PHYSICO CHEMICAL STANDARDIZATION AND PHYTOCHEMICAL SCREENING OF SIDDHA PREPARATION UDARA NOI NIVARANA THIRAVAGAM

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ABSTRACT

Udara Noi Nivarana Thiravagam is a herbo mineral formulation originated from Siddha System of Medicine. It is mainly indicated for Gunmam (Peptic Ulcer). All the ingredients in the drug were properly collected and preserved and authenticated by experts. The Ingredients are purified properly as per the traditional Siddha Literatures. After that the drug was prepared systematically. The prepared drug was subjected to Physico-Chemical, Bio-Chemical, Phyto-Chemical Parameters. The results obtained from the above said parameters, Serve as a tool for authentication and standardization profile of the herbo mineral formulation.

KEYWORDS: Siddha, Udara Noi Nivarana Thiravagam, Gunmam, Peptic ulcer.

INTRODUCTION

Siddha System is the primitive form of medicine practiced from the ancient times. The System was invented by Siddhars. They followed various measures to cure diseases. They wrote various formulations. In order to prove their valuable effort, the standardization of their formulations became important. In the present Investigation UNT is one of the Siddha formulations mentioned in the Classical Siddha texts is taken for standardization. The formulation consists of salts, minerals and plant products. The drug is used in the treatment of Gunmam. The route of administration is eternal. The recommend dose is 8.4 – 16.8gms with hot water as adjuvant. UNT is a liquid drug it acts very quickly than other form of drugs.
prepared drug was investigated for Physico-Chemical, Bio-Chemical and Phyto-Chemical parameters for the standardization of the preparation.

MATERIALS AND METHODS

Preparation of the drug

*Udara noi nivarana Thiravagam* has been selected from the classical siddha literature *Anuboga vaidhya navaneetham* part 3.[1]

Collection of the drugs

The raw drugs *Kariyuppu*- Sodium chlodium, *Karchunnam*- Lime stone, *Uzhamun*- Sodium bicarbonate and root bark of *Mutsangan*- Azima tetracanthaare brought from local drug shop in Tirunelveli, Tamilnadu. Fresh leaves of Pedalium murex was brought from Thuckalay, Kanyakumari district, TamilNadu.

Identification and Authentication of drugs

The raw materials were identified and authenticated by the experts of PG Gunapadam Dept Government Siddha Medical College, Tirunelveli. The identified raw materials were preserved in the laboratory of PG Gunapadam, Government Siddha Medical College, Tirunelveli for further reference.

Ingredients of the drug

<table>
<thead>
<tr>
<th></th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Kariyuppu</em></td>
<td>1400 gm</td>
</tr>
<tr>
<td><em>Karchunnam</em></td>
<td>1400 gm</td>
</tr>
<tr>
<td><em>Uzhamun</em></td>
<td>1400 gm</td>
</tr>
<tr>
<td>Root barks of Azima tetracantha</td>
<td>700 gm</td>
</tr>
<tr>
<td>Leafs of Pedalium murex</td>
<td>700 gm</td>
</tr>
<tr>
<td>Well water</td>
<td>5.2 litres</td>
</tr>
</tbody>
</table>

Purification of the Drugs

*Kariyuppu*-Sodium Chloride

Sodium chloride was dissolved in seawater or rainwater and filtered. The filtrate is boiled into a semisolid in state. Then it is placed under day light. It was allowed to dry and scrapped from the vessel.

*Karchunnam*-Lime stone

Limestone was heated in water and it was dried under daylight.
Uzhamun -Sodium bicarbonate
Sodium carbonate was mixed with water and the filtrate was boiled until to a semisolid state then it was placed under day light and allowed to dry. The dried salt bars were scrapped from the vessel.

Mutsangan-Azimatetracantha
Azima tetracantha root bark was taken and the outer covering of the roots were removed with a knife.

Pedalium murex
Leaf of the pedalium murex was cleaned with a cloth and the dried and infected leaves were removed.

PROCESS
The mineral drugs and the root of Azima tetracantha and leaves of pedalium murex are grounded well and transferred to the distillation apparatus (vaalai yanthiram) and intensely heated. During the process of heating the drugs were completely decomposed and expel the fumes. The fumes are condensed at the condenser submerged in cold water and the drug was collected in a glass vessel.

Physico chemical Parameters[2]
Udara Noi Nivarna Thiravagam was evaluated for various physico-chemical parameters such as physical appearance (Colour, odour) pH and specific gravity.

Colour examination
5 ml of Thiravagam was taken in a watch glass and placed against white background in white tube light. It was observed for its colour by naked age.

Odour examination
2ml of Thiravagam was smelled individually the time interval among two smelling was kept 2 minutes to nullify the effect of previous smelling.

Determination of pH
Operate the pH meter and electrode system according to the manufacturer’s instructions. Standardize the meter and electrodes with 0.05m sodium borate when measuring the alkaline solution. At the end place an accurately measured amount 10ml of Thiravagam in a 100ml
volumetric flask and add 100ml of distilled water the solution was sonicated for about 10 min. PH was measured with the help of digital PH meter.

**Specific gravity**
A thoroughly clean and dry pycnometer was selected and calibrated by filling it with recently boiled and cooled water at 25°C and weighing the contents. Assuming that, the weight of 1 ml of water at 25°C when weighed in air density 0.0012g/ml was 0.99602g. The capacity of the pycnometer was calculated. Adjusting the temperature of Thiravagam to about 20°C and the pycnometer was filled with it. Then the temperature of the filled pycnometer was adjusted to 25°C any Thiravagam was removed and weight was taken. The tare weight of the pycnometer was subtracted from the filled weight. The weight per milliliter was determined by dividing the weight in air expressed in gm of the quantity of the Thiravagam which fills the pycnometer at the specified temperature. Specific gravity of the thiravagam was obtained by dividing the weight of the Thiravagam contained in the pycnometer by the weight of water contained both determined at 25°C.

**Microbial Limit Test**

**Determination of Total Aerobic Microbial Count**
For Bacteria and Fungi.

**Test For Specified Micro-Organisms**
Escherichia coli
Salmonella
Pseudomonas aeruginosa
Staphylococcus aureus.

**CHEMICAL ANALYSIS**

**Procedure:** The drug (Thiravagam) is directly used as the extract.

**Qualitative Analysis for Basic Radicals**
**Test for Calcium:** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution. Formation of white precipitate indicates the presence of calcium.
Test for Iron (Ferric)
The extract is acidified with glacial acetic acid and potassium ferro cyanide. Formation of blue color indicates the presence of ferric iron.

Test for Iron (Ferrous)
The extract is treated with concentrated Nitric acid and ammonium thio-cyanate solution. Formation of blood red color indicates the presence of ferrous iron.

Test for Zinc
The extract is treated with potassium Ferro-cyanide. Formation of white precipitate indicates the presence of zinc.

Qualitative Analysis for Acidic Radicals

Test for Sulphate
2ml of extract is added to 5% barium chloride solution. Formation of white precipitate indicates the presence of sulphate.

Test for Chloride
The extract is treated with silver nitrate solution. Formation of white precipitate indicates the presence of chloride.

Test for Phosphate
The extract is treated with ammonium molybdate and concentrated nitric acid. Formation of yellow precipitate indicates the presence of phosphate.

Test for Carbonate
On treating the extract with concentrated hydrochloric acid giving brisk effervescence indicates the presence of carbonate.

Test for starch
The extract is added with weak iodine solution. Formation of blue colour indicates the presence of starch.

Test for albumin
The extract is treated with Esbach’s reagent. Formation of yellow precipitate indicates the presence of albumin.
Test for tannic acid
The extract is treated with ferric chloride. Formation of bluish black precipitate indicates the presence of tannic acid.

Test for unsaturation
The extract is treated with potassium permanganate solution. The dis-colourization of potassium permanganate indicates the presence of unsaturated compounds.

Test for the reducing sugar
5ml of Benedict’s qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 8-10 drops of the extract and again boil it for 2 minutes. Any colour change indicates the presence of reducing sugar.

Test for amino acid
One or two drops of the extract is placed on a filter paper and dried it well. After drying, 1% Ninhydrin is sprayed over the same and dried it well. Formation of violet colour indicates the presence of amino acid.

Phytochemical Screening
Phyto-chemicals, chemical compounds that occur naturally in plants (phyto means "plant" in Greek), are responsible for color and biological properties. The term is generally used to refer to those chemicals that may have biological significance but are not established as essential nutrients.

The following tests are used for the analysis of phytochemicals as described by Harborne, and Onwukaeme and coworkers, 1999 were carried on alcoholic extract of plant.

1. Alkaloids-Dragandroffs test
8g of Bi (NC>3) 3. 5H2O was dissolved in 20 ml HNO3 and 2.72g of potassium iodide in 50 ml H2O. These were mixed and allowed to stand. When KNO3 crystals out, the supernatant was discarded off and made up to 100 ml with distilled, water. The alkaloids were regenerated from the precipitate by treating with Na2CC>3 followed by extraction of the liberated base with ether.

To 0.5ml of alcoholic solution of extracts were added to 2.0 ml of HC1. To this acidic medium 1.0 ml of reagent was added. An orange red precipitate produced immediately indicates the presence of alkaloids.
2. **Flavanoids**
In a test tube containing 0.5 ml of alcoholic extract 5-10 drops of dilute HCl and a small piece of ZnCl2 or Mg were added and the solution was boiled for few minutes. In the presence of flavanoids reddish pink or dirty brown color was produced.

3. **Tannin-Ferric-chloride test**
To 1 -2 ml of aqueous extract, few drops of 5% ferric chloride solution was added. A bluish black colour which disappears in addition of a few ml of sulfuric acid, there is no formation of yellowish brown precipitate.

4. **Phenols-Lead Acetate Test**
1 ml of alcoholic extract was diluted to 5ml with distilled water and to this few drops of 1% aqueous solution of lead acetate was added. A yellow precipitate was formed, which indicate the presence of phenols.

5. **Glycosides**
A small amount of alcoholic extract was dissolved in 1 ml of H2O and the aqueous NaOH solution was added. Formation of yellow colour indicates the presence of glycosides.

6. **Terpenoids**
To 2ml of chloroform extract 1 ml of concentrated E^SC^ was added carefully along the sides of the test tube in the presence of terpenoids a red color was produced in the chloroform layer.

**RESULTS AND DISCUSSION**

**Physicochemical analysis of Udara Noi Nivarana Thiravagam**

<p>| Table - 1: Physical Characterization of UNT |</p>
<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Organolepticcharacters</td>
<td>a. Colour</td>
<td>Colourless</td>
</tr>
<tr>
<td></td>
<td>b. Odour</td>
<td>Odourless</td>
</tr>
<tr>
<td></td>
<td>c. sense of touch</td>
<td>water</td>
</tr>
<tr>
<td></td>
<td>d. Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td></td>
<td>e. Taste</td>
<td>L.M.sweet</td>
</tr>
<tr>
<td>2.Physio chemical standard</td>
<td>a. Loss on drying</td>
<td>99.2%</td>
</tr>
<tr>
<td></td>
<td>b. specific gravity</td>
<td>1.00/1ml</td>
</tr>
<tr>
<td></td>
<td>c. PH</td>
<td>7.72</td>
</tr>
<tr>
<td>3.Microbiological analysis</td>
<td>a. Total viable aerobic count</td>
<td>8x104 col/g</td>
</tr>
</tbody>
</table>
Chemical Analysis

Table -2: Result of Acidic and Basic Radicals

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameter</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calcium</td>
<td>Absence of calcium</td>
</tr>
<tr>
<td>2</td>
<td>Sulphate</td>
<td>presence of sulphate</td>
</tr>
<tr>
<td>3</td>
<td>Chloride</td>
<td>presence of chloride</td>
</tr>
<tr>
<td>4</td>
<td>Carbonate</td>
<td>Absence of carbonate</td>
</tr>
<tr>
<td>5</td>
<td>Starch</td>
<td>Absence of starch</td>
</tr>
<tr>
<td>6</td>
<td>Iron ferrous</td>
<td>presence of ferrous iron</td>
</tr>
<tr>
<td>7</td>
<td>Phosphate</td>
<td>Absence of phosphate</td>
</tr>
<tr>
<td>8</td>
<td>Albumin</td>
<td>Absence of albumin</td>
</tr>
<tr>
<td>9</td>
<td>Tannic acid</td>
<td>Absence of Tannic acid</td>
</tr>
<tr>
<td>10</td>
<td>Unsaturation</td>
<td>Presence of unsaturated compounds</td>
</tr>
<tr>
<td>11</td>
<td>Reducing sugar</td>
<td>Absence of Reducing sugar.</td>
</tr>
<tr>
<td>12</td>
<td>Amino acid</td>
<td>Absence of amino acid</td>
</tr>
<tr>
<td>13</td>
<td>Zinc</td>
<td>Absence of zinc</td>
</tr>
</tbody>
</table>

Phytochemical Analysis

Table 3: Phyto Chemical Analysis

<table>
<thead>
<tr>
<th>S. No</th>
<th>Test</th>
<th>Observation</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alkaloids</td>
<td>Orange red precipitate was found</td>
<td>presence of alkaloid (++)</td>
</tr>
<tr>
<td>2</td>
<td>Flavanoids</td>
<td>No characteristic change was observed</td>
<td>Absence of flavanoid (-)</td>
</tr>
<tr>
<td>3</td>
<td>Phenols</td>
<td>Yellow precipitate was formed</td>
<td>presence of phenols</td>
</tr>
<tr>
<td>4</td>
<td>Terpenoids</td>
<td>No characteristic change was formed</td>
<td>Absence of terpenoids (-)</td>
</tr>
<tr>
<td>5</td>
<td>Tannins</td>
<td>No characteristic change was formed</td>
<td>Absence of tannins (-)</td>
</tr>
</tbody>
</table>

Physico-chemical analysis shows the trial drug UNT’s pH is alkaline, Hence, this drug can be used as an antacid (since PH > 7). The physical state of the drug is in liquid form, hence it’s easily absorbable and palatable (Mild Sweet Taste).

Biochemical analysis shows chloride, ferrous iron, sulphate and unsaturated compounds. Chloride plays an important role in acid base balance and determining the pH and acid level in the stomach.
Phyto-chemical analysis shows the presence of alkaloids and phenols. Phenols exert good antioxidant and chemo-protective properties and protects the gastric mucosa.

**CONCLUSION**

The achieved results of Physico-Chemical, Bio-Chemical, Phyto-Chemical will be useful as a tool for authentication, standardization profile and quality control assessment of herbo mineral formulation.

**ACKNOWLEDGEMENT**

The authors are thankful to Dr.G.Essakipandian, Dr.A.Kingsly.Gunapadam department, Government Siddha Medical College, Palayamkottai.

**REFERENCE**

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