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Research Article

Standardization and estimation of Sodium and Potassium of marketed lavan Bhasker Churna

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ABSTRACT

The purpose of this standardization involves the safe, proper selection and handling of crude materials, ensure efficacy and stability of finished product, and guiding the consumer about the product. With this aim the present study was designed; Bhasker lavan Churna an Ayurvedic formulation prepared from various medicinal plants which are commonly used in rheumatism, dyspepsia, malabsorption syndrome, angina pectoris, disease of skin, splenic disorder, oedema, asthma and constipation. The present study consists of preparation and standardization of Bhasker lavan Churna for parameters like physicochemical properties, phytochemical screening and physical properties and Na^+ and K^+ content through flame photometry of final formulation as per WHO guideline and the results were compared with the marketed formulation. These findings will be useful towards establishing pharmacopoeial standards for crude drugs as well as for formulation which is gaining relevance in research on traditional medicinal system.

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Introduction

Traditional system of medicines i.e. Ayurveda etc., which formed the basis of health care throughout the world since the earliest days of mankind are still widely used, and have considerable importance in international trade. India is sitting on a gold mine of well-recorded and well practiced knowledge of traditional medicine. There are several reasons for this; one of the major reasons is that our products are not backed by rigorous scientific studies to establish their safety, efficacy and standards. The demand of ayurvedic medicine is gearing up at a rapid rate and the scientific community worrying about the quality, safety and efficacy of the traditional formulation. Standardization is the process of agreeing on technical standards. A standard is a document that establishes uniform engineering or technical specifications, criteria. methods. processes. or practices. The standardization of ayurvedic preparations have many characteristic features and needs careful considerations. In ayurvedic formulation, standardization refers to providing processed plant material that meets a specified concentration of a specific marker constituent Quality of raw materials is essential for the manufacture of standard drug. The safety and efficacy of herbal medicines is closely correlated with the quality of the source materials used in their production. The quality of source materials is, in its turn determined by intrinsic factors (genetic) and extrinsic factors (environmental conditions, cultivation and harvesting, field collection and post harvest/collection transport and storage). Therefore, it is very difficult to perform quality controls on the raw materials of herbal Drugs. Therefore, production of quality traditional medicines has become a challenge to regulatory authorities, scientific organizations and manufacturers.

Bhaskar Iavan churna

The Bhaskar Iavan churna, (BLC), a well known formulation described in Ayurvedic formulary of India, traditionally used for digestive impairment, rheumatism, dyspepsia, malabsorption syndrome, angina pectoris, disease of skin, splenic disorder, oedema, asthma and constipation. Among all the ayurvedie medicine for the gastro intestinal disturbance Bhasker lavan churna is the most celebteared ayurvedic practitioners of India. It falls under the category of churna in ayurvedic formulations**.** BLC Falls under the category churna of ayurvedic formulation, chuma known as fine powders of fully dried crude drugs and in Rasa Bhaisajya Kalpana Vigyan .BLC is well known ayurvedic formulation official in Ayurvedic formulary of India, Sutra illustrate that Samudra Iavan, saindhav

Iavan, vida Iavan, sochar Iavan, pippali, pippali mula.dhaniya, kala jira. tej patra, nagkeshar, kali mircha, jira talisa, visa, dalchini, elaichi, dadima bija and amalvetsa, powdered and filter together with cotton cloth.

Table 1: Ingredients of Lavan Bhaskar Churna

Sl. no	Sanskrit Name	Biological name	Quantity
1	Dhnayaka	Coriendrum sativum fr.	24 gms
2	Pippali	Piper longum Fr.	24 gms
3	Pippali Mula	Piper longum Rt.	24 gms
4	Krisna Jira	Carum carvi fr.	24 gms
5	Patrak	Cinnamomum tamala lf.	24 gms
6	Nagakeshar	Mesua ferra Fl.	24 gms
7	Talisa	Abies webbiana lf.	24 gms
8	Amlavatasa	Rheum emodi Rz.	24 gms
9	Maricha	Piper nigrum Fr.	12 gms
10	Jiraka	Cuminum cymium Fr.	12 gms
11	Visva	Zingiber officinale Rz.	12 gms
12	Dadima	Punica grantum Se.	48 gms
13	Tvak	Cinnamomum zeylanicum Brk.	06 gms
14	Ela	Elettera cardamom Se.	06 gms
15	Samudra lavan	Plain salt	96 gms
16	Suralavan	Black salt	60 gms
17	Sindava lavan	Rock salt	24 gms
18	Vida lavan	Vida salt	24 gms

Dose: 03 to 06 *gm/* day with water

Use: Digestive impairment, rheumatism, dyspepsia, malabsorption syndrome, aging pectoris, disease of skin, splenic disorder, asthma and constipation

Materials and methods

Formulation of lavan Bhasker Churna:

All the raw materials used in selected formulation were purchased from local market and identified morphologically and microscopically and compared with standard Pharmacopoeial monograph. Two Bhaskar Iavan churnas were prepared in laboratory with taking salt and without taking salt with keeping other ingredients as same in both the formulations, as per the method described in Ayurvedic

Formulary of India. Some lavan bhasker formulations were purchased from market for standardization. The laboratory batches and the marketed formulations were coded as BLC1, BLC2, BLC3, BLC4. These samples were stored at identical conditions of temperature, light.BLC1 was coded for in-house formulation without salt, BLC2 was coded for in house formulation containing salt where as BLC3 and BLC4 were coded for two different procured marketed formulations.

1) **Determination of Physiochemical properties of formulation**s:

   Organoleptic and all the different physiochemical studies like extractive values in different solvents, total ash content, moisture content, flow properties were carried out as per WHO guide lines .

2) **Determination of qualitative phytochemical studies of formulations**

   A preliminary phyto chemical study was carried out to detect the presence of various phyto constituents in formulations. The tests were performed on alcohol, water, chloroform and petroleum ether extract. Qualitative chemical analyses were done for all formulations of each using the procedures of Evans.

3) **Determination of swelling index:**

   The swelling index was determined for all formulations as per WHO guide lines.

4) **Determination of Na+ and K+ content in formulations by Flame photometry Methods:**

   1000 ppm standard solution of analytical grade sodium chloride and potassium chloride was prepared. From that stock solution 20,40,60,80,100 ppm solution of sodium chloride and potassium chloride was prepared. The sample was prepared by taking 1 g of four different formulations in 100 ml of double distilled water. It was then filtered and 10 ml of the filtrate was taken and volume was made up to 100 ml. Their sodium content and potassium content was measured by flame photometer.

RESULTS AND DISCUSSIONS:

The raw material used in Churna was examined for probable adulterants such as plant material of similar appearance by organoleptic and some physicochemical parameter. The result of evaluation of raw material lies within limit which is mentioned in Table 2 and Table3

Table 2: Sensory characters of raw ingredients of BLC

Sl. No	Plant name	Colour	Odour	Taste	Size and shape
1	Coriendrum sativum	Yellowish brown	Aromatic	Spicy and characteristic	Subglobular cremocarpous fruit/2-4 cm dia., 3-4 em in length
2	Zingiber officinale	Yellowish brown	characteristic	Aromatic sweet followed by	Laterally compressed bearin short flat ovate branches
3	Piper longum	Dull dark brown to black	characteristic	Bitter	small, ovoid ,sunken structure embedded in flashy spike/2.5 -4 cm diameter.
4	Piper nigrum	Dark brown to black	characteristic	Bitter	small, cylindrical much branched/ 4-9 cm length,0.5 cm in diameter.
5	Cumimum	Dark brown	Ridges are light brown	Characteristic aromatic	Tapering at both end,each maerican is havig five longitudinal ridges.
6	Abis webbians	Dark brown	Odourless	bitter	Opposite or sub opposite glabrous and are scaly
7	Punica grantum	Dark brown	Odourless	bitter	Opposite, glaborous and re scaly shine above
8	Carum carvi	Yellowish brown	Characteristic aromatic	Aromatic and sweet	Mericarp is elongated, narrow, taPering at the end shows resence of 5 yellow primary ridges /2-7mm
9	Cinnamomum zeylanicum	Dark brown	Fragrant	Aromatic and sweet	Found in compound quills
10	Rheum emodi	Brownish emodi	odourless	bitter	barrel shaped cylindrical *I 8-10* em length, 3-4 em in thickness
11	Elleteria cardamomum	green to pale buff	Characteristic	Sweetish	ovoid or oblong 3 sided, sharply backed at top *I* 2 em in length, 1-3 em
12	Mesua ferra	Dark brown	Characteristic	bitter	Fragrant *I* 2-3cm in length, 0.2-0.5 em in diameter
13	Cinamomum tamala	Greenish brown	Characteristic	Penetrating bitter	opposite, glabrous and are scaly, shining above *I* 5- 7.5 by 12.5-20 em

Table 3: Sensory characters of laboratory batches and marketed formulation

Sl. no	Batch	colour	Odour	Taste
1	BLC1	Yellowish	Characteristic	Normal
2	BLC2	Yellowish	Characteristic	salty
3	BLC3	Yellowish	Characteristic	salty
4	BLC4	Yellowish	Characteristic	salty

Microscopic inspection of medicinal plant materials is indispensable for the identification of broken or powdered materials, the specimen may have to be treated with chemical reagents. Microscopic characters have been recorded and compared in all the powdered crude plant materials, laboratory formulations.

Physical characteristics different batches of BLC

All the laboratory batch and marketed formulations were subjected to evaluation of physical characteristics in form of tap density, bulk density, angle of repose and pH as per the method described

Table 4: Physical characteristics different batches of BLC

Sl. No.	Batch	Bulk Density	Tap density	Angle of Repose	pH
1	BLC1	0.5	0.5	31.22	6.5
2	BLC2	0.5	0.5	34.20	6.4
3	BLC3	0.5	0.97	34.21	6.4
4	BLC4	0.5	0.97	32.21	6.5

Determination of loss on drying:

All the laboratory batch and marketed formulations were subjected to evaluation of total moisture content of the samples.

Table 5: Determination of extractive values:

S.No.	Batch	Loss on Drying
1	BLC1	0.3± 0.002
2	BLC2	0.2±0.003
3	BLC3	0.19±0003
4	BLC4	0.6±0.004

Determination of extractive values:

The percent extractive values were determined in various solvents ranging from non polar semi polar to polar behaviour. The extractive values are recorded in ether, alcohol and water with a view to study the distribution of various constituents of different batches.

Table 6: Qualitative phytochemical studies

Sl.No	Batch.	Alcohol extractive values	Pet. Ether	Water extractive
1	BLC 1	23± 0.58	25±0 44	73.7±0. 96
2	BLC 2	25±0.98	24±0 72	72.5±0. 8
3	BLC 3	28±0.52	16±0 36	77.6±0. 76
4	BLC 4	15.2±0.9	12±0 25	73.6±0. 25

Qualitative phytochemical studies:

To detect the presence of various phyto constituents in formulations as well as in raw materials phytochemical investigation was performed. The tests were performed on alcohol, hydro alcoholic extract of different batches.

Table 7: Qualitative phytochemical studies:

Sl. no	BLC	BLC	BLC	BLC
Alkaloids	+	+	+	+
Carbohydra	+	+	+	+
Tannins	+	+	+	+
Gums and	-	-	-	-
Fixed oil	-	-	-	-
Saponins	+	+	+	+
Protein and	+	+	+	+

+ Present - Absent

Determination of swelling index

Swelling index was determined for laboratory batch and marketed formulations were determined as per the methods

Table 8: Determination of swelling index

Sl. No	Batch	Swelling index
1	BLC1	3.829
2	BLC2	3.876
3	BLC3	4.25
4	BLC4	4.12

Table 9: Determination of Na+ and K+ content in formulations by Flame photometry Methods

Sl. No	Batch	Na^+	K^+
1	BLC1	121.4 ± 0.03	113.3 ± 0.25
2	BLC2	142.8 ± 0.09	115.8 ± 0.1
3	BLC3	141.7 ± 0.1	116.4 ± 0.2
4	BLC4	140.6 ± 0.08	126.6 ± 0.09

Discussion

The organoleptic evaluation provides the simplest and quickest means to establish the identity and thereby ensure quality of a particular sample and these features are useful in judging the material in its entirety and in powder form. The results revealed that the crude drugs used for preparation of formulation lie within the limit which signifies their good quality and purity. This value varies within fairly wide limits and is therefore an important parameter for the purpose of evaluation of crude drugs. Moisture is an inevitable component of

crude drugs, which must be eliminated as far as practicable. The preparation of crude drug from the harvested drug plants involves cleaning or garbling to remove soil or other extraneous materials followed by drying which plays a very important role in the quality as well as purity of the material. The objectives of drying fresh material are, to aid in their preservative, to 'fix' their constituents, i.e., to check enzymatic or hydrolytic reaction that might alter the chemical composition of the drug, to facilitate subsequent comminution (grinding into a powder) and to their weight and bulk. Insufficient drying favors the spoilage by molds and bacteria and makes possible the enzymatic destruction of active principles. Not only is the ultimate dryness of the drug is important, equally important is the rate at which the moisture is removed and the condition under which it is removed. If the rate is too slow, much spoilage may occur before the drying process is completed The results of moisture content revealed that the crude drugs used for the preparation of in-House formulation and standard formulation were properly dried and also the rate of drying is proper, the results of the In House formulation were comparable with that of the standard formulation. Extractive values were determined in various solvents solvent ether, methanol and distilled water) with a view to study the distribution of various constituents of BLC-1, BLC-II, and marketed formulation BLC-3, BLC-4 . Highest extractive values were obtained in water and alcohol soluble extract. This indicates high proportion of tannins, carbohydrates and glycoside etc in the formulations as well as raw material. To detect the presence of various phytoconstituents in formulations as well as in raw materials phytochemical investigation was performed. The tests were performed on hydroalcholic extract of both marketed and laboratory batches. The formulations were found to have phenolic (tannins), carbohydrates, glycosides, phytosterols, fixed oil and fats, alkaloids, saponins and proteins which support significance addition of crude drugs in the formulation. The concentration of Na and K said about the amount of these elements. However the concentration is lower in laboratory formulation prepared adding without salt. This concludes that the elements also found in the included herbs.

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