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ANTHELMENTIC STUDIES OF FLOWERS OF *SCLEROPYRUM PENTANDRUM* (DENNST) MABB

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ABSTRACT

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

KEYWORDS

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

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INTRODUCTON

Scleropyrum pentnadrum (Dennst) Mabb (syn*: Scleropyrum wallichianum* Am.) belongs to the family santalaceae. Ayyanar M and Ignachimuthu S reported in 2005 about the plant as it grows to a maximum height of 6 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 Tamilnadu[1]. Debritto A J and Mahesh R explained that the whole plant or parts are applied externally to treat skin irritation in Kani tribal settlement, *Agasthyamalai* biosphere reserve, Tinnenlveli South India[2]. Rajith N P and Ramachandran V S reported the use of crushed

roots *Scleropyrum wallichianum* as stomach ailments in *Kurichyas* tribal community in Kannur district, Kerala[3]. Sapura muhammed published the contraceptive activity of the roots. The root is boiled and the decoction is taken as a contraceptive by semalai people. It is believed that women will become barren after consuming the decoction. Sapura muhammed also reported the skin ailment property of paste of stem bark and leaf[4]. Wongsatit Chuakul et al published the galactagogue property of stem[5]. Gale *et al*, (2007) presented the cyclo oxygenase inhibiting, anti-malarial and anti TB 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].

Extensive literature reviews of *Scleropyrum pentandrum* revealed that much of the bioactivities of this plant remain unexplored.

Paniya, Kattunaika and Kuruma tribes of Wynad district, Kerala, India calls *Scleropyrum pentandrum* fruits and seeds as kirinda and is consumed as food[9]. It is also called irumulli. This is used as a mechanical barrier (fencing) in dried or live condition[10]. 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 leaf of *scleropyrum pentandrum.* The anti-inflammatory activity and qualitative and quantitative microscopy studies also reported[11,12].

Collection of flowers must always be made in fine, dry weather because petals which are damp when gathered become badly discoloured during drying. Flowers must be gathered at precisely the correct time and consequently the process of collection may extend over several days or in some cases weeks, so that the flowers maybe taken as they come to the proper condition upon the inflorescence[13]. Flowering tops of plants are collected just before they reach their flowering stage (maturity). Flowers are collected just before pollination or many time before their full expansion. They are collected in dry weather and preferably during morning hours[14]. Flowers are harvested by using a special device known as strippers[15]. The collection is usually made by picking or cutting the flowers by hand. The drying must be done carefully and rapidly, otherwise the colours are spoilt. The flowers and floral members contain volatile oil, upon which their pharmaceutical value depends so it dried at low temperature as possible[13]. It dried in shades so as to retain their colour and volatile oil content depending upon the type of chemical constituents. Natural drying, it may be either direct sun drying or in the shed[16].

Anthelmintics are used to rid the body of worms. These agents may act locally to rid the gastrointestinal tract of worms or work systematically to eradicate worms that are invading organs or tissues[17]. Sowjanya pulipati, Sreenivasulu T and Sreenivasababu P carried out a study of *in vitro* anthelmintic activity of *Ixora cochinea* L on *pheritima prosthuma* and observed a marked activity compared to standard albendazole drug. The study demonstrated that flowers of *Ixora coccinea* L. possess anthelmintic activity which is agreeing with folklore claims in treating several human ailments[18]. V. Rajamanickam *et al* carried out a study of anthelmintic activity of flower extract of *Couroupita guianensis* on *Pheritima phosthuma* and observed the activity compared to standard drug piperazine citrate. The activity was assessed by worm motility assay involved time of paralysis and death of worm[19]. P. L. Rajagopal, *et al* carried out a study of anthelmintic activity of flower of *Sesbania grandiflora* pers on *Pheretima prosthuma* and observed reasonable activity compared to standard drug albendazole. The flowers of *Sesbania grandiflora* used to treat intestinal worm infections. Three concentrations of extract are studied. In which the determination of time of paralysis and time of death of worms are concerned. As the dose increases the anthelmintic activity is also increased. The ethanolic extract of flower shows anthelmintic activity at high concentration[20]. Rafi Khan, *et al* carried out a study of *in vitro* anthelmintic activities of *Nerium olender* flower extract in Indian adult earth worm *Pheretima prosthuma* and observed the activity compared to standard drug albendazole.

Nerium oleander potentiate to paralyze earthworm and also caused its death after sometime. The studies demonstrate that Nerium olender is a point anthelmintic[21]. Zafar Iqbal, *et al* carried out a study of anthelmintic activity of *Calotropis provera* Ait. F flowers in sheeps. In vitro studies revealed anthelmintic effects of crude aqueous extract and crude methanolic extract of *Calotropis provera* flowers on live haemonchus contorts as evident for *in vivo* studies *Calotropis procera* flowers were administered as aqueous extract and methanolic extract to sheep naturally infected with mixed species of gastrointestinal nematodes. And finally it was found that *Calotropis procera* flowers possess good anthelmintic activity against nematodes[22].

EXPERIMENTAL

Plant Materials

Collection and extraction of flowers 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 and the herbarium is deposited at Botany department, Calicut University, Kerala (No: 107864). After collection, the flowers were air dried under shade at room temperature and grounded. The Soxhlet extracted drug was evaporated to dryness and used for the anthelmintic activity studies.

Preparation of Extracts

The fresh fully grown flowers of *Scleropyrum pentandrum* were collected from the same location in a large scale. The collected flowers were dried to avoid direct sun light to protect the metabolites of the flower. The dried flowers of *Scleropyrum pentandrum* is subjected to extraction with alcohol and water using soxhlet method. This extracts were used for the anthelmintic activity study.

Anthelmentic activity

Animals

Adult earthworms (*Pheretima prosthuma*) and Roundworm (*Ascaridia galli*) were used to carry out in vitro anthelmintic activity studies. Earthworms were collected from the watery paddy fields of Poyilkavu, near Chemanchery railway station, Calicut. The roundworms were obtained from intestine of freshly slaughtered chicken. Infested intestines of chicken were collected from the local slaughter house of Vellimadukunnu, Calicut. These were washed with normal saline solution to remove all dirty particles and kept in normal saline solution. The average size of earthworm was 4-7 cm. Average size of round worm was 4-6cm. Services of veterinary practitioners were utilized to confirm the identity of worms both *Pheretima posthuma,* and *Ascaridia galli.*

Drugs and chemicals

Piperazine citrate (Glaxo Smithkline) was used during the experimental protocol. Tests were prepared at the concentrations 25mg/ml, and 50 mg/ml of *Scleropyrum pentandrum* aqueous and alcoholic extracts 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 (50mg/ml) was used as reference standard and distilled water as control[23]. The same procedure was applied for both *Pheretima posthuma,* and *Ascaridia galli* worms. The freshly prepared test solutions and standard drug solution were used for this experiments. Observations were recorded for the time taken for paralysis and death. No movement of any type except when the worms were shaken vigorously is considered as the paralysis. Time taken for death was recorded by assuring that worms not moved when they shaken vigorously and dipped in warm water of 50º C. The results were shown as in Table No.1 and No.2[24].

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

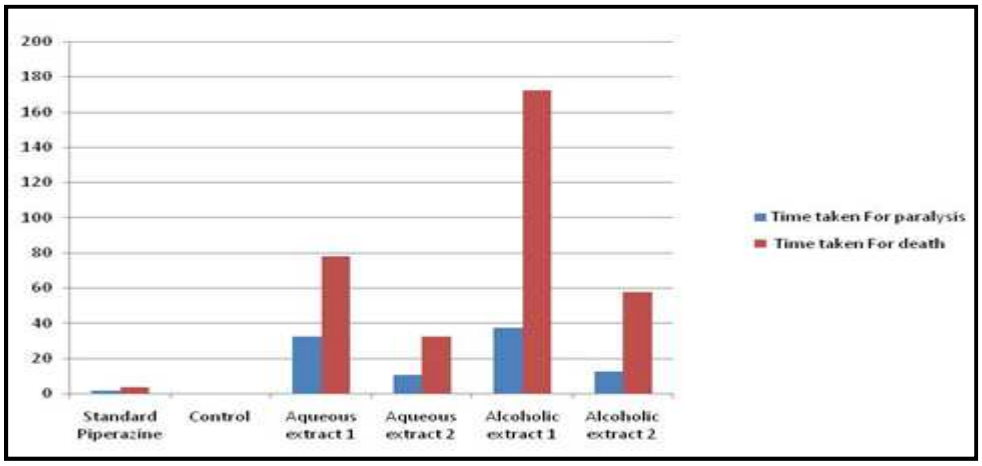
Aqueous extracts of 50mg/ml showed a maximum anthelmintic activity compared to the alcoholic extracts of either 25mg/ml or 50mg/ml concentrations.

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

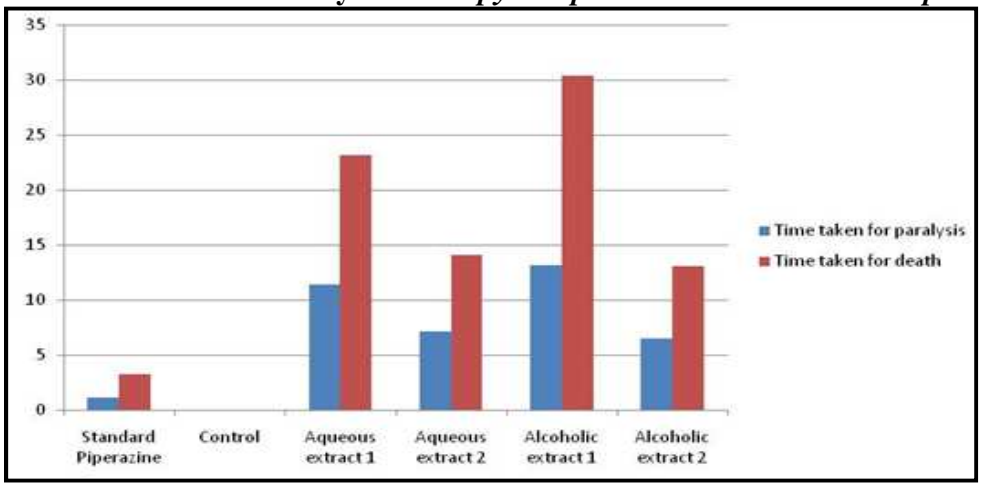
S.No	Treatment		Time taken in minutes	
			For paralysis	For death
1	Standard Piperazine	50mg/ml	1.43 ±.17	3.31 ±.21
2	Control	Distilled water	0	0
3	Aqueous extract	25mg/ml	32.12 ±.26	78.15 ±.29
4	Aqueous extract	50mg/ml	10.44 ±.20	32.16 ±.24
5	Alcoholic extract	25mg/ml	37.08 ±.27	172.10±.32
6	Alcoholic extract	50mg/ml	12.22 ±.17	57.52±.23

Table No.2: Anthelmentic activity of *Scleropyrum pentandrum* extract on *Ascaridiagalli*

S.No	Treatment		Time taken in minutes	
			For paralysis	For death
1	Standard Piperazine	50mg/ml	1.16±.12	3.32±.14
2	Control	Distilled water	0	0
3	Aqueous extract	25mg/ml	11.43±.18	23.15±.22
4	Aqueous extract	50mg/ml	7.23±.19	14.14±.21
5	Alcoholic extract	25mg/ml	13.25±.22	30.42±.26
6	Alcoholic extract	50mg/ml	6.54±.15	13.12±.19



Plot No.1: Anthelmintic activity of *Scleropyrum pentandrum* on *Pheritima prosthuma*



Plot No.2: Anthelmintic activity of *Scleropyrum pentandrum* on *Ascardia galli*

CONCLUSION

The aqueous extract of *Scleropyrum pentandrum* at 50mg/ml concentration is more potent than the alcoholic extracts. Both anthelmintic evaluations are promising with similar results. Further studies must be conducted to establish the anthelmintic activity of the flower extract by using different techniques and different standards. The isolation of chemical constituents responsible for the anthelmintic activity will result in further enhancement in the study.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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