal tract worms or work systemically to eradicate worms that are invading organs or tissues<sup>13</sup>. Shambaditya Go swami *et al* (2011) carried out the in vitro evaluation of the anthelmintic activity of *Hedychinum spichatum* rhizomes and *Zingiber zerumbet* rhizomes on the

*Pheritima posthuma* model. The procedure for the study is carried out according to Ghosh *et al* and (Albendazole) was used as standard drug<sup>14,15</sup>. Ravindra D. Bendgude *et al*. carried out the in vitro anthelmintic activity of roots of *Capparis zeylanica* Linn. Using *Pheretima posthuma* as test worms because of its anatomical and physiological resemblance with the intestinal round worm parasite of human beings<sup>16</sup>. *Baliospeemum montanum* Muell. Arg root's anthelmintic activity is done by R. G Mali and R. R. Wadekar<sup>17</sup>. The assay is as per the method of Ajaiyeoba *et al*. with some modifications<sup>18</sup>. Adult Indian earth worms, *Pheretima posthuma* and *Ascardia galli* worms are used for assay<sup>19,20</sup>. The anthelmintic activity of roots extracts of *Baliospermum montanum* as been confirmed by activity against the worms used in the study.

## MATERIAL AND METHODS

### Plant Materials

Roots of *Scleropyrum pentandrum* were collected from the 12 acre sacred groves of Poyilkavu Durga Devi temple situated at the coastal area of Calicut district, 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).

*Scleropyrum pentandrum* roots for anthelmintic activity study are collected in 2019 September last week.

### PREPARATION OF EXTRACTS

The fresh roots of *Scleropyrum pentandrum* were collected from the same location in a large scale. The collected roots were dried avoiding direct sun light to protect the metabolites of the leaf.

### ANTHELMINTIC ACTIVITY

#### Animals

Satish B. Kosalge and Ravindra A reported the in vitro anthelmintic activity of *Thespesia lampas* with adult earthworms (*Pheretima prosthuma*) and Roundworm (*Ascardia galli*). Earthworms were collected from the domestic land of south

Koduvally, Calicut. Average sized round worms of 4-7 cm were used for this protocol.

The round worms were obtained from intestine of freshly slaughtered chicken. Infested intestines of chicken were collected from nearby slaughter house of JDT Islam College of pharmacy, Calicut. These intestines were cleaned well with water to remove dirty particles. The average sized of round worms of 4-6 cm worms were kept in normal saline solution. Earthworms and round worms were identified with the help of veterinary practitioners to confirm the identity.

### DRUGS AND CHEMICALS

Kaushik R K *et al* reported the usage of piperazine citrate (Glaxo Smithkline)<sup>20</sup>. Test samples of the extract were prepared at the concentrations, 25mg/ml, and 50mg/ml in distilled water. Six worms of *Pheretima prosthuma*, 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 (50mg/ml) was used as reference standard and distilled water as control.

Mali R G *et al* carried out anthelmintic activity study on *Capparis edecidua*. This procedure is used to study anthelmintic activity with *Pheretima prosthuma*, and *Ascaridia galli*<sup>21</sup>. Freshly prepared test solutions and standard drug solution were used for the experiments. Observations were made on time taken for paralysis and death. Absence of movement when the worms were shaken vigorously is taken as the paralysis. Time for death of worms is considered when worms are immobile when they shaken vigorously and dipped in warm water of 50° C<sup>22</sup>.

The results were shown as in Table No.1 and 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

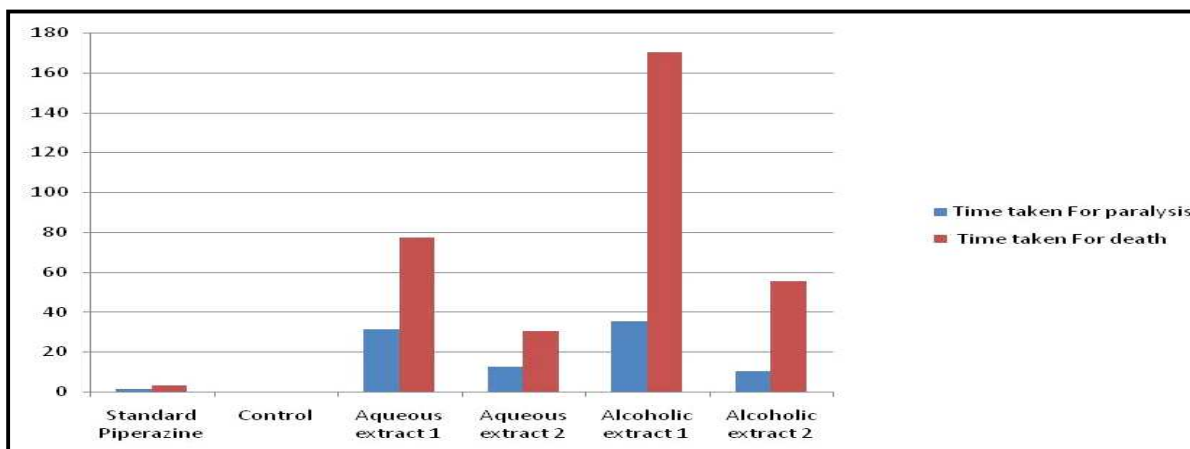
Extracts of 50mg/ml concentration showed a maximum anthelmintic activity in both alcoholic and aqueous extracts.

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

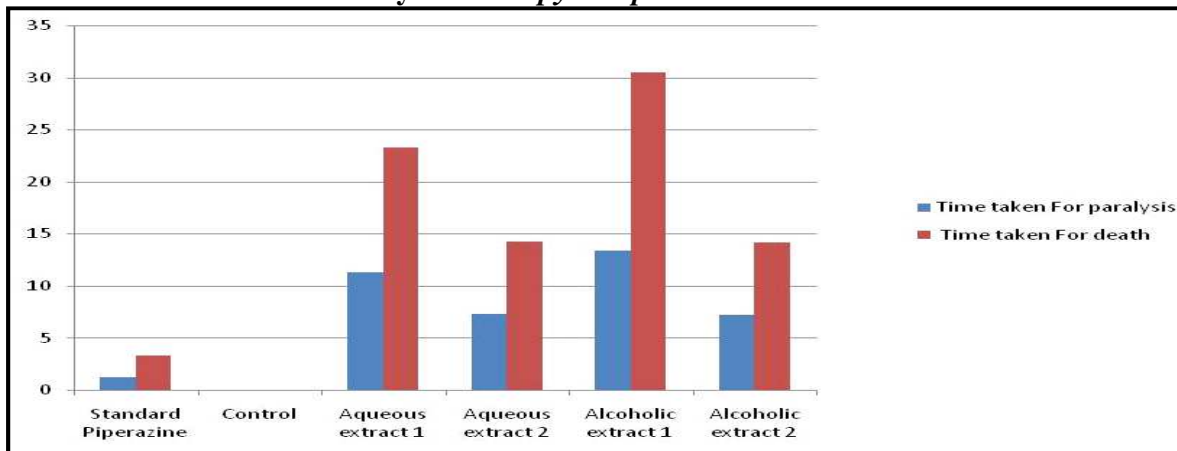
S.No	Treatment		Time taken in minutes	
			For paralysis	For death
1	Standard Piperazine	50mg/ml	1.40 ±.17	3.31 ±.21
2	Control	Distilled water	0	0
3	Aqueous extract	25mg/ml	31.12 ±.26	77.15 ±.29
4	Aqueous extract	50mg/ml	12.44 ±.20	30.16 ±.24
5	Alcoholic extract	25mg/ml	35.08 ±.27	170.10±.32
6	Alcoholic extract	50mg/ml	10.22 ±.17	55.52±.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	1.18±.12	3.32±.14
2	Control	Distilled water	0	0
3	Aqueous extract	25mg/ml	11.33±.18	23.25±.22
4	Aqueous extract	50mg/ml	7.33±.19	14.24±.21
5	Alcoholic extract	25mg/ml	13.35±.22	30.52±.26
6	Alcoholic extract	50mg/ml	7.24±.15	14.18±.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 extract of the drug at 50mg/ml concentration of *Sceropyrum pentantrum* is found to be more effective than the 25mg/ml of alcoholic and aqueous extracts. Both methods of anthelmintic activity evaluations were similar result giving. 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.

## BIBLIOGRAPHY

1. Ayyanar M and Ignachimuthu S. Traditional knowledge of Kani tribals in Kouthalai of Tirunelveli hills, Tamil Nadu, India, *Journal of Ethnopharmacology*, 102(2), 2005, 246-255.
2. Debritto A J and Mahesh R. Evolutionary medicine of Kani Tribal's Botanical Knowledge in Agasthyamalai Biosphere Reserve, South India, *Ethnobotanical Leaflets*, 11, 2007, 280-290.
3. Rajith N P and Ramachandran V S. Ethnomedines of Kurichyas, Kannur district, Western ghats, Kerala, *Indian Journal of natural products and resources*, 1(2), 2010, 249-253.
4. Sapura Mohammed. The ethnobotany of the semalai community at Tasek bera pahng,

- Malasya, *An ethnographic approach for resettlement*, 2005,100.
5. Wongsatit Chuakul, Promjit Saralamp and Ampol Boonpleng. Medicinal plants used in the Kutchum District, Yasothon Province, Thailand *Thai journal of phytopharmacy*, 9(1), 2002, 236.
  6. George Gale A. In search of cyclooxygenase inhibitors, anti-mycobacterium tuberculosis and antimalarial drugs from Thai flora and microbes, *Pharmacology and Therapeutics*, 115(3), 2007, 307-51.
  7. Venugopal T M, Swathi D, Suchithra Y, Prasanth Kekuda T R, Mallikarjun N, Soundarya S, Eyasu Ejeta and Raghavendra H L. Mineral composition, cytotoxic and anticaryogenic Activity of *Scleropyrum pentandrum* (Dennst) Mabb, *Int J Drug Dev and Research*, 3(4), 2011, 344-350.
  8. Disadee W. Unprecedented furan-2-carbonyl C-glycosides and phenolic diglycosides from *Scleropyrum pentandrum*, *Phytochemistry*, 74, 2012, 115-122.
  9. Sivadasan M, Narayanan M K R, Balakrishnan V, Anilkumar N. Wild edible plants used by the Kattunaikka, Paniya and Kuruma tribes of Wayanad District, Kerala, India, *Journal of Medicinal Plants Research*, 5(15), 2011, 3520-3529.
  10. Prasad S K and Raveendran K. Traditional plant Fencing and it's Conservatory nature in Kasargod District, Kerala, India, *Ethnobotanical Leaflets*, 14, 2010, 681-86.
  11. Ajithbabu T K, Ganesan V and Sajith P. Anatomical and Phytochemical Studies of *Scleropyrum pentandrum* (Dennst.) Mabb, *Asian journal of Phytomedicine and Clinical Research*, 1(1), 2013, 33-39.
  12. Ajithbabu T K, Ganesan V and Sajith P. Phytochemical constituents and anti-inflammatory activity of Leaf extracts of *Scleropyrum pentandrum* (dennst.) Mabb, *Int Journal of Research in Pharmaceutical and Nano Sciences*, 2(3), 2013, 262- 267.
  13. Leon Shargel. Comprehensive pharmacy review, *Harwal publishing*, 2<sup>nd</sup> Edition, 662.
  14. Ghosh T, Maily T K, Bose A and Dash G K. Anthelmintic activity of *Bacopa monierr*, *India J Nat prod*, 21, 2005, 16-9.
  15. Rastogi T, Bhutda V, Moon K, Aswar P B, Khadabadi A S. Comparative studies on anthelmintic activity of *Moringa oleifera* and *Vitex negundo*, *Asian J Res chemo*, 2(2), 2009, 181-182.
  16. Ravindra Bendgude D, Manish Kondavar S, Sandeep Patil B, Rupali Hirave H. *In vitro* anthelmintic activity of roots of *Capparis zeylanica*, *Linn Journal of Advanced Pharmacy Education and Reasearch*, 2, 2011, 154-158. ISSN 2249-3379.
  17. Mali R G and Wadekar R R. *In vitro* anthelmintic activity of *Baliospermum montanum* Muell Arg roots, *Ind Journal of Pharmaceutical Sciences*, 70(1), 2008, 131-133.
  18. Ajaiyeoba E O, onocha P A, olarenwaju O T. *In vitro* anthelmintic properties of *Buchholzia coriaceae* and *Gynandropsis gynandra* extract, *Pharm No*, 39(3), 2001, 217-20.
  19. Chatterjee K D. Parasitology, protozoology and Helminthology, *Calcutta; in Guha Ray Sree Saraswaty press Ltd*, 6<sup>th</sup> Edition, 1967.
  20. Kaushik R K, Katiyar J C, Sen A B. Studies on the mode of the action of anthelmintics with *Ascardia galli* as a test parasite, *India J med Res*, 62(9), 1974, 1367-75.
  21. Mali R G, Hundiwale J C, Sonawane R S, Patil R N, Hatapakki B C. Evaluation of *Capparis edecidua* for anthelmintic and antimicrobial activities, *Indian J Nat prod*, 20, 2004, 10-3.
  22. Mali R G, Shailaja Mahajan, Patil K S. Anthelmintic activity of roots barks of *Capparis spinosa*, *Indian J Nat prod*, 21, 2005, 50-1.

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