

Ancient medicine dosage forms: a historical review

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Abstract

Ancient medicine dosage forms represent the earliest systematic attempts to prepare, preserve, and deliver therapeutic substances to the human body. Civilizations across the world—including India, China, Egypt, Greece, and the Middle East—developed unique methods for processing herbs, minerals, and animal products to enhance their medicinal value and ensure patient acceptability. In ancient India, Ayurveda introduced a wide variety of formulations such as Churna (powders), Kashaya (decocotions), Vati/Gutika (pills), Asava–Arishta (fermented liquids), Ghrita (medicated ghee), and Taila (medicated oils), each designed with specific therapeutic intentions and principles related to dosha balance. Similarly, Traditional Chinese Medicine (TCM) utilized preparations like Tang (decocotions), San (powders), Gao (pastes), and Wan (pills), reflecting deep understanding of herb compatibility and extraction techniques. Unani medicine offered formulations such as Sharbat (syrups), Majun (electuaries), Safoof (powders), and Roghan (oils), emphasizing temperment-based healing. Natural excipients such as honey, ghee, milk, jaggery, and plant-based resins played essential roles as preservatives, binders, and carriers. Although modern pharmaceuticals now relies on advanced chemistry and technology, many foundational principles—including drug standardization, extraction processes, fermentation, and patient-centred delivery—trace their origin to ancient practices. These dosage forms not only exemplify the scientific ingenuity of early healers but also continue to inspire contemporary drug research, natural product development, and holistic healthcare systems.

Keywords: Ancient medicine, Traditional medicine, Dosage forms, Ayurvedic formulation, Traditional Chinese Medicine (TCM)

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Introduction

Medicine has been a part of human civilization since ancient times, evolving through observation, experience, and experimentation.[1] In the early periods, healers and physicians developed various ways to prepare and administer natural substances such as herbs, minerals, and animal products to cure diseases and maintain health.[2] These preparations, known as dosage forms, were the earliest attempts to ensure that medicines were effective, stable, and acceptable to patients.[3] Ancient systems of medicine such as Ayurveda, Unani, and Traditional Chinese Medicine (TCM) laid the foundation for the modern concepts of formulation and drug delivery.[4]

In Ayurveda, ancient Indian scholars described numerous dosage forms, including Churna (powder), Kashaya (decocotion), Vati or Gutika (tablets or pills), Asava and Arishta (fermented liquids), and Ghrita or Taila (medicated ghee and oils).[5] Similarly, in Chinese medicine, preparations like Tang (decocotions), San

(powders), and Wan (pills) were common, while Unani medicine used forms such as Sharbat (syrups), Majun (semi-solid mixtures), and Roghan (oils).[6] Each system developed its dosage forms based on local materials, therapeutic needs, and philosophical principles regarding balance and harmony in the human body.[7] Ancient dosage knowledge, forms reveals the deep understanding early healers had of drug stability, palatability, and bioavailability.[8] They used natural excipients like honey, ghee, and milk to enhance the effectiveness and acceptability of medicines.[9] Although modern pharmaceutical science has advanced with technology and synthetic compounds, many of its principles—such as controlled dosage, patient compliance, and preservation—trace back to these ancient practices.[10] Thus, ancient medicine dosage forms not only represent the roots of pharmacy but also continue to inspire modern drug formulation and natural product research.[11]



Fig 1: Ancient medicine herbs

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History:

The history of ancient medicine dosage forms dates back thousands of years, when early humans began using natural substances such as plants, minerals, and animal products to treat illnesses. Initially, these remedies were used in their raw forms—like leaves, roots, and juices—but over time, healers discovered that proper preparation and combination could enhance their healing power. This gave rise to the earliest dosage forms, or methods of preparing and administering medicines. Ancient civilizations such as those of India, China, Egypt, and Greece developed unique systems of medicine based on observation, trial, and experience, laying the foundation for the structured pharmaceutical practices we know today.

In India, the Ayurvedic system of medicine described in texts like Charaka Samhita and Sushruta Samhita (around 1000 BCE) offered detailed methods for preparing medicines in various forms. These included Churna (powders), Kashaya (decocitions), Asava and Arishta (fermented liquids), and Ghrita or Taila (medicated

ghee and oils). Meanwhile, Traditional Chinese Medicine (TCM) developed around the same period, emphasizing the preparation of herbal formulas in forms such as Tang (decocitions), San (powders), and Wan (pills). In Unani medicine, which evolved from Greek and Arabic traditions, physicians like Hippocrates and Avicenna contributed to the understanding of dosage forms like Hab (pills), Sharbat (syrups), and Majun (semi-solid preparations). As these systems evolved, the art of medicine preparation became increasingly sophisticated. Ancient healers learned how to preserve medicines, mask unpleasant tastes, and improve absorption using natural ingredients such as honey, jaggery, ghee, and milk. They also recognized the importance of dosage, purity, and proper storage—concepts that are still fundamental in modern pharmacy[11]. The long history of ancient dosage forms reflects the deep knowledge and innovation of early medical practitioners, whose discoveries continue to influence the development of modern pharmaceutical science.



Fig 2:History of Ancient medicine

Classification of ancient medicine



Fig3: clarification of ancient medicine

Ayurveda

Ayurveda is a traditional Indian system of medicine based on maintaining the balance of the body, mind, and spirit. It aims to prevent and treat illness by using natural methods such as herbs, diet, lifestyle routines, yoga, and detoxification therapies. **Examples:**(Turmeric, Ashwagandha, Amla, Ginger and Cardamom)[12].

Table 1:Showing the drugs under Ayurveda

<u>S.No.</u>	<u>Formulation Type</u>	<u>Description</u>	<u>Example</u>
1.	Churna (Powder)	Fine powdered herbal mixture used internally.	Triphala Churna, Hingvastak Churna
2.	Vati / Gutika (Tablets/Pills)	Solid dosage forms made from herbal powders and binders.	Chandraprabha Vati, Yojraj Guggulu
3.	Arishta (Fermented Liquid)	Self-fermented formulations with herbs, jaggery/honey.	Ashwagandharishta, Dashmularishta

Unani

Unani Medicine is a traditional system of healing that originated in ancient Greece and was later developed by Arab and Persian physicians. It is based on the concept of maintaining balance among the four humors of the body: Blood (Dam), Phlegm (Balgham), Yellow bile (Safra), and Black bile (Sauda). Example:(Castor oil, Birbahuti, Habib-e-Surjan) [13]

Table 2: Showing the drugs under Unani

<u>S.No</u>	<u>Formulation Type</u>	<u>Description</u>	<u>Example</u>
1.	Sharbat (Syrup)	Sweetened herbal syrup used for cooling, tonics, or specific treatments.	Sharbat-e-Banafsha, Sharbat-e-Unnab
2.	Habb / Qurs (Tablets/Pills)	Compressed or rolled pill formulations.	Habb-e-Bawaseer, Qurs-e-Mafasil
3.	Sufoof (Powder)	Finely powdered herbs or herbal combinations.	Sufoof-e-Mohazzil, Sufoof-e-Isabgol

Siddha

Siddha Medicine is one of the oldest traditional medical systems that originated in South India, especially Tamil Nadu. It is based on the teachings of ancient sages called Siddhars, who believed that health is achieved by maintaining the balance of the three humors—Vatham (air), Pitham (fire), and Kabam (water). **Example:**(Nilavembu kudineer, Notchi kundineer)[14]

Table 3: Showing the drugs under Siddha

<u>S.No</u>	<u>Formulation Type</u>	<u>Description</u>	<u>Example</u>
1.	Chooranam (Powder)	Finely powdered herbal or mineral drugs used internally.	Nilavembu Chooranam, Thalisathi Chooranam
2.	Mathirai / Vatagam (Tablets/Pills)	Solid dosage forms made from herbs, minerals, or metal ash.	Thanga Bhasma Mathirai, Gowri Chinthamani
3.	Manapagu (Syrup)	Concentrated herbal syrup used for cough, fever, or digestion.	Thippili Manapagu, Nellikkai Manapagu

Yoga

Yoga is an ancient Indian discipline that aims to harmonize the body, mind, and spirit through physical postures (asanas), breathing techniques (pranayama), meditation, and ethical practices. **Example:** (Asana (Physical Posture), Pranayama (Breathing Technique)[15]

Table 4: Showing the under Yoga System

<u>S.No</u>	<u>Type of Yoga</u>	<u>Focus/Description</u>	<u>Example</u>
1.	Hatha Yoga	Basic physical postures and breathing; foundation of all yoga.	Tadasana, Bhujangasana
2.	Ashtanga Yoga	Fast-paced, structured series of poses; promotes strength and stamina.	Primary Series, Vinyasa Flow

3.	Vinyasa Yoga	Flow-based yoga linking breath with movement.	Sun Salutation (Surya Namaskar)
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Homeopathy

Homeopathy is an alternative medical system based on the principle of "like cures like," meaning a substance that causes symptoms in a healthy person can be used in highly diluted form to treat similar symptoms in a sick person. **Example:**(Arnica Montana, Nux comics)[16]

Table 5: Showing the under Homeopathic medicine

S.No	Formulation Type	Description	Example
1.	Mother Tincture (\emptyset)	Original herbal/chemical extract prepared in alcohol	Aconitum \emptyset , Arnica \emptyset , Belladonna \emptyset
2.	Dilutions (Potencies)	Serially diluted solutions prepared by succussion; denoted as X, C, LM	Arnica 30C, Nux Vomica 200C, Sulphur 6X
3.	Triturations	Potentized powders prepared by grinding insoluble substances with lactose	Silicea 3X, Calcarea carb 6X

Naturopathy

Naturopathy is a system of medicine that focuses on natural healing using the body's own self-healing ability. It emphasizes a drug-less, holistic approach and uses natural methods such as diet, exercise, hydrotherapy, sunlight, massage, fasting, and lifestyle correction to prevent and treat diseases. **Example:**(Hydrotherapy, Sun therapy,Diet therapy)[17]

Table 6:showing the under-Naturopathy System

S.No	Formulation Type	Description	Example
1.	Mud Pack	Clean natural mud mixed with water into a smooth paste	Mud pack for eyes, abdomen, or face

2.	Hot Fomentation Pack	Cloth dipped in hot water and applied	Used for muscle pain, stiffness
3.	Steam Formulation	Steam produced from boiled water, sometimes with herbs	Used for detox, respiratory issues

Advantage

Natural and Safe Ingredients

- Ancient dosage forms were primarily prepared from natural sources such as herbs, minerals, and animal products.
- These formulations had fewer side effects compared to many synthetic modern drugs.
- The use of biocompatible ingredients made them safer for long-term use[18].

Holistic Healing Approach

- Ancient medicine focused on treating the root cause of diseases rather than just the symptoms.
- The formulations were often designed to balance the body, mind, and spirit, promoting overall well-being.
- Systems like Ayurveda, Unani, and Siddha emphasized personalized treatment based on an individual's constitution (Dosha or temperament)[19].

Simplicity and Accessibility

- The preparation methods were simple and cost-effective, often made with locally available ingredients.
- People could prepare and use medicines at home under traditional guidance.
- This made healthcare affordable and accessible even in rural and remote areas.

Long Shelf Life and Stability

- Many ancient dosage forms like powders (Churna), tablets (Vati), and oils (Taila) had good stability and could be stored for long periods without losing efficacy[20].
- Use of natural preservatives like honey and ghee enhanced self-life and potency.
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Disadvantages

Lack of Standardization

- Ancient medicines were prepared using traditional methods without fixed standards for dosage, purity, or concentration.

- Variations in ingredients, preparation methods, and storage could lead to differences in potency and effectiveness.
- This made it difficult to ensure consistent results from one batch to another[21].

Slow Action and Longer Treatment Time

- Most ancient formulations acted slowly because they relied on natural healing processes.
- Patients often needed to take medicines for weeks or months to see results.
- This slow response may not be suitable for acute or emergency conditions.

Limited Scientific Validation

- Many ancient formulations lack modern scientific studies to prove their safety, efficacy, and mechanisms of action.
- The absence of clinical trials makes it difficult to gain global acceptance or meet regulatory-requirements.
- Some remedies may be based on traditional beliefs rather than evidence-based research[22].

Difficulty in Accurate Dosage

- Doses were often estimated using non-standard measurements (like pinches, spoons, or handfuls)
- This caused inconsistent dosing and could lead to under- or over-medication.
- Modern patients may find it difficult to follow exact dosage instructions.

Type of ancient medicine dosage form

Churna (Powder Form):

Churna is a traditional Ayurvedic formulation made by blending finely powdered medicinal herbs. The word *churna* literally means “powder,” and it has been an integral part of Ayurvedic healing for centuries. Churnas are widely used to balance the **doshas**—Vata, Pitta, and Kapha—while supporting digestion, metabolism, immunity, and overall wellness. Because powders are quickly absorbed in the body, they deliver fast therapeutic action. Eg; Triphala Churna aids digestion and detoxification, while Sitopaladi Churna supports respiratory health[23].



Fig 4:churn (powder form)

Kashaya / Kwatha (Decoction)

Kashaya, also known as Kwatha or herbal decoction, is one of the most important liquid dosage forms used in Ayurveda. It is prepared by boiling selected medicinal herbs in water to extract their active constituents, resulting in a concentrated therapeutic liquid. Eg; A simple example is Tulsi–Ginger Kashaya, prepared by boiling Tulsi leaves, crushed ginger, and black pepper in water^[24].



Fig 5: Kashaya Kawatha

Arishta and Asava(Fermented Preparations)

Arishta and Asava are important Ayurvedic fermented liquid preparations known for their long shelf life, rapid absorption, and potent therapeutic action. They are commonly used for digestive disorders, respiratory problems, anaemia, weakness, and metabolic imbalances. Eg; **Arishta**: Dasamoolarishtam – used for weakness, inflammation, and respiratory issues. **Asava**: Drakshasava – used for improving digestion, appetite, and mild anemia



Fig 6: Arishta and Asava

Vati / Gutika (Tablets or Pills)

Vati or Gutika is a traditional Ayurvedic solid dosage form prepared by converting herbal ingredients into tablet-like or pill forms. These formulations are used for a wide range of conditions, including digestive issues, fever, respiratory problems, cardiac disorders, and metabolic imbalances. Eg; A classical example is Chandraprabha Vati, commonly used for urinary disorders, diabetes, digestive issues, and improving overall vitality^[25]



Fig 7:Vati/Gutika(Tablet or Pill)

Avaleha / Leha (Herbal Confection or Paste)

Avaleha, also called Leha, is a semi-solid Ayurvedic dosage form prepared by processing medicinal herbs with jaggery, sugar, or honey to achieve a thick, linctus-like consistency. It is designed for easy consumption, better palatability, and prolonged shelf life. Eg; One of the most famous examples is Chyawanprash, prepared from Amla, Dashamoola, ghee, honey, and numerous rejuvenative herbs^[26]



Fig 8:Avelaha/Leha(Herbal Confection paste)

Taila (Medicated Oils)

Taila is an important Ayurvedic medicinal preparation in which therapeutic herbs are processed in a base oil such as sesame oil, coconut oil, or castor oil. Tailas are beneficial for nourishing the body, reducing pain and inflammation, improving circulation, strengthening muscles and joints, calming the nervous system, and balancing Vata dosha. Different Tailas are selected based on the disorder, body constitution, and therapeutic goal. Eg: Bala Taila is prepared using Bala (Sida cordifolia) processed in sesame oil



Fig 9:Taila(Medicated Oil)

Ghrita (Medicated Ghee)

Ghrita is a classical Ayurvedic dosage form prepared using purified ghee as the base. It is one of the most important formulations in Ayurveda due to its unique ability to carry the medicinal properties of herbs deep into the tissues. Eg; Triphala Ghrita is a medicated ghee prepared using the herbs of Triphala—Haritaki, Bibhitaki, and Amalaki[27].



Fig 10:Ghrita (medicated Ghee)

Bhasma (Calcinated Metals or Minerals)

Bhasma is a unique Ayurvedic dosage form prepared through the incineration and purification of metals, minerals, or animal products. Eg; Prepared from purified gold, Swarn Bhasma is used to improve immunity, strength, memory, and overall vitality[28].



Fig 11:Bhasma

Lepa (Herbal Paste for External Application)

Lepa is a traditional Ayurvedic external dosage form in which herbal powders, pastes, or fresh plant materials are mixed with liquids such as water, ghee, oil, or herbal decoctions to create a thick paste. Eg;(Neem–Turmeric Lepa) Prepared using neem leaves and turmeric powder mixed with water or rose water[29].

**Fig12:Lepa (Herbal Paste)****Rasakriya / Ghana (Solid Extracts)**

Rasakriya, also known as Ghana, is a concentrated semi-solid or solid Ayurvedic dosage form prepared by boiling herbal decoctions (Kashaya) to a thick, dense extract. This process removes excess water and preserves the potent active constituents of the herbs in a compact form. Eg;(Rasakriya / Ghana) Amalaki Ghana – prepared by concentrating the decoction of Amla (Indian Gooseberry)[29].

**Fig 13:Rasakriya /Ghana(Solid Extracts)**

7. Dosage Forms in Ancient Egyptian Medicine. Ancient Egyptian medical papyri, such as the Ebers Papyrus (c. 1550 BCE), document over 700 medicinal recipes. Dosage forms included:

- **Decoctions and Infusions:** Herbal materials were boiled or steeped in water, wine, or milk.
- **Pills and Lozenges:** Powders were mixed with honey or fat to form ingestible tablets.
- **Ointments and Liniments:** Animal fats and vegetable oils served as bases for topical application.
- **Suppositories and Enemas:** Used for gastrointestinal ailments, showing an advanced understanding of rectal absorption.

The Egyptians also utilized **honey** as both a sweetener and antimicrobial preservative, highlighting their practical approach to formulation stability[29]

Greek and Roman Contributions

Greek medicine, particularly through **Hippocrates (460–370 BCE)** and **Dioscorides (1st century CE)**, refined dosage preparation methods. The Greeks introduced:

- **Electuaries:** Semi-solid mixtures of powdered drugs and honey.
- **Troches (Lozenges):** Medicinal pastilles for oral dissolution.
- **Cataplasms (Poultices):** Herbal preparations applied externally for inflammation.

The **Romans**, influenced by Greek practices, expanded pharmacological texts and standardized drug compounding through **Galen (129–216 CE)**. Galen's methods emphasized the balance of the “four humors” and introduced the concept of “**Galenic formulations**”, which became foundational to pharmacy. His *De Compositio Medicamentorum* detailed recipes for ointments, syrups, and emulsions—many of which are precursors to modern dosage forms.

Ancient Indian (Ayurvedic) Dosage Forms

Ayurvedic medicine, described in classical texts such as the *Charaka Samhita* and *Sushruta Samhita* (circa 1000 BCE–500 CE), features a highly structured pharmaceutics known as *Bhaisajya Kalpana*. Major dosage forms include:

- **Swarasa (Juice Extracts)**
- **Kalka (Herbal Pastes)**

- **Kwatha (Decoctions)**
- **Churna (Powders)**
- **Asava and Arishta (Fermented Preparations)**
- **Vati or Gutika (Pills/Tablets)**
- **Taila and Ghrita (Medicated Oils and Ghee)**

Ayurvedic formulators also recognized **adjutants (Anupana)** such as honey, milk, and ghee to enhance bioavailability—an early understanding of pharmacokinetic modification.



Fig 14:Ancient Indian(Ayurvedic)

Traditional Chinese Medicine (TCM) Dosage Forms

In China, the Shennong Bencao Jing (ca. 200 CE) recorded diverse forms of herbal dosage. Key types included:

- **Tang (Decoctions):** The most common, prepared by boiling herbs in water.
- **San (Powders):** Ground herbs taken directly or dissolved in liquids.
- **Wan (Pills):** Formed with honey or starch binders.
- **Gao (Pastes) and Jiu (Medicinal Wines):** Used for external or tonic purposes.

The use of **wine, vinegar, and honey** as solvents and stabilizers demonstrated early understanding of solubility and preservation principles[29]



Fig 15:Traditional Chinese Medicine

Other Ancient Traditions

- **Mesopotamian Medicine:** Cuneiform tablets from 2000 BCE mention ointments, salves, and decoctions.
- **Persian and Islamic Medicine:** The works of **Avicenna (Ibn Sina)** in The Canon of Medicine (1025 CE) integrated Greek and Arabic knowledge, categorizing dosage forms like syrups (sharbat), juleps, and distillates—introducing techniques like **steam distillation**.

Conclusion

Ancient medicine dosage forms represent the convergence of art, observation, and early scientific reasoning. These formulations not only addressed therapeutic needs but also laid the foundation for the modern discipline of pharmaceutics. Understanding these ancient practices deepens appreciation for the continuity and innovation inherent in human approaches to healing.

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