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Physicochemical and Phytochemical Evaluation of Siddha formulation Sivathai choornam

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Abstract

Aim: The aim of this study was to investigate the physicochemical and phytochemical properties of Sivathai Choornam.
Materials and Methods: Sivathai root is collected from Tirunelveli and surrounding areas. Sivathai root was identified and authenticated by botanists at the Government Siddha Medical College, Palayamkottai.
Results and Discussion: Physicochemical analysis shows the LOD at 1050C 5.77%, Total Ash3.99%, Acid insoluble ash 0.12%, Water soluble ash 0.60%, Sulphated ash 6.20%, pH of water extract (4% aqueous solution) 5.72, Alcohol soluble extractives 29.25%, Water soluble extractives53.75%, Volatile oil Nil. Phytochemical analysis shows the presence of Tannins, Terpenoids, Alkaloids, Flavanoids, Carbohydrates, Proteins.
Conclusion: According to the results of this study, the physicochemical and phytochemical characteristics of the chemicals in Sivathai choornam have been investigated.

Keywords: Sivathai Choornam, Physicochemical and phytochemica analysis

Introduction

Siddha Medicine is a medical system that originated in the ancient and highly specialized Tamil culture, which was originated by the Siddhars.

The Siddhas have given solutions to many diseases in humans through plant products, animal products, metals and mineral products.

They mentioned a special medicine called Sivathai choornam for peptic ulcer disease in humans.

Sivathaichoornam is a combination of herbs such as Sivathaiver (*Operculina turpethum*), kothumalli vithai (*Coriandrum sativum*), kadukkai (*Terminalia chebula*), Thippili (*Piper longum*), Koraikizhangu (*Cyperus rotunds*), Vaividangam (*Embelia ribes*), Sukku (*Zingiber officinale*), Milagu (*Piper nigrum*), Thandrikai (*Terminalia bellirica*), Sugar(*Saccharum officinarum*).

Physicochemical and phytochemical analysis of the Sivathai choornam made from this composite material.

Investigate its nature and investigate the potency of Sivathai choornam to eliminate diseases and find out whether Sivathai choornam contains chemicals that can remove stomach ulcers as stated in Sarabendra Kunmarogasikichai and find out that Sivathai choornam can be used for peptic ulcers as stated in *Sarabendra Kunmarogasikichai.*

Materials and Methods

Sivathai root is collected from Tirunelveli and surrounding areas.Sivathai root was identified and authenticated by botanists at the Government Siddha Medical College, Palayankottai.

Physicochemical analysis:

The physicochemical analysis such as determination of loss on drying, total ash value, acid insoluble ash, water soluble ash, sulphated ash, pH value, volatile oil, alcohol soluble extractives, water soluble extractives were carried out by standard methods. The information collected from these tests are used for standardization.

Preliminary Phytochemical Analysis:

Preliminary phytochemical screening was carried out to find out the presence of various phyto constituents using standard procedures.

Selection of drugs:

In Siddha medicine, texts containing many herbs with unique disease-relieving properties have been recorded.

Sivathai choornam is an excellent remedy for stomach ailments due to its anti-ulcer properties.

It is mentioned in *Sarabendra Kunmaroga-sikichai.*

Ingredients:

Ingredients of Sivathai choornam

(Ref: SARABENTHIRA KUNMA ROGA SIKICHAI, medicines Page.No:55)

Preparation:

Sl. No.	Mooligai sarakku	Weight
1.	Sivathai ver	27 Varaganidai(113.4 g)
2.	Kothumalli vidhai	1 Varaganidai(4.2g)
3.	Kadukkai	1 Varaganidai(4.2g)
4.	Thippili	1 Varaganidai(4.2g)
5.	Koraikilangu	1 Varaganidai(4.2g)
6.	Vaividangam	1 Varaganidai(4.2g)
7.	Sukku	1 Varaganidai(4.2g)
8.	Milagu	1 Varaganidai(4.2g)
9.	Thantrikai	1 Varaganidai(4.2g)
10	Sarkarai	Sari edai(147g)

The root and other herbal materials added to it should be cleaned thoroughly and filtered in water for purification.

After that, the root should be dried well in the shade. It should be in cow's milk.

Cleaned goods should be dried well in the shade.

Then grind it well in a grinder.

Then it should be bored well and proper weight of sugar should be added to this chooranam.

Then take it in a clean air-tight container and secure it.

Test conducted:

(i) Physico- chemical Analysis (LOD, Total Ash, Acid insoluble ash, water soluble Ash, Sulphated ash, pH, water soluble extractive, alcohol soluble extractive, volatile oil)

(ii) Preliminary Phytochemical analysis

(i) Physico- chemical Analysis Sivathai Chooranam

Sl. No.	Parameters	Result
1.	LOD at 105^0C	5.77%
2.	Total Ash	3.99%
3.	Acid insoluble ash	0.12%
4.	Water soluble ash	0.60%
5.	Sulphated ash	6.20%
6.	pH of water extract (4% aqueous solution)	5.72
7.	Alcohol soluble extractives	29.25%
8.	Water soluble extractives	53.75%
9.	Volatile oil	Nil

(ii) Preliminary Phytochemical analysis

Tests	**Result**
Saponins	-
Tannins	+
Phenols	-
Terpenoids	+
Alkaloids	+
Flavanoids	+
Steroids	-
Glycosides	-
Carbohydrates	+
Quinones	-
Proteins	+

+ present
- absent

I. Physico-chemical Analysis of Sivathai Chooranam

A 100 ml beaker is accurately weighed. Take about 4 g of powdered drug (about 3 mm in thickness) in the beaker and accurately weighed. Place the beaker in an oven and dry at 105^{o}C for 5 hours. Cool in a desiccator and weigh. Repeat the process until constant weight is obtained. Calculate the percentage of loss in weight of the sample.

2. Total ash

A silica crucible is ignited, cooled and weighed. Take about 2 g of powdered drug in the crucible and accurately weighed. Incinerate the drug until free from carbon in a muffle furnace, cool and weigh. Calculate the percentage of Total ash.

3. Acid-insoluble ash

Take total ash in the crucible. Add 25 ml 6N Hydrochloric acid and boil for five minutes. Filter with an ash less filter paper. Wash with hot water until the filtrate is free from acid (For this take some filtrate coming from the funnel and add some silver nitrate solution. If there is no precipitate formed, the filtrate is free from acid). After filtration, transfer the filter paper containing the insoluble matter into the same crucible and ignite either in a electric Bunsen or in a muffle furnace to constant weight. Calculate the % of the Acid- insoluble ash.

4. Water-soluble ash

Take total ash in the crucible. Add 25 ml water and boil for five minutes. Filter with an ash less filter paper. Wash with hot water. Transfer the filter paper containing the insoluble matter into the same crucible and ignite to constant weight. Weight of water soluble ash is obtained by subtracting the water insoluble residue from the total ash content. Calculate the % of the water soluble ash with reference to the air dried drug.

5. Sulphated ash

Take total ash in the crucible. Moisten the ash with small amount (1ml) of sulphuric acid. Heat it in a Muffle furnace at 600°C till the charred ash is completely incinerated. Weigh the cooled crucible and calculate the residue percentage.

6. Alcohol-soluble extractive

Take about 4 g of coarsely powdered drug and accurately weighed. Transfer it in a glass stoppered conical flask and add 100 ml alcohol (approximately 95%). Shake occasionally for 6 hours. Allow to stand for 18 hrs. Filter rapidly.

Take a 50 ml beaker and weigh. Pipette out 25 ml of the filtrate to the beaker. Evaporate to dryness

on water bath and keep it in air oven at 105°C for 6 hours. Cool in desiccator for 30 minutes and weigh. Calculate the percentage of alcohol soluble extractive.

7. Water-soluble extractive

Take about 4 g of coarsely powdered drug and accurately weighed. Transfer it in a glass stoppered conical flask and add 100 ml distilled water. Shake occasionally for 6 hours. Allow to stand for 18 hrs. Filter rapidly. Take a 50 ml beaker and weigh. Pipette out 25 ml of the filtrate to the beaker. Evaporate to dryness on water bath and keep it in air oven at 105°C for 6 hours. Cool in desiccator for 30 minutes and weigh. Calculate the percentage of Water-soluble extractive.

8. pH of water extract

The pH value of an aqueous liquid may be defined as the common logarithum of the reciprocal of the hydrogen ion concentration expressed in g per litre. The pH value indicates whether the water extract of the drug is acidic, neutral or alkaline. If the pH value obtained is less than 7 the water extract is acidic, if 7 neutral and more than 7, it is alkaline.

The pH value of a liquid can be determined potentiometrically by means of the glass electrode, a reference electrode and a pH meter of the digital type.

9. Volatile oil

Take 20 g coarsely powdered drug in a 1 litre R. B. flask. Add 300 ml of water and a few porous pieces. The flask is connected to a volatile oil apparatus (Clevenger apparatus). The contents of the flask are now heated and boiled for 2 hours or until distillation is completed. The flask is rotated occasionally to wash down any material that adheres to its sides. The apparatus is allowed to cool for 10 minutes and the volume is read. The % Volatile oil is calculated.

II. Preliminary Phytochemical Analysis of Sivathai Chooranam

1. Test for Saponins

To a few mg of extract distilled water is added and shaken well. The formation of foam indicates the presence of saponin.

2. Test for Tannin

To Substance in water is added with 5 % alcoholic ferric chloride. Dark blue colour shows presence of tannin.

3. Test for Terpenoids

To a few mg of extract in chloroform, addconc. H_2SO_4. Presence of dark brown precipitate indicates the presence of terpenoids.

4. Test for Phenol

To Substance in water is added with 5 % alcoholic ferric chloride. Dark blue or green colour shows presence of phenol.

5. Test for Steroids (Lieberman Burchard Test)

To a few mg of the extract 2 ml of chloroform is added in a dry test tube. Few drops of acetic acid is added, heated and few drops of acetic anhydride and 2 drops of concentrated sulphuric acid are added. The green colour indicates the presence of steroid.

6. Test for Quinones

To a few mg of extract, add few drops of concentrated sulphuric acid. Appearance of red colour shows the presence of quinone.

7. Test for Glycosides

Substance is treated with anthrone and concentrated sulphuric acid. On heating over a water bath, the appearance of green colour shows the presence of glycoside.

8. Test for Carbohydrates

To the sample solution, added few drops of α-naphthol and 2-3 ml conc. H_2SO_4. The appearance of reddish violet or purple ring at the junction of two liquids indicates the presence of Carbohydrates.

9. Test for Alkaloids (Dragendorff's Test)

Few mg of extract in separate test tube was warmed with 2% Sulphuric acid for 2 minutes. And it was filtered in separate test tube and few drops of Dragendorff's reagent were added. The presence of orange red precipitates indicates the presence of alkaloids.

10. Test for Flavonoid

To the substance in alcohol add 10% NaOH or ammonia. A dark yellow colour indicates the presence of flavanoid

11. Test for Proteins (Biuret test)

To the sample solution in a test tube, add sodium hydroxide solution and then add a few drops of very dilute (1 %) copper II sulphate solution and mix gently. Appearance of purple colour indicates the presence of protein.

Conclusion

According to the results of this study, when examining the physico-chemical and phytochemical nature of Sivathai choornam, we can know that Sivathai choornam has the ability to cure stomach ulcer as stated in Sarabendra Kunmarogasikichai.

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