

# UNIT-10

## Introduction to herbal formulations

### Points to be covered in this topic

- INTRODUCTION
- HERBAL FORMULATIONS CAN BE CLASSIFIED INTO VARIOUS TYPES BASED ON THEIR DOSAGE FORM
  - ❖ Modern herbal dosage form
  - ❖ Novel dosage form
- CHALLENGES IN HERBAL FORMULATION

## 10.1 INTRODUCTION

Herbal formulations are dosage forms that contain one or more herbs in precise amounts to offer particular nutritional, therapeutic, and/or other benefits intended to be used in the diagnosis, treatment, mitigation of human or animal diseases, and/or modification of the physiology or structure of humans or animals.



## 10.2 HERBAL FORMULATIONS CAN BE CLASSIFIED INTO VARIOUS TYPES BASED ON THEIR DOSAGE FORM

- 1. Traditional dosage form:** These are derived from various traditional systems of medicine like Ayurveda, Siddha, Unani and Homeopathy.  
e.g.- Tincture, powder, pills, extract, etc.
- 1. Modern herbal dosage form:** This formulation developed from modern technological process. Convenient and effective absorption characteristics are provided by modern herbal formulations.  
e.g.- Tablet, Syrup, Solution, Capsule, Eye drops, Powder, etc.
- 1. Novel dosage form:** A variety of novel herbal formulations have been reported using bioactive and plant extracts. The novel formulations are reported to have remarkable advantages over conventional formulations of plant actives and extracts, which include enhancement of solubility, bioavailability, protection from toxicity, enhancement of pharmacological activity, and enhancement of stability.  
e.g.- Polymeric nanoparticles, Nanocapsules, Liposomes, Phytosomes, Nanoemulsions, Microspheres, Transferosomes, and Ethosomes.

### 1. MODERN HERBAL DOSAGE FORM

#### 10.2.1 Syrup

A saturated solution of sucrose formed in purified water with the concentration of 66% w/w sugar is known as simple syrup. These preparations are viscous and sweet in taste.



Herbal syrup

## Types of syrup:

1. Simple Syrup
2. Medicated Syrups
3. Flavoured Syrups

### Formulation

- Herbal syrup is a formulation made by combining a concentrated decoction of herbs with honey or sugar, as well as alcohol such as infusions, decoctions, expressed juices, fermented liquors, or simple water solutions.
- Ayurvedic herbal cough syrup comprises the goodness of herbs such as tulsi, liquorice, ginger, and Vasaka, which have been reported to provide effective relief for coughs without causing adverse effects.

### Advantage

- Bacterial growth, fungal growth, and the growth of moulds are the main reasons for decomposition, which is prevented by syrups due to their high osmotic pressure.
- There is an advantage to incorporating syrups into nauseous preparations, as the sweetness of the sugar makes the preparation palatable.

## 10.2.2 Mixtures

Mixtures are liquid dosage forms meant for oral administration. In these preparations, any **solid or liquid medicament is dispensed in a suitable vehicle** either by dissolving or suspending the medicament in it. Liquids contain more than one dose, and are therefore dispensed in large bottles.

Depending on the composition and uniformity mixture classified as:

- **Homogeneous Mixtures:** These mixtures consist of uniformly spread particles.
- **Heterogeneous Mixtures:** These mixtures do not have uniformity and consistency in their composition.

### Advantage

- Easy to administer.
- More bioavailability compared to solid dosage form.
- Suitable for insoluble drug.
- Suitable for immiscible drug.

## Disadvantage

- More Incompatibilities.
- Tedious storage and transport.
- Less stable.

### 10.2.3 Tablet

Tablets are the **solid dosage form of powdered herbs**, herbal extracts or their constituents prepared by Molding or compression. Pharmaceutical tablets are defined by the Indian Pharmacopoeia as solid, flat, or biconvex discs that are made by compressing medications or a combination of pharmaceuticals, with or without diluents.



Herbal tablet

Tablets are used for the dispensing of 70% of all medications.

#### Ideal properties of a tablet

- It should be attractive having its own identity and free from defects such as cracks, chips, contamination, discoloration etc.
- It should have chemical and physical stability to maintain its physical integrity.
- It should prevent any alteration in chemical and physical properties of medicinal agents.

#### Advantage

- It is unit dosage forms that provide stable and accurate dose.
- Easy to use, handle, and carry by the patient.
- Their manufacturing cost is low as compared to other dosage forms.

#### Disadvantage

- Drugs that are amorphous in nature or have a low-density character are difficult to compress into a tablet.
- Not suitable for hygroscopic drugs.
- Drugs having a bitter taste and objectionable odour require special treatment like coating which may increase their production cost.
- Children and critically ill patients face difficulty in swallowing tablets.

### 10.2.4 Infusions

It is a dilute aqueous preparation prepared from herbal material known as an infusion. These are made by using cold or hot water for herbal extraction and are dilute solutions that should be stored in a cold and dry place. Its shelf life is up to 24 hours.

e.g.- Tea, coffee, lemon infusions



Infusions

### 10.2.5 Tincture

It is an **alcoholic or hydroalcoholic extract** of herbal materials made by using 1 part herb and 5–10 parts ethanol. Can be stored in a cool, dry, and dark place for 2 years.

e.g. Tincture of iodine, Benzoin tincture, Cannabis tincture.

### 10.2.6 Ointment

These are oily, **semi-solid preparations** with anhydrous immiscible base that are typically applied to the mucosa of the nose, rectum, or skin.

- They usually contain medicament that is dissolved, suspended or emulsified in ointment base.
- The process of making ointment involve heating of oil & aqueous phase separately & then mixing of both phases with constant stirring until the mixture get congealed.

e.g.- Calendula ointment.

### 10.2.7 Herbal creams

Creams are **semisolid dosage forms** containing herbs in a hydrophilic base. Prepared by mixing powdered drugs or plant extracts in cream bases used for their therapeutic properties. It has a relatively short shelf life as compared to ointment.

e.g.- Herbal fairness cream, baby cream.

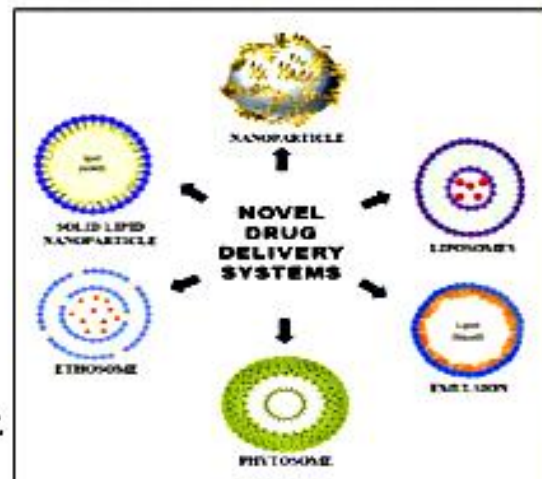


Herbal cream

## 2. NOVEL DOSAGE FORM

Today, significant attention has been concentrated on the development of novel drug delivery systems (NDDS) for herbal drugs.

The needs of maintaining the drug component at a consistent rate during the course of treatment cannot be met by conventional dose forms since they are not target-specific.



### Advantages

1. Improvement of solubility and bioavailability.
2. Increase stability.
3. Improving distribution of drug in tissues.
4. Sustained delivery.
5. Protection from physical degradations.
6. Target specific drug delivery system.

### Disadvantages

1. Unaffordability of medicine.
2. Modernization is necessary for industrial output, yet it is an expensive endeavor.

## 10.3 CHALLENGES IN HERBAL FORMULATION

- A key challenge is to objectively assess conflicting toxicological, epidemiological, and other data and the verification of herbal materials used.
- Management of risk.
- Pharmacological, toxicological and clinical, documentation.
- Pharmacovigilance.
- Understanding of addition of harmful additives works evaluating "drug" interactions.
- Clinical trial limitations.
- Indiscriminate harvesting and poor post-harvest treatment practices.
- Inadequate quality assurance protocols.
- Lack of current good manufacturing practices.
- Lack of R and D on product and process development.
- Challenges related to marketing.
- Inadequate infrastructure for local equipment fabrication.