

VARIOUS EXTRACTION TECHNIQUES IN ANCIENT PHARMACOLOGY (*BHAISHJYA KALPANA*)

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ABSTRACT

Ancient extraction techniques has been practice in Ayurveda under *Bhaishjya kalpana*, a medicinal branch deals mainly with herbal pharmaceuticals. With the evolution of five basic primary dosage form (*Panchvida kashaya kalpana*) in *Samhita kala*, most of the other secondary extraction techniques have been came into practice. The choice of these dosage forms are according to consistency and availability of raw drugs, *Agni* (Digestion capacity) *Prakriti* (Nature), *Bala* of patient (physical and mental capacity), *Kala* (season) and *Vaya* (age) etc. Present paper aimed to highlight the importance of ancient extraction techniques so that basic concept behind these techniques is understood. Decoction is the most important primary dosage form from *panchvida kashaya kalpana* on the basis of it other dosage form have been prepared such as *Pramathya*, *Laksharasa*, *Kshirpaka*, *Aushadsiddha paniya*, *Ghanasar*, *Arka kalpana* and *Asavaarishta*. Cold infusion and hot infusion are other extractions techniques which are mainly used for volatile drugs with less potency. *Mantha*, *Panak* and *Sharkara* are the other secondary dosage forms which are practiced frequently. All the dosage forms have their own importance due to its specific therapeutic value, easy palatability, increased shelf life and convenient dispensing.

Keywords: *Bhaishjya Kalpana*, Decoction, *Mantha*, Dispensing

INTRODUCTION

Ayurveda the oldest medical tradition is mostly relies on plant based medicines. The use of natural products with therapeutic properties is as ancient as human civilization and

for a long time plants products were the main sources of drugs.

Bheshaj (Drug) has given prime importance in *Ayurveda* as it is the tool for curing diseases

and maintaining the wellbeing. The various *Kalpana* (various dosage form) of these drugs according to *Vaya* (age), *Kala* (season), *Bala* (Physical and mental strength), *Prakruti* (Nature) etc came into practice in *Bhaishjya kalpana*, a medicine branch deal with pharmaceuticals. It is the science of manufacturing and dispensing the medicines. Various medicinal preparation such as *Somarasa*, *sura*, *Madhya* etc. were in practice since *Vedic kala*,¹ however exact nature of pharmaceutical processing was not clearly mentioned .

Extraction of crude drugs came into light with evolution of *panchvidha kashaya kalpana* in *Samhita kala*.² *Swarasa*, *Kalka*, *Kwath*, *Heema* and *Fanta* are the five basic and primary dosage form accepted by *Ayurveda* and hence paved foundation for various *Upkalpanas* (secondary dosage form)³ These *kalpanas* are highly potent and concentrated. Choice and dose of these *Kalpana* are according to the consistency and availability of raw drugs, *Prakruti* (Nature), *Bala* of patient (mental and physical capacity), *Kala* (season) and *Vaya* (age) etc.⁴

In modern pharmacology extraction is done by using various solvent other than water. Extraction mimics *Kwatha* (Decoction), *Fanta* (Hot Infusion) and *Hima* (Cold Infusion) in Ayurvedic pharmacology. There are various extraction techniques from simple traditional extraction to advance extraction technologies. The purpose of standardized extraction procedures for crude drugs (medicinal plant parts) is to attain the therapeutically desired portions and to eliminate unwanted material by treatment with a selective solvent known as *menstruum*⁵ In *Ayurveda* extraction (*kwatha*) of raw drugs is done in various ways so as to get maximum

extract of that drug especially for direct therapeutic use and to increase shelf life. Although various new advances in extraction technologies are on rise, having good advantages and limitations also, conventional extraction techniques have their own advantages. The present paper aimed to focus what are the various ways of extraction to enhance their therapeutic properties, for extension of its expiry date, increase palatability etc. so that we can understand its importance and applicability in various field of pharmaceutical area

Various extraction techniques

Kwatha (Decoction)

In this process, the crude drug is boiled in a specified volume (i.e. 1:16 or 1:8) of water for a definite time; it is then cooled and strained or filtered. The initial ratio of crude drug to water is fixed according to the consistency (soft, medium and hard) of drugs; the volume is then brought down to one-fourth or one eighth of original volume by boiling during the extraction procedure. The concentrated extract thus obtained is filtered and used as such or processed further.⁶ Use of *Mritticapatra* (Earthen vessel) and *Mandagni* (Less temperature) are mandatory things for conventional method of *Kwathkalpana*. Addition of water is also according to the consistency of drugs i.e. *Mrudu* (Soft), *Madhyam* (Less hard) and *Kathin* (Hard) and proportion of raw drugs taken for *kwatha*.⁷⁻⁸ This is to get maximum extraction. However, it is been suggested that addition of water and how much it should be remained at the end of extraction is according to the judgment of *Vaidhyas*.⁹ As earthen pot is impractical now a days so coated copper or iron vessels can be used .¹⁰ Keeping lid on the

vessel while preparation of *Kwatha* is strictly avoided as it may spoil the quality of kwath.¹¹

Pramthya

It's a type of decoction. Fine paste of raw drugs to be boiled with eight part of water and to be kept up to one fourth, filtered.¹² Its therapeutic use is different than *Kwath* as it is used in median stage of disease.¹³ Raw drug taken for *Pramthya* is fine powder hence it is more potent than decoction.

Laksharasa

Laksha is red colored type of gum found on big trees. It is used in its extract form called *Laksharasa*. There are various methods of *Laksharasa* preparations.

1) When *Laksha* is in fresh form then it is extracted with six part of water keeping it overnight and next day it is rinse properly and then filtered with cloth at 21 times.¹⁴

2) When *Laksha* is in its dried form, one part of *Laksha* boiled with eight part of water up to one fourth. It is also filtered at 21 times.¹⁵

3) In *Dolayantra* technique, one part *Laksha* is taken in soft cloth and it is tightly knot and then keep in middle of *Dolayantra* having six part of water to be boiled up to one fourth, filtered at 21 times. This technique can be done with other drugs such as *Lodhra*, *Badaripatra kalka* and *Swarjika Kshar*. So as to increase efficacy of *Laksharasa*.¹⁶

***Kshirpaka* (Medicated milk)**

Kshirpaka is one of the dosage forms includes use of milk along with water for extraction. The principle behind *Kshirpaka* is to enhance properties of milk by adding the drugs so that the bitterness and pungent qualities of raw

drugs gets milder. With addition of milk nutritional value also increases.

One part raw drug with eight part milk and thirty two part of water to be boiled until to remain only milk and then filtered.¹⁷ It is especially mentioned in chronic fever.

Another method of *Kshirpaka* is mentioned in which one part of raw drug along with fifteen part of milk and fifteen part of water to be boiled up to remain milk only.¹⁸ It is a *Laghu* (Easy to digest) *Kshirpaka* as compare to previous one.

Some pharmacist practices *Kshirpaka* with direct addition of respective decoction in the milk so that whole extract of raw drug can be obtained in water which is not possible in previous technique due to the presence of milk.¹⁹ *Kshirpaka* is usually practice with pungent drugs.

***Aushadsiddha paniya* (Medicated water)**

In *Aushad siddha paniya kalpana* one part of raw drug is taken with sixty four times of water to be boiled up to half i.e. thirty two part of water, is then used for various purposes such as to drink and to make *Peya*, *Vilepi* etc. (various dietary dosage forms used especially in disease condition).²⁰ The principle behind this dosage form is that one can use medicated water for drinking purpose and making various dietary form instead of using plain water.

***Heema Kalpana* (Cold Infusion)**

Raw drug is infused in cold water throughout night is termed as *Heema* or *Shrutshita jala*. The concept behind *Heema kalpana* is to save active principles of volatile drugs. One part of raw drug is infused in six part of cold water to be kept whole night (8 to 10 hrs.) and in the

next morning marc is squeezed mashed properly and filtered.²¹ *Heema* mostly used for those drugs having active principle in volatile form.

Fanta Kalpana (Hot Infusion)

In *Fanta kalpana* raw drug is infused with boiling water for few minutes (up to it become lukewarm) then mashed and filtered. It is *laghu kalpana* (Easy to digest) in *Panchvidha kashaya kalpana*. It is very easy and less time consuming process among all other dosage form. Due to very less extraction, it is used in patients having very poor digestion capacity.

In *Fanta kalpana* one part of drug is infused with four part of boiling water for few minutes.²² Its therapeutic use is instant as compare to other extraction techniques.

Mantha Kalpana

The term *Mantha* refers to churning. One part of raw drug is triturated with four part of water and filtered.²³ Instead of hot water cold water is also used in the process.

Mantha is also prepared by mashing *Sakktu* (A dietary form) with *Ghrit* (ghee) and then infused with cold water and filtered. It should not be too thick or too thin in consistency.²⁴

Panak Kalpana

It is also called *Panha* in local language, mostly prepared from juicy fruits. Pulp of fruit is taken with sixteen part of water to be kept for some time and filtered²⁵. Addition of sugar, salt, cardamom powder etc. is optional. Its use is especially mentioned in summer season.

Sharkara (syrup)

It a type of syrup from sugar to be flavored with scented flowers such as Rose, *Kewada* etc. or with addition of fruit juices. One part coarse raw drug is infused with eight part of water in the night, it is then boiled in next morning up to one eighth, filtered, further it is mixed with same quantity of sugar to make a syrup form.²⁶ In other technique cold or hot infusion of raw drug or distilled liquids are boiled with twice sugar to get a syrup.²⁷

Arka Kalpana (Distilled formulations)

The process is meant for heat sensitive volatile drugs. Extract is obtained by distillation of that plant material. For this purpose distillation apparatus (*Arkapatana yantras*) is used. one part of raw drug powder is distilled with 10 times of water up to ½ of water taken²⁸. In distilled formulations the shelf life of that drug is increased.

Aasava and Aristas (Fermented Preparations)

Here the extracts are obtained by fermentation of plant materials. It is called as *Sandhan Kalpana*²⁹. Alcohol generated in the process is act as preservative. Decoction or express juice of medicinal plants, sugar or jiggery, *sandhaniya dravya* (ferments) along with *Prakshepdavya* (powdered drugs usually flavored) is allowed to ferment in a close container³⁰. This facilitates the extraction of active principles of drugs. This dosage form has no shelf life hence can to preserve for long duration as it is more effective therapeutically over a period of time. Generally heat sensitive and flavored drugs are subjected for *Asava* preparation with its expressed juices or cold infusions and other those are thermo stable drugs are subjected for

Arista preparations with its decoction³¹. This facilitates the extraction of the active principles contained in the drugs.

Rasakriya and Ghanasaar (Concentrated decoction)

It is solid extract prepared by evaporation of the decoction constantly on low temperature. When it becomes semisolid it is called as *Rasakriya*³². when it is further dried to form solid mass it is called as *Ghanasaar*. This dosage form is also called as *Avaleha or leha*. It has longer shelf life.

DISCUSSION

Kwath Kalpana is the main dosage form in Ayurvedic pharmaceutical industry. Basic aim of it to get maximum active constituents, hence, quantity of water differs according to the constituency and proportion of raw drug to get maximum yield. Also active principles of it are saved by mild heating and use of earthen pot as mentioned in ancient method of *Kwatha*. *Pramthya* is second most important dosage form as it has maximum extraction due to use of fine powder of raw drug for *kwatha*. As per therapeutic value is concern *Pramthya* has been use to those having good digestive capacity as it has more potency than *Kwatha*. *Laksharasa* is prepared from Sticky *Laksha* with the aim to get its extract only but not its sticky particles so it is stained twenty one times. In *Kshirpak kalpana*, milk is used along with water for extraction of raw drugs especially with bitter and pungent taste with the aim to mild its astringent properties and bitterness. Milk itself is a complete food hence *Kshirpaka* become high therapeutic and diet value. *Aushad-siddha paniya* is the extraction technique

which is mainly aimed to get medicinal water to the patients instead of plain water with respective therapeutic properties. Cold infusion and hot infusion has various advantages as cold infusion is used especially for cooling effect on body and is prepare mainly with volatile drugs so as to save active constituent. Hot infusion is the quick extraction with less potency hence used for those with minimal digestive capacity. *Mantha kalpana* is triturated extraction instead of direct heating with nutritional value. *Panak Kalpana* is meant to get benefits of sugar syrup and juicy fruits with added flavors to enhance its taste in order to provide relief from excessive water loss from body. *Sharkara* or syrup form of extraction is mainly for long shelf life. *Arka Kalpana* is the distillation of various volatile raw drugs with water having good therapeutic value with less dosage and long shelf life. Alcoholic fermentations are the extraction having high therapeutic value with no shelf life due to self-preservation. *Ghanasar* is the repeated boiling of decoction to get it concentrated and dry to increase its shelf life and decrease its dose.

CONCLUSION

Panchavidha kashaya kalpana are the basic and primary dosage form. All the other secondary dosage form have its own importance; for its therapeutic value, enhancement of properties due to special pharmaceutical techniques, easy palatability as compare to basic dosage forms, increased shelf life and easier dispensing.

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