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**Physicochemical analysis of Herbo marine formulation  
Muthuchippi parpam**

**S.Balamurugan<sup>1\*</sup>, G. Thanganila<sup>2</sup>, R.Madhavan<sup>3</sup>**

<sup>1</sup>Lecturer, Dept. of Nanju Maruthuvam, National Institute of Siddha, Chennai-47.

<sup>2</sup>PG scholar, Dept. of Nanju Maruthuvam, National Institute of Siddha, Chennai-47.

<sup>3</sup>Head of Department, Dept. of Nanju Maruthuvam, National Institute of Siddha, Chennai-47.

Corresponding author: **Dr. S.Balamurugan**, Lecturer,  
Dept. of Nanju Maruthuvam, National Institute of Siddha, Chennai-47.  
E-mail: [drbalasmart2010@gmail.com](mailto:drbalasmart2010@gmail.com)

**Abstract**

Traditional Medicine has played an important role in meeting the demands of primary health care in many developing countries and its use has expanded widely in many developed countries. Siddha system of medicine is one among them, which has flourished in the Southern India especially Tamilnadu. Muthuchippi parpam is traditional Herbo marine formulation which used for the treatment of many diseases, which is extensively used by the traditional medicine practitioners. It has high therapeutic value in treating the wide variety of diseases. Therefore, an attempt has been made to unveil the facts about the Herbo marine siddha drug, a calcinated product of pearl-oyster shell from the siddha literature by scientific analysis of its purification and preparation process by evaluating the Physico chemical characters, The drug is free of microbial contamination and shows positive for the presence of alkaloids, tannins, phenols, steroids, saponins, Carbonates, flavonoids, Starch etc. The total ash value is 78 %. The heavy metals such as lead, arsenic, mercury, cadmium are below detectable limit.

**Keywords:** Traditional medicine, siddha, Muthuchippi, Physico chemical analysis.

**1. Introduction**

Siddha system is one of the oldest systems of medicine in India. The term Siddha means achievements and Siddhars were saintly persons, masters in preparing medicine from herbal, metal, mineral and animal products<sup>1</sup>. Even though the traditional systems of medicine are effective, to globalise the wealth of the Siddha system, there is a need to develop standardization technique. The use of scientific tools are essential to validate the traditional claim. Though Siddha drugs are considered to be safe and effective, it is the utmost duty of the siddha physician to standardize the formulation before trying out in humans. Siddha system that properly processed

herbomineral preparation can contribute significantly to the health care of the society<sup>2</sup>.

Muthuchippi parpam anunique Siddha preparation prepared from *Muthuchippi* (Pearl oyster shell) one of the Uparasam 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 preparation. 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 languages<sup>3</sup>:

English: Pearl Oyster Shell.

Tamil: *Muthuchippi*

Bengal & Hindi: Mukta-Jhinuk.

Marathi & Gujarati: Motisimp

Sanskrit: Sukth

### Zoological classification<sup>3</sup>:

Phylum :Mollusca

Class: Pelecypoda (or) Bivalvia

Order: Pseudolamellibranchiata

Genus: Pinctada

## 2. Materials and Methods

Muthuchippi parpam an unique Siddha preparation prepared from Muthuchippi (Pearl oyster shell) one of the Uparasam 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 preparation<sup>4</sup>. 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.

### 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 impurities<sup>4</sup>.

### 2.2 Preparation of Muthu Chippi Parpam<sup>4</sup>

1. Muthu Chippi (Pearl oyster shells)
2. Adathodai leaves (*Adathoda vasica* leaves)
3. Notchi leaves (*Vitex negundo* leaves)
4. Nilapanaikizhanghu (Rhizome of *Curculigo orchoides*)

The purified Muthuchippi is crushed with the fresh leaf extract of *Adathoda* followed by *Vitex negundo* and then by using the rhizome extract of *Curculigo orchoides*. 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.

### 2.3 Siddha analytical parameters for Parpam

The parameters specific to Parpam are mentioned in the guidelines of Siddha classical texts. Parpam is usually lusterless, white or pale white on naked eye examination. A pinch of Parpam when kept on the tongue should be tasteless and it should float on the water. When placed between the thumb and index finger it should enter the furrows of the finger and must show a clear fingerprint<sup>5</sup>.

### 2.4 Physicochemical analysis

The sample is tested for the following parameters as per the guidelines followed by WHO. Loss on drying , Total ash , Water soluble ash , Acid insoluble ash , Water soluble extractive , Alcohol soluble extractive, Microbial load Aflatoxins and Heavy metals<sup>5,6</sup>.

### 2.5 Preliminary Phytochemical Tests<sup>7</sup>:

Preliminary Phytochemical tests such as test for Proteins (Biuret test) , Steroids (Lieberman Burchard Test) , Flavonoids (Shinoda test), Phenol , Tannin , Alkaloids (Dragendorff's Test) , Glycosides , Cardiac glycoside (Keller-Killani Test) , Reducing sugar (Fehling's Test) , Saponins were carried out.

### 2.6 Instrumental analysis<sup>8</sup>:

Elemental analysis EDAX was carried out by Carl-Zeiss AG supra 40 WDS, model- D8, manufactured by Bruker corporation Pvt, Ltd (Germany) was used. Surface analysis of particles and size was done using Scanning Electron Microscope.

### 3. Results and Discussion

#### 3.1 Physico chemical analysis

S.No.	Parameter	Muthuchippi parpam
1.	Colour	Grey color
2.	Odour	Odourless
3.	Taste	Slightly alkaline
4.	Solubility	Soluble in dilute Hcl
5.	pH(1% solution)	8.89
6.	Loss on Drying (%)	1.99
7.	Total ash (%)	94.87
8.	Water soluble ash (%)	4.65
9.	Acid insoluble ash (%)	5.56



#### 3.2 Microbial load Aflatoxins

Table no: 1

Test	Observed Result
Aflatoxin B1	BDL(D.L-0.3µg/kg)
Aflatoxin B2	BDL(D.L-0.3µg/kg)
Aflatoxin G1	BDL(D.L-0.3µg/kg)
Aflatoxin G2	BDL(D.L-0.3µg/kg)
Organophosphorus	Not detected (D.L: 0.005MG/kg)
Organochloride	Not detected (D.L: 0.005MG/kg)

#### 3.3 Heavy metal analysis

preparation method can be quite safe for the internal administration.

The heavy metals are present under detectable permissible limits. it can be revealed that Parpam

Table no:2

Heavy Metal	Specification as per AYUSH/WHO/FDA(26....)	Observed Result
Lead	10ppm	BDL(D.L-0.05PPM)
Cadmium	0.3ppm	BDL(D.L-0.05PPM)
Arsenic	3.0ppm	BDL(D.L-0.05PPM)
Mercury	1ppm	BDL(D.L-0.01PPM)

### 3.4 Preliminary Phytochemical Tests:

Table no: 3

Sl. No	Name of the Test	Result
1.	Test for Amino acids (Biurette test)	+ve
2.	Test for Steroid (Lieberman Burchard Test)	+ve
3.	Test for Flavonoids (Shinoda test)	+ve
5.	Test for Phenol	+ve
6.	Test for Tannin	+ve
7.	Test for Alkaloids (Dragendorff's Test)	+ve
8.	Test for Glycosides	+ve
9.	Test for Saponins	+ve
10.	Test for Anthraquinones	+ve

### 3.5 Chemical analysis by EDAX:

EDAX analysis was done Calcium as the major element in the MCP it present about 48% in the final product and other microelements like Fe, Cu, Ni, Al, K,

Zn were present in the final product. The presence of vital elements may be due to addition of the herbal juices in the preparation process of the MCP. It may predict the bioavailability of parpam.

#### a) Showing the composition of Ca, C,O by EDAX method in MCP

Table no 4:

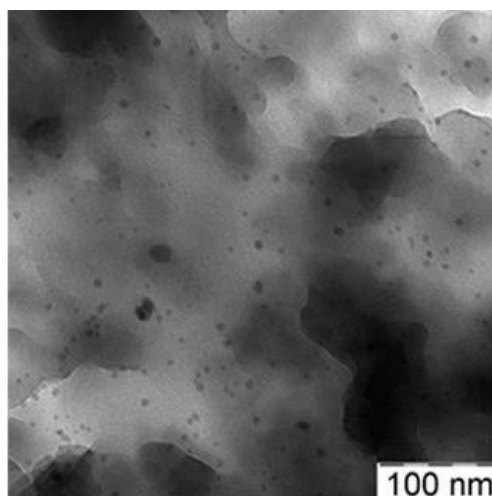
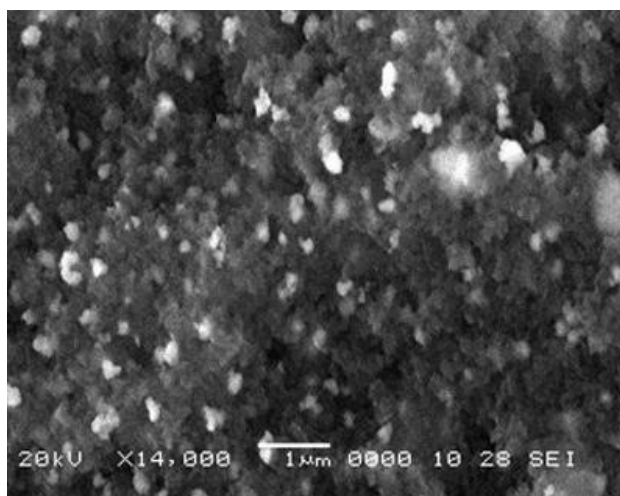
Elements	Weight	Atomic
Ca	49.56%	29.52%
O	46.02%	61.32%
C	9.12%	16.25%

#### b) Trace elements in the sample MCP

Table no 5:

Elements	Weight	Atomic
Mg	0.56%	0.43%
Al	0.76%	0.16%
Si	0.35%	0.45%
Fe	1.04%	0.12%
Cu	0.65%	0.29%
Ni	0.27%	0.11%
K	0.63%	0.23%

### SEM analysis of MCP



The SEM analysis done for to evaluate the particle size of the drug. The particle size plays in important role in pharmacodynamics action. The Photomicrograph of bulk particles shows wide distribution of size in the sample. We also observe that the particle size present in aggregated form. Shape and surface morphology different. The particles of Muthuchippi parpam are in Nano size of 86.0 nm. The other random particles showed the nano particles of the size 114nm, 117nm, 119nm and 146nm. Nano particles of drugs have attracted increasing technology interest because they are bio safe and bio-compatible and can be used for bio medical applications without coating and toxicity. With these unique characteristics, Muthuchippi parpam is one of the most important nano materials in future research and applications.

#### 4. Conclusion

From the present study it can be clear that use of traditional methods and application of modern advanced tools helps in standardization and quality control of siddha formulations. It reveals that muthuchippi parpam in nano range calcium carbonate in calcite form. SEM images vouched that reduced particle size of the parpam which provides a reason for good absorption. MCP is the good source of elemental calcium and essential micronutrient element in permissible limit. This siddha formulation to be safe as well as efficacious of internal administration.

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