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Comparative Standardisation of Four Marketed Formulations of Karppooraadi Churna

Susan Raju[1*], Dr. Meena Kurup[2], Dr. Meera paul[3],

[1, 2]Associate Professor, Department of Pharmaceutics, MGM Silver Jubilee College of Pharmaceutical Sciences and Research, Ernakulum, Kerala

[3]Professor Department Pharmaceutical Chemistry, MGM Silver Jubilee College of Pharmaceutical Sciences and Research, Ernakulum, Kerala

susanraju418@gmail.com

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Abstract: Standardisation of herbal formulation is essential in order to assess the quality of drugs for therapeutic value as it is a plant-derived material containing raw ingredients. According to an estimate of world health organization (W.H.O) most of the developing countries rely on traditional medicines. Standardisation of herbal formulations is essential to ensure their quality, safety, and therapeutic efficacy, as variability in plant-based raw materials can influence formulation consistency. The present study aimed to comparatively standardise four marketed formulations of Karpooradi Churna, an Ayurvedic polyherbal preparation commonly used in the management of respiratory disorders. The selected formulations were evaluated for organoleptic characteristics, physicochemical parameters (total ash, acid-insoluble ash, extractive values, and loss on drying), physical properties (bulk density, tapped density, angle of repose, Carr's index, and Hausner's ratio), pH, and qualitative phytochemical constituents following World Health Organization guidelines. Total ash values ranged from 33.96–37.23% w/w, while water-soluble extractive values varied between 4.8–10.4% w/w. Loss on drying was found to be within 1–1.2% w/w, and pH values indicated a mildly acidic nature (5.82–6.06). Phytochemical screening revealed the presence of alkaloids, carbohydrates, terpenoids, and tannins in all formulations.

The findings indicate that all four marketed formulations complied with acceptable quality control parameters. The generated data may serve as reference standards for routine quality assessment and contribute to the standardisation of Karpooradi Churna formulations.

Keywords: Karpooradi Churna; Standardization; Ayurvedic formulation; Physicochemical evaluation; Quality control.

INTRODUCTION

Herbal medicines represent one of the oldest and most widely practiced forms of healthcare known to humanity. Traditional systems of medicine such as Ayurveda, Siddha, Unani, and Traditional Chinese Medicine rely extensively on plant-based formulations for the prevention and treatment of diseases. According

to the World Health Organization (WHO), approximately 70–80% of the world's population depends on traditional medicines for primary healthcare, particularly in developing countries, due to their accessibility, affordability, cultural acceptance, and perceived safety [1, 2]. In recent decades, there has been a renewed global interest in herbal medicines, not only in developing nations but also in developed countries, as complementary and alternative therapies [3].

Despite their widespread use and therapeutic potential, herbal medicines face significant challenges related to quality, safety, and efficacy. The chemical composition of herbal drugs may vary considerably due to factors such as geographical source, climatic conditions, soil characteristics, time and method of harvesting, post-harvest processing, storage conditions, and manufacturing practices [4, 5]. These variations can lead to batch-to-batch inconsistency, affecting the therapeutic efficacy and safety of herbal products.

Standardisation of herbal medicines is defined as the process of establishing consistent quality parameters to ensure the identity, purity, potency, safety, and efficacy of herbal products [6]. The WHO has issued comprehensive guidelines for the quality control and standardisation of medicinal plant materials and herbal formulations, emphasizing the evaluation of organoleptic, physicochemical, and phytochemical parameters [7]. In India, regulatory bodies such as the Central Council for Research in Ayurvedic Sciences (CCRAS) and the Ministry of AYUSH have also developed pharmacopoeia standards to promote uniformity and quality assurance in traditional medicines [8]. However, many marketed Ayurvedic formulations still lack comprehensive scientific data supporting their quality attributes, particularly comparative studies among different commercial brands.

Churna is one of the most commonly used dosage forms in Ayurveda, prepared by fine pulverisation of dried medicinal ingredients. Churnas are widely prescribed due to their ease of administration, rapid onset of action, and suitability for combination therapy [9]. However, because they are powdered formulations, churnas are highly susceptible to moisture absorption, microbial contamination, adulteration, and degradation if not properly standardised and stored [10]. Therefore, systematic evaluation of churna formulations using modern quality control parameters is crucial to ensure their safety and therapeutic reliability.

Karpooradi Churna is a classical Ayurvedic polyherbal formulation traditionally indicated for the management of respiratory disorders such as cough, dyspnoea, bronchitis, and chronic respiratory ailments. It is also prescribed for conditions like anorexia and certain cardiac-related complaints [11]. The formulation is commonly administered with sugar and water and is widely available in the market under different brand names. Karpooradi Churna typically contains medicinal ingredients such as Cinnamomum camphora (camphor), Zingier officinal (ginger), Piper nigrum (black pepper), Piper longum (long pepper), Myristica fragrans (nutmeg), Illicium verum (star anise), Cinnamomum zeylanicum (cinnamon), and Mesua ferrea (nagakesara), either with or without sugar [12–14]. These ingredients are reported to possess expectorant, carminative, stimulant, anti-inflammatory, and antimicrobial properties, which contribute to the therapeutic efficacy of the formulation [15, 16].

Although Karpooradi Churna has a long history of traditional use, the quality of marketed formulations may vary due to differences in raw material selection, proportions of ingredients, manufacturing processes, and storage conditions. Such variations can influence physicochemical characteristics, phytochemical composition, flow properties, and overall stability of the product. Inadequate quality control may also lead to safety concerns such as contamination, adulteration, or substitution of ingredients [17]. Therefore, comparative standardisation of marketed formulations is essential to assess their quality and to ensure compliance with recommended guidelines.

Safety, Toxicity, and Efficacy Considerations

Safety, toxicity, and efficacy are interrelated aspects of herbal medicine evaluation and are closely linked to standardisation practices. Although herbal medicines are generally considered safe based on their long-standing traditional use, several reports have highlighted adverse effects arising

from improper identification of plant materials, contamination with heavy metals or pesticides, adulteration with synthetic drugs, and inappropriate dosage [18,19]. WHO emphasizes that most adverse effects associated with herbal medicines are attributable to poor quality rather than inherent toxicity of the plants themselves [20]. Hence, evaluation parameters such as ash values, moisture content, extractive values, and phytochemical screening serve as indirect indicators of safety and quality.

The efficacy of traditional polyhedral formulations like Karpooradi Churna is often attributed to the synergistic interaction of multiple bioactive constituents rather than a single active principle. In classical formulations with well-documented traditional use, extensive clinical trials may not always be mandatory; instead, scientific validation through physicochemical and phytochemical evaluation is considered acceptable to support efficacy claims, as per WHO guidelines [21]. Comparative studies of marketed formulations further help in identifying variations and establishing reference standards for quality control.

Physicochemical parameters such as total ash, acid-insoluble ash, extractive values, and loss on drying are widely employed in herbal drug standardisation to assess purity, inorganic content, and moisture levels [22]. Physical parameters including bulk density, tapped density, angle of repose, Carr's index, and Hausner's ratio provide information about flow properties and handling characteristics of powdered formulations [23]. Additionally, qualitative phytochemical screening helps in identifying major classes of secondary metabolites present in the formulation, which are often responsible for therapeutic activity [24].

Despite the availability of pharmacopoeial guidelines, there is a paucity of published data comparing the standardisation parameters of different marketed brands of Karpooradi Churna. Most existing studies focus on individual formulations or other classical churnas, such as Sitopaladi Churna, Hingwashtak Churna, and Ashwagandha Churna [25–27]. Comparative evaluation of multiple marketed products is therefore necessary to assess consistency and to generate scientifically validated reference data.

In this present study was undertaken to comparatively standardise four marketed formulations of Karpooradi Churna using organoleptic evaluation, physicochemical analysis, physical parameters, pH determination, and qualitative phytochemical screening in accordance with WHO-recommended guidelines. The findings of this study aim to contribute to the scientific validation of Karpooradi Churna and to provide baseline data for routine quality control, thereby supporting the safe and effective use of this widely prescribed Ayurvedic formulation.

2. MATERIALS AND METHODS

2.1. Materials

1. Nagarjuna karpooradi churna (10 g)

Table 1

INGREDIENTS	QUANTITY
Cinnamomum camphora	0.2g
Cinnamomum zeylanicum	0.2g
Illium verum	0.2g
Myristica fragrance	0.2g
Eugenia caryophyllata	0.4g
Mesua ferrea	0.6g
Piper nigum	0.8g
Piper longum	1g
Zingiber officinale	1.2g
Myristica fragrance	0.2 g
Sugar	5 g

2. Vaidyaratnam karpooradi churna (10g)

Table 2

INGREDIENTS	QUANTITY
Cinnamomum camphora	0.208 g
Syzygium aromaticum	0.416 g
Illicium verum	0.208 g
Myristica malabarica	0.208 g
Cinnamomum zeylanicum	0.208 g
Mesua ferra	0.625 g
Piper nigrum	0.625 g
Piper longum	1.04 g
Zingiber officinale	125

3. ETM Karpooradi churna

Table 3

INGREDIENTS	QUANTITY
Cinnamomum camphora	0.2 g
Cinnamomum zeylanicum	0.2 g
Illium verum	0.2 g
Myristica fragrance	0.2 g
Syzygium aromaticum	0.4 g
Mesua ferrea	0.6 g
Piper nigrum	0.8 g
Piper longum	1 g
Zingiber officinale	1.2 g
Saccharum officinarum	5 g

4. Kottakkal Karpooradi Churna

Table 4

INGREDIENTS	QUANTITY
Cinnamomum camphora	0.2 g
Cinnamomum zeylanicum	0.2 g
Illium verum	0.2 g
Myristica fragrance	0.2 g
Syzygium aromaticum	0.4 g
Mesua ferrea	0.6 g
Piper nigrum	0.8 g
Piper longum	1 g
Zingiber officinale	1.2 g
Saccharum officinarum	5 g

2.2 Development of Standardisation Parameters For Karpooradi Churna

1. Study of Organoleptic characters

The Organoleptic characters such as colour, odour and tastes are tested on each formulations of karpooradi churna of kottakkal karpooradi churna, Nagarjuna karpooradi churna, and ETM karpooradi churna and Vaidyaratnam karpooradi churna are evaluated. The study of organoleptic characters in terms of visualising of evaluation and also be in part of sensing evaluation. We determining the characters by colour. The colour may vary in different herbal products. This may involve in various evaluation techniques. Odour is different part of evaluation and it is an important role in macroscopically evaluations. We sensing the smell of herbal product and evaluate them. Taste is the another parameter for evaluation. It is evaluated by different tastes such sweet, sore, salt, pungent etc.

2. Physicochemical Analysis

a. Determination of Ash values

i) Total Ash value: Weighed accurately 1 g of churna in a previously ignited and tarred silica crucible. The material was then ignited by gradually increasing the heat to 500-600°C until; it appeared white indicating absence of carbon. It is then cooled in a desecrator and total ash in mg per g of air –dried material is calculated.

Figure 1

ii) Acid Insoluble Ash: To the crucible containing total ash, 5 ml of dil. HCL was added and boiled gently for 5 minutes, and then about 5ml of hot water was added and transferred in to crucible. The insoluble matter was collected on ash less filter paper. This was then washed with hot water until filtrate is neutral and the filter paper along with the insoluble matter was transferred into crucible and ignited to constant weight. The residue was then allowed to cool.

b. Determination of Extractive Values

This is the method determines the amount of active constituents extracted with solvents from a given amount of medicinal plant material. It is employed for materials for which as yet no suitable chemical or biological assay exist.

i).Water Soluble Extractive Value: Weighed accurately 2.5 g of churna and placed inside a glass stoppered conical flask. It is then macerated with 50 ml of chloroform water for 18 hours. It was then filtered and about 12.5 ml of filtrate was transferred in to china dish and was evaporated to dryness on a water bath. It was then dried at 105°C for 6 hour, cooled and finally weighed.

c. Determination of Loss on Drying

A clean china dish was taken and dried in a hot air oven at 105°C for 30 minutes .then 1 g of powder sample was taken and dried in an oven drying was continued till a constant weight of sample was obtained. After drying, the dish was allowed to cool to room temperature in a desiccator before weighing and then the weight of dried sample was recorded. The percentage loss on drying was calculated with reference to powder sample taken initially.

Figure 2

3. Physical evaluation of churna

Powder fineness

Bulk density, Angle of repose, Hausner's ratio, and Carr's index was determined for evaluating physical characteristic of churna.

i) Bulk Density

It is the ratio of total mass of powder and bulk volume of powder. It was measured by pouring the weighed powder into a graduated measuring cylinder and the volume was recorded. It is expressed in gm/ml and is given by

$$Db = M/Vb$$

Where M is mass of powder, Vb is the bulk volume of the powder.

Method

Accurately weighed quantities of the blended mixture (10g) were carefully poured into the graduated cylinder through a funnel and the bulk volume was recorded with and without tapping. The untapped (Du) and tapped bulk densities (Dt) were calculated from the following formula,

$$\text{Bulk density} = \frac{\text{Weight taken}}{\text{Bulk volume}}$$

ii) Tapped density

The tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. Tapped density is obtained by mechanically tapping a graduated measuring cylinder or vessel containing a powder sample. After observing the initial powder volume or weight, the measuring cylinder or vessel is mechanically tapped, and volume or weight readings are taken until little further volume or weight change is observed. The tapping can be performed using different method. The tapped density is calculated as mass divided by the final volume of powder.

$$\text{Tapped density} = \frac{\text{Weight taken}}{\text{Tapped volume}}$$

iii) Angle of repose

From the angle of repose on a fixed base with a retain a layer of powder on the base .The base should be free of vibration .vary the height of the funnel to carefully built up a symmetrical cone of powder .care should be taken to prevent vibration as the funnel is moved .The funnel height should be maintained approximately 2-4 cm from the top of the powder pile as it is being formed in order to minimize the impact of falling powder on the tip of the cone .If a symmetrical cone of powder cannot be successfully or reproducibly prepared this method is not appropriate .Determine the angle of repose by measuring the height of the cone of the powder and calculating the angle of repose ,θ,from the following equation ;

$$\text{Angle of repose} = \tan^{-1}\theta(h/r)$$

$$\tan\theta = h/r$$

Where, h =height of heap

r =radius of heap

Figure 3

iv) Compressibility /carr's index

Carr's index is an indication of the compressibility of a powder. In a free flowing powder, the bulk density and tapped density would be close in value there for the carr index

would be small. A carr'sindex is greater than 25 is consider to be an indication of poor flowability, and below 15, of good flow ability.

Carrs index =

$$\frac{\text{Bulk density(Tapped)} - \text{Bulk density (untapped)}}{\text{Bulk density (Tapped)}} \times 1$$

v) Hausners Ratio

The Hausner ratio is number that is correlated to the flow ability of the powder or granular material .The formula used to determine the Hausners ratio is,

$$\text{Hausners ratio} = \frac{\text{Bulk density (Tapped)}}{\text{Bulk density (Untapped)}}$$

4. Determination of PH range

PH of the churna was determined using PH meter by dispersing 1% w/v churna in water

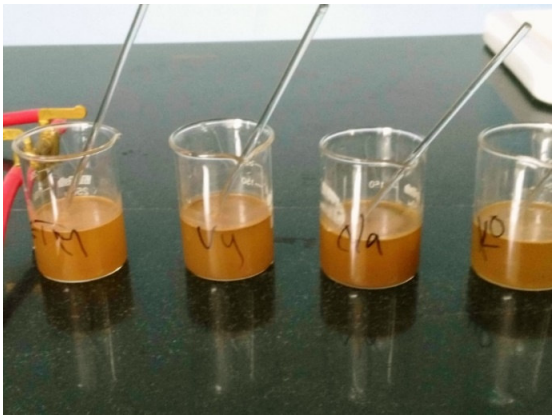

Figure 4

5. Quantitative phytochemical screening

The various physicochemical tests like, test for alkaloids, test for amino acids, test for carbohydrates, test for phenols, test for flavonoids, test for tannins, test for fats and fixed oils was carried out as the identification tests.

Test for alkaloids

(i) Wagner's test

The sample was treated with wagner's reagent (solution of iodine in potassium iodide) give a reddish brown precipitate.

(ii) Hager's test

Little of the sample was treated with hager's reagent (saturated solution of picric acid gives yellow colour precipitate.

Test for carbohydrates

(i) Biuret test

An aqueous sample is treated with an equal volume of 1% strong base (sodium or potassium hydroxide) followed by few drops of copper sulphates. If the solution turns purple it contains protein.

(ii) Molisch test

2 ml of sample solution is placed in a test tube. 2 drops of mulish reagent (solution of napthol in 95% ethanol) is added. The solution is poured slowly into attest tube containing 2ml of concentrated sulphuric acid. So that two layers formed.

Test for phenol

(i) Ferric chloride test

Compounds with a phenol group will form a blue, violet, purple, green, or red brown colour upon addition of aqueous ferric chloride. This reaction can be used as test for phenol.

Test for amino acids

(i) Millon's test

A few drops of the reagent was added to the test solution which is then heated gently. A reddish brown colouration or precipitate indicate presence of tyrosine residue.

(ii) Ninhydrin test

Prepare a solution of the sample by placing 10 ml of water. 3 drops of 1% solution of ninhydrin in ethanol is added to 1ml of the solution and the solution heated for 5 min in a boiling water bath. The formation of red, blue or purple colour indicate presence of amino acids.

Test for flavonoids

To 1 ml of the crude stock extract, a few drops of dilute sodium hydroxide was added. An intense yellow colour appeared in crude extract. Which become colourless on the addition of a few drops of dilute acid which indicate presence of flavonoids.

Test for terpinoids

To the little of the sample add 2 ml of chloroform, 5ml concentrated sulphuric acid was carefully added to form a layer and observed for presence of reddish brown colour. It will indicate presence of terpinoids.

Test for tannins

2 drops of 5% Fecl3are then added. Production of a greenish precipitate is an indication of the presence of tannins.

Test for fats & oils

Fats and oils when heated with some crystals of potassium bi sulphite in attest tube. A pungent irritating smell of acrolein confirms the presence fats& oils.

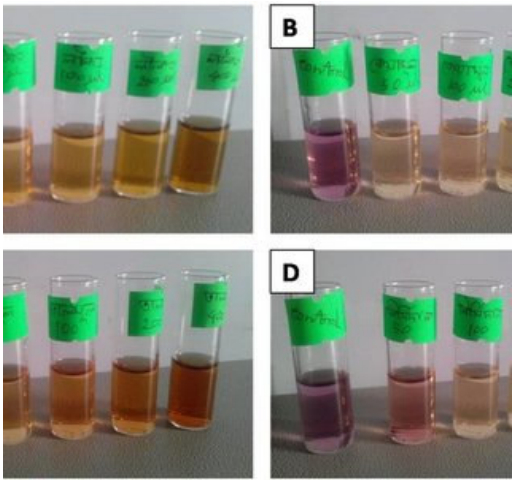

Figure 5

3. RESULTS AND DISCUSSION

1. Study of organoleptic characters

Table 5: Organoleptic characters

formulations	colour	odour	taste
Formulation i	greenish brown	pleasant	slightly sweet
formulation ii	greenish brown	pleasant	slightly sweet
formulation iii	greenish brown	pleasant	slightly sweet
formulation iv	greenish brown	pleasant	slightly sweet

2. Physicochemical evaluation

a. Ash value: The ash remaining following ignition of medicinal plant material is determined by different method which measure total ash, acid insoluble ash. The total ash method is designed to measure the total amount of material remained after ignition. This include both 'physiological ash' which is derived from the plant tissue itself and 'non physiological ash', which is the residue of the extraneous matter (eg. sand and soil) adhering to plant surface. Acid insoluble ash is the residue is obtained after boiling the total ash with dilute hydrochloric acid, and igniting the remaining insoluble matter. This measures the amount of silica present, especially as sand and siliceous earth. Ash values for four formulation and results are described in Table no.6

Table 6: Ash value

Formulations	Total ash value	Acid insoluble ash
Formulation I	37.23	37.22
Formulation II	37.22	37.15
Formulation III	34.9	34.86
Formulation IV	33.96	33.95

b. Extractive value: This method determines the amount of active constituents extracted with solvents from a given amount of plant material. Extractive value is indicative of nature of chemical constituents present in crude drugs. It is carried out for all four formulations using water soluble extractive method and results are described in Table no: 7

Table 7: Extractive value

Formulations	Water soluble extractive value
Formulation I	8.8
Formulation II	9.2
Formulation III	4.8
Formulation IV	10.4

c. Determination of loss on drying: moisture content is useful to determine stability of constituents and susceptibility of crude drug to undergo microbial attack. Moisture content for all four formulation was determined and results are tabulated in Table no :8

Table 8: Determination of loss on drying

Formulations	% loss on drying (%w/w)
Formulation I	1
Formulation II	1
Formulation III	1.2
Formulation IV	1

3. Physical evaluation of churna

(i) Bulk density

Bulk densities of 4 respective formulations are given below. It was measured by pouring the weighed powder in to graduate measuring cylinder and volume was recorded.

Table 9: Bulk density

Formulations	Bulk density (g/cc)
Formulation I	0.4545
Formulation II	0.4545
Formulation III	0.4347
Formulation IV	0.4545

ii) Tapped density

Tapped densities of respective 4 formulations are recorded that is given below. Tapped density was obtained by mechanically tapping a graduate measuring cylinder or vessel containing powder sample, weight change was observed by taking the difference between the initial powder volume and final powder volume.

Table 10: Tapped density

Formulations	**Tapped density (g/cc)**
Formulation I	0.625
Formulation II	0.662
Formulation III	0.666
Formulation IV	0.588

iii) Angle of repose

Angle of repose of 4 formulations are given below, it was determined by measuring the height of the pile and radius of the circle.

Table 11: Angle of repose

Formulations	Angle of repose (°)
Formulation I	35.8906
Formulation II	35.183
Formulation III	35.537
Formulation IV	36.0236

iv) Compressibility index

Compressibility index of 4 formulations are given below, when the bulk density and tapped density are found to be closer the value of compressibility index is small. Compressibility index is greater than 25 indicates the poor flow ability. Below 15 indicates good flow ability.

Table 12: Carr's index

Formulation	**Carr's index (%)**
Formulation I	27.28
Formulation II	31.3962
Formulation III	34.7297
Formulation IV	22.704

i) Hausner's ratio

Hausner's ratio is the number that is correlated to the flow ability of the powder or granular material, Hausner's ratio of 4 formulations are given below.

Table 13: Hausner's ratio

Formulations	**Hausner's ratio**
Formulation I	1.3751
Formulation II	1.4576
Formulation III	1.532
Formulation IV	1.2937

4. Determination of PH range

PH of the formulations are monitored by using PH meter, by dispersing the 1%w/v each churna in water. PH of the following 4 formulations are revealed that all 4 formulations are acidic in nature.

Table 14: Determination of PH

Formulations	**PH**
Formulation I	5.86
Formulation II	5.82
Formulation III	6.03
Formulation IV	6.06

5. Quantitative phytochemical screening

Chemical test of the following 4 formulations are performed. The various tests performed in each churnas are test for alkaloids, carbohydrates, terpenoid, tannins, amino acids, flavonoids, phenols and fats&oils. The 4 test to be carried out for 4 churna found to be positive, that is test for alkaloids, carbohydrates, terpenoids, and tannins. Other 4 testes are found to be negative, that is test for amino acids, flavonoids, phenols and fats & oils.

Table 15: Phytochemical Screening

	FORMULATIONS			
	I	**II**	**III**	**IV**
Alkaloids	+	+	+	+
Carbohydrates	+	+	+	+
Terpenoids	+	+	+	+
Tannins	+	+	+	+
Amino acids	_	_	_	_
Flavonoids	_	_	_	_
Phenols	_	_	_	_
Fats & oils	_	_	_	_

Standardisation is essential to ensure the quality, safety, and consistency of polyherbal Ayurvedic formulations. In the present study, four marketed formulations of Karpooradi Churna were comparatively evaluated using organoleptic, physicochemical, physical, pH, and phytochemical parameters in accordance with WHO guidelines.

Organoleptic evaluation revealed uniform colour, odour, and taste across all formulations, indicating consistency in raw material selection and absence of gross adulteration. Such sensory parameters are widely used as preliminary indicators of identity and quality in herbal formulations [28].

Physicochemical evaluation showed total ash values ranging from 33.96 to 37.23% w/w. The relatively high ash content may be attributed to the presence of mineral-rich ingredients, camphor, and sugar, as reported in other standardised churna formulations [29]. Acid-insoluble ash values were comparable among formulations, suggesting minimal contamination with siliceous matter. Water-soluble extractive values (4.8–10.4% w/w) indicated variation in polar phytoconstituents, possibly due to differences in formulation composition and manufacturing practices [30]. Loss on drying values (1–1.2% w/w) were within acceptable limits, reflecting low moisture content and good formulation stability [31].

Physical evaluation demonstrated comparable bulk and tapped densities among the formulations. Angle of repose values (35.18°–36.02°) indicated moderate flowability, which is typical for fine polyherbal powders [32]. Carr's index and Hausner's ratio values suggested fair to poor flow characteristics, likely due to fine particle size and hygroscopic components such as sugar, consistent with earlier reports on Ayurvedic churnas [33].

The pH values of all formulations ranged between 5.82 and 6.06, indicating a mildly acidic nature. This pH range is considered suitable for oral administration and may support stability of certain phytoconstituents [34]. Qualitative phytochemical screening confirmed the presence of alkaloids, carbohydrates, terpenoids, and tannins in all formulations. These phytoconstituents are known to contribute to the expectorant, anti-inflammatory, and therapeutic effects of Karpooradi Churna in respiratory disorders [35, 36].

Overall, the comparative analysis demonstrated that all four marketed formulations complied with acceptable quality control parameters, despite minor inter-brand variations. The findings emphasize the importance of systematic standardisation studies to establish reference quality standards and to ensure consistency and reliability of marketed Ayurvedic formulations [37].

CONCLUSION

The four churnas was evaluated depending on various evaluation parameters and from the results obtained it was found to be within the standards. These preliminary tests can be prescribed as standards to fix the quality control test the churna and can be used in routine analysis of the same. In standardization of marketed formulation physical evaluation it was found that karpooradhi churna has ash value within limits as well as it has polar and medium polar constituent's 30-40 % w/w respectively. Moisture content is in permissible limits. There is less chance for hydrolysis of constituents and microbial attack.

A therapeutically important Ayurvedic preparation was formulated evaluated and resembles different characteristic features. The organoleptic characters showed the good quality of the formulation with the appropriate appearance and pleasant odour. The histological evaluation clearly displayed As part of standardization procedure and guidelines of WHO, the finished product of karpooradhi churna were tested for relevant Organoleptic evaluation, Powder drug analysis, Physicochemical Parameters (Loss on drying, total ash, acid insoluble ash, water soluble ash, water soluble extractive value, ethanol soluble extractive value).

The study shows that the contents of formulation presents within the permissible limits as per WHO, all these investigations are not specified in the standard literature such as in pharmacopoeia. The result of present study will also serve as reference monograph in the standardisation of drug formulation.

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