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Review Article

ARKA KALPANA - A REVIEW OF TRADITIONAL AND MODERN METHODS

Jayanta Bag[1]*, Neetu Singh[2]
*[1]PG Scholar, [2]Assistant Professor, Dept of Rasa Shastra & Bhaishajya Kalpana, Govt. Ayurvedic College, Patna, Bihar, India.

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ABSTRACT
Arka Kalpana is nowadays a known *Kalpana* among the Ayurvedic procedures. It was introduced in Ayurvedic Pharmacy in the later part of the Samhita period, which is very specific in its mode of preparation and therapeutic effect. It is a more palatable form of Ayurvedic dosage forms in comparison to *Swarasa* (Juice), *Kalka* (paste), *Kwath* (decoction) etc. *Arka Prakash* is the first Ayurvedic classical text in which various kinds of distillation Procedures and heating methods are mentioned for preparing *Arka* from different types of *Dravya* for different diseases. In this context, *Arka Kalpana* is given specific importance and it opines that it has more potency in comparison to the other *Kalpana*. Today's population is becoming more and more in demand for *Arka Kalpana*, which is the first choice because of its potency, lower dose, improved shelf life, ease of absorption, quick action, and patient compliance.

INTRODUCTION
Ayurveda has got many branches, one of which is *Bhaishajya Kalpana.* It deals with various formulations, pharmaceutical and therapeutic uses of the drug. Dosages are derived basically from *Panchavidha Kashaya Kalpana*. They are *Swarasa, Kalka, kwatha. Hima* and *Phanta*. According to *Arka Prakash Samhita -Kalka*, *Churna, Rasa, Taila* and *Arka* are *Panchavidha Kashaya Kalpana*. *Arka Kalpana* has got more importance than other *Kalpana's*, because of its potency. *Arka* is a unique preparation in which essential oils from herbal drugs are extracted through the distillation method.

References of *Arka Kalpana* were not found in either Vedic period or in *Samhita* period. *Arka Kalpana* was foremostly mentioned by '*Acharya Shodhala'* during the 12th century. Beyond this in '*Gadanigraha*', on the chapter '*Asavadhikar*' in the context of '*Kharjurasav*'[1] and in *Sahasra yoga* also described about *Arka yantra* and *Arka* preparation. Even though different books were written on *Arka Kalpana* during the Modern era, but *Arka Prakash* written by Ravan is considered as a compressive referral book as far as *Arka Kalpan*a is concerned. As far as *Rasa-Shastriya* literature is concerned, there is only a single reference in *Rasatarangini* that mentions *Arka-Kalpana*; no other such references can be sort out in-relation to *Arka Kalpana*. The references were described in the context of '*Parishrutasalilam'*,

यन्त्रेण नाडिकाख्येन वह्निसन्तापयोगतः ।
बिन्दुशो यत्स्रुतं नीरं तत्परिस्रुतमुच्यते ॥। [R.T 2/59]

The simple distillation of only water or the water added with medicinal drugs, yield the drop- by-drop distillate collected in the receiver of the simple distillation apparatus. The same is properly packed and used as *'Parisrta jala'* (distilled water).[2]

Importance of the *Arkas*
द्रव्यकल्पः पञ्चधा स्यात् कल्कश्चूर्ण रसं तथा।
तैलमर्क क्रमाज्ज्ञेयं यथोत्तरगुणं प्रिये ।। [A.P1/46]

These five forms of the pharmaceutical viz. *Kalka* (paste), *Curna* (powder), *Rasa* (expressed juice), *Taila* (oil), and *Arka* (distilled liquid), the medicinal potency increases successively. Therefore, among all the pharmaceutical forms of medicinal preparation '*Arka'* holds peak position on account of its excellence in medicinal attributes.[3] The extract which is prepared on a male day (Sun, Mars, Jupiter) in the male constellation is appropriate to be given to a woman

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and on the contrary, the extract which is prepared on a female day (Moon, Mercury, Venus, Saturn) in the female constellation and manufactured during night time should be given to a man.[4]

Material and Method

Arka Yantra Nirman:[5]

Mruttikakaran:

लोहचूर्ण स्फटिका च गैरिका भ्रष्टमृत्तिका ।
मृत्तिकास्थिभवं चूर्णं काचं कीकसजं रजः ।। 52 ।।
एतानि समभागानि सर्वतुल्या च मृत्तिका।
भ्रंशनीया पञ्चमूत्रैर्गवाश्वमहिषोद्भवैः । । 53 ।।
गजाजसम्भवाभ्यां च सटितं तद्विशोषयेत्।
यावद्गन्धविनाशः स्यात्तावत्सम्मर्दयेच्च ताः ।।54।।

(a) Components (Requirement)

Group: I

1. *Lohacurna* : Iron powder
2. *Gairika*: Red chalk
3. *Sphatika*: Alum
4. *Bhrstamrttika*: Black clay
5. *Mrttika*: Red soil
6. *Asthibhavacurna*: Bones-powder
7. *Kacacurna*: Glass-powder
8. *Kasisaraja: Green vitriol Powder*

[Quantity: Equal proportion of articles nos. 1-8]

Group II

1. *Mrttika*: Ordinary clay

10-14. *Pranipanca mutra*: Urine of five animals viz. cow, horse, buffalo, elephant and goat.

[Quantity: No. 9 equal to total quantity of all components from nos. 1-8 and no. 10 liquids in sufficient amount].

All articles (nos. 1-8) are mixed with media-material (no. 9), and this whole mixture should be impregnated/ground with the liquids specified (nos. 10-14) and then it gets dried. Further, the grinding of whole by adding a bit of water frequently, till the material in process becomes free of odour.

Yantra Nirman Vidhi (Layout)

लघुहस्तः कुलालोऽस्य कुर्याद्यन्त्रं सुनिर्मलम्।
यथेष्टां स्थालिकां कुर्यात्त्र्यङ्गुलं प्रान्तसारिकाम्।। ५५ ।।
पृथुब्रध्नोदराकारां द्व्यङ्गुलां सन्धिवेष्टिताम्।
शारिकान्ते तु परिधिं त्र्यङ्गुलोत्सेधशोभिताम् ।। ५६ ।।

Further, a skilled potter should make a good quality and well-designed *Arka yantra* by his skilled hands/light manipulation applying art of pottery, with specification of distillation apparatus necessary for the pharmaceutical process.

It should conform the features in the designing this apparatus. It is in round shape and its mouth/ opening with boundary of three *Angula* height (*Prantasarika*) minimum. The lid (in sun- shape) is made befitting for covering hole (mouth) completely. The boundary of lid in three *Angula* height is provided for adhering adequately the mouth / apparatus afterwards the paste of clay, with two *Angula* thickness which is smeared for closing / covering the joints *(Sandhivestitam)* perfectly.

विनिर्मायाथ सार्य्यन्ते यथा शिल्पविनिर्मितम् ।
छिद्रं कृत्वा नलं दद्याद्गजशुंडासमं सुधीः ।।57।।
सारिकापरिधेरन्तस्तस्य कुर्यात्पिधानकम्।
अर्द्धनिम्बूफलसमं परिधेस्तस्य चान्ततः ।।58 ।।
वेदाङ्गुलं मस्तकोर्ध्वं कार्यं तोयस्य धारणे ।
समर्थां तस्य नलिकां कुर्यात्तोयविमोचनीम् ।। 59।।
तस्यैवान्तरतो लेप्या घनाजीर्णास्थिमृत्तिका ।
अथवा श्वेतकाचं च सर्वदोषापनुत्तये ।। 60।।

A hole should be made on the upper part of apparatus prepared by a skilled potter and a pipe like trunk of elephant should be inserted below three *Angula*. Subsequently, the hole/joints need to be closed/covered fully by smearing with clay. Further, a boundary of four *Angula* height for filling should be made over/around the lid/cover, keeping water. Another pipe is filled below the boundary for expelling out water when it becomes warm. This water flowing (exit) pipe should be provided with cork/stopper, in order to get stayed and released the water whenever required. The joints of this water pipe should be covered/closed with clay-smearing alternatively, it should be closed up by employing powder of white glass for removing all kinds of possible defects.

According to *Ayurveda Sara Sangraha* (fig no 1), *Naadika Yantra*[6] *(Bhabka)* is well known among all the *Vaidya's* in India. The essence of the substances which need to be extracted can be extracted by this *Yantra*. But some of these is made out of clay and some of with copper. The method of making it is also described in this text as follows. Make a copper vessel of the required size and get it tinned inside. Then make a copper lid of its size in such a way that an inverted bowl is attached inside it and two separate pipes are attached to it facing each other. In which one pipe should be attached inside the bowl for extracting the essence and the other pipe should be attached to the water reservoir above the bowl (leaving the bowl) through which hot water will be extracted. A pipe of 12 fingers or one hand length should be attached to both the pipes, through which the extract and hot water keep coming out from far away. Later fill the medicine and water in the lower vessel. That is, if 12 seers of water come in *Bhabka*, then fill 6 seers of water and 1 seer of medicine. After that cover it with urad flour or

clay mixed in water and wait till it get dry. Apply heat from the bottom of the vessel after ensuring that, it is properly dried. In this way, as the water gets heated, the vapors of the extract will rise and hit the bottom of the upper water reservoir vessel and becomes extract and will go in to the extract vessel through the extract pipe. A vessel should be kept below this tube for the collection of the extract coming out through the tube. This vessel should be kept in cold water so that the extract coming out of the tube into the vessel keeps cooling. When the water in the tub becomes hot, replace it with cold water again. Similarly, when the water poured in the upper part of the *Yantra (Jaladhar)* becomes hot, open the cork of the tube from which hot water comes out and remove the hot water. After this, put a cork in the tube again and fill cold water in Jaladhar. In this way, whenever the water in *Jaladhar* becomes hot, remove it and keep filling it with cold water. The *Yantra* made in this way is popularly known as *Karamveek*.[6]

Old Bones Clay (*Jirnasthimrttika*)[7]

अथ वक्ष्ये तु जीर्णास्थिमृत्तिकाकरणं प्रिये।
शिलाजतुस्थले कुर्याद्दीर्घ गर्तं मनोहरम् ।। 61 ।।
निक्षिपेत्तत्र नानास्थिसञ्चयं द्विचतुष्पदाम् ।
स्वर्जिक्षारं महाक्षारं मृत्क्षारं लवणानि च।। 62।।
गन्धकोष्णजलं क्षेप्यं नानामूत्राणि तत्र च ।
एवं कृत्वा मासषट्कं दद्यात्पाषाणमृत्तिकाम्। । 63 ।।
पंकास्थ्यूर्ध्वं तदूर्ध्वं तु कुर्याद्वह्निष्टिकाः शुभाः।
त्रिवर्षाज्जायते सर्वमेकीभूतं द्रवत्सयम् ।। 64 ।।

O! Beloved; (Ravana further adds)

Now I describe the procedure for preparing the clay by utilizing old (deposited) bones *(Jirnasthimrttikakarana vidhi*). A big, deep and good-looking pit/ditch should be made/dug at the place (location) where *Silajatu* (ashphaltum) is produced naturally. In this pit, the bones of various types of animals/cattle's having two and four legs (quadruplets), and over this deposit of bones, a powder mixture containing *Svarjika kshara, Mahakshara mrtkshara, Sarvalavana* (all varieties of salts), *Gandhaka* (sulphur), along with of urine (obtained from various animals) and hot water (*Ushnajalam*). This whole material (combination of solid and liquids as mentioned) should be left as such for a period of six months. Afterwards, the pit should be covered with stones, clay, mud and other similar material and covered well by laying the bricks properly. It should remain (kept underground) as such for continuously three years by allowing (rendering) the material fully mixed up / fully unified. This type of material procured from the pit is known as *Jirnasthimrttika.*

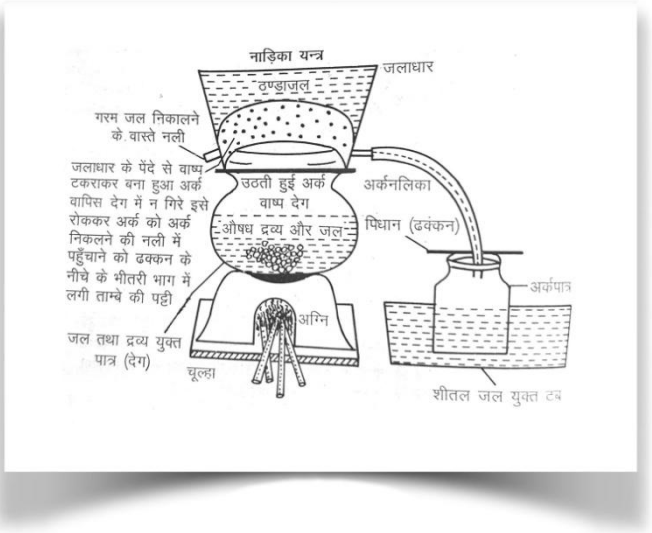

Fig. 1 (*Nadika Yanta)*/Ayurveda Sarasangraha

Method of Preparation of *Arka*

The pharmaceutical aspects regarding this formulation have been explained in detail with specific importance to the *Yantras, Patras, Agni* and different method The required quantity of water is added to the drugs for soaking and kept overnight. The next day morning it is poured into the *Arka yantra* and the remaining water was added and boiled. Condensed and collected vapors are placed in a receiver. The aliquots collected in between contain the active ingredients and may be mixed to ensure uniformity of the *Arka*. Drugs are soaked and stored overnight, according to contemporary literature. Eight times water must be added. *Madhyagni* (moderate fire) or *Teevra Agni* (extreme fire) must be maintained during the procedure and only two third of the poured liquid must be collected.

Arka is extracted in two ways.

Wet drugs
Dry drugs

1) *Arka* of Wet drugs

For wet drugs about 60% *Arka* is obtained Quantity of water added is as follows –

- Wet and soft drugs:6 times water
- Wet and mildly hard: 8 times of water

2) *Arka* of Dry drugs

From Dry drugs about 60%-70% *Arka* is obtained

- Dry and softer drug: 6 - 8 times of water
- Dry and moderately hard: 8 times of water
- Dry and Hard: 10 times of water

Table 1: Quantity of water for milky drugs[8]	
Parts of drug	Quantity of water added
Juicy drug	1/20th part of water
Leaves	1/100th part of water
Fruit	No water
Green and juiceless	1/20th part of water
Flowers	1/16th part of water
Mrudu milky drugs	4 times of water added
Tikshna milky	1/10th part of water

Thermal Gradation in Distillation Process in Classical View

अर्कनिष्कासनार्थाय क्रमाद्देयाः षडग्नयः।
धूमाग्निश्चैव मन्दाग्निर्दीपाग्निर्मध्यमस्तथा।। 80 ।।[9]

Distribution of *Agni* in *Arka Prakash* for the preparation of *Arka*, 6 types of *Agni* are given.

There is gradual increase of fire in every next type.

1. *Dhumagni*
2. *Dipagni*
3. *Mandagni*
4. *Madhyamagni*
5. *Kharagni*
6. *Bhattagni*

Table 2: Distribution of *Agni* in preparation of *Arka*[10]		
1	*Dhumagni*	11/2 *Prahara*
2	*Dipagni*	1 *Prahara*
3	*Mandagni*	1/2 *Prahara*
4	*Madhyamagni*	Up to 1 *Muhuruta*
5	*Kharagni*	Up to 1 *Muhuruta*
6	*Bhattagni*	The *Agni* in which the flame spreads all over the bottom of the vessel

Characteristics of Arka[11]

द्रव्यादधिकसौगन्ध्यं यस्मिन्नर्के प्रदृश्यते।
जीर्णास्थिपात्रसंक्षिप्तो द्रव्यवर्णः प्रदृश्यते ।।74।।
शंखकुन्देन्दुधवलोऽन्यथापात्रान्तरस्थितः ।
जिह्वोपरिगतः स्वादं दद्याद्रव्यभवं तु यः ।। 75।।

I. Good Quality (*Prasasta Arka*)

- If the extract of the medicine from which it is extracted gives out more fragrance and if the color is the same when,
- Kept in a vessel made in the manner of '*Jirnasthi*', then that extract is the best.
- Colour of *Arka* should resemble with the pure white color (*Dhavala)* of *Sankha* (conch-shell), *Kunda* (a kind of flower) and *Indu* (moon).
- And when kept in many types of vessels, and when kept on the tongue, it gives the taste of the substance from which it is extracted, then that extract will be the best.

II. Worst Quality (*Nikrstarka*)

- *Arka* possessing characters / features reverse (opposite) to above/earlier category quality wise falls in lowest / discardable cadre.

Collecting Ware Of Distillate (*Arka Sangrahana)*[12]

जीर्णास्थिपात्रे गृह्णीयादर्कं वा काचसम्भवे।
पाषाणकेऽथवा पात्रे अभावे मृन्मये न्यसेत् ।।87।।

A suitable ware or container should be obtained for receiving/ collecting *(Grahana)* the liquid distilled by the apparatus. For this purpose, anyone ware made of *Jirnasthi mrttika* (old bonny-clay), *Kaca* (glass), *Pashana* (stone) should be chosen. In case, no ware out of these three utensils, a clay-made ware (*Mrnmaya*) should be taken up for collection of distillates i.e. *Arka sangrahana.*

Removing *Durgandha* from *Arka*[13]

The products of *Arka* if they emit foul or unpleasant smell (*Durgandhayorbhavet*) should be made agreeably odorous (*Carugandhakam*). Therefore, all kinds of *Arka* (s) having foul odour and *Mamsarka*(s) should be filled into a new earthen ware (*Navina handika*) which is fumigated frequently by burning of *Dhupa*-recipe consisting a mixture of *Ghrta, Rajika, Hingu, Jiraka* and *Methika*, so that the bad or foul smell is eliminated (*Durgandhata brajet*).In this way, the fumigation of this *Dhupa dravyas* effecting pleasant aroma (*Gandhavarana*) if treated repeatedly removes desmelling of *Arka*(s) which get pleasant or agreeable odour (*Ayati rocako gandho*). This type (quality) of *Arka* serves stomach- i.e. stimulating (promoting) gastric/digestive power (*Bhavedvah nodipanah*).

Shelf life:[14] 1 year

Collection of Arka Formulations from Classical Literature

Table 3: Ayurved Sar Sangrah[15]

S.No	*Arka* Formulations
1	*Ajavayan Arka*
2	*Usba Arka (Ananta Moola)*
3	*Giloya Arka*
4	*Gaawajavan Arka*
5	*Gorakhamundi Arka*
6	*Gulvanspa Arka*
7	*Chadannadi Arka*
8	*Chandan Arka*
9	*Chirayata Ras*
10	*Triphala Arka*
11	*Dasamoola Arka*
12	*Pitpapada Arka (Sahatara)*
13	*Punarnava Arka*
14	*Pudina Arka*
15	*Bramhi Arka*
16	*Vayavidang Arka*
17	*Makoya Arka*
18	*Mahamanjisthadi Arka*
19	*Mahasudarsan Arka*
20	*Medohar Arka*
21	*Sunthi Arka*
22	*Sonph Arka*
23	*Arka Hara-Vhara*
24	*Raktadosantank Arka*
25	*Dugdha Arka (Godugdha)*

Table 4: Formulation From API & AFI [16,17,18,19]

No.	API-Part-II (Formulation) Vol. III[16]	AFI Part-I Formulation[17]	AFI Part –II Formulation[18]	AFI Part -III- (Formulation)[19]
1	*Brahmyarka*	1. *Ajamodarka*	1.*Pudinarka*	1. *Kakamacyarka (Makoya Arka)*
2	*Gulabarka*	2. *Karpuradyarka (Sugandhiganarka)*	2. *Yavanyarka*	2. *Kiratatiktarka (Cirayata Arka)*
3	*Jatamamsyarka*	3. *Jatamamsyarka*		3. *Guducyarka (Giloya Arka)*
4	*Kakamacyarka*	4. *Satapusparka*		4. *Gulabarka*
5	*Munditikarka*			5. *Candanadyarka*
6	*Nilodupusparka*			6. *Triphalarka*
7	*Parpatarka*			7. *Dashamularka*
8	*Pudinarka*			8. *Nilodupushparka (Gavajavana arka*)
9	*Punarnavarka*			9. *Parpatarka (Pittaparpata Arka)*
10	*Satahvarka*			10. *Punarnavarka*
11	*Vanyajamodarka*			11. *Brahmyarka (Brahmi Arka)*
12	*Yavanyarka*			12. *Munditikarka (Gorakhmundi Arka)*
13				13. *Vanyajamodarka*
14				14. *Shatahvarka (Saunf Arka)*

Dose of *Arka* in AFI is mentioned as 10 to 20 ml per day in divided doses.

Table 5: *Arka* Formulation From Rasa Tantra Sara and Siddha Prayoga Sangraha-Part I & II[20,21]

No.	Rasa Tantra Sara and Siddha Prayoga Sangraha-Part-I [20]	Rasa Tantra Sara and Siddha Prayoga Sangraha-Part-II [21]
1	*Udaramrit Yoga*	*Arka Revanthchini*
2	*Karpuradhara*	*Arka Lohabhan*
3	*Kirathadhi Arka*	*Arka Shabhabha Aabhara*
4	*Ghajur ka Arka*	*Kushmanda Arka*
5	*Gudamaar Arka*	*Gandamalahara Arka*
6	*Chandanadi Arka*	*Chandrahas Arka*
7	*Chandi ki Khijab*	*Pleehari Arka*
8	*Jambeeri Drav*	*Rakthasodhak Arka*
9	*Jwaramurari Arka*	*Raseswar Arka*
10	*Jwarahara Arka*	*Rasonadi Arka*
11	*Nimbu Arka*	*Sanjeevan Arka*
12	*Punarnava Arka*	*Chandanadi Arka*
13	*Balabandhu Arka*	
14	*Mahasudharshan Arka*	
15	*Medohar Arka*	
16	*Laghu Sankhadrav*	
17	*Laksha Arka*	
18	*Sankha Drav*	
19	*Shodhanashak Arka*	
20	*Somph ka Arka*	
21	*Strighadhantak Arka*	

Table 6: *Arkas* of Single Drugs from *Arka Prakasha*[22]

1. *Haritakı Arka*	99. *Langali Arka*
2. *Bibhitaka Arka*	100. *Karavira Arka*
3. *Amalaka Arka*	101. *Canala Arka*
4. *Sunthi Arka*	102. *Dhattura Arka*
5. *Ardrka Arka*	103. *Vasa Arka*
6. *Pippali Arka*	104. *Parpata Arka*
7. *Marica Arka*	105. *Nimba Arka*
8. *Granthika (pippalimula) Arka*	106. *Mahanimba Arka*
9. *Cavya Arka*	107. *Paribha-dra Arka*
10. *Gajapippali Arka*	108. *Kancanara Arka*
11. *Citraka Arka*	109. *Kovidara Arka*
12. *Yavani Arka*	110. *Shobhanjana (soubhanjana) Arka*
13. *Ajamoda Arka*	111. *Madhushigru (raktashigru) Arka*
14. *Parasikayavani Arka*	112. *Shigru Arka*
15. *Jiraka Arka*	113. *Girikanya (ghrtakumari) Arka*
16. *Krshnajiraka Arka*	114. *Sinduvara Arka*
17. *Karavi Arka*	115. *Nirgundi Arka*

18. *Dhanyaka Arka*	116. *Kotaja (kutaja) Arka*
19. *Mishi Arka*	117. *Karanja Arka*
20. *Mishreya Arka*	118. *Ghrtakaranja Arka*
21. *Jvala (lanka) Arka*	119. *Karanja Arka*
22. *Methika Arka*	120. *Uccata Arka*
23. *Vanamethika Arka*	121. *Gunja Arka*
24. *Candrasura Arka*	122. *Kapikacchu Arka*
25. *Hingu Arka*	123. *Mamsarohini Arka*
26. *Vaca Arka*	124. *Cilha (cilhaka) Arka*
27. *Parasikavaca Arka*	125. *Kantakari Arka*
28. *Kulinjana Arka*	126. *Vetasa Arka*
29. *Sthulagranthi Arka*	127. *Jalavetasa Arka*
30. *Dvipantaravaca Arka*	128. *Hijjala (hinjala) Arka*
31. *Habusa (hapusha) Arka*	129. *Ankota Arka*
32. *Vidanga Arka*	130. *Bala Arka*
33. *Vamshalocana Arka*	131. *Atibala Arka*
34. *Rshabhaka Arka*	132. *Mahaba-la Arka*
35. *Rshabhaka Arka*	133. *Nagabala Arka*
36. *Rshabhaka Arka*	134. *Lakshamana Arka*
37. *Meda Arka*	135. *Svarnavalli Arka*
38. *Mahameda Arka*	136. *Vamsha Arka*
39. *Kakoli Arka*	137. *Nala (kamala Nala) Arka*
40. *Kshirakakoli Arka*	138. *Yashti (madhuyashti) Arka*
41. *Rddhi Arka*	139. *Shvetatrivrt Arka*
42. *Vrddhi Arka*	140. *Sharapunkha Arka*
43. *Madhuparni (madhuyashti) Arka*	141. *Javasa (yavasaka) Arka*
44. *Kampillaka Arka*	142. *Mundi Arka*
45. *Jalayashti Arka*	143. *Apamar-ga Arka*
46. *Aragvadha Arka*	144. *Raktapamarga Arka*
47. *Bhunimba*	145. *Kokilaksha Arka*
48. *Bhadra (gambhari) Arka*	146. *Asthisa-mharika Arka*
49. *Madanaphala Arka*	147. *Raktapunarnava Arka*
50. *Tubaru (thumbara) Arka*	148. *Prasarini Arka*
51. *Rasna Arka*	149. *Kumarika (ghrta kumari) Arka*
52. *Nagabhinna Arka*	150. *Karpasa Arka*
53. *Macika Arka*	151. *Shvetapunarnava Arka*
54. *Tejasvini Arka*	152. *Sariva Arka*
55. *Jyotishmati Arka*	153. *Bhrnga-raja (bhrngiraja) Arka*
56. *Kustha Arka*	154. *Shanapu-shpi (shanapuspilata) Arka*
57. *Pushkaramula Arka*	155. *Trayanti (trayamana) Arka*
58. *Hemahva (svarnakshiri) Arka*	156. *Murva Arka*
59. *Shrngi Arka*	157. *Kakam-aci Arka*
60. *Katphala Arka*	158. *Kakanasa Arka*
61. *Bharngi Arka*	159. *Kakajangha Arka*
62. *Pashanabheda Arka*	160. *Nagini Arka*
63. *Kusumbha Arka*	161. *Meshashrngi Arka*

64. *Dhataki Arka*	162. *Hamsap-adi Arka*
65. *Manjistha Arka*	163. *Somavalli Arka*
66. *Laksha Arka*	164. *Akashavalli Arka*
67. *Haridra Arka*	165. *Patalagarudi Arka*
68. *Arnyaharidra Arka*	166. *Vatapatri (pashanabheda) Arka*
69. *Karpuraharidra Arka*	167. *Hingupatri Arka*
70. *Darvi (Daruharidra) Arka*	168. *Vamshapatri Arka*
71. *Rasanjana Arka*	169. *Matsyakshı Arka*
72. *Bakuci Arka*	170. *Sarpakshi Arka*
73. *Prapunnata (cakramarda) Arka*	171. *Shankha-pushpi Arka*
74. *Visa (ativisha) Arka*	172. *Arkapushpi Arka*
75. *Lodhra Arka*	173. *Lajjalu Arka*
76. *Brhatpatra (pattikalodhra) Arka*	174. *Alambusha Arka*
77. *Bhallataka Arka*	175. *Vrndavrksa (tulasijati) Arka*
78. *Guduci Arka*	176. *Dugdhika Arka*
79. *Bilva Arka*	177. *Bhumivalli Arka*
80. *Kumbhari (gambhari) Arka*	178. *Brahmi Arka*
81. *Tambuli (tambula) Arka*	179. *Brahmamanduki Arka*
82. *Patali (patala) Arka*	180. *Dronap-uspi Arka*
83. *Agnimantha Arka*	181. *Suryamukhi Arka*
84. *Syonaka (shyonaka) Arka*	182. *Bandhyakarkotaki Arka*
85. *Shaliparni Arka*	183. *Markandika Arka*
86. *Prshtaparni (prshniparni) Arka*	184. *Devadali Arka*
87. *Vartaki (brhat kantakari) Arka*	185. *Dhattura Arka*
88. *Kantakari Arka*	186. *Gojihva Arka*
89. *Gokshura Arka*	187. *Nagapushpi Arka*
90. *Jivanti Arka*	188. *Vellantra (virataru) Arka*
91. *Mudgap-arni Arka*	189. *Chikkini Arka*
92. *Mashaparni Arka*	190. *Kouhundara (kukundara) Arka*
93. *Pancangulaka (eranda) Arka*	191. *Sudarshana Arka*
94. *Habusha (hapusha) Arka*	192. *Taruni Arka*
95. *Mandara (arka) Arka*	193. *Kantakari (shveta kantakari) Arka*
96. *Arka (arkarka)*	194. *Ketaki Arka*
97. *Vajri (sehunda) Arka*	195. *Ela (brahadela) Arka*
98. *Satala Arka*	196. *Sukshmaila Arka*

In addition to above described *Arkas*, Acharaya in *Arka Prakasha* also describes following types of *Arkas*, like *Bahumulika Arka, Rogaghna Arka, Karmanusara Arka, Indrajala Arkas* etc in various chapters.[23]

***Bahumulika Arkas*:** Polyherbal distillates made from multiple plants, described in the fourth chapter, with characteristics and uses. *Rogaghna Arkas*: Disease-curing distillates, mentioned in the fifth chapter, specific to various diseases like fever, diarrhea, and skin conditions. *Arkas* for specific diseases: The sixth chapter deals with distillates for diseases like *Galaganda* (goiter), *Gandamala* (scrofula), and others, including their ingredients and preparation methods. *Indrajala Arkas*: Distillates with magical or supernatural powers, described in the eighth chapter, used for various purposes like attracting, repelling, and neutralizing. *Karmanusara Arkas*: Distillates categorized by their nature of action, like *Nadiposhaka* (diuretic), *Vamana* (emetic), and others, including their properties and uses.

According to Modern Science it is known as process of distillation. Distillation is the process of separating the component or substances from a liquid mixture by selective evaporation and condensation. Distillation is the most basic method used for the

purification of liquids and for the separation of liquid mixtures. Distillation involves the heating of a liquid to boiling and then collecting their vapors to condense them in liquid state.

By this method,

- Separation of the liquids of the mixture, having a few degrees different boiling points,
- Separation of a liquid from non-volatile components,
- Purification of the liquid, is carried out.

A condenser is placed in the flask neck holding the substance to be distilled during the procedure. As vaporization occurs, the vapors enter the condenser, the pressure of the vapors causes the distillate to spurt out from it. The liquid that is kept in the condenser also produces some back pressure, which impedes the distillation process's smooth operation.

Distillation consists of two steps;

A. Evaporation
B. Condensation

(A). Evaporation: A liquid's surface vapors escaping freely is known as evaporation. Different from boiling or ebullition, which only occurs at a specific temperature and pressure, this one should be noted. Evaporation is the process by which heat transforms a liquid into a gas.

(B). Condensation: Condensation is the reverse of evaporation, where water vapors is converted back into liquid water. To evaporate 1 gram of water at 100°C, 537 calories of heat energy are required. Conversely, when water vapors condenses, it releases this heat energy, resulting in cooling."

There are six basic applications for distillation, depending on what kind of chemical needs to be eliminated or purified.

1. Simple Distillation
2. Fractional Distillation
3. Steam Distillation
4. Vacuum Distillation
5. Molecular Distillation
6. Fractional Distillation under Reduced Pressure

1. Simple Distillation

Simple distillation is a method used to separate liquids with different boiling points (at least 80°C difference). It's effective for purifying substances like hydrocarbons, alcohols, and fatty acids. The process involves heating the mixture, collecting the vapor, and condensing it into a separate container. As distillation progresses, the temperature changes indicate the separation of pure compounds, which can be collected in fractions.

2. Fractional Distillation

Fractional distillation is used to separate liquids with close boiling points (less than 80°C difference). It involves a fractionating column between the flask and condenser, providing a temperature gradient for distillation. The column allows rising vapors to condense and revaporize, separating the liquids. Fractions of the distillate are collected over a small temperature range and may require additional distillation to achieve purification.

3. Steam Distillation

Steam distillation is a separation process used to purify temperature-sensitive materials, like natural aromatic compounds, without decomposing them. Steam or water is added to lower the boiling points of the compounds, which must be immiscible with water. This method reduces decomposition and is useful for purifying organic compounds, isolating essential oils, and separating commercially important compounds like fatty acids.

4.Vacuum Distillation

Vacuum distillation is used for organic compounds that decompose at their boiling points, like glycerol. By lowering the pressure, the boiling point is reduced, allowing the substance to boil without decomposing. This is achieved by creating a partial vacuum, enabling the substance to distill at a lower temperature and purify without decomposition. Vacuum distillation can also be used to purify solids, removing impurities from materials like resin and stain.

5. Molecular Distillation

Molecular distillation is a safe separation method for unstable molecules with low volatility and high boiling points. It uses low temperatures and short residence times in the heated zone, made possible by a high vacuum (less than 0.001 mm Hg). This process separates molecules based on their mean free path, allowing for collision-free passage. It can reduce boiling points by 200-300°C, making it ideal for sensitive compounds.

6. Fractional Distillation Under Reduced Pressure

The main difference between molecular distillation and simple vacuum distillation is the addition of a fraction header to separate the liquid mixture into distinct fractions, which are then collected in specialized containers.

Distillation has various important applications

- Water purification and desalination
- Production of distilled water for batteries and humidifiers
- Purification of fermented products like alcoholic beverages

- Extraction of perfumes and food flavorings from herbs and plants
- Oil stabilization for safe storage and transportation
- Separation of air into nitrogen, oxygen, and argon through cryogenic distillation
- Industrial-scale purification of liquid products from chemical synthesis.

DISCUSSION

Arka Kalpana's, a coveted formulation in modern times, is revolutionizing healthcare with its reduced dosage, enhanced patient compliance, and increased potency. This ancient wisdom has been extensively documented in esteemed literatures such as A.F.I, *Ayurveda Sara Sangraha, Gadanigraha, Rasatantrasara* and *Siddhaprayogasangraha. Ravana's Arka Prakasha* provides a comprehensive guide to *Arka* manufacturing, while various classifications are mentioned in different texts, based on factors like content, part used, preparation duration, *Dosha* action, *Manogunas, Ritus*, and disease treatment. Remarkably, the classical *Arka Yantra* and modern distillation apparatus share the same scientific principles, highlighting the significance of the detailed procedures explained in the classics. As we bridge traditional knowledge with contemporary science, *Arka Kalpana is* potential to transform healthcare is undeniable."

CONCLUSION

Unveiling *Arka Kalpana*, A centuries-old *Ayurvedic* gem rooted in *Hima* and *Phanta Kalpana.* This ancient formulation has been passed down through generations, with *'Arka Prakash'* serving as a guiding light for its preparation. However, modern research and pharmaceutical advancements are necessary to fully understand and harness its potential. By mastering distillation techniques, understanding the role of *Agni* (fire) in transformation, and integrating traditional knowledge with contemporary science, we can unlock the secrets of *Arka Kalpana's* and unleash its full strength to promote health and wellness.

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***Address for correspondence**
Dr. Jayanta Bag
PG Scholar,
Dept of Rasa Shastra & Bhaishajya Kalpana, Govt. Ayurvedic College, Patna,
Email: drjb007rsvd@gmail.com

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