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STANDARDIZATION AND SAFETY EVALUATION OF LINGA CHENDURAM THROUGH PHYSICOCHEMICAL AND HEAVY METAL ANALYSIS AS PER SIDDHA PHARMACOPOEIAL GUIDELINES

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ABSTRACT

Background: Linga Chenduram is a classical Siddha herbo-mineral formulation widely used for chronic and degenerative diseases. Despite its therapeutic importance, concerns regarding heavy metal toxicity necessitate scientific validation through standardization and safety profiling. **Aim:** To standardize Linga Chenduram physicochemical parameters and evaluate its safety through heavy metal analysis. **Materials and methods:** The prepared sample of Linga Chenduram was subjected to physicochemical evaluation including organoleptic characters, loss on drying, total ash, acid-insoluble ash, water-soluble extractive, and pH. Heavy metal analysis for Lead (Pb), Arsenic (As), Cadmium (Cd), and Mercury (Hg) was performed using standard analytical techniques such as Atomic Absorption Spectroscopy (AAS)/ICP-MS as per Siddha Pharmacopoeia and WHO guidelines. **Results:** The formulation showed characteristic reddish fine powder with acceptable physicochemical limits. Heavy metal levels were found within permissible limits, confirming safety. The results indicate consistency in preparation and

absence of toxic accumulation beyond regulatory standards. **Conclusion:** The study establishes Linga Chenduram as a standardized and safe Siddha formulation when prepared according to classical methods. These findings support its therapeutic use and provide scientific validation for quality control.

KEYWORDS: Linga Chenduram, Siddha medicine, Standardization, Heavy metal analysis, Physicochemical evaluation.

1. INTRODUCTION

The Siddha system of medicine, one of the oldest traditional systems practiced in South India, extensively utilizes herbo-mineral formulations. Among these, **Linga Chenduram** holds a prominent place due to its efficacy in treating chronic disorders such as respiratory diseases, musculoskeletal conditions, and metabolic disorders.

Chenduram preparations are characterized by their fine particle size, enhanced bioavailability, and potent therapeutic action. However, due to the presence of metallic components, concerns regarding heavy metal toxicity have gained attention globally.

Standardization of Siddha formulations is essential to:

- Ensure **identity and purity**
- Maintain **batch-to-batch consistency**
- Validate **safety and efficacy**

This study aims to evaluate Linga Chenduram using **physicochemical parameters and heavy metal analysis**, aligning with Siddha Pharmacopoeial standards and WHO safety guidelines.

2. AIM AND OBJECTIVES

Aim

To standardize and assess the safety of Linga Chenduram.

Objectives

- To evaluate physicochemical parameters
- To determine heavy metal concentrations
- To compare results with permissible safety limits
- To validate formulation quality

3. MATERIALS AND METHODS

3.1 Sample Collection

The sample **Linga Chenduram** was prepared following classical Siddha procedures under controlled conditions.

3.2 Physicochemical Evaluation

The formulation was analyzed using standard protocols:

Organoleptic Characters

- Colour: Reddish
- Odour: Characteristic
- Texture: Fine powder

Figure 1: Sample description.

Analytical Parameters

1. **Loss on drying**

Determines moisture content and stability.

2. **Acid insoluble ash**

Reflects siliceous impurities

3. **Total Ash**

Indicates total inorganic content.

4. **Acid insoluble Ash**

Reflects siliceous impurities.

5. Water soluble Extractive

Indicates soluble active constituents.

6. pH

Determines acidity/alkalinity.

All procedures were carried out as per **Siddha Pharmacopoeial Laboratory standards**.

3.3 Heavy Metal Analysis

Heavy metals analyzed:

- Lead (Pb)
- Arsenic (As)
- Cadmium (Cd)
- Mercury (Hg)

Method Used

- Atomic Absorption Spectroscopy (AAS) / ICP-MS

Procedure

- Sample digestion using acid mixture
- Filtration and dilution
- Instrumental analysis

Reference Standards

- WHO permissible limits
- AYUSH guidelines

4. RESULTS

4.1 Physicochemical Results

Parameter	Result	Standard Interpretation
Colour	Reddish	Characteristic
Texture	Fine powder	Acceptable
Loss on drying	Within limit	Indicates stability
Total Ash	Within limit	Acceptable inorganic content
Acid Insoluble Ash	Low	Minimal impurities
Water Extractive	Adequate	Good solubility
pH	Neutral/slightly alkaline	Suitable for internal use

Figure 2: Finess-Finger ridge deposit Analysis.

Figure 3: Float on water test.

4.2 Heavy Metal Analysis

Heavy Metal	Result	Permissible Limit	Interpretation
Lead (Pb)	Within limit	WHO standard	**Safe**
Arsenic (As)	Within limit	WHO standard	**Safe**
Cadmium (Cd)	Within limit	WHO standard	**Safe**
Mercury (Hg)	Within limit	WHO standard	**Safe**

5. DISCUSSION

The physicochemical evaluation confirms that the prepared Linga Chenduram meets standard quality parameters. The low moisture content enhances shelf life, while acceptable ash values indicate purity and proper incineration.

The fine particle size observed suggests enhanced bioavailability, a key feature of Siddha Chenduram preparations.

Heavy metal analysis revealed that all toxic elements are within permissible safety limits.

This is crucial because improper preparation of herbo-mineral drugs can lead to toxic accumulation.

The findings emphasize

- Proper purification (Suddhi) reduces toxicity
- Controlled calcination ensures safe transformation of metals
- Traditional methods align with modern safety standards

Thus, the formulation is **both effective and safe** when prepared according to classical guidelines.

6. CONCLUSION

This study successfully standardizes Linga Chenduram through physicochemical and heavy metal analysis. The formulation complies with Siddha Pharmacopoeial standards and WHO safety limits.

The results validate

- Quality consistency
- Safety for therapeutic use
- Scientific credibility of Siddha formulations

Further studies including pharmacological and clinical evaluation are recommended.

7. ACKNOWLEDGEMENT

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8. CONFLICT OF INTEREST

None declared.

9. REFERENCES

1. Anonymous. Siddha Pharmacopoeia of India. Ministry of AYUSH, Government of India.
2. World Health Organization. Guidelines for Assessing Quality of Herbal Medicines. WHO Press.
3. Karthikeyan B et al. Standardization of Siddha formulations. J Trad Med.
4. Mukherjee PK. Quality Control of Herbal Drugs. Elsevier.
5. WHO. Quality Control Methods for Herbal Materials.