Original Article

Evaluation of Dhouti Yog Churna and Comparision of Inhouse Preparation with Marketed Preparation

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ABSTRACT

Most of the traditional systems of medicine are effective but they lack of standardization. So, there is a need to develop a standardization technique. Central Council of Research in Ayurveda and Siddha has given preliminary guidelines for standardizing these conventional formulations. For the uniformity in production of herbal formulations it is necessary to develop methods for evaluation. In the paper, attempt had been made to evaluate Dhouti-Yog Churna, an Ayurveda formulation. One sample was procured from manufacturer and was subjected to compare with in house preparation sample by performing physicochemical screening, phytochemical screening, and microscopic characterization. It was observed that market samples matched with that of authentic standards. The inhouse formulation also produced the similar results with that of marketed formulation[1].

Keywords: Dhouti-Yog Churna, Phenazone Test, Gelatin Test.

INTRODUCTION

Dhouti-Yog churna is the old age formulation the most commonly employed in Constipation, gases, indigestion, acidity, irregular bowels, piles etc. It is very safe and effective remedy for routine digestive problem like constipation etc. Standardization is an essential factor. It is very important to establish a system of standardization for every plant medicine in the market, since the scope for variation in different batches of medicine is enormous. Plant material when used in bulk quantity, they may vary in its chemical content and therapeutic effect according to the different batches of collection. By considering the increasing demand of Ayurvedic formulations, proper documentation regarding their standardization is more important to assure the quality, purity, safety and efficacy[2]

Aims & Objectives

Lack of in-process quality control techniques makes it difficult to maintain the consistency and quality of Ayurvedic formulations. Therefore, there is an immediate need to develop standard protocol for the uniform manufacturing of

Ayurvedic formulations. Standardization is a burning topic in Ayurvedic drug industry today, and remains lacking in documentation, validation and determination of marker compounds. So the standardization of the market formulation is very useful and guarantees the quality and the safety of the product to the consumer would be given. Therefore, establishing quality and standard parameters for the Ayurvedic formulation is important. So, the aim of this work is to develop evaluation parameters for Dhouti-Yog churna & comparison with market formulation[2].

MATERIALS AND METHODS

Material

All chemicals and solvents used were of analytical grade. Dhout-Yog Churna contains the crude drugs Senna, Haritaki, Saindhav. All these plant crude drugs required for the preparation of the standard formulation of Dhouti-Yog churna were collected from the local market of Solapur, in the month of November, 2012. All the materials were authenticated

IDENTIFICATION TEST FOR

1. SENNA

A.

Senna occurs as greyish-green to brownish-green, thin, fragile leaflets, lanceolate , mucronate, asymmetrical at the base, usually 15mm to 40mm long and 5mm to 15mm wide, the maximum width being at a point slightly below the centre; the lamina is slightly undulant with both surfaces covered with fine, short trichomes. Pinnate venation is visible mainly on the lower surface, with lateral veins leaving the midrib at an angle of about 60°C and anastomosing to form a ridge near the margin.

B.

Reduce to a powder. The powder is light green to greenish-yellow. Examine under a microscope using *chloral hydrate solution*. The powder shows the following diagnostic

Characters : polygonal epidermal cells showing paracytic stomata ; unicellular trichomes, conical in shape, with warted walls, isolated or attached to fragments of epidermis ; fragments of vascular bundles with a crystal sheath of prismatic crystals of calcium oxalate ; cluster crystals isolated or in fragments of parenchyma.

C.

Examine by thin-layer chromatography, using *silica gel G* as the coating substance.

Test solution. To 0.5g of the powdered drug, add 5 ml of a mixture of equal volumes of *alcohol* and *water* and heat to boiling. Centrifuge and use the supernatant liquid.

Reference solution. Dissolve 10mg of *senna extract CRS* in 1 ml of a mixture of equal volumes of *alcohol* and *water* (a slight residue remains). Apply to the plate as bands 20mm by 2mm 10µl of each solution. Develop over a path of 10 cm using a mixture of 1 volume of *glacial acetic acid*, 30 volumes of *water*, 40 volumes of *ethyl acetate* and 40 volumes of *propanol*. Allow the plate to dry in air, spray with a 20 per cent V/V solution of *nitric acid* and heat at 120°C for 10 min. Allow to cool and spray with a 50g/l solution of *potassium hydroxide* in *alcohol* (50 per cent V/V) until the zones appear. The principal zones in the chromatogram obtained with the test solution are similar in position (sennosides B, A, D and C in the order of increasing *Rf* value), colour and size to the principal zones in the chromatogram obtained with the reference

Solution. Between the zones corresponding to sennosides D and C a red

zone corresponding to rhein-8-glucoside may be visible.

D.

Place about 25mg of the powdered drug in a conical flask and add 50 ml of *water* and 2 ml of *hydrochloric acid*. Heat in a water-bath for 15 min, cool and shake with 40 ml of *ether*. Separate the ether, dry over *anhydrous sodium sulphate*, evaporate 5 ml to dryness and to the cooled residue add 5 ml of *dilute ammonia*. A yellow or orange colour develops. Heat on a water-bath for 2 min. A reddish-violet colour develops.

2. MYROBALAN

A. Phenazone Test

To 5 ml of aqueous solution of tannin containing drug, add 0.5g of sodium acid phosphate. Warm the solution, cool and filter. Add 2% phenazone solution to the filtrate. All tannins are precipitated as bulky, colored precipitate.

B. Gelatin Test

To a 1% gelatin solution, add little 10% sodium chloride. If a 1% solution of tannin is added to the gelatin solution, tannins cause precipitation of gelatin from solution.

C.

Test solution, add 5% of ferric chloride solution shows deep blue black colour

D.

Test solution, add Bromine water shows Decolouration of Bromine water

E.

Test solution, add potassium dichromate which produces Red ppt.

F.

Test solution, add 1 drop of ammonium hydroxide, add excess 10% of silver nitrate solution heat for 20 minutes in boiling water bath. White ppt. observed then dark silver mirror deposits on wall of test tube.

Identification tests for Saindhav

Some Saindhav crystals can be reddish, off white, colorless or beige in color. Crystals, slabs, tiles, plates, salt lamps etc. made for Himalayan Rock salt/Saindhav are widely popular in culinary as well as holistic health enthusiasts.

All these tests were performed in the college lab & they shown the positive results.

METHODS

Dhouti-Yog churna was prepared by Grinding and Sieving method. In house formulation Dhouti-Yog Churna was prepared. All of the drugs were grinded separately and powdered in mortar and mixed together after passing through sieve16#.

EXPERIMENTAL

1. Physical Parameters[4]

Determination of Bulk Density, Tapped Density, Hausner's Ratio

About 10 gm of powder of both the standard and test formulation were weighed and filled into graduated cylinder of densitometer. The volume initially measured as bulk volume. After putting the cylinder on the densitometer and was set for 100 tapping. Tapping was done until constant volume was obtained. After those bulk densities, tapped density, compressibility, Hausner's ratio was calculated using following equations:

Determination of angle of repose

A glass funnel was held in place with a clamp on a ring support over a glass plate. The glass plate was placed on a micro lab jack. Approximately 20g of powder was transferred into the funnel keeping the orifice of funnel blocked by the thumb. As the thumb was removed, the lab jack was adjusted so as to lower the plate and maintain about a 6.4mm gap between the bottom of the funnel stem and the top of the powder pile. When the powder was emptied from the funnel, the angle of the heap to the horizontal plane was measured. The height of the pile (h) and the radius of the base was measured with a rular. The angle of repose thus estimated.

tan θ = height of pile funnel(h)/radius(r).

2. Physico-chemical parameters

Determination of Ash Values[5]

2-3g of accurately weighed formulation was incinerated in a tared silica crucible at a temperature not exceeding 450°C in a muffle furnace until white ash has been obtained indicating the absence of carbon. It was then cooled, weighed and percentage of ash was calculated with reference to the air-dried powdered drug.

Particle Size Determination[6]

Particle size determination was done by Microscopy Examination.

This method is suitable for counting and characterizing particles of 1µm and greater with increased resolving power of microscope particles smaller than 1µm can be detected and characterized. The method is particularly useful for characterizing particle that were not spherical. This may be done for irregular shaped particles.

Method

With help of stage micrometer, microscope calibration was done. After calibration, the powder was spread on slide and observed under 40X for particle size determination.

DISCUSSION

The Dhouti Yog Churna was analyzed for various parameters, it had shown very good results. The home made preparation also analyzed for the same parameters like angle of repose, particle size etc. The bulk density, tapped density & Hausner's ratio are

matching with that of marketed formulation while the particle size is quite greater. Ash value is less for home made formulation & the angle of repose is more little beat.

CONCLUSION

After analysis, standard and test ayurvedic formulation of Dhouti-Yog churna by different parameters such as physical parameters and physico-chemical parameters.

It can be concluded that the in house formulation was comparable with marketed formulation.

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Table 1. Composition of dhouti-yog churna

Sr. No.	Ingredients	Quantity (in gm for 40gm)
1.	Senna	22.84
2.	Saindhav	5.72
3.	Haritaki	11.44

Table 2. Composition of standard dhouti-yog churna

Name and address of the Manufactures	Ingredients	Quantity each 10gm contain
Siddha Pharmaceuticals 7, Ravindhra society, Padmawati, Pune.	Senna	5.71
	Saindhav	1.43
	Haritaki	2.86

Table 3. Determination of ash value

Sr. No.	Sample	Ash value (%)
1.	STANDARD	38.6
2.	TEST	31.4

Table 4. Particle size determination for market formulation

Sr. No.	Size range	Mean size(d)	No.of particle(n)	% of (n)	Cumulative % frequency	Nd
1.	0-15	7.5	70	48.61	48.61	525
2.	15-30	22.5	47	32.63	81.24	1057.5
3.	30-45	37.5	18	12.5	93.74	675
4.	45-60	52.5	7	4.86	98.6	367.5
15.	60-75	67.5	2	1.38	99.98	135
			∑n=144			∑nd=2760

Average particle size =∑nd/∑n
=2760/144
=19.16µm

Table 5. Particle size determination for in-house preparation

Sr. No.	Size range	Mean size(d)	No.of particle(n)	% of (n)	Cumulative % frequency	Nd
1.	0-15	7.5	64	41.55	41.55	480
2.	15-30	22.5	39	27.08	68.63	877.5
3.	30-45	37.5	25	16.23	84.86	937.5
4.	45-60	52.5	17	11.03	95.54	892.5
5.	60-75	67.5	9	5.84	101.73	607.5
			∑n=154			∑=3795

Average particle size =∑nd/∑n
=3795/154
=24.64µm

Table 6. Morphological study of in house preparation and marketed preparation of Dhouti-yog churna

Sr. No.	Parameter	Marketed preparation	Inhouse preparation
1.	State	Coarse powder	Coarse
2.	Colour	Greenish brown	Greenish brown
3.	Odour	Slight	Slight
4.	Taste	Bitter	Bitter

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Table 7. Physical parameters
(Parameters for Dhouti Yog Churna in house preparation and market preparation)

Parameter	Marketed preparation	Inhouse preparation
Bulk density (gm/ml)	0.4	0.43
Tapped density (gm/ml0	o.5	0.54
Carr's Index (%)	40	43
Hausner's Ratio	1.25	1.25
Angle of Repose	33.424	32.822
Particle size (µm)	24.64	19.16
Ash value (%)	31.4	38.6