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Preparation and evaluation of fermented Ayurvedic formulation: Arjunarishta

S. F. Sayyad, D. S. Randive, S. M. Jagtap, S. R. Chaudhari and B. P. Panda

S. F. Sayyad, D. S. Randive,
S. M. Jagtap, S. R. Chaudhari
Amrutvahini College of Pharmacy,
Sangamner, Maharashtra,
India- 422 608.

B. P. Panda
Pharmaceutical Biotechnology
Laboratory, Faculty of Pharmacy,
Jamia Hamdard, New Delhi,
India- 110 062.

ABSTRACT

Growing awareness about harmful side effects of modern medicine has led to interest in Ayurveda at the international level as well as within India. Ayurveda comprises of various types of formulations including fermented forms, namely, arishtas and asavas. Arishtas are regarded as unique and valuable therapeutics due to their efficacy, stability and desirable features. It prepared 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. In present study attempt has been made for preparation and evaluation of arjunarishta. *Terminalia arjuna* is a active constituent of arjunarishta and prescribed in cases of cardiovascular diseases as a cardiotoxic. 6.42% w/w alcohol was generated after fermentation of traditionally prepared arjunarishta formulation. It is palatable to use due to sweet taste combined with fine aroma which masks unpleasant taste and odour of added herbal ingredients.

Keywords: Ayurveda, fermented formulation, arishta.

INTRODUCTION

The Indian subcontinent, with the history of one of the oldest civilization, harbours many traditional health care systems. Ayurveda is one of the most ancient systems of medicine known today developed through daily life experiences with the mutual relationship between mankind and nature (Mukharjee and Wahile, 2006). The word 'Ayurveda' is composed of two parts *Ayu* (Life) and *Veda* (knowledge). The origin of this science of life indeed difficult to pinpoint, it have been placed by scholars of Ayurveda and ancient Indian literature at somewhere around 6000 BC (Thatte and Dahanukar, 1986). Ayurvedic remedy considered as cheaper, inherently safe and with lesser side effects (Bouldin *et al.*, 1999). This traditional system comprises of various types of medicines including fermented forms, namely, arishtas and asavas. Fermented dosage forms shows high palatability and stability (Vyas *et al.*, 2010).

For Correspondence

Mr. S. F. Sayyad
Department of Pharmaceutics,
Amrutvahini College of Pharmacy,
Amrutnagar, P. O. Sangamner (S.
K.), Tal. Sangamner, Dist.
Ahmednagar, Maharashtra,
India- 422 608.
Phone: +919881908940

Arishtas are made with decoctions of herbs in boiling water while asavas are prepared by directly using fresh herbal juices (Sekar and Mariappan, 2008). These are unique liquid dosage form that contains self generated alcohol (Mulay and Khale, 2011). Arishtas are classical Ayurvedic preparations typically used as digestive and cardiotoxic (Kalaiselvan *et al.*, 2010). It is weak spirituous preparations prepared in airtight sealed vessel by anaerobic fermentation of decoction of plant material, sugar and dried flowers of *Woodfordia fruticosa* (L.) Kurz (Lythraceae) occasionally supplemented with some other powdered dried plant materials (Kroes *et al.*, 1993; Mishra *et al.*, 2010). Fermentation probably results into transformation of several phytochemical compounds present in medicinal plants, thereby rendering them less toxic and more potent; besides helping in their absorption (Mishra *et al.*, 2010). Due to their medicinal value, sweet taste and easy availability people are prone to consume higher doses of these drugs for longer periods (Weerasooriya *et al.*, 2006). Arjunarishta is commonly used oral liquid cardiotoxic prepared using *Terminalia arjuna* as an active constituent. It nourishes and strengthens heart muscle and promote cardiac functioning by regulating blood pressure and cholesterol (Lal *et al.*, 2009).

In the present study attempt has been made for formulation of arjunarishta by traditional method and its quality assessment.

MATERIALS AND METHODS

Plant materials *Terminalia arjuna* (Combretaceae) bark, flowers of *Madhuca indica* (Sapotaceae) and *Woodfordia fruticosa* (Lythraceae) were collected from forests of Sahyadri Ghats of Maharashtra (India); fruits of *Vitis venifera* (Venifera) and jaggery procured from local market.

Formulation preparation

Arjunarishta is a fermented liquid preparation made with ingredients in the formulation composition shown in table 1. It contains not more than 10% and not less than 5% of self generated alcohol (Anonymous 2008). Collected raw drug materials cleaned, washed, dried and used for formulation preparation.

Preparation of decoction

Pulverized *Terminalia arjuna* bark was passed through sieve no.44, mixed with required amount of potable water and soaked overnight (table 1). Then mild heating is carried out until the quantity get reduce to one fourth of initial volume. This decoction filtered through muslin cloth and filtrate was used for further processing (Anonymous 2008).

Table. 1: Arjunarishta formulation composition

Ingredient	Quantity
<i>Terminalia arjuna</i> bark	4.80 Kg
<i>Vitis venifera</i> fruits	2.40 Kg
<i>Madhuca indica</i> flower	0.96 Kg
<i>Woodfordia fruticosa</i> flower	0.96 Kg
Jaggery	4.80 Kg
Water	49.152 L

Fermentation

Required quantity of jaggery was dissolved in decoction by stirring and filtered through muslin cloth. Filtrate was collected in clean porcelain jar and remaining ingredients along with *Woodfordia fruticosa* flower were added and mixed. Then container was sealed with mud smeared cloth and kept in clean and dry room for fermentation. After fermentation the fermented material is filtered through muslin cloth. Filtrate was packed in air tight container and used for evaluation (Anonymous, 2008).

Physico-chemical evaluation

Preliminary evaluation

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

Determination of alcohol content

Not less than 25ml of preparation being examined was transferred to the distillation flask and its temperature is noted. It was diluted with equal volume of water. Afterwards it distilled and distillate about 2 ml less than the total volume collected. Water was added to measure exactly same volume of original test liquid and adjusted to temperature noted before. Specific gravity of this liquid was determined and alcohol content analyzed using relative density table given in United States Pharmacopoeia (USP) (Anonymous, 2009).

Total solid content

10g of a formulation was taken in evaporated dish which was previously weighed and allowed to evaporate so that only solid content remains in the dish and rest of the fluid gets evaporated. Then it again weighed and the solid content of formulation calculated (Anonymous, 2008).

pH

Calibrated pH meter was used to check the pH of formulation.

Viscosity

Viscosity of arjunarishta was determined with the help of Brookfield viscometer.

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 (Anonymous, 1996).

Total phenolic content

Absorbance of standard tannic acid solutions are recorded on UV-visible spectrophotometer (Shimadzu-1800) at 750 nm and standard curve is plotted. Sample of arjunarishta prepared as per Ayurvedic Pharmacopoeia of India and processed for estimation of total phenolic content (Anonymous, 2008).

RESULTS AND DISCUSSION

Organoleptic characteristics of prepared arjunarishta (table 2) revealed this is palatable to use because of sweet taste combined with fine aroma which masks unpleasant taste and odour of added herbal ingredients. Measured pH and acid value indicates that arjunarishta formulation have weak acidic properties (table 3). Self generated alcohol itself act as preservative and improve stability of formulation, no addition of external preservative is essential.

Table. 2: Organoleptic characteristics of arjunarishta.

Parameter	Description
Colour	Brown
Odour	Alcoholic
Taste	Sweet, astringent
Appearance	Clear

Table. 3: Physico-chemical properties of arjunarishta.

Parameter	Observed value
pH	4.367±0.026
Specific gravity	1.092±0.003
Alcohol (% w/w)	6.42
Total solid content (% w/w)	9.94±0.167
Acid value	0.091±0.012
Refractive index	1.3532±0.001
Viscosity (cps)	1.629±0.002

Preparation of decoction is the step of prime importance in the manufacturing of arishta formulations. Continuous mild heating during the preparation of decoction facilitates extraction of water soluble components of the herbal drug. But excessive heating results in charring of plant drug. Added *Madhuca indica* flower, *Vitis venifera* fruits and jaggery are source of nutrient and also initiator of fermentation process. *Woodfordia fruticosa* flower has been used as source of yeast. Temperature at fermentation area can affect duration and extent of fermentation process hence season of fermentation is important for production of arishta by traditional method.

CONCLUSION

Traditional Ayurvedic formulations are losing their value in international market. Alcohol percentage, pH, acid value, solid

content, viscosity, refractive index and specific gravity can be considered as the basic tools for the quality control measures of arishtas to improve their acceptance.

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