



RESEARCH ARTICLE

In house & Marketed Preparation of Hingwashtak Churna, A Polyherbal Formulation: Comparative Standardization and Measures

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Abstract:

Background:

Hingwashtak Churna is a polyherbal Ayurveda based classical formulation used to cure certain digestive disorders. We have attempted to prepare and standardize this preparation comparing it with standard preparation to ensure its quality.

Objective:

The current research was aimed at the preparation of Churna in house and to compare it with the marketed formulation on all the standard norms while standardizing it.

Materials and Methods:

The Churna was prepared in-house according to The Ayurvedic Formulary of India. The Churna was comparatively evaluated along with its marketed preparation based on the evaluation of external features, physical constants, and physico-chemical parameters.

Results:

The scientific findings were found to be comparable and suitable enough for the evaluation of Churna.

Conclusion:

Ayurvedic medicine, HW has been standardized using the various parameters and can be incorporated while developing the pharmacopoeial standards.

Keywords: Hingwashtak churna, Polyherbal, Ayurveda, Digestive disorders, Ayurvedic medicine, Vermifuge.

1. INTRODUCTION

The matter of standardization of crude herbal drugs as well as formulations is wider and an area of deep concern. So many controversial findings, beliefs on the matter of safety, efficacy and purity of herbal based medicines and their association with human physiology, functions and mechanisms. For the goal of research work on the various aspects of herbs in any form nutraceuticals as well as cosmeceuticals, a sound information on the deeper aspects of the important medicinal herbs found in India is essential and widely applicable in the preparation of Ayurvedic formulation is of prime importance. Standardization of herbal formulations is required for the assessment of the efficacy, purity and efficacy of drugs, on the basis of phytoconstituents present in them [1].

India needs to explore the medicinally important plants widely due to rich heritage of larger amounts of rich and diverse floral kingdom. This can be achieved only if the herbal products are evaluated and analyzed using sophisticated

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modern techniques of standardization. The necessity of quality control for ayurvedic formulations is due to the fact that the preparation of drug as per the traditional methods has decreased due to the industrialization of ayurvedic pharmacy. Due to lack of post-market surveillance and the scarcity of testing facilities makes the quality control of ayurvedic medicines less predictable [2].

In order to ensure the quality, quantity, purity and efficacy of drugs, evaluation of herbal based formulations is an utmost requirement based on the amount of their phytoconstituents [3, 4]. "Hingwashtak churna" is a polyherbal based ayurvedic medicine used as a digestive aid as it helps in the removal of all digestive disorders, by acting as a carminative and antispasmodic. It is a strong vermifuge, and helps in the treatment of all painful conditions like sciatica and stiffness in back.

The constituents present in the churna play important role to justify its digestive role. It has been used as a household measure for the treatment of stomach ailments, in order to take care of functions of the gastrointestinal tract. It helps in dealing with the problems such as defecation, micturition, flatulence. This Churna is an outstanding remedy for flatulence, indigestion, constipation and other disorders related with impaired metabolism of digestive tract [5]. The Churna is chiefly gastro-protective in action [6]. This study is an effort performed on the evaluation of Hingwashtak churna on the basis of organoleptic characters, physical features and physicochemical features.

In house preparation, which was made by the assemble of all ingredients together and the marketed drug, procured from market have been evaluated and compared on the basis of organoleptic features, physical characters, and physicochemical aspects of both the formulations separately. Standardization of herbal formulations is essential in order to assess the quality of drugs, based on the concentration of their active principles [7].

2. MATERIALS AND METHODS

2.1. Plant Material

Hingwashtak churna is composed of mainly eight ingredients viz., Piper nigrum, Piper longum, Zingiber officinale, Nigella sativa, Cuminum cyminum, Trachyspermum ammi, Ferula foetida, and Rock salt (Saindhava Lavana). All these ingredients were purchased from the local area.

2.2. Development of Hingwashtak Churna

The churna was formulated according to the procedures given in Ayurvedic Formulary of India. Piper nigrum, Piper longum, Zingiber officinale, Nigella sativa, Cuminum cyminum and Trachyspermum ammi were taken in equal amounts that were 100 grams each as mentioned in Table 1, in the coarsely powdered form and were fried in equal quantities. The fried ingredients as shown in Fig. (1) become more stable, moisture free and more potent. They were then coarsely grinded separately and passed through 80 # sieve and mixed together in an equal proportions, along with Ferula foetida fried in ghee and rock salt to get uniform and homogenous churna [8].



Fig. (1). Constituents of Hingwashtak Churna.

Table 1. Composition of Hingwashtak Churna.

S.No	Constituent	Parts
1.	Piper nigrum	1 part
2.	Piper longum	1 part
3.	Zingiber officinale	1 part
4.	Nigella sativa	1 part
5.	Cuminum cyminum	1 part
6.	Trachyspermum ammi	1 part
7.	Ferula foetida	1 part
8.	Rock salt	1 part

2.3. Role of the Constituents

Role of individual components is important in order to signify the usage of the particular crude drug. As the formulation is digestive in nature, the constituents taken are effective as carminative and fight against flatulence and bloating.

Black salt, as shown in Fig. (2) is used as an integral component of many products meant for the purpose of easing digestion like Hingwastak Churna which is used for care of abdomen as it facilitates digestion without causing irritation in stomach and worsening gastritis. Ginger powder, shown in Fig. (3), is used as a remedy to cure indigestion.

**Fig. (2).** black salt.**Fig. (3).** Ginger powder

Piper nigrum and longum in Figs. (4, 5), serve important role as carminatives. They help to remove the flatulence, caused by the formation of gases in the gastro-intestinal tract. The alkaloid piperine present in both serves many medicinal purposes. It is digestive, appetizer and also acts as a tonic [9]. Ferula foetida, as shown in Fig. (6) and Black cumin in Fig. (7) are a boon for several diseases of the stomach. It is one of the best alternates available for the problem of flatulence and is an important part of most of the digestive formulations. To get rid of flatulence and distension of the abdomen, asafoetida is dissolved in hot water and used [10]. Hingwashtak churna preparation designed in the lab, as shown in Fig. (8), is a perfect blend of digestives as T. ammi, as shown in Fig. (9) and cumin shown in Fig. (10) facilitates the secretion of gastric acid; also when added to the infusions, the gastric acid secretion enhances upto four folds. It reduces food retention time and also increases the efficacy of digestive enzymes and facilitates a higher secretion of bile acids [11, 12].



Fig. (4). Piper nigrum.



Fig. (5). Piper longum.



Fig. (6). Asafoetida.



Fig. (7). Black Cumin.



Fig. (8). In house preparation.



Fig. (9). Ajowan



Fig. (10). Cumin.

It solves the problem of constipation upto major extent, when taken on regular basis [13]. Cumin, as shown in Fig. 10, and ginger powder, shown in Fig. 3, are used as a remedy to cure indigestion, flatulence and lack of appetite [14].

2.4. Marketed Samples

The marketed samples of Hingwashtak churna and preparation designed in the lab, as shown in Fig. (8) were evaluated on the basis of their organoleptic features, physical characters and physicochemical aspects.

Organoleptic evaluation refers to the assessment of the preparation by its sensory features as colour, odour, taste, touch, appearance *etc.* The organoleptic characters [15] of the samples were measured on the basis of the methods as described by Siddiqui *et al.*

2.5. Physicochemical Explorations

Physicochemical explorations of both formulations were carried out, involving the inspection of extractive values and ash values [16].

2.6. Fluorescence Investigation

The powdered samples were revealed to ultraviolet light at short and long wavelengths of 254 and 366 nm respectively [4]. Fluorescence examination was tested out as per the procedures defined by Kokoshi *et al.* One milligram of powdered drug is usually preferred for the purpose of examination on the microslide and then observed under short and long UV as well as day light to study the fluorescent features of powder. One milligram powdered drug was treated with 1 ml of 1 N HCl on the microslide and observed under UV 366, 254 and in day light. Then again fresh sample was taken on the microslide, which was further treated with 1 ml 1 N NaOH and examined after a few minutes in day light, under UV 366 and 254. Powdered drug was then treated with 1 ml 1 N NaOH in 1 ml methanol. Similarly one milligram powdered drug was placed on a microslide and treated with 1 ml 50% KOH and another one milligram sample was treated with 1 ml of 50% sulfuric acid and observed under UV 366, 254 and in day light. Treatment with 1 ml of concentrated sulfuric acid and analysis under UV 366, UV 254 and in day light is performed. One milligram powdered drug was placed on a microslide and treated with 1 ml of 50% HNO₃ and observed under UV 366, UV 254 and in day light. On the treatment with 1 ml of concentrated HNO₃ and observed under UV 366, UV 254 and in day light, different results were obtained. The samples were treated with 1 ml of acetic acid and observed under UV 366, UV 254 and in day light. The powdered drug was placed on a microslide and treated with 1 ml of iodine and observed under UV 366, UV 254 and in day light [17].

2.7. Phytochemical Analysis

The churnas, both in house as well as the marketed preparation were tested for the presence of different phytoconstituents. Different reagents were used for this purpose to detect the groups of carbohydrates, phenols, glycosides, alkaloids, steroids, tannins and proteins [11].

3. RESULTS AND DISCUSSIONS

In house formulation was designed strictly according to the directives of Ayurvedic Formulary of India. The ash values of both the formulations were determined by referencing to the method as mentioned in the WHO guidelines for medicinal plant materials. The physicochemical and sensory features as shown in Table 2 of both the formulations were compared and the values are given in the following tables [18 - 20]. The physical parameters such as pH was determined to avoid gastric irritation and the moisture content was determined to find out any increase in weight caused by moisture absorption as more amount of moisture decreases the shelf life of churna. Since ashing process involves oxidation of components of product, an increase in ash value indicates contamination, substitution and adulteration.

Table 2. Organoleptic features of Hingwashtak Churna.

S.No	Parameters	In House Preparation	Marketed Preparation
1.	Colour	Dark brown	Pale yellow
2.	Odour	Characteristic	Characteristic
3.	Taste	Pungent	Pungent
4.	Appearance	Powder	Powder

The datas obtained with the market and the in house formulations were found to be comparable and variation was negligible. They were found to be more or less similar. The colour variation may be due to difference in the place of origin of the constituent. As they were obtained from different sources. Fluorescence analysis as shown in Table 3 is similar of both formulations. Regarding the physico-chemical parameters as shown in Table 4, there is a variation in the extractive values, both in the alcoholic and aqueous samples. The extractive values namely water-soluble and alcohol soluble indicates the amount of active constituent in given amount of plant material when extracted with respective solvents, a lower value compared to standard value indicates presence of exhausted material. The water-soluble extractive value indicated the presence of sugar, acids and inorganic compounds. Less or more extractive value indicates addition of exhausted material, adulteration or incorrect processing during drying, or storage or formulating.

Table 3. Fluorescence analysis.

S.No	With Different Reagents	In House Formulation		Marketed Formulation	
		254 nm	366 nm	254 nm	366 nm
1.	P in KOH soln.(50%)	Light green	Greenish black	Light green	Greenish black
2.	P in H ₂ SO ₄ (50%)	Light green	Black	Light green	Black
3.	P in HNO ₃ (50%)	Dark green	Black	Light green	Black
4.	P in Iodine water	Dark green	Blackish brown	Light green	Black
5.	P in CH ₃ COOH	Green	Black	Light green	Black
6.	P in NaOH soln	Dark green	Black	Light green	Black
7.	P in HCl	Green	black	Light green	Black

Table 4. Physico-chemical parameters.

S.No	Parameter	In House Formulation	Marketed Formulation
1.	Extractive value(alc.)	12%	6%
2.	Extractive value(aq.)	4%	2.5%
3.	Loss on drying	4%	3.9%
4.	Ash value	2%	2%

Phytoconstituents were found to be similar to the major extent. Steroids are absent in both the formulation. Whereas carbohydrates are absent in the marketed preparation and glycosides are absent in the in-house preparation. The phytochemical features are highlighted in Table 5.

Table 5. Phyto chemical Screening.

S.No	Absence of Phytoconstituents	In House Formulation	Marketed Formulation
1.	Alkaloids	+	+
2.	Glycosides	-	+
3.	Tannins	+	+
4.	Carbohydrates	+	-
5.	Steroids	-	-
6.	Phenols	+	+
7.	Proteins	+	+

CONCLUSION

The standardization of polyherbal formulation Hingwashtak churna, both in house and marketed was carried out. Both in house and marketed formulations were evaluated as per WHO guidelines and as mentioned in Indian Herbal Pharmacopoeia. The formulation was prepared accordingly and observed for various organoleptic, fluorescence and phytochemical properties in comparison with the marketed sample. Hingwashtak churna is a promising herbal medicine used to treat various ailments related to gastro intestinal tract. With the effective work on all its parameters, this churna can be explored for all its applications and other hidden aspects. From the datas and stats obtained from Hingwashtak Churna, it could be used as a valuable analytical tool in the routine analysis. It helps to check the batch to batch variations. This Ayurvedic medicine has been standardized by intervention of modern scientific quality control measures in the traditional formulation described in classical texts. Pharmacognostic characters established for the raw materials could be employed as quality control standards for evaluating its identity and can be used for routine analysis. Purity and potency of the materials and formulations following the procedure given could be performed in quality control and assurance of pharmaceuticals. The defined parameters were found to be sufficient enough to standardize the churna and can be used as reference standards for the further quality control/quality assurance sectors of a Pharmaceutical company as well as to explore new phytoconstituents and new medicinal activities.

ETHICAL APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No animals/ humans were used for the studies that are bases of this research.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise.

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REFERENCES

- [1] Quality control methods for medicinal plant materials, 559, revOriginal English. World Health Organisation 1992; p. 159.
- [2] Anonymous . The Ayurvedic formulary of India, Govt of India. New Delhi: Ministry of Health and Family Welfare 1976.
- [3] Ekka NR, Nmedo KP, Samal PK. Standardization strategies for Herbal drugs. Res J Pharm Tech 2008; 1: 310-2.
- [4] WHO. Quality Control Methods for Medicinal Plant Materials. Delhi: AITBS Publishers 2002; pp. 65-7.
- [5] Vaishali K, Shruti M, Praharsha M, Jagadeeswari L. Mounika. Comparative standardization study of two marketed Ayurvedic formulations of Hingwashtak Churna. J Med Plants Studies 2017; 5(2): 25-8.
- [6] Shirwaikar A, Ram HN, Mohapatra P. Antioxidant and antiulcer activity of aqueous extract of a polyherbal formulation. Indian J Exp Biol 2006; 44(6): 474-80. [PMID: 16784118]

- [7] Sriwastava NK, Shreedhara CS, Aswatha Ram HN. Standardization of Ajmodadi churna, a polyherbal formulation. *Pharmacognosy Res* 2010; 2(2): 98-101. [<http://dx.doi.org/10.4103/0974-8490.62957>] [PMID: 21808548]
- [8] Ayurvedic Formulary of India. Government of India, Ministry of Health and family welfare. 2nd revised edition. New Delhi. Department of ISM and H; 2003. The Ayurvedic Formulary of India, Part I; p. 106.
- [9] Agrawal AK, Rao CV, Sairam K, Joshi VK, Goel RK. Effect of Piper longum Linn, Zingiber officinalis Linn and Ferula species on gastric ulceration and secretion in rats. *Indian J Exp Biol* 2000; 38(10): 994-8. [PMID: 11324171]
- [10] Mahendra P, Bisht S. Ferula asafoetida: Traditional uses and pharmacological activity. *Pharmacogn Rev* 2012; 6(12): 141-6. [<http://dx.doi.org/10.4103/0973-7847.99948>] [PMID: 23055640]
- [11] Indian Pharmacopoeia, Ministry of Health and Family Welfare. New Delhi: Government of India 1996.
- [12] Srivastava KC. Extract of a spice--omum (*Trachyspermum ammi*)-shows antiaggregatory effects and alters arachidonic acid metabolism in human platelets. *Prostaglandins Leukot Essent Fatty Acids* 1988; 33(1): 1-6. [[http://dx.doi.org/10.1016/0952-3278\(88\)90115-9](http://dx.doi.org/10.1016/0952-3278(88)90115-9)] [PMID: 3141935]
- [13] Mavcure, 19+ health benefits of black salt that you should know. Available from <https://mavcure.com/health-benefits-uses-of-black-salt/>.
- [14] Johri RK. Cuminum cyminum and Carum carvi: An update. *Pharmacogn Rev* 2011; 5(9): 63-72. [<http://dx.doi.org/10.4103/0973-7847.79101>] [PMID: 22096320]
- [15] Siddiqui , Hakim MA. Format for the pharmacopoeial analytical standards of compound formulation, workshop on standardization of Unani drugs, (appendix) New Delhi: Central Council for Research in Unani Medicine (CCRUM); 1995. Jan 2425.
- [16] Pal RS, Pal Y, Wal P, Wal A. Pharmacognostic evaluation of roots of benincasa hispida (Thunb.) Cogn.(*Cucurbitaceae*). *The Open Plant Sci J* 2018; 11: 1-6.
- [17] Skoog AD, West DM, Holler FJ. Fundamentals of analytical chemistry. 17th ed. New York, USA: Saunders College Publishing 1991; pp. 613-5.
- [18] Mendham J, Denney RC, Bames JD, Thomas M. Vogel's text book of quantitative chemical analysis. 6th ed. Singapore: Pearson Education Pvt. Ltd 2002; pp. 605-13.
- [19] Lachman L, Lieberman HA, Kanig JL. The theory and practice of Industrial pharmacy. 3rd ed. Mumbai: Vergheese Publishing House 1987; pp. 183-316.
- [20] Aulton ME. Pharmaceutics, The science of dosage forms designs. 2nd ed. New Delhi: Churchill Livingstone 2002; pp. 205-21.

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