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HERBAL DRUG TECHNOLOGY

UNIT 3

TOPIC :

- **Herbal excipients :**

Herbal Excipients– Significance of substances of natural origin as excipients– colorants, sweeteners, binders, diluents, viscosity builders, disintegrants, flavors & perfumes.



Herbal Excipients

- Excipients are inactive substances mixed with active drugs to prepare pharmaceutical dosage forms.
- They do not possess therapeutic activity but play an important role in manufacturing, stability, bioavailability, patient acceptability, and appearance of formulations.
- Herbal excipients are natural excipients obtained mainly from plants and other natural sources. They are preferred because of their safety, biocompatibility, biodegradability, and eco-friendly nature.

Significance of Herbal Excipients

Herbal excipients are widely used because:

1. Non-toxic and biodegradable
2. Biocompatible and safe
3. Easily available and economical
4. Improve patient compliance
5. Reduce side effects
6. Eco-friendly in nature
7. Suitable for herbal, ayurvedic, and modern formulations
8. Better patient acceptability
9. Renewable natural sources

Advantages of Herbal Excipients

- Natural origin
- Less toxic
- Easily biodegradable
- Low cost
- Better compatibility with herbal drugs
- Wide availability
- Renewable sources

Disadvantages of Herbal Excipients

- Risk of microbial contamination
- Variation in quality due to environmental factors
- Shorter shelf life
- Difficult standardization
- Possibility of allergic reactions in some individuals

Classification of Herbal Excipients

According to pharmaceutical uses, herbal excipients are classified as:

1. Herbal colorants
2. Herbal sweeteners
3. Herbal binders
4. Herbal diluents
5. Herbal viscosity builders
6. Herbal disintegrants
7. Herbal flavours and perfumes

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Herbal Colorants (Colouring Agents)

- Herbal colorants are natural colouring agents obtained from plants, minerals, fungi, lichens, or animal sources and are used to improve the appearance, elegance, and identification of pharmaceutical and cosmetic products.
- These colorants contain natural pigments and are considered safer than synthetic dyes.

Sources

Herbal colorants are obtained from different natural sources such as:

- Roots
- Bark
- Leaves
- Flowers
- Fruits
- Seeds
- Fungi and lichens

Ideal Properties

1. Non-toxic
2. Non-carcinogenic
3. Stable during storage
4. Free from harmful impurities
5. Water soluble or easily dispersible

Uses

1. Improve product appearance
2. Help in product identification
3. Increase patient acceptability
4. Used in pharmaceutical preparations
5. Used in herbal cosmetics

Examples

Plant	Biological Source	Pigment	Uses
Turmeric	Rhizomes of <i>Curcuma longa</i>	Curcumin	Tablets, creams
Saffron	Stigma of <i>Crocus sativus</i>	Crocin	Cosmetics, syrups
Beetroot	Roots of <i>Beta vulgaris</i>	Betanin	Lip products, foods
Henna	Leaves of <i>Lawsonia inermis</i>	Lawson	Hair dyes

Herbal Sweeteners

- Herbal sweeteners are natural substances obtained from plants or natural sources and used to impart sweetness to pharmaceutical and cosmetic preparations.
- They are mainly used to improve taste and patient acceptability of formulations such as syrups, chewable tablets, lozenges, and oral preparations.

Sources

Herbal sweeteners are obtained from:

- Leaves
- Roots
- Fruits
- Plant extracts
- Natural bee products

Ideal Properties

1. Non-toxic
2. Pleasant sweet taste
3. Stable during storage
4. Water soluble
5. Non-cariogenic
6. Compatible with formulation ingredients
7. Safe for diabetic patients
8. Economical and easily available

Uses

- Impart sweetness
- Mask bitter taste of drugs
- Improve palatability
- Increase patient compliance
- Enhance acceptability of oral formulations

Examples

Sweetener	Source	Uses
Stevia	Leaves	Syrups, tablets
Honey	Honey bee product	Cough syrups
Liquorice	Roots	Lozenges

Herbal Binders

- Herbal binders are natural substances obtained mainly from plants and used in pharmaceutical formulations to hold powder particles together during granulation and tablet compression.
- They provide cohesiveness to powders and help in the formation of strong tablets and granules.

Sources

Herbal binders are obtained from:

- Plant gums
- Mucilages
- Seeds
- Roots
- Stem exudates

Ideal Properties

1. Non-toxic
2. Biocompatible
3. Good adhesive property
4. Stable during storage
5. Easily available and economical
6. Compatible with active ingredients
7. Should not affect drug release

Uses

- Bind powder particles together
- Improve tablet hardness
- Prevent tablet breakage
- Improve granule formation
- Maintain integrity of dosage forms
- Improve stability of formulations

Examples

Binder	Source	Uses
Acacia	Stem exudate	Tablets
Tragacanth	Plant exudate	Granules
Guar	Seeds	Tablets

Herbal Diluents

- Herbal diluents are natural inactive substances used in pharmaceutical formulations to increase the bulk or volume of dosage forms when the quantity of active drug is very small.
- They are also known as fillers because they fill the required volume in tablets and capsules.

Sources

Herbal diluents are obtained from natural plant sources such as:

- Seeds
- Roots
- Tubers
- Cereals
- Plant fibers

Ideal Properties

1. Non-toxic
2. Chemically inert
3. Biocompatible
4. Easily compressible
5. Stable during storage
6. Compatible with active ingredients
7. Economical and easily available

Uses

- Increase bulk of dosage forms
- Improve compressibility of powders
- Improve uniform distribution of drug
- Facilitate tablet compression
- Improve handling and processing

Examples

Diluent	Source	Uses
Starch	Maize, potato	Tablets, capsules
Cellulose	Plant fibers	Tablets
Lactose substitute from plants	Plant origin	Solid dosage forms

Herbal Viscosity Builders

- Herbal viscosity builders are natural substances obtained mainly from plants and used to increase the thickness or viscosity of pharmaceutical and cosmetic preparations.
- They improve consistency, stability, texture, and spreadability of formulations.

Sources

Herbal viscosity builders are obtained from:

- Plant gums
- Mucilages
- Seeds
- Leaves
- Stem exudates

Ideal Properties

1. Non-toxic
2. Stable during storage
3. Compatible with active ingredients
4. Good thickening property
5. Easily dispersible in water
6. Biodegradable and economical

Uses

1. Increase viscosity and thickness
2. Improve consistency of formulations
3. Stabilize suspensions and emulsions
4. Prevent sedimentation of particles
5. Improve spreadability of creams and gels
6. Enhance appearance and patient acceptability

Examples

Viscosity Builder	Source	Uses
Guar	Seeds	Suspensions
Acacia	Gum exudate	Emulsions
Aloe Vera	Leaf mucilage	Gels

Herbal Disintegrants

- Herbal disintegrants are natural substances obtained mainly from plants and used in tablet formulations to help tablets break apart into smaller particles after administration.
- They promote rapid disintegration and dissolution of tablets, which helps in drug release and absorption.

Sources

Herbal disintegrants are obtained from:

- Seeds
- Roots
- Plant gums
- Mucilages
- Tubers

Ideal Properties

1. Non-toxic
2. Rapid swelling property
3. Good water absorption capacity
4. Compatible with active ingredients
5. Stable during storage
6. Economical and easily available

Uses

- Promote tablet disintegration
- Improve dissolution of drugs
- Enhance drug release
- Improve bioavailability
- Reduce disintegration time of tablets

Examples

Disintegrant	Source	Uses
Starch	Maize, potato	Tablets
Psyllium husk	Plantago ovata	Tablets
Guar gum	Guar seeds	Tablets

Herbal Flavours and Perfumes

Herbal flavours and perfumes are natural aromatic substances obtained mainly from plants and used in pharmaceutical and cosmetic formulations to improve taste and fragrance.

Flavours are mainly used to improve taste, while perfumes are used to provide pleasant smell and mask unpleasant odours.

Sources

They are obtained from:

- Flowers
- Leaves
- Fruits
- Seeds
- Bark
- Roots

Ideal Properties

1. Non-toxic
2. Pleasant aroma and taste
3. Stable during storage
4. Compatible with formulation ingredients
5. Free from harmful impurities
6. Economical and easily available

Uses

- Provide pleasant taste and fragrance
- Mask unpleasant odor and taste
- Improve patient compliance
- Increase acceptability of products
- Produce refreshing and cooling effect

Examples

Flavour/Perfume	Source	Uses
Peppermint	Leaves	Toothpaste, syrups
Clove	Flower buds	Oral products
Rose	Flowers	Perfumes, creams
Sandalwood	Wood	Cosmetics