



## RESEARCH ARTICLE

# Formulation and evaluation of fermented Ayurvedic formulation: Asava

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Asava, an Ayurvedic formulation is used since more than 3000 years for the treatment of various diseases. Due to accelerated commercialization, the assurances on safety and efficacy of Ayurvedic products have become an important issue. Growing awareness about harmful side effects of modern medicine has led to interest in Ayurveda at the international level as well as within India. It is prepared by using decoction of herbal drug and contains self generated alcohol. Although these formulations are mentioned in traditional literature and used regularly their scientific investigation and reporting is essential to strengthen Ayurveda in global market. Determination of qualitative as well as quantitative evaluation parameters of various asava is warranted to ensure the quality and safety of these preparations. Therefore, to achieve this, the world health organization advocates to undertake various standardization parameters. In present study attempt has been made for formulation and evaluation of prepared asava.

**Keywords:** Ayurvedic formulations; Asava; standardization; physicochemical parameters

## Introduction

Ayurveda considered as one of the world's oldest traditional system of medicine with sound philosophical and experimental basis, which is believed to be over 3000 years old, and is still being practiced today. It is known to be a complete medical system that comprised of physical, psychological, philosophical, ethical, and spiritual health. It also became extremely popular by making the mutual relationship between mankind and nature. Rigveda, Samveda, Yajurveda and Atharva Veda have made sound impact on evolutionary change of living a healthy life in India. Today, there is a growing interest in accepting treatment with alternative system of medicines, is mainly due to more side effects, less curative values, high cost and enhanced microbial resistance developed by synthetic drugs, as well as surfacing of many complicated life threatening diseases [1].

Asava is a fermented formula, or herbal wine, widely used in Ayurveda to strengthen the lungs. Beneficial in conditions of Asthma, cough, fever, detoxification of your lungs after quitting smoking, or inhaling chemicals. Prepared formulation was standardized for preliminary and physicochemical parameters like pH, viscosity, acid value, refractive index, solid content, alcohol content, and total phenolic content. Based on the study, the formulation has been characterized and a few silent features of the Asava has been recorded which would facilitate the identification of formulation [2, 3].

Asava is used for the treatment of respiratory diseases it mainly contains purified datura, which acts as bronchodilator and it gives relief from an acute attack of asthma and increases 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 herbs and improvement in drug delivery into the human body sites [4].

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Received: 01 Oct 2019, Accepted:23 May 2020



## Materials and Methods

### Collection of raw materials

Plant materials were collected from forests of Nagzira National park of Maharashtra (India). All the crude drugs and others ingredients (Sugar and Honey) required for the preparation of proposed formulation were collected from the local region of Sakoli in Maharashtra, some of were collected from appropriate sources. The plant material was authenticated from department of Botony, Manoharbai Patel College of Arts & Science, Sakoli Maharastra.

### Preparation of formulation

Traditional method as described in Ayurvedic Pharmacopoeia of India (API), Part II was followed for preparation of the proposed formulation. Briefly all the crude drugs were washed, shade dried, powdered and sieved through sieve # 44 mesh. Coarsely powdered drugs were added to sugar solution contained in a porcelain jar. At the end honey, draksha and dhatkipushpa were added and container was sealed with a clay smeared cloth. Container was kept at an isolated chamber maintained at  $25 \pm 2^\circ\text{C}$  and  $45 \pm 5\%$  relative humidity. The process of completion of formulation was checked on 8<sup>th</sup>, 15<sup>th</sup>, 22<sup>nd</sup>, 30<sup>th</sup> day and was filtered through a clean muslin cloth, packed in amber colored air tight glass container [5, 6].

### Preparation Method

For the Preparation asava, the official method was followed, warm water was taken and in earthen pot specified quantity of Sugar and Honey was added then mix it well and add crushed Munaka. Then add Dhataki flower powder and mix it in the thoroughly blender. To this add all other ingredients and mix them. Then leave it for 30 days for fermentation. Asavas are the self generated fermented alcoholic liquid preparations. Fermentation is brought about by the addition fodhataki flowers. Fermented alcohol facilitates the extraction of active constituents in the drug and also acts as a preservative. Asava contain up to 12 % of alcohol and hence are also called medicinal wines. The filtered final Asava should not contain any particle of sediment. The taste should not be sour. The preparation should have the characteristic odour of fermented liquid. If any growth of mould is observed, reject immediately. Mix equal quantity of water and asava before consumption [7, 8].

### Fermentation time Duration

Fermentation varies according to different seasons. Literature revealed that fermentation takes place in 6 days during autumn and summer seasons, 10 days in winter and 8 days in rainy and spring

seasons. Generally in hot tropical climate 7-10 days are enough and 30 days in cool temperature climate [9].

### Physio chemical evaluation

Preliminary evaluation Determination of organoleptic characteristics viz. odour, taste, colour and clarity of prepared formulation was carried out.

### Determination of Specific gravity

10 gm of a formulation was taken in evaporated dish which was previously weighed and allowed to evaporate so that only solid content remain in the dish and fluid get evaporated and then it weighed and calculated.

### Determination of pH

The pH of solution provides a useful practical means for the indication of the acidity or alkalinity of a solution. pH determined by a digital ph meter calibrated at = 6. pH of ayurvedic preparation is acidic in nature.

### Determination of Viscosity

Ostwald viscometer is used to measure the viscosity of the liquid with a know density.

### Refractive Index

The Refractive Index of formulation was found out by using Abbe's Refractometer.

### Acid value

Acid value was determined as per the procedure given in Indian Pharmacopoeia [1].

### Det ermination of Alcohol Content

Alcohol content was estimated by Saritha et al. [10] method with slight modification. Precisely, 1 ml sample of asava was taken in 50 ml volumetric flask with 25 ml dichromate reagent (34g of  $\text{K}_2\text{Cr}_2\text{O}_7$  dissolved in 500 ml distilled water, and to that 325 ml of concentrated  $\text{H}_2\text{SO}_4$  was added drop wise). Flask was then incubated in water-bath ( $60^\circ\text{C}$  for 20min). After cooling, absorbance was measured at 620 nm. For calibration standard curve was prepared by using absolute alcohol.

**Determination of total phenol Content** Diluted samples of asava (0.2 ml) were mixed with 0.5 ml of Folin-Ciocalteu reagent. After 3 minutes of incubation at room temperature 2.0 ml of 20%  $\text{Na}_2\text{CO}_3$  solution was added to each tube, mixed

**Table 1** List of ingredients used in formulation

Content	Common Name	Plant Part Used	Quantity
Datura metal	Dhatura	Whole plant	3.84 g.
Adhatoda vasaka	Vasaka	Root and Bark	1.92 g
Glycyrrhiza glabra L.	Mulethi	Root	1.92 g
Piper longum L.	Pippali	Fruit	1.92 g
Solanum xanthocarpum	kantakari	Root	1.92 g
Ocimum sanctum	Tulsi	Whole Plant	1.92 g
Mesua nagassarium	Keshara	Stamen	1.92 g
Zingiber officinale	Shunt	Rhizome	1.92 g
Clerodendrum serratum	Bharngi	Root	1.92 g
Abies webbiana	Talisapatra	Leaf	1.92 g
Woodfordia fruticosa	Dhataki	Flower	1.92 g
Vitis vinifera	Manuka	Fruits	19.2 g
Sugar	–	–	2.4 kg
Honey	–	–	1.2 kg
Water	–	–	500 ml

**Figure 1** Fermentation pot

thoroughly and incubated exactly for 1 minute in boiling water bath. Blue colour developed in reaction mixture was read at 650 nm on UV-visible spectrophotometer. Catechol was used as standard [11].

**Determination of Solid Content** About 10 ml (11.02 g) of the asava under study were accurately pipette out and transferred to a tarred china dish which was known for its weight and kept in a hot air oven at 100 – 105° C for an hour. Then, the sample was weighed along with china dish to deduct the actual weight of tarred china dish. The weight of the content was noted to calculate the solid content.

## Result

As per the WHO guideline all the parameters of prepared asava by specified method and standard kanakasava was compared for the final conclusion of the project. All the result obtained from physicochemical analysis result revealed that the specific gravity, total solid content and sugar content were gradually decreased with increase in time. Alcohol content was found to be increase up to six months. The pH value remains constant.

## Discussion and Conclusion

For the preparation of asava with all the ingredients mentioned in the table 1 was carefully collected from local region, and was authenticated. From the physicochemical analysis of formulated asava is the appropriate quality and can be prescribed by the Ayurvedic practitioner for healthy of several ailments of their patients. Established preliminary and physico-chemical standard give important information for further investigation and facilitate the identification of formulation in routine industrial production.

## References

- [1] Anonymous. Indian Pharmacopoeia. vol. II. Delhi: Ministry of Health & Welfare, Government of India, the Controller of Publications; 1996.
- [2] Shashikanth J, Mohan C, Sridhar S, Reddy PR. Elemental Compositions of *Lannea coromandelica* (Houtt.) Merr. Stem Bark by ICP-MS. International Journal of Pharmacognosy and Phytochemical Research. 2014;15(6):4.
- [3] Pourmorad F, Hosseinimehr SJ, Shahabimajd N. Antioxidant activity, phenol and flavonoid contents of some se-

**Table 2 Organoleptic characteristics**

Sr. No	Parameters	Method	Results
1.	Color	Natural light	Dark brown
2.	Odour	Sensory	Alcoholic
3.	Taste	Palatability	Sweet

**Table 3 Physico-chemical properties of asava**

Sr No.	Parameter	Result	
		Kankasava	Prepared asava
1	pH	3.86	4.06 ±0.026
2	Specific Gravity	1.046	1.199 ±0.003
3	Viscosity	1.52	1.63±0.002
4	Refractive Index	1.325	1.5232±0.001
5	Acid value	0.097	0.014±0.012
6	Alcohol Content	7.18 % v/v	7.25 % v/v
7	Total Solid Content	14.64 % w/v	15.13 % w/w
8	Total Phenolic Content	0.079 % w/v	0.095 % w/v

lected Iranian medicinal plants. African journal of biotechnology. 2006;5(11).

- [4] Anonymous. The Ayurvedic Pharmacopoeia of India. Communication and Information Resources (NISCAIR). 2008;(2):45–47.
- [5] Handa SS. Extraction Technologies for Medicinal and Aromatic Plants. International Centre for Science and High Technology. 2008;p. 112–120.
- [6] Mishra AK, Gupta A, Gupta V, Sannd R, Bansal P. Asava and Arishta: An Ayurvedic Medicine- An Overview. International J Pharm & Biol Arch;2010(1):30–30.
- [7] Anonymous. The Ayurvedic Pharmacopoeia of India. Appendix-2, Part-II; 2008. p. 199–199.
- [8] Anonymous. The Ayurvedic Pharmacopoeia of India. and others, editor. Delhi: National Institute of Science, Communication and Information Resources (NISCAIR), CSIR; 2008.
- [9] Das C, Ghosh G, Das D. Ayurvedic liquid dosage form asava and arista: An overview. Indian J Pharm Edu Res. 2017;51(2):169–76.
- [10] Saritha E, Anand R, Suja S, Swaminathan K. Production of ethanol from *Ipomoea batatas* using *Saccharomyces cerevisiae*. Asian Journal of Bio Science. 2009;4(2):266–269.
- [11] Lal UR, Tripathi SM, Jachak SM, Bhutani KK, Singh IP. HPLC analysis and standardization of arjunarishtan an Ayurvedic cardioprotective formulation. Sci Pharm. 2009;77:605–616.