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Herbal Cosmetics: “Trends in Skin Care Formulation”

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ABSTRACT

Popularity of herbal cosmetics in society and technological advances in manufacturing process has resulted in flooding of market with herbal formulations. Recently herbal cosmetics have gained much recognition and became popular among people. These products claimed to have efficacy and intrinsic acceptability due to routine use in daily life and devoid of side effects commonly seen with synthetic products. The herbs used in preparation of these Skin cosmetics have multifunctionality like antioxidant, anti-inflammatory, antiseptic and antimicrobial. This paper will review the state of art of herbal based skin cosmetic formulations along with scientific data and concerned cosmetic importance of herbs that could be utilized in preparation of these formulations.

Key words: Herbal Cosmetics, Skin Cosmetics, Antioxidant, Anti-inflammatory, Antiaging.

INTRODUCTION

Cosmetics are used almost regularly and universally in different forms to enhance beauty. Cosmetics are developed to reduce wrinkles, fight acne and to control oil secretion. For various types of skin ailments formulations like skin protective, sunscreen, antiacne, antiwrinkle and antiaging are designed using varieties of materials, either natural or synthetic. The development process for cosmetic formulation needs maintenance of quality standard. The quality of a formulation should satisfy the consumer's need in terms of its performance. The herbs used in cosmetic preparation have varieties of properties like antioxidant, anti-inflammatory, antiseptic and antibacterial etc. These herbal products claim to have no side effects, commonly seen with products containing synthetic agents. Attractiveness of such herbal preparations have socially as well as technologically resulted in flooding of marketplace in India.

The literature in Ayurveda, especially Charak Sahita, stated numerous medicinal plants in Varnya kashaya. The herbs like chandan, haldi, khas, nagksheshara, manjistha, yastimadhu are used to obtain glowing complexion and arusa, amala bavchi, guduchi, chakmard are mentioned as kustaharan (1-2).

Herbs like amalaki, haridra, abhaya, khadira, vidyanga, jati saptaparna, karavira of various potential from Khshthagha and Mahakashiya are mentioned effective in skin disorder. Charak and other sages Sushruit stated in the literature that the Eladi Gana containing ela, tagar, kusstha, jatamani, tvak, dhmamaka, potra harenuka, shutki, stouneyaka, choraka, guggol sarjarasa, agaru, devedaru and padmaksher could be used to eliminate toxins from the body and clear the complexion that leads to grow on the skin and protect from kushtha and boils. (3). In this review, the authors have compiled the scientific data according to the cosmetic potential of herbs and hesitant cosmetic importance from traditional system to modern scientific system.

Age of Synthetic cosmetics

In the leisure time of the 20th century, when soap and synthetic chemistry was at the urge in cosmetic preparation,

surfactants made preparations reached to the market and replaced home made cosmetics and became less burdensome. A big population started using cosmetic preparations containing synthetic ingredients for their instant effects with some advantages like; less time consuming, ease of application, high aesthetic appeal, ease to store, easy to carry etc. with some limitations like; sporadically deterioration, more unwanted after effects, skin allergies and cost effectiveness (4).

Modern age of Herbal cosmetic

Botanical extracts that support the health, texture and integrity of skin and hair are widely used in commercial cosmetic formulations. Plant materials, from which these extracts are prepared, have a long history of traditional “cosmeceutical” use, although the term itself is of recent origin. In most cases, these cosmetic applications are adequately supported by efficacy and safety data documented in scientific literature. Among the more popular functional natural ingredients, several antioxidants used in cosmetics are scientifically proven to offer additional benefits in supporting skin texture, appearance and tone. While in traditional cultures, plant materials were used in crushed or dried and powdered form, their incorporation into existing cosmetic formulations presents unique challenges. Highly colored or gritty plant extracts need to be blended seamlessly into “milky” or clear creams, lotions and gels. This is where a judicious blend of art and science comes in practice.

Plant extracts are gaining popularity as ingredients in cosmetic formulations, primarily because of the poor image of animal-derived extracts acquired during the past few years. Historically, plants were the main source of cosmetic ingredients until methods for synthesizing substance with similar properties were discovered. Even though natural molecules derived from plant extract are currently the constituents of many commercial cosmetic products and offer a particularly exciting avenue for further research. In the modern age color, odor, elegance and efficacy of herbal cosmetics are maintained in effective manner with following benefits (5-6).

- Being natural, least harmful effect on the skin or other body part.
- Relatively more safe.
- More placebo effect to the consumers due to its use in traditions and culture.
- Flexibility in formulation.
- Population proves effects from ancient time.
- Easy availability.
- Economical.

Present status

According to market survey the global market for cosmetics and toiletries reached nearly \$150 billion in 2004, increase by more than 4 per cent from 2003, which highlights major growth in key developing markets (7). The herbal market has been boosted by increasing demand for natural alternative medicines. World demand for herbal products has been growing at a rate of 10% - 15% per annum. The medicinal plants related trade in India alone is approximately Rs. 5.5 billion. World Health Organisation (WHO) has forecasted that the global market for herbal products would be worth \$5 trillion by the year 2050. Global sales of herbal products are expected to reach \$26.2 billion dollars in 2007. Europe and the United States are the two major herbal products markets in the world, with a market share of 41 percent and 20 percent respectively (8).

According to the World Bank, the global market for medicinal plants and their products includes the potential sectors of pharmaceuticals, nutraceuticals and cosmeceutical to be estimated of worth US\$ 62 billion, offers a plethora of opportunities for the Indian Pharma and cosmetic companies.

Cosmeceuticals

In ancient Greece and Rome, countless ointments and tonics were recommended for the beautification of the hair, skin as well as remedies for the treatment of scalp and skin diseases. Henry de Mondeville was the first to make a distinction between medicinal therapies intended to treat diseases and cosmetic agents for the purpose of beautification (9). But today's delineation of cosmetics from pharmaceuticals has become more complex through the development of cosmetics with physiologically active ingredients, i.e. cosmeceuticals. Cosmeceuticals are topical cosmetic – pharmaceutical hybrids intended to enhance the beauty and provide additional health related function or benefits. They are applied topically as cosmetics, but contain ingredients that influence the skin's biological function (10). These cosmeceuticals serve as a bridge between personal care products, Pharmaceutical and phyto-material.

Cosmeceutically active ingredients are now being used by large and small manufacturers engaged in cosmetics, pharmaceuticals, biotechnology and natural extracts in cosmetic formulations. The advancement in the field of cosmetics and knowledge of skin biology and pharmacology have facilitated the formulation of cosmetics (11). The developed novel active and natural compounds are being rapidly used as cosmeceuticals. The desirable features of cosmeceuticals are their efficacy, safety, formulation stability,

novelty, easy metabolism with in skin and low cost, which has enhanced the demand and use of herbal cosmetics (12). Natural extracts from plant, animal and mineral origin have been used as active ingredients of cosmetics for long time. Oils, butters, honey, beeswax, lead, lemon juice and aloe gel etc. were common ingredients of the beauty recipes. A wide range of plant extracts used in skin cosmetics and toiletry preparations as cosmeceuticals are described in Table-I.

Table I: Plants Used in Skin Cosmetics and Toiletries as Cosmeceuticals

Name of Plant	Active Constituent	Cosmetic use
<i>Areca Catechu</i>	Catechin	Antioxidant
<i>Crocus Sativus</i>	Crocetin	Protective
<i>Curcuma Longa</i>	Curcumin	Antibacterial
<i>Glycyrrhiza Glabra</i>	Glycyrrhizin	Skin Whitener
<i>Green Tea</i>	Chammomile	Photoprotective
<i>Crataeva Murula</i>	Lupenol	Antiaging
<i>Rosemarinus Officinalis</i>	Rosemary	Antiaging
<i>Buckwheat Seeds</i>	Rutin	Antiwrinkle
<i>Embillica Officinale</i>	Ascorbic Acid, Tannins	Protective
<i>Ginko Biloba</i>	Ginki	Skin Tonic
<i>Centella Asiatica</i>	Centella	Skin Firming/ Conditioning
<i>Psorolia Corlifolia</i>	Psorolin	Skin Staining & Pigmenting Agent
<i>Citrus Limonus</i>	Hesperedin	Fungal Infection of Skin
<i>Aloe Vera</i>	Aloin	Antidermatitis
<i>Aricaria Recutita</i>	Chammomile Gallic Acid,	Antiphlogistic
<i>Thea Viridis</i>	Catechin and Rutin	Antioxidant
<i>Vitis Vinifera</i>	Carotene	Eczema
<i>Daucus Carota</i>	Beta Corotene	UV Protection
<i>Lycopercicon Esculantum</i>	Tamotine and Tamotidine	Potent Bacteriostatic
<i>Allium Sativum</i>	Alliin and Allicin	Antioxidant
<i>Haemamalis Virginiana</i>	Gallic Acid	Cooling Agent

Natural Extractives

Natural extracts, whether from animal (enzymes, proteins, peptides vitamins etc.), botanical and mineral origin (betonies, titanium dioxides and different forms of clays and mud), have been used as active cosmetic ingredients from ancient time also.

The botanical extract is active cosmetic ingredient, it may contain hundreds of chemical structure with proven activity. These botanical cosmetic ingredients can be separated out from the herbs by extraction and purify without synthetic process. These natural extractives can be utilized in different forms like:

- Total extracts
- Selective extracts

- **Biotechnology extracts**

From these natural extractives, total extract are most commonly used in the cosmetic formulations. Their mode of preparation or extraction is also adopted from traditional systems of different countries like China, India, Africa, Europe, America or from traditional practitioners. The contents of total extracts vary according to the temperature, plant solvent ratio, time of contact, part of plant use, their species and seasonal collection. The extract must be concentrated and isolated by selective techniques like chromatographic, UV spectrophotometric and electrophoresis. The solvent used for herbal extraction is again a matter of selection criteria, solvent selection is not only considered for extraction of active constituents but also for its compatibility with the final formulation (10, 43).

The mixture of water, glycol and ethanol can be utilized for extraction at room temperature or elevated temperature. Ethanol is suitable for extractions because it could maintain the stability, preservation ability and better compliance with formulation ingredients. Historically, many herbals have been used for the treatment of various skin and hair conditions. Traditional uses and scientific studies of these natural extractive intimate at potential functional actions such as anti-inflammatory, antioxidants, antimicrobial, antihyaluronidase, antityrosinase, antimelanogenesis in cosmetics.

Functional active agents

The functional activities play important role in alternation of skin physiology and cosmetic science. With the great advances in our understanding of skin physiology, it is possible to think of a single substance that can alter the skin function and tactile sense of skin or hair. The most convincing example is water, the environment in which all fundamental processes occurs and considered innocuous or safe. On the other hand, when water moistened cotton pad is sealed to human skin for two days, pro inflammatory substances such as interleukins are released from the dead stratum corneum. These provoke a series of cytotoxic changes in the viable epidermis below and inflammatory reaction is provoked in the dermis (14). This is the basic adverse clinical event associated with prolonged exposure to water.

The traditional substance like petrolatum considered inert to skin physiology, however, various studies show that petrolatum promotes healing of wounds and prevent ultraviolet induced tumors, even though it is not a sunscreen (15). These are clearly medicinal effects that affect the structure and function of skin. From these and any other examples, it is apparent that nearly all cosmetic articles would have to be reclassified as drugs, if a strict interpretation of the "structure and function" proviso of the FDC act of 1938 act "A cosmetic is defined as an article intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or other wise applied to the human body or any part there of for cleansing, beautifying, promoting attractiveness, or altering the appearance without affecting structure or function". It is noteworthy that in this definition the cosmetic is not allowed to have any activity (i.e. without affecting structure or function).

In India the definition of cosmetic was reevaluated and described by the Drug and Cosmetic act 1940. "Any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or other wise applied to the human body or any part there of cleansing, beautifying, promoting attractiveness, or altering the appearance and includes any articles intended for use as a component of cosmetic".

It is interesting that 'cosmeceuticals' are used by ancient civilization, although the term itself is of recent origin. Cosmeceuticals like natural antioxidants that quench free radicals are an essential component of Sunscreen and Antiaging formulations.

Antiaging

Natural Antiaging skin care primarily targets slow or reverse approaches to the signs of aging. Ingredients for this purpose are obtained from natural extractives, with a long history of traditional use. The changes in skin contour are always symptoms of aging process, either externally or by internal oxidative stress. Besides external inducers of oxidative attack, the skin has to cope with endogeneous generation of reactive oxygen species (ROS) and other free radicals which are continuously produced during physiological cellular metabolism. To counteract the harmful effects of ROS, the skin is equipped with antioxidant systems, which maintain equilibrium between peroxidants and antioxidants. In the recommendation of skin advancement, variety of primary (preventive vitamin C) and secondary (interceptive, vitamin E) antioxidant mechanism have been developed, which form an antioxidant network of closely interlinked components.

Natural ingredients participate in the biochemical reaction occurring in body during cell aging. Biochemical reactions that accelerate the progression of skin aging have their root in inflammatory processes, as inflammation generates micro scars that mature into blemishes or wrinkles. They potentially offer protection against tissue damage. Various types of inflammatory mediators such as leukotrienes and prostaglandins, cytokines and growth factors may influence melanin synthesis by effecting the proliferation and functioning of melanocytes (17). Cytokines such as endothelins (also known as vasoconstructive peptides) are also reported to accelerate melanogenesis. Natural anti-inflammatory agents are thereof included in Antiaging formulations that serve to sooth, heal and protect skin tone and integrity (23). In addition, natural oils are good source of tocopherols and phytosterol components offering both antioxidant activity and bioactivity for skin care formulations. The eye wrinkle cream helps forestall the signs of aging and generally contains wheat germ oil and corn oil, aqualene and carrot extract. Eye firming fluid has alosain, from seaweed that helps the skin to maintain elasticity. The details of plants with their activity profile and cosmetic benefits are shown in Table-I (33-48).

Now a day peptide technology is also proving its ability against natural aging via penetration of skin without redness or irritation to improve the skin morphometric parameters. The use of specific active peptide able to target and regulate cell function, maximize collagen production by stimulating the

growth of collagen cells, results in reduction of fine lines, increasing skin firmness and tone.

Natural antioxidants

Many plants and their products are being used as medicine since ancient time. Several studies are still going on the properties and mechanism of these plant extracts in skin care. Natural antioxidants that quench free radicals are an essential component of Antiaging formulations. They potentially offer protection against damage to the tissues by environmental and other agents.

Antioxidants intervene at different levels of oxidative processes as described below:

- Scavenging free radical
- Scavenging lipid peroxy radicals
- Binding with metal ions
- Removing oxidatively damaged biomolecules

The imbalance of prooxidant or antioxidant may result in oxidative damage of biomolecules such as lipids, proteins and DNA and has been termed as 'oxidative stress'(22).

Natural antioxidants which include minor lipids are of special interest in cosmetics and skin care formulation for protection against intrinsic and extrinsic aging. They also offer extended shelf life to vegetable oil based formulations as well as protection of cell constituents of skin such as proteins, lipids and DNA. Many common natural oils such as rapeseed oil, sunflower oil and soybean oil are rich in polyunsaturated fatty acids, mainly linolic and linoleic acids. These natural oils are of significant importance and are also used as emollient for skin care applications. However the drawback of unsaturated oils are their high sensitivity to oxidation and limited shelf-life during storage as well as after application. Natural oils like Bergamot, Lavender, Rose, Majoram, Chamomile also prove cosmetic value via different activities like antityrosinase, antielastase and antioxidant (16).

The micronutrients like vitamins, enzymes, proteins and antioxidants are capable of directly scavenging lipophilic and hydrophilic pro-oxidants through or by the topical delivery. Flavonoids, polyphenols and vitamins contribute to antioxidant defence mechanism and may also retard endogenous aging process. Vitamin C regenerates tocopherol from the tocopheroyl radical and transfer the radical load to the aqueous compartment where it is finally eliminated by antioxidant enzymes (24). From earlier it appeared that natural antioxidants are photoprotective, anti-inflammatory and proven as anti-aging agent.

Ascorbic acid is one of the most effective antioxidant *in vivo* and found to be logical candidate as topical photo protectants to control sunburn, cell formation and tumour formation (26). Besides vitamin C and E other natural antioxidants that have been studied for photoprotective efficiency are polyphenolic compounds, carotene and enzymes like SOD that are found to regenerate Vitamins E, C and glutathione. These agents alter the physical and chemical properties of skin, thereby inhibiting penetration of UV wavelengths and counteract the oxidative reactions on skin (27).

Application of different plant extracts, particularly flavonoids is found to diminish acute and chronic skin damages.

Flavonoids like Apigenin, Catechin, Epicatechin, Alflavoglycosylrutin and Silymarin are polyphenolic compounds that occur in fruit and plants and due to free phenolic groups exhibit antioxidant capacity (32).

Vitamins

Dietary ascorbate is absorbed and distributed throughout the body within few hours. The biochemical importance of vitamin C in cosmetic is primarily based on its reducing potential, as it is required in number of hydroxylation reactions. Several hydroxylases involved in collagen synthesis require ascorbate as a reductant (23). In human skin, which is dependent on dietary vitamin C, the epidermis apparently contains approximately five fold higher levels than the dermis (28).

The major lipophilic antioxidant is vitamin E, which is collectively referred to eight naturally occurring molecules (four tocopherols and four tocotrienols), which exhibit antioxidant activity. In human skin α -tocopherol is the most abundant vitamin E analogue, followed by γ -tocopherol. Vitamin E acts as an antioxidant by scavenging free radicals which can either directly or indirectly initiate (HO^* and O^*_2) or propagate (lipid peroxy radical) lipid chain reactions (29-31). Tocopherols are important antioxidants frequently used in both food and skin care formulations. In vegetable oil their main function is to protect polyunsaturated fatty acids against oxidation during storage. In human skin they are part of the natural defense system with tocopherol being the predominant lipid soluble antioxidant in human stratum corneum. They protect cellular components such as DNA, proteins and lipids against free radicals and reactive oxygen species caused by UV radiation, pro-oxidative environments and air pollutants (31). Dietary vitamin A is available in the form of pro-vitamin A compounds e.g.: α , β -carotene and cryptoxanthin. Vitamin A generically encompasses retinol, retinal and retinoic acid. The main focus of retinoid usage in cosmeceuticals has been its role as the mythical 'foundation of youth' (i.e. reversal of photo-aging). Retinol is necessary dietary nutrient required for growth and bone development and skin keratinization.

Emollients

Emollients soften skin and moisturisers add moisture. They are used to correct dryness and scaling of the skin, fine lines and wrinkles and mild irritant contact dermatitis. The terms 'moisturiser' and 'emollient' are interchangeable as they describe different effects of these agents on the skin. Basically they have two actions:

Occlusives, which provide a layer of oil on the surface of the skin to slow water loss and thus increase the moisture content of the stratum corneum.

Humectants, which are substances introduced into the stratum corneum to increase its water holding capacity. Some moisturisers contain both occlusives and humectants (98).

Emollient preparation containing monounsaturated jojoba esters were used for cosmeceutical purpose (5). Some of these ingredients include black cohosh, soy extract, vitamin A and E. A nourishing complex containing hyaluronic acid and a revival complex containing green tea extract and glutathione

combination are available in the market for skin nourishing purpose (12).

Natural phospholipids, from lecithin, are fantastic humectants. An important benefit of phospholipids is that they are hygroscopic (attract water from the surrounding air) and hold water where an increased level of hydration is needed. Therefore, phospholipids increase the hydration levels of the skin without being occlusive. A recent study proved the value of topically applied phospholipids in skin care. It found that environmental factors (sun, wind, pollution) and the detergents and solvents, found in most skin cleansers, actually stripped the natural phospholipid content from the top layer of skin. This loss resulted in a rough feel and a pitted appearance under a microscope. Importantly, the phospholipids in the uppermost skin layers cannot be replaced by natural cell function, as the top layer of cells no longer metabolise; they serve only as a protective barrier (99).

Skin lightening actives

Skin colour results from the presence and ratio of several chromophores in the skin like oxyhaemoglobin (bright red), reduced haemoglobin (bluish red), and bilirubin (yellow) that are found in the small blood vessels of dermis (13).

A variety of skin lightening formulations are available. These formulations contain natural extracts which directly or indirectly influence the melanization process. The first and rate limiting step of melanin formation is mediated by tyrosinase. This enzyme catalyses the hydroxylation of tyrosine into 3,4-dihydroxyphenylalanine (DOPA) and the subsequent DOPA to DOPA quinone. The pharmacological inhibitors of tyrosinase or agents that target melanogenesis pathway may serve as topical inhibitors of melanogenesis resulting as skin lightening agents. Variety of skin lightening formulations are available commercially. They contain one or more different combinations of natural extractives like Arbutin (*Uvae Ursifilium*), Azelaic acid (*Malassezia*), Kojic acid (*Aspergillus Spp.*), α and β -hydroxyl acids from citrus fruits and Resveratrol (*Morus Alba*) and Liquorice (*G. Glabra*) are available (52). The synergistic action of these extracts with each other or separately in formulations could be used as an additive as skin whitening cosmetic formulations.

Skin peeling agents such as trichloroacetic acid are also used to destroy and remove skin tissues loaded with melanin (53). Sun protection measures are recommended in addition to skin lightening formulations.

Antimicrobial

Natural antimicrobials such as rosemary extract, sage extract, olive leaf extract, certain mushroom extract, spice essential oils and probiotics are also effective deodorants. Antimicrobials in cosmetic serve to address skin, hair and nail infections as well as to improve the shelf life of cosmetic formulations. In personal care formulations that target skin conditions such as acne, there is an increasing need for economical active ingredients with lesser side effects having a long history of topical use. With the increased occurrence of antibiotic resistant microbial strains and expanding knowledge of deleterious side effects associated with prolonged antibiotic use, natural ingredients including essential oils, probiotics and

botanical extracts present attractive alternatives for use as topical antimicrobials. Extract of *C. Longa*, *C. Zeylanicum*, *C. Tora*, *C. Asiatica*, *P. Corlifolia* and long chain alcohols, natural phenolic compound that inhibit microbial growth or possess bactericidal/ fungicidal properties are potential options for synthetic preservatives.

Anti-inflammatory agents

Inhibiting inflammation is an effective approach to slow or reverse the signs of aging. Olibanum, the resin from the *Boswellia* species *Boswellia Serrata* has been used as incense for centuries and is currently used as fixative in perfumes, soaps, creams, lotions and detergents. In India, the gum resin exudates of *Boswellia Serrata*, known in the vernacular as Salai Guggul, have been used in Ayurvedic system of medicine as anti-inflammatory agents. Boswellin can conveniently be used in conventional cosmetics and has a characteristic pleasant aroma that blends well into formulations (55). Liquorice (*G. Glabra*), Marigold (*C. Officinale*), Varuna (*C. Nurvala*) etc are the potent anti-inflammatory herbs that are widely utilized in inflammatory mediators such as thromboxanes, leukotrienes and prostaglandins. Coriander (*C. Sativum*) active contains petroselinic acid triglyceride which is reported to be a potent inhibitor of the enzyme topoisomerase (51).

Topoisomerase alter the structure of DNA and are implicated in the progression of several proliferative disease. Petroselinic acid is therefore potentially useful in conditions such as psoriasis (52). Umbelliferin can be conveniently blended into cosmetic formulations and does not produce side effects such as irritation or sensitization. In a study, methanol extracts of *Eucommia Ulmoides* (52%), *Evodia Officinale* (45%), and *Pleuropterus Multiflorus* (41%) showed a potent inhibitory effect on the matrix metalloproteinase-1 (MMP-1) production in ultraviolet B (UV-B) irradiated human fibroblasts. The active phytoconstituents in acubin is photoprotective and could be used as a potential agent in preventing photoaging.

Some herbs are being utilized as cosmeceuticals in sunscreen formulations because of their anti-inflammatory activity. These herbal cosmetic ingredients act directly on the basic mechanism of inflammation during or post sun exposure reactions within the skin.

Anti-irritant

Moisturizers usually incorporate emollients to soothen the skin surface by working their way into the nonliving outer layers of the skin, filling spaces between the layers and lubricating, and humectants to help skin cells absorb and retain moisture in these layers.

The plant extract also function as an anti-irritant and helps to maintain skin texture and tone. Topical applications of essential fatty acids have shown to improve hydration and elasticity and help to prevent skin breakdown. Such fatty acids are reported to function as antimicrobial agents and skin penetration enhancers (53). Recent research findings confirmed that long chain fatty acids are potential Antiaging agents as well. Topical application of essential fatty acids has been shown to improve hydration and elasticity and help in preventing skin breakdown in individuals with poor nutritional status (54). Additional evidence of the protective role of

petroselinic acid is provided by research reports wherein orally administered petroselinic acid was found to counteract the overproduction of arachidonic acid (55). The other functional ingredients include butcher's broom, chamomile, vitamin E, antioxidants Vitamin A, C, and E, Green tea and Tiare Flower, Ginko Biloba and also cucumber, calendula and alfa bisabolo. An active constituent of chamomile has been utilized to calm irradiated skin. In the eye lifting moisture cream a key ingredient aosain (an algae extract) that treats puffiness. It also protects future skin damage and helps to plump up the wrinkles.

Scope and Challenges

As discussed previously that India is the birthplace of renewed system of indigenous medicine such as Siddha, Ayurveda and Unani and enriched with flora and therefore plants have been used since ancient times for the simple remedies became popular. The physician of traditional medicine in different parts of India and local believer always tried to utilize the local plants as cosmetics for the maintenance of skin appearance, texture as well as beauty.

Following criteria are used for selection of herbal cosmetics-

- 80% of the world populations still depend on natural products.
- It is line with nature with no hazardous reaction.
- Many of these having some scientific as well as traditional evidences that are based on experimental data on animals and ethno botanical survey.
- Selection can be done easily based on recognized natural system of cosmetic by referring to well recognized, validated and well accepted books on natural system of medicines as well as cosmetics where the safety and effects are time tested.
- Selection of plants in present study is based on new claims and discoveries mentioned in the research review.

Benefits

- It helps to cleans and beautify the body without side effects.
- It normalizes the body function
- It has extreme nutritional value with high content of vitamins and minerals.
- It enhances the energy level of body.
- It stimulates the body's immune system without disturbing the natural balance of the body.
- Variety of phytoconstituents can be incorporated.

Formulation challenges

- Currently, Poor scientific justifications are available.
- More susceptible to microbial and inorganic contamination.
- Identifying substantial identity of herbs.
- Multi phytoconstituent evaluation is hard- hitting.
- Poor organoleptic properties.
- Immiscibility of extract with other ingredients.
- Appropriate values of basic pharmaceutically considered parameters like PH values, acid values and complexation of natural phyto-ingredients may change the competency of formulation.

CONCLUSION

Tremendous advances in the understanding of herbal skin cosmetic formulations and skin biology have been made over the last decades. A variety of commercial skin care formulations like skin whitening, photo protective and antiaging are available. Such available herbal formulations are serving cosmetic domain other than medicinal benefits to the skin. The new avenue of research is required for delivery of herbal cosmetically active ingredients because the skin condition research became really exciting and significant progress has been made in this field. It is expected that the paper will stimulate the research over next decade and will lead to the development of herbal actives research in cosmetic field.

REFERENCES

1. R.K. Sharma. *Charak Sambhita*. (Bhagwandas Chowkambha Sanskrit series office, Varanasi, 1988) 51-56.
2. *The Ayurvedic Formulary of India*, Part-I, (Govt. of India, Ministry of Health and Family Planning, Department of Health, 2003) 103-119.
3. *Pharmacopoeial Standards for Ayurvedic Formulations* (Central Council for Research in Ayurvedic and Sidda, Ministry of Health and Family Welfare, New Delhi, 1987) 112-113.
4. N. Kuno and M. Matsumoto. Skin Beautifying agent, Antiaging agent for skin, Whitening Agent and External Agent for the skin. *US Patent* 6682763 (2004).
5. D.J.G. Arquette. Dry Emollient Composition Composing mono-unsaturated jojoba esters. *US Patent* 6432428 (2002).
6. <http://www.internationalbusinessstrategies.com> (Accessed in March 17, 2008)
7. <http://www.sanjivaniharbals.com> (Accessed in March 17, 2008)
8. R.M. Trueb. The Value of Hair Cosmetics and Pharmaceuticals. *Dermatology*. **202**: 275-282 (2001)
9. R. Martin. Use of atleast one extract of the genus chrysanthemum for assisting skin and/or hair pigmentation. *US Patent* 6726940 (2004)
10. H. Dureja, D. Kaushik, M. Gupta, V. Kumar and V. Lather. Cosmeceuticals: An emerging concept. *Indian J. Pharmacol.* **37**: 155-159 (2005).
11. M.J. Teneralli. Traditional Skin Care Lines: Improving looks with dietary supplements. *Neutraceuticals World*. **7**: 74-80 (2004).
12. Y. Kurata. New Raw materials and technologies in cosmetics: Properties and applications of plant extract complexes. *Fragr. J.* **22**: 49-53 (1994).
13. A.M. Klingman. Hydrating injury to human skin. In: P.G.M. Vander Valk, H.I. Maibach, Eds. The irritant contact dermatitis syndrome. CRC press Inc, Boca Raton; 187-194 (1996).
14. L.H. Klingman and A.M. Klingman. Petrolatum and other hydrophobic emollients reduce UV-A induced damage. *J. Dermatol. Treatment*. **3**: 3-4 (1992).
15. J.J. Etienneand and J.L. Pham. New and unexpected cosmetic properties of perfumes. *Int. J. Cosmetic Sci.* **22**: 317-328 (2000).
16. M.Y. Lee, K.S. Park and C. Hayashi. Effect of repeated short term skin contact with proteolytic enzymes. *Contact. Dermatitis*. **46**: 75-80 (2002).
17. W.P. Smith. Barrier disruption treatments for structurally deteriorated skin. *US Patent* 5720963 (1998).
18. K. Briviba and H. Sies. Nonenzymetic antioxidant defense system. In: B. Frei. Eds *Natural Antioxidants in Human Health and Disease*. Academic Press, New York; 9-11 (1994).
19. H. Sies. Introductory remark. In: Sies H. Eds. *Oxidative Stress*. F.L. Academic Press, Orlando; 1-7 (1985).
20. H. Sies. Biochemie des oxidativen streb. *Angew Chemie*. **98**: 1061-1075 (1986).
21. J.G. Morilli and D. A. Norris. Influence of inflammatory mediators and cytokines on human melanocyte function. *J. Invest. Dermatol.* **100**: 191S-195S (1993).
22. W.B. Lo and H.S. Black. Inhibition of carcinogen formation in skin irradiated with ultraviolet light. *Nature*. **246**: 489-491 (1973).
23. W.B. Dunham, E. Zuckerandl, R. Reynolds, R. Willoughby, R. Marcuson, R. Barth and L. Pauling. Effects of intake of L- ascorbic acid

- on the incidence of dermal neoplasms induced in mice ultraviolet light. *Proc. Natl. Acad. Sci.* **79**: 7532-7536 (1982).
24. D.L. Bissett, R. Chatterjee and D.P. Hannon. Chronic Ultraviolet radiation induced increase in skin iron and the photoprotective effects of topically applied iron chelators. *Photochem. Photobiol.* **54**: 215-223 (1991).
 25. S.K. Katiyar, N.J. Korman, H. Mukhtar and R. Agrawal. Protective Effects of Silymarin against photocarcinogenesis in mouse model. *J. Natl. Cancer Inst.* **89**: 556-559 (1997).
 26. Z.Y. Wang, R. Agrawal, D. Bickers and H. Mukhtar. Protection against Ultraviolet- B radiation- induced hairless mice by green tea polyphenols. *Carcinogenesis*. **12**: 1527-1530 (1991).
 27. H.S. Black, N.J. Lowe and C.N. Hensby. Role of reactive oxygen species in inflammatory process. *Pharmacology and the skin*. **2**: 1-20 (1989).
 28. S. Englund and S. Seifter. The Biochemical Function of Ascorbic Acid. *Annu. Rev. Nutr.* **6**: 365-406 (1986).
 29. Y. Shindo, E. Witt, D. Han, W. Epstein and L. Packer. Enzymic and nonenzymic antioxidants in epidermis and dermis of human skin. *J. Invest. Dermatol.* **102**: 122-124 (1994).
 30. H. Sies, W. Stahl and A.R. Sundquist. Antioxidant functions of vitamins. *Ann. NY Acad. Sci.* **669**: 7-20 (1992).
 31. M.G. Traber and H. Sies. Vitamin E in Human Demand and Delivery. *Ann. Re. Nutri.* **16**: 321-347 (1996).
 32. M.S. Ashawat, S. Saraf and S. Saraf. Flavonoids: A nutritional protection against oxidative and UV induced cellular damages. **1**: 130-140 (2007).
 - A. Jari, A. Ann-Charlotte and L. Christer. Cosmetic emollients with high stability against photooxidation. *Lipid Technology*. **18**: 226-230 (2006).
 33. S. Gonzalez and M.A. Pathak. Inhibition of UV induced formation of reactive oxygen species, lipid peroxidation, erythema and skin sensitization by *polypodium leucotomos*. *Photodermatol Photoimmunol. Photomed.* **12**: 45-46 (1996).
 34. S. Gonzalez, M.A. Pathak and J. Cuevas. *polypodium leucotomos* prevents acute sunburn and psoralen induced phototoxic reactions as well as depletion of Langerhans cells. *Photodermatol Photoimmunol. Photomed.* **13**: 50-60 (1996).
 35. H.I. Gensler, B.N. Timmermann and S. Valcic. Prevention of Photocarcinogenesis by topical administration of pure epigallocatechin gallate isolate from green tea. *Nutr. Cancer*. **26**: 325-335 (1996).
 36. E. Bangha, P. Elsner and G.S. Kistler. Suppression of UV- induced erythema by topical treatment with melatonin, influence of the application time point. *Dermatology*. **195**: 248-252 (1997).
 37. E. Bangha, P. Elsner and G.S. Kistler. Suppression of UV- induced erythema by topical treatment with melatonin, A Dose response study. *Arch. Dermatol. Res.* **288**: 522-526 (1996).
 38. H. Hamanaka, Y. Miyachi and S. Imamura. Photoprotective effects of topically applied superoxide dismutase on sunburn reaction in comparison with sunscreen. *J. Dermatol.* **17**: 595-598 (1990).
 39. L. Montenegro, F. Rigano, S. Giogilli and S. Sirigu. Protective effect evaluation of free radical scavenger on UV-B induced human cutaneous erythema by skin reflectance spectrophotometry. *Int. J. Cosmet. Sci.* **17**: 91-103 (1995).
 40. K. Katsuta. New raw material and Technologies for cosmetics, ROD extractive *Bifidus*. *Frag. J.* **24**: 118-123 (1996).
 41. H. Kakegawa, H. Matsumoto and T. Satoh. Inhibitory effects of some natural products on the activation of hyaluronidase and their antiallergic actions. *Chem. Pharm. Bull.* **40**: 1439-1442 (1992).
 - A. Knaiat. Botanical extracts. In: P. Elsner, H.I. Maibach eds. *Cosmeceuticals*. Vol 23: Marcel Dekker, Bhetsa; 97-101 (2000).
 42. K.K. Lee and J.D. Choi. The effect of *Areca Catechu* L. extract on antiinflammation and antimelanogenesis. *Int. J. Cosmet. Sci.* **21**: 285-297 (1999a)
 43. K.K. Lee and J.D. Choi. The effect of *Areca Catechu* L. extract on antiinflammation and antimelanogenesis. *Int. J. Cosmet. Sci.* **21**: 275-284 (1999b)
 44. M. Ito, H. Tanaka and H. Kojima. New raw materials and new technologies in cosmetic. *Frag. J.* **22**: 38-42 (1994).
 45. P.A. Balch and I.F. Balch. In: Prescription for nutritional healing. 3rd ed. Vonore Avery Publishing group, NY, 63-67 (2000).
 46. L. Petit and G.E. Pierard. Skin lightening products revisited. *Int. J. Cos. Sci.* **25**: 169-181 (2003).
 47. M. Majeed. Novel natural approaches to anti-aging skin care. *Cosmetics & Toiletries Manufacture worldwide*. **1**: 1-5 (2005).
 48. S. Naish, C.J. Cooksey, A.M. Later, C.I. Jhonson and P.A. Riley. In Vitro assessment of the structure activity relationship of tyrosinase dependent cytotoxicity of a series of substituted phenols. *Melanoma Res.* **1**: 273-287 (1991).
 49. M. Majeed. Fighting acne and more: effective natural approaches to skin care. *Cosmetics & Toiletries Manufacture worldwide*. **1**: 215-219 (2004).
 50. Y. saks and G.R. Barkai. *Aloe Vera* gel activity against plant pathogenic fungi, post harvest. *Biol. Technol.* **6**: 159-161 (1996).
 51. S.E. Dal'belo. L.R. Gaspar Maia and P.M. Campos. Moisturizing effect of cosmetic formulations containing *Aloe Vera* extract in different concentrations assessed by skin bioengineering technique. *Skin. Res. Technol.* **12**: 241-246 (2006).
 52. K.K. Lee, J.J. Choi, E.J. Park and J.D. Choi. Antielastase and antihyaluronidase of phenolic substance from *Areca Catechu* as a new Antiaging agent. *Int. J. Cosmet. Sci.* **23**: 341-346 (2001).
 53. Y.H. Guo Luo and Z.D. Jia. Comparison of constituents between raw *Psoralea Corylifolia* L. and Processed. *J. Chines medicinal material*. **29**: 1142-1144 (2006).
 54. S. Shahanaz and V. Agrawal. In- Vitro propagation and extraction of psoralen from *Psoralea Corylifolia* L- An endangered and rare traditional medicinal herb. *World Congress on In Vitro Biology*. 2117 (2007).
 55. S. Nakamura and M. Yoshikawa. Bioactive constituents from Chinese natural medicines. XX Inhibition of antigen-induced degranulation in RBL-2H3 cells from the seeds of *Psoralea Corylifolia*. *Chem. Pharm. Bull.* **55**: 106-110 (2007).
 56. J.H. Sampson, A. Raman, G. Karlsen. And I.M. Leigh. In- Vitro keratinocyte antiproliferant effect of *Centella Asiatica* extract and triterpenoid saponins. *Phytomedicine*. **83**: 230-235 (2001).
 57. C.D. Anthony. International Cosmetic Exp 2000 on functional botanicals- their chemistry and effects, Miami, florida. *USA* (2000).
 58. D.N. Guhabaksi, P. Sensharma and D.C. Pal. A Kexicon of medicinal plants. Calcutta Press. India. 146-149 (1999).
 59. R.L. Ram. Advance in plant science. New Delhi, India. 1-49 (2004).
 60. M.S. Ashawat, S. Saraf and S. Saraf. Antioxidant activity of skin care herbal cosmetic cream and lotion. *Plant Archieve*. **7**: 685-687 (2007).
 61. T.K. Acharya and B. Chatterjee. Isolation of Chrysophanic acid-9 anthronethe major antifungal principle of *C. Torra*, conference at lloydia (Cincinnati) **35**: 218-220 (1975).
 62. P. Fidler, C.L. Loprinzi and J.R. O'Fallon. Prospective evaluation of Chamomile mouthwash for prevention of 5-FU- induced oral mucositis. *Cancer*. **77**: 522-525 (1996).
 63. L.E. Marteli and M. Beradesca. Topical formulation of new plant extract complex with refering properties. *Int. J. Cosmetic. Sci.* **22**: 201-206 (2000).
 64. B.S. Shetti, S.L. Udupa, A.L. Udupa and S.N. Somayaji. Effect of *Centella Asiatica* L. (Umbelliferae) on normal and dexamethasone suppressed wound healing in wistar albino rat. *Int. J. Low. Extrem Wounds*. **5**: 137-143 (2006).
 65. C.L. Salas, M.M. Fernandes and A.M. Martinez. Topical chemotherapy for the treatment of burns. *Rev Enferm.* **28**: 67-70 (2005).
 66. L. Lu, K. Ying, S. Wei, Y. Fang, Y. Liu, L. Ma and Y. Mao. Asiaticoside induction for cell cycle progression, proliferation and collagen synthesis in human dermal fibroblasts. *Int. J. Dermatol.* **43**: 801-807 (2004).
 67. T. Aburjai and F.M. Natsheh. Plants used in cosmetics. *Phytotherapy Research*. **17**: 987-1000 (2003).
 68. Y. Hara. Antioxidative action of tea polyphenols: Part-1. *Am. Biotechnol. Lab.* **12**: 48 (1994).
 69. M.G. Hertog, E.J. Feskens, P.C. Hollman, M.B. Katan, and D. Kromhout. Dietary antioxidant flavonoids and risk of coronary heart disease: the Zutphen Elderly study. *Lancet* **342**: 1007-1011 (1993).
 70. M. Hirose, T. Hoshiya, K. Akagi, M. Futakuchi. Inhibition of mammary gland carcinogenesis by *Green Tea* catechins and other naturally occurring antioxidants in female Sprague-Dawley rats pretreated with 7,12- dimethylbenzo[alpha] anthracene. *Cancer Lett.* **83**: 149-156 (1994).
 71. A.C. Dweck. Talking Terminalia. *Soap, Perfumery and Cosmetics*. **67(10)**: 63-64 (1994).
 72. D.M.A. Jayaweera. Medicinal plants used in Ceylon Part 2. National Science Council of Shri Lanka. Colombo. 15-20 (1980).
 73. V. Clare. Bostock Wood: Trees in society in reral Karnataka, India (Overseas development Administration. National Resources Institute, in association with Karnataka Forest development, India. ISBN No. 0-902500-47, 1992).

74. R.C. Wren. New Cyclopaedia of botanical drugs and preparations. 8th impression (Published C.W. Daniela Co. Publication, Essex England) 7: 09-13 (1985).
75. V.E. Tyler, L.R. Brady and J.E. Robbers. Pharmacognosy. 9th ed. Lea & Febier, Washington Square, Philadelphia. 11-14 (1988).
76. R.N. Chopra, S.I. Nayar and I.C. Chopra. Glossary of Indian Medicinal Plants (Publication and information Directorate CSIR, New Delhi) 89-120 (1956).
77. S. Bunney. The illustrated book of Herbs. Octopus book Incorporation, London. 6-9 (1984).
78. R.C. Wren. Potters New Encyclopedia of botanical drugs and preparations (eds. C.W. Daniels). ISBN 0-85032-009-7. 111-113 (1985).
79. W.C. Evans. Trease and Evans. Pharmacognosy. 13th Ed. (Balliere Tindall Publication, London, 1998) 9-13.
80. Martindale. The Extra Pharmacopoeia (Eds by Reynolds, Royal Pharmaceutical Society, London, 1989) 210-216.
81. V.E. Tyler, L.R. Brandy and J.E. Robbers. Pharmacognosy. 9th Ed. (Lea and Febiger, Washington Sqyarre, Philadelphia, 1988) 1-4.
82. D. Keys. Chinese Herbs- Their Botany, Chemistry and Pharmacodynamics. Charles E. Tuttle. Rutland. USA. 65-69 (1976).
83. J.M. Watt and M.G. Breyer-Brandwijk. The Medicinal and Poisonous Plants of Southern and Estern Afica. E and S Livingstone Ltd. London. 11-13 (1962).
84. Council of Europe. Plant preparations used as ingredients of cosmetic products, 1st Ed. Strasbourg, HMSO. ISBN No 92-871-1689-X. 13-48 (1989).
85. S. Abayomi. Medicinal Plants and Traditional Medicine in Africa. (New York: John Wiley and Sons Ltd, 1982) 11-17.
- A. Jari, A. Ann-Charlotte and L. Christer. Cosmetic Emoilents with high stability against photo-oxidation. *Lipid Technology*. **18**: 228-232 (2006).
86. D.N. Guhobakshi, P. Sensharma and D.C. Pal. A lexicon of Medicinal Plants in India. (Vol 1, Calcutta, India, 1999) 512-517.
87. J.L. Funk, J.N. Oyarzo, J.B. Frye, G. Chen, R.C. Lantz, S.D. Jolad A.M. Solyom and B.N. Timmermann. Termeric Extracts containing Curcuminoids prevent experimental rheumatoid arthritis. *J. Nat. Prod.* **69** (3): 351-355 (2006).
88. K. Somia, R. Saeed Ur, U. Hamid, A. Waqar and A. Manzoor. Biological effects of indigenous Medicinal Plants *C. Longa* and *A. Galanga*. *Fitoterapia*. **76**: 254-257 (2005).
89. D.N. Guhobakshi, P. Sensharma and D.C. Pal. A lexicon of Medicinal Plantsin India. (Vol 1. Culcutta, India,1999) 409-411.
90. C.F. Leye. Herbal Delights. Faber and Faber. ISBN 0-571-14850-6. 7-22 (1987).
91. M.S. Ashawat, S. Saraf and S. Saraf. Cosmetic Potentiality of Plant Extracts and Natural Oils. *Biosciences Biotechnology Research Asia*. **3** (1a): 181-188 (2006).
92. .S. Ashawat, S. Saraf and S. Saraf. Sunscreen Properties of Natural Skin Care Lotion. *Plant Archiev*. **6** (1): 253-256 (2006).
- A. Sandra, S.D. Shenoj and C.R. Srinivas. *Contact Dermatitis*. **34**: 69-72 (1996).
93. R. Tisserand. The Art of Aromatherapy. C.W. Daniel and Co. Ltd. NYW. 109-128 (1987).

Skin Care Natural Tips. Skincare service. Formula Botanica. Higher education. Natural Home Made Skin Care Recipes. Health & wellness website. Swiftcraftymonkey. Blogger. Natural Skincare Consultancy. Product/service. Making Skincare.Â Learn Cosmetic Formulation. 13 January Â. Did you resolve this year to learn how to create your own formulas or understand better how to create bath and body products? Are you thinking of taking a course? Do you want to make gorgeous anhydrous, all-natural, potentially organic whipped body butters, body oils, facial sera, lip balms, and lotion bars like these? General Cosmetic formulation lists. Cosmetic Bench Reference Â€ A list of hundreds of supplier formulas searchable by type, ingredient trade name and more. Suppliers for all materials included. Requires registration. C & T 2008 Skin Care formulary Â€ Formulas for creams, lotions, cleansers, and masks. C & T 2006 C&T Skin formulary Â€ Formulas for creams, lotions, cleansers, and masks. Happi formulary Â€ Wide range of formulations from suppliers of cosmetic raw materials. Also some formulation of household products if youâ€™re looking for that. No registration required. The Six Biggest Skin-Care Trends and Innovations Coming in 2019. All the best technology, ingredients, and ideas to watch for this year. By Sarah Kinonen. January 12, 2019. Courtesy of brands. There's no denying it: Last year was a huge moment for skin care. However, it's even clearer that 2019 is bound to be bigger, better, and tech-ier than ever. Here, Allure's skin-care editor Sarah Kinonen breaks down the ingredients, tools, and trends that you need to know.Â "Let's think of glycolic acid [and AHA] like a thumbtack," Joshua Zeichner, the director of cosmetic and clinical research in dermatology at Mount Sinai Hospital in New York City, previously told Allure. "If you step on the thumbtack, even though it's little, it's going to hurt, right? Now, let's think of a bed of nails or thumbtacks.