

A brief study on standardization and evaluation of ayurvedic preparations of Ushirasava

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ABSTRACT

Ushirasava is the polyherbal hydroalcoholic product prepared from about 27 ingredients. It is a liquid preparation popularly used for bleeding disorders, skin diseases, diabetes and many more. Due to the cooling properties of Ushirasava, it is widely used in the diseases where excessive heat occurs in the body. This study aimed to standardize and evaluate some marketed formulations of Ushirasava with special reference to its physicochemical properties. The organoleptic and physicochemical properties of Ushirasava were standardized with reference to the protocol of testing Ayurvedic, Siddha and Unani medicines. The results were further compared with specifications given in Ayurvedic Pharmacopoeia of India. The results of this study serve a reference tool for standardizing and evaluating formulations of Ushirasava.

Keywords: *Standardization, Physicochemical, Organoleptic, Fermentation, Bioefficacy*

Introduction

Ayurveda or the natural products are the most common ancient medicine system used for treating many diseases and maintaining healthy life from thousands of years. Ayurveda is one of the oldest systems of medicine in India and according to Ministry of Ayush, the total turnover of ayurvedic medicine production in India is about \$18.2 billion in 2022 which has been increased from \$3 billion in 2014 [1]. The basic meaning of Ayurveda is “the Science of Life” which is originated from Sanskrit and it is also known as “Mother of All Healing” [2]. The major perception of Ayurveda is to maintain balance between nature and individual in order to safeguard best health [2]. Even these days, the ayurveda has taken its important place as an alternative medicine due to non-toxic and non-invasive nature of ayurvedic medicines. The ayurvedic medicines are classified in various categories such as Asava and Arishta, Lauha, Bati, Avaleha, Ghrtia, Parpati, Taila, Guggulu, Churna and Rasa. Various methods are used to formulate ayurvedic medicines and among them fermentation is one of the methods used for the preparation of medicines. Indian Ayurveda holds significant position due to two widely used Fermented Traditional Medicines i.e., Asava (made from powdered herbal drugs) and Arishtas (made from decoctions of herbal drugs) [3]. Asava and Arishta are the potent and less

toxic type of dosage forms with fast absorption [4]. In ayurveda, Asava and Arishta are comprised by Charaka Samhita, Sushruta Samhita, Astanga Hridaya, Bhaisajya Ratnavali, Sarangadhara Samhita, Yogaratnagaram, Asavarishtasangram and Astanga Sangraham [5]. These are the alcoholic preparations prepared by fermenting the juices or decoctions with the addition of sugar. The total products of asava and arishta are 79, out of which asava has 37 products and arishta has 42 products [6,7]. Some of the common products of asava are Drakshasava, Kanakasava, Kumaryasava, Lohasava and Ushirasava and few products of arishta are Abhayarishta, Asokarishta, Babbularishta and Ashvagandhadyarishta. Asava and Arishtas are medicinal products that are made by soaking the medicines either in the form of a coarse powder or in the form of a broth (kashaya) in a solution of brown sugar, as may be the case during a certain period of time in which they go through a fermentation process creates alcohol that facilitates the extraction of the active ingredients contained in the medicinal products. The alcohol produced in this way also serves as a preservative [8,9].

Ushirasava is considered to be one of the important asava and is mentioned in the category of classics like Bhaisajya Ratnavali, Sharangdhara Samhita, Gadanigraha and Sahtrayog [10]. It is a liquid dosage form which is used for treating various kinds of bleeding disorders, skin diseases, blood purification, diabetes, piles, and urinary related problems. Ushirasava soothes excessive Pitta dosha (responsible for digestion in the body) due to its cooling properties. According to Ayurvedic Pharmacopoeia, there are various ingredients involved in the preparation of Ushirasava and are mentioned in the table 1 [11, 12].

Table 1. Representing composition of Ushirasava

S.No.	Ingredients	Botanical Name	Part used	Quantity
1	Ushira	<i>Vetivera zizanioides</i>	Rt.	48 gm
2	Lotus	<i>Nelumbo nucifera</i>	Flower	48 gm
3	Hribera	<i>Coleus vettiveroides</i>	Root	48 gm
4	Gambhari	<i>Gmelina arborea</i>	Root/ stem bark	48 gm
5	Neelotpala	<i>Nymphaea stellata</i>	Flower	48 gm
6	Priyangu	<i>Callicarpa macrophylla</i>	Flower	48 gm
7	Dhanvayasa	<i>Fagonia cretica</i>	Whole plant	48 gm
8	Patha	<i>Cissampelos pareira</i>	Root/ whole plant	48 gm
9	Kiratatikta	<i>Swertia chirata</i>	Whole plant	48 gm
10	Padmaka	<i>Prunus cerasoides</i>	Stem	48 gm
11	Lodhra	<i>Symplocos racemose</i>	Stem/ bark	48 gm
12	Manjishta	<i>Rubia cordifolia</i>	Root	48 gm
13	Shati	<i>Hedychium spicatum</i>	Rhizome	48 gm
14	Parpataka	<i>Fumaria parviflora</i>	Whole plant	48 gm
15	Pundarika	<i>Nelumbo nucifera</i>	Flower	48 gm
16	Patola	<i>Trichosanthes dioica</i>	Leaf/ whole plant	48 gm
17	Kanchanara	<i>Bauhinia variegata</i>	Stem Bark	48 gm

18	Nyagrodha	<i>Ficus benghalensis</i>	Root/ Stem bark	48 gm
19	Udumbara	<i>Ficus religiosa</i>	Root/ Stem bark	48 gm
20	Jambu	<i>Syzygium cumini</i>	Stem bark	48 gm
21	Shalmali	<i>Salmalia malabarica</i>	Exudate	48 gm
22	Draksha	<i>Vitis vinifera</i>	Dry fruits	960 gm
23	Dhataki	<i>Woodfordia fruticose</i>	Flower	768 gm
24	Sarkara (Sugar)	-	-	4.8 gm
25	Madhu (Honey)	-	-	4.8 kg
26	Jala (Water)	-	-	24.576 litres
27	Black pepper	<i>Piper nigrum</i>	Fruit	Quantity sufficient

It is very important for the researcher to develop reliable and specific quality control methods in order to have good quality final herbal products. Standardization is one essential method to ensure the good quality herbal products. Thus, standardization is defined as the method to define all measures taken at the time of manufacturing of products [13]. The standardization of herbal products is difficult task as it may affect the bioefficacy and therapeutics and therefore, proper care should be taken for identifying the plants, collection area, extraction and purification of herbal drugs. All physical, chemical and pharmacological parameters should be appropriately patterned to authenticate the manufacturing process and to choose finished herbal product [14]. Some of the stability parameters for herbal products are mentioned in figure 1 [15].

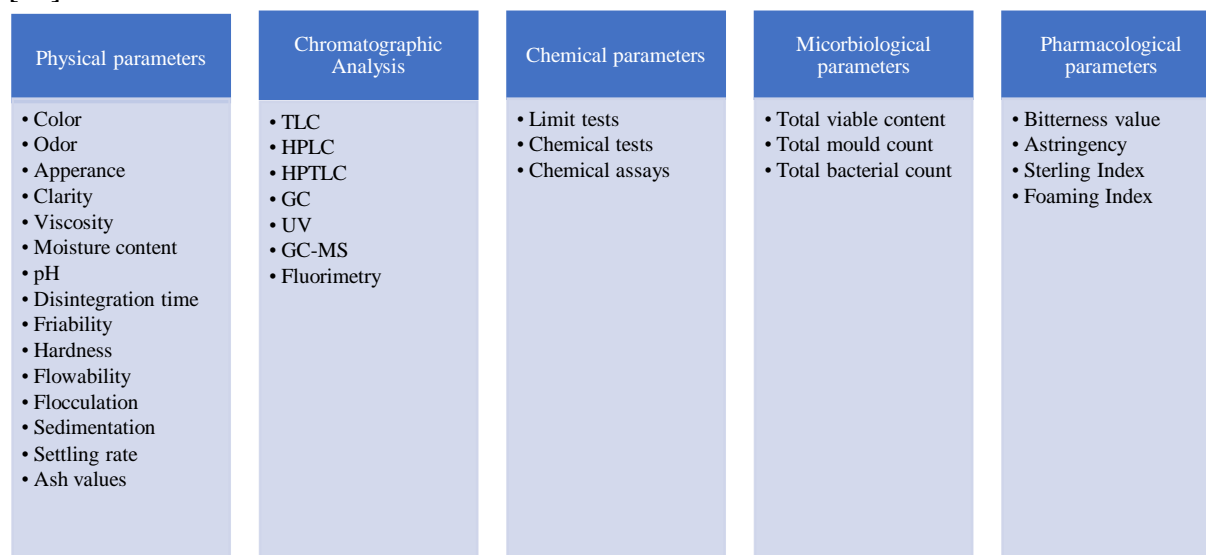


Figure 1. Representing various parameters of standardization of herbal drugs

Materials and methods

Test samples of Ushirasava- The test samples i.e., Dabur (A) and Patanjali (B) used in the research were collected from local shop of Moradabad City (Uttar Pradesh).

Physicochemical studies- The following physicochemical properties of market preparations of Ushirasava were studied-

Organoleptic properties- The organoleptic properties such as colour, odour, taste and appearance of Ushirasava were analysed.

pH- The pH of marketed formulations was measured by using calibrated pH meter.

Total solid content- The solid content of the formulations was determined by using 10 ml of test sample in porcelain evaporating dish and then heated on electric water bath at about 60–70 °C. After that, the test sample was heated in oven at about 105 °C to constant weight.

Specific gravity- 10 ml of specific gravity bottle was taken to determine the specific gravity. The following formula was used to calculate the specific gravity of test sample-Specific gravity = (Weight of 10 ml of liquid / 10) / (Weight of 10 ml of water / 10)

Ethanol content- The ethanol content was determined by testing 25 ml of test sample in 500 ml of RBF (Round bottom flask) which is diluted with 150 ml of distilled water. About 90 ml of distillate was taken in 100 ml of volumetric flask and then diluted with distilled water upto volume. The relative density was further determined and alcohol content was evaluated according to the table in Indian Pharmacopoeia 2014 [9].

Determination of Reducing Sugar content- The reducing sugar content was determined by taking 10 ml of test sample in 100 ml of volumetric flask and volume was make up upto 100 ml with distilled water. The solution was further titrated with Fehling's solution (5 ml each of Fehling solution A + Fehling solution B) by using methylene blue indicator. The average titration value was calculated with the help of using following formula-
Percent reducing sugar (% w/v) = (Fehling factor × Dilution factor × 100) / (Average titer value (ml)).

Determination of Non-reducing Sugar Content- The non-reducing sugar content value was calculated with the help of following formula-
Percent non-reducing sugar (% w/v) = (Percent total sugar (% w/v)) – (Percent reducing sugar (% w/v))

Result and discussion

Organoleptic properties- The following table 2 showed all organoleptic properties of test samples.

pH- As per the Ayurvedic Pharmacopoeia of India, the pH of test samples was in the range of 3.5-4.5. The pH of test sample A and test sample B was 4.3 and 4.2 respectively.

Total solid content (% w/v)- As per the Ayurvedic Pharmacopoeia of India, the total solid content of test samples was in the range of NLT 7%. The total solid content (% w/v) of test sample A and test sample B was 9.8 and 20.9 respectively.

Specific gravity (g/cc)- As per the Ayurvedic Pharmacopoeia of India, the specific gravity of test samples was in the given range 1.0-1.10. The specific gravity of test sample A and test sample B was 1.02 and 1.03 respectively.

Ethanol content (% v/v)- As per the Ayurvedic Pharmacopoeia of India, the ethanol content of test samples was in the range 5-10%. The ethanol content of test sample A and test sample B was 6.4 and 9.6 respectively.

Reducing sugar content (% w/v)- The reducing sugar content of test sample A was found to be 6.4 which means the sample complies with the specifications (NLT 5%) while test sample B did not comply with the specification i.e., the reducing sugar content was 3.4.

Non-reducing sugar content (% w/v)- The non-reducing sugar content of test sample A was 1.2 which means the sample did not comply with the specifications (NLT 0.65%) while test sample B complies with the specifications i.e., the non-reducing sugar content was 0.8.

Table 2. Showing organoleptic properties of test samples of Ushirasava

Test sample	Colour	Odour	Taste
A	Dark Brown	Alcoholic	Sweet
B	Light Brown	Alcoholic	Sweet

Table 3. Showing physicochemical properties of test samples of Ushirasava

Physicochemical properties	Specifications	Test sample A	Test sample B
pH	3.5-4.5	4.3	4.2
Total solid content (% w/v)	NLT 7%	9.8	20.9
Specific gravity (g/cc)	1.0-1.10	1.02	1.03
Ethanol content (% v/v)	5-10%	6.4	9.6
Reducing sugar content (% w/v)	NLT 5%	6.4	3.4
Non-reducing sugar content (% w/v)	NLT 0.65%	1.2	0.8

Conclusion

Ushirasava is the fermented traditional medicine prepared by large number of companies such as Dabur, Baidyanath, Patanjali, Dhootapapeshwar, Sandu and many more. It is the most powerful asava that is widely used as pacifier due to its cooling properties. It is also used as diuretic, tranquilizer and blood purifier. Ushirasava is most commonly used in various bleeding disorders. Till now, no side-effects are reported by the use of Ushirasava. In this scenario, it is very important to control the quality parameters to attain the better therapeutic actions. Therefore, the market samples of Ushirasava were analyzed with standardization process such as organoleptic properties and physicochemical properties. The various analytical methods were applied on market samples to identify the purity of herbal products, physical characteristics and potency of drugs for the safer use. The overall goal of ayurvedic companies is to manufacture uniform products with respect to physical, chemical and biological properties. The study was aimed to highlight standardization of marketed products of Ushirasava and it was found that all marketed products are superior in their quality and authenticity.

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Conflict of interests

The authors declare that there is no competing interest.

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