Research Article **CODEN: IJRPJK** **ISSN: 2319 – 9563**

International Journal of Research in Pharmaceutical and Nano Sciences

Journal homepage: **www.ijrpns.com**

ANTIBACTERIAL ACTIVITY OF FRUITS OF *SCLEROPYRUM PENTANDRUM* [DENNST] MABB

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ABSTRACT

Scleropyrum pentandrum [Dennst] Mabb is a small tree which is commonly found in the Western Ghats of India and evergreen sacred grooves of Northern Kerala. It is also known as hard pear, grows in the sandy soil of divine forests of coastal Kerala, Peninsular India, Western Ghats, South and Central Sahyadris. *Scleropyrum pentandrum* is used for its biological activities by the tribal community of different regions of world. This study explains the anti-bacterial activity of fruits of *Scleropyrum pentandrum*. The methanolic extract of fruits was tested for the anti-bacterial activity. Literature review of this plant proved the necessity of scientific evaluation, as very less work has been done 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 activities.

KEYWORDS

Scleropyrum pentandrum, Anti-bacterial activity and Methanolic extract of fruits.

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INTRODUCTION

Scleropyrum pentandrum [Dennst.] Mabb is a small tree, from the family Santalaceae. The plant is normally found on the sandy soil as well as semi and dry ever green forests and grows upto a height of 6 - 7 meter. As per the Journal of Ethno pharmacology by Ayyanar M and Ignacimuthu S, the plant is commonly called Malayamukki in Kozhikod and Naikkuli in Kasaragod of Kerala and Mulkiryan in Tirunelveli of Tamilnadu[1]. The paste of whole plant parts are externally applied to treat skin diseases in Kani tribal settlement, Agasthyamalai biosphere reserve, Tirunelveli,

South India[2]. The roots were crushed and used for curing stomach ailments in Kurichya tribal community, Kannur district, Kerala[3]. Stem is used as galactogogue[4]. Paste of stem bark and leaf is externally used to treat skin diseases[5]. Apichartsuksamran *et al*, (2005), presented the anti mycobacterial activity of scleropyric acid isolated from the twigs of the plant[6]. The anti malarial and anti tubercular activities of *Scleropyrum pentandrum* was presented by George A Gale et al in 2007[7]. Venugopal T M *et al*, (2010) studied the anti cariogenic and cytotoxic activity of methanolic extract of leaves of *Scleropyrum pentandrum*[8]. Five unprecedented furan-2-carbonyl C-glycoside, scleropentasides and two phenolic diglycosides were isolated from leaves and twigs of *Scleropyrum pentandrum* by Tripetch Kanchanapoom *et al*, (2012)[9].

Fruits and seeds of *Scleropyrum pentandrum* also called Kirindas consumed by Kuruma, Paniya and Kattunaika tribes of Wayanad district, Kerala, India[10]. Ajith Babu T K *et al*, (2013) carried out the anatomical and phytochemical studies and reported the presence of carbohydrate, phenols, flavonoids, tannins, glycosides, sterols, terpenoids in alcoholic extract of plant *Scleropyrum pentandrum.* The qualitative and quantitative microscopy and anti inflammatory activity were also reported[11].

Fruits are collected depending upon the type of fruits used. They are collected fully grown either ripe or half ripe[12]. It collected normally when it contain highest amount of constituents and it should retain the quality and appearance even after drying[13]. Leaves, flowers and fruits should not be collected when covered with rain or dew. It is difficult to get the leaves, flowers and fruits free from other plant parts even with hand picking[14].

There is a very less literature review on *Scleropyrum pentandrum* as very less studies has been done.

MATERIAL AND METHODS

Plant materials

Collection of fruits of *Scleropyrum pentandrum* was done from the sacred groves of Poyilkavu Durga Devi Temple situated at the coastal areas of Kozhikod, Kearala. The plant material was identified by Dr. V S Anil Kumar, HOD Botany, Government college of Kasaragod, Kerala. After collection the samples were air dried at room temperature and grounded.

Preparation of extracts

The fresh fruits of *Scleropyrum pentandrum* were collected from the same location. The collected fruits were dried avoiding direct sun light to protect the metabolites. The dried and powdered fruits of *Scleropyrum pentandrum* was extracted by soxhlet method with alcohol. This extract were evaporated by using rotary evaporator and used for the anti bacterial activity study.

ANTI BACTERIAL ACTIVITY

Micro organisms

Gram positive bacteria (*Enterococcus faecalis* and *Staphylococcus aureus*) and gram negative bacteria (*Escherichia coli* and *Pseudomonas aeruginosa*) were used to evaluate antibacterial activity *in vitro*. The microorganisms were collected from the laboratories of different locations of Kerala. *Enterococcus faecalis* was collected from Bharat Laboratory, Kasaragod. *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Escherichia coli* were collected from Baba Diagnostic and Research Centre, Feroke, Calicut.

Drugs and Method

Ciprofloxacin was used during the experimental protocol. Test samples of the extracts were prepared in concentrations of 10 and 25mg/ml in DMSO. Ciprofloxacin (5mg/ml) was used as reference standard and DMSO as control. In this method nutrient agar is melted, cooled at 45°C and poured into a sterile petri plate. After solidification, the microorganisms were swabbed on the surface of the nutrient agar. After this holes about 9mm in diameter are cut in the medium with a sterile cork borer. The standard, control and extracts were poured into the holes using micro pipette. Incubated for 24 hours at 37± 2°C. The zone of inhibition gives an indication of the relative antibacterial

activities of the different plant extracts against bacteria[15].

Statistical analysis

From the statistical analysis, it was observed that the fruits are having a comparable activity as that of standard against all the pathogenic micro organisms.

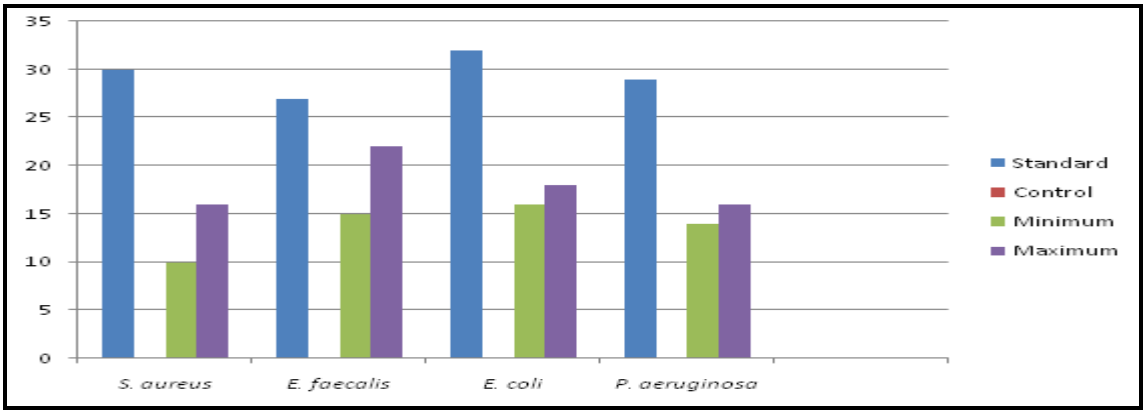
RESULTS AND DISCUSSION

Methanolic extract of 25mg/ml *Scleropyrum pentandrum* has shown maximum activity against *Enterococcus faecalis* followed by 25mg/ml of *Scleropyrum pentandrum* against *Escherichia coli.*

The results are shown in the Table No.1 and Table No.2

S.No	Drug used	Concentration	Diameter of zone of inhibition	
			S. aureus	***E. faecalis***
1	Standard	5mg/ml	30mm	27mm
2	Control	0	0	0
3	Methanolic extract of fruit	Min: 10mg/ml	10mm	18mm
		Max: 25mg/ml	16mm	22mm

S.No	Drug used	Concentration	Diameter of zone of inhibition	
			E. coli	***P. aeruginosa***
1	Standard	5mg/ml	32mm	29mm
2	Control	0	0	0
3	Methanolic extract of fruit	10mg/ml	16mm	14mm
		25mg/ml	18mm	16mm



Plot No.1: Anti bacterial activity of methanolic extract of fruits *S. Pentandrum* on pathogenic organisms

CONCLUSION

In the present investigation, the fruit was found to be possessing a very good activity. Further studies are required to exploit maximum valuable information regarding the *Scleropyrum pentandrum* in both phytochemical and pharmacological region.

ACKNOWLEDGEMENT

The authors wish to express their sincere gratitude to Department of Pharmaceutical Chemistry, Malik Deenar College of Pharmacy, Kasaragod, Kerala, India for providing necessary facilities to carry out this research work.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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Please cite this article in press as: Asmath Lubna C A *et al.* Antibacterial activity of fruits of *scleropyrum pentandrum* [Dennst] MABB, *International Journal of Research in Pharmaceutical and Nano Sciences,* 8(6), 2019, 287-290.