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Research Article

Establishment of Standardization Parameters for Herbal Formulation, Swarasa Bhvit Amalaka Churnam

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ABSTRACT

Herbal formulations are very useful for human health because of their natural and simple processing. A quality herbal formulation must pass the test for their characteristic properties. In spite of the large number of Ayurvedic formulations available in the market, standards of their quality are yet to be laid. Amlaka churnam or amalaki rasayanam is a swarasa bhavita, important herbal formulation used for treatment related to immunity systems of human body. In addition to this it is also used for nurturing of skin, heart, eye and stomach. The main ingredient of amalaka churnam is amla (*Embalica officinalis*) family Euphorbiaceae. Though amalaka churnam is described in many classical Ayurvedic granthas, but there are minor differences in their formulations. Also marketed formulations of amalaki rasayanam by manufacturers do not have description about its standardization. Therefore, it is necessary to develop standard parameters for establishment of quality of the formulation. In this work, a standardization of herbal formulations of amalaka churnam is reported in terms of organoleptic evaluation of ingredients with rasayana formulation, loss of drying analysis, foreign matter, phytochemical screening, pH estimation, evaluation of ash value, extractive value and rheological evaluation.

Keywords: Bhvit, amalaka Churnam, Organoleptic, rheological etc.

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INTRODUCTION

Now a day, a common interest of people has been inclined towards utilization of naturally originated formulations due to their negligible adverse effects. An Ayurvedic medicinal system rasayana refers as medication which is used to increase rasa and dhatus to the body for boosting body system. Rasayana promote cure from diseases by improving function of body immunity system[1]. The term rasayana generally considered various fruit minerals, herbs and other medicine such as pippli, bahera, amla, silajeet etc which promote health and aging. It boosts vital force of like (Oja). & also boosts shukra dhatu (semen production). According to ancient concept of ayurveda rasayan improve rasa, rakta, mansa, meda, asti, massa, shukra[2]. There are many type of rasayana used in ayurvedic medicine system for example pipplirasayan, Dhatri tilrasayan, amalkirasayana, Haritakirasayan, vidangarasayan, Silajeetrasayan, brahmirasayanrasayan, dhatri churn rasayana, triphalarasayana[3] and ashvagandharasayan.

Rasayan Ayurvedic formulations are made from natural ingredients are multi targeted while modern synthetic medicines are single targeted and toxic effects[4]. The quality of traditional rasayan formulations can be improved by utilizing modern scientific methods[5].

Amalkirasayan churnam (amalaka churnam) is an ancient Ayurvedic formulation. The formulation of amalaki churnam is described in Charak Samhita, Sushruta Samhita, Chakradutta, Bhaisjyaratnavali. They formulate amalakirasayana churnam for treatment of gastric problems, rejuvenating actions, nourishing the skin, hair and aphrodisiac purpose. The main ingredient of amalakirasayana is amla or dhatri (*Embilica officinalis*), dry fruit powder and amlaswarasa.

All the Ayurvedic granthas formulate amalakirasayana in different manner. The marketed amalaka formulations show difference in amount of ingredients and lack quality establishment parameters in product descriptions. Thus,

there is a need for development of standardization parameters for Amlaka churnam[6,7].

This work's establishment of quality standard parameters of amalaka churnam have been presented. The parameters selected from WHO guidelines are organoleptic analysis[8], evaluation of loss on drying and presence of foreign matter, physio chemical analysis[9], pH determination, establishment of ash value, extracted value and rheological analysis[10]. The results of study are useful for testing of formulation and conducting advance research on formulations.

MATERIALS AND METHODS

Raw material used for preparation of above-mentioned formulation, amla collected from farm house of bundelkhand region and identified morphologically, microscopically and compared with their standard monographs for authentication.

Preparation of formulation,

Dhatrifruits (*Embilica officinalis*) firstly crushed then seed has been removed. Seedless dhatri fruits then dried. To obtain powder form (80 mesh size), the dried dhatri fruits grinded

Fresh dhatri fruits have been collected for preparing juice. The juice has been prepared by crushing fresh dhatri fruit followed by filtering using muslin cloth.

Both powdered dhatri fruits and juice dhatri fruits have been mixed in the ratio of 1:1. Then, mixture has been titrated for 20 minutes. The titrated mixture then dried at 40° C in hot air over oven. The dried mixture then crushed and powdered (80 mesh size). The step is called bhavna in ayurveda. The bhavna step is repeated 20 times and finally obtained powder is ready material for establishment of standardization parameters.

Organoleptic analysis

Organoleptic analysis included color, odour, taste, touch analysis of ingredients and formulations. Colors are examined at daylight by naked eye. The odour of samples of rasayana was tested by smelling and kept 2 minutes interval between two tests to nullify the nullifying effect of previous sample smelling. The all samples were tasted with time interval of 15 minutes. All the samples were also verified for their touch profiles. All the analysis is repeated by another person to recheck the results.

Loss on drying

To determine loss of drying, a 1 g of air-cooled formulation is placed in a standard bottle. The sample is weighted with bottle. The bottle with sample has been dried using an oven at 100-105° C for one hour. The dried sample is again weighted with bottle and the difference of weights before drying and after drying is measured as loss on drying.

Loss on drying and identification of foreign matter

To determine loss of drying, a 1 g of air-cooled formulation is placed in a standard bottle. The sample is weighted with bottle. The bottle with sample has been dried using an oven at 100-105° C for one hour. The dried sample is again weighted with bottle and the difference of weights before drying and after drying is measured as loss on drying. For determination of foreign matter, a sample of 5g is taken and spread in a thin layer and foreign matter sorted using a magnifier lens (10x). The sample then passed through sieve of no. 250. The separated foreign matter is weighted to provide the percentage of its presence.

Phytochemical screening

The phytochemical studies were carried out to determine presence of tannin, alkaloids, phenolics, protein, glycoside, carbohydrate, terpene and saponin[11]. Many tests have been conducted like gelatin test, lead acetate test, ferric chloride test, Mayer's, dragendroff's, Millon's biuret and Ninhydrin test, Borntranger's test, iodine test, molisch's test, Fehling's test, Libermann's test, Salkowski test, Froeh test etc.

pH Determination

To determine pH value of the material amla swaras, 10 % solution of amla churna and its formulation prepared to determine pH value using pH paper and pH meter.

Ash Value determination

To determine total Ash value take 2 gm amlaka churnam lab and marketed formulation and its ingredients on silica dishes ignited in muffle furnace at 550-600° C until it is indicating the free from carbon then cooled and calculated percentage of total ash with reference to the air dried material.

Acid insoluble Ash Value determination

The ash amlaka churnam lab and marketed formulation and its ingredients were boiled for 5 min with dil. HCL and insoluble matter were collected, washed with hot water then filtered ignited to a constant weight and calculated the percentage with reference to the air dried drug.

Water soluble Ash Value determination

The total ash obtained from amlaka churnam lab and marketed formulation and its ingredients were boiled for 5 min with 10 ml water and insoluble matter were collected, washed with hot water then filtered ignited to a constant weight. To determine water soluble ash value, the weight of insoluble matter as subtracted from total ash value. The percentage of water-soluble ash was calculated from air dry formulations and its ingredients.

Extractive values evaluation

The extractive values of amla and amlaki rasayana were recorded in alcohol and water using cold maceration method. Weight 3 gm of air dried amla churna and formulations were macerated 100 ml with solvents (alcohol and water) in closed flask for 24 hours and were shaken frequently during 3 hours then allowed to stand for 18 hours. The mixture was filtered quickly to avoid loss of solvent due to evaporation then take twenty-five ml of in tared flat bottomed dish and evaporate to dryness at 105° C to a constant weight and percent extractive values (alcoholic and water) were calculated with reference to air dried ingredients and formulation.

Rheological evaluation

All the samples of materials were subjected to tests for rheological evaluation of the samples in terms of tap density, bulk density, angle of repose,

(i) Bulk density

To measure bulk density, mass of the powder and volume of the powder is required. The powder put into a 100 ml cylinder. The cylinder is dropped over a wooden plank again and again keeping time interval of 2 seconds from 2 cm height. Powder in cylinder is weighted again. The volume of the cylinder is measured in cm³. The bulk density is obtained by dividing weight of the cylinder by volume in cm³.

(ii) Tap density

The powder of a sample is carefully taken into 100 ml cylinder. To reduce volume of the material, the cylinder is dropped again and again over a wooden plank from height of 2 cm till there is no significant decrease in volume. Tap density is obtained by ratio of weight of sample in gm to final volume of the cylinder in cm³.

(iii) Angle of repose

In order to execute this test, a glass funnel is kept by using a clamp with a ring support. The glass placed is placed on a micro lab jack. 100 gm powder is taken into the funnel and the orifice of the funnel is closed by a thumb. To measure the angle of repose, the thumb is removed from the funnel. While removing the thumb, about 6.5 mm difference is maintained between funnel orifice and top of the powder

pile. When complete powder comes out of the funnel the angle of heap to horizontal plane is measured, this heap angle is called angle of repose.

RESULTS AND DISCUSSION

In order to determine standardization parameters, amalaka rasayana churnam is under undergone through all the methods discussed previously. In this section, the results obtained after the proves of evaluation has been presented. In order to represent name of samples following abbreviations have been used; AM (Amla Churn), AMS (Amla Swarasa) AMR-I (Amalki Rasayan Churn-I), AMR-II (Amalki Rasayan Churn-II), AMR-III (Amalki Rasaya Churn-III), MAMR (Marked Amalki Rasayan Churn). Organoleptic analysis of the formulation and all raw ingredients were evaluated by earlier discussed method. The organoleptic analysis summarized in Table 1.

Table 1: Organoleptic Evaluation of Amalki Rasayan Churn and its Ingredients

S.No.	Name	Color	Odour	Taste	Touch
1.	AM	Brown	Specific	Sour & Sweet	Smooth
2.	AMS	Green	Specific	Sour & Sweet	Soft Fluidy
3.	AMR-I	Dark Brown	Specific	Sour & Acidic	Smooth
4.	AMR-II	Dark Brown	Specific	Sour & Acidic	Smooth
5.	AMR-III	Dark Brown	Specific	Sour & Acidic	Smooth
6.	MAMR	Dark Brown	Specific	Sour & Acidic	Smooth

Amla Churna and its lab batches with its raw materials were evaluated for loss on drying and foreign matter through the method discussed earlier the result of both recorded and tabulated in Table 2.

Table 2: Loss on drying & foreign matter in Amalki Rasayan Churnam & its Ingredients

S.No.	Name	%LOD*	% Foreign Matter*
1.	AM	3.54 ± 0.488	1.42 ± 0.242
2.	AMS	83.58 ± 4.558	1.01 ± 0.151
3.	AMR-I	3.51 ± 0.321	Nil
4.	AMR-II	3.43 ± 0.366	Nil
5.	AMR-III	3.22 ± 0.324	Nil
6.	MAMR	3.60 ± 0.412	Nil

*mean ± S.D. (n=6)

Further, results of phytochemical analysis of raw material and laboratory formulations with marketed formulation of Amlaka Churna are recorded in Table 3.

Table 3: Phyto Chemical Screening of Amalki Rasayan Churnam & its Ingredients

Name	Tannin	Alkaloids	Phenolics	Protein	Glycoside	Carbohydrate	Terpene	Saponin
AM	+	+	+	-	+	+	-	+
AMS	+	+	+	-	+	+	-	+
AMR-I	+	+	+	-	+	+	-	+
AMR-II	+	+	+	-	+	+	-	+
AMR-III	+	+	+	-	+	+	-	+
MAMR	+	+	+	-	+	+	-	+

pH value of all samples of Amla churna and amalaka rasayana including marketed formulations has been evaluated. pH value of samples has been evaluated using pH paper and pH meter. The average of these two values is shown in

Table 4.

Table 4: pH of Amalki Rasayan Churnam & its Ingredients

S.No.	Name	pH Paper	pH Meter
1.	AM	4	3.8
2.	AMS	3	2.8
3.	AMR-I	4	3.2
4.	AMR-II	4	3.3
5.	AMR-III	4	3.4
6.	MAMR	4	3.3

Total Ash value has been determined by using 2 gm amlaka churnam lab and marketed formulation and its ingredients with reference to the air dried material. The result obtained for total ash, acid insoluble ash and water-soluble ash are tabulated in Table 5.

Table 5: Percentage Ash Value of Amalki Rasayan Churnam & its Ingredients

S.No.	Name	Total Ash* (% w/w)	Acid Insoluble Ash* (% w/w)	Water Soluble Ash* (% w/w)
1.	AM	6.486 ± 0.382	1.982 ± 0.127	2.588 ± 0.426
2.	AMS	1.456 ± 0.217	0.872 ± 0.048	0.986 ± 0.235
3.	AMR-I	6.279 ± .312	1.846 ± 0.245	2.392 ± 0.845
4.	AMR-II	6.584 ± 0.248	1.632 ± 0.184	2.288 ± 0.413
5.	AMR-III	6.789 ± 0.411	2.811 ± 0.446	1.892 ± 0.456
6.	MAMR	6.824 ± 0.621	3.282 ± 0.129	2.584 ± 0.218

*mean ± S.D. n=3

The extractive values of amla and amalki rasayana were recorded in alcohol and water using cold maceration method (Table 6). Details of the proposed method are described previously in materials and methods section.

Table 6: Extractive Values of Amalki Rasayan Churnam & Amla

S.No.	Name	Alcohol Soluble Extractive (% w/w)	Water Soluble Extractive (% w/w)
1.	AM	42.126 ± 1.347	53.426 ± 1.282
2.	AMR-I	43.247 ± 1.284	54.188 ± 3.725
3.	AMR-II	44.108 ± 1.486	53.988 ± 2.722
4.	AMR-III	45.208 ± 2.104	53.524 ± 1.082
5.	MAMR	44.288 ± 1.848	53.682 ± 1.864

*mean ± S.D. n=3

Tap density, Bulk density, Angle of Repose, Hausner ratio and Carr's Index of the lab formulation, its marketed formulation and ingredients were established through the method discuss and data are tabulated in a Table 7.

Table 7: Rheological Evaluation of Amalki Rasayan Churnam & Amla

S.No.	Name	Tap density*	Bulk density*	Angle of repose*	Hausner ratio*	Carr's index's*
1.	AM	0.53±0.02	0.46±0.01	28.89±0.62	1.15±0.01	12.88±0.22
2.	AMR-I	0.56±0.03	0.42±0.02	41.44±0.72	1.33±0.03	22.24±0.12
3.	AMR-II	0.54±0.03	0.41±0.03	39.32±0.35	1.31±0.03	20.34±0.52
4.	AMR-III	0.62±0.04	0.49±0.04	36.52±0.37	1.26±0.02	23.72±0.32
5.	MAMR	0.57±0.03	0.45±0.03	37.72±0.67	1.27±0.03	21.78±0.62

*mean ± S.D. n=3

CONCLUSION

In this work, Amalaka churnam is evaluated according to standard procedures. Initially, organoleptic properties of the material have been evaluated later on extractive values, phytochemical and rheological evaluation has been calculated. The standard established for the formulation can be used as reference by Ayurvedic manufacturers for quality assessment and improvement of their formulations quality.

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