

**HERBAL DRUG PREPARATION AND STANDARDISATION WITH THEIR USES****Sonpal Singh Thakur\*, Dr. Jagdish Rathi, Karan Rajak, Kripal Gurjar, Madiha Khan, Mahendra Kumar Sharma and Mahendra Kumar Thakur**

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**ABSTRACT**

Plants serve as a rich source of bioactive molecules, which are used to treat various diseases in Ayurveda. Medicinal plant materials are formulated into valuable Ayurvedic medicines by application of modern scientific techniques, where standardization plays a pivotal role for authentication. Standardization confirms the identity, quality and purity of drugs. World Health Organization has set up suitable specific standardization parameters to evaluate the crude drugs and their finished products. These include various evaluation techniques such as pharmacognostical, physico-chemical, phytochemical, analytical, biological and biotechnological. Nowadays, application of several modern analytical techniques has become inevitable for evaluating the polyherbal Ayurvedic formulations to ensure quality, safety and efficacy. Various spectroscopic and chromatographic methods applicable for this purpose are ultra-violet spectroscopy, Fourier-transform infrared spectroscopy, nuclear magnetic resonance spectroscopy, thin-layer chromatography, high performance thin layer chromatography, high performance liquid chromatography, gas chromatography, mass spectroscopy and hyphenated techniques such as gas chromatography-mass spectroscopy, liquid chromatography-mass spectroscopy, liquid chromatography-nuclear magnetic resonance spectroscopy. Out of several formulations available in Ayurveda, asavas and aristas are considered as unique dosage forms due to their indefinite shelf life. Standardization and formulation of different asava-arista formulations using various analytical techniques are vividly discussed in this review.

**KEYWORDS:** Ayurveda, Asava, Arista, Standardization, Formulation.**INTRODUCTION**

Ayurveda is considered by many scientists to be the oldest healing science. In Sanskrit, Ayurveda means "The Science of Life." Ayurvedic knowledge originated in India more than 5,000 years ago and is often called the "Mother of All Healing".<sup>[1]</sup> Ayurveda translates into knowledge (Veda) of life (Ayur) and is one of the oldest and still widely practiced medical systems in the Indian subcontinent.<sup>[2]</sup> The concept of Ayurvedic medicine is to promote health, rather than to fight disease, and Ayurveda in daily life aims at maintaining harmony between nature and the "individual" to ensure optimal health. Ayurveda contains 8 branches of sciences and 10 different diagnostic tools based on tridosha theory (three humours of body). Ayurveda comprises of various types of medicines including the fermented forms namely arishtas (fermented decoctions) and asavas (fermented infusions). These are regarded as valuable therapeutics due to their efficacy and desirable features. Asava-arista is a novel yet least exploited continuous hydro alcoholic extraction method, being traditionally used in Ayurveda. This advanced dosage form probably results into transformation of several phytochemical compounds

present in the herbs used to prepare it and thereby either rendering them less toxic or more potent, besides helping in their faster absorption. Arishtas and asavas are self-generated herbal fermentations of traditional Ayurvedic system. They are alcoholic medicaments prepared by allowing the herbal juices or their decoctions to undergo fermentation with the addition of sugars. Arishtas are made with decoctions of herbs in boiling water while asavas are prepared by directly using fresh herbal juices. Fermentation of both preparations is takes place by the addition of a source of sugar with dhataki (*Woodfordia fruticosa* Kurz) flowers.<sup>[5]</sup> Many preparations contain additional spices for improving their assimilation. They are moderately alcoholic (up to 12% by volume) and sweetish with slight acidity and agreeable aroma. Presence of alcohol in the preparation shows several advantages, like better keeping quality, enhanced therapeutic properties, improvement in the efficiency of extraction of drug molecules from the herbs and improvement in drug delivery into the human body sites. Indian Ayurvedic literature that included arista and asava are Charaka Samhita, Sushruta Samhita, Astanga Hridaya, Bhaishajya Ratnavali, Sarngadhara Samhita,

Khadhan- igragam, Arsaschikitsa, Sagasrayogam, Chik-  
itshasthanam, Yogaratnagaram, Asavarisht-asangra,  
How, shathagunasangraham and Astangasangraham.

## METHOD AND MATERIALS

- Digital weighing balance
- Beaker
- Measuring cylinder
- Distillation flask
- Separating funnel
- Heating metal
- Water bath
- Specific gravity bottle
- Water
- Earthen pot

### Dasmularista

#### Ingredients

Brihat Panchamoola  
Bilva (Indian Bael) – Aegle marmelos  
Agnimantha (Arani) – Premna serratifolia  
Gambhari (Beechwood/ Kasmari) - Gmelina arborea  
Shyonaka – Oroxylum indicum  
Patala – Stereospermum suaveolens

### Laghu Panchamoola

Brihati (Indian Nightshade) – Solanum indicum  
Shalaparni – Desmodium gangeticum  
Vitex negundo - Nirgundi  
Pluchea lanceolata - Rasna  
Piper longum - Pippali (long pepper)  
Areca catechu - Puga (Betel nut)  
Hedychium spicatum - Shati  
Curcuma longa – Haldi (Turmeric)  
Foeniculum vulgare - Saunf (Fennel Seeds)  
Prunus cerasoides - Padmaka  
Mesua ferrea - Nagkesar  
Cyperus rotundus - Mustak (Nut grass)  
Holarrhena antidysenterica - Indrayava  
Piper cubeba - Kabab-chini/Kankola (Cubeb pepper)  
Coleus vettiveroides - Jala  
Santalum album - Chandan  
Myristica fragrans - Jatiphala (nutmeg)  
Syzygium aromaticum - Laung (Clove)  
Cinnamomum zeylanicum – Dalchini (Cinnamon)  
Elettaria cardamomum - Ela (cardamom)  
Cinnamomum tamala - Tejpatra  
Strychnos potatorum - Nirmali/KatakaPha  
Pistacia integerrima kakar singhi/ Karkatashringi  
Pueraria tuberosa - Jivaka  
Microstylis wallichii - Rishabhaka  
Polygonatum cirrhifolium - Meda  
Asparagus racemosus - Shatavari  
Withania somnifera - Ashwagandha  
Dioscorea bulbifera - Zimikand  
Vitis Vinifera - Draksha (Raisins)  
Woodfordia fruticosa - Dhataki  
Water for decoction  
Honey or Madhu

Jaggery or Guda

### Method

Wash the herbals and sundry them completely to  
remove moisture particles

Powder each of the herbs separately and sieve them to  
remove impurities and other solid particles

Douse the decoction herbs in a specified quantity of  
water and boil till it decreases to ¼ of its initial volume

Filter the concocted liquid by passing it through a  
sterile muslin cloth to eliminate the impurities and the  
residual herb part

Now, add jaggery to the clear decoction and keep  
swirling till everything mixes properly

Next, pour the solution into a wide-mouthed vessel  
smeared with cow ghee from the inside

Add the remaining powdered aromatic herbs to the  
decoction and tightly seal the opening of the container  
with a mud-smeared cloth

Keep the container untouched in the fermentation room  
and let it ferment for a month

On culmination of the fermentation process, filter the  
fermented liquid through a sterile muslin cloth to  
eliminate solid particles and impurities

Empty the herbal concoction into an amber-coloured,  
air-tight glass jar

Stock it in a cool, dry environment for maturing.

### Kumariasava

#### Ingredients

1.2 Kg Haritaki – Terminalia Chebula  
12.28 Kg Kumari Rasa – Aloe Vera Juice  
768 grams Dhataki flowers – Woodfordia Fruticosa  
48 grams Bibhitaki – Terminalia Bellerica  
48 grams Pushkarmool – Inula Racemosa  
48 grams Jaiphal (Nutmeg) – Myristica Fragrans  
48 grams Laung (Clove) – Syzygium Aromaticum  
48 grams Sheetal Mirch (Kebab Chini) – Piper Cubeba  
48 grams Jatamansi – Nardostachys Jatamansi  
48 grams Chavya (Java Long Pepper) – Piper Chaba  
48 grams Chitrak – Plumbago Zeylanica  
48 grams Javitri (Mace) – Myristica Fragrans  
48 grams Karkatashringi – Pistacia Chinensis  
24 grams Loha Bhasma  
24 grams Tamra Bhasma  
4.8 Kg Guda (Gur) – Jaggery  
3 Kg Shahad – Honey  
12.28 Kg Water

## Method

Wash, dry and powder the herbal components and pass each of them separately through sieve number 44 to get a coarse powder. Boil haritaki powder in the required quantity of water till it reduces to ¼ of its initial quantity. Screen the mixture by passing it through a clean muslin cloth to get rid of the impurities and the residual herb part. Add jaggery, sugar and honey to the clear decoction and keep stirring till everything mixes properly next, pour the decoction into a wide-mouthed vessel lubricated with ghee from the inside. Add aloe vera gel and the remaining powdered herbs to the vessel. Lock the mouth of the container with a mud-smeared cloth tightly. Keep the container untouched in the fermentation room and allow it to ferment for a month. On culmination of the fermentation process, screen the fermented liquid through a clean muslin cloth to abolish solid particles and impurities. Pour the herbal concoction into an amber-coloured, air-tight glass jar. Keep the jar in a cool, dry environment for maturation.

## Standardisation

### Dasamularista

In a comparative study, Dasamularista was prepared using identical size, shape and capacity of earthen pots, stainless steel vessel and porcelain jar by filling up to ½, 2/3<sup>rd</sup> and 3/4<sup>th</sup> capacity of the container. TLC using solvent system butanol, acetic acid and water (63:17:10) showed five spots in different preparations. From different analytical and physico-chemical study results, it was found that pot filled up to 3/4<sup>th</sup> capacity was most suitable for fermenting Dasamularishta. Presence of total phenolics, alkaloids, flavonoids and saponins in the marketed Dasamularishta and in the in-house preparation was analysed on a UV spectrophotometer (Shimadzu 1800 and Cyclomixer, Remi). Percent total phenolic content was found to be more in the in-house preparation than the marketed formulation, whereas the total flavonoid, alkaloid and saponin content was less in the in-house preparation than the marketed formulation. Variations in geographical sources of raw materials and different methods adopted for their processing might have influenced these differences. TLC showed two spots under UV light with the solvent system n-butanol:glacial acetic acid:water (4:4:2) when sprayed with alcoholic KOH.

### Kumariasava

Alcohol content of Kumaryasava was determined using both specific gravity as well as GC (Chemito GC7610 Carbowax 20M) method. The result showed gradual reduction in ethanol content on storage of Kumaryasava in different containers, which may be due to vaporization on opening of the container. Therefore, asava and arista preparations have to be consumed within a shorter period of time or the formulation can be prepared in smaller volume. Total phenolic content was found to be 0.1 %. According to Dash *et al* the limit of total phenolic compound should not be less than 0.6 % w/v.

## DISCUSSION

An attempt has been made to review and understand the asava – arishta, a dosage form from the classical, pharmaceutical and standardization perspective. A review of the available literature suggests that the industrial approach for the preparation of fermented preparations, asava–arishta are based on traditional principles. The new approaches with new techniques contribute to better quality control for the large scale production. It must however be noted that the asava–arishta preparations produced adopting modern parameters of standardization as against by traditional method may pose some limitations. The limitations in case of asava–arishta standardization arise at all three steps of raw material standardization, process standardization and finished product standardization. In case of raw material: Relevance of madhura dravyas i.e. sweeteners like sugar, honey or jaggery to a particular ingredient or group of ingredients; proportion to which it is used and time of addition will definitely affect the alcoholic extraction of therapeutic attributes during fermentation. These are required to be critically and comparatively studied. *W. fruticosa*, *M. longifolia*, *Surabeeja* or *Kinva* are added in liquid for fermentation. Among these the most beneficial trigger medium for fermentation is to be examined. Use of yeast as a reliable medium to trigger and enhance fermentation process is known; however, its comparative effect as against *Dhataki* flowers are yet to be established for quality and efficacy. Timing of additives, at what stage to add, is also important. This is relevant to ingredients and the environmental conditions under which the fermentation process is undertaken. Equally important is the method for addition of additives; mixing, spreading or pottali in liquid ingredients should be deliberate. These different factors will impact the clinical efficacy. In case of process standardization: Ancient method avoid direct exposure to sunlight to maintain constant temperature; but other factor like humidity should also be studied. Artificial maintenance of temperature and its effect on the properties of the finished product is yet to be studied. In case of finished product standardization: For different formulations the period of maturation varies. There is a need to evaluate the need for addition of preservative and other effects, if any. The Central Council for Research in Ayurveda and Siddha (CCRAS) and Pharmacopoeia laboratory for Indian medicine have notified standard protocol for quality control of asava–arishta. The compliance of pharmacopoeia standards for compound formulations does help in achieving uniformity and consistency in commercial production of Ayurvedic drugs. The limitations which arise for the standardization of classical dosage form can also be looked upon as a scope for newer research for a better understanding of the principles and processes, better end product with improved clinical efficacy. To bridge the gap between traditional concepts and modern parameters it is desirable to find solutions with deeper understanding of principles for the use of modern technologies

## CONCLUSION

Medicinal wines or asava-arishtha is a formulation wherein microbial transformation helps in initiating the process of generating alcohol which helps in extracting the attributes and enhancing the bioavailability of the ingredients. Changes in fermentation techniques and adaption to modern technologies are followed for better standardization and quality control. A range of galvanometric, spectroscopic and chromatographic techniques as with TLC, HPTLC or Gas chromatography methods have been applied to evolve standards for asava-arishtha. The outcome of these different methods has been variable. Some of these techniques have further potential to contribute to evolve better standardization methods for this liquid dosage form in its totality. There are not many comparative analytical studies between traditional and modern methods of preparations. Confirmation of therapeutic and clinical assessment between the traditional and modern methods of preparations will definitely provide better insights to develop more reliable methods of preparations and better parameters of standardization. Critical evaluation of Ayurvedic principles will help examine innovative applications of present day technologies to develop better standardized, more safe and more clinically effective asava and arishtha. Technologies.

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