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## Standardization Of Triphala Churna: A Polyherbal Formulation

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### ABSTRACT

To achieve the quality of medications for their medicinal benefits, herbal formulations must be standardized. Inducing the immune system, improving digestion, relieving constipation, cleaning the gastrointestinal tract, and treating diabetes and eye disorders are all benefits of Dabur Triphala Churna. The current work focuses on standardizing Dabur Triphala Churna, which includes Terminalia chebula (Retz.) (Harada), Terminalia officinalis (Garetn.) (Amla), and Terminalia bellerica (Gaertn)Roxb.(Baheda). According to the World Health Organization's rules, it was standardized to assess the quality of medications based on the concentration of their active ingredients. Morphological traits and physicochemical attributes are among the many parameters that are evaluated. It was discovered that the established criteria were sufficient to standardize the Triphala churna and could be The obtained results could be regarded as a tool to help manufacturers, research organizations, and regulatory bodies develop standard formulations with significant efficacy.

**KEYWORDS:** Standardization, Triphala Churna, Traditional medicine, Physico-chemical parameters, Marketed formulation (MF), WHO guidelines.

### 1. INTRODUCTION

The practice of ayurvedic medicine has grown significantly during the past few decades. The standardization and assessment of ayurvedic formulations are essential. [1] The purpose of standardization is to ensure that every drug packet sold contains the right amount and will affect its therapeutic efficacy. [2] In 1992, WHO also released Guidelines for Quality Control Methods for Medicinal Plant Materials, with the explicit goal of offering general test procedures for accurate botanical evaluation and identification of medicinal plants that are widely used in home and conventional medicines. [3] An ancient and widely used Ayurvedic powder in Indian medical systems is triphala. Emblica officinalis, Terminalia chebula, and Terminalia bellerica were combined to create this well-known combination.

In equal amounts according to the Ayurvedic Formulary of India (AFI) examination. The mixture serves as a laxative, cleansing, and rejuvenating agent and is prescribed as a first line of treatment for numerous illnesses. [4] In accordance with the instructions provided in ancient writings, the traditional processes are used to prepare Triphala churna. This might not have the batch-to-batch stability and quality that is sought. As a result, this formulation requires standardization in accordance with WHO guidelines. [5] Justifying the appropriateness of herbal crude pharmaceuticals in the current medical system requires careful consideration

of their formulation and evaluation. Synthetic drug standardization does not provide any issues with well defined analytical parameters. Using five or more different botanical components in a single recipe is not uncommon.

When there is no reference standard for identification, the batch-to-batch discrepancy begins with the raw material collection itself. WHO has emphasized the necessity of employing contemporary methods and appropriate criteria and parameters to ensure the quality control of goods made from medicinal plants. Standardized goods and services provide advantages. Standardization offers significant advantages to businesses, including a strong platform for the development of new technologies and an opportunity to exchange and enhance current procedures. Since standardization supports legislative, regulatory, and policy activities, it also plays a critical role in supporting governments, administrations, regulators, and the legal profession.

## 2. MATERIALS AND METHODS

**Material collection:** An authentic Kanpur trader sold a marketed Triphala Churna mixture. The Pharmacognosy Research Lab in Kanpur used standard organoleptic features to identify the marketed formulation. Until it was used for additional research, the formulation was stored in a secure, dry location out of direct sunlight.

**2.1 Organoleptic Evaluation:** This method involves assessing a formulation based on its color, taste, odor, and other characteristics. The samples' organoleptic characteristics were examined using the methodology outlined by Siddique et al. [9]

**Table 1: Organoleptic Properties of Triphala Churna.**

| Parameter  | Marketed formulation |
|------------|----------------------|
| Appearance | Powder               |
| Colour     | Yellowish            |
| Odour      | Characteristics      |
| Taste      | Salty                |

## 2.2 Physicochemical Evaluation

### 2.2.1 Determination of Total Ash

Identifying the physiological ash (ash from plant tissue) and nonphysiological ash (ash from extraneous substances, like sand and dirt that adhere to the drug's surface) is what total ash determination entails. A appropriate tared silica crucible that had been previously fired and weighed was filled with 2g of the formulation's powdered ingredient for detection. The powder was chilled in a desiccator, burned by progressively raising the temperature to no more than 450°C until it was carbon-free, weighed, and the percentage of ash was computed by comparing the weight of the crucible with its empty weight and the weight of the crucible with all of the ash. [10]

### 2.2.2 Acid insoluble ash

After boiling the ash as described above for five minutes with 25 milliliters of diluted hydrochloric acid, the insoluble material was gathered on ash-free filter paper, cleaned with hot water, and burned to a consistent weight. It was determined what proportion of the air-dried medication was acid-insoluble ash. [9] 2.2.3 Ash Soluble in Water After five minutes of boiling with 25 milliliters of water, the ash was collected in an ash-less filter paper, cleaned with hot water, and ignited for fifteen minutes at a temperature that did not exceed 450 degrees Celsius. The weight of the water-soluble ash is the difference between the weight of the ash and the weight of the insoluble materials. The proportion of water-soluble ash in relation to the medication that was air-dried was computed.

### 2.2.3 Alcohol Soluble Extractive Value

In a closed flask, 5g of coarsely ground, air-dried medication was macerated with 100ml of alcohol for 24 hours, shaking regularly every 6 hours, and then left to stand for 18 hours. After that, it was quickly filtered to prevent solvent loss. In a shallow dish with a tared bottom, 25 milliliters of the filtrate were dried out at 105 degrees Celsius to a consistent weight and weighed. With reference to the air-dried medication, the proportion of alcohol-soluble extractive was computed and is shown as a percentage value.

### 2.2.4 Water Soluble Extractive Value

A closed flask containing 5g of coarsely powdered air-dried medication and 100 ml of water was macerated for 24 hours, shaking regularly every 6 hours, and then left to stand for 18 hours. Then, in order to prevent solvent loss, it was quickly filtered. Using a tared flat-bottomed shallow dish, 25 milliliters of the filtrate were dried out at 105°C to a consistent weight and weighed. The water-soluble extractive percentage, expressed as a percentage value, was computed using the air-dried medication as a reference. [10]

### 2.2.5 Loss on Drying

The mass loss, given as a percentage of weight, is known as loss on drying. Ten grams of excavated samples of each formulation were precisely weighed in a flat weighing vial that had been dried and tared, and they were then dried for five hours at 105 degrees Celsius. The percentage was computed using the starting weight as a guide.

**Table 2: Physicochemical Parameters: Triphala Churna Quantitative standards.**

| Parameter                  | Result in % w/w |
|----------------------------|-----------------|
| Total ash value            | 9.50%           |
| Acid insoluble ash         | 3.10%           |
| Aqueous soluble ash        | 5.10%           |
| Moisture content           | 12.5%           |
| Alcohol soluble extractive | 11.30%          |
| Aqueous soluble extractive | 41.30%          |

### 2.2.6 Bulk Density and Tap Density

A metric used to characterize the arrangement of particles or granules is called bulk density.  $D_b = M/V_b$  is the formula for calculating bulk density (D). where V is the packing's total volume and M is the particle mass. An equipment with a graded cylinder mounted on a mechanical tapping device (Jolting Volumeter) with a specially cut spinning can can be used to measure the packing's volume. Using a funnel, 100g of the weighing formulation powder was carefully put to the cylinder. Usually, after noting the initial volume, the sample was tapped until no more volume decline was observed. After tapping, the volume decreased, revealing the tapping density value, while the original volume provided the bulk density value. [10, 11]

### 2.2.7 Angle of Repose

Since angle of repose is related to interparticle cohesiveness, it has been used as an indirect way to measure powder flow ability. According to standard recommendations, powders with an angle of repose more than 50 degrees have flow properties that are not satisfactory, whereas those with an angle of repose close to 25 degrees have very good flow properties. A funnel that is fixed with its tip at a specific height—2.5 cm (H)—above the graph paper that is set on a level horizontal surface is used in both the fixed funnel and the freestanding cone methods. When the apex of the conical pile just brushed the funnel's tip, powder or granulation was gently poured through the funnel.[7, 8]  $\tan \theta = \frac{H}{R}$  or  $\theta = \arctan \frac{H}{R}$  R is the conical pile's radius; where is the angle of repose?

### 2.2.8 Hausner Ratio

It can be used to forecast the powder flow characteristics because it is associated with interparticle friction. While more cohesive, less flowable powders, like flakes, have a Hausner ratio more than 1.6, powders with little interparticle friction, like coarse spheres, have a ratio of about 1.2.  $D_f / D_o$  is the formula to calculate the Hausner ratio, where  $D_f$  is the taped density and  $D_o$  is the bulk density. [12, 13]

**Table 3: Physical characteristics of marketed formulation of Triphala churna.**

| Parameter       | Result    |
|-----------------|-----------|
| Tap density     | 0.62±2.45 |
| Bulk density    | 0.44±3.30 |
| Angle of repose | 32.1±1.67 |
| Hausner ratio   | 1.31±1.05 |

## 3. RESULTS AND DISCUSSIONS

The Triphala Churna was examined for the pertinent physical and chemical characteristics as part of the standardization process. The powder had a salty taste, was smooth, golden, and had a distinct smell. Table 1 listed the commercial formulation's organoleptic characteristics. The moisture content, ash content, water soluble extractive, methanol soluble extractive, acid insoluble ash, and water insoluble ash of Triphala Churna and its constituent ingredients were all tested for quality and determined to be within the acceptable parameters. Table 2 provides information on the formulation's ash and extractive levels. The mean (n=6) ± standard deviation (SD) is the way the results are presented. Differences were noted in the majority of the physicochemical parameters studied. Acid insoluble ash value was found to be 3.20%. The extractive values of formulations in water were found to be much higher than alcohol extractive values. The values are

mentioned in the Table 2. The flow ability of the formulation was found to be satisfactory, which was further confirmed by high values of Hausner ratio, presented in Table 3.

#### 4. CONCLUSION

When examined for the different specified parameters, the current study's findings verified that the commercially available formulation of Triphala churna fits the excellence on the quality scale. Overall, the metrics developed in this study would be used as benchmarks for future quality assurance of the commercial formulation. The information gathered will aid in the formulation's assessment for a number of reasons. The current study offers the researchers a methodology to standardize the marketed formulation based on the standards of the quality control parameters in addition to the standards.

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