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Research Article

Physiochemical analysis and heavy metal analysis of Siddha formulation Naaga Sangu Parpam

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ABSTRACT

The use of traditional medicines rapidly increases all over the world. Standardisation of herbo-mineral formulations is mandatory to assess the quality of traditional medicine. *Naaga Sangu Parpam(NSP*) is one of the major Siddha formulations which is widely used in Siddha system of medicines.

This paper deals with the Physio-chemical parameters and analysis of heavy metals by Atomic Absorption Spectroscopy (AAS) of NSP. This study reveals that the presence of Zinc, Iron, Sulphide, Sulphate, Calcium etc and in physio-chemical analysis its PH value is 3.70 loss of drying is 2.80% and its total ash value is 76.76%.

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INTRODUCTION

Siddha system is one of the traditional medical systems in the world and deals with physical, psychological ,social and spiritual well-being of an individual. The roots of this system are twined with the culture of ancient Tamil civilization. The Siddha system of medicine is categorized into two classes

1.Internal medicine

2.External medicine

Among 32 internal medicines *Parpam* is one among them and its shell life is for 100 years. the WHO estimates that perhaps 65 to 80% of population uses traditional medicine .In present scenario standardization is need to prove the Safety and chemical profile of any medicine.

MATERIALS AND METHODS

Required raw drugs:

1. Naa*gam* - Zinc

2. Sangu - Conch shell

3. Utthamani leaf juice - Pergularia daemia. Linn

SOURCE OF RAW DRUGS

The required raw drugs for preparation of *Naaga Sangu Parpam* are purchased from a well reputed country shop. The raw drugs will be authenticated by Pharmacogonist Siddha central research institute, Arumbakkam, Chennai. The raw drugs will be purified and the medicine will be prepared as per SOP in the Gunapadam Laboratory.

PURIFICATION OF TRIAL DRUGS:

1. *Naagam:* The ghee of south Indian mahua (Madhuca longifolia) – *Illuppai ghee* is taken in a mud pot. Two pieces of Ammonium chloride *(Navaa Charam*) are placed in the pot in such a way that half of the portion of the pieces is immersed in the ghee on opposite direction The Zinc melted in a iron pot is poured twenty one times to the ghee of south Indian mahua and washed.

2. *Sangu:* Equal quantities of lime stones and fuller‟s earth will be taken and mixed with 8 parts of purified water, the clear filtrate will be obtained. Conch shell will be allowed to boil in the above said filtrate for a sufficient period.

METHOD OF PREPARATION:

Purified *naagam* will be taken in a iron pan and subjected to excessive heat then the *naagam* will reach melting consistency.

Conch powder will be poured over the melting *naagam* and the mixture will be stired well till it reached powder form.

The powder will be ground with *utthamani* leave juice for 12 hours and kept in the earthen pan covered with another earthen pan and finally sealed with clay smeared cloth and subjected to calcination process with cowdung cakes.

DRUG STORAGE:

The trial drug *Naaga Sangu Parpam* will be stored in a clean and dry wide mouthed glass bottle.

DISPENSING:

 The prepared drug will be dispensed in sachets.

 The study drug packages will contain130mgs of *Naaga Sangu Parpam* powder sachets. At each visit (once in 8days for 24days) the patients will be given the above drug packages for 8 days treatment. At each visit the patients will be advised to return the unconsumed drugs and return to the research scholar.

Dosage : 130mg (twice/day) after food

Adjuvant : Cow‟s Ghee

Rout of Administration : Oral Route

Duration : 24 days.

PHYSIO-CHEMICAL ANALYSIS OF NAAGA SANGU PARPAM:

1. **Colour Examination**:

5gm of *Naaga Sangu Parpam* were taken into watch glasses and positioned against white back ground in white tube light. Its colour was observed by naked eye

2**. Moisture Content:**

An accurately weighed 1g *of Naaga Sangu Parpam* formulation was taken in a tarred glass bottle. The crude drug was heated at 1050C in an oven till a constant weight. Percentage moisture content of the sample was calculated with reference to the shade dried material.

3. **Determination of total ash:**

Weighed accurately 1g *of Naaga Sangu Parpam* formulation was added in crucible at a temperature 600^0C in a muffle furnace till carbon free ash was obtained. It was calculated with reference to the air dried drug.

4. **Determination of acid insoluble ash**:

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

5. **Determination of water soluble ash:**

Total ash 1g was boiled for 5min with 25ml water and Insoluble matter collected on an ash less filter paper was washed with hot water and ignited for 15min at a temperature not exceeding 450^0C in a muffle furnace. Difference in weight of ash and weight of water.

6. **Determination of water soluble Extractive**:

1gm of air dried drug, coarsely powered *Naaga Sangu Parpam* was macerated. With 100ml of distilled water in a closed flask for twenty-four hours shaking frequently. Solution was filtered and 25 ml of filtrated was evaporated in a tarred flat bottom shallow dish, further dried at 100^0 C and weighted. The percentage of water soluble extractive was calculated with reference.

7. **Determination of alcohol soluble extractive**:

1 gm. of air dried drugs, coarsely powdered *Naaga Sangu Parpam* was macerated with 100 ml. alcohol in closed flask for 24 hrs. With frequent shaking. It was filtered rapidly taking precaution against loss of alcohol. 25ml of filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100^0C and weighted. The percentage of alcohol soluble extractive was calculated with reference to air dried drug.

8. **pH Value:**

Potentiometrically pH value was determined by a suitable pH meter

RESULTS

PHYSIO-CHEMICAL ANALYSIS OF *NSP*:

Table 1 & 2 shows the result of physio-chemical analysis of *NSP*:

Table 1.Physio-chemical parameters of *NSP*

S .no	parameters	results
1	Appearance	White slightly grey fine powder.
2	PH at 25oc	7.2-7.5
3	Solubility	Partially soluble in water and acid.

Table 2. Physio-chemical parameters of *NSP*

S.NO	PARAMETERS	RESULTS
1	Loss of drying at 1050c	80%
2	Total ash	76.76%
3	Acid insoluble ash	3.42%
4	Water soluble extraction	7.16%
5	Acid soluble extraction	4.86%

Table.3 Heavy metal analysis of *NSP:*

S.NO	NAME OF THE ELEMENTS	RESULTS
1	Lead	0.0128 ppm 10 ppm (WHO)
2	Cadmium	Not detected0. 3 ppm (WHO)
3	Arsenic	Not Detected 3 ppm (API)
4	Mercury	Not Detected 1 ppm (API)

DISCUSSSION

The physio-chemical analysis of *NSP* (table 1 & 2) concludes the following results; *NSP* was a white coloured fine powder, odourless without any taste. The parpam answered the following tests showing that it was properly processed. There was no metallic luster when taken between the index finger and thumb and spread it was as fine as to get easily in to finger lines.

When a small quantity of parpam was spread on cold and still water it floated on the surface. The ash content of 76.67% indicated that the drug contains organic matter and negligible amount of inorganic matter. Acid insoluble ash was 3.42% revealing that the parpam contains negligible amount of acid insoluble silica and salts of tin.

Physico-chemical properties of *Naaga Sangu Parpam* has given the result that the ph of *NSP* was 7.2-7.6 which was weakly alkali. Hence on oral intake it will not cause any strong alkali or acid like irritation to the gastrointestinal tract ie, Any physical irritation. Qualitative analysis of *NSP* revealed the presence of Zinc, Iron, Sulphide, Sulphate, Calcium etc.

CONCLUSSION

- The aim of the study was to compare the therapeutic efficacy of the trail DRUG - *Naaga sangu parpam* (*NSP*) (internal) in *Rattha moolam*.
- The biochemical study of the trial *DRUG NAAGA SANGU PARPAM (NSP)* - reveals the presence of Zinc, Iron, Sulphide, Sulphate , Calcium etc.
- Heavy metal analysis of the trial drug *NAAGA SANGU PARPAM(NSP)* reveals the presence of Lead is within permissible limit -0.0128ppm (10ppm as per WHO permissible limit) and cadmium ,arsenic ,mercury were not detected
- The confirmation of nanoparticle size and the contents of heavy metals are under the deduction limit favors the *NAAGA SANGU PARPAM* as a safer drug under Siddha system.
- The results of the study are concluded that the qualitative analysis of *NAAGA SANGU PARPAM (NSP*) reveals the purity and bio-availability of the drug.

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