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## REVIEW ARTICLE

# CRITICAL ANALYSIS ON PHARMACEUTICS OF ALCOHOLIC PREPARATIONS (ASAVA-ARISHTA) IN AYURVEDA

A M SREELAL<sup>1</sup>, GANTI Y BASAVARAJ<sup>2</sup>, SAOKAR M RESHMA<sup>3</sup>

<sup>1</sup>PG Scholar, <sup>2</sup>Associate Professor and Head, <sup>3</sup>Assistant Professor,

Department of Rasashastra & Bhaishajya Kalpana; Shri Dharmasthala Manjunatheswara College of Ayurveda, Hassan-573201, Karnataka, India

Corresponding author email address: alathursree@gmail.com

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### Abstract:

Asava and arishta the preparation which come under madyakalpana are popular since samhita period due to their better absorption in human body and thereby quick action, longer shelf life and palatability. References of these preparations are available even during vedic period. The emergence of sandhana kalpana was a revolutionary innovation at that period. In the course of time, various formulations indicated for multitude of disease came into existence in the form of asava arishta. Here an attempt is made to critically analyze the pharmaceutical processing of asava and arishta mentioned in ayurvedic literature. This involves inspection of the constituents required for preparation, with their composition, dravadravya (liquid), sandhaneeya dravya (fermenting materials), prakshepaka dravya (additives), madhura dravya (sweetening agents), sandhana paatra (fermentation vessels) used, samskaras prior to sandhana, method of preparation, the sandhana sthala (location) and time (season) of fermentation and the duration of process. In this way the principles of ayurvedic pharmaceuticals regarding asava arishta preparation will be blended with modern technology for better understanding of the topic.

**Key words:** asava, arishta, alcoholic preparations, self generated alcohol, bio-fermentation, sandhana kalpana

### Introduction:

Asavas and arishtas (fermented preparation) possess self generated alcohol which acts as natural preservative obtained through conventional process. In ayurvedic system of medicine these formulations are in vogue since the time of samhita period. Samhitas present detailed description of the technology of manufacturing of asava arishta. Due to palatability, accelerated therapeutic action and enhanced drug concentration, these formulations are superior over other kalpanas.

This article explore the inspection of the constituents required for the preparation of

asava and arishta along with their composition of ingredients, dravadravya (liquid), sandhaneeya Dravya (fermenting materials), prakshepaka Dravya (additives), madhura dravya (sweetening agents), sandhana paatra (fermentation vessel) used, paatra samskara, method of preparation, sandhana sthala (location) and time (season) of fermentation and the duration of process. An attempt is made here to critically review the principles of ayurvedic pharmaceuticals regarding asava arishta preparation through modern perspective.

### Historical review

References of these preparations are available since vedic period eg: preparation of soma rasa for gods and sura for humans in Yajurveda & Rigveda. Terminologies like asava, arishta, prasanna, medaka, etc. and vessels used for manufacturing are also mentioned. Post vedic period depicts the advanced technology of using sandhaneeya dravya (fermenting agents) like dhataki pushpa (*Woodfordia fruticosa*) or madhuka pushpa (*Madhuca indica*) in manufacturing.<sup>1</sup>

#### Asava arishta

Asava are preparations which comes under madya kalpana<sup>2</sup> prepared by using swarasa (expressed juice) technology<sup>3</sup> and one which acts very quickly<sup>4</sup>. Arishta are having more samskara and guna<sup>5</sup> as compared to asava and are prepared using kwatha (decoctions).<sup>6</sup>

Asavas and arishta are medicinal preparations made by soaking the drugs, either in powder form or in the form of decoction (kwatha), in a solution of sugar or jaggery, as the case may be, for a specified period of time, during which it undergoes a process of fermentation generating alcohol, thus facilitating the extraction of the alcohol soluble along with water soluble active

principles contained in the drugs<sup>7</sup>. The general properties of asava are mana shareera vardhana (~enriches mind and body) agni vardhana (appetizer), bala vardhana (~strengthening body), shoka nashana (~reduces saddness), aruchi nashana (appetizer) and harsha Pradhana (~induces happiness)<sup>8</sup>. Arishta are laghu in paka, shreshta (superior) among sandhana Kalpana and potent than asava.<sup>9</sup>

#### Samanya nirmana (general method of preparation)

The drugs are taken in specified quantity and made into kwatha (decoction) for arishta or swarasa (expressed juice) for Asava, then madhura dravya (sweetening agents) sarkara (sugar) or madhu (honey) or guda (jaggery) is added. Kinva (sediments containing yeast cells) is added and kept for sandhana in sandhana paatra to which lepa (smearing) of mamsi, maricha, lodra is applied. Mouth of the vessel is then properly sealed (sandhibhandana) and kept for fermentation. Once jatarasa (confirmatory test) is seen it should be filtered through a cloth.<sup>10</sup>

There are many number of asava arishta mentioned in our classics as shown in table 1.

Book name	Asava	Arishta
Charaka samhita	10	20
Sushruta samhita	07	14
Ashtanga hrudya	03	5
Ashtanga sangraha	04	13
Sharngadhara samhita	04	09
Bhaishajya ratnavali	08	22
Gada nigraha	35	10
Sahasra yoga	25	20
Ayurveda formulary of india	18	20

**Table 1: showing asava arishta in Ayurvedic classics**

#### Constituents of asava-arishta

#### General proportion of constituents

The anuktha maana for the preparation of asava arishta is jala- 1 drona (12.288 liter),

guda (jaggery)– 1 tula(4.8kg), madhu (honey) – ½ tula(2.4kg), prakshepaka dravya- 1/10 tula (480g).<sup>11</sup>

#### Dravya (drug substance)

The drugs commonly used in arishta are twak (bark), moola (root) which are kathina or madhyama dravyas and these are made into kashaya. The drugs in asava are generally mrudu, volatile in nature viz; karpooora, chandana, ushira etc. and these are made as hima (cold decoction)/ phanta (hot decoction)/ swarasa (expressed juice).

There are 9 yoni's for the preparations of asava arishta such as dhanya(cereals), phala(fruit), mula(root), saara(heart wood), pushpa(flower), kanda(tuber), patra(leaf), twak(bark) and sarkara dravya(sweetening agents) making at total of 84 in number<sup>12</sup> as shown in table 2.

SL No	Yoni	Number	Example	Example	Reference
1	Dhanya	06	Shaali	Sura	Sharngadhara <sup>13</sup>
2	Phala	26	Draksha	Draksharishta	Sharngadhara <sup>14</sup>
3	Mula	11	Dasamula	Dasamularishta	Sharngadhara <sup>15</sup>
4	Saara	20	Khadira	Khadirarishta	Sharngadhara <sup>16</sup>
5	Pushpa	10	Dhataki	Mustakarishta	Bhaishajya Ratnavali <sup>17</sup>
6	Kanda	04	Ikshu	Ikshurasava	Susrutha <sup>18</sup>
7	Patra	02	Kumari	Kumaryasava	Sharngadhara <sup>19</sup>
8	Twak	04	Kutaja	Kutajarishta	Sharngadhara <sup>20</sup>
9	Sharkara	1	Guda	Abhayarishta	Caraka <sup>21</sup>

**Table 2: showing nine yoni's of asava arishta with example**

#### Dravadravya (liquid)

Arishta in general are prepared using kwatha whereas hima (cold decoction), jala, swarasa (expressed juice) etc. are used for

asava preparation. The dravadravyas generally used in asava arishta are shown as per in table 3.

SI No	Dravadravya	Yoga	Reference
1.	Jala (water)	Pippalyasava	Sharngadhara <sup>22</sup>
2.	Gomutra (cows urine)	Chitrakasava	Astanga Hrudaya <sup>23</sup>
3.	Dadhi (curd)	Gandeeerasava	Gadanigraha <sup>24</sup>
4.	Gomayarasava (cowdung)	Gandeeerasava	Gadanigraha <sup>25</sup>
5.	Takra (buttermilk)	Takrarishta	Astanga Hrudaya <sup>26</sup>
6.	Kwatha (decoction)	Dasamoolarishta	Sharngadhara <sup>27</sup>
7.	Swarasa (expressed juice)	Dhatryarishta	Caraka <sup>28</sup>

**Table 3: showing dravadravya generally used in asava arishta with example**

There are exceptions for this common rule encountered in the manufacture of arishta and asava for eg: - in takrarishta<sup>29</sup> even though it is named as arishta, no kashaya (decoction) is prepared. Here a vishesha samskara is followed as the formulation 75% of drugs which are volatile and mrudu nature. Second example is kumaryasava<sup>30</sup> though, Kashaya is used even then it is named as asava. In this formulation abhaya (*Terminalia chebula*)

being comparatively kathina dravya is made into kashaya and samanya nirmana vidhi is followed for the remaining ingredients.

There is a special method of preparing kashaya by soaking the drug in water for duration of 8hrs before keeping on fire, this facilitates the better extraction of active principles into kashaya and increase in potency.<sup>31</sup>

#### Sandhana paatra (fermenting vessel)

Earthen pots are commonly used as sandhana paatra, reference of using gold vessel in the preparation of saraswatharishta is also seen<sup>32</sup>. The main intension for using mud pots is, it maintains the proper temperature and is also inert in nature but the major drawback is that they are easily breakable.

In the present era use of plastic and steel tanks for fermentation is seen in the pharmaceutical industry could be an ideal replacement for mud pots as they fulfill the required criteria.<sup>33</sup>

#### **Paatra samskara (process especial)**

Conventionally, lepa (smearing) using a combination of lodra, jatamamsi and grutha lepa is applied internally to the vessel prior to the fermentation process. The main logic behind this samskara may be blocking of minuteness pores in mud pots, and thus maintenance of temperature and also inhibition of fungal growth.

A recent new trend in samskara named as amlavirodha is followed for the reused vessel by washing it with hot water for 3 to 4 times. Then vessel is again washed in lime water (prepared in 1:15 ratio) and finally washed with hot water until the litmus paper turns blue<sup>34</sup>. It is presumed that this procedure checks microbial growth and thereby preventing acidic fermentation.

Another samskara done during this preparation is dhupana (fumigation). chandana, karpooora, guggulu, agaru, jatamamsi, maricha are drugs commonly used for this purpose. The logic behind this is to remove bad odour of paatra when reused and augments the sterilization of the sandhana paatra and thus influences sandhana process.

#### **Prakshepaka dravya (additives)**

Although prakshepaka dravyas form one of the major drug portion in the asava arishta, it does not play significant role in fermentation process. Lavanga, ela, twak, patra, nagakesara, trikatu are commonly used as prakshepaka dravya, and these are made into yavakuta (coarse powder) form and added. This prakshepaka dravyas impart attractive

flavour and colour to the finished product apart from having the therapeutic action.

#### **Sandhaneeya dravya (fermenting agents)**

Even though as such terminology is not available but dhataki pushpa, madhuka pushpa which acts as fermenting agent are been included under prakshepaka dravya in classics. The well known sandhaneeya dravya in ayurveda is dhataki pushpa<sup>35</sup> but its use had commenced since the era of ashtanga hrudaya. Charaka had not mentioned any sandhaneeya dravya whereas acharya susruta mentioned surabeeja or kinwa as sandhaneeya dravya<sup>36</sup>. References of madhuka pushpa as sandhaneeya dravya are found in sharangadhara samhita<sup>37</sup>. All these drugs are possessing rich amount of yeast cells which facilitates the fermentation process.

In contemporary ayurvedic industry the practice of using yeast as sandhaneeya dravya is gaining importance due to easy handling, improved hygiene, quick alcohol production, low acidity, reduction in cost and time and magnification of batch size.

#### **Madhura dravya (sweetening agent)**

Guda (jaggery), sharkara (sugar), phanita (molasses), sitopala (candy sugar) are the major sweetening materials used in asavaristhas. These are generally obtained from herbal sources. In addition, honey an animal source as sweetening agent is also used either independently or along with guda or sharkara.

All these dravya have high concentration of sugar which acts as major factor in fermentation. In this there is incomplete oxidation of sugar into ethyl alcohol with release of carbon dioxide brought about by the enzyme zymase secreted by yeast cells. In anuktha maana<sup>38</sup> one tula (4.8kg) guda (sharkara) is dissolved in one drone (12.288litre) jala, (40 % of sugar) this when compared with modern parameters comes to the ideal amount of sugar needed for fermentation ie. 39.06%. But this ideal amount varies from formulation to formulation as shown in table 4.

Book Name	Minimum (%)	Maximum (%)
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Charaka samhita	15.18 Madhukasava <sup>39</sup>	156.25 Dantyarishta <sup>40</sup>
Sushruta samhita	25 Vrischikadyarishta <sup>41</sup>	178.57 Putikadyarishta <sup>42</sup>
Ashtanga hrudaya	20.23 Madhukasava <sup>43</sup>	156.25 Dantyarishta <sup>44</sup>
Sharangadhara samhita	32.03 Lohasava <sup>45</sup>	156.25 Draksharishta <sup>46</sup>

**Table 4: showing minimum and maximum percentage of sweetening agent**

**Sandhana process (bio-fermentation process)**

After doing the samskara ingredients are mixed properly in the liquids. It should then be filled in the well prepared and recommended container and kept in suitable place recommended for the purpose for a specified period of time for the alcoholic fermentation to start and to go on smoothly. While filling in sandhana paatra in ayurvedic classics have specified to keep 1/4<sup>th</sup> vacant space conducive to the free movement and escape of gases.<sup>47</sup>

After the completion of fermentation the necessary tests should be carried out to ensure that fermentation is complete. Then it is filtered in a suitable container.

**Sandhana sthala (fermentation place)**

There are a few terms, described in the context of asavarishta preparations, which specifically indicate the suitability of the place for fermentation, viz., dhanyarashi<sup>48</sup> (heap of barley), dhanya Madya<sup>49</sup> (keeping inside heap of cereals), yavapalla<sup>50</sup> (heap of barley) and bhूमounikhatayet<sup>51</sup> (kept under earth) etc.

The logic behind this is to maintain uniform temperature during fermentation, as temperature between 25<sup>o</sup>c – 30<sup>o</sup>c is considered ideal for proper fermentation<sup>52</sup>. Nowadays few of the pharmaceutical companies use air-conditioner for the same.

**Sandhana avadhi (duration of fermentation)**

The literature review elucidates the gross variation of sandhana avadhi depending on formulation as shown in table 5.

Sl No	Duration	Formulation	Reference
1	7 days	Vasarishta	Sahasrayoga <sup>53</sup>
2	15 days	Bringarajasavam	Sahasrayoga <sup>54</sup>
3	30 days	Dasamoolarishta	Bhaishajya Ratnavali <sup>55</sup>
4	180 days	Guggulusava	Gadanigraha <sup>56</sup>

**Table 5: showing variation in duration of fermentation**

In case of vasarishta, vasa is the only major ingredient so it might need short duration for fermentation where as in case of guggulusava many ingredients are there and guggulu being a resin might take long period to get transform to asava, so the variation is observed.

The confirmatory test told in the above mentioned classics are jatarasam<sup>57</sup>, vyaktha amla katuka jatam<sup>58</sup>, etc. and even

like other kalpana gandha varna rasautpatti<sup>59</sup> are also described.

**Discussion:**

The asava arishta formulations are very well standardized since the samhita period related to the method of preparation, constituents etc. In arishta, kathina drugs are used which are made into kashaya whereas in asava volatile and mrudu drugs are made into hima/ swarasa leaving some expectations as in

takrarishta and kumaryasava. Earthen pots where used for fermentation which are being replaced by plastic and steel tanks. Dhataki pushpa is commonly used sandhaneeya dravya but yeast can be also used in its place. In anuktha maana though the ideal percentage (40%) of sweetening agents is mentioned lot of variation is seen in classics. The only difference being in the technology involved based on the practical exposure in large scale production time consumption like usage of air-conditioned room for sandhana sthala, yeast as sandhaneeya dravya etc. The common norm is still followed in the present era of modern pharmaceutics with a variation in technology.

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### Conclusion:

Arishta and asava are considered as one among best formulation in ayurveda as they possess self generated alcohol which acts as self preservative. The main difference between asava & arishta lies in the preparation of kashaya with few expectations. Drugs used for preparing arishta are found to be kathina or madhyama where as in case of asava are mrudu and volatile in nature.

Even though there are many numbers of asava arishtas mentioned in our samhitha's which are therapeutically used. There remains a wide scope to revalidate them scientifically by means of other sciences for the betterment of mankind.

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