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Development and Evaluation of Triphala Churna

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Abstract: *In the recent years there has been rapid growth in the field of herbal medicine most of the tradition systems of medicine are accepted universally after standardization only. it very important to develop an essential techniques to standardization of herbal related drugs. The present study standardization of Triphala Churna majorly focused on that area under WHO guidelines. Method: This polyherbal Churna used treat the constipation and other gastric disorders. In this study a prepared Thriphala Churna was comparatively standardized with the reference obtained from market. For the standardization of the above formulations were done by evaluating the macroscopical, microscopical, powder flow properties, extractive values, Physicochemical characters, heavy metal content detection, qualitavte and quantitive determination of tannins and alkaloids, TLC finger print, in-vitro anti-oxidant activity and cytotoxic activity to assess the quality and safety and therapeutic activity of formulation. Results: The above parameters for the both formulation complies with the strands. The flow properties are poor. From the preliminary phytochemical test revealed the presence of various bioactive constituents. Majorly the concentration of tannins and flavonoids are high in water extract and also the water extract having the good anti-oxidant and in vitro cytotoxic activity. Hence the Triphala extracts may be used for various Ayurvedic preparations to chronic diseases like cancer.*

Keywords: Cytotoxic activity, in-vitro anti-oxidant activity, standardization, Thriphala Churna, TLC finger print

I. INTRODUCTION

In recent years, there has been rapid growth in the field of herbal medicine. Most traditional systems of medicine are accepted universally only after proper standardization. Therefore, it is very important to develop essential techniques for the standardization of herbal drugs and formulations. The present study on the standardization of Triphala Churna is mainly focused on this aspect under WHO guidelines.

In Ayurveda, Triphala is a combination of three fruits namely Harad, Baheda, and Amla. These herbs are taken in a defined ratio to prepare Triphala powder. It is considered beneficial for balancing the three doshas: Vata dosha (Haritaki), Kapha dosha (Bibhitaki), and Pitta dosha (Amalaki).

Triphala Churna involves the meticulous preparation of a polyherbal formulation using dried powders of Amla (*Emblica officinalis*), Harad (*Terminalia chebula*), and Baheda (*Terminalia bellirica*). It is a traditional Ayurvedic remedy renowned for its digestive, detoxifying, and antioxidant properties and is generally prepared in a 1:1:1 ratio.

This polyherbal churna is used to treat constipation and other gastric disorders. In the present study, the prepared Triphala Churna was comparatively standardized with a marketed formulation. Standardization of the formulation was carried out by evaluating macroscopical and microscopical characteristics, powder flow properties, extractive values, physicochemical parameters, heavy metal detection, qualitative and quantitative estimation of tannins and alkaloids, TLC fingerprinting, in-vitro antioxidant activity, and cytotoxic activity to assess the quality, safety, and therapeutic efficacy of the formulation.

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CHURNA

Triphala Churna is a traditional Ayurvedic herbal powder composed of three dried fruits—Amla (Indian Gooseberry), Haritaki, and Bibhitaki. It is widely used to support digestive health, detoxification, and immunity. It acts as a gentle, non-habit-forming laxative and helps in constipation, metabolism regulation, and weight management while balancing the body's three doshas: Vata, Pitta, and Kapha.

HISTORY OF TRIPHALA CHURNA

Triphala, meaning "three fruits," is one of the oldest and most respected polyherbal formulations in Ayurveda, with a history spanning more than 3,000 years in India. It is a churna (powder) prepared from the dried fruits of Amalaki, Bibhitaki, and Haritaki.

Ancient Origins (1000–500 BCE)

Foundational Texts

Triphala is documented in the *Charaka Samhita* and *Sushruta Samhita*, the foundational texts of Ayurveda.

Traditional Uses

Traditionally, Triphala was used to balance the three doshas (Vata, Pitta, and Kapha) and as a *Rasayana* (rejuvenator) for promoting longevity and digestive health.

Supreme Medicine

Ancient Ayurvedic practitioners believed that daily consumption of Triphala, often mixed with honey and ghee, could help a person live a long and disease-free life.

LITERATURE REVIEW

Traditional Importance of Triphala Churna

According to Ayurvedic texts, Triphala acts as a "Rasayana" that promotes rejuvenation and longevity. The combination of the three fruits provides synergistic therapeutic effects due to the presence of tannins, flavonoids, gallic acid, vitamin C, and polyphenols.

Haritaki is mainly used for digestive and laxative activity.

Bibhitaki is useful in detoxification and respiratory disorders.

Amalaki possesses antioxidant and immunomodulatory properties.

COMPOSITION AND PHYTOCHEMISTRY

The therapeutic effects of Triphala are attributed to its rich phytochemical constituents, including:

- Tannins
- Gallic acid
- Chebulagic acid
- Chebulinic acid
- Flavonoids
- Vitamin C
- Polyphenols

PLAN OF WORK

- Collection of raw materials
- Authentication of drugs
- Drying of fruits
- Pulverization
- Sieving

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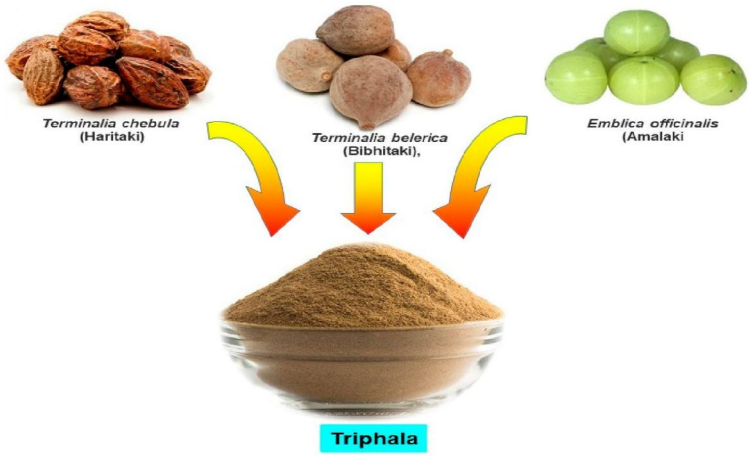
- Mixing in equal ratio
- Preparation of Triphala Churna
- Evaluation tests
- Stability studies
- Result and conclusion



AIM AND OBJECTIVES

Aim

Development and evaluation of Triphala Churna.

Objectives

Digestive Health: Acts as a mild laxative to relieve constipation, tone the colon, and promote regular bowel movements.

Detoxification: Cleanses the gastrointestinal tract and supports liver function by eliminating toxins (*Ama*).

Immunity and Rejuvenation: Rich in antioxidants and vitamin C, Triphala strengthens immunity and protects the body against oxidative stress.

Metabolism and Weight Management: Improves metabolism and helps in reducing body fat, cholesterol levels, and blood sugar management.

Antimicrobial and Anti-inflammatory Action: Supports oral hygiene, prevents plaque and gingivitis, and promotes healthy skin.

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Nutritional Value

ingredients	Picture	nutritional value
Amla		High nutritional value, particularly its rich antioxidant, polyph enol and vitamin C content
Harde		contains 18 amino acids, tannins (chebulinic acid) and significant minerals like phosphorus, potassium and magnesium and
Beheda		vitamin C : High levels , strengthening the

MATERIALS AND METHODS

Preservation

The prepared churna should be stored in airtight containers.

Precautions

- Cleaned and dried drugs should be used.
- Ingredients should be finely sieved.
- Each ingredient should be powdered separately before mixing.
- Mortar and pestle should be clean and dry.
- The formulation should be stored in a dry container.
- Preparation should be avoided during the rainy season.

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INGREDIENTS

- Amla powder
- Harad powder
- Baheda powder

APPARATUS

- Weighing balance
- Knife or cutter
- Drying tray
- Mortar and pestle
- Grinder/Pulverizer
- Sieve (No. 80 preferred)
- Mixing bowl or blender
- Airtight glass container
- Spatula
- Measuring cylinders/beakers

FORMULA

sr.no	Ingredients	Quantity Given (gm)	Role
1	Amla	6.3gm	Diuretic
2	Harde	6.3gm	Astringent
3	Beheda	6.3gm	Astringent

sr.no	Common Name	Botanical Name	Family
1	Haritaki	Terminalia chebula	Combretaceae
2	Bibhitaki	Terminalia belliric	Combretaceae
3	Amalaki	Phyllanthus emblica	Phyllanthaceae

Ingredient	Quantity
Amla Powder	1 Part
Harad Powder	1 Part
Baheda Powder	1 Part

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Ratio = 1 : 1 : 1

PROCEDURE

Weigh all ingredients accurately.
Mix properly by trituration in a mortar and pestle to obtain a fine powder.
Pass the powder mixture through a sieve.
Collect and evaluate the final mixture.

METHOD OF PREPARATION

Step 1: Collection
Collect dried fruits from authenticated sources.
Step 2: Cleaning
Remove foreign matter and impurities.
Step 3: Drying
Shade dry the materials to remove moisture.
Step 4: Powdering
Powder each ingredient separately.
Step 5: Sieving
Pass through sieve No. 80 for uniform particle size.
Step 6: Mixing
Mix all three powders in equal proportion (1:1:1).
Step 7: Storage
Store in an airtight container protected from moisture.

EVALUATION PARAMETERS

Organoleptic Evaluation
Organoleptic parameters help determine the identity, purity, and quality of the formulation.

Parameter	Observation
Color	Brownish to yellowish-brown
Appearance	Fine powder
Odor	Characteristic
Taste	Astringent
Texture	Smooth

PHYSICOCHEMICAL EVALUATION

Parameter	Observation
Loss on Drying	3–12% w/w
Total Ash Value	6–10%
Acid Insoluble Ash	Below 3%
pH	3.4–6.2
Water Soluble Extractive	Higher
Alcohol Soluble Extractive	Lower

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FLOW PROPERTY EVALUATION

1. Bulk Density

Bulk Density =Mass/Bulk Volume
=17.25/38
= 0.45gm/ml

2. Tap Density

Tap Density = Mass/Tap volume
=17.25/22.5
=0.76gm/ml

3. Hausner's Ratio

Housners ratio = Tap Density / BulkDensity
=0.7/0.45
=1.68%

4. Carr's Index

Carr'sIndex= (Tap Density - Bulk Density)/ Tap Density
= (0.76 - 0.45) / 0.76
=0.45

5. Angle of Repose

tanθ=h/r =38°

ADVANTAGES OF TRIPHALA CHURNA

- Mild natural laxative
- Improves digestion
- Natural herbal formulation
- Rich in antioxidants
- Anti-inflammatory activity
- Boosts immunity
- Antimicrobial activity
- Minimal side effects
- Supports overall health
- Economical and easily available

LIMITATIONS OF TRIPHALA CHURNA

- Variation in raw materials
- Bitter and astringent taste
- Moisture sensitivity
- Short shelf life if improperly stored
- Possible gastrointestinal disturbances
- Slow onset of action
- Need for standardization

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STABILITY STUDIES

1. Accelerated Stability Study

The formulation is stored under high temperature and humidity conditions to predict long-term stability in a shorter time.

Conditions

Temperature: 40°C ± 2°C

Relative Humidity: 75% ± 5%

Duration

3–6 months

2. Long-Term Stability Study

The formulation is stored under normal room conditions.

Conditions

Temperature: 25°C ± 2°C

Relative Humidity: 60% ± 5%

Duration

6–12 months or longer

OBJECTIVES OF STABILITY STUDIES

- To determine shelf life of Triphala Churna
- To evaluate physical and chemical stability
- To detect microbial contamination
- To determine suitable storage conditions
- To ensure safety and therapeutic efficacy

RESULT AND DISCUSSION

Organoleptic Evaluation

Parameters	Observation
Color	Brown
Odor	Characteristic aromatic
Taste	Astringent and slightly bitter
Texture	Fine powder

Flow Property Evaluation

Parameters	Result
Bulk Density	0.45gm/ml
Tapped Density	0.76gm/ml
Carr's Index	0.45
Hausner Ratio	1.68%
Angle of Repose	38°

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DISCUSSION

The prepared Triphala Churna showed satisfactory pharmaceutical and physicochemical characteristics. Organoleptic evaluation confirmed the typical appearance, odor, and taste of Triphala prepared from:

- Haritaki
- Bibhitaki
- Amalaki

The moisture content was found to be low, indicating reduced chances of microbial spoilage and improved stability during storage.

Ash values were within acceptable limits, suggesting low inorganic contamination and good quality of crude drugs. Water-soluble and alcohol-soluble extractive values confirmed the presence of active phytoconstituents responsible for pharmacological activity.

The pH of the formulation was slightly acidic, which is characteristic of Triphala due to the presence of tannins and vitamin C.

Overall, the results demonstrated that the prepared Triphala Churna complied with standard Ayurvedic and pharmacopoeial specifications and possessed good quality, stability, and therapeutic potential.

II. CONCLUSION

Triphala Churna is a traditional Ayurvedic polyherbal formulation prepared by mixing equal proportions of the dried fruits of *Terminalia chebula* (Haritaki), *Terminalia bellirica* (Bibhitaki), and *Phyllanthus emblica* (Amalaki). The preparation process involves proper cleaning, drying, pulverization, sieving, and blending of the ingredients to obtain a fine and homogeneous powder.

The evaluation of Triphala Churna showed that the formulation complies with standard organoleptic and physicochemical parameters such as color, odor, taste, particle size, ash value, extractive value, moisture content, and pH.

Phytochemical screening confirmed the presence of beneficial constituents including tannins, phenolics, flavonoids, glycosides, and vitamin C, which contribute to its therapeutic activity.

The formulation demonstrated significant medicinal properties such as antioxidant, digestive, mild laxative, antimicrobial, and rejuvenating effects. Proper preparation and quality evaluation ensure the purity, safety, efficacy, and stability of the formulation.

Therefore, Triphala Churna remains an effective and widely used herbal preparation in Ayurvedic medicine for maintaining overall health and treating various disorders naturally.