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ANTIBACTERIAL ACTIVITY OF TOPICAL SIDDHA MEDICINE *SIRATTAI THYLAM* AGAINST SELECTED HUMAN PATHOGENS

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ABSTRACT

Siddha system of medicine is the main traditional medicine which is very popular in south India. In this system herbals are mainly used for the medicine preparation and to treat the diseases. Each and every part of the herbs can be used for various,multiple ailments because of their different phyto constituents. In Siddha , medicines has been classified into *Aga marunthu* (internal) and *Pura marunthu* (external) having 32 forms of medicines in each. The external remedies are very useful for topical ulcers, skin diseases like eczema, psoriasis and fungal infections. An attempt has been made to evaluate the *In vitro* antibacterial activity of special siddha medicine *sirattai thylam* which is prepared from the shells of coconut. This oil has been widely used for all types of skin diseases especially for fungal infection as topical application. *In vitro* antibacterial activity was tested by cup-plate method against the major infection causing pathogens Staphylococcus aureus, B - Haemolytic Streptococci, Streptococcus pyogenes, Escherichia coli, Proteus specious, Salmonella Typhi, Salmonella Paratyphi, Klebseilla pneumoniae, and Pseudomonas aeruginosa. The result has been evaluated as the diameter of the inhibition zone of microbial growth showed that the *sirattai thylam* was more active against both gram positive and gram negative bacteria. Finally this study concluded that the *sirattai thylam* can be used as an anti bacterial agent.

KEYWORDS: Siddha medicine, Sirattai thylam, antibacterial, cup-plate method.

INTRODUCTION

An antimicrobial is an agent that kills microorganisms or inhibits their growth.[1] Antimicrobial medicines can be grouped according to the microorganisms they act primarily

against. For example, antibacterials (commonly known as antibiotics) are used against bacteria and antifungal are used against fungi. Use of substances with antimicrobial properties is known to have been common practice for at least 2000 years.

Long before mankind discovered the existence of microbes, the idea that certain plants had healing potential, indeed, that they contained what we would currently characterize as antimicrobial principles, was well accepted. Since antiquity, man has used plants to treat common infectious diseases and some of these traditional medicines are still included as part of the habitual treatment of various diseases.

Plants have been used as folk remedies. For centuries, the ethno-botanical literature has described the usage of plant extracts, infusions and powders for diseases now known to be of viral origin. The ethno pharmacology provides an alternative approach for the discovery of antimicrobial agents, namely the study of medicinal plants with a history of traditional use as a potential source of substances with significant pharmacological and biological activities.[2] Herbal preparations are more frequently used to prevent and treat several diseases in world. In developing countries, the World Health Organization (WHO) estimates that about 80% of the population relies on plant based preparations used in their traditional medicinal system and as the basic needs for human primary health care.[3] In recent years, there is a need to study the plants having different values in their medicinal properties. Therefore, several medicinal plants have been evaluated for possible an antimicrobial activity and potential cure from a variety of ailments especially of microbial origin.[4, 5]

The traditional methods, especially the use of medicinal plants, still play a vital role to cover the basic health needs in the developing countries too and moreover the use of herbal remedies have increased in the developed countries in the last decades. In this connection, plants continue to be a rich source of therapeutic agents.[6] In the recent years, infections have increased to a great extent and resistant against antibiotics, become an ever increasing therapeutic problem. Due to the indiscriminate application of antibacterial drugs most of the microbial organisms have developed high resistance to a good number of the commercial antibiotics. This coupled with other problems like the dangerous side effects of some commercial antibiotic drugs have led the scientists to think of other alternatives like new antimicrobial substitutions from other sources especially medicinal plants.[7, 8, 9] Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources; many of these isolations were based

on the uses of the agents in traditional medicine. This plant-based, traditional medicine system continues to play an essential role in health care, with about 80% of the world's inhabitants relying mainly on traditional medicines for their primary health care.[10,11] According to the World Health Organization, medicinal plants would be the best source to obtain a variety of drugs. Therefore, such plants should be investigated to obtain a thorough knowledge about their properties, safety and efficacy.[12] There is a renewed interest in traditional medicine and an increasing demand for more drugs from plant sources. The presence of antimicrobial substances in the higher plants is well established fact and they provided a source of inspiration for novel drug compounds as plants derived medicines have made significant contribution towards human health. Such a novel drug has been used in *Siddha system* of medicine for a long time is *Sirattai Thylam*[13] (oil taken from the shell of coconut) which is indicated for taenia infection[14] has been evaluated for its antimicrobial activity.

MATERIALS AND METHODS

Sirattai Thylam Preparation

The *sirattai thylam* has been prepared as per the literature reference by *Kuzhi Pudam* method in *kuzhi thyla karuvi* (which is a special traditional instrument made up of mud pot having minute holes in the bottom). The shells of coconut are kept inside the mud pot and closed with a suitable mud lid and finally sealed with clay paste over the lid. A small vessel is placed under the mud pot to collect the oil extracted from the shell. This unit is placed in a pit and then burnt with 30 numbers of *varatti* (cow dung cake). While burning, the oil will ooze out from the mud pot and extracted in the vessel (Fig-1). This process may take 4 hours approximately and oil can be taken. This extracted oil is called as *Sirattai thylam*.

Anti bacterial activity

The *in-vitro* antibacterial activity of *Sirattai thylam* was performed by using the Cup-plate method.[15] The required number of Muller hinton agar plates were prepared and swabbed with different isolates of lag phase cultures of test organisms. The plates were allowed to stand for few minutes. Required numbers of 6 mm diameter wells were made over the plates at an equidistant position. Wells were loaded with 50 µl of the drug at the concentration of 62.5, 125, 250, 500, and 1000 mg / ml. Dimethyl sulfoxide (DMSO) was used as the solvent.[16] The bacterial plates were kept at 37 $^{\circ}$C for 18 – 24 hours. The zone of inhibition was measured using the calipers.

RESULTS

The results of antibacterial activities of S*irattai thylam* showed concentration dependent activity against tested microorganisms (Table - 1). The different concentration of *sirattai thylam* (62.5, 125, 250, 500, and 1000 mg/ml) were tested against gram positive and gram negative bacterial strains. The higher concentration of *sirattai thylam* had inhibitory effects towards the bacterial strains namely Escherichia coli, Staphylococcus aureus, Salmonella Paratyphi, Klebseilla pneumonia , and Streptococcus pyogenes.

Table: 1 Antimicrobial activity of *Sirattai Thylam*.

S. No.	Organism	Zone diameter in mm / Concentration of the drug				
		1000µl/ml	500 µl/ml	250 µl/ml	125 µl/ml	62.5 µl/ml
1.	*Staphylococcus aureus*	26	24	18	15	11
2.	*B-Haemolytic Streptococci*	21	20	16	14	Nil
3.	*Streptococcus pyogenes*	22	12	Nil	Nil	Nil
4.	*Escherichia coli* NCIM 2931	28	19	15	13	10
5.	*Escherichia coli* ATCC 25922	26	16	12	9	Nil
6.	*Proteus Spp.*	29	22	19	16	9
7.	*Salmonella Typhi*	13	9	Nil	Nil	Nil
8.	*SalmonellaParatyphi*	25	20	18	Nil	Nil
9.	*Klebseilla spp.*	22	17	12	Nil	Nil
10.	*Klebseilla pneumoniae*	23	18	15	12	11
11.	*Pseudomonas aeruginosa* NCIM 2945	24	22	20	14	7

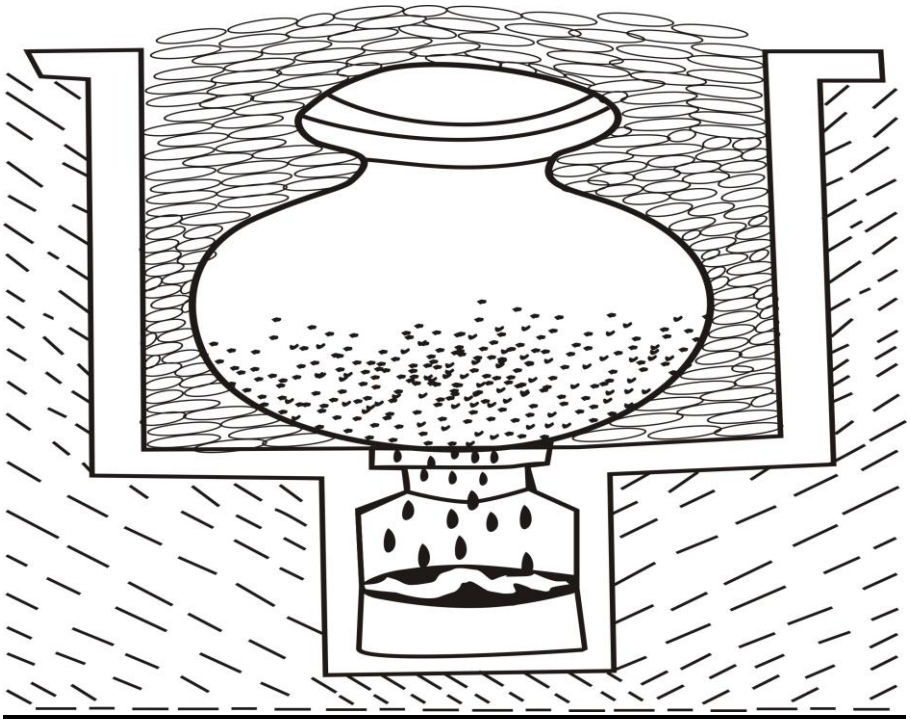
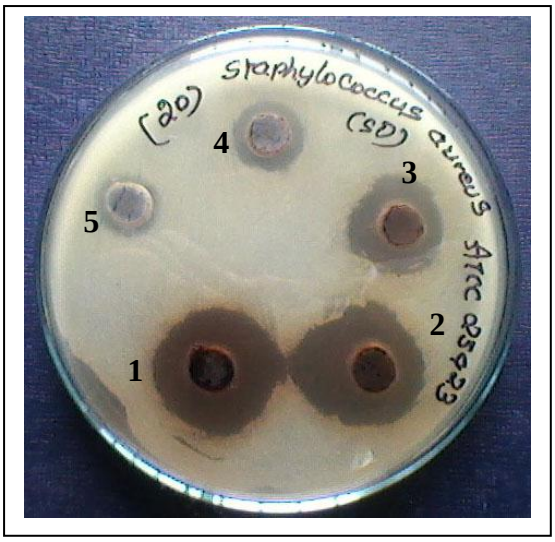
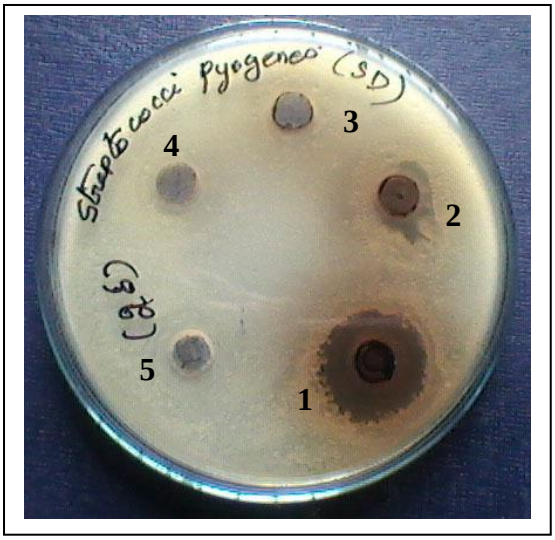
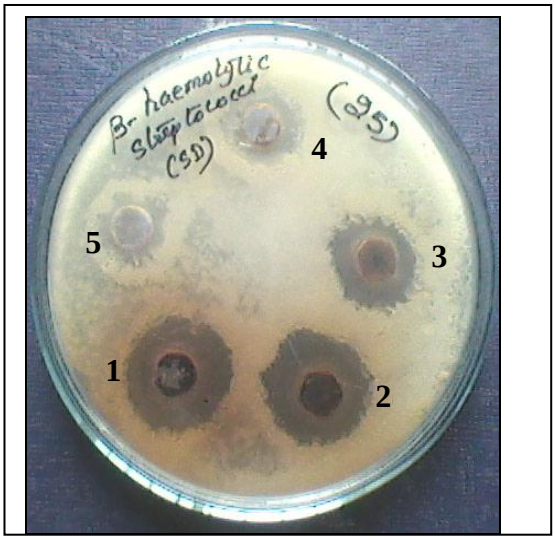


Figure: 1: *Sirttai Thylam Preparation- Kuzhi pudam* method


Proteus spp.
(SD)
5
4
1
3
2


(20)
Staphylococcus aureus
(SD)
4
3
5
2
1


Streptococci Pyogenes
(SD)
3
4
2
(18)
5
1


(25)
B. haemolytic
Streptococci
(SD)
4
5
3
1
2


Salmonella Paratyphi
(SD)
4
5
3
(16)
1
2


Salmonella Typhi
(SD)
4
5
3
(17)
1
2

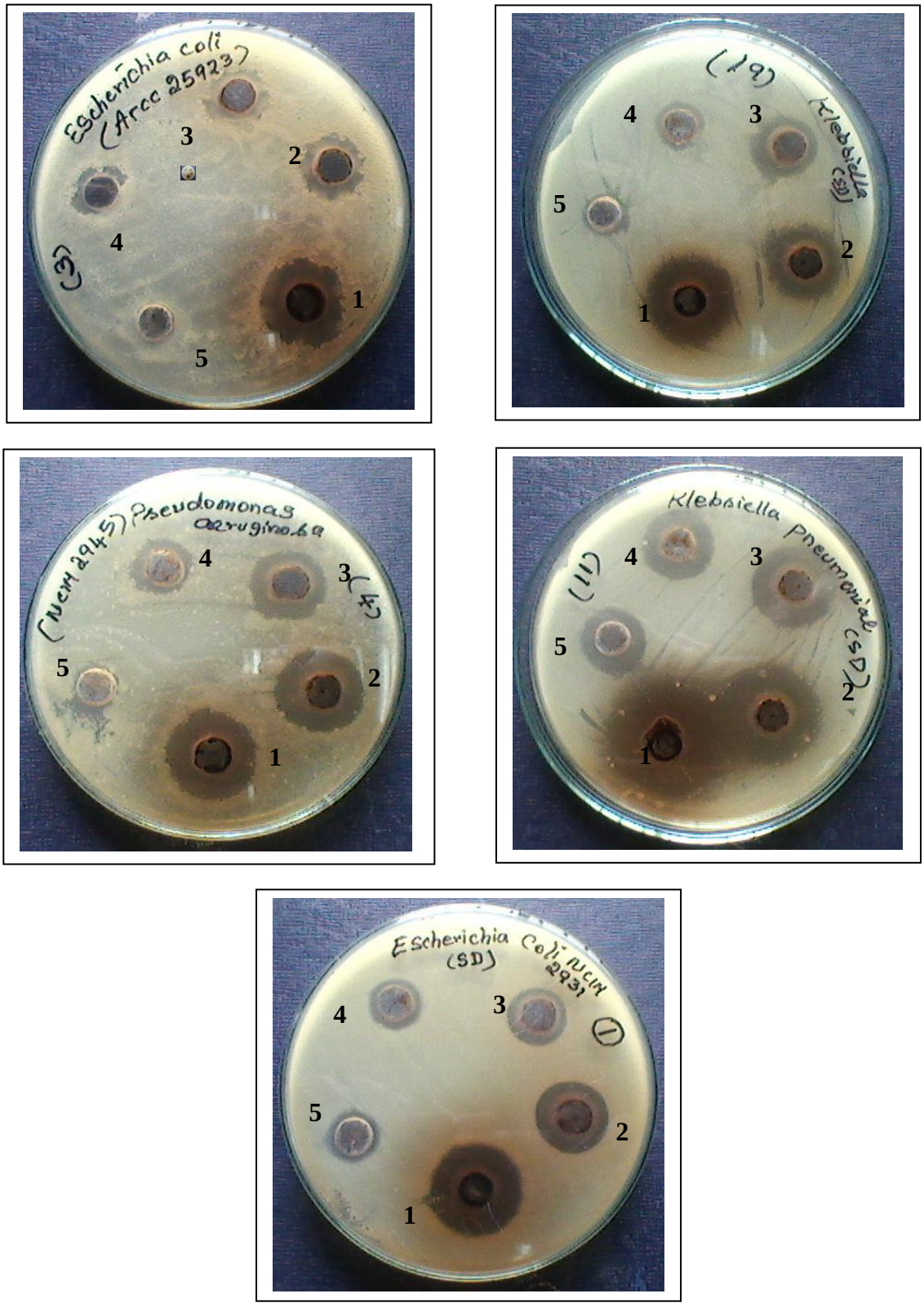


Figure: 2: Antibacterial activity of *sirattai thylam*

DISCUSSION

The *sirattai thylam* is one of the special traditional herbal formulations in siddha system of medicine which is very effective for all kinds of skin disorders. The antibacterial activities of

sirattai thylam were tested against bacterial strains. The results showed promising antibacterial activity against the bacteria tested (Fig-2). The highest zone of inhibition against Staphylococcus aureus is 26mm, B-Haemolytic Streptococci is 21mm, Streptococcus pyogenes is 22mm, Escherichia coli (NCIM2931) is 28mm, Escherichia coli (ATCC25922) is 26mm, Proteus spp. is 29mm, Salmonella Typhi is 13mm, Salmonella Paratyphi is 25mm, Klebseilla spp. is 22mm, Klebseilla pneumoniae is 23mm, and Pseudomonas aeruginosa is 24mm. This effect was concentration dependent.

CONCLUSION

The good antibacterial activity of *sirattai thylam* against Staphylococcus aureus, etc is an indication that the *sirattai thylam* is beneficial as a cure for skin diseases. The inhibiting nature of *sirattai thylam* reveals that the simple process and single ingredient provides a significant effect against the gram positive and negative bacteria.

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REFERENCES

1. Anti microbial- Definition from the Merriam – Webster online Dictionary.
2. Ambasta SP(Ed). The useful plants of India. Publications and Information Directorate 1992; CSIR, New Delhi, India.
3. WHO, General guidelines for methodologies on research and evaluation of traditional medicine. 2000; HO/EDM/TRM/2000. I. Geneva P.74.
4. Dada JD, Alade PI, Ahmad AA, Yadock LH. Antimicrobial activities of some medicinal plants from Soba-Zaria, Nigeria. Nig Qt J Hosp Med., 2002; 2: 55-56.
5. Chandrasekaran M,Venkatesalu V. Antimicrobial and antifungal activity of Syzygium jambolanum seeds. J Ethnopharmacol., 2004; 91: 105-108.
6. Kianbakht S. Jahaniani F. Evaluation of antibacterial activity of Tribulus terrestris L. growing in Iran. Iran J Pharmacol Therapeut., 2003; 2: 22-24.
7. Kadar G, Nikkon F, Rashid MA, Yeasmin T. Antimicrobial activities of the rhizome extract of Zingiber zerumbet Linn. Asian Pacific Journal of Tropical Medicine., 2011; 409- 412.
8. Solanki R. Some medicinal plants with antibacterial activity,International Journal of Comprehensive Pharmacy., 2010; 4: 10.

9. Sumathi P, Parvathi A. Antimicrobial activity of some medicinal plants. J Med Plant Research., 2010; 4: 316-321.
10. Viji M, Murugesan S. Phytochemical analysis and antibacterial activity of medicinal plant Cardiospermum halicacabum Linn. Pytopharmacol., 2010; 2: 68-77.
11. Rasdi NHM, Samah OA, Sule A, Ahmed QU. Antimicrobial studies of Cosmos caudatus Kunth(Compositae). Journal of Medicinal Plant Research., 2010; 4: 669-673.
12. Hassan A, Rahman S, Deeba F, Mahmud S. Antimicrobial activity of some plant extracts having hepatoprotective effects. Journal of Medicinal Plant Research., 2009; 3: 020-023.
13. R.Thiyagarajan; Gunapadam Thaathu Jeeva Vakuppu, Published by Directorate of Indian Medicine & Homeopathy, Chennai, 2004; 40.
14. R.Thiyagarajan; Siddha Maruthuvam Sirappu, Published by Directorate of Indian Medicine & Homeopathy, Chennai, 2008; 267.
15. Anonymous, 1996. Indian Pharmacopoeia, Microbiological assay and tests, P.P A-100-106.
16. Divakar, C.M and Nair, G.R.N., Antiulcer, Antibacterial and Spermicidal activities of Salanin. Indian Drugs, 2001; 38(2): 629-932.