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Formulation And Evaluation Of Triphala Churna

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ABSTRACT :

A combination of three fruits has been well formulated traditionally as part of Ayurvedic medicine in the form of Triphala Churna, comprising of Amalaki (Emblica officinalis), Haritaki (Terminalia chebula), and Bibhitaki (Terminalia bellirica), having unique therapeutic benefits each. The objective of this article is to develop and evaluate a formulation of Triphala Churna regarding its physicochemical characterization and quality control. Formulation entails equal proportions of these fruits as it would further enhance their synergy to give antioxidant, anti-inflammatory, digestive, and immune enhancement effects. The individual components of Triphala have been used for ages to treat a number of health disorders, including digestive disorders, inflammation, and oxidative stress.

The evaluation process includes a series of rigorous quality control tests, such as determination of moisture content, ash values, extractive values, and microbial analysis, ensuring the safety, efficacy, and consistency of the product. Additionally, the study includes tests for active constituents, which are believed to contribute to the therapeutic actions of Triphala. The physicochemical properties, including particle size and solubility, are analyzed to assess the formulation's stability and bioavailability. This study aims to give a comprehensive view of the quality parameters of Triphala Churna and its potential therapeutic applications in modern health care. The results of this study may help validate the traditional claims of Triphala and support its inclusion in contemporary health practices. This investigation provides insights into the quality control and standardization of herbal formulations, fostering their integration into mainstream medicine.

Keywords: Triphala churna, moisture content, inflammation, ash value, quality control, oxidative stress

Introduction :

Traditional Ayurvedic herbal preparation Triphala Churna has been largely recognized for the potential therapeutic application towards overall health and wellness. Comprising three fruits- Amla (*Emblica officinalis*), Haritaki (*Terminalia chebula*), and Bibhitaki (*Terminalia bellirica*), Triphala has been an age-old drug, used in diverse health practices that support digestion, detoxification, and immune functions [1].

Evaluation of Triphala Churna is very important for the purpose of safety and efficacy in modern health care [2]. Quality control testing involves a set of rigorous tests that are conducted to determine various parameters such as moisture content, ash values, extractive values, and microbial analysis [3]. These tests confirm that the product is safe, free from contaminants, and has consistency. In addition, the research is focused on identifying active fractions in Triphala, such as polyphenols, flavonoids, and tannins, that are supposed to account for its medicinal activities [4]. The study of these compounds will enable researchers to understand better about their role in the successful formulation of the formulation. In addition, physicochemical characteristics such as particle size, solubility, and bioavailability of Triphala Churna are studied to determine the shelf life and rate of absorption of the drug substance [5]. These properties play an important role in ensuring the formulation's consistency and therapeutic effectiveness.

The results of this comprehensive study give valuable insight into the quality parameters of Triphala Churna, thereby validating the traditional therapeutic claims of this Ayurvedic drug and supporting its incorporation into modern health care practices [6]. By setting standards for herbal formulations, the present research works toward the mainstreaming of traditional medicines, which can be used in contemporary treatment regimens safely and effectively.

The combination of Amalaki (*Emblica officinalis*), Haritaki (*Terminalia chebula*), and Bibhitaki (*Terminalia bellirica*) is widely known as Triphala in Ayurvedic medicine. It is a well-recognized herbal formula in traditional Indian medicine, used for its therapeutic properties [7].

Materials and methods :

Collection of material:

The ingredients used in the Triphala Churna are Amla (*Embellica officinalis*), Behda (*Terminalia bellerica*), Hirda (*Terminalia chebula*) were purchased from local market.

Preparation

Preparation of Triphala Churna Fruits of *Terminalia chebula*, *Terminalia bellerica* and *Emblica officinalis* were powdered. The powders were passed through sieve No 80. The Triphala churna was prepared by mixing an equal proportion of powdered fruits [8,9].

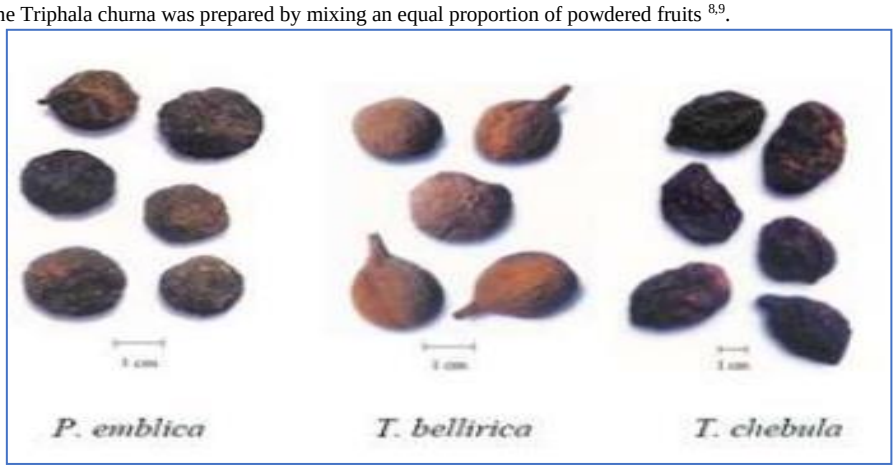

Fig. no.1 Amla, Baheda and Hirada fruit

Fig.no. 2. Churna powder

FORMULA:

Table no.1: List of Ingredients and Quantity.

S.N.	*Ingredient*	*Quantity (in mg)*
1	*Emblica Officinalis* dried fruit pulp powder- Amalaki Powder	333
2	*Terminalia Bellirica* dried fruit pulp powder- Bibhitaki Powder	333
3	*Terminalia Chebula* dried fruit pulp powder- Haritaki Powder	334

2.3. Organoleptic Evaluation

Organoleptic evaluation refers to the evaluation of formulation by colour, odour, taste, etc [10].

Table no. 2: Organoleptic Evaluation of Churna

Parameters	*Properties*
Appearance	Powder
Colour	Brownish
Odour	Characteristics
Taste	Salty

Physicochemical Investigations

Determination of Total Ash :

2 gm of powder was accurately weighed in tarred silica dish and heated on burner until ash free from carbon was obtained, cooled and weighed. Percentage of ash was calculated with reference to air dried sample [10].

Ash value: = 100/a x(c-b)

Where, a is initial weight of sample,

b is weight of empty crucible,

c is Weight of crucible

Acid insoluble ash

Total ash obtained from above process was boiled for 5 minutes in 25ml dil. hydrochloric acid. The solution was then filtered through ash less filter paper [10]. The ash was dried and the percentage of acid insoluble ash was calculated with reference to air dried sample.

Water Soluble Ash

The ash was boiled with 25 ml of water. The insoluble matter was then collected in an ash less filter paper. It was washed with hot water, and ignited for 15 minutes at a temperature not exceeding 450oC. Subtract the weight of the insoluble matter from the weight of the ash; the difference in weight represents the water-soluble ash [10]. The percentage of water soluble ash with reference to the air-dried drug was calculated.

Alcohol Soluble Extractive Value

4 gm of powder was accurately weighed and transfer it to a dry 250 ml conical flask. Fill a 100 ml graduated flask to the delivery mark with the solvent (90% alcohol).cork the flask and set aside for 24 hours. Filter the solution and transfer 25 ml of the filtrate to a weighed, thin porcelain dish, as used for the ash value determination [10]. Evaporate to dryness on water bath. Calculate the % w/w of extractive with reference to the air dried drug.

Water Soluble Extractive

Value Steps are similar to those mention in the point 5, use chloroform water instead of alcohol

Loss on Drying

Loss on drying is the loss of mass expressed as percent w/w. About 10g of dug samples of each formulation was accurately weighed in a dried and tarred flat weighing bottle and dried at 105 C for 5hrs [10]. The percentage was calculated with reference to initial weight.

Bulk Density

The term bulk density refers to a measure used to describe the packing of particles or granules. The equation for determining bulk density (D), Db=M/Vb. Where, M is the mass of the particles and V is the total volume of the packing. It is the ratio of given mass of powder and its bulk volume. It is determined by transferring an accurately weighed amount of powder sample to the graduated cylinder with the aid of a funnel [10]. The initial volume was noted. The ratio of weight of the volume it occupied was calculated.

Bulk density=W/V0 g/ml

Where, W = mass of the powder, V0 = untapped

Tapped Density

It is measured by transferring a known quantity (25g) of powder into a graduated cylinder and tapping it for a specific number of times. The initial volume was noted. The graduated cylinder was tapped continuously for a period of 10-15 min. The density can be determined as the ratio of mass of the powder to the tapped volume [10].

Tapped volume= W/Vf g/ml

Where, W = mass of the powder, Vf = tapped volume

Angle of Repose

The internal angle between the surface of the pile of powder and the horizontal surface is known as the angle of repose. The powder is passed through funnel fixed to a burette at s height of 4 cm. Powder or granulation was carefully poured through the funnel until the apex of the conical pile just touched the tip of the funnel. A graph paper is placed below the funnel on the table. The height and the radius of the pile were measured using the formula [10].

Tan = H/ R or = arc tan H/R

Where is the angle of repose, R being the radius of the conical pile

Hausner Ratio

The ratio of tapped density to the bulk density of the powder is called Hausner ratio. It is related to interparticle friction and as such can be used to predict the powder flow properties [10]. Powders with low interparticle friction such as coarse spheres have a ratio of approximately 1.2, whereas more cohesive, less flow able powders such as flakes have a Hausner ratio greater than 1.6. The equation for measuring the Hausner ratio is:

Hausner ratio= Tapped density/bulk density

Table no. 1. Observation for Churna Powder Evaluation

S. N	Evaluation Parameter	Observation
1	Total Ash	7.33 %
2	Acid insoluble ash value	3.90 %

3	Water soluble ash	4.22 %
4	Alcohol soluble extractive value	2.70 %
5	Water soluble extractive value	2.75 %
6	LOD	0.21 %
7	Bulk density	0.61
8	Tapped density	0.75
9	Angle of repose	30.20
10	Hausner ratio	1.22

RESULT :

The Triphala Churna was tested for various organoleptic and physicochemical parameters. The powder was found to be amorphous, brownish in color having characteristic odour, possessing salty taste. The physicochemical Quality tests for Triphala Churna were performed for moisture content, ash content, water soluble extractive, methanol soluble extractive, acid insoluble ash and water insoluble ash and were found to be within the standard limits. The total ash value was found to be 7.33 %. The water soluble ash was found to be higher with 4.22 % as compared to the acid insoluble ash value of 3.90 %. The water soluble extractive value was found to be higher 2.75 % than Alcohol soluble extractive value 2.70 %. Acid insoluble ash value was found to be 3.90 %, which shows that the components of churna are highly water soluble. The loss of drying was found to be minimum with 0.21 %. Hence proving that the churna shows stability even on exposure to intense heat. The flowability of the formulation was found to be satisfactory which was ensured by undergoing various tests such as tapped density which was found to be 0.75 volume. The bulk density was found to be 0.61. And the Angle of Repose was found to be 30.20 shows good flow property. Hausner ratio of 1.22. The churna was prepared and was evaluated for its analysis. All the results obtained have been tabulated and were found to be within the standard limits.

CONCLUSION :

The formulation and evaluation of triphala churna show that it is an effective herbal remedy with numerous health benefits. The preparation process, including the selection and proper mixing of triphala components, namely amalaki, bibhitki, and harikrant, ensures a balanced formulation rich in bioactive compounds such as vitamin C, tannins, and flavonoides, which contribute to its antioxidant, anti-inflammetory, and digestive properties. Evaluation of triphala churna, through quality control tests such as organoleptic evaluation and physical analysis, confirms consistency and safety for use. The churna meets the standards set for herbal formulation, showing no significant contamination and adhering to the required potency levels.

REFERENCE:

1. Sinha, R. (2016). A Pharmaceutico-Analytical Study of Triphala Masi and its Anti-Microbial Activity (Doctoral dissertation, Rajiv Gandhi University of Health Sciences (India)).
2. Peterson, C. T., Denniston, K., & Chopra, D. (2017). Therapeutic uses of triphala in ayurvedic medicine. The Journal of Alternative and Complementary Medicine, 23(8), 607-614.
3. Nafiu, M. O., Hamid, A. A., Muritala, H. F., & Adeyemi, S. B. (2017). Preparation, standardization, and quality control of medicinal plants in Africa. Medicinal spices and vegetables from Africa, 171-204.
4. Mukherjee, P. K. (2019). Quality control and evaluation of herbal drugs: Evaluating natural products and traditional medicine. Elsevier.
5. Morbale, S. T., Parida, S., Chowdhury, L., & Sahinsha, M. M. (2024). Introduction to Herbal Drugs and Technology. Addition Publishing House.
6. Ahmed, S., Ding, X., & Sharma, A. (2021). Exploring scientific validation of Triphala Rasayana in ayurveda as a source of rejuvenation for contemporary healthcare: An update. Journal of Ethnopharmacology, 273, 113829.
7. Peterson, C. T., Denniston, K., & Chopra, D. (2017). Therapeutic uses of triphala in ayurvedic medicine. The Journal of Alternative and Complementary Medicine, 23(8), 607-614.
8. Ayurvedic Formulary of India (2003). The Ayurvedic Formulary of India. Ayurvedic Formul. India 7 (15), 323.
9. Gunji Venkateswarlu, Seru Ganapaty, Akula Murali Sri Sudhakar. Preparation of TriphalaChurna using the Ingredients Obtained from Local Market and Comparative Standardization. Pharmacognosy Journal. 2019; 11(1):102-111.
10. Sweta Kulkarni et al. Standardization and Physicochemical Investigation of Triphala Churna. Indo American Journal of Pharmaceutical Research.2018:8(03).
11. Indian Pharmacopoeia (2020). Ministry of health and family welfare, Government of India.
12. World health organization (WHO). (2003). Quality control methods of medicinal plants materials. Geneva: world health organization.