

CURRENT MARKETED AYURVEDIC FORMULATIONS AND THEIR APPLICATION

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ABSTRACT

Ayurveda is an ancient system of medical science which elucidates about the different forms of Dosage, which is the physical form of a medication deliberate for administration. As per Ayurveda the different types of dosage forms can be prepared by the Vaidya (physician) According to Yukti (solution by scientific logic), seeing samyoga, vishesha, kala and samskara. Different types of dosage forms have been described in the Ayurvedic texts. These all are Classified into different types such as Aushadhakalpana, Aaharakalpana, and Bahyaand Abhyantarakalpana, including solid, liquid and semisolid forms, as well as their sources also such as plant, animal and mineral origin. The dosage forms are mainly premeditated to Increase shelf life, palatability and to alter potency. These all can be used for both purposes Internally and externally. Few of the dosage forms of them have been described mainly based on the physical mode of medicine, its uses and advantages.

Keywords: Ayurvedic Formulation, Dose, Shelf Life, Kala, Samaskara, Kalpana.

I. INTRODUCTION

The Vedas, Puranas, and ancient writings penned by numerous Acharyas over various eras contain information about the history of Ayurvedic dose forms. Preparations that follow the principles of Ayurveda and are made from natural sources, such as plants and animals, are known as Ayurvedic dosage forms. The Trisutra, Hetu, Linga, and Aushadhi are the primary foundations of Ayurveda. Among these, aushadhi is crucial for treating both human and animal illnesses [1].

Pancha Mahabhuta (the five basic components), Doshas (biological elements), Dhatus (basic tissues), Malas (waste products), and Agni (biological fire) are the foundations of the Ayurvedic approach to healthcare [2].

The dosage form is crucial to any healing system because it gives medications a physical form, and once physical forms are available, patients may easily receive the right dosage of the medication. There are several different dosage forms that fall into the solid, liquid, and semisolid in the Ayurvedic medical system. When compared to other dosage forms, the solid dosage forms have a longer half-life[3].

When compared to other dosage forms, liquid dosage forms have a higher bioavailability, while semisolid dosage forms have a greater capacity to enter the skin. Consequently, it is fascinating that every type of dose form has unique benefits and drawbacks. Various dosage forms are designed to be used both internally and externally, or to diagnose, treat, mitigate, or prevent diseases or disorders in humans or animals. Every dosage form is produced solely using the formulas found in the first schedule of the Drug andCosmetic Act of 1940, which are based on authentic texts of the Ayurvedic medical system [4].

A drug's dosage form is a physical form that is meant to be consumed or administered in order to transport the compounds to the body's sites of action. Based on their physical state, ayurvedic medications can be divided into four groups: solid, semisolid, liquid, and gaseous. These dosage forms primarily address the drug's dosage, delivery method, absorption, metabolism, palatability, and shelf life [5].

Conventional medicine in India acknowledges Ayurvedic science as being on par with contemporary medical science. One Natural products are abundant in India and are used in traditional medicine across a variety of therapeutic systems, including naturopathy, Ayurveda, Siddha, Unani, and homeopathy. India has evolved a traditional healthcare system and herbal remedies over many generations. Approximately 500 traditional groups use roughly 800 plant species to cure various illnesses, and 20,000 medicinal plant species have recently been identified[6].

II. DIFFERENT DOSAGE FORM

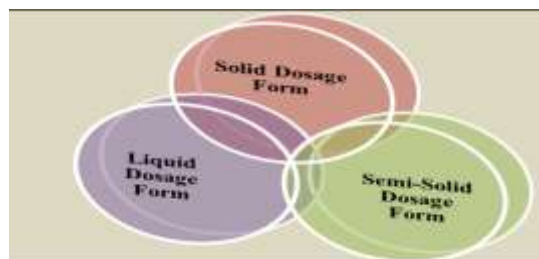


Fig 1: Different Dosage Form

CLASSIFICATION OF DIFFERENT DOSAGE FORM

Solid	Semi-Solid	Liquid
Churna	Kalka	Swarasa
Vati	Avaleha	Kwatha
Lavana	Rasakriya	Hima
Kshara	Lepa	Phanta
Masi		Arka
Kupipakva-Rasayana		Sarkara
Rasa-Yoga		Asavarishta
Pistil		Taila/Grutha
Bhasma		Dravaka
Kara		

SOLID DOSAGE FORMS:

In Ayurveda, solid dosage forms are commonly used to deliver medicinal herbs and preparations effectively. Some popular solid dosage forms include:

Churna

Churna is a powder of a single drug or a mixture of two or more drugs. Churna is freeflowing and retains its potency for one year if preserved in an airtight container. Here the drugs are finely powdered and they are filtered through a cloth so that the powder is very fine which can be used internally as well as externally. This can be used for preparations like Vati, Avalehya, etc. for example Triphala churna, Trikatu churna, Drakeshadi churna, and Sudharsana churna (6).



Fig 2: Churna

Vati

Vati kalpana is a pharmaceutical procedure in which the powder of raw drugs (Herbal or Herbo minerals) triturated together with certain Kasayam or Juice or even honey and the medicines are prepared in the form of pills or tablets. It is solid preparation which is prepared either by cooking the powder of a drug with jaggery, sugar or guggulu or without cooking. Then macerating the powder with liquid like honey and guggulu and then rolled into pill forms. This form is considered to be the most convenient form of medicine for the patient. It can also be used internally and externally and can be used for many years.eg. Bilvadi gutika, Gudavarti, Triphala

guggulu. The synonyms of Vati described by Sarngadhara are Gutika, Vati, Modaka, Vatika, Pindi, Guda, Varti, etc. The medicine made into circular shape mass dosage form, is called as Gutika. If the Gutika or Vati medicine is modified into long oval solid shape form, then it is called as Varti. This is commonly used for local administration in the anal canal, vaginal canal, penis, eye for different diseases. Medicine moulded into big circular mass form is known as Vatika. Aushadhi churna is mixed with Sarkara and moulded like circular mass then it is called as Pinda or Pindi. Modaka having a circular shape, big size, and possessing weight around 20 g, 50 g (7).



Fig 3: Vati

Lavana

Lavana is the preparation consisting of Saindhava lavana and the ash of the drug obtained after igniting it in a closed samputa. In this preparation, the saindhava lavana is powdered and is combined with arka, narikela, and is covered. The puta is then given on agni so as to obtain a black coloured lavana. It could be preserved for many years by keeping it in airtight containers, e.g. Narikela lavana, Abhaya lavana, and Arka lavana. The dose of 12-24 g is given for Arka lavana. There are two methods adopted for the preparation of Lavana is, Lehapaaka vidhi and Putapaka vidhi. In Lehapaaka vidhi, the decoction is adopted whereas, in Putapaka vidhi, the raw drug along with Lavana is taken in a Sharava, closed with another Sharava and the joint is sealed with mud smeared cloth and subjected to heat with cow dung cakes, for example, Arka Lavana (8).



Fig 4: Lavana

Kshara

Kshara is a preparation obtained from the ash of plants, animal and mineral products. The Kshara preparation is carried out by the extraction of 'alkalies' from the ash of dried plants. It is believed that the diseases which are complicated to treat could be cured by Kshara. Kshara reduces recurrence of diseases. Kshara is able to reduce the chances of post-surgical infections due to its alkalinity. Kshara has the topmost place in all surgical and para-surgical measures. It is used both internally as well as externally. Internally used kshara is called paniya kshara and externally used kshara is called pratisaraneeya kshara. It is again divided into 3 types, i.e., mrudu, madhyama, and teekshna kshara. The examples of Kshara are Yava kshara, Gokshura kshara, Chinchha kshara, Kadali kshara, and Apamarga kshara (9).



Fig 5: Kshara

Masi

Masi is an ayurvedic preparation of plant or animal origin, in which the drug is brought to a carbonized form by the process of employing heat to the dry ingredients of the drug. During the preparation of Masi, drugs have to be covered completely with earthen pots so that direct exposure of drug with atmospheric air can be avoided. Masi is used for both internal and external purpose. The drug should be powdered from which masi is prepared and then placed in a sarava and samputa with placing another sarava over the first one and sealing it. It is thus prepared by giving either laghuputa or mahaputa according to the nature of the drugs involved. After the cooling of the samputa, the prepared masi is ground once again to obtain a homogeneous and fine powder, for example, Triphala masi, Haritaki masi, Amalaki masi, and Vibhitaki masi (10).

**Fig 6:** Masi**Kupipakva-Rasayana**

These are the ayurvedic preparations obtained from mineral and metallic origin in the form of powder. The minerals and metallic part is mixed together and placed in glass flask occupying about one-third of the volume. The glass flask is then closed with clay smeared pieces of cloth around the bottle in seven consecutive layers. The flask is dried and buried in the sand (Valukayantra) upto the neck. The flask in Valukayantra is then heated gradually in three type of agni that is Mrdu-agni, Madyam-agni and tiksni-agni for a specified period of time as mentioned in process. The red hot iron rod about 5cm in diameter is then inserted in glass flask through the opening and stirred properly, so that opening of a flask is not choked due to the coating formed by sublimed Sulphur. When the process is over, the glass flask is cooled and broken to collect the content carefully without the contamination of any glass pieces therein, for example, Makaradhvaja and Swarnasindura (11).

**Fig 7:** Kupipakva-Rasayana**Rasa-Yoga**

The Rasa-Yoga or Rasashastra is an ayurvedic preparation containing mineral drugs as their main ingredients in the form of powder or pills. It is prepared by trituration followed by compression to get powder and pills respectively. Kapura Rasa, Laghu Rasa, Malini Rasa, and Vasant Rasa are some important examples of Rasa-Yoga. Rasashastra deals with the various pharmaceutical processes of Shodhana, Marana, Jarana, Murchana and other detail description of metals, minerals, poisonous herbal drugs and animal products used therapeutically in practice of Ayurveda (12).



Fig 8: Rasa-Yoga

Pistil

The pistil is a solid Ayurvedic preparation which is obtained by triturating the drug with the specified liquids and then exposed to sunlight or moonlight, for example, Praval Pistil, and Mukta Pistil.



Fig 9: Pistil

Bhasma

Bhasma is the powdered form of the drugs, obtained by calcination of metals, minerals or animals. It is prepared by a special process in closed crucibles in pits which is covered with cow dung cake. The selected examples of bhasmas are Godanti Bhasma, Lauha Bhasma, Swarna Bhasma, and Parad Bhasma (13).



Fig 10: Bhasma

Kara

Kara is a preparation obtained from the ash of drugs which is alkaline in nature. Kara is prepared by cutting drugs into small pieces and burnt to get ash. The ash is then dissolved in water and again evaporated to get rid of water to obtain an alkaline solid, e.g. Yak Kara, and Pals Kara



Fig 11: Kara

ADVANTAGES

Convenience and Portability: Solid dosage forms are easy to carry, store, and take, ensuring better patient compliance.[25]

Precise Dosing: Provides accurate and consistent doses, enhancing therapeutic effectiveness and reducing the risk of over- or under-dosing.[26]

DISADVANTAGES

Delayed Onset of Action: Solid forms take longer to disintegrate and absorb, leading to slower onset of action.[27]

Difficulty in Adjusting Dosage: Solid forms are not easily adjustable for individuals with varying dosages or needs, particularly for those unable to swallow pills.[28]

SEMI-SOLID DOSAGE FORMS

In Ayurveda, semi-solid dosage forms are commonly used for topical applications or internal use where a paste-like consistency is beneficial. These preparations are used for their therapeutic effects on the skin, mucous membranes, or digestive system. Some of the main types of semi-solid dosage forms in Ayurveda include:

Kalka

Fresh herbs grounded into a fine or coarse paste is called Kalka. If the plant does not yield appreciable quantities of juice, kalka is prepared. It has quite an amount of fibre and therefore useful in digestive disorders because it stays longer in the gut. It is a soft paste prepared by both wet and dry drugs prepared by grinding wet and dry drugs. It is usually used for external applications and if taken internally, the recommended dosage is 1 *karsha* (12 g). Kalka is also used in the preparation of oils to add specific colour, fragrance and medicinal properties. Some examples of such forms are Nimba Kalka, Triphala kalka, and Rasonakalka (14).

**Fig 12: Kalka****Avaleha**

It is another type of semi-solid preparation which is prepared either by adding jaggery and/or sugar and is boiled with a prescribed drug, decoction of drug or its juice to get a semi-solid preparation known as Avaleha. Avaleha contains an aqueous medium (*kashaya*, *swarasa*, etc.), a substrate (sugar, sugar candy, jaggery), *Oushada dravyas* (powdered drugs), lipid medium (*Ghrita*, *Tila taila*, etc.), and additives (honey, gingelly oil, salts). The confirmatory tests for Avaleha preparation can be categorized into *Asannapakalakashana* (tests before attaining *Paka*) and *Sidhalakashana* (tests after the preparation) which are mainly used to identify the *Paka* of Avaleha and it depends on sweetening agent and water ratio. The dose is specified as one *Karsha* (12 g) to two *Palas* (96 g) based on the strength of the patient and severity of the disease. These forms are including *Kushmanda Avaleha*, *Soorana Avaleha*, *Chyavanaprasa*, and *Agastya Rasayana* (15).

**Fig 13: Avaleha**

Rasakriya

It is also another type of semi-solid preparation where the swarasa is extracted, boiled down to thick consistency so as to obtain a semi-solid preparation known as Rasakriya. It is used mainly for the bitter drugs, so it will be easier for consumption and the dosage of the drug can be minimised. The process of the Rasakriya is considered to be similar to the preparation of the aqueous extraction of the drug. It is considered to contain all the active principles as that of the whole drug. So, the dosage of the drug can be reduced by giving the drug in the Rasakriya form and also the palatability of the drug is still more increased by adding sugar or jaggery to the Rasakriya and preparing it as syrup. This increases the palatability and also helps for the easy absorption of the drug. Generally, Rasakriya is prepared in two methods. In the first method, juice or decoction is heated into a semisolid state and then fine powders of the prakshepa dravyas are added. In the second method, first jaggery or sugar is mixed with water and heated till it becomes syrup and then the prescribed drugs are added, e.g. Daruharidra Rasakriya (16).

**Fig 14:** Rasakriya**Lepa**

The preparations in the form of paste meant for external applications on the body are known as Lepa. There are many lepa preparations are in practice which include sinduradi lepa, and pathyadi lepa

**Fig 15:** Lepa**ADVANTAGES**

Localized Action: Semi-solid forms are ideal for topical treatments, providing localized relief for skin conditions or joint pains.[29]

Ease of Application: These forms are easy to apply and are often used for external use, ensuring better compliance in topical treatments.[30]

DISADVANTAGES

Stability Issues: Ayurvedic semi-solid formulations can have stability issues due to the natural ingredients used, which may degrade or lose potency over time. This can lead to reduced therapeutic effectiveness.[31]

Limited Shelf Life: Many Ayurvedic semi-solid dosage forms have a shorter shelf life, particularly if preservatives are not added. Natural ingredients can cause microbial growth, affecting the formulation's longevity.[32]

LIQUID DOSAGE FORMS

In Ayurveda, liquid dosage forms are widely used for internal and external therapeutic purposes. These forms allow for the easy absorption of herbal medicines and are commonly used for a wide range of health issues. Some of the major liquid dosage forms in Ayurveda include:

Swarasa

Swarasa is an extracted juice of herbs which is used as a liquid dosage form of medicament predominately for internal administration, external application as well as for the preparation of different secondary preparations like, fermentative medicinal formulations, medicated oil etc. It is one of the basic preparations in Ayurveda and one among the pancavidha kashaya kalpana and the most potent among them. It is used as a bhavana dravya and as shodhana dravya in mineral preparation. It is mainly administered in the dose of 0.5-1 pala. There are different methods involved in for the extraction of juice from drug and they are mainly based on the nature of drugs. For the extraction of soft drugs the pounding method is adopted; for hard drugs adding 8 times of water and reducing it to one-fourth part and for fibrous drugs putapaka method is adopted. The examples of swarasa dosage forms are including Tulasi swarasa and Lemon swarasa (17).

**Fig 16: Swarasa****Kwatha**

Kwatha is a liquid dosage form of medicament which is prepared by decoction process. This dosage form is acquired by boiling of herbal drug(s) with water in a specific proportion and is reduced to the desired quantity provided the heat is moderate. While formulating it as per Ayurvedic principles, stresses on various clauses where the quantity of water, nature of the drug, the intervention of heat, and the addition of Prakshepa Dravya play a major role in developing the effectiveness of the preparation. It is prepared by decoction process where the coarse powder form of a drug is taken and it is boiled with a different ratio of water as in case of soft drugs 4 parts of water is used. In case of medium and hard drugs 8 times of water is used and in case of very hard drugs 16 of water is used in an earthen pot and it is heated on mandagni (slow heat) till it is reduced to one-eighth part of the original quantity. For example, the required dose of rasnadi kwatha preparation is 2 palas. It can also be used for secondary preparation like preparation of medicated ghee or oil and also used as anupana, niruhabasti, bhavanadravya. There are certain upkalpana of kwatha like pramathya kalpana, paniya kalpana, usnodaka, ksirapaka, laksarasa, and mamsa rasa (18).

**Fig 17: Kwatha****Hima**

It is the primary preparation mentioned in Ayurveda as a cold infusion. One part of the drug is put in 6 part of cold water and kept overnight in an earthen pot. Next day the drug is taken and macerated well and filtered through a clean cloth, and the formulation thus obtained is called as the Hima kalpana. This type of preparation mainly acts as a pittashamaka and hrudya and they can also be used as an instant source of energy, e.g. Dhanyaka hima. The dose of this kind of preparation is 2 palas (96 mL). The upkalpana of hima are mantha kalpana, udaka kalpana, panaka kalpana, and palashpushpa hima kalpana (19).



Fig 18: Hima

Phanta

It is also a preparation among the pancavidha kashaya kalpana as a hot infusion. Here the coarse powder of a drug is put into hot water and it is rubbed and filtered with a cloth. By this there is softening of the drugs takes place as the extraction of all the volatile principles from the drug to water. It is considered to be the least potent among the panchavidha kashaya kalpana, such as rose, fennel, coriander, and saffron (20).



Fig 19: Phanta

Arka

Arka kalpana can be defined as a secondary suspension preparation obtained by distillation of certain liquids or of drugs soaked in water using the Arkayantara or any convenient modern distillation apparatus. Arka is used in the case of agnimandya, amaajeerna and amatisara. Some of the common Arka available in the market are Pudina Arka, Punarnava Arka, and Tulasi Arka (21).



Fig 20: Arka

Sarkara

The medicines in the syrup form are called sarkara. Here two parts of sugar is added to one part of kwatha/swarasa/hima is added and heated on mandagni till it gets proper paka and after cooling it is filtered and mainly used for children due to its sweetness and the sugar concentration in this preparation will be 66.7% due to which it also acts as a preservative e.g. parushaka sarkara (22).



Fig 21: Sarkara

Asavarishta

Asava and Arishta are the special kinds of medicinal preparation which is made by soaking the drugs either in the powder form or in the kashaya form in a solution of sugar or jaggery for a specific period of time for fermentation to generate alcohol. The alcohol thus generated acts as a preservative and thus facilitating the extraction of active principles contained in it. It is preserved for many years. Asava is preparation, which is prepared with the natural fermentation process using herbs, water and sugar. Almost all Asava medicines do not include preparation of decoctions, but it has very few exceptions. Arishta is the type of ayurvedic medicines, which are prepared with natural fermentation process using herbal decoctions, Dhataki flowers and sugar. Arishta means to have a long shelf-life, for example arjunarishta, draksarista, kanakasava, ashokarishta, aravindasava, and kumaryasava (23).



Fig 22: Asavarishta

Taila/Grutha

Taila alleviates vata and does not aggravate kapha. It promotes body strength. Acharya Charak mentioned that Tila taila is best one for strength and function and considered best for the pacification of Vata. Taila assimilates the properties of other drugs added to it during the paka of Sneha without losing its own properties. Taila /Grutha are preparations in which taila are boiled with a prescribed kashaya and kalka according to the formula. This is mainly in the ratio 1:4:16. This form of medicine can be used internally as well as externally eg. Triphalagrutha, Dhanwantara taila (24).



Fig 23: Taila/Grutha

Dravaka

The liquid preparations obtained from lianas or shares are known as Drivakis. They are prepared by distillation process with or without the addition of any fluids. e.g. Sancta Dravaka



Fig 24: Dravaka

ADVANTAGES

Faster Absorption: Liquids are absorbed more rapidly into the bloodstream, leading to quicker therapeutic effects.[33]

Easier to Adjust Doses: Liquid forms allow for precise dosing, especially for children or elderly patients who may have difficulty with solid forms.[34]

DISADVANTAGES

Shorter Shelf Life: Liquid forms are more prone to degradation, contamination, and loss of potency over time compared to solid forms.[35]

Storage and Handling: Liquids require proper storage to avoid contamination and spoilage, and they are less convenient to carry than solids.[36].

III. CONCLUSION

A dosage form is required to take a drug in a good manner. For accuracy in a dose of drug administration, the dosage form of a drug is also important. In the Ayurvedic system of medicine, the preparation methods of dosage forms are easy and convenient. Standardization of dosage forms and specific dose calculation are still there to explore. From this review, it could be concluded that the researchers from the Ayurveda world have a long list of work to do in the future by taking references from these existing dosage forms.

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