

PHARMACEUTICAL REVIEW OF ARKA KALPANA**Rahul U¹, Gazala Hussain², Basavaraj Y Ganti³**¹, 2nd year P.G Scholar, Dept.of Bhaishajya Kalpana, SDMCA, Hassan, Karnataka, India² Asso. Professor, Dept. of Bhaishajya Kalpana, SDMCA, Hassan, Karnataka, India³ Asso. Professor & Head Dept. of Bhaishajya Kalpana, SDMCA, Hassan, Karnataka, India**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 *Swarasa*, *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*, *Choorna*, *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 : *pharmaceutic*, *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 Kalpana*¹ is described as one among the *Panchavidha kashaya kalpana*² by *Lankapati Ravana*. The word *Arka*³ 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 *Arkayantra*⁴ 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 Prakasha*⁵. 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, *anupana* (adjuvant), *aushada sevana kala* (time of drug administration) and *bheshaja marga* (route of drug administration) of each *Arka* is mentioned separately.

Bharateeya Bhaishajya Kalpana: Synonyms, History⁹, Method of preparation, Precautions, *Samyak lakshana* and eight different examples of *Arka kalpana* are told.

Though different books are written on *Arka kalpana* in *Adhunik 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 required¹⁰:

Following equipments are required for preparation of *Arka*:

- Chulha*: Angidi or stove
- Lakadi* (wood) : Coal along with kerosene oil

c. *Dravya*: *Oushadha dravya*, medicine

d. *Patra*: Glass bottles

e. *Yantra*: *Bhakka yantra*, *Varuni yantra*, *Tiryak patana yantra*, *Karanambika*, *Arka yantra* and *Nadika yantra*.

f. *Arka sangrahana patra*

a. Wood for preparing Arka¹¹

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

b. Yogya ayogyaoushadhi¹²

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 pot¹³ is used.

d. Arka yantra¹⁴

Ingredients required for preparing *Arka yantra*:-

The ingredients required for preparing mud for *mruttika* (mud) for *Arka yantra* are:

Loha churna (iron powder), *Sphatika* (rock crystal powder), *Gairika* (Haematite), *Brasta mruttika* (fried mud), *Asthibhava mruttika* (bone powder), *Kacha churna* (glass powder), *Kikasa raja* (*Kaseesa*), *Mitti* (mud), *Pancha mutra* (*Gava*, *Ashva*, *Mahisha*, *Gaja*, *Aja*), *Lid*, *Toyadhara* (water bath) and Cork

Preparation of *mruttika* 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.

□ Method of manufacturing *Arka yantra* – From the above *mruttika* round shaped vessel (*golakara*) should be manufactured by the pot maker. The mouth of the *Arka yantra* should not be less than 3 *angula* (6cm ap-

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 *Jeernasthi mrittika*, *Kacha patra*, *Pashana patra* and *Mrit patra*

General method of preparation¹⁶

Arka Prakasha of *Ravana* clearly mentions the pharmaceutical aspects of *Arka Kalpana*

Table No. 1: *Shat Agnis* in preparation of *Arka kalpana*

Sl no.	Type of <i>Agni</i>	Total Time taken	Quantity of fuel	Feature
1	<i>Dhumagni</i> (Smoky, no fire)	2 <i>yama</i> (6 hours)	Not mentioned	Without any flame if there is huge amount of fumes (smoky), such <i>Agni</i> is known as <i>Dhumagni</i> .

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 overnight¹⁷. Eight times of water must be added¹⁸. *Madhyagni*¹⁹(moderate fire) or *Teevra agni*²⁰ (extreme fire) must be maintained during the procedure and only two third of the poured liquid must be collected

***Shat agnis* in preparation²¹**

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

2	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.
3	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
4	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.
5	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.
6	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

Sl.no	Type of drug	Quantity of water	Examples
1	Atyanta Katina	3 parts	Chandana
2	Katina (hard drugs)	2 parts	Ajamoda

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

3	<i>Sarasa Nala</i> (stem with juice)	1/20 part	<i>Nirgundi, Eranda</i>
4	<i>Patra</i> (leaves)	1/100th part	<i>Vasa</i>
5	<i>Nirasa</i> (devoid of juice)	1/20 th part	<i>Vata, Asvatha</i>
6	<i>Mridu dugdhika</i> (mild latex)	4 part	<i>Dugdhika</i>
7	<i>Tiksna dugdhika</i> (10 part	<i>Satala</i>
8	<i>Phala</i> (fruit)	0	<i>Amra</i>
9	<i>Kashta oushadas</i> (plant drugs)	Add 1/80th part of water, 4 times <i>Sarjikhshara</i> and <i>Saindhava</i> . 1/40th part of water is added to it	<i>Udumbara</i>
10	<i>Atipakwa phala</i> (very ripe fruit)	0	<i>Kadali</i>
11	<i>Pushpa</i> (flower)	1/16 part	<i>Gulab arka</i>
12	<i>Katu phala</i>	1/40 part	<i>Pippali</i>
13	<i>Drava dravya</i> (liquids)	0	<i>Gomutra</i>

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: *Sarasa* and *Nirasa*

Sarasa: *Sarasa* means with juice. For preparation of *Arka* from *Sarasa* 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: *Nirasa* means drugs devoid of juice. 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 ie, *mridu dugdhika* and *tikshna 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: It 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. The dry drug is coarsely powdered. 1/80 part of water, 4 times *Sarjikhshara* and *Saindha-*

valavana (rock salt) is added to it. 1/40th 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 - 1/16th part of water is added and kept for 3 hrs.

Katu phala: wash with water-several times. Add 1/40th part of water.

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

CLASSIFICATION²³

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 1/40th part salt to it to remove the sliminess. Later wash the water part and then add *Ash-tagandha* 1/6th part and sugarcane juice 1/8th 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.3²⁴

1	<i>Tushodaka madyam</i>	Raw barley with husk
2	<i>Sauveera madyam</i>	Raw barley without husk/ wheat
3	<i>Aranala and dhanyamla madya</i>	Raw wheat without husk Rice or <i>kodrava</i> used
4	<i>Shandaki madya</i>	<i>Rajika, mulaka, sarshapa</i> rasa with rice paste
5	<i>Suktamadya</i>	<i>Swarasa</i> of stem, root and fruit with ghee and salt
6	<i>Arishta madya</i>	<i>Kwatha</i> used for <i>Arka</i>
7	<i>Suramadya, varunimadya</i>	Rice is used for <i>Arka</i> <i>Punarnava</i> paste is used
8	<i>Pakvarasa madya, Shee-tarasa madya</i>	Ripe sugarcane juice Raw sugarcane juice

*Prashastha Arka Lakshanani*²⁵

- *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*²⁶ :

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 *Ghrta* (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*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 pharmaceutical 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. dis-

tillation 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.

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