

Antimicrobial Activity of Muthuchippi Parpam

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Abstract: Pearls are hard, rounded secretion formed inside the shell of certain mollusks, used as a gem. It is secreted by the epithelial cells of the mantle, a curtain of tissue between the shell and body mass, and is deposited in successive layers around an irritating object - usually a parasite in the case of natural pearls - that gets caught in the soft tissue of the mollusk. The pearl is built up of layers of aragonite or calcite (crystalline forms of calcium carbonate) held together by conchiolin (a horny organic substance); its composition is identical to that of the mother of pearl, or nacre, that forms the interior layer of the mollusk shell. In Siddha system Metallic and Mineral drugs are used for medicinal preparation. "Muthu" is one among the Nine gems and its shell muthuchippi under the category of animal origin products. Zoologically it is equated as shell of *Pinctada vulgaris*. The aim of study was to determine the antimicrobial activity of muthuchippi parpam against different microorganisms. The diluted sample (80%) was used to find the activity which was assessed by agar well diffusion method. The microbial inhibition was more effective. Among all species, *Candida albicans* was found to be highly susceptible while *Acinetobacter* was highly resistant. Other bacterial species were also susceptible to this material. Muthuchippi parpam not only helps to overcome physiological activities of human, but can also protect the body by inhibiting the pathogenic organism of respiratory and gastrointestinal tract. This indicates that Muthuchippi parpam contain antimicrobial compounds to control pathogens.

Keywords: Muthuchippi parpam, agar well diffusion, *Candida albicans*, susceptible

1. Introduction

The Siddha system of medicine is a gift of the mankind by the Siddhars who were the greatest scientists in ancient times. Siddhars who defied death, preached the philosophy of Siddha medicine and theory of immortality. Siddhars have contributed a lot to the development of this medical system. According to the Siddhars, the universe is composed of five basic elements, the panchabootham namely, Prithivi (earth), Appu (water), Theyu (fire), Vaayu (air) and Akaayam (ether). As the human body (microcosm) is a replica of the universe (macrocosm), there is a fundamental harmony between Universe and man and so are foods or drugs irrespective of their origin¹. Siddha medicine uses an extensive pharmacopoeia that includes herbal, animal, mineral and metallic preparations. The system has developed a rich and unique treasure of drug knowledge in which use of various types of herbs, metals, minerals and animal products is very much advocated. *Muthuchippi parpam* unique Siddha preparation prepared from *Muthuchippi* (Pearl oyster shell) one of the nine precious gems is selected and studied from standardization point of view employing modern analytical tools and attempts were also made to understand the importance of purification processes involved in the preparation². Pearl oyster is the source of pearl or Muthu and possess straight long hinge uniting the two valves. The *muthuchippi* shell is hard, externally grey or dark brown and rough and internally white, smooth and shining.

Names in Regional languages³:

English: Pearl Oyster Shell.

Tamil: *Muthuchippi*

Bengal & Hindi: Mukta-Jhinuk.

Marathi & Gujarati: Motisimp

Sanskrit: Sukth



Zoological classification³:

Phylum: Mollusca

Class: Pelecypoda (or) Bivalvia

Order: Pseudo lamellibranchiata

Genus: *Pinctada*

2. Materials and Methods

2.1 Purification method

A Mixture of lime stone and fullers earth, to be added in water and the extract is taken. Raw *Muthuchippi* (Pearl oyster shells) are to be immersed in this extract and boiled 5-8 times to be purified from impurities⁴.

2.2 Preparation of Muthu Chippi Parpam⁴

- 1) Muthu Chippi (Pearl oyster shells)
- 2) Adathodai leaves (Adathodavasica leaves)
- 3) Notchi leaves (Vitex negundo leaves)
- 4) Nilapanaikizhanghu (Rhizome of Curculigoorchoides)

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The purified Muthuchippi is crushed with the fresh leaf extract of Adathoda followed by Vitex negundo and then by using the rhizome extract of Curculigoorchoides. The grounded mixture is then subjected to Pudam process by using clay smudged ribbon on earthen ware vessels and cow dung cakes. The weighed purified muthuchippi subjected to the calcination is 875 gm. For one calcinations (Pandri putam) 50 cow dung cakes were used as per the Siddha Formulary of India, Government of India Publication.

The processed sample was diluted in sterile distilled water to make 80% solution. The sample was filtered through Whatman filter paper and filtrate was stored under refrigeration condition until use. Twenty five pure cultures of bacterial and fungal species were collected from culture bank of Department of Microbiology, MTCC, Chandigarh. Among them 13 were Gram negative, 8 were Gram + and 4 were Candida species. Microbial susceptibility was determined by agar well diffusion method (Betoniet al, 2006) using 5mm borer. It was carried out for E. coli, Pseudomonas florescense, Klebsiellaoxytoca, Citrobacter, Salmonella typhi, Salmonella paratyphi A, Acinetobacter, Shigelladysenteriae, Staphylococcus aureus, Staphylococcus saprophyticus, Streptococcus pneumoniae, Bacillus subtilis and Candida albicans. Overnight cultures (37°C) in Brain Heart Infusion (BHI) were adjusted to 0.5 MacFarland’s standard and inoculated on MHA.

3. Results and Discussion

Table 1: Zone of inhibition of different isolates

Gram positive		
Species	No of isolates	Zone of inhibition(mm)
S.aureus	02	16
S.saprophyticus	01	17
S.pneumoniae	01	19
B.substillis	01	19

Gram negative		
Species	No of isolates	Zone of inhibition(mm)
Salmonella paratyphi A	01	16
Shigelladysenteriae	02	17
E.Coli	01	17
Klebsiellaoxytoca	01	16
P.florescense	02	16
Salmonella typhi	01	14
Citrobacter	01	13
Actinetobacter	01	R

Yeast		
Candida albicans	02	50

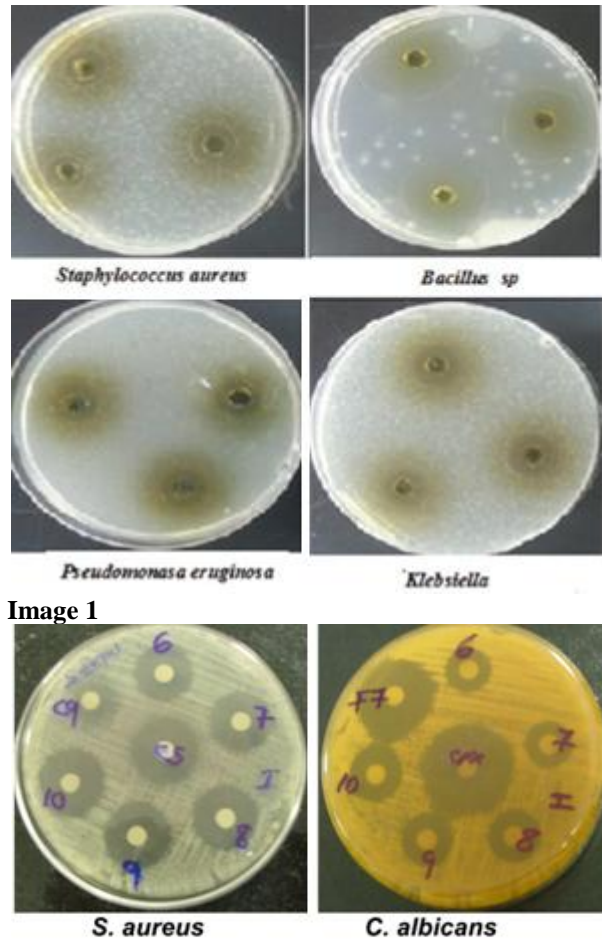


Image 2

The calcinated shells of Muthuchippi (Pearl oyster shell) is a source of pearl and has similar properties as that of pearl. Calcium carbonate (CaCO₃) constitutes 85-90% of Oyster’s shell. It also contains phosphate and sulphate of Calcium and Magnesium, Oxide of iron, Aluminum and Silica. It is said to be very effective against chronic bronchitis and asthma, digestive troubles, and UTI. It is also believed to slow down the process of aging because of the anti-oxidant activity. Most research papers described its physiological properties and activity in humans and animals. Antifungal activities of muthuchippi parpam have been reported⁵.

Studies have showed that it has Anti osteoporotic and anti-inflammatory activity⁶, and the test drug prepared from pearl oyster shell, showed highly significant antiulcer activity than standard group (Sucralfate). This may be contributed by the alkaline pH and chemical components which might have inhibited the secretions neutralized the acidity⁷. In this study it was found that the muthuchippi parpam gave intermediate zone of inhibition with gram positive and negative bacteria. Only Acinetobacter spp. was resistant to its action. Among gram positive (+) organism; Streptococcus pneumonia and B.subtilis showed greater zone of inhibition (20mm). While S.aureus showed a zone of inhibition (17mm) and S. saprophyticus showed a zone of (15mm). Among gram negative (-) organism, Shigelladysenteriae and Salmonella paratyphiA showed greater zone of (17mm) in diameter. E.coli showed a zone of (16mm), P.florescense and Klebsiellaoxytoca showed a zone of (16mm), Salmonella typhi showed a zone of (14mm) and Citrobacter

showed a zone of (13mm). Greater zone of inhibition (50mm) was found in *Candida albicans* as compared to bacteria. The literature reported mostly antifungal activity of *Muthuchippi parpam*.

4. Conclusion

It is concluded that this The marine environment make available an huge source of vegetation and creatures with huge potential not only helps to overcome Dietary requirements of human but simultaneously protects the body by inhibiting various pathogenic organisms of respiratory and gastrointestinal tract. It is crystal clear that the formulation *Muthuchippi parpam* was found to be more effective against test pathogens.

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