



## Antimicrobial activity of Siddha poly herbal formulation Elapodi

**Dr S Jeeva<sup>\*1</sup>, Dr S Sakthikala<sup>2</sup>, Dr B Anbarasan<sup>3</sup>, Dr S K Sasi<sup>4</sup>**

<sup>1,2</sup>PG Scholar, Post Graduate Dept of Noi Naadal, Govt. Siddha Medical College, Chennai

<sup>3</sup>Consultant, Dr Jay's Ayush Hospital, Chennai

<sup>4</sup>Associate Professor, Post Graduate Dept of Noi Naadal, Govt Siddha Medical College, Chennai

\*Corresponding author: [jeeva2710@gmail.com](mailto:jeeva2710@gmail.com)

### Abstract

Our world is blessed with numerous herbs, in which some of them have medicinal values. Medicinal herbs are being used by traditional medicinal systems in various parts of the world since ancient past. One such traditional system flourishing in South India is Siddha System of medicine, which insists treating with medicinal plants is the first priority. *Elapodi*, a poly herbal formulation was evaluated for its Anti-microbial action against four bacterial species namely, *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Streptococcus mutants*. Maximum zone of inhibition was observed against *P. aeruginosa* followed by *E. coli*, *S. mutants* and *S. aureus* respectively. No zone of inhibition was observed against *S. aureus*.

**Keywords:** Ela podi, Antimicrobial, zone of inhibition

### Introduction

Microbes are everywhere in our world from high peaks to deep oceans and some of them are harmful to humans. Screening of antimicrobial activity on medicinal herbs is important to develop herbal based drugs against pathogenic organisms. In this way, Anti-microbial action of a poly herbal Siddha formulation *Elapodi*, against four bacterial species namely, *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Streptococcus mutants* was evaluated.

*Staphylococcus aureus* causes various skin lesions such as abscesses and carbuncles, and other infections such as osteomyelitis, pyoderma, pneumonia, endocarditis, septicaemia, food poisoning, toxic shock syndrome and staphylococcal scalded skin syndrome. *Streptococcus mutans* is an alpha haemolytic streptococcus which is commonly present in the mouth, from where it can spread to cause dental caries or endocarditis. *E. coli* is gram negative bacillus, which causes diarrhoea, dysentery, urinary tract infection, meningitis and respiratory tract infection. *Pseudomonas aeruginosa* is a gram negative bacillus, which can cause opportunistic infections of the lung and nosocomial infections. (Arti Kapil, 2013)

Agar well diffusion method was used for the study. Streptomycin was used as standard. Streptomycin belongs to the class of medicines known as aminoglycoside antibiotics. It works by inhibiting protein synthesis (Padmajaudaykumar, 2013)

## Materials and Methods

### Details regarding the sample

The drug *Ela podi* is mentioned in Siddha text book *Gunapadam Part I* indicated for cough and stomach ache (Murugesamudaliyar K S, 1936).

### Drug collection and authentication

All the ingredients of the drug are bought in Ramasamychetty country drug shop, Broadway, Chennai and authenticated at Department of Botany, Govt. Siddha Medical College, Chennai.

**Table 1: Ingredients of Ela podi**

Botanical name	Family	Vernacular name (Tamil)	Parts used
<i>Elettaria cardamomum</i>	Zingiberaceae	Elarisi	Seed
<i>Glycyrrhiza glabra</i>	Fabaceae	Adhimathuram	Root
<i>Embilica officinalis</i>	Phyllanthaceae	Nellivattal	Dried fruit
<i>Santalum album</i>	Santalaceae	Santhanam	Wood
<i>Piper cubeba</i>	Piperaceae	Vaal milagu	Seed

### Details Regarding Experiment

#### Agar- Well Diffusion Method

Muller Hinton Agar Medium (1 L) The medium was prepared by dissolving 33.8 g of the commercially available Muller Hinton Agar Medium (MHI Agar Media) in 1000ml of distilled water. The dissolved medium was autoclaved at 15 lbs pressure at 121°C for 15 minutes. The autoclaved medium was mixed well and poured onto 100mm petriplates (25-30ml/plate) while still molten.

One litre of nutrient broth was prepared by dissolving 13 g of commercially available nutrient medium (HI Media) in 1000ml distilled water and boiled to dissolve the medium completely. The medium was dispensed as desired and sterilized by autoclaving at 15 lbs pressure (121°C) for 15 minutes.

Petriplates containing 20ml Muller Hinton Agar Medium were seeded with bacterial culture of *E. coli*, *Pseudomonas aeruginosa*, *Streptococcus mutans* and *Staphylococcus aureus* (growth of culture adjusted according to McFards Standard, 0.5%). Wells of approximately 10mm was bored using a well cutter and different concentrations of sample such as 250µg/mL, 500µg/mL, 1000µg/mL were added. The plates were then incubated at 37°C for 24 hours. The antibacterial activity was assayed by measuring the diameter of the inhibition zone formed around the well (NCCLS, 1993). Streptomycin was used as a positive control.

### Results and Discussion

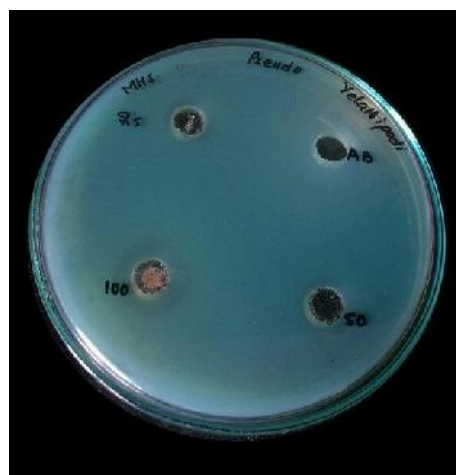
The antibacterial activity of *Ela podi* was evaluated *in vitro* against four bacterial species (*Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Streptococcus mutants*).

**Table 2. Antibacterial effect of Elapodi**

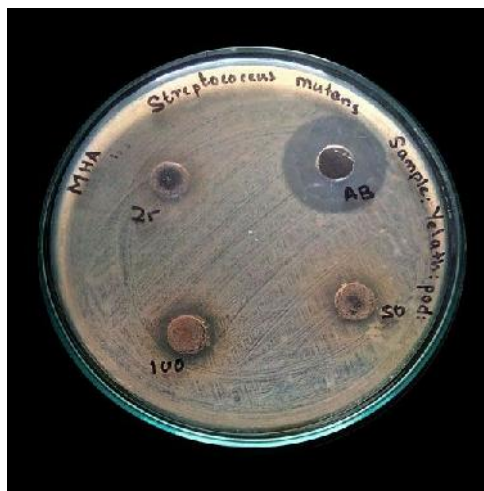
Organism	Standard drug	Zone of inhibition in mm		
		250 µg/mL	500 µg/mL	1000 µg/mL
<i>Escherichia coli</i>	30	10	12	15
<i>Pseudomonas aeruginosa</i>	24	11	13	16
<i>Staphylococcus aureus</i>	25	-	10	11
<i>Streptococcus mutans</i>	26	12	13	15



**Figure 2. *Escherichia coli***



**Figure 1. *Pseudomonas aeruginosa***



**Figure 4. *Streptococcus mutans***



**Figure 3. *Staphylococcus aureus***

The zone of inhibition exhibited by the sample at maximum concentration (1000 µg/mL) against *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Streptococcus mutants* are 15mm, 16 mm, 11 mm and 15 mm respectively. The maximum zone of inhibition at 1000 µg/mL was observed against *Pseudomonas aeruginosa* and the second maximum zone of inhibition next to *P. aeruginosa* was against *E. coli* and *S. mutants*. Lowest zone of inhibition at maximum concentration was exhibited against *St. aureus*. No zone of inhibition was observed against *St. aureus* at the concentration level 250 µg/mL. The zone on inhibition exhibited by standard drug at 1000 mg/L against the four pathogens, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Streptococcus mutants* were 30 mm, 24 mm, 25 mm and 26 mm respectively. Hence, zone of inhibition of the sample at different concentrations were minimum than the standard drug which shows that the antibacterial activity of *Elapodi* is lower than the standard drug.

### Conclusion

From the present study, it is concluded that the sample *Elapodi* has some antimicrobial activity but not up to the level of Standard drug. Further research about the sample on chemical

constituents, phytochemicals, pharmacological studies is to be done for the evaluation of its therapeutic efficacy.

### Acknowledgements

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