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Solid Dosage Form In Traditional Medicines: A Review.

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ABSTRACT

Medicine is the key of every medical system for its effective service to mankind where are a dosage form are the identity for the same. A particular health management is recognised through its effective dosage form. Ethnomedicine gives rudimental importance to sundry pharmacological activities of the panacea, thereby designing the dosage form accordingly. In ayurvedic healing system many dosage forms are available to satisfy the requirement of the nature of the medicaments as well as to consider the potency of elixir, to take care of the convenience for route of administration, stability period & palatability. Uniqueness in ayurvedic dosage form popularly known as *panch vidha kashaya kalpana*, described in around 5000 years back in *Charak Samhita*. *Kashaya kalpana* can be defined as a suitable pharmaceutical dosage form prepared in a very systematic & planned way, from the raw drug substances that have the qualities to cause harm/destruction to the disease factor. The present paper is aimed to bring out the existing knowledge on the solid dosage form with its chronological development reviewed from the ancient Compendia with its continuum in *Ayurvedic* classics of different period of time till recent past.

Keywords: dosage form, ethnomedicine, solid dosage form, *panchvidh kashaya kalpana*

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INTRODUCTION

Panchvidha kashaya kalpana are the initial dosage forms in the history of medical science irrespective of different philosophy. It may be divided into primary and secondary *kalpanas*. Primary *kashaya kalpana* are the dosage forms prepared directly out of crude herbal materials only just after their *shodhan* (physical purification / washing). Secondary *kashaya kalpana* or dosage form are prepared considering one or more primary *kalpanas* as base. Sundry secondary *kalpanas* are designed with the aim- for isolation of suitable active principles through different processing techniques by using various suitable media. These are explained in classics for the purpose of making it compatible without losing the potency or efficiency of the drugs. In classics it is mentioned that different dosage forms can be made by the *Yukti* of the physician involving principle of *Samyoga or Vibhakt* to convert into another dosage form. The currently available tools & technologies have given an artistic approach to existing formulation & to design new formulations. Hence primary preparation are modified into a suitable secondary form of increasing palatability, shelf life & potency, easy to dispense, posology, global acceptance & preferable for marketing standards with compatibility - patient compliance etc. Dosage form may be classified on the basis of their physical form as solid, semi-solid, liquid, aerosol. Solid dosage form is more popular than the rest, as it provides accurate dosage, no problem when it comes to palatability. Practically, it is easy to ship and handle. It is also more stable with longer shelflife. In ayurvedic text, number of solid dosage forms were mentioned. These are *Churna, Vati, Varti, Ghanvati, Khanda, Gudapaka, Guggulu, Sattwa, Lavana, Ayaskriti, Masi, Bhasma Kalpana & Kshara*.

DIFFERENT SOLID DOSAGE FORMS IN AYURVED:

Churna kalpana: When completely dried crude drug medicaments are pounded, grinded and then filtered through a cloth, the filtrate are known as *Churna*. *Rajha and Kshoda* are the synonyms of *Churna*. [1]

In *Astang Samgraha Churna* is considered as the variety of *Kalka*. When dry materials pounded & filtered through fine cloth is called *Churna*. It is just the type of *Kalka* because while preparing the *Churna* whole material is taken for processing as in case of *Kalka* [2].

A material when made into finer form by pounding is called *Churna*. It is therapeutically used for various purposes like; externally as *Anjana, Vrana Varti*, internally used in different systemic diseases like *Grahani, Ama-dosa* etc [3]. e.g., *Sitoplaadi churna* [4]

Vati kalpana: *Vati* is the solid dosage form prepared out of fine powder of different raw materials by triturating with specified herbal juices/decoctions in a mortar & pestle, till the material becomes enough smooth so that *vati* could be easily prepared by rolling the paste thus formed. *Vati* can be prepared with involvement of *Agnee like Avaleha* or without the involvement of *Agnee* by adding *guggulu* like different binding agents [5]. In *Vati* preparation, *guggulu*, jaggery and sugar like natural binding agents are used where cooking is done followed by trituration. E.g., *Chandra prabha vati* [6].

Modaka :circular in shape, & generally contains higher amounts of medicaments e.g., *Pippali modak* [7]. Ranges from 10gm to 100gm. **Pindi** : when medicines are mixed with sugar and mould into big size circular shape .contain 10gm to 50 gm of medicaments e.g., *Shurana pindi* [8]. Some compare it with big *amalaki* by weight.

Gutika/vatika: small dosage form in comparison to *modaka and pindi*. e.g., *Viyoshaadi gutika* [9].

Vatak : *vatak* is bigger than *vatika* in size. (approx. 500mg). e.g., *Mandur vatak* [10].

VartiKalpana: *Varti* is the extended form of *vati kalpana*, pharmaceutically prepared in similar process, having round and elongated form in comparison to *vati*, tapering at end, used locally for intended therapeutic purposes. (normally used for evacuation of stool & flatus by applying at anus). According to *acharya Charak varti* used in genitalia should have size: (front end) part which has to be inserted into body part – *sarsapa* [mustard]. (back end) – *masa* [udada]. *Varti* used in rectum should be *Angustha pramaan* (thumb like thick). It should be smooth & should not crack/break e.g., *pippliyaadi varti* [11]. As per specific type of *varti* (ingredients are generally *Teekshna & Sukshma* in nature) generally water & jaggery are common in all types of *varti* acting as binding agent. e.g., *Phalvarti* [12], *Rasaanjan varti* [13], *Pushpavarti* [14].

Khanda: *Khanda kalpana* are the unique preparations where final pharmaceuticals product is achieved in granular form. It is called *khanda* (pieces) *kalpana* because after preparing medicines it's dosage form is available in small pieces forms. It is an extended form of *avaleha kalpana*. It has more shelf life in comparison to *avaleha kalpana*. *Khanda kalpana* can be defined as a solid pharmaceuticals dosage form having granular consistence that is prepared by *paka* (heating) of the specified medicaments with sugar and water/decoction. E.g.,: *narikela khanda* [15], *haridrakhanda* [16].

Guda kalpana: Like *vati kalpana*, *Guda-paka kalpanas* are also prepared in two ways: 1. With the involvement of fire 2. Without the involvement of fire. *Acharya Sharangadhara* has told *guda* as one of the synonym of *vati* [17]. Boiling of decoction mixed jaggery to thick consistency & adding fine powdered i.e., *Prakshepa dravya*. *Paka* should not be completed in only one day for achieving more active principle into the final product. Because due to, in-process, of materials in different decoctions there is more chance, that active principles to be incorporated into the product. Hence process should be continued for some days & in every day heating process is carried out for some time depending on the amount of medicines going to be prepared [18]. E.g., *kalyanaka guda* [19].

Guggulu kalpana: It is either prepared with fire or without fire as like *vati kalpana*. *Guggulu* preparation involving fire is prepared like *Avaleha*. When it is prepared without fire then after sufficient pounding it is triturated with specified liquid materials and honey [20]. Before preparing any *Guggulu kalpana*, *guggulu* must be taken in *shodhita* form (pure) [21-22]. e.g., *Yograj Guggulu* [23], *kaishor Guggulu* [24].

Generally the medicines containing *Guggulu* as one of the ingredients are called *Guggulu kalpa* but it is not almost always true. As like *Guda-paka*, it is pharmaceutically processed in similar way; after obtaining *guggulu* in *suddha* form. Both *Guda-paka* & *Guggulu-paka/kalp* different from other dosage form because these ingredients are acting like natural binding agents along with their therapeutic potency. Hence due to proper compactness in the dosage form, shelf life increases.

Satwa kalpana & Ghan-Vati: *Satwa* is the solid pharmaceutical dosage form prepared as water extract with or without application of heat from the raw material, generally rich in starch content. *Ghana* is the solid remnant of decoction after evaporating all the water, when given the shape of *vati* is called *Ghana Vati*. Both these solid dosage forms are the concentrated active principles of certain selective raw materials, developed to achieve desired equal therapeutic effect in small dose & to increase the stability period. e.g., *Guduchi Satva* [25].

Satwa, Ghana, Ghana sara, Rasa-Kriya like dosage forms are prepared following the similar pharmaceutical processings. Dosage forms are named differently because of selection of raw material & characteristics of the final product. For example: *Satwa* is prepared from *Guduchi Satva*²⁵ where raw materials are rich in starch; *Ghana* is prepared from *kutaj* [26] where along with starch carbohydrate & sweetening materials are also found, whereas *Rasa-kriya* is prepared from *Daruharidra*²⁷ that contains starch & carbohydrates.

Lavana kalpana: It is the solid dosage form where certain specific raw materials are processed with *Saindhav lavana* through a particular pharmaceutical process (*Antar-dhum process*) with the help of specially designed tools in ancient pharmaceuticals. The processing is generally performed in closed casseroles (*Samputa*) with the involvement of fire. two types e.g., *Ark Lavana* [28], *Narikela Lavana (sajal)* [29] (*nirjala*) [30].

Kshara Kalpana: The materials that cause the *ksharana* (corrosive) & *kshanana* (cutting) [31] like function to the applied place are called *kshara*. According to *acharya Charak*, *kshara* is the materials that causes cauterization and takes away the debris [32].

Bhasma Kalpana and Ayaskriti kalpana: Therapeutic usage of metals was known even during the *Samhita* period (2500 BC – 500 BC). However they were used only in a fine powder form but not in *bhasma* state. Preparation of *Lauha Rasayana* in *Charak Samhita* [33] may be considered as the initial form of *Lauha Bhasma* described in *Ras Ratan Samuchhaya* [34], the similar process is also described in the name of *Ayaskriti* in *Sushrut Samhita* [35] and *Astanga Hridaya* [36], *Sthalipaka* & *Bhanupaka* in *Astanga Samgraha* [37]. The process of *Bhasmikanana* is not mentioned in *Samhita Granthas*. *Bhasma* is very fine powder dosage form prepared through certain series of pharmaceutical procedures, which forms the materials of metal/mineral or animal origin, for its intended therapeutic use.

Table 1: List of solid dosage form and their matra (dose), The Gazette of India, part II-section 3-subsection (i),D&C ACT 1940,ruled 1945.

S.NO.	DOSAGE FORM	SHELF LIFE
1.	<i>Churna</i>	2 years
2.	<i>Vati</i>	
	<ul style="list-style-type: none"> <i>Vati</i> containing <i>kasthaushadhi</i> along with <i>Rasa/Uparasa/Bhasma/</i> 	5 years
	<i>Guggulu.</i>	
	<ul style="list-style-type: none"> <i>Vati</i> containing only <i>kasthaushadhi.</i> <i>Vati</i> containing only <i>Rasa/ Uparasa/</i> 	3 years 10 years
	<i>Bhasma</i> except <i>Naga, Vang,</i> and <i>Tamra Bhasma.</i>	
3.	<i>Varti</i>	2 years
4.	<i>Khand</i>	3 years
5.	<i>Guda</i>	3 years
6.	<i>Guggulu</i>	5 years
7.	<i>Satwa</i>	2 years
8.	<i>Lavana</i>	5 years
9.	<i>Kshar</i>	5 years
10.	<i>Ayaskriti</i>	10 years
11.	<i>Bhasma</i> (except <i>Naga, Vanga, Tamra</i> <i>Bhasma</i>)	10 years
	<ul style="list-style-type: none"> <i>Naga, Vanga, Tamra Bhasma</i> 	5 years

DISCUSSION

Traditional medicine is an integral part of the health care system in a number of developing countries including India. The world today is looking at these remedies for a number of ailments. However, these remedies can only find a place for themselves in the mainstream medicine if their claims are evaluated scientifically and documented systematically. Drug should be suitable for preparing many recipes, should possess the *Gunas* and should be readily available. *Churna* as solid dosage form produces more rapid dissolution in body fluids. The rapid dissolution increases the blood concentration in a shorter time, there by the action is produced in a lesser time. Powders drugs are more economical because of their simple preparation they do not require any special technique or equipments. *Vati kalpana* is designed to protect the drug for longer time by compacting and there by discouraging the quick environmental effect. Dose fixation is easier & also it is very easy and convenient for packaging, distribution and dispensing. This dosage form also masks the bitter taste and irritating odor of the drugs hence improves palatability. A drug that is needed to work in intestine are designed as enteric coated tablets. *Varti* (suppositories) are solid forms intended for introduction into body cavities where they melt, releasing the drug & the choice of suppository base or drug carrier can greatly influence the degree & rate of drug release. This route of drug administration is also indicated for drugs inactivated by the gastrointestinal fluids when given orally or when the oral route is precluded, as for example when a patient is vomiting or unconscious. *Avaleha kalpana* means a product liked by all ages throughout the world & it is recognised as an ingredient of balanced drug/diet which is used for ingestion. *Khanda kalpana* (granules) is extended form of *aveleha kalpana*. It has more shelf life than *aveleha kalpana*. In comparison to to only herbal based *vati/tablet, Guda* and *Guggulu kalpana*(both are natural binding agent) are having longer shelf-life. *Ghan Satva* having higher concentration of medicaments, lower dosage, subtle in nature (so go to subtle target tissue), longer shelf life and better Bio availability.*Lavana kalpana* predominantly contains high amount of Sodium & Potassium, which is probably why *Narikel Lavana* is found to be effective against *Parinaam Shula* and other acid peptic disorders. *Saindhav* is essentially *pittahara, sheet veerya,* and with its *shaman* property, *Sandhav* pacifies the vitiated *Pitta*. It also reduces secretion of acid in stomach & prevents acid reflux.*Ayaskriti* is recently known as *Lauha Bhasma*. Now a days, *Bhasma kalpana* is very much sensitive dosage form due to high therapeutic significance as well as bio-technological values along with known metal toxicity in long term as well as short term use.*Kshara, Lavana & Masi Kalpana* are dosage forms prepared in similar method of preparation. *Masi kalpana* is mostly used as an externally

applied drug agent whereas *Lavana kalpana* is used internally & *kshara kalpana* is used case specific, both externally & internally. Due to alkaline & corrosive nature of *Kshara*, it removes the debris of leisons facilitating the quick healing up of wound. Hence we can say that each solid dosage form has specific importance and it is dependent on disease conditions and strength of patient with respect to gastric fire, physical & mental status etc.

CONCLUSION

The total number of dosage forms told in *Ayurved* is not told by any other system of medicine. And from the above discussion it is clear that modern solid dosage forms are much similar to traditional solid dosage forms. The truth is, there are diseases that modern medicine has failed to treat which traditional medicine can treat and there are diseases that can be appropriately tackled by modern medicine only. Most of the developing solid dosage form in modern medicine was already developed in traditional system of medicine i.e., *Ayurved*.

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