Development of A of Skin Herbal Care Formulation With Herbal Extract

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Abstract- *They may be applied to the skin, placed on the surface of the eye or used nasally, vaginally or rectally. Topical preparations are used for both local and systemic effects. The following distinction is an important one with regard to dermatological applications. A topical dermatological product is designed to deliver drug into skin in treating dermal disorders with skin as target organ.1 Dermatological products applied to the skin are diverse in formulation and range in consistency from liquids to solid powders, but most popular products are semisolid preparations. Some of these may be non-medicated, in the sense that these may be devoid of any therapeutically active ingredients and are used for cosmetic purposes.*

Keywords- Skin, Skin disorders, Anatomy of the skin, Herbs used in Skin Disoreder formulation.

I. INTRODUCTION

Ayurveda makes use of many herbs to make cosmetics for beautification and protection from external effects. The natural phytoconstituents not causes any side effects on the human body; but provide nutrients and other useful minerals to the body [1]. Herbal cosmetics or products are made from various cosmetic ingredients to form the base in which one or more herbal ingredients are incorporated for defined cosmetic benefits [2]. The health, habits, job routine, climatic conditions and maintenance are mainly responsible for the skin and hair beauty [3]. Excessive exposure to heat, the causes skin to dehydrate during summer and causes wrinkles, blemishes, pigmentation and sunburns. Extremes of winter causes damages to the skin and hairs in the form of cracks, cuts,infections, hair fall and dandruff [4]. The diseases of skin are common among all age groups and can be due to exposure towards microbes, chemical agents, biological toxins, and also due to malnutrition [5]. large number of herbs are available commercially as cosmetics for skincare, hair care and antioxidant effects. These herbal formulations produce cleansing and beautifying effects and improves overall appearance when rubbed, poured, sprayed externally or applied to body parts [6,10]. Cosmetics from natural sources are considered better and safer [11]. Plants are the natural sources of cosmetic formulations. They can be used to design some useful inorganic materials that are called green synthesis. [12] They are made from original ingredients in plants, leaves, roots, fruits and flowers which have properties for health and beauty [13]. Major chemical compounds in plants are alkaloids, flavonoids, terpenoids, steroids, tannins and saponins which can be assessed by phytochemical screening. Herbs serve as important cosmeceuticals as they do not carry any adverse effects [14].

Skin

The skin is the largest organ of the body, and major portion interface with the environment, the skin composed of specialized epithelial and connective tissue cells have many protective and synthetic functions[18,19].

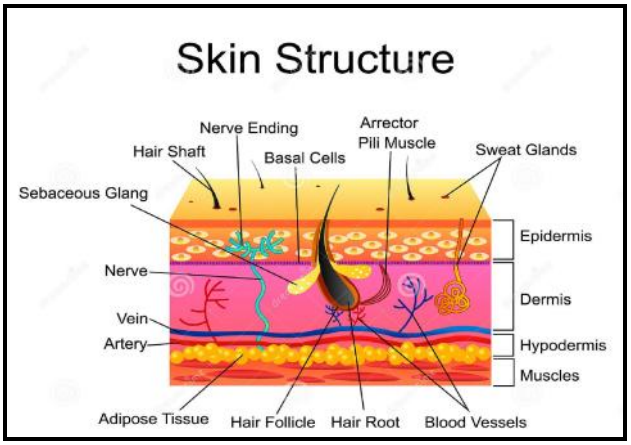

Fig No: 1: Structure of skin

II. ANATOMY OF THE SKIN

1] Epidermis

a) Layers of the epidermis The epidermis forms the external surface of the skin and is mainly composed of keratinocytes which differentiate to form four layers, the stratum basale (basal layer), stratum spinosum (spinous or prickle cell layer), stratum granulosum (granular layer), and stratum corneum (surface layer)[19-22].

Stratum basale The basal layer consists of 1 cell layer of cuboidal cells attached by hemidesmosomes to a thin basement membrane which separates it from the underlying dermis. Mitotic figures are usually in this layer, and the cells

are interconnected by desmosomes and gap junctions. Stratum spinosum Above the basal layer is the spinous or prickle cell layer. Active protein synthesis occurs in this layer, producing a fibrillar protein keratin which aggregates to form tonofibrils[21]. These tonofibrils migrate to the granular layer to eventually become part of the keratin complex. Stratum granulosum Above the spinous layer is the granular layer, in which each keratinocyte contains basophilic keratohyalin granules. The protein filaggrin is a major component of these granules, and it is thought to bind to the keratin filaments (a modified form of the tonofibrils produced in the spinous layer) to form the keratin complex[23].

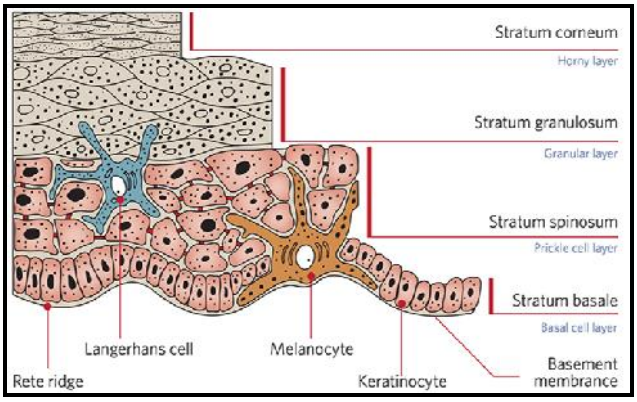

Fig:No:2. Anatomy of skin

The cells also synthesize lipids which are believed to serve as "intercellular cement". Stratum corneum The outer layer of the epidermis is the corneal layer which consists of fully keratinized, flat, fused cells bound together by lipids synthesized in the granular layer. The protein involucrin is produced in the stratum granulosum and corneum and forms a thickened protein layer on the inner surface of the plasma membrane[21.22].

b) Cellular components of the epidermis Keratinocytes The basal keratinocyte is a mitotically active cell (analogous to the stem cell of bone marrow), which differentiates terminally from the basal (least keratin) to the cornified cells (most keratin). As it migrates upward, there is progressive synthesis of keratin proteins, which constitute part of the protective interface between the body and the environment. The migration process normally takes approximately 28 days19[24] .

Melanocytes (pigment cells) Melanocytes produce melanin for skin pigmentation, which is partially protective against UV radiation. These cells are derived from the neural crest and migrate to the basal layer of the epidermis during fetal development, where they become interspersed among the keratinocytes by 8-10 weeks of gestation in the cephalic skin and by the 4th month of gestation in the caudal regions. Melanosomes (pigment containing granules produced within melanocytes) are present in melanocyte dendrites and are transferred to surrounding keratinocytes[25]. The melanocytes tend to form a cap over the keratinocyte nucleus and partially protect it from UV radiation. Melanin synthesis begins with the oxidation of tyrosine by the enzyme tyrosinase to form 3,4-dihydroxyphenylalanine (DOPA) within the melanosomes. A second oxidation, also under the control of tyrosinase, forms dopaquinone, and additional nonenzymatically mediated oxidation and polymerization alterations in the resulting quinone molecule then occur to form the final products-either eumelanin (brown or black) or phaeomelanin (red, yellow). Pheomelanin is formed by the addition of cysteine to dopaquinone20,-25[26] .

Neither sex nor race affects the number of melanocytes. Negroid skin contains the same number of melanocytes as Caucasian skin, but the pigmentation is more intense as a result of genetically determined increased melanin synthesis in Negroid skin as well as the diffuse distribution of melanin granules within the keratinocytes[27]. Individuals of Causasoid or Mongoloid genetic background produce fewer melanin granules and the granules are packed into cytoplasmic aggregates (melanosome complexes) within the keratinocytes rather than being individually packaged and spread diffusely throughout the cytoplasm, as in Negroid skin. Two factors profoundly influence melanin synthesis: ultraviolet light and hormones. Exposure to ultraviolet light, both in UVB and UVA wavelengths, increase melanin synthesis and transfer of melanin to keratinocytes, causing the characteristic tanning of the skin. In addition, 2 trophic hormones in the pituitary gland, α-MSH and β-MSH, cause generalized hyper-pigmentation, they are components of a pituitary stem peptide that is cleaved to release the 2 melanocytestimulating hormones[28] .

Skin disorders

Skin forms a remarkable protective barrier against the external environment1 , helping to regulate temperature and fluid balance, keeping out harmful microbes and chemicals and offering some protection against sunlight2-4 . Solar radiation is radiant energy emitted by the sun, particularly electromagnetic energy. Sunlight is composed of radiation with differing wavelengths: Ultraviolet radiation (5%), visible radiation (39%) and infra-red radiation (56%). UV radiation is of particular interest because it can interact with human skin cells and cause a variety of damaging effects30-32. UV radiation can be further categorized as UVA (320 to 400 nm), UVB (290 to 320 nm) and UVC (100 to 290 nm)[29]. UVC is the most dangerous radiation, but it is mostly absorbed by the ozone layer and does not reach the earth‟s surface. The remaining UV radiation that reaches the ground is about 10%

UVB and 90% UVA at midday. In contrast to UVB radiation which varies considerably with the time of the day and the seasons, large amounts of UVA are constantly present during daylight hours and throughout the year33-35. Finally, while 90% of UVB radiation is blocked by the stratum corneum (SC), over 50% of the UVA radiation received is capable of penetrating deep into the cutaneous structures as far as the dermis[30].

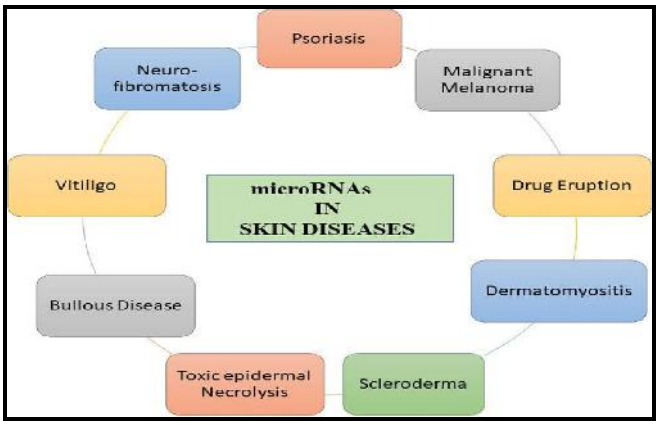

Fig No: 3. Disorder of skin

represent the major mechanisms involved in skin photoaging and photocarcinogenesis. Ultraviolet A rays damage the skin through oxidative stress–related mechanisms, generating ROS. These highly reactive derivatives of oxygen include superoxide radical anion, hydroxyl radical, singlet oxygen, and hydrogen peroxide and can trigger further ROS generation. Oxidative damage is done to the cellular structures, such as nucleic acids, cellular proteins, and lipids in various skin strata[31] . Moreover, the consequent increases in ultraviolet radiation induced skin disorders, predominantly cutaneous malignancies, immunosuppression, wrinkles, aging, etc.

III. HERBS USED IN SKIN DISOREDER FORMULATION

1] Emblica officinalis

Plant profile

- Botanical Name -Emblica officinalis
- Division - Magnoliophyta Class Magnoliopsida
- Order- Euphorbiales
- Family - Euphorbiaceae
- Genus - Phyllanthus L
- Species - Phyllanthus E L
- Popular Name(s) - Phyllanthus E, E, Amla

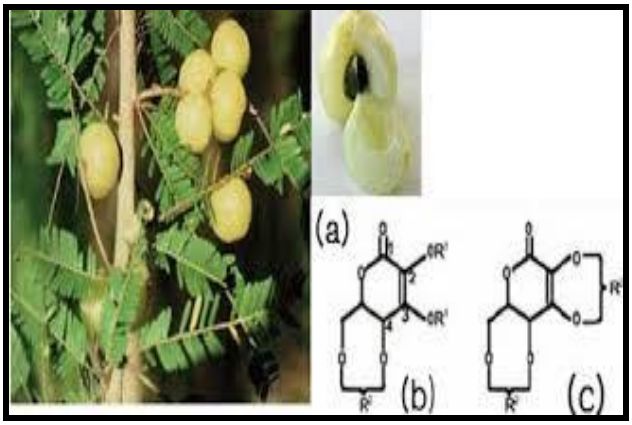

Fig. 4: Emblica officinalis fruits

Plant Description:

The tree is small to medium in size, reaching 1 - 8 m (3 ft 3 inch - 26 ft 3 inch) in height. The branchlets are not glabrous or finely pubescent, 10–20 cm (3.9 - 7.9 inch) long, usually deciduous. The leaves are simple, subsessile and closely set along branchlets, light green, resembling pinnate leaves. The flowers are greenish-yellow. The fruit is nearly spherical, light greenish yellow, quite smooth and hard on appearance, with six vertical stripes or furrows[26,21].

Chemical constituents:

Emblica officinalis is very high in vitamin C, pectin, polyphenol compounds, gallic acid, ellagic acid, corilagin, phyllantidine and phyllantine (both alkaloids). Its ascorbic acid content ranges from 1000mg to 1700mg per 100grams. Also found are hydrolysable tannins punigluconin, pedunculagin and Emblicanin A and Emblicanin B[28,9].

Uses: Emblica exhibits strong antioxidant activity. It is one of the most important plants in the traditional Ayurvedic medical system as well as in other traditional health systems for immunomodulatory, antiulcer, anti-inflammatory, hepatoprotective and anticancer actions. However, there is very limited clinical evidence to support the use of emblica for any indication[29,12].

2] Hibiscus rosasinensis

Plant profile

- Kingdom Plantae- plants
- Sub kingdom Tracheobionta – vascular plants
- Super division Spermatophyta – seed plants
- Division - Magnoliophyta
- Flowering plants Class Magnoliopsida – Dicotyledons

- Sub class - Dilleniidae
- Order- Malvales
- Family -Malvaceae
- Genus Hibiscus L – Rosemallow
- Species- Hibiscus rosa sinensis L

Fig. 5: Hibiscus rosasinensis

Plant Description:

Hibiscus rosa-sinensis is a bushy, evergreen shrub or small tree growing 2.5–5 m (8–16 ft) tall and 1.5–3 m (5–10 ft) wide, with glossy leaves and solitary, brilliant red flowers in summer and autumn. The 5- petaled flowers are 10 cm (4 in) in diameter, with prominent orange-tipped red anthers[30,34].

Chemical Constituents:

Leaves and stems contain β-sitosterol, stigmasterol, taraxeryl acetate and three cyclopropane compounds and their derivatives. Flowers contain cyanidin diglucoside, flavonoids and vitamins, thiamine, riboflavin, niacin and ascorbic acid. Quercetin-3- diglucoside, 3,7-diglucoside, cyanidin-3,5-diglucoside and cyanidin-3-sophoroside-5-glucoside have been isolated from deep yellow flowers; [31,25] all above compounds and kaempferol-3- xylosylglucoside have been isolated from ivory white flowers[32].

Uses:

The flowers of Hibiscus rosa-sinensis are edible and are used in salads in the Pacific Islands. The flower is additionally used in hair care as a preparation. It is also used to shine shoes in certain parts of India. It can also be used as a pH indicator. When used, the flower turns acidic solutions to a dark pink or magenta color and basic solutions to green.

3] Bacopa monnieri

Plant profile

- Kingdom- Plantae
- Division -Magnoliophyta
- Class - Magnoliopsida
- Order- Lamiales
- Family - Scrophuaraiaceae
- Genus- Bacopa
- Species - Bacopamonnieri
- Zoological Name – Bacopamonnieri

Fig. 6: Bacopa monnieri

Plant Description:

Brahmi is the small creeping herb with the numerous branches[32,33]. It grows to a height of 2 -3 feet and its branches are 10 -35 cm long. It has oval shaped leaves that are 1-2 cm long and 3- 8 mm broad. Leaves are formed in pairs along the stems[35,35]. Smalltubular, five petaled flowers are white-purple in colour[36]. Its stem is soft, succulent, and hairy with the glands. Roots emerge out of the nodules and directly go to the soil. The fruit is oval and sharp at apex[37,38].

Chemical constituents:

The major phytoconstituent of Brahmi are Bacosides. Bacosides are saponins in nature, which help to repair damaged neurons by enhancing proteins involved in the regeneration of neural-cell synapses in body. The alkali Brahmine resembles strychnine in action but is less toxic. It contains stigma sterol in free state. The active principle, Hersaponin resembles reserpine and chlorpromazine in action[34].

Uses:

Bacopa has been used in traditional Ayurvedic treatment for epilepsy and asthma. It is also used in Ayurveda

for ulcers, tumors, ascites, enlarged spleen, inflammations, leprosy, anemia and gastroenteritis[39].

IV. CONCLUSION

The present review is to know about the various constituents available in herbal extracts such as minerals and amino acids may be the cause for the significant hair growth activity. All these drugs not only show remarkable activity but are also devoid of potential side effects as compared to synthetic drugs. It gets absorbed into the skin with in a shorter period of time and thus acts as nourishment to skin .

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