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## Phytochemical and Physicochemical Analysis of *Thayir Chundi* *Chooranam* a Siddha Herbo-Mineral Formulation



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### ABSTRACT

Standardization of Siddha drugs is the need of the hour. '*Thayir Chundi choornam*' is a herbal -mineral Siddha preparation, being used as the drug for diarrhea, dysentery, fever, vomiting for a long time. **Aim and Objective:** To do the physicochemical and phytochemical analysis for the drug *Thayir Chundi Chooranam*. **Materials and Methods:** The drug was prepared as per the method mentioned in the classic Siddha literature. Preliminary phytochemical screening of the extract was carried out as per the Pharmacopeial laboratory standards of Indian medicine. The powder of this formulation was subjected to physicochemical study such as total ash value, acid insoluble ash, water soluble ash, water-soluble extractive, Alcohol soluble extractive, moisture content. The behavior of the prepared powder with different reagent and fluorescence analysis was also carried out. **Results:** Preliminary phytochemical screening of the extracts showed the presence of alkaloid, carbohydrate, glycoside, diterpenes, flavonoids, gum & mucilage. The physicochemical study reveals that drug contains the following composition: total ash value 31.79%, acid insoluble ash 3.20%, water-soluble ash 29.53%, water-soluble extractive 46.37%, Alcohol soluble extractive 19.33%, moisture content 6.70%. The achieved results of physicochemical and phytochemicals profiling will be used as tools for authentication and standardization profile of the herbal-mineral formulation.



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## **INTRODUCTION**

Siddha is the indigenous system of Indian Medicine practiced in South India especially in Tamil Nadu. Siddha medicine has immense faith in the miracles drugs and in the prolongation of life through rejuvenating treatments and intense yogic practices the advantage and unique feature is the removal of the root causes of the disease and perfect remedy for body and mind. There is a popular saying in Siddha system of medicine that food is medicine and medicine is food. The drug under investigation is an example of this saying, it is taken along with food and not as medicines there is an overall shift towards herbal medicines from modern medicine, the standardization part of medicine became mandatory for the acceptance of the drug by modern scientific community and the pharmacopoeial standards are prerequisites for the quality control of the drug. *Thayir Chundi choornam* is one of the Siddha herbal-mineral formulations mentioned in the classical texts. The formulation composed of salts and herbal drugs.

## **INDICATION**

Chronic diarrhea, fever vomiting, diarrhea due to indigestion and sprue.

## **DOSE**

1-2 gram

## **ANUPANAM**

Hot water and Kaanthachendooram, twice a day.

## **AIM AND OBJECTIVE**

The aim of this study is to do physicochemical and phytochemical analysis for the drug *Thayir Chundi choornam*. The Physico-chemical parameters like pH value, Total ash value, Acid soluble ash content and water soluble ash content and Preliminary phytochemical analysis for steroid, triterpene, flavonoid, alkaloid, phenol, tannin, acid, glycoside and saponin also were estimated.

## MATERIALS AND METHODS

### Sample Collection

The sample was collected from Impcops pharmacy in Thiruvanmiyur, Chennai

#### 1. Ingredients of the drug *Thayirchundi chooranam* are given below.

1. Induppu-Sodium chloride impure	35 grams
2. Valalay uppu-	35 grams
3. Pooneeru-oxides of calcium and potassium	35 grams
4. Sotruppu-sodium chloride	35 grams
5. Kalluppu-	35 grams
6. Chukku-cleaned dry ginger	175 grams
7. Pulitha thayir-sour curd	1400 grams

#### 2. Physicochemical characterization:

The physicochemical and phytochemical analysis was done as per the protocol for testing of Ayurvedic, Siddha and Unani Medicines, by PLIM, Ghaziabad, under the Ministry of AYUSH, Ministry of Health and Family Welfare, New Delhi.

## PHYSIOCHEMICAL ANALYSIS OF -THAYIRCHUNDI CHOORANAM

### 2.1: Loss on Drying:

An accurately weighed 2g of *Thayir Chundi choornam* formulation was taken in a tarred glass bottle. The crude drug was heated at 105<sup>0</sup>C for 6 hours in an oven till a constant weight. Percentage moisture content of the sample was calculated with reference to the shade-dried material.

## 2.2: Determination of total ash:

Weighed accurately 2g of *Thayir Chundi choornam* formulation was added in a crucible at a temperature 600<sup>0</sup>C in a muffle furnace till carbon-free ash was obtained. It was calculated with reference to the air-dried drug.

## 2.3: Determination of acid insoluble ash:

Ash above obtained, was boiled for 5min with 25ml of 1M Hydrochloric acid and filtered using an ashless filter paper. Insoluble matter retained on filter paper was washed with hot water and filter paper was burnt to a constant weight in a muffle furnace. The percentage of acid insoluble as was calculated with reference to the air-dried drug.

## 2.4: Determination of water-soluble ash:

Total ash 1g was boiled for 5min with 25ml water and insoluble matter collected on an ashless filter paper was washed with hot water and ignited for 15min at a temperature not exceeding 450<sup>0</sup>C in a muffle furnace. The amount of soluble ash is determined by drying the filtrate.

## 2.4: Determination of water-soluble Extractive:

5gm of air-dried drug, coarsely powdered *Thayir Chundi choornam* was macerated with 100ml of distilled water in a closed flask for twenty-four hours shaking frequently. The solution was filtered and 25 ml of filtrate was evaporated in a tarred flat bottom shallow dish, further dried at 100<sup>0</sup> C and weighted. The percentage of water-soluble extractive was calculated with reference to the air-dried drugs.

## 2.5: Determination of alcohol-soluble extractive:

2.5gm. of air-dried drugs; coarsely powdered *Thayir Chundi choornam* was macerated with 50 ml. alcohol in closed flask for 24 hrs. With frequent shaking, it was filtered rapidly taking precaution against loss of alcohol. 10ml of the filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100<sup>0</sup>C and weighted. The percentage of alcohol-soluble extractive was calculated with reference to the air-dried drug.

### 3. THE PRELIMINARY PHYTOCHEMICAL SCREENING TEST

#### *THAYIR CHUNDI CHOORANAM*

The preliminary phytochemical screening test was carried out for each extract of *Thayir Chundi choornam* as per the standard procedure.

#### 1. Detection of alkaloids

Extracts were dissolved individually in diluted hydrochloric acid and filtered.

##### Mayer's test

2 ml of extract was treated with few drops of Mayer's reagent; formation of yellow colored precipitate indicates the presence of alkaloids.

##### Wagner's test

2 ml of filtrate was treated with Wagner's reagent. Formation of brown /reddish precipitate indicates the presence of alkaloids.

#### 2. Detection of carbohydrate

The extract was dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

##### Molisch's test

2 ml of filtrate was treated with few drops of alcoholic Alpha naphthol solution in a test tube. Formation of the violet ring at the junction indicates the presence of carbohydrates.

##### Benedict's test

The filtrate was treated with Benedict's reagent and heated gently. Orange-red precipitate indicates the presence of reducing sugars.

### 3. Detection of Glycosides

#### Liebermann's test

2ml of the extract was treated with 2ml chloroform and 2ml of acetic acid, Violet color change into blue and green indicates the presence of Glycosides.

### 4. Detection of saponins

#### Froth test

Extracts were diluted with distilled water to 20 ml and this was shaken in a graduated cylinder for 15 minutes. Formation of a 1-centimeter layer of foam indicates the presence of Saponins.

#### Foam test

0.5-gram extract was shaken with 2 ml of water. If foam produced persists for 10 minutes, it indicates the presence of saponins.

### 5. Detection of phytosterols

#### Salkowski's test

Extracts was treated with chloroform and filtered; the filtrates were treated with few drops of concentrated sulphuric acid, shaken and allowed to stand for few minutes. Golden yellow color indicates the presence of triterpenes.

### 6. Detection of phenols

**Ferric Chloride test:** 2 ml of extracts was treated with 3-4 drops of ferric chloride solution. Formation of bluish black color indicates the presence of phenols.

### 7. Detection of tannins

#### Gelatin test

To the extracts, 1% of gelatin solution containing sodium chloride was added, formation of white precipitate indicates the presence of tannins.



## 8. Detection of flavonoids

### Alkaline reagent test

The extract was treated with few drops of 10% sodium hydroxide, the formation of intense yellow color then on the addition of diluted hydrochloric acid it becomes colorless, and it indicates the presence of flavonoids.

### Lead acetate test

The extract was treated with few drops of lead acetate solution; yellow color precipitate indicates the presence of flavonoids.

## 9. Detection of proteins and amino acids

**Xanthoproteic Test:** The extracts were treated with few drops of conc. Nitric acid. Formation of yellow color indicates the presence of proteins.

## 10. Detection of diterpenes

### Copper Acetate test

Extracts were dissolved in water and treated with 3-4 drops of copper Acetate solution; formation of emerald green color indicates the presence of diterpenes.

## 11. Test for gum and mucilage

The extract was dissolved in 10 ml of distilled water and to this 2ml of absolute alcohol with the constant stirring white cloudy precipitate indicates the presence of gum and mucilage.

## 12. Test for Quinones

The extract was treated with sodium hydroxide blue or red precipitate indicates the presence of Quinones.

## RESULTS AND DISCUSSION

### Physicochemical characterization

The result obtained in the physicochemical characterization is listed below table -1

**Table 1: Table showing result obtained in the physicochemical characterization**

Sr.no	Parameters	Percentage
1	Loss on drying	6.70%
2	Total ash value	31.79%
3	Acid-insoluble ash	3.20%
4	Water soluble ash	29.53%
5	Water-soluble extraction	46.37%
6	Alcohol soluble extraction	19.33%

## RESULTS -II

### Phytochemical characterization:

The results of the phytochemical parameters are given in Table 2

**Table 2: Table showing result obtained in the phytochemical parameters**

Sr. no.	Phytochemicals	Test Name	H <sub>2</sub> O ext.
1	Alkaloids	Mayer's test	+ve
		Wagner's test	+ve
2	Carbohydrates	Molisch's test	-ve
		Benedict's test	+ve
3	Glycosides	Libermann Burchard's test	+ve
4	Saponins	Froth test	-ve
		Foam test	-ve
5	Phytosterols	Salkowski's test	+ve
6	Phenols	Ferric chloride test	-ve
7	Tannins	Gelatin test	-ve
8	Flavonoids	Alkaline Reagent test	-ve
		Lead acetate test	+ve
9	Proteins and Amino acids	Xanthoproteic test	-ve
10	Diterpenes	Copper acetate test	+ve
11	Gum & mucilage	Extract + alcohol	+ve
12	Quinone	NaOH + Extract	-ve

+ve/-ve present or absent if component tested



## DISCUSSION

*Thayir Chundi choornam* was prepared using the standard procedure. The results obtained from physicochemical screening total ash was found to be 31.79% which indicated the amount of mineral and earthy material. The amount of acid insoluble ash in the *Thayir Chundi choornam* was found to be 3.20%. The water-soluble extractive was found to be 46.3% which indicates the presence of sugar, acid, and inorganic compound. The alcohol-soluble extractive value 19.33% indicates the presence of polar constituents. The result obtained from phytochemical screening reveals that phytoconstituents like carbohydrates, alkaloids, glycosides, phytosterols, diterpenes, in *Thayir Chundi choornam*. The present study on *Thayir Chundi choornam* reveals the presence of the bioactive compounds.

## CONCLUSION

Based on the above results, it can be assumed that the drug *Thayir Chundi choornam*. has validated the traditional claim and the present study leads to the further research in the way of isolation.

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