PHARMACEUTICAL REVIEW OF ARKA KALPANA

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ABSTRACT

Bhaishajya Kalpana is the branch of Ayurveda which primarily deals with the different kinds of dosage forms and their therapeutic utility. Among the large number of formulations specified by Acharyas, the Panchavidha kashaya kalpanas have great importance as they form the primary or basic dosage forms from which other secondary dosage forms are prepared. The five basic kalpanas comprise of Swaras, Kalka, Sruta, Sheeta and Phanta. But some Acharyas have varying opinions in the respective formulations. According to Ravana’s Arka Prakasha, the Panchavidha kalpanas include Kalka, Choorona, Rasa, Taila and Arka.

In this text, Arka Kalpana is given specific importance and he opines that it has more potency in comparison to the other kalpanas. It is the most potent due to dosharahithatva and its specific gunas. It is having increased potency, reduced dose, more shelf life and also easy absorption, fast action and patient compliance. Arka kalpana is a demand of the age. So there arises a need to know the exact procedures and methodologies involved in the preparation of this formulation.

The pharmaceutical aspects regarding this formulation have been explained in detail with specific importance to the yantras, patras, agni and different method of preparation based on the consistency of dravyas. This paper is an attempt to review the pharmaceutical aspects of Arka Kalpana in the available literature in Ayurveda.

Keywords: pharmaceutical, yantra, patra

INTRODUCTION

Bhaishajya Kalpana is the branch of Ayurveda which primarily deals with the different kinds of dosage forms and their therapeutic utility. Arka Kalpana1 is described as one among the Panchavidha kashaya kalpana2 by Lankapati Ravana. The word Arka3 is derived from ‘Ru-gatau’. Every word contains meanings. Gati (motion) denotes three different meanings i.e. Gyan, Gaman and Prapti. In Arka process all these three meanings are to be accepted, as the knowledge of the contents of the drug is first thing (i.e. Gyan) then the motion is given to the contents through water (i.e. Gaman) and lastly required amount of active content is obtained (i.e. Prapti). Thus, Arka contains the complete aspect of its manufacturing process by root word ‘Ru-Gatau’.

Arka kalpana can be defined as a liquid preparation obtained by distillation of certain liquids or of drugs soaked in water using the Arkayantra4 or any convenient modern distillation apparatus. The concept of Arka as a dosage form can be seen in different texts but the pharmaceutical aspect of Arka kalpana is mentioned in detail mainly in Ravana’s Arka Praksha5. So there arises a need to review the pharmaceutical aspect of Arka kalpana from the available literatures of Ayurveda.
AIMS & OBJECTIVES
To review the method of preparation of Arka from the available literature in Ayurveda

LITERARY REVIEW

Samhita Kala:
References about Arka kalpana are not available in any Samhitas. Usage of Arkas may be not popular during that period.

Adhunik Kala:
Gada Nigraha\(^6\), Asavarishta Vijnana\(^7\) and Sahasrayoga\(^8\): In Kharjurasava, an equipment similar to Arka yantra & preparation of Arka from Asava is mentioned

Ayurvedic Formulary of India: The definition, method of preparation, characteristics and examples of Arkas are mentioned in both the volumes.

Rasatantra Sara and Siddha Prayoga Sangraha: Examples of 21 Arkas are mentioned in the first volume. In this book the practical experiences of the author is also mentioned along with dose specification of particular yoga. The method of preparation, amupana (adjuvant), aushada sevana kala (time of drug administration) and bhesaja marga (route of drug administration) of each Arka is mentioned separately.

Bharateeya Bhaishajya Kalpana: Synonyms, History\(^9\), Method of preparation, Precautions, Samyak lakshana and eight different examples of Arka kalpana are told. Though different books are written on Arka kalpana in Adhunika kala, Arka Prakasha is considered as a comprehensive referral book as far as Arka kalpana is concerned.

MATERIALS & METHODS
The details of the method of preparation of Arka kalpana is taken from Ravana’s Arka Prakasha

Equipments required:\(^10\):
Following equipments are required for preparation of Arka:
a. Chulha: Angidi or stove
b. Lakadi (wood): Coal along with kerosene oil
c. Dravya: Oushadha dravya, medicine
d. Patra: Glass bottles
e. Yantra: Bhakka yantra, Varuni yantra, Tiriyak patana yantra, Karanambika, Arka yantra and Nadika yantra.
f. Arka sangrahana patra

a. Wood for preparing Arka\(^11\)
The wood used for preparing Arka must be sarasa (with latex) and atisushka (extremely dry) preferably made up of Khadiradi woods.

b. Yogya ayogyoushadhi\(^12\)
Drugs with following features must not be taken as fuel
- More than one year old
- Infested with keeta (micro organisms or pests)
- Ganda rasa vivarjita (devoid of natural odour and taste)

c. Patra: For soaking Kalayidar vessel or mud pot\(^13\) is used.

d. Arka yantra\(^14\)
Ingredients required for preparing Arka yantra:-
The ingredients required for preparing mud for mrittika (mud) for Arka yantra are:
- Loha churna (iron powder)
- Sphatika (rock crystal powder)
- Gairika (Haematite)
- Brasta mrittika (fried mud)
- Asthibhava mrittika (bone powder)
- Kachcha churna (glass powder)
- Kikasa raja (Kaseesa)
- Mitti (mud)
- Pancha mutra (Gava, Ashva, Mahisha, Gaja, Aja)
- Lid, Toyadhara (water bath) and Cork

Preparation of mrittika for Arka yantra :-
Above churnas should be taken in equal quantities and mitti should be mixed in equal quantity. Pancha mutras are added and mar-dana (grinding) of above drugs must be done till the smell of urine gets completely removed.
prox.) in size and it should be like that of Surya mandala. For covering of Arka yantra, again same size of lid should be prepared and there should be lips of 3 Angula by which it is tightly jointed with the vessel. Jeernasthi mrittika should be used to seal the edges of Arka yantra to make it airtight. In the lid one small hole should be made. In this chidra (hole), the tube of Bamboo (One is small and another one is double the size of first one) is inserted and mrittika should be applied on all the joints so that fumes will not escape out of Arka yantra. Toya dhara must be kept on the top of Arka yantra. The small tube is inserted measuring 4-5 Angula (10 cm approx.) inside the pot. Arka patra should be kept just below the large tube. The vapours that are formed after boiling and which come out from the pot is collected in that vessel. This vessel should then be kept in cold water. In this way the fumes will get condensed and again collected in the form of Arka.

e. Arka patra (Receiver) 15

Arka patra means the Patra which is used to receive Arka. Arka patra must be prepared out of Jeernsthi mrittika, Kacha patra, Pashana patra and Mrīt patra

General method of preparation 16

Arka Prakasha of Ravana clearly mentions the pharmaceutical aspects of Arka Kalpana with much detail. The text explains the general method of Arka preparation which is as follows:

The required quantity of water is added to the drugs for soaking and kept overnight. Next day morning it is poured into the Arka yantra and the remaining water was added and boiled.

The vapors get condensed and collected in a receiver. The aliquots collected in between contain the active ingredients and may be mixed together to ensure uniformity of the Arka.

In recent books it is mentioned as

Drugs are soaked and kept overnight 17. Eight times of water must be added 18. Madhyagni 19 (moderate fire) or Tīvra agni 20 (extreme fire) must be maintained during the procedure and only two third of the poured liquid must be collected

**Shat agnis in preparation** 21

During Arka patana (collection of arka) the Agni (fire) must be proper. If the Agni is less, there will be no production of distilled vapours and Arka will not be obtained. If the Agni is more, the drugs will turn to khara paka and there will be vaivarnya and altered burnt smell for the Arka. All the qualities of the Arka will be lost. For the preparation of Arka six different types of agni are mentioned and are illustrated in the table No. 1

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Type of Agni</th>
<th>Total Time taken</th>
<th>Quantity of fuel</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dhumagni (Smoky, no fire)</td>
<td>2 yama (6 hours)</td>
<td>Not mentioned</td>
<td>Without any flame if there is huge amount of fumes (smoky), such Agni is known as Dhumagni.</td>
</tr>
</tbody>
</table>
Deepagni (2 /4 times dhumagni) 1 ½ yama (4.5 hours) 2 part of the quarter of 1 mushti (fist) If the flame of Dhumagni is increased to two or four times, it is considered as Dipagni.

Mandagni (4 times deepagni ) 1 yama (3 hours) Quarter of 1 mushti (fist) If the flame of Dipagni is again increased to four times, it is termed as Mandagni.

Madyamagni (between deepagni & mandagni ) 2 yama (6 hours ) ½ mushti (fist) The Agni in which the flame is in between Dipagni and Mandagni it is termed as Madhyarnagni.

Kharagni (5 times madyagni ) 1 muhurtha (45 minutes ) 2 ½ mushti (fist) Fifth part of complete Agni is known as Kharagni, this Agni is used for all-purpose.

Bhatagni ( high burning flame ) 1 muhurtha (45 minutes ) Not mentioned The Agni in which the flame spreads all over the bottom (high burning flame) of the vessel is considered as Bhatagni.

By mentioning the word “kramat “author describes the gradual sequence of Agni that must be given during the preparation of Arkas.

Arka Niskaranartha Agni Kala
- Saardha yama(4:30 hrs)
- Yama(3 hrs)
- Yamardha(1:30 hrs)
- Muhurta (48 min)

Table No. 2: Different method of preparation of Arkas

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Type of drug</th>
<th>Quantity of water</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atyanta Katina</td>
<td>3 parts</td>
<td>Chandana</td>
</tr>
<tr>
<td>2</td>
<td>Katina (hard drugs)</td>
<td>2 parts</td>
<td>Ajamoda</td>
</tr>
</tbody>
</table>

Specific method of preparation22 (Pancha vidha Oushada)

The fivefold classification of drugs is Atyanta Katina (very hard), Katina (hard), Ardra (wet), Pallava (tender leaves) and Drava (liquids). Different methods of preparation of Arka are mentioned for different Arkas. The types of drugs, quantity of water and example of each type are shown in table no. 2.
### Atyanta Katina Dravyas

For preparing *Arka* of these, the dry drugs are coarsely powdered, soaked in twice quantity of water and kept in shade till the water dries and drug turns soft. Then water is added equal to the quantity of the drug and kept in sunlight and moon light for 8 praharas (1 prahara = 3hrs). Further it is transferred to *Arka yantra* to extract *Arka*.

### Katina Dravya

For preparing *Arka* the dry drug is coarsely powdered and twice the quantity of water is added to it. It is then kept in moon light for 8 praharas (24 hours). If in cold climate or cold place soak it for 16 praharas (48 hours). Later transfer it to *Arka yantra* to extract *Arka*.

### Ardra Dravya

The term *Ardra* means wet. It is of two types: *Saras* and *Nirasa*

- **Saras**: For preparation of *Arka* from *Saras* drugs, the churna is prepared from *naala* (stem) of these drugs and 1/20th part of water is added. Heat it for 1 muhurtha (48 min).
- **Nirasa**: For preparation of *Arka* from these drugs - 1/20th part of water is added and soaked for 1 prahara.

### Patra

*Patra* means leaves. For preparation of *Arka* from leaves - 1/100th part of water is added and kept for 24 minutes for soaking and transferred to *Arka yantra*.

### Sadugdha

*Sadugdha* is a type of *nirasa* dravya. It includes plants which are having milky fluid in it. It is of two types *mridu dugdhika* and *tiksna dugdhika*.

- **Mridu Dugdhika**: It includes plants like *Arka* (*Calotropis procera*) for preparation of *Arka*. Water is added 4 times to it and *Arka* is extracted till it turns hot.
- **Tiksna Dugdhika**: Drug pieces and water required is soaked for 3 days and pounded well. If milk does not come from that, water is added 10 parts of the drug and *Arka* is extracted.

### Phala

*Phala* includes plants like *Amra* (mango). *Arka* is prepared without adding any water.

### Kashta Oushadas

*Kashta oushadhas* means woody stem. For preparing *Arka* from *kashtas* the following procedure is adopted.

1. The dry drug is coarsely powdered.
2. 1/80 part of water, 4 times *Sarjikshara* and *Saindhava*.
3. 1/40 part of water is added to it.

4. It is transferred to *Arka yantra* to extract *Arka*.
valavana (rock salt) is added to it. $\frac{1}{40}$th parts of water is added to it and transferred it to Arkayantra.

**Ati pakwa phala**: Here Arka is prepared without adding water

**Pushpa**: For preparation of Arka from Flowers - $\frac{1}{16}$th part of water is added and kept for 3 hrs.

**Katu phala**: Wash with water several times. Add $\frac{1}{40}$th part of water.

**Drava dravya**: For Arka preparation from liquid drugs. Drugs are filled in Arkapatra and Arka is to be prepared.

**CLASSIFICATION**

1. **Mamsanam bheda**

The Arka prepared according to the different types of mamsa (meat) are:

- **Mrudu mamsa arka**
  
  One part of mrudu mamsa (soft meat) is taken and chopped into big pieces. Add $\frac{1}{40}$th part salt to it to remove the sliminess. Later wash the water part and then add Ash-tagandha $\frac{1}{6}$th part and sugarcane juice $\frac{1}{8}$th part. If sugarcane juice is not available, milk can be used as a substitute. Fill the mamsa in arkapatra to extract Arka. Close the vessel with lid and place jasmine flowers on top of it. This Arka is very tasty like that of nectar.

- **Katina mamsa arka**
  
  Take 1 part of Katina mamsa (hard meat) and make it into small pieces. Mix kashaya rasa and salt to it. Later wash with aranala or kanji (rice gruel) for three times followed by hot water for 7 times. Fill in Arkapatra. Close the vessel with lid and place jasmine flowers on top of it and extract arka.

- **Ghana mamsa arka**
  
  Take 1 part of Ghana mamsa (thick meat) and make it into extremely small pieces. Shake it well in shankadrava followed by washing it in hot water for 7 times. Fill in Arkapatra. Close the vessel with lid and place jasmine flowers on top of it and extract Arka.

2. **Madya arka**

The arka prepared out of anna is called madya. There are different types of madya which is listed in Table No. 3:

<table>
<thead>
<tr>
<th>No.</th>
<th>Tushodaka madyam</th>
<th>Raw barley with husk</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Sauveera madyam</td>
<td>Raw barley without husk/ wheat</td>
</tr>
<tr>
<td>3</td>
<td>Aranala and dhanyamla madya</td>
<td>Raw wheat without husk</td>
</tr>
<tr>
<td>4</td>
<td>Shandaki madya</td>
<td>Rajika, mulaka, sarshapa rasa with rice paste</td>
</tr>
<tr>
<td>5</td>
<td>Suktamadya</td>
<td>Swarasa of stem, root and fruit with ghee and salt</td>
</tr>
<tr>
<td>6</td>
<td>Arishta madya</td>
<td>Kwatha used for Arka</td>
</tr>
<tr>
<td>7</td>
<td>Suramadya, varunimadya</td>
<td>Rice is used for Arka</td>
</tr>
<tr>
<td>8</td>
<td>Pakvarasa madya, Sheetarasa madya</td>
<td>Ripe sugarcane juice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw sugarcane juice</td>
</tr>
</tbody>
</table>

**Prashastha Arka Lakshanani**

- **Arka** should have more fragrance than its constituent dravyas taken alone.
- On keeping in jeernasthi mrithika patra, the colour of the drug must appear same. The Arka must resemble Shankha (conch shell), Kunda, Indu (moon) on keeping in other vessels

- The taste of the Arka while keeping on tongue should be that of the constituent drug itself. All other Arka opposite to the above said features are to be discarded.

**Removing durgandha from Arka**:

If Arka is having bad smell then it has to be fumigated with dhuma (smoke) produced from powder of Hingu (asafoetida), Methika
(fenugreek) and Rajika (mustard) mixed in Ghrita (ghee) and kept in new pot. If the process of fumigation is repeated several times, Arka will lose its bad odour, develop good odour (flavour) and in addition will gain its therapeutic efficacy of increasing Jatharagni\textsuperscript{27}(digestive fire)

**DISCUSSION**

Arka kalpana is one of the most sought after formulation in this modern age. Many number of dosage forms are being converted to Arka due to its reduced dose, patient compliance and increased potency. We find many references regarding the pharmaceutic aspects of Arka kalpana in different literatures like A.F.I, Ayurveda Sara Sangraha, Gadanigraha, Rasatantrasara and Siddhaprayogasangraha etc. A detailed explanation regarding all the aspects in the manufacture of Arka is seen in Arka Prakasha by Ravana.

The description of Arka yantra makes one to ponder on the sophistication involved in the preparation of this particular kalpana which has eventually led to the usage of this formulation to a minimum. Scientific advancement has made use of distillation apparatus in the modern scenario for more convenient preparation of Arka. The equipments for preparing Arka include Chulha, Lakadi (Wood fuel), Dravya, Patra, Yantra and Arka sangrahana patra. Seven different types of classification of Arka are mentioned in different literatures. They are based on contents, part used, duration of preparation, action on doshas, manogunas, rutus and diseases. General method of preparation is mentioned in AFI and for different Arka precise method of preparation is also told. This is to ensure that maximum active principle came to the Arka according to the specific type of ingredients in it. On close examination we see that the Arka yantra told in the classics and the modern day distillation apparatus are following same principles of science, ie. distillation which clearly states the significance of the detailed procedures explained.

**CONCLUSION**

Arka kalpana is a very unique formulation in Bhaishajya Kalpana, owing to its method of preparation and efficacy. Yet the pharmaceutical aspects of this formulation have not been reviewed much in Ayurveda. The main authentic text which explains the procedures involved in the manufacture of Arka kalpana is Ravana’s Arka Prakasha. There are a number of factors which have a significant role in the preparation of arka starting from the equipments required like the Arka yantra, Arka patra, the specific woods, the drugs for the preparation of Arka and the agni to be used along with the duration.

**REFERENCES**


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