

## A REVIEW ON – HERBAL EXCIPIENTS EXERCISED IN COSMETICS

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### ABSTRACT

Excipients are of great importance in preparation of pharmaceuticals. They're inert, raw materials that are included in pharmaceutical preparation along with APIs, during development, to maintain stability in vivo as well as in vitro. They affect the quality of the pharmaceutical preparation. These assist in providing favourable pharmacokinetics and pharmacodynamics for the medication. Moreover, excipients are responsible for physical properties such as solubility, consistency, weight and volume, and the rate of release of the medication, making sure that the correct dosage of the drug is delivered through the prescribed dosage form. Recently a number of synthetic excipients are studied in many pharmaceutical compositions including tablets, capsules, and new drug delivery systems. But most of the synthetic excipients are having some side effects for administration. Hence the more interest is towards natural excipients that leads to less side effects and toxicity. Many natural excipients are available such as binders' diluents sweetening agents, colorants, preservatives, film formers, which are found in large quantities in plants, animals and in the minerals. The non-toxic biocompatible biodegradable and affordable properties of the natural excipients have increased the interest of pharmaceutical companies to use the natural excipients in formulations with new drugs as well as in cosmetics and foods.

**KEYWORDS:** Herbal excipients, Natural polymers, Gum acacia, Herbal cosmetics, Pharmaceutical excipients, Natural gums, Cosmetic formulations, Biodegradable excipients, Emulsifying agents, Stabilizers.

**Preface**

Pharmaceutical excipients are functional components of drug formulations that accompany the active pharmaceutical ingredient responsible for the activity of the drug formulation. The active ingredient is responsible for the effect, while the excipient helps in this activity through its ability to help the drug delivery and enhance absorption and compliance of the patients.

This chapter provides an account of the development of excipients through time from their early use in traditional medicine to their modern uses in drug formulations based on natural resources.

Historically the excipients which were previously regarded simply as "inactive" fillers or binders, are now recognized as an important part of the medicine, influencing the delivery and performance of the medicine. This chapter explores the current legal provisions and recent advances made in formulation of excipients. Further focus has been placed on growing demand for natural biodegradable and environmentally compatible excipients to meet the demands of current and future pharmaceutical industry. These illustrations utilized in this chapter represent the significance of excipients in making this pharmaceutical sector diverse. Related to the advancements in the fields of nanotechnology, biocompatible polymers and green chemistry. Some of the heat maps in this chapter clearly illustrate the importance of excipients to the evolution of the pharmaceutical industry.

**Herbal excipients overview****CATEGORY OF HERBAL EXCIPIENTS****Binders:**

They're used for giving cohesiveness to dry materials. Plant mucilage are the herbal binders or polysaccharide natural properties.

**Disintegrants**

These materials are responsible for breaking down a tablet after ingestion into fragments for release of the drug. The qualities that make them non-toxic and biodegradable properties increase people's willingness to use it.

**Examples**

Plantago seed mucilage is utilized in disintegration of tablets due to their moisture retention property. The plant material - Fenugreek seed mucilage has also been reported as a disintegrant.

**Fillers or Diluents**

This is a class of herbal excipients used to provide bulk in cases where there is a need to add more volume to a formulation due to limited active pharmaceutical ingredients.

**Example**

An appropriate herbal filler would be determined by the flow and compressibility properties such as microcrystalline cellulose can be termed as an appropriate example

**Stabilizers**

These help in protecting the formulation against any degradation and provide stability to the formulation.

**Examples**

Gum tragacanth is a plant extract used as a thickening agent for liquid and semisolid preparations stabilizer. As a stabiliser xanthan gum is produced by the fermentation of sugars derived from plant bacteria.

**Emulsifiers**

Herbal emulsifier: for checking the stability and to prevent the separation of oil and water in the emulsion.

They're definitely safer than other emulsifiers, because they're non-toxic and biodegradable. Natural lecithin (capsules) Soyabean, a natural source of lecithin, emulsifier used in oral or topical preparations. Plant based saponins (e.g. Quillaja or Yucca species emulsifying agent)

**Lubricants**

These compounds minimize the friction between the tablet mass and machinery parts during the process of tablet preparation and enable easy removal of tablets from dies and punches.

**Examples**

Castor oil is used for providing lubrication to the tablets.

A plant oil that can function as a good lubricant is rice bran oil.

**Flavouring and Sweetening Agents**

Natural flavouring and sweetening agents are used in oral formulations for better taste acceptance and improved palatability of the medication.

**Examples**

Natural sweetener is taken from various origins but they're: Stevia extract, rebaudian from Stevia rebaudiana; Menthol, Readily obtainable from peppermint oil, which is a flavouring in smoking, chewing and other pharmaceutical preparations.

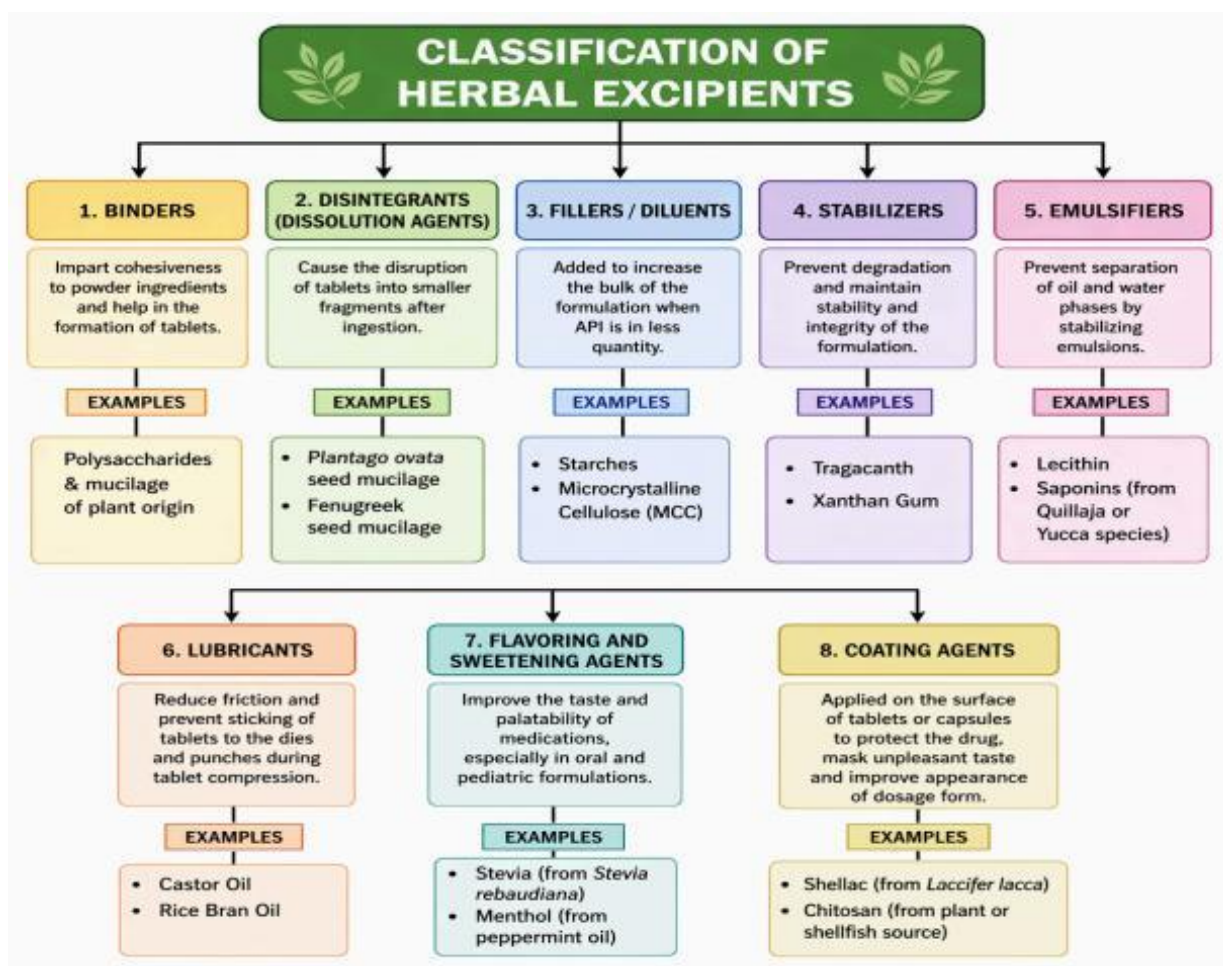
**Coating Agents**

Natural herbal coating agents can be used to coat the tablets and capsules for protecting the drug.

**Examples**

Shellac: The insect Laccifer lacca produces the exudate shellac, which is used as a natural film coating material and it has good film forming material so it can be used as natural coat most pharmaceutical industries use them as a natural film-coating. Chitosan also acts as a natural coating agent as it has film forming properties.

Shellac: The insect Laccifer lacca produces the exudate shellac, which is used as a natural film-coating agent in pharmaceutical formulations. Chitosan: Although it comes from shellfish, some of these chitosan can be derived from plants and, in that form, are applied as a coating agent, owing to their film-forming properties.



## BRACKET GROUNDED ON SOURCE OF EXCIPIENTS

### Natural Sources

### Biotechnological Sources

### Synthetic Sources

### Natural Sources

After the plant, the next popular natural extract used is animal or human derived, a good example being gelatin which is an animal derived material. Continuing in this area of animal derived materials, some other additives include albumin derived using fermentation techniques or cofactors such as selenium, vitamins or minerals. To name a few of the plant-based excipients, some are glucose, dextrose or soybean, corn and potato starchy. Microcrystalline and methylcellulose are classed under this head as they're synthetic cellulose derived. Lastly, acacia gum, pectin and gum acacia are popular natural extracts used.

### Biotechnology Based

Citric acid, water soluble proteins and preservative such as benzoates are some biotechnologically derived excipients

### Chemical Based

Lastly, there are some excipients which are semi-synthetic by chemically modifying naturally occurring substances.

**Examples**

Hyaluronic acid in ophthalmic and dermal formulations and dermal preparations. Albumin in some biopharmaceutical preparations. Chemical Sources: Semi-synthetic excipients: Based on natural ingredients but subjected to chemical alterations.

**Examples**

Ethyl cellulose.

Hydroxypropyl methylcellulose. Carboxymethyl cellulose.

**GUM AS HERBAL EXCIPIENT**

Epoxies are natural, factory- deduced polysaccharides that are extensively exercised as herbalexipients in pharmaceutical phrasings. They're attained substantially as factory exudates( e.g., acacia, tragacanth) or from seeds and marine sources( e.g., guar goo, alginates).

Because of their biodegradability,non-toxicity, and biocompatibility, epoxies have come important druthers to synthetic excipients.

**CLASSIFICATION OF GUMS**

Gums and mucilages occur in large amounts across a wide range of plants, animals, seaweeds, fungi, and other microorganisms. They serve important structural and metabolic roles, with plants being the primary source. These substances can be classified in the following ways:

**1. Based on charge**

- A. Non-ionic seed gums: guar, locust bean, tamarind, xanthan, amylose, arabinans, cellulose, galactomannans.
- B. Anionic gums: arabic,karaya, tragacanth, gellan, agar, algin, carrageenans, pectic acid.

**2. Based on source**

- A. Marine (algal/seaweed) gums: agar, carrageenans, alginic acid, laminarin.
- B. Plant sources:
  - Tree and shrub exudates: gum arabica, gum ghatti, gum karaya, gum tragacanth,khaya, and albizia gums.
  - Seed gums: guar gum, locust bean gum, starch, amylose, cellulose. Extracts: pectin, larch gum.
  - Tubers and roots: potato starch.
- C. Animal sources: chitin, chitosan, chondroitin sulfate,hyaluronic acid.
- D. Microbial sources (bacteria and fungi): xanthan,dextran,curdian, pullulan, zanflo, emulsan, baker's yeast glycan, schizophyllan, lentinan,krestin,scleroglucan.

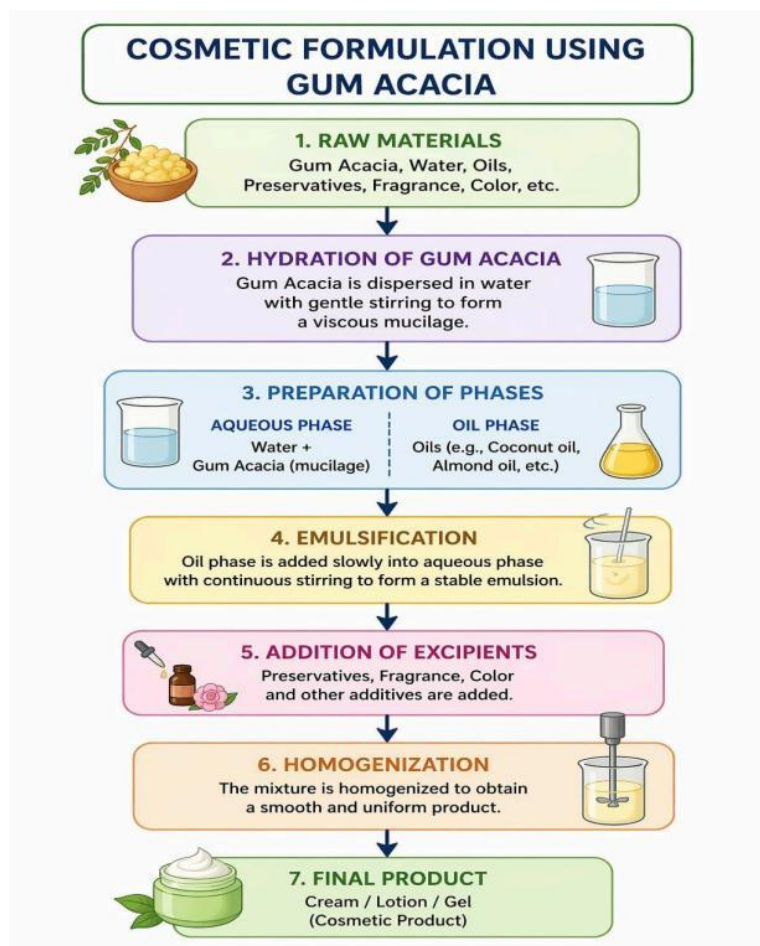
**3. Semi-synthetic gums**

- A. Starch derivatives: hetastarch, starch acetate, starch phosphates.
- B. Cellulose derivatives: carboxymethyl cellulose (CMC), hydroxyethyl cellulose, hydroxypropyl methylcellulose (HPMC),methylcellulose (MC), microcrystalline cellulose (MCC).

#### 4. Based on structure (shape)

- A. Linear: algin, amylose, cellulose, pectins.
- B. Branched: short-chain branched types such as xanthan, xylan, and galactomannan.

#### GUM ACACIA IN HERBAL COSMETICS



#### USE OF GUM ACACIA IN HERBAL COSMETICS

##### Gum acacia

polymers, salts of polysaccharides magnesium calcium potassium salts. Hydrolysed to galactose arabinose glucuronic acid and rhamnose. The gum arabic is an edible plant, based biopolymer.

##### Film Former and Tensor

It is a film-forming agent that creates a film over the skin surface; the film formed by it is non-occlusive and results in a temporary tightening and smoothing of the skin. Therefore, it is used in anti-aging creams and serums.

##### Emulsion Stabilizer and Thickener

The ingredient is applied in lotions and emulsions for improving their consistency and preventing separation.

##### Adhesive

It's used as adhesive in products such as mascara, eyeliner or brow gels.

**Hydration**

This ingredient has moisturizing properties.

A common ingredient in herbal cosmetics, gum acacia is used as an emulsifier, stabilizer and thickener.

**EVALUATION KEY FIELDING****Safety and toxicity**

It has undergone re-assessment by EFSA and a numerical acceptable daily intake cannot be defined, suggesting that it is highly safe. It is neither genotoxic nor toxic but excessive consumption can result in minor gastric problems.

**Chemical Structure**

It is a combination of salts of calcium, magnesium, and potassium of high molecular weight polysaccharides.

**Functional Properties**

It is used as an effective emulsifier and stabilizer. The high water solubility and low viscosity at high concentration makes it suitable for coating applications.

**Pharmaceutical Applications**

It serves well as a binder of tablets due to its compressibility and good flowability.

**Quality Parameters**

Guidelines for purity levels, permitted maximum for heavy metallic content are set by standards. Health Benefits: Rich in dietary fibre. Promotes the growth of beneficial intestinal bacteria.

**TRENDS IN GUM ACACIA MARKET OF COSMETICS****Clean Label & Natural Ingredients**

There is an increasing consumer interest in botanical or naturally derived products and raw materials leading companies to substitute chemical components with natural gums.

**Diverse Functional Application**

It is widely employed for film forming ability in mascara and eyeliner, as well as for thickening and stabilizing in lotions and hair care products respectively.

**Main Functions**

It acts as a natural adhesive, stabilizer of emulsions and skin conditioning agent.

**Organic & Sustainable Products**

The market is dominated by the organic segment which has seen significant growth in demand for high-quality and sustainable gum acacia.

**Geographic Trends**

Growing demand for the ingredient is seen in Asia-Pacific and North America regions for use in natural cosmetics.

**CONCLUSION**

Gum acacia is a good property of Hypromellose for formulation of cosmetic and personal products and also to improve stability and skin compatibility. This product has a great benefit in cosmetic manufacturing because it is natural and no harm.

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