# PharmacoLearn

**MPH204T Cosmetic and Cosmeceuticals, M.Pharm Semester 2**

## Unit 5: Herbal Cosmetics

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### 5.1 Why herbs: the herbal cosmetic premise

Herbal cosmetics use plant derived ingredients, extracts, fixed oils, essential oils and isolated phytochemicals, as the functional or the positioning core of the product. The premise is part pharmacology (plants genuinely supply emollients, antimicrobials, antioxidants, anti inflammatories and pigments), part consumer trust in natural materials, and part tradition, with Ayurveda giving the Indian market a classical formulary of its own. The formulator's discipline is to hold both truths at once: a plant extract is a complex chemical mixture, variable by season, soil and extraction method, and "natural" is not a synonym for safe, since plants also supply potent allergens, phototoxins and irritants. This unit works through the standard ingredient shelf for hair, skin and oral care, then the private standards that police natural claims, then the formulation challenges that make herbal products technically harder than their marketing suggests.

### 5.2 Herbal ingredients for hair care

| Ingredient | Source and key chemistry | Cosmetic role |
|---|---|---|
| Amla | Phyllanthus emblica fruit, tannins and ascorbic acid | Traditional hair tonic and colour support, antioxidant positioning |
| Bhringraj | Eclipta alba herb | Classic Ayurvedic hair oil ingredient for hair fall positioning |
| Brahmi | Bacopa monnieri and Centella asiatica (the name serves both) | Scalp soothing and strengthening claims in oils and shampoos |
| Henna | Lawsonia inermis leaves, lawsone dye | Natural hair colorant, binds keratin, orange red shades; also a conditioner |
| Shikakai | Acacia concinna pods, saponins | Natural surfactant cleanser, the original herbal shampoo |
| Reetha (soapnut) | Sapindus mukorossi fruit, saponins | Natural foaming cleanser for hair and delicate fabrics |
| Aloe vera | Aloe barbadensis leaf gel, polysaccharides | Soothing, moisturizing scalp and hair care base |
| Coconut and sesame oils | Fixed oils of Cocos nucifera and Sesamum indicum | The standard hair oil vehicles, emollient and pre wash protective; coconut oil is documented to reduce protein loss from hair |
| Neem | Azadirachta indica leaf and seed | Antimicrobial positioning, anti dandruff and scalp care |
| Hibiscus | Hibiscus rosa-sinensis flowers and leaves, mucilage | Conditioning and traditional colour care |

### 5.3 Herbal ingredients for skin care

| Ingredient | Source and key chemistry | Cosmetic role |
|---|---|---|
| Turmeric | Curcuma longa rhizome, curcumin | Anti inflammatory and complexion positioning; strong colour limits dose |
| Sandalwood | Santalum album wood and oil, santalols | Fragrance, soothing and traditional fairness positioning; sustainability limits supply |

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| Ingredient | Source and key chemistry | Cosmetic role |
|---|---|---|
| Aloe vera | Leaf gel polysaccharides | After sun, soothing and moisturizing products |
| Kumkumadi and saffron | Crocus sativus stigma, in classical oil formulations | Premium complexion care positioning |
| Liquorice | Glycyrrhiza glabra root, glabridin | Tyrosinase related pigmentation care (Unit 4.8) |
| Green tea | Camellia sinensis leaf, catechins such as EGCG | Antioxidant and photoprotection support |
| Neem | Leaf and seed extracts | Anti acne and antimicrobial positioning |
| Tulsi | Ocimum sanctum leaf | Antimicrobial and purifying positioning |
| Rose | Rosa damascena water and oil | Fragrance, toners, mild astringent care |
| Multani mitti | Fuller's earth clay | Oil absorbing face packs for oily skin |
| Walnut and apricot scrub particles | Ground shell and kernel | Mechanical exfoliants in scrubs |
| Shea and kokum butters | Plant seed fats | Emollient bases for creams and lip care |

## 5.4 Herbal ingredients for oral care

Herbal oral care draws on the chewing stick tradition, in which the active delivery system was the plant itself. **Neem** twigs and extracts supply antimicrobial positioning against plaque bacteria. **Babool** (Acacia arabica bark) is the classic astringent gum care ingredient. **Clove** provides eugenol, an established dental analgesic and antiseptic used in dentistry itself. **Miswak** (Salvadora persica) contains silica for cleaning, fluoride in small amounts and antimicrobial compounds, and chewing sticks of it are recognised in the dental literature as effective plaque control aids when used properly. Supporting members are liquorice (sweetness and soothing), tulsi, peppermint and other mint oils as flavours with mild antimicrobial action, and triphala in traditional gum care. The formulator's task in a herbal toothpaste is to carry these into the blocks of section 3.11 without losing the fluoride based caries protection that is the evidence core of the product, a point on which herbal positioning and dental evidence must be reconciled honestly rather than traded against each other.

## 5.5 Private standards for herbal cosmetics: the COSMOS review

Because "natural" and "organic" have no complete statutory definition for cosmetics in most markets, private certification bodies wrote the rules, and the syllabus requires a review of their guidelines with respect to the five formulation block classes. **COSMOS** (COSMetics Organic and natural Standard) is the harmonised standard of the European founders BDIH, Cosmebio, Ecocert, ICEA and the Soil Association, and it certifies products at two levels, COSMOS Organic and COSMOS Natural. Its approach is a positive and restrictive list system applied block by block:

| Building block class | COSMOS position in outline |
|---|---|
| Preservatives | Only a short list of permitted preservatives, mainly nature identical ones such as benzoic acid, sorbic acid, dehydroacetic acid and benzyl alcohol, within limits; the standard synthetic systems of Unit 3 are excluded, which is why preservation is the herbal formulator's hardest problem (section 5.6) |
| Emollients | Must be of natural origin and obtained by permitted physical or biotechnological processes; mineral oil and petrolatum are excluded, so the occlusive benchmark of Unit 4 is unavailable and plant oils and butters take its place |

| Building block class | COSMOS position in outline |
|---|---|
| Foaming agents (surfactants) | Permitted surfactants are plant derived and readily biodegradable, such as alkyl polyglucosides and approved sulfates of natural origin; ethoxylated synthetics are excluded |
| Emulsifiers | Natural origin emulsifiers and their permitted derivatives; the synthetic nonionic pairs of Unit 3 are largely excluded |
| Rheology modifiers | Natural gums, starches and celluloses are permitted; carbomers and other synthetic acrylic thickeners are excluded |

The standard also governs percentages of organic and natural origin content, packaging and environmental management of manufacture. Other private and regional schemes exist alongside it, but the examinable point is the pattern: a private standard is a list discipline across every block, and certifying a product means reformulating it block by block, not adding a herb to a conventional base and labelling the result natural.

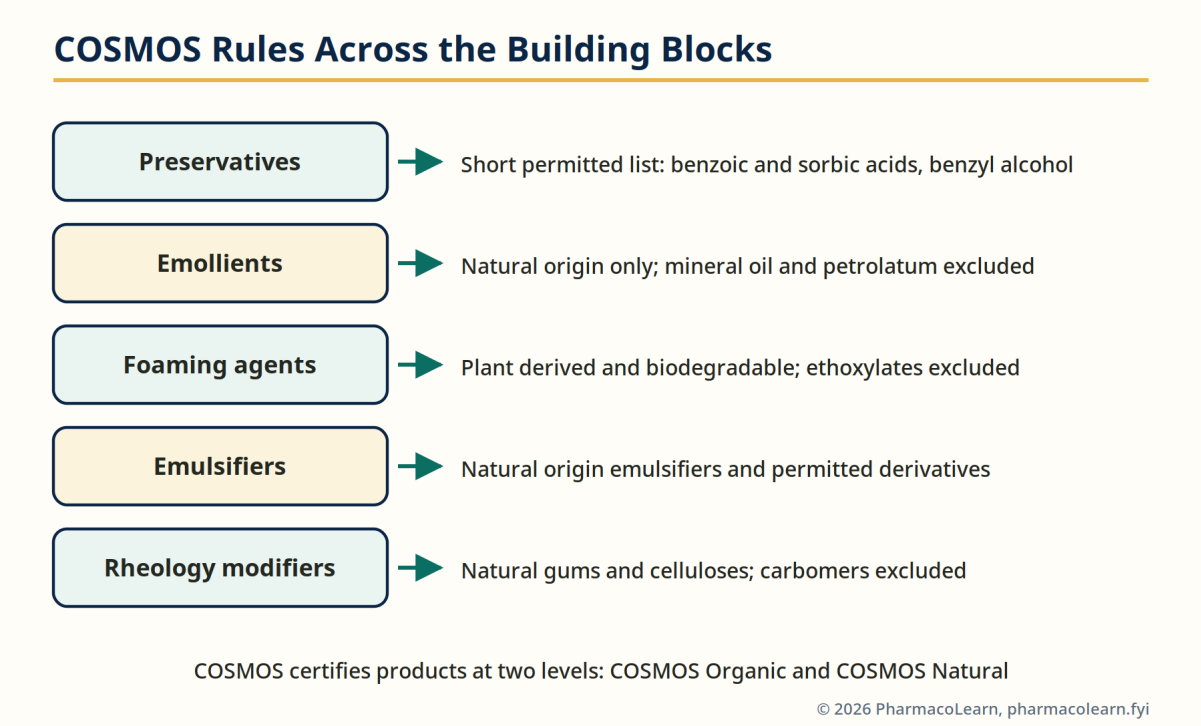


*Figure: A private standard is a list discipline applied to every building block, not a herbal label on a conventional base.*

## 5.6 Challenges in formulating herbal cosmetics

The challenges are technical, and they close the subject because they gather every earlier unit into one product:

- **Standardisation:** an extract varies with plant source, harvest and extraction; without marker compound specifications and fingerprint testing, batch to batch efficacy and colour drift, and the product cannot be reproducible in the sense Unit 1's licensing assumes.
- **Stability:** plant antioxidants oxidise, colours fade or darken (turmeric and henna chemistry), essential oils evaporate and resinify, and the formulator's antioxidant and packaging defences are weaker because several synthetic stabilisers are excluded by the standards of section 5.5.
- **Preservation:** water based herbal products are excellent microbial media, plant material arrives with a bioburden, and the permitted preservative list is short and comparatively weak; preservative efficacy testing (Unit 3.7) fails herbal products more often than any other category.

- **Compatibility and physical form:** polyphenols complex with proteins and metal ions, tannins precipitate and darken with iron contamination, natural gums vary in viscosity, and emulsions built only on natural emulsifiers are less robust to heat and electrolyte.
- **Safety substantiation:** natural allergens (the fragrance allergens of section 3.13 arrive automatically inside essential oils), phototoxic furanocoumarins in citrus oils, and adulteration of expensive oils all require the same safety testing as synthetics, with less published data to rely on.
- **Claims and cost:** the market wants drug like promises at cosmetic claim limits (the Unit 1 and Unit 4 boundary), genuine certified ingredients cost more, and sustainable sourcing of pressured species such as sandalwood is a supply problem as well as an ethical one.

The subject's conclusion is therefore a professional one: a herbal cosmetic is a cosmetic, held to the same law, built from the same blocks, aimed at the same biology and problems, with an ingredient palette that is older, more variable and more constrained. Formulating one well is not a lesser skill than formulating its synthetic counterpart; on the evidence of this unit, it is the harder one.

## Frequently Asked Questions

**Q: What is the legal definition of a cosmetic in India? A:** Under the Drugs and Cosmetics Act 1940, a cosmetic is any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to the human body for cleansing, beautifying, promoting attractiveness or altering the appearance, and soap is included in the definition.

**Q: What is the difference between a misbranded and a spurious cosmetic? A:** A misbranded cosmetic deceives through information: it is not labelled as prescribed or its label makes false or misleading claims. A spurious cosmetic deceives through identity: it imitates another product or falsely claims to be made by a manufacturer who did not make it.

**Q: What is a loan licence for cosmetics? A:** A loan licence allows a person who has no factory of their own to manufacture cosmetics on the premises of another manufacturer who already holds a licence for those premises, marketing the product under the loan licensee's own name and licence number.

**Q: Why does dry skin lose water, and which ingredient classes repair it? A:** Dry skin has a defective stratum corneum barrier, from loss of natural moisturizing factor and disorganisation of the intercellular lipids, so transepidermal water loss rises. Occlusives such as petrolatum cut the loss, humectants such as glycerin and urea bind water in the stratum corneum, emollients smooth the surface, and ceramide containing formulas replace barrier lipids.

**Q: What are the four factors that combine to produce acne? A:** Increased sebum secretion under androgen influence, abnormal keratinization plugging the follicle to form a comedo, proliferation of Cutibacterium acnes inside the plug, and inflammation, which turns comedones into papules, pustules and nodules.

**Q: How are surfactants classified, and which class conditions hair? A:** Surfactants are classified by head group charge into anionic (main detergents, e.g. sodium laureth sulfate), cationic, nonionic and amphoteric classes. Cationic surfactants such as cetrimonium chloride condition hair, because their positive charge makes them deposit on the negatively charged damaged sites of the hair shaft.

**Q: What decides whether a preservative system actually works in a finished cosmetic? A:** The free preservative concentration in the water phase, which pH, partitioning into the oil phase, binding by nonionic surfactants and micelles, the packaging and the initial bioburden all influence. That is why efficacy is proven by a preservative challenge test on the finished product rather than calculated from the formula.

**Q: What is the difference between a vanishing cream and a cold cream? A:** A vanishing cream is an oil in water emulsion based on stearic acid partly converted to a soap emulsifier, which rubs in and vanishes leaving a dry matte film. A cold cream is classically a water in oil emulsion of beeswax and borax with a large mineral oil phase, leaving a rich occlusive film and a cooling feel as its water evaporates.

**Q: What does SPF measure, and why is the label value higher than real life protection? A:** SPF is the ratio of the minimal erythemal UV dose on protected skin to that on unprotected skin, a mainly UVB measure. It is tested at an application of 2 mg per square centimetre, while most users apply about half that or less, so protection in real use is substantially below the labelled value.

**Q: What makes herbal cosmetics harder to formulate than conventional cosmetics? A:** Variable and unstandardised raw materials, weaker stability of plant actives and colours, a short permitted preservative list under standards such as COSMOS against a high microbial load in plant materials, exclusion of workhorse synthetic blocks such as mineral oil and carbomers, and natural allergens that arrive automatically inside essential oils.

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