

## Antimicrobial Activity of Padigalinga Chenduram against Enteric Pathogens

V.C. Jiji Mol\*, S.Vasanth, P. Shanmugapriya, R.Madhavan, S.Murugesan, V.Manjari, M. Murugesan  
 Department of Nanjunool,  
 National institute of Siddha,  
 Chennai, Tamil Nadu, India  
 drjijivijay@gmail.com

### ABSTRACT

Siddha system of Medicine is a traditional system of Medicine with a pharmacopeia base of natural resources –herbs, minerals, metallic salts and animal products. Herbo -mineral compounds offer advantages over plant drugs by virtue of their long shelf life, lower dosage, easy storability, and sustained availability as it contain minerals and metals as integral part of the formulations. Siddha system emphasizes aetiology and management of various diseases affecting mankind. Kirahaninnoi (chronic diarrhoea) caused by kirumi (microbes) is one among them. Padigalinga chenduram, a herbo-mineral Siddha medicine is mentioned in our Siddha literature is indicated for Seetha bedhi(mucus diarrhoea), Raththa bedhi (dysenteric diarrhoea), Kazhichal suram(fever accompanying diarrhoea) specifically. Kirahani is characterized by acute diarrhoea, gripping abdominal pain and uncomfortable desire to empty the bowel, accompanied by dehydration, weight loss and rise in temperature. In this study, Padigalinga Chenduram was investigated for antibacterial potential against enteric pathogens like Escherichia coli, Salmonella typhi by Agar well diffusion method. The study implies that the herbo mineral compound may be useful as an alternative in the treatment of enteric pathogens. Further research in my topic of interest will be the detection of the compounds responsible for the observed antimicrobial activity.

**Keywords:** Siddha, antimicrobial, Herbo-mineral, Padigalinga chenduram

### INTRODUCTION

Siddha system is one of the traditional system of medicine practiced in southern peninsular of Tamil Nadu. It is a nectar to south people and foremost of all system of medicine. Siddha formulations are mainly based on 3 resources namely –Thathu (metals and minerals), Thavara (plant products), Sangama (living things) porutkal. Siddha system emphasizes aetiology and management of various diseases affecting mankind. Kirahaninnoi (chronic diarrhoea) caused by Kirumi (microbes) is one among them<sup>[1]</sup>. Padigalinga chenduram is one those kind of medicine clinically indicated for mucus

diarrhoea (Seethabethi), dysenteric diarrhoea (Ratthabethi), diarrhoea with fever (kzhichalsuram) and menorrhagia (Perumbadu) also<sup>[2]</sup>.

At present there is no available works regarding the antimicrobial property of this herbo-mineral drugs against enteric pathogens. It will be useful in treatment of diseases caused by antibiotic resistant strains. We are in siddha field, should have the responsibility to work on these medicines and convey it to scientific people. In this scenario author outlines the scientific rationale and the antimicrobial activity of the above mentioned herbo mineral

formulation<sup>[3]</sup>. Therefore my topic of interest regarding this study was the detection of antimicrobial potential of test drug against enteric pathogens like *Escherichia coli* and *Salmonella typhi*<sup>[5]</sup>.

## MATERIALS AND METHOD

Antibacterial assay of test drug done through the method of Agar well diffusion method<sup>[6]</sup>.

### Test drug

The test drug Padigalinga chendurm was procured from IMPCOPS was used in the present study. The test drug contain ingredients such as Lingam (Red sulphide of mercury), padikaram (alumen - alum), kadukkai poo (*Terminalia chebula* gall) and kataththi poo (*Woodfordia fruticosa*)<sup>[4]</sup>.

Stock solutions of various concentration of siddha drug, Padigalinga chenduram were prepared by dissolving them separately. The test drug dissolved by vortexing with 10 ml of distilled water. Three stock concentrations were prepared accordingly 50µg/µl, 100µg/µl, 150µg/µl<sup>[7]</sup>

### Test microorganisms:

Microorganisms used in this study were procured from the laboratory stock of AU -KBC. Bacteria used were *salmonella typhi* (MTCC443), *Escherichia coli* (MTCC733)<sup>[8,9]</sup>

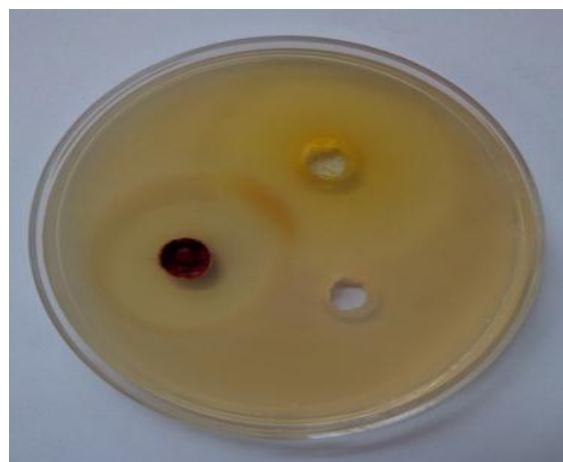
### Methodology

24 hrs culture of microorganism were grown in nutrient broth (HI medium). The medium was sterilized through autoclaving under the pressure of 121°C for 15 to 20 minutes. Then nutrient medium was poured to the plates with aseptic conditions inside the LAF. Then strains (*Escherichia coli* MTCC 733, *salmonella typhi* MTCC443) are swabbed to the plates which contain nutrient medium. Then samples and

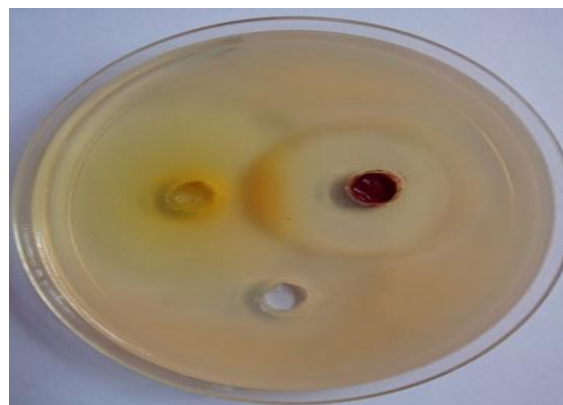
standard according to the concentration as mentioned previously were added to the wells. Distilled water used as Blank. Tetracycline was used as reference control. Diameter of Zone of inhibition in mm measured after 24hrs incubation and compared with reference control Tetracycline-250µg/µl was used as a control<sup>[6][10]</sup>. The tests were performed in triplicate.

## RESULTS

Anti bacterial activity against *Escherichia coli* (MTCC 733)



Antibacterial activity against *Salmonella typhi* (MTCC443)



Name of the microbial strain	Inhibition value after treatment with padigalinga chenduram and incubation at 37°c for 24 hrs		
	Zone of Inhibition in mm		
	50µg/µl	100µg/µl	150µg/µl
Escherichia coli(MTCC 733)	20	21	22
Salmonella typhi( MTCC443)	19	20	21

Zone of Inhibition in mm for Tetracycline against both strains - 22mm

Dilution Concentration of standard- 250µg/µl

Mean and standard error of inhibition zone of test drug against Escherichia coli (MTCC733) is 21±0.3

Mean and standard error of inhibition zone of test drug against Salmonella typhi ( MTCC443) is 20±0.3

#### DISCUSSION

Different dosages of test drug against microorganisms showed increasing inhibitory effect with incremental dosages. There was not much variation among different dosages of test drug on enteric pathogens Escherichia coli (MTCC 733), Salmonella typhi ( MTCC443).The test drug exerted equivalent inhibitory effect as that of Tetracycline with lesser dosage that is at 150 µg/µl of test drug compared with 250 µg/µl of Tetracycline. This result indicates that the test drug Padigalinga chenduram is efficacious against enteric pathogens Escherichia coli (MTCC 733) and Salmonella typhi ( MTCC443) as compared to synthetically manufactured drug(Tetracycline).The inhibitory

effect on the organisms is found to be statistically significant. The test drug shows significantly equivalent inhibitory effect as that of control drug even in lesser dosage and then that of any other Siddha drugs. Thus the drug can be used as a safe alternative to Tetracycline in treating the disease caused by enteric pathogens.

#### CONCLUSION

The development of resistance against the presently available antibiotics arises the necessity of rediscovery of new antibacterial agents in traditional systems of medicines. The findings reveal that, Siddha herbo-mineral drug - Padigalinga chenduram have antimicrobial potency against enteric bacterial pathogens and they can be used in the treatment of infectious diseases pertaining to Gastro intestinal tract. The data obtained in these studies justify and support the usage of this drug in case of diarrhoea and dysentery. Further research in my topic of interest will be the detection of the compounds responsible for the observed antibacterial activity.

#### ACKNOWLEDGEMENT

I express my profound sense of thankfulness to Mr. M. Subramanian MSC PGDHA for his valuable Guidance and encouragement.

#### ↓ REFERENCES

- 1) Shanmuga velu. SiddhaMaruthuva Noinadal NoiMudhalNadal thirattu . Indian medicine and Homeopathy department, 2003; volume1 :355-356
- 2) Dr.Kuppuswami mudhaliyar HPIM, Siddha Maruthuvam Pothu, Indian medicine and homeopathy department, 2007; volume1:412-413
- 3) Dr.Thiyagarajan. Gunapadam –Thathu JeevaVaguppu. Indian medicine and homeopathy department, 2009; volume 2 :279-280

- 4) Anonymous. Formulary of Siddha medicine – IMCOPS, 27
- 5) Dr.Prof.C.P.Baveja. Text book of Microbiology. Arya publications, 2000;588-589
- 6) Bhattacharya SK. An evaluation of current cholera treatment. National Institute of Cholera and Enteric Diseases, 2003; 141–6.
- 7) U.S.Pathi, N.B.kurdae. 31 antibacterial screening methods for Evaluation of Natural Products, hillagric.ac.in.
- 8) Shankara..etal. In vitro antibacterial activity of leaf gall extract of Terminalia chebula against human pathogens. International current pharmaceutical journal, 2012 ;212-217
- 9) Kumaraswamy.etal.Antibacterial potential of extract of Woodfordia fruticosa kurz on human pathogens, World Journal of medical science, 1998 ;96-97
- 10) Muhammad Amin 1, Farooq Anwar etal, Anti helicobacter pylori and inhibition activities of some traditional plants, Molecules, 2013:vol-18 issue2 ;2135