PHYSICO CHEMICAL CHARACTERIZATION OF A HERBO MINERAL SIDDHA DRUG - PITHA PAANDU MAATHIRAI

ABSTRACT:

Introduction: Siddha system of medicine is the science that deals with mind and body. Siddhars classified 4,448 types of disease. Within that veluppu noi (or) paandu noi is one of the disease commonly affecting women and children. **Pitha Paandu,** a nutritional deficiency disease described by Yugi munivar in his Yugi Vaidhya Chinthamani 800 was classified under six types of paandu . The symptoms are correlated withIron deficiency Anaemia and the Herbo mineral formation PITHA PAANDU MAATHIRAI was administered as per the literature. The standardization of drug is essential to prove the efficacy of siddha drug.

Aim: To Estimate the physico chemical analysis for PITHA PAANDU MAATHIRAI .

Materials and Methods: The formulation was prepared as per the siddha literature. The physico chemical analysis such as Loss on Drying, Total Ash, Water Soluble Ash, Acid Insoluble Ash,Water Soluble Extractive, Alcohol Soluble Extractive and pH were carried out.

Results :The Physicochemical analysis revealed that **t**he LOD 6.24%total ash value was 53.61%,Acid insoluble ashvalue was 30.79%,watersoluble ash value was 35.51%,Alcoholsoluble extractive value was 18.12%,Water soluble extractive value was 28.21%, pH 10.8 and also Assay of sodium 6.24 %, potassium 11.44%.

Key Words: Physico chemical analysis, pitha paandu , Iron deficiency anemia

1. INTRODUCTION

A Siddha system of medicine is the oldest holistic management system with meticulously documented medicines and being practiced by a large population in south India. The development of this traditional system of medicines with perspectives of safety, efficacy and quality will help not only to preserve the traditional heritage but also to rationalize the use of natural products in health care. According to WHO guidelines, an herbal product needs to be standardized with respect to safety before releasing it into the market[1]
Iron deficiency anemia (IDA) is a widespread and significant global health issue, particularly affecting vulnerable populations such as young children, women of reproductive age, and pregnant women. It is characterized by a decrease in the number of red blood cells or hemoglobin levels due to insufficient iron stores, leading to impaired oxygen transport and various systemic manifestations.[2]
In Siddha system numerous herbo-mineral preparations used to treat anaemic disorders. The interventional drug is Pitha Paandu Maathirai(PPM), which was quoted on the text sarabendra vaithya muraigalused for Paandu (Anaemia)[3].The formulation was evaluated for its physico-chemical study such as ash value, extractive value, behavior of maathirai with different reagents, fluorescence analysis.

2. MATERIALS AND METHODS:

2.1 OBJECTIVES

The aim of the study is to do Physico-chemical and Preliminary instrumental analysis for the drug PITHA PAANDU MAATHIRAI.

2.2 MATERIALS AND METHODS

The herbs and minerals used for the formulation were identified and authenticated by SIDDHA CENTRAL RESEARCH INSTITUTE, Arignar Anna Govt Hospital campus, Arumbakkam,Chennai-106.

2.3 INGREDIENTS OF PITHA PAANDU MAATHIRAI:

Purified Indhuppu(rock salt), Milagu*(piper nigrum),* Thippili(*piper longum*), Seeragam*(cuminum cyminum*)-equal quantity,Purified Ayam(ferrum) - half of the above ,Kaiyanthagarai juice(*eclipta prostata*) - as per needed.

2.4 ADMINISTRATION

DOSE **:** 1tablet(500mg)twice a day**.** ADJUVANT **:** Ghee**.** INDICATION**:** pitha paandu**,** kaamalai**.** DRUG STORAGE: The trial drug is stored in clean dry air tight container and it is dispensed to the patients in packets. Route Of Administration: Oral[4].

2.5 SOURCE OF RAW DRUGS:

The required raw drugs are procured from a well reputed indigenous drug shop. The raw drugs will be authenticated by the concerned pharmacognosist at SCRI, Chennai.

2.6 PURIFICATION OF RAW DRUGS:

Raw drugs are purified as mentioned in Gunapadam Thadhu Jeevam[5].

2.7 PREPARATION:

The purified raw drugs are finely powdered .Then rubbed it with juice and made into pills.

3. METHODOLOGY:

All the physicochemical parameters were carried out as per the standard test procedures (Protocol for testing of Ayurvedic, Siddha and Unani medicines. Ghaziabad: Government of India, Department of AYUSH, Ministry of Health & Family Welfare, Pharmacopeial Laboratory for Indian Medicines.

3.1 Standardization as per Siddha Classical Literature:

Standardization of a drug means confirming its purity, quality and identifying any adulterants. The test drug's organoleptic characters were evaluating the Colour, Taste, Odour, Flow Property, Lustre, Fingerprint Test, Texture[9].Particle Size of 1gram of the test medication were evaluated in daylight with naked eye[9]. The results were noted.

3.2 Standardization as per Modern Aspect:

Physico-chemical analysis relies on a wide variety of analysis techniques to know the intrinsic properties of molecules or atoms. The following Physicochemical studies of the trial drug have been done according to the PLIM guidelines[6,7].

3.2.1. Loss of Drying:

5g of the test drug PPM was accurately measured and taken in a tarred evaporating dish. The test drug was placed in an oven and heated at 105˚c for five hours. The procedure is continued until the difference between two consecutive procedure is not more than 0.25

percent. Then the percentage of moisture content in the sample was calculated in comparison with shade dried drug.

3.2.2. Determination of Total Ash:

2g of the test drug was accurately measured and taken on tared silica dish. The test drug was placed on the furnace and incinerated at 450˚c until it is carbon free. The sample is the left to cool and weighed. The percentage of total ash is calculated in comparison with the air-dried drug.

3.3.3. Determination of Acid Insoluble Ash:

25ml of hydrochloric acid was added to the ash and the insoluble matter was collected. It was washed with hot water. Then the sample was dried on hot plate and ignited until it reaches a constant weight. It is then left too cool in a desiccator for 30 minutes and weighed. Then the acid insoluble ash was calculated with reference to air dried drug.

3.3.4. Determination of water-soluble ash:

2g of the ash was boiled in 25 ml of water for 25 minutes, the insoluble material was collected in crucible. The collected material is washed with hot water and boiled ignited for five minutes at 450 ˚c. the weight of the insoluble matter was subtracted from the weight of ash. This represented the water-soluble ash and the percentage of water-soluble ash was calculated with reference to that of the air-dried drug.

3.3.5. Determination of Water-Soluble Extractive:

5gms of PPM was macerated with 100ml of chloroform water in a closed flask for 24 hours, shaken frequently for 6 hours and it was allowed to stand for eighteen hours. The solution was filtered rapidly with taking precautions to prevent loss of solvent. 25 ml of the filtrate was evaporated to dryness in a tarred flat bottom shallow dish, further dried at 105ºC to constant weight and weighed. The percentage of water-soluble extractive was calculated with reference to the air-dried drugs.

3.3.6. Determination of Alcohol Soluble Extractive:

The test drug PPM was macerated with 100ml of alcohol in a closed flask for twenty-four hours, shaken frequently for six hours and it was allowed to stand for eighteen hours. The solution was filtered rapidly with taking precautions to prevent loss of solvent. 25 ml of the filtrate was evaporated to dryness in a tarred flat bottom shallow dish, further dried at 105ºC to constant weight and weighed. The percentage of alcohol soluble extractive was calculated with reference to the air dried drug[8].

4. RESULTS:

- The total ash value of pitha paandu maathirai was 53.61%
- The acid insoluble ash value was 30.79%
- The water soluble ash value was 35.51%
- Alcohol soluble extractive value was 18.12%
- Water soluble extractive value was 28.21%

5. DISCUSSION :

Standardization is a quality control process of assessing the quality and purity of Herbo-mineral drugs, using a wide range of standards, including chemical, biological and physical observation. Standardization of Herbo mineral drugs is significant in order to guarantee the effectiveness, safety and quality of herbal medicine and integrate it into the current healthcare system. The quality of an end product of a drug is very significant, especially in the pharmaceutical industry. Despite the considerable risk to patients' lives and health, regulatory bodies have taken special care and developed a number of standards to ensure a suitable level of quality in the pharmaceutical drugs.

PITHA PAANDU MAATHIRAI is an internal medicine to treat various ailments. Maathirai is one of the thirty-two forms of enteral internal medicine which possesses haematenic properties likely Iron and thus standardization plays a major role to prove its quality. The Physico-chemical analysis of PPM from Table explains the parameters such as Moisture content, Total ash value, Acid insoluble ash, Water soluble ash, Water soluble extraction, Alcohol soluble extraction and pH are within the normal limits. The ingenuity, purity, and quality of the test drug PPM are demonstrated by its organoleptic properties, color, texture, taste, and delicate powder nature. The drug PPM was brownish in color and it was an odourless drug with pH of 10.80 % that reveals it is slightly alkaline and so our stomach will absorb more of it than the intestine . It is apparent that this Herbo - mineral formulation contains significant minerals that maintain the body's normal pH balance and also in simultaneously normalising trace elements uptake in the body and thus counteracting the disease progression. The loss on drying value represents the drug's moisture content, which was assessed as 6.24%. The moisture content of the Herbo mineral drug should be minimal since it promotes the growth of live organisms, fungi, or insects and causes degradation on subsequent hydrolysis. By this way the study helps to standardise the preparing procedure of this Herbo mineral composition.

The total ash value of the test drug PPM was 53.61% and the value of insoluble acid ash was 30.79% showing the purity of the trial drug. One of the most important quantifiable elements for the herbo mineral drug's standardization is its ash value. An elevated ash value indicates a higher concentration of inorganic elements6. The water and alcohol soluble extractive values were found as 28.21 % and 18.12 % respectively. Extractive values are helpful in determining the percentage of chemical soluble in a specific solvent and in determining the amount of phytoconstituents present in the herbo mineral medicine5. The trial drug PPM has a pH value of 10.8 indicates that it is weekly alkaline. A drug's pharmacological activity and bioavailability are influenced by its solubility property. The trial drug PPM is highly soluble in water and soluble in ethanol, insoluble in chloroform and ethyl acetate in chloroform and ethyl acetate.

6. CONCLUSION:

This study reveals the purity and bioavailability of the Pitha Paandu Maathirai. The analysis expounds the presence of essential trace elements in test drug PPM which is necessary for a variety of vital biological activities. Moreover, pharmacological research must be carried out to validate the therapeutic value of Pitha Paandu Maathirai.

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