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ANALYTICAL STUDY OF LOKANATHA RASA

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ABSTRACT

In any research, analysis is an important tool to estimate the quality, safety and efficacy of the product. These controlled measures collectively known as Quality Assurance (QA) operates not only at the final stage but at all stages starting from raw material to finished product. Ayurveda has explained these quality checks at each and every step and also different analytical parameters for all different dosage forms. Based upon them different modern analytical procedures also have developed for ensuring the final products quality. In the present study Lokanatha rasa was prepared according to the classical reference and was further analyzed based on classical siddhi *lakshanas* and modern analytical tools to know the chemical configuration and the physical and chemical changes which occur during and after different pharmaceutical steps.

KEYWORDS: *Lokanatha rasa*, Quality control, Analytical parameters.

INTRODUCTION

Definition of the term Analysis[1]

A thorough study of the identification and measurement of the chemical constituents of a substance or a detailed examination of anything complex in order to understand its essential features is called analysis. Pharmaceutical analysis plays a major role today and it can be considered as an interdisciplinary subject. Ayurvedic formulations contain mainly plant or mineral or animal origin drugs.Ayurvedic classical texts have explained systematically identification of raw drugs,different procedures of preparation and many confirmative tests for end products for quality assurance.

Various modern parameters like organoleptic characters,physical constants,many sophisticated instruments etc can be used even for Ayurvedic formulations and compared with established standards. In the present study *Lokanatha rasa* was prepared according to the classical reference and was further analyzed based on classical siddhi *lakshanas* and modern analytical tools to know the chemical configuration and the physical and chemical changes which occur during and after different pharmaceutical steps.

MATERIALS AND METHODS

Types of Analysis[2]

There are 2 types of analysis.

1) **Qualitative analysis**: It is concerned with which components are present in the given sample.
2) **Quantitative analysis**: It is to determine the quantity of individual component in the given sample.

Analytical study in this research work

In the present study, *Lokanatha rasa* was prepared by doing *Kaparda poorana* of *Kajjali* prepared of *Rasasindoora* and *Suddha Gandhaka* and later subjected to *Puta*.[3] This formulation was analyzed for the following parameters.

ANALYTICAL PARAMETERS

The sample were analyzed at ISO-LABS, Maruti Nagar, Bangalore.

1. Organoleptic characters: color, odor, appearance, taste, touch.
2. Physico chemical parameters

- Loss on ignition
- Moisture%
- Ash content
- Acid insoluble ash

- Water soluble ash
- pH

3. Instrumental analysis: ICP MS , SEM EDX

Methodology of analysis

1. Organoleptic characters

Method: Organoleptic characters of *Lokanatha rasa* were examined by means of Sensory organs.

- Form: *Bhasma* form (fine powder)
- Color: Creamish white
- Taste: No characteristic taste
- Odor: No characteristic odor
- Consistency: solid

Classical parameters

- *Rekhapoorna*[4]
- *Varitaratwa*[5]
- *Slaksnatva*
- *Mrudutv*a

2. Physico chemical parameters

A) Determination of pH[6]

The pH value of an aqueous liquid may be defined as the common logarithm of the reciprocal of the hydrogen ion concentration expressed in g per liter.

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

B) Ash Value[7]

Method: Incinerate about 2 to 3 g accurately weighed, of the ground d rug in a tared platinum or silica dish at a temperature not exceeding 450 ^{0}C until free from Carbon, cool and weigh. If carbon free ash cannot be obtained by this way, exhaust the charred mass with hot water, collect the residue on an ash less filter paper, incinerate the residue and filter paper, add the filtrate, evaporate to dryness and ignite at a temperature not exceeding 450 ^{0}C. Calculate the percentage of acid ash with reference to air dried drug.

C) Acid Insoluble Ash[8]

Method: To the crucible containing total ash add 25 ml of dilute Hydrochloric acid.

Collect the insoluble matter on an ash less filter paper (Whatman 41) and wash with hot water until the filtrate is neutral. Transfer the filter paper containing the insoluble matter to the original crucible, dry on a hot plate & ignite to a constant weight. Allow the residue to cool in a suitable desiccator for 30 minutes and weigh without delay. Calculate the content of acid insoluble ash with reference to air dried drug.

Water Soluble Ash[9]

Method: Boil the ash for 5 minutes with 25 ml of water; collect insoluble matter in a Gooch crucible / on an ash less filter paper, wash with hot water and ignite for 15 minutes at a temperature not exceeding 450 ^{0}C.

D) Determination of Loss on Ignition.

Method: A silica crucible previously ignited for one hour at a temperature not exceeding 500°C was weighed and cooled in desiccator. Accurately weighed sample was transferred to the crucible. The crucible was weighed accurately. The loaded crucible placed in the muffle furnace and ignited the crucible to 500°C, until constant weight is indicated. Then loss on ignition was calculated with reference to air dried drug.

f) Determination of Moisture content (Loss on drying)[10]

Method: Accurately weighed sample was taken in the tared evaporating dish dry at 105^{0}C for 5 hours, and weighed. Continued the drying and weighings at one hour interval until the difference between two consecutive weighing corresponded to not more than 0.25%.Constant weight was reached when two consecutive weighings after drying for 30 minutes and cooling for 30 minutes in a dessicator showed not more than 0.01 g difference.

DISCUSSION OF ANALYTICAL STUDY

1. Organoleptic characters

Form: After the *Puta*, in prepared *Lokanatha rasa*, the burnt *Kapardas* were brittle and soft and on trituration it was converted into fine powder which was *Rekhapoorna* and *Varitara*, *Slakshna*. These parameters quantify the physical nature of the formulation which indirectly modify the drug dissolution and absorption.

Varitaratva specifies the ability of the formulation to retain the specific gravity less than to the water and also mentions intermolecular forces among the particles of the drug.

Rekhapoornatva indicates fineness and the fine particles influence the free movement of the particle and facilitates absorption, assimilation to the body system. The SEM technique reveals the desired specification of fineness or *Rekhapoornatva*.

Color: Creamish white like that of *Kaparda Bhasma*.

Taste: no characteristic taste and did not produce any burning sensation on the tongue which shows the proper preparation of the formulation.

Odor: no characteristic odor which shows the *Paka* was optimum.

2. Physico chemical parameters

a) Determination of pH

This test is done to determine the acidity or alkalinity of the sample. The obtained pH was 11.14 which indicates

the sample is alkaline. This alkalinity might help in treating *Atisara, Amlapitta* and other acid peptic disorders by acid neutralization of gastric mucosa.

b) Total ash

This test is done to determine the amount of inorganic salts in the sample. Total ash was 62.08, which might be due to the high calcium content in the finished product.

c) Acid Insoluble Ash.

It is the ash fraction that is insoluble in dilute HCl solution. An ash constitutes inorganic matter, but acid insoluble ash consists mainly of silica and silicates. The acid insoluble ash in this formulation was 4.86.

d) Water Soluble Ash

In this formulation, water soluble ash was 0.002, which was quite minimal due to presence of inorganic compounds.

e) Loss on ignition

LOI is used to determine water content levels, amount of organic matter, and amount of volatile compounds. In this formulation LOI was 37.92 which could be due to Gajaputa *Paka* and led to some loss of organic and volatile principles.

f) Moisture Content

Moisture content plays a very important role in the physical appearance like shape, color, texture, weight, taste and also it affects the products shelf life, freshness, quality and resistance to bacterial contamination. Lower its value more stable the drug is. In this formulation the moisture percentage was 0.29 which was very minimal indicating more shelf life.

CONCLUSION

By doing the analytical study, the prepared *Lokanatha Rasa* passed through various *Bhasma Pariksha* and physico chemical tests.

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