

UNIT-3

Herbal Cosmetics

Herbal cosmetics is defined as the beauty products, which possess desirable physiological properties such as skin healing, smoothening, enhancement of appearance and conditioning properties with the help of herbal ingredients in them.

- These are prepared using plant products having cosmetic actions.
- In recent times, the use of herbal ingredients in cosmetics have increased mainly due to their non-toxic nature and least or negligible side effects.

Advantages of Herbal Cosmetics

- They do not cause allergic reaction and do not have negative side effects.
- They are easily incorporated with skin and hair,

- With small quantity, they are very effective as compared to synthetic products.

- easily available and found in large variety and quantity.

Disadvantages

- slower effects as compared to allopathic dosage form.
- They are difficult to hide taste and odour.
- Manufacturing process is time consuming and complicated.
- No pharmacopoeia defines their specific procedure

Herbal cosmetics for skin

A) Herbal creams

The key ingredients in the formulation of herbal creams are plant derivatives.

- 1) Cold creams :- Galen formulated the first herbal cold cream using beeswax, water, olive oil and rose petals (as fragrant).

Cold creams are water-in-oil emulsion (w/o) and the bases used in their preparation are:

- a) Almond oil and white beeswax
- b) Borax (as emulsifier) and rose water.

2) Vanishing creams :- These are oil-in-water emulsion (o/w) and are hardly visible when applied to skin. They impart moisturizing as well as emollient effect. For example, Jojoba vanishing cream.

3) Nourishing Creams :- These creams are non-greasy and provide nourishment as well as protection to the skin.

4) Moisturiser Creams :- These creams heal and repair dry skin and maintain the softness of skin. They maintain skin hydration by reducing evaporation. e.g. aloe moisturising cream,

5) Anti-Acne Creams :- These creams are applied on skin surface and mainly act on hair follicles and sebaceous glands.

6) Sunscreen Creams :- These creams are used topically to protect the skin from harmful effects of sunrays. They act either by scattering of sunlight or by absorbing the erythematous rays of sun.

7) Fairness creams :- These creams reduce melanin formation as well as skin pigmentation.

B) Herbal Powders

A range of powders are available in the market such as:

Dusting powder	
Talcum powder	(Talc - 71%)
Body powder	(Talc - 50%)
After-bath powder	
After-shave powder	(Talc - 71%)
Baby powder	(Talc - 63.63%)

A minor difference exists among the formulation of all these powders. These powders are dispensed in plastic or metal cans.

3) Herbal Face-washes

They are used to remove dirt, dust and other debris adhered to the facial skin. These preparations also have antiseptic as well as antimicrobial properties.

4) Herbal Soaps

They are used for cleansing the body.

Hair Care Products

1) Hair Gels

These are used for hair styling as they make hairs manageable, easy to handle, reduce their tendency to fly specially by air, etc.

2) Herbal shampoos :- They are used for cleaning hairs. They keep the hairs dirt-free and silky.

3) Herbal Hair Colours :- They are generally used to cover-up the grey hair. Other uses includes giving hairs different colours as a style statement.

4) Herbal Hair Oils :- Hair oils provide nourishment to the scalp and hair roots, as well as impart a lustrous texture to hair.

Oral Hygiene Products

1) Toothpastes :- They remove stains from the teeth and freshen up breath and mouth. Toothpastes have mild abrasives which help in cleaning teeth properly.

2) Tooth powders :- Tooth powders are mixtures of dental abrasives, flavouring agents and sweetening agents and foaming agents. They are now losing popularity.

3) Mouthwashes :- These are flavoured liquids used for cleaning oral cavity after brushing and flossing. They mainly clean teeth, prevent tooth decay and gum diseases and also freshen up breath.

4) Gargles :- These are medicated aqueous preparations used for treating pharyngitis, laryngitis and any other throat infections. They are spitted out after rinsing the oral cavity, not swallowed.

Sources and Description of Raw Materials of Herbal origin used in Herbal Cosmetics

Fixed oils

oils are derived from vegetable and mineral sources and are used in cosmetics.

→ vegetable oils - almond oil, arachis oil, castor oil, olive oil and coconut oil.

→ Mineral oils - light and heavy paraffin.

1) Almond oil :- It is obtained from the seeds of Prunus amygdalus. It is pale

yellow in colour. Due to its emollient action, it is used in the preparation of creams and lotions.

2) Castor oil :- It is obtained from the seeds of Ricinus communis. It is either yellow

in colour or colourless and has a slight odour. Due to its emollient action, it is used in the preparation of lipsticks, hair oils, creams and lotions.

3) Arachis oil :- It is obtained from the seeds of Arachis hypogea. It is pale yellow in colour. It is used in preparation of hair oils.

4) Olive oil :- It is obtained from the fruits of Olea europaea. It is either pale yellow or greenish yellow in colour. Due to its emollient action and soothing properties, it is used in the preparation of creams, lotions and bath oils.

5) Coconut oil :- It is obtained from dried kernel part of endosperm of coconut, i.e., Cocos nucifera

6) Light liquid Paraffin :- It consists of a mixture of hydrocarbons and appears as a colourless and odourless oily liquid. Its viscosity and weight per ml (0.83-0.87 gm) are low. Due to its better spreadability, it is used in the preparation of bath and hair oils, creams.

7) Heavy liquid paraffin :- It is obtained from petroleum. It is a mixture of hydrocarbons and appears as a colourless and odourless oily liquid. Due to its soothing effect on the skin, it is used in the preparation of creams, lotions, hair oils and bath oils.

Waxes

They are used as a base in cosmetics, along with oils and fats.

- 1) Beeswax :- It is purified wax separated from the honeycomb of bees, Apis mellifera. It is composed of 70% myricyl palmitate ester. It is a yellowish brown coloured solid with honey-like odour. Beeswax helps in water incorporation to form an emulsion.
- 2) Carnauba wax :- It is obtained from the leaves of the Brazilian wax palm, Copernicia carifera. It occurs as moderately coarse powder or flakes. Carnauba wax is hard and is used in the manufacture of candles, wax varnishes and leather and furniture polishes.
- 3) Paraffin wax :- It is obtained by the distillation of petroleum. It is colourless, odourless or a whiti, translucent, wax-like solid and slightly greasy to touch.

Colours

Colour is an important ingredient of cosmetic formulations.

- 1) Cochineal :- It is a red dyestuff obtained from the dried female insect, Dactylopius coccus. The main colouring agent in cochineal is carminic acid.
- 2) Saffron :- It is the stigmas and tops of the styles of the plant, Crocus sativus. Saffron powder is yellowish and easily soluble in water. Thus, it is used as flavouring and colouring agent in food preparations.
- 3) Chlorophyll :- It is natural green pigment abundantly found in nature.

Perfumes

Some commonly used perfuming agents are:

- 1) Rose :- It is obtained by steam distillation of the flower petals of Rosmarinus officinalis.
- 2) Jasmine essential oil :- It is obtained from the flowers of Jasminum grandiflorum.

- 3) Lavender oil :- It is obtained from the flowers and stalk of Lavandula officinalis.
- 4) Tuberose oil :- It is obtained from Epiradium acuminatum. Its oil is a brown, viscous liquid with a sweet, heavy and sensuous scent.
- 5) Champa oil :- obtained from Michelia champaca.
- 6) Cinnamon oil :- It is obtained from roots, barks and leaves of Cinnamon zeylanicum.

Bleaching Agents

- 1) Mercury compounds :- Mercuric chloride, red mercuric oxide and ammoniated mercury are the mercury compounds possessing skin bleaching properties. However, currently, the use of mercury compounds is prohibited.
- 2) Hydroquinones :- They are used as bleaching agents at 1.5-2% concentration for temporarily lightening the skin.
- 3) Ascorbic acid and its derivatives :- Ascorbic acid is mostly used in skin bleaching creams containing hydroquinones as a stabiliser.

Antioxidants

- 1) Tamarind :- Tamarindus indica is widely grown in tropical regions. Due to its antioxidant activity, tamarind is added in anti-wrinkle cosmetics.
- 2) Vitamin-C :- Carrots, peaches, sweet potatoes, oranges, etc. are sources of vitamin C.
- 3) Pomegranate :- The extracts of pomegranate plant, Punica granatum, exhibit antioxidant and antiviral properties and enhance the effectiveness of topical sunscreens.
- 4) Liquorice :- Glycyrrhiza glabra extract is used to treat skin irritation, dermatitis, eczema, pruritus.
- 5) Ferulic acid :- It is a potent antioxidant that provides photoprotection to skin. It is added to sunscreens, lotions, etc.

Herbal Excipients

Excipients are inert substances added to a pharmaceutical formulation alongside the Active Pharmaceutical Ingredient (API) to aid in the manufacturing process, improve drug delivery, stability or enhance the overall characteristics of the formulation.

Herbal excipients are natural substances derived from plants that are used in pharmaceutical formulations for various purposes.

Examples of natural excipients of plant origin are starch, agar, alginates, guar gum, xanthan gum, gelatin, pectin, acacia, tragacanth and cellulose.

These are used for various purposes in pharmaceutical formulations.

Advantages of Herbal excipients

- Biodegradable
- Biocompatible and non-toxic
- Economic

- Safe and no side effects
- Easy availability.

Disadvantages

- Microbial contamination
- Slow process of production

Significance of substances of natural origin as excipients

The significance of following excipients is discussed:

- | | | |
|---------------|----------------------|------------------|
| 1) Colourants | 2) Sweeteners | 3) Binders |
| 4) Diluents | 5) Viscosity binders | 6) Disintegrants |
| 7) Flavours | 8) Perfumes | |

Colourants

Colourants play a significant role in pharmaceutical formulations.

- They give a good appearance to the product.
- They also help in product identification and brand differentiation.

When derived from herbal sources, colourants offer the added benefit of being natural.

Examples - Chlorophyll, Curcumin (Turmeric), carotenoids, Annatto, Saffron, etc.

Significance

- 1) Herbal excipients offer a natural alternative to synthetic dyes and pigments.
- 2) They may possess medicinal properties of plants.
- 3) Consumer preference is high due to an automatic inclination towards natural and organic products.
- 4) They contribute to visual appearance of pharmaceutical products.
- 5) They help in product identification and differentiation which aids in patient compliance.
- 6) Plant-derived colourants is a sustainable option, supporting environment-friendly practices in pharmaceutical manufacturing.

Sweeteners

Herbal sweeteners are substances used to give sweetness to pharmaceutical formulations, particularly oral liquid medications, chewable tablets and lozenges. Due to adverse effects of synthetic sweeteners, the natural sweetening agents are preferred.

Natural sweetening agents are non-saccharides.

Examples

Stervia :- extracted from the leaves of Stervia rebaudiana plant, Stervia is 200-300 times sweeter than sucrose.

Honey:- A natural sweetener produced by bees from flower nectar. It is commonly used in pharmaceutical formulations for its sweetening properties and potential medicinal benefits.

Significance

- 1) Natural alternative to synthetic sweeteners.
- 2) They are low-calorie or calorie-free, making them suitable for use in formulations intended for individuals with dietary restrictions.

- 3) They have minimal effects on blood sugar levels, making them suitable for diabetic-friendly formulations.
- 4) Herbal sweeteners may contain bioactive compounds with potential health benefits, such as antioxidant properties in honey.
- 5) Sweeteners improve palatability and patient compliance and acceptance of medication.

Binders

Binders are agents used to impart cohesiveness to the granules so that the tablets remain intact after compression.

→ They are added to tablet formulation to impart plasticity and increase inter-particulate bonding strength within the tablets.

Examples

Acacia :- It is obtained from the stems and branches of *Acacia senegal* and *Acacia rabinia*.

Gelatin :- It is obtained by partial hydrolysis of collagen, derived from the skin, white connective tissue, tendons, ligaments and bones of ox, sheep, etc.

Significance of binders

- 1) Binders ensure that tablets remain intact and do not break apart during handling, packaging, etc
- 2) Binders help in evenly distributing the API and other excipients throughout the tablet.
- 3) They help in disintegration of tablets upon ingestion
- 4) Binders enhance bioavailability.
- 5) Dosage form stability

Diluents

Diluents, also known as fillers, are inert substances added to formulations to increase the bulk of the dosage form. Their main purpose is to increase the weight and volume of the tablet formulation.

Examples

Lactose :- derived from milk of most mammals and used as a filler in tablets and capsules.

Mannitol:- It is a sugar alcohol found naturally in fruits and vegetables. It is often used as a diluent in tablets and capsules.

starch:- obtained from corn, potato or rice, starch is commonly used as a herbal diluent in tablets and capsules.

significance of diluents

- 1) Diluents increase volume and bulk of dosage form ensuring uniformity in size and weight of tablets or capsules.
- 2) Herbal diluents enhance flow properties of powders, facilitating uniform mixing and distribution of active ingredients and excipients.
- 3) Readily available and cost-effective.
- 4) Help in disintegration of tablets and capsules upon ingestion.
- 5) They are generally biocompatible and well-tolerated by patients, reducing the risk of adverse reactions.

Viscosity Binders

viscosity binders are a category of excipients used in formulations to adjust the viscosity of the formulation.

→ They are particularly important in the manufacturing of semi-solid dosage forms such as gels, creams and ointments.

Examples

Xanthan gum:- derived from the fermentation of carbohydrates by the bacterium

Xanthomonas campestris.

It enhances the viscosity of semi-solid formulations improving spreadability and consistency.

Carrageenan:- It is a sulphated polysaccharide and is obtained from the red algae *Chondrus crispus*.

→ It is used in the preparation of toothpastes, creams, lotions and other cosmetic products.

→ In food industry, it is used in milk products, ice creams and gels.

Disintegrants

Disintegrants are the agents added to tablets, capsules and some other formulations, aiding in their breakdown into smaller particles when they come into contact with moisture or bodily fluids. Thus, disintegrants increase the available surface area and promote rapid release of drug particles.

Ideal properties of a disintegrant

- It should strongly interact with water to exert its disintegrating action.
- Super disintegrants give significant improvements over starch.

Examples

1. Plant-based gums (e.g. guar gum, locust bean gum)
2. starch derivatives (e.g. corn starch, potato starch)
3. cellulose derivatives (e.g. microcrystalline cellulose, sodium carboxymethyl cellulose)
4. Alginate derivatives (e.g. sodium alginate)

significance

- Disintegrants facilitate the rapid disintegration of herbal formulations.
- They help in achieving uniform dispersion of herbal ingredients within the dosage form.
- They aid in stabilization of herbal extracts, preventing clumping of active ingredients during formulation and storage.
- They are compatible with a wide range of herbal ingredients, making them versatile excipients.
- Most disintegrants are cost effective and readily available.

Flavors

Flavouring agents are added to enhance the palatability of pharmaceutical preparations by increasing taste. Some of the commonly used natural flavours are fruit, nut seafood, spice blends, vegetables and wine.

Example

Peppermint :- known for cooling sensation and digestive benefits, often used to mask bitterness.

Ginger :- commonly used in supplements and other pharmaceuticals.

Lemon :- offers a citrusy aroma and mild flavor, used to improve taste.

Chamomile :- known for its calming activities.

Cinnamon :- provides a warm, sweet flavor, often used to mask the bitter taste of drugs.

lavender :- Adds a floral aroma and subtle flavor, employed to enhance sensory appeal in various products.

significance

- Flavours mask unpleasant tastes of dosage forms and encourage patient compliance.
- Pleasant Flavours can help alleviate the discomfort of experiencing nausea while taking medications.

- Some flavouring agents possess medicinal properties and also help in digestion.
- For health-conscious people, natural flavours are preferable.

Perfumes

Perfumes are used to enhance the odour of the formulation.

Example

lavender :- it is extracted from the flower spikes of certain species of lavender by distillation

Sandalwood :- With its woody and earthy aroma, its perfume is often used for its grounding and meditative effects.

significance

- Add pleasant fragrances and improve sensory feel.
- Certain fragrances have therapeutic properties.
- Perfumes contain natural preservative, thus, enhance shelf life of herbal products.
- Perfumes can evoke positive emotions and contribute to mental well-being through aromatherapy

Herbal Formulations

Herbal formulations and dosage forms that consist of one or more herbs in specified quantities to provide specific nutritional or medicinal benefits.

Herbal formulations such as syrups, mixtures and tablets are discussed below:

Syrups

Syrups are essentially liquid preparations consisting of a concentrated solution of sugar (usually sucrose) in water, in which herbal extracts are added for therapeutic effects.

→ Syrups serve as convenient vehicles for administering herbal remedies, especially for those who may have difficulty swallowing pills or capsules.

→ It is advantageous to incorporate syrups in nauseous preparations as the sweetness of sugar makes the preparation palatable.

Components of a herbal syrup

- Sugar or sucrose
- Purified water
- Medicinal herb
- Preservatives
- Colouring agent and flavouring agent

Classification

Syrups can be classified into the following three classes:

1) Simple syrups :- A saturated solution of sucrose formed in purified water with the concentration of 66.7% w/w sugar is known as simple syrup. e.g. ginger syrup. The formulae for syrup I.P. is given below;

Sucrose - 667 gm

Purified water - 1000 gm

2) Medicated syrups :- These syrups contain therapeutic agents.

Example - ephedrine sulphate syrup

3) Flavoured syrups :- These syrups are usually added to the preparation for providing a flavour or as a preservative. These syrups do not have any pharmacological activity. Examples - cherry syrups, Tolu balsam syrup, etc.

Preparation of Syrup (Hot process)

- 1) Sucrose is added to purified water.
- 2) It is heated with occasional stirring until the sucrose is dissolved fully.
- 3) The solution is then cooled and sufficient purified water is added to make up the desired weight.

Mixtures

Mixtures are liquid dosage forms meant for oral administration. In these preparations, medication is either dissolved or suspended. These mixtures normally contain more than one dose and are therefore dispensed in large bottles. But, when

the mixture dispensed in a bottle contains only single dose, it is known as a draught. Mixtures are meant for the treatment of acute conditions, like constipation, cough, indigestion, diarrhoea, etc.

Classification

Depending upon composition and uniformity, mixtures are classified as:

- 1) Homogenous Mixtures :- These mixtures consist of uniformly spread medicament particles.

2) Heterogenous Mixtures :- These mixtures do not have uniformity and consistency in their composition. The two phases of these mixtures can be separated from each other mechanically.

Examples

- 1- Suspensions
- 2- Colloidal dispersions

Formulation of mixtures (herbal)

- 1) Vehicles (Generally water or medicated vehicle.)
- 2) Chemical stabilisers
- 3) Colouring agents
- 4) Flavouring agents
- 5) Preservatives

Preparation Method

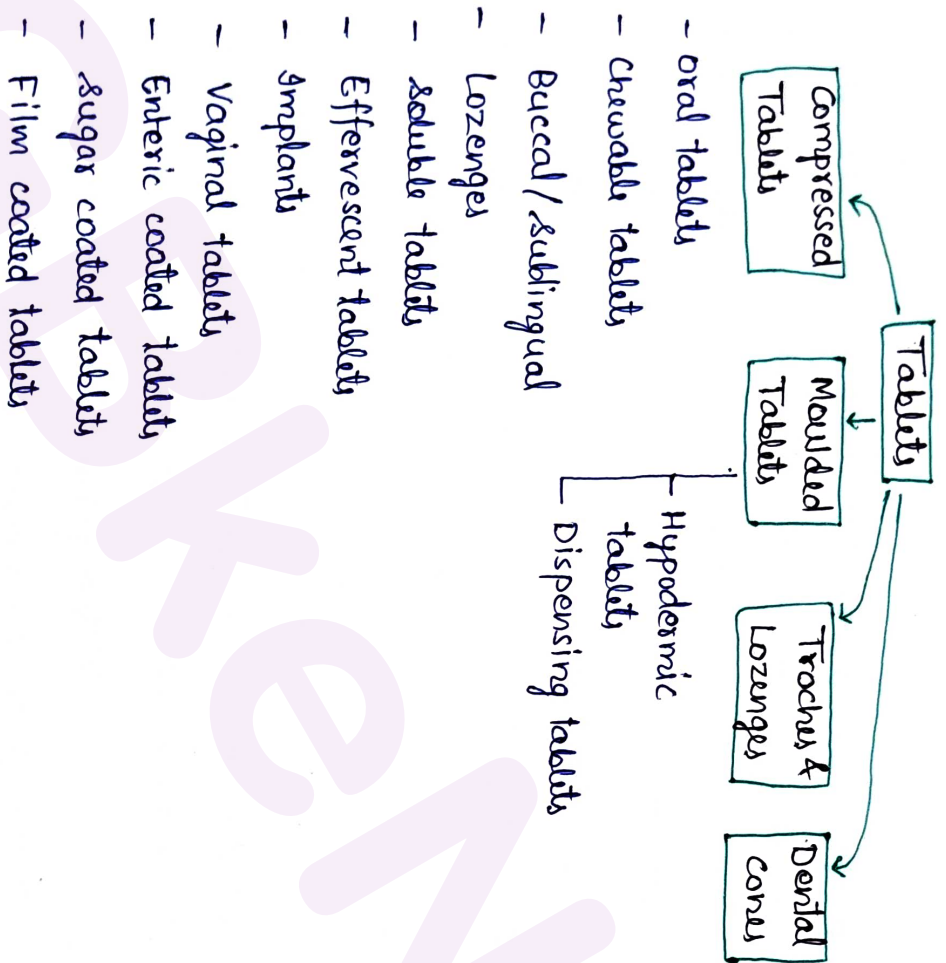
- 1) The solid material is dissolved in $\frac{3}{4}$ th of the vehicle.
- 2) The solution is observed against light to detect the presence of any foreign particle.
- 3) The other liquid ingredients are added to the above mixture.
- 4) The final volume is made up by adding more of the liquid to the formed mixture.
- 5) The mixture is transferred into a bottle and stoppered.
- 6) The label is attached to the bottle, wrapped and then dispensed.

Tablets

Herbal tablets are a popular form of herbal medicine. These tablets are typically made by compressing powdered herbs into a tablet form using binding agents. They are widely used for various health purposes, ranging from improving digestion to boosting immunity.

Ideal properties of a tablet

- 1) It should be free from defects such as cracks, chips, contamination, discolouration, etc.
- 2) It should have physical and chemical stability.
- 3) It should prevent any alteration in chemical and physical properties of medicinal agents.
- 4) It should withstand the rigors of mechanical shocks encountered during its production, packaging, shipping and dispensing.
- 5) It should release the medicament in the body in a predictable and reproducible manner.

ClassificationPreparation

- 1) Dispensing:- All the ingredients to be used for manufacturing tablets are accurately weighed and dispensed according to their dose.

2) Sizing:- The ingredients are finely divided by size reduction process for better flowability and ease of mixing.

3) Powder blending:- The powdered drug substance and other ingredients are mixed.

4) Granulation:- Small powder particles are gathered and converted into permanent aggregates so that they can flow freely.

5) Drying and dry screening:- The wet granules are dried in a tray dryer or fluid bed dryer for a specific time period at 55°C temperature to obtain dried granules, which are screened through a suitable mesh screen.

6) Tablet compression:- The dried granules are compressed into flat, convex, round, oblong or unique shaped tablets.

7) Coating:- The compressed tablets are coated to mask the unpleasant taste/odour of some drugs, to enhance the appearance of uncoated tablets, etc.

Novel Dosage Forms

Novel herbal dosage forms are innovative ways of delivering herbal remedies to consumers. This is due to advancements in technology and formulation techniques. These forms aim to enhance the efficacy, convenience and user experience of herbal products.

→ In novel drug delivery technology, drug distribution can be controlled by incorporating the drug in carrier system or by changing the drug structure at molecular level.

→ Novel drug delivery system is a novel approach of delivering drug that addresses the limitations of the traditional drug delivery systems.

→ In novel drug delivery technology is applied in herbal medicine, it increases the efficacy and reduces the side effects of various herbs and herbal compounds. This is the basic idea of behind incorporating novel method of drug delivery in herbal medicines.

Advantages of Novel Drug Delivery systems

- They enhance drug solubility.
- They improve drug bioavailability.
- They provide protection against toxicity.
- They enhance the pharmacological activity of drugs.
- They enhance drug stability.
- They provide sustained drug delivery.
- They provide protection from physical and chemical degradation.

Phytosomes

Phytosome is a novel drug delivery technology that was introduced in 1989.

Phytosomes are like tiny delivery vehicles for plant extracts. They wrap around the plant compounds with a special coating made of phospholipids, which are natural fats found in our bodies. This coating helps the plant compounds get absorbed better in our bodies. Its like giving plant extracts a boost, making them work effectively.

Advantages of phytosomes

- 1) They increase bioavailability due to phospholipid complex, thus improves therapeutic effect.
- 2) They are required in fewer doses due to high bioavailability.
- 3) They improve gastrointestinal absorption.
- 4) Due to their high lipophilicity, they cause high penetrability, hence used in cosmetics.
- 5) They have better clinical benefits.

Method of Preparation

- 1) Extraction:- The active compounds from the plant material are extracted using suitable solvents like ethanol or water.
- 2) Isolation of Phospholipids:- Phospholipids are isolated from natural sources like soybeans and lecithin.
- 3) Complexation:- The extracted plant compounds are mixed with the isolated phospholipids under controlled conditions such as temperature and pH.

This allows the plant compounds to bind to bind to the phospholipids, forming the phytosome complexes.

- 4) Filtration and drying:- The phytosome complexes are then filtered to remove any impurities and dried to obtain the final product.
- 5) Formulation:- The dried phytosome complexes can be formulated into various dosage forms such as capsules, tablets or liquid suspensions, depending on the intended application.



★ drug
● phospholipid

Phytosome