

# SUN PROTECTION

## Points to be covered in this topic

→ SUN PROTECTION

→ SKIN CARE

→ HAIR CARE

→ ORAL CARE

→ BIS SPECIFICATION

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# SUN PROTECTION

- **Sunscreen**, also known as **sunblock or sun cream**, is a **photoprotective topical product** for the skin that mainly absorbs, or to a much lesser extent reflects, some of the **sun's ultraviolet radiation** and thus helps protect against sunburn and most importantly **prevent skin cancer**.



## ➤ CLASSIFICATION OF SUNSCREEN AND SPF

### ❖ PABA (Para-amino benzoic acid)

- Very effective in the **UVB range (200-320 nm)**.
- Most effective in conc. of **5% in 70% ethanol**.
- Maximum benefit when applied **60 minutes** prior to exposure (to ensure penetration and binding to stratum corneum).
- **Contact dermatitis** can develop.
- May **stain clothing**.

### ❖ PABA Esters (Padimate A, Padimate O, Glyceryl PABA)

- Also very effective in **UVB range (280-320)**
- Most effective in conc. **2.5-8% in 65% alcohol**
- May penetrate **less effectively** than PABA
- Similar application and adverse effect
- **Less staining**

### ❖ Benzophenones (oxybenzone, dioxybenzone, sulisobensone)

- Slightly **less effective than PABA**.
- Absorbs from **250-400 nm spectrum** (i.e, UVA & UVB).
- Combined with **PABA or PABA ester** improves penetration and is superior to either agent used alone (200-400 nm wavelength coverage).
- **Beneficial in preventing** photosensitivity reactions.
- Contact dermatitis is rare.

## ❖ Cinnamates and Salicylates

- **Minimally effective**, absorb **UVB spectrum**.
- Generally used in combination with one of the above.

## ❖ Anthranilates

- Minimally effective, absorbs **UVA spectrum 250-322 nm**.
- Usually combined with **UVB agent to broaden spectrum**.

## ➤ SUN PROTECTION FACTOR

- The **term "sun protection factor"** was adopted by the **FDA** to describe the **effectiveness of Sunscreens**.
- SPF is a measure of how much **solar energy (UV radiation)** is required to produce sunburn on **protected skin** (i.e., in the presence of sunscreen) relative to the amount of **solar energy required** to produce sunburn on unprotected skin.
- As the SPF value increases, **sunburn protection increases**.
- SPF defined as the **UV energy required** in producing a minimal erythematol dose (MED) on **protected skin**, divided by the UV energy required to produce a **MED on unprotected skin**.

$$\text{SPF} = \frac{\text{Minimal erythematol dose in sun - Screen protected skin}}{\text{Minimal erythematol dose in a non - Sunscreen protected skin}}$$

## ❖ SUN PROTECTION FACTOR CLASSIFICATION

PROTECTION LEVEL	SPF VALUE
Low protection	6.10
Medium protection	15.20.25
High protection	30.40
Very high protection	50+



## SKIN CARE

- Herbal skincare products are made with **natural ingredients** that are gentle on the skin and are **less likely** to cause breakouts and other **skin irritations**.
- Regular **skincare products**, on the other hand, are **chemical-laden**.
- They may lead to **wrinkles, spots, or skin damage**.



### ➤ **ALOE**

- ✓ **Synonyms** :- Ghritkumari , Musabbar
- ✓ **Biological source** :- Aloes is obtained from the dried juice of leaves of **Aloe Vera**
- ✓ **Family** :- **Liliaceae**
- ✓ **Chemical Constituent** :- Aloin, Barbaloin,  $\beta$ -barbaloin



### ✓ **Cosmetic uses**

- The **Aloe gel (Muco-polysaccharides)** gives **chilling effect** and also acts as a **moisturizing agent**.
- It also has role in **rejuvenation of aging skin**.
- **Aloe vera gel** gloves improved the skin integrity, decrease appearance of acne wrinkle and **decrease erythema**.
- The **hardened skin cells** become softer by the applied form of **amino acids** present in gel.
- Zinc proceeds as an **astringent to tighten pores**.



## ✓ **Aloe Vera gel Preparation**

### ▪ **Method -I using a blender**

- Wash a **healthy aloe vera** leaf under running water.
- Using a knife, cut the **serrated edges** off the leaf.
- Make a **lengthwise incision** in the middle of the leaf to peel off the skin.
- **Place knife** under the rind & slide it along the length of the leaf to **remove the skin**.
- Repeat the same for the **other half of the skin**.
- Scoop out the **pulp & blend it for 30sec**
- Transfer the gel into an **airtight container**.

### ▪ **Method II scraping**

- Clean the **leaf with water** chop off the serrated ends with a knife.
- Peel off the **upper skin of the leaf**.
- Place the leaf over a bowl & using **multiple short strokes**, scrape out the gel.
- Transfer the **collected gel** into an air tight **container store** it in refrigerator.

## ➤ **TURMERIC**

✓ **Synonyms** :- Haldi

✓ **Biological source** :- Obtained from dried rhizomes of *Curcuma longa*

✓ **Family** :- Zingiberaceae

✓ **Chemical Constituents** :- Curcuminoids, Curcumin -I, II and III

✓ **Uses** :- Anti-inflammatory, Spice, Carminative

### ✓ **Properties**

- It is considered as an **effective wound-healing medicine** and is strongly related to the social **customs of India**.
- If a wound occurs as a **part of a ritual**, only **turmeric powder** is used for healing.
- The wounds are usually caused by **old, rusty, unclean iron** sword or hooks while **performing certain rituals**; even in such cases the wounds get healed without **any pus formation** or infection.



# HAIR CARE

- **Herbal hair products** are **cosmetic preparations** that involve the usage of **traditional Ayurvedic herbs** to clean and provide your scalp and hair with **sufficient nutrition**.
- ✓ **Basic feature of hair care cosmetics are as**
  - Should be **easy to use**
  - Should have **local effect**
  - Should not be **harmful to hair skin** and mucous membrane
  - Should not be **allergic to body**.
  - Should be **applied topically**.
  - Hair care **cosmeceuticals formulations** mainly include shampoo, gel, lotion solution and oil.

## ➤ **HENNA**

- Henna is consist of dried leaves of *Lawsonia inermis* belonging to family **Lythraceae**.
- It is cultivated as **garden plant throughout the India**.
- **Flowers are numerous**, small with rose coloured fragrance.



## ✓ **Chemical constituents**

- The leaves contains **soluble matter Lawsons**.
- This **quinone dissolves** in alkaline solution to give an **intense red colour**.
- Henn leaf also contains **flavonoids, coumarins and xanthones**.



## ✓ USES

- It is used in **cosmetic preparation** in many ways as **colouring and cosmetic ingredients**.
- It has been used as a **hair colour, nail colour** and **decoration purpose**.
- The drug is widely used in **cosmetology** for its **dyeing properties** due to strong binding property of **lawsone to hairs**.
- It is also used in the form of **shampoo and hair lotions**.
- Henna is used in **Ayurvedic preparation** for the treatment of skin ailments, burns and wounds.

## ➤ **AMLA**

- It is a fresh and **dried fruit of Emblica Officinalis** belonging to family **Euphorbiaceae**.
- In India often cultivated in UP, Gujrat, Rajasthan and Maharashtra.
- The taste is sour and astringent.



## ✓ **Chemical Constituents**

- Amla contains about **5-6 % Tannins** (gallic acid, ellagic acid and phyllembelin).
- It is rich source of natural **Vitamin C**.
- It is destroyed on **heating and drying in sun**.
- It is also reach **source of pectin** and **minerals like phosphorus, iron and calcium**.

## ✓ **Amla has various uses**

1. **Antifungal**
2. **Antibacterial**
3. **Antiviral**
4. **Antioxidants**

## ✓ **It is used in the herbal preparations like**

1. **Hair dyes**
2. **Hair conditioners**
3. **Hair Shampoos**
4. **Hair Tonic**



Amla Hair oil



Amla Candy



Amla Juice



Amla Capsule

## ORAL CARE

- In many **traditional cultures**, there are **no plastic-bristle brushes**, rather, the use of herbal "**chewing sticks**" are common.
- Chewing sticks are usually taken from **plants, shrubs** or trees with **high anti-microbial activity**.
- The ends of **selected sticks** are shredded and they are used to massage the gums and "**floss**" the teeth.
- **Young twigs** of any of a number of Neem, oaks, willows have served for chewing sticks, and are still available today.

### ➤ **NEEM**



- **Botanical name** : **Azadirachta indica**
- **Family**: **Meliaceae**
- **Chemical constituents** : The most important active constituent is **Azadirachtin** and the others are **Nimbolinin, Nimbin, Nimbidin, Nimbidol, Sodium Nimbinate, Gedunin, Salannin, and Quercetin**.

### ❖ **USES**

- Neem bark and leaf extract is most effectively used in **preventing cavities and gum disease**.
- Mouthwash containing Neem is a remedy for tooth decay, **oral infections, prevents bleeding and sore gums**.
- **Twigs of Neem tree** are used as chewing sticks by people all over India.





## ➤ **CLOVE**

- **Botanical name** - *Syzygium aromaticum*
- **Family** - Myrtaceae
- **Chemical constituents** - Eugenol

## ❖ **USES**

- It **helps numb and reduce pain to ease a toothache**.
- Eugenol also has natural **anti-inflammatory properties**.
- It may reduce **swelling and irritation** in the affected area.



## **BUREAU OF INDIAN STANDARDS**

- The **National Standards Body Of India** Functioning Under Ministry Of Consumer Affairs.
- It was established by **BIS act 1986**.

## ➤ **OBJECTIVES**

- Harmonious development of activities of **standardization, marking and quality certification**.
- BIS has been **providing traceability and tangibility** benefits to the **national economy** in a number of ways:
  - ✓ **Providing safe reliable quality goods**
  - ✓ **Minimizing health hazards to consumers**
  - ✓ **Promoting exports and imports substitute**
  - ✓ **Control over proliferation** of varieties etc. Through standardization, certification and testing.

## ➤ MAIN ACTIVITIES OF BIS SPECIFICATIONS

- **Standards Formulation**
- **Certification**
  - ✓ Product
  - ✓ Hallmarking of Gold Jewelry
  - ✓ Quality Management System
  - ✓ Environmental Management Systems
  - ✓ Occupational Health and Safety Management System
  - ✓ Hazard Analysis and Critical Control Points
  - ✓ Imported Products FMCS
- **Laboratory Management**
- **International Activities**
- **Training Services**
- **Others**
  - ✓ Information Services
  - ✓ Consumer Affairs & Standards Promotion
  - ✓ Sale of Standards

## ➤ BIS REQUIREMENTS FOR SHAMPOO

CHARACTERISTICS	REQUIREMENTS
The pH of shampoo should be	Between 4.0 to 9.0
The maximum heavy metals (lead) permitted in shampoos	20 ppm
The maximum arsenic (As <sub>2</sub> O <sub>3</sub> ) permitted in shampoos is	2 ppm
List of dyes, colours and pigments permitted to be used in cosmetics is under	Schedule Q of Drug and Cosmetics Act
Non-volatile alcohol soluble matter, percent by mass, Min	10
Foam height for 2 % solution, Min	150 mm

➤ **BIS REQUIREMENTS FOR TOOTHPASTE**

<b>CHARACTERISTICS</b>	<b>REQUIREMENTS NON FLUORIDATED</b>	<b>REQUIREMENTS FLUORIDATED</b>
<b>Fineness</b> Particle retained on 150 micron IS sieve, percent by mass, Max	10	1.0
<b>Particle retained on 75 micron IS sieve, percent by mass, Max</b>	2.5	2.5
<b>The pH of aqueous suspensions should be</b>	5.5 to 10.5	5.5 to 10.5

➤ **BIS REQUIREMENTS OF SKIN CREAM**

<b>CHARACTERISTICS</b>	<b>REQUIREMENTS</b>
<b>Thermal stability</b>	To pass the test
<b>The pH</b> For creams with bees wax and borax pH	Between 4.0 to 9.0 Between 5.0 to 10.0
<b>The maximum heavy metals (lead) permitted</b>	20ppm
<b>The maximum arsenic (AS<sub>2</sub>O<sub>3</sub>) permitted</b>	2ppm
<b>List of dyes, colours and pigments permitted to be used in cosmetics is under</b>	Schedule Q of drug and cosmetic act
<b>Total fatty substance content, percent by mass, min</b>	5.0
<b>Total residue percent by mass, min</b>	10.0
<b>Microbial counts :</b> Total viable counts per gram, max Gram negative pathogens per gram, max	1000 Absent