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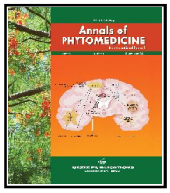

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A review on recent scenario of herbal cosmetics

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Abstract

Humans have utilized herbs for a number of purposes, such as food, medication and cosmetics. Cosmetic is a translation of the word "kosm tikos" in Greek, which signifies having the ability to plan and decorate. Cosmetics are a group of cosmetics and health products utilized to improve and may alter someone's appearance and additionally care for the body and face parts. In almost every civilization on earth, cosmetics have such a tradition that spans more than 7,000 years. It is clear that the beauty business has done an amazing job at influencing our minds' perceptions. India now counts among the developing nations that has the fastest-growing cosmetic industries with each passing year. The Indian cosmetics industry registered revenues of more than 350 billion rupees in 2009, despite the global economic downturn. Soaps, creams, and sunscreens are a few of the common cosmetics. Despite the fact that a sizable portion of the world's population views cosmetics as a boon, cosmetics do carry some danger and toxicity. Some of the most recent trends in cosmetics include releases based on biological stimuli, Circular Economy, and *in vitro* modeling for cosmetics. The category of cosmetics known as "hypoallergenic" can be characterized as those that, when compared to other cosmetic formulas, tend to cause fewer allergic reactions. FDA was affirmed by the court despite claims from the two companies that it lacked the authority to impose the regulation. Subsequently, the United States Court of Appeals ruled that cosmetic businesses may continue to use the phrase "hypoallergenic" on their labels. Those with sensitive skin and hair may have fewer severe allergic reactions thanks to the labeling process. It is clear that cosmetics play a significant part in daily life and are utilized by people of all sexes, resulting in a rise in cosmetic usage.

1. Introduction

Among the category of medical, similarly cosmetic goods which were also utilized to improve or improve, taking care of one's face and physique is important, as is how they seem. In addition to being used to making one look better, cosmetics must also be accustomed to caring for one's skin and body and to add fragrance. There are many different forms of cosmetics with distinct and important purposes, even though cosmetics are typically associated with skin and body care.

In daily life, cosmetics are used by people of many different ethnicities and civilizations. The ability to express oneself creatively; the importance of self-identity are said to be the main drivers of cosmetics present popularity. The primary purpose of makeup is to provide the user with a fresh, presentable appearance. Despite the enormous popularity of the cosmetics business, many Western Nations still view cosmetics as little more than simple makeup. The US FDA plainly declared that cosmetics items that are primarily meant for use in the body of humans change appearance, encouraging beauty, cleanliness and either enhancing rather than endangering the building or functionality of the body" (Garg, 2018; Surya and Gunasekaran, 2021).

Bark, leaf, flowers, roots, fruits, and seeds are only a few of the plant's many components that contain bioactive substances. As a result, plants play an important role in cosmetology and are directly used by the majority of civilizations to treat a variety of illnesses. As they are less expensive, have fewer side effects, and are an excellent source for a safe future, plant-based goods are becoming more and more popular (Sharma and Alam, 2022). Plants have long been recognised as potential sources of a wide range of chemical molecules known as phytochemicals (Kumari *et al.,* 2022). Herbs and spices are among the various useful foods that include a plethora of bio-functional molecules, and they are typically used as preservatives and flavoring enhancers (Balyan, 2022). The region of the Himalayas is the epicentre of several herbal plant species (Gurav *et al.,* 2022). Natural pigments are very important economically since they are more advantageous and have important characteristics like anticancer and antioxidant Plants produce phytochemicals to protect themselves from microbial invasions, and they can be used therapeutically in pharmaceutical and nutraceutical products (Pandhi *et al.,* 2022).

1.1 History

There is a past to cosmetics. That stretches spanning over 7,000 years and has a presence in almost all historical civilizations. The

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use of cosmetics in body art is said to be the first known type of human ritual. Using red natural colorants and coloring books connected to the appearance of the Homo beings are in Africa regarded as definitive proof of the aforementioned claim. The Old Testament makes reference to cosmetics in 2 Kings 9:30, when Delilah painted her eyelids around 840 BC, and the book of Ester details a number of cosmetic procedures. These historical facts are mentioned in 2 Kings 9:30 of the Bible's Old Testament.

Although, cosmetics were not popular in Rome, certain wealthy Romans at the time did use them. It has been discovered that some Romans created cosmetics in the past. For example, eye lining was done with kohl.

An unnamed American made the cosmetic discovery of deodorant in 1888, and Mom became the brand name for the product. Also, after 1900 AD, people still did not accept cosmetics. Aerosol deodorant and roll-on deodorant first appeared on the market in 1952 and 1965, respectively.

At some time in 1910, both colored cosmetics and Russian ballet were first performed. It should be mentioned that modern cosmetic businesses began producing products somewhere in the early 1900s.

Japan is the world's second-largest market for cosmetics, and the industry has reached a stable period. On the other hand, the market scenario is changing quickly. In the present era, anyone can quickly and easily get knowledge about numerous cosmetics for various purposes. This helps to create new work opportunities in the cosmetics business. The expansion of the cosmetics sector is, however, somewhat erratic. 2010 had little change, but between 2004 and 2012, Russian perfumery saw the most growth, growing to a value of US$13.5 billion (Surya and Gunasekaran, 2021; Marcia *et al.,* 2019; Burlando *et al.,* 2010; Reshetnikov *et al.,* 2021).

2. Commercialization of beauty idea

Greed has no limits because someone with a certain skin tone and hair type wants to emulate that individual as a role model. But, a humorous side might be shown whenever the "mentor" still aspires to perfection. Commercialization is the fundamental cause of this unhappiness with us. Commercialization is carried out in a way that lessens discontent with our physical attributes. Hence, it is evident that the beauty industry has done an incredibly magnificent job of brainwashing our thoughts.

3. Manufacturing of cosmetics in India

The growth of the Indian cosmetics industry from 2006 to 2008 was 7.48%. Although, the significant rise is attributed to consumers' increased fashion awareness and money supply, the industry was anticipated to retain its development momentum from 2009 to 2012. It should be mentioned that the media is crucial in helping Indian customers become aware of fashion.

The majority of Indian cosmetics manufacturers currently serve the home market, although they are slowly gaining ground in other markets. Recently, orders from foreign markets have been placed with Indian cosmetic manufacturers, India's Cosmetic Industry (Mohiuddin, 2019). The expansion of Indian beauty products during the years 2006 to 2008 in the past ten years, there have been many international companies that have entered the Indian cosmetics business, which has historically been dominated by some large Indian competitors like Ponds and Lakme. According to a study of the market, the components of the Indian cosmetics market: skin care, hair care, colour perfumes, cosmetics, and dental worry were valued at 3.5 billion dollars during 2008 and are projected to increase by around 7% annually. There are several herbal cosmetics brands available in the Indian cosmetics market, including forest important, Himalayan Biotique, Blooming Louts, Kochhar, and Dabur. India has emerged as among the developing nations having significant development in the cosmetics industry.

The Indian cosmetics industry registered revenues of more than 350 billion rupees in 2009, despite the global economic downturn. Cosmetic manufacturers spend a lot of money, especially in India, on marketing and other kinds of advertising efforts (Mohiuddin, 2019).

4. The significance of cosmetics

One can improve one's appearance by using cosmetics. Cosmetics have been around for many centuries. The first nation to use cosmetic treatments is Egypt. According to ancient Egyptian history, the major cosmetics used were materials for producing a nice odor or eye coloration. In the modern day, both men and women have developed fashion tastes and a concern for their physical appearance. Cosmetics are produced in either a sensitive or natural form to satisfy user needs. The main goal of cosmetics is often thought to be to increase a person's self-confidence and contentment with their appearance. It ought to additionally be able to make an impression on other people. Eye shadows, lotions, antiageing products, lipstick, nail polish, and scents are all popular cosmetics right now. Lipstick, nail paint, and face cream formulations are used to enhance the coloration and brightness of the applied portion. They are produced with the right amount of wax and cocoa butter. These formulations are semi-solids made besides using fatty bases such as wax and coconut oil. Because of their cleansing properties, certain formulations such as gels, creams, and colognes are frequently used in everyday life, regardless of gender. Antiageing creams primary goal is to slow down skin oxidation and promote a young appearance. As well as cleansing cream, soap and water are regarded as necessary cleaning agents. For dry, rough skin, cosmetic creams act as a skin food; cream-based cosmetic preparations are applied to the skin. Some common fat creams.

Lipstick, nail polish, and face cream formulations are used to enhance the coloration and whiteness of the application. Dry creams are used as a basis for the skin for the production of soap and gelatin. Teenagers frequently use hair oils and gels, which has made the global hair care business one of the top producers. Huge amounts of moisturizers, shampoos, and herbal oils are created to prevent dandruff and lice. Jobs in the film industry typically place more emphasis on creating an attractive exterior. The finest film professionals mostly concentrate on visual glamour, which may be achieved by consistently using a wide variety of cosmetics. These musicians employ. Lipstick, nail polish, and face cream formulations are used to enhance the coloration and whiteness of the application. Cosmetics did not have a dedicated method to shield hair and skin from damaging ultraviolet rays in the medieval ages. When the weather is hot, such as in the late afternoon and summer, the sun emits ultraviolet rays. But thanks to significant scientific advancements, new formulations have been developed recently that use a particular technique to defend the skin from ultra violet sunrays. Either reflects or absorption into the deep skin can

be the process. As a consequence, the sun also aids in delaying the ageing process of the skin. The accountability for the specific aim also grows with time as the group of cosmetics becomes more broad.

Despite the fact that a sizable portion of the world's population views cosmetics as a boon, cosmetics do carry some danger and toxicity. Since a large population uses cosmetics frequently, safety should be guaranteed and included in the products while they are being created. Moreover, excessive use of cosmetics can have hazardous and long-lasting negative effects, some of which may even be permanent. Safety concerns.

The following are a few safety issues that may be connected to personal care items and cosmetics:

- Scrapes and irritated skin around the eyes.
- Pollution of goods made outside of the United States.
- Intolerance to product ingredients or allergic reactions to such ingredients.
- Bacteria's dispersion on the dermal surface.
- Fire risks in regard to aerosol goods.

The effects of cosmetics cannot last longer than a certain amount of time. Several regulatory authorities, including the US FDA, suggest washing off the chemical before bed.

Measures for Safer Usage By taking the measures listed below, you can ensure the safety of the cosmetics:

A first step at comprehending safety includes understanding basic ingredients utilized in cosmetics. These databases allow for searches based on the manufacturer, product, product name, and even brand name. A hazard key score, which ranges from 1 to 10, can be used to display the degree of risk associated with the components in a particular cosmetic product. The relationship between the product's safety and the key risk score is inverse. Data about the relationship between an ingredient and a certain disease or ailment is provided by database programmes like the technology is developing (California Safe Cosmetics Program Product Database) is safety testing.

When producing cosmetic products, the cosmetics industry must adhere to USFDA regulations. The US Food and Drug Administration (USFDA) advise firms to use cosmetics evaluation tests. Yet, it is not absolutely necessary. It should be mentioned that a cosmetic product should be labeled with a notice that product safety testing has not been done if the industry does not analyze the product's safety. A product must bear a label stating that it has not undergone safety testing. D and C (drug and cosmetic), FD and C (food, drug and cosmetic), or external D and C may also appear after the identification of a colour, as in D and C Red No. 36. These substances are most commonly referred to as colour additives. Only skin-applied medications and cosmetics are permitted to employ external D and C. FD and C colour is permitted for use in foods, pharmaceuticals, and cosmetics while D and C colour is only permitted to be employed in drugs and cosmetics. FD and C is used on a wide range of products, including food, medicine, and cosmetics. D and C versus external D and C differ in that they use different pharmacological and cosmetic compositions. The colour additive's use of the word "external" residues and parabens are two chemicals often utilized for safety, and phthalates are the two widely used chemicals for increasing the safety of cosmetic items. Phthalates are used in a wide variety of cosmetics production formulas. Phthalates can be safely used in cosmetic preparations, according to a number of reviews and research investigations. This substance is employed in perfumes for its fixative properties in addition to its function as a solvent. Furthermore, phthalate is used in nail polish to stop it from cracking after application. Phthalates are used in hair spray formulations to avoid stiffness. It is believed that parabens are not as safe as phthalates. Considering that some evidence suggests a link between parabens and breast cancer. Parabens are mainly used for antimicrobial purposes. This chemical is used within the specified limit by minimizing the possible toxicity of the product (Bhuvaneswari and Chandan, 2018).

5. Latest trends in cosmetics

The state of science is improving every hour. The science of dermatology, trichology, and other fields is being used make advancements in aesthetic technology. Some recent advancements in cosmetic technology are listed below.

5.1 Better ageing as the new antiageing

The currently being developed cosmetic products are anti-aging creams. Among the most recent inventions in human history is anti-aging creams. Antiageing cream has a special activity that makes it a possible area of research for scientists. There are many ways to slow down the ageing process of the skin, including chemical peeling and laser resurfacing. Natural hydrogel is frequently used as a dermal filler to minimize wrinkles. Doctors are still trying to figure out what antiageing really means. Antiageing refers to a race against time, because ageing is a phrase that becomes worse over time. Yet, it should be understood that antiageing cosmetics do not always target specific issues. This is so because it is unlikely that cosmetics will alter the brain. Life expectancy has greatly increased thanks to incredible advances in medical research. So, a healthy strategy can be used to stop or slow down every ageing process, including changes in diet, sleep patterns, and many others. Although, it is believed that mindfulness slows down the ageing process, this effect is not particularly significant. Asians have been engaged in the practice of mindfulness for many years.

5.2 Cosmetic *in silico* modeling

The hottest cosmetic technology trend right now is artificial intelligence. Using *in silico* modeling, the toxicity of a specific cosmetic preparation might be foreseen prior to production. Artificial intelligence and genomics can be used to investigate new classes of naturally occurring bioactive peptides for targeted distribution. According to Charles Darwin, evolution was essential in introducing possible benefits for mankind. It is possible that this flora or animal source has amazing healing abilities. The quest for hidden magical characteristics in creatures of all kinds is made easier by the use of AI. Targeting, predicting, and unfolding are the three primary steps in the search process. Artificial intelligence can read through research papers at a rate of about 10,000/day. As compared to the speed of the human brain, this is a very large increase. When this artificial intelligence is merged with genomics, the compound containing the required biological activity can be identified in a shorter period of time. When this machine learning and genomics are combined, it takes less time to identify the chemical that has the necessary biological activity. The peptide potential can be unlocked by using

this technology, which is essential for bringing it to life. The structure-activity relationship can be derived with the aid of this artificial technology (SAR). This phenomenon aids in the production of a specific chemical without activity loss. By using QSAR, deeper learning can be accomplished (quantitative structure-activity relationship).

5.3 Circular economy

The modern strategy in the cosmetic industry maintains sustainability by properly processing byproducts of natural origin, trailed by wasted food and other crop residues into active pharmaceutical ingredients in cosmetics. By improving waste management and generating a carbon footprint for each ingredient used in cosmetic products, the cycle of product development may be maintained.

By maximizing natural byproducts as well as other food waste through recycling, numerous applications can be gained. Suppliers of components for cosmetic preparation view this action as a sustainable decision. For instance, flavonoids from citrus fruit rinds and polyphenols from olive waste.

5.4 Based on biological cues and release

The positively charged layers of artificially layered dual hydroxide clays have the ability to balance charges at the interlayer junction. Excellent safety, beta biocompatibility, and a programmable chemical composition are a few advantages of this kind of clay. As a reason, it is frequently employed as a drug release controller. This is an implied process in the creation of medicines like antibiotics and amino acids, among others. This kind of component is used as rheological modifiers, absorbents and mattifying agents. The phytoconstituent loading for skin or hair care is particularly good, packing more than 48% weight-for-weight. Lately, excipients of this type have been employed to release antiperspirants based on biological reaction. Thus, the antiperspirant is promptly released.

These substances are used in the release of plant metabolites and additives in cosmetic formulation.

5.5 Non-invasive, comprehensive skin research

Wearable technology is used in a number of therapeutic applications. This kind of wearable technology can support non-invasive skin research. This aids in providing *in vitro* and *in vivo* outcomes that are repeatable. Using wearables allows for non-destructive sampling.

Wearable technology has the same level of precision and accuracy as mass spectroscopy and other analytical methods that involve taking intrusive skin samples. Watching the well-being and accomplishments of athletes in various sports makes excellent use of this type of technology. It aids in the monitoring of the electrolyte content of perspiration generated by athletes through cosmetic technology. This makes it easier to tailor cosmetic preparation based on the sport.

Further study in this area contributed to the creation of technology that can analyze an individual's sweat to determine its chemical composition. This aids in the prediction of microbial illness, which can be avoided by using a particular class of cosmetics. This can aid in identifying the skin's microbiome's flora and fauna. Hence, cosmetic

5.6 Microbiomic research in the creation of cosmetic products

Understanding contemporary approaches and developments in microbiomic sciences is necessary to comprehend cosmetic preparations linked to microbiology. With advancements in the domains of genetics, biogenomics and pharmacogenomics, the significance of the human microbiome is now widely acknowledged.

A person needs to have a solid understanding of the range of corresponding flora and fauna in order to apply cosmetics correctly. The world's population needs to be aware of the hidden connection between two significant factors, the dermal microbiome and beauty.

The aforementioned claim unequivocally states that a person cannot become beautiful on their own through the use of cosmetics for external use. The total effectiveness of such cosmetic products can also be improved by using some food products, such as probiotics and prebiotics. They influence the formation of good bacteria and aid in the degeneration of harmful microorganisms that are harmful to human bodies. The human body's microbiome is now moving towards the zone of balance.

Several advantages, including improved skin health and fairness, are offered by this kind of strategy. It is evident that the positive consequences for the human organism are almost limitless when the skin and gut microbes are nurtured. For instance, a prodrug route can be started, and when it comes into contact with a particular microorganism enzyme, it can biochemically turn into an active drug. This dimensional strategy can lessen any potential harm that active medication may provide by aiming at houses. Nutricosmetics is currently not just about creams, ointments, and gels. This makes skin care products for a whole future group more effective and long-lasting. This strategy can only be implemented by combining dietary and cosmetic factors.

The range of nitrocosmetics' effects is wide. As a result, even if nutricosmetics is designed for facials, it will nevertheless have an impact on the condition and wellbeing of hair and also nails by supplying the right nutritional balance.

Some cosmetic products for topical use have chances of going beyond the regional limit of dermal layers. But, the precision of nutricosmetics is higher when compared (Vermer and Glichrest, 2020; Nomakhosi and Heidi, 2018)

6. Nutricosmetics

Nutricosmetics is the term used to describe the category of supplements that aid in the upkeep and improvement of the nutrition of the skin. Various micronutrients and macronutrients are thought to process this occurrence, according to studies.

The following instances illustrate the goal of nutricosmetics:

- A number of micronutrients, including beta carotene and omega 3-fatty acids, not only support healthy skin but also, to a lesser extent, healthy hair.
- Ascorbic acid aids in the reduction of free radicals, hence enhancing the antioxidant action. Even skin care products are divided into different markets based on the year, location, intended use, and type of therapy, as well as the degree of targeting. The market for nitrochemics is expanding as the benefits and targeting capabilities increase. The prevalent pattern

6.1 Demands for growing nutricosmetics

- Growing motivation to "age well and look well".
- Increased desire to use antiageing products and the emergence of the spa culture.

- Consistent scientific evidence of the main elements.
- Finding an appropriate method to preserve beauty among the ageing population.
- Increase in demand for particular useful products and substances.
- More knowledgeable about the usage of various products (especially those that promote inner beauty); Pursuing a holistic regimen for ageing as well as beauty.
- Demand natural ingredients because they have fewer adverse effects (Dini and Laneri, 2019).

7. Cosmeceuticals

Nowadays, everyone is aware of the word "cosmetics," which plays a part in maintaining the health of the skin in a natural and organic way. The distinction between a cosmetic and a cosmetic is striking. Cosmetic is a combination of the words cosmetic and pharmaceutical.

The term designates a product that combines cosmetics and medication. In essence, a cosmetic is a skincare item that includes a physiologically active ingredient that is supposed to have medicinal skin benefits. This does not imply that all cosmetic products are made entirely of synthetic chemicals. The global cosmetics industry is shifting away from synthetic products in favor of natural ones for hair and scalp care since they often have fewer adverse effects. In some spray-oriented cosmetics, natural plant extracts are employed as an anti-inflammatory and a fragrance. Hence, it is transformed into actual cosmetics.

Although, if the term "cosmetic" is used in science, regulatory agencies like the USFDA do not classify it as a distinct category. This idea is opposed by several government agencies in charge of drug regulation.

The cosmetics regulation takes into account the fact that a cosmetic treatment tends to have preventive benefits against microbial disease but may not necessarily have therapeutic effects. If a commodity or recipe desires to be referred to as cosmetics.

Through, the Food, Drug and Cosmetics Act, the US FDA explains the definition of a drug in great detail. According to this law, a drug is any substance that is used to treat, prevent, or cure a certain disease or disorder. While there are no formal regulatory procedures for the approval of cosmetics. There are extensive guidelines for the proper marketing and approval of drugs that have been developed by regulatory bodies around the world.

The labels for items used only for cosmetic purposes must specifically state that the product is not to be utilized to treat sick conditions. Any product that can be used as both a cosmetic and a medication (cosmetics) must be supported by adequate scientific research.

8. Cosmeceuticals: Regulation and licensing

When compared to drug registration, the pharmaceutical registration protocol should not be cumbersome. Nonetheless, by using Good Clinical Practices (GCP) throughout evaluation, effective clinical evaluations for its treatment response must be produced. It should be mentioned that this product should only be used if the user has a minor skin condition or is otherwise healthy and in homeostasis. Cosmetics are not meant to address serious or persistent skin and hair issues. With toxicity tests, the Cosmos article's therapeutic efficacy data must be supplied. According to the toxicity tests, there is little possibility of harmful responses while treating small skin and hair conditions.

Cosmetics are typically included as "Over The Counter" drugs when they are registered.

8.1 Cosmeceuticals used in a variety of therapeutic uses

- Moisturization
- Antiageing properties
- The antioxidants
- Sunscreens; skin whitening or depigmentation

  Stabilizing hair, stopping hair loss, promoting hair growth, and improving hair texture
- Lessening of facial scars

  Treatment of particular diseases, including acne, rosacea, and melasma

The miscellaneous uses (Dallmeier, 2012; Epstein, 2009).

9. Cosmetics with hypoallergenic

The category of cosmetics known as "hypoallergenic" can be characterized as those that, when compared to other cosmetic formulas, tend to cause fewer allergic reactions. This does not imply that these cosmetic preparations must be used primarily on skin that is more sensitive than other skin types. The phrase "hypoallergenic" is not properly defined by federal standards. So, a cosmetic manufacturer may label its product as having a hypoallergenic formulation without having to file any paperwork or follow any regulatory requirements.

Most people view this as a deliberate strategy to draw in more customers by saying that their product is less allergenic than those of competing cosmetic manufacturers. Since it does not immediately compare to any brand or formulation, this word does not have a true meaning in and of itself. Moreover, there is no considerable market significance for this category of cosmetic products. Customers are not guaranteed that products with labeling like "tested for allergy," "hypoallergenic," *etc*. would not definitely induce an allergic reaction (Joshi and Pawar, 2015).

To qualify as a hypoallergenic product, various regulatory agencies are publishing new requirements for the cosmetics industry. The US Court of Appeals has categorically said that the US FDA's regulation of "hypoallergenic" is not practicable in nature in the twenty-first century. Also, there is a distinct set of rules that will only be used by the cosmetic businesses, whose products require that kind of labeling.

The use of this word on cosmetics labels was met with strong criticism. Because there is no promise that hypoallergenic cosmetics are not allergenic, there is a significant risk for patients who are allergic sensitive. Race enhanced the likelihood of anaphylactic response in these patients.

Certain cosmetic companies demanded proper evaluation tests for biological plausibility and to demonstrate that the formulations of cosmetic products were not allergic. Yet, if similar labeling is required, more money may need to be invested in high-quality tests.

Even, if these tests are carried out in accordance with the guidelines set forth by regulatory organizations and the cosmetic formulations

are designated as hypoallergenic, the likelihood of a negative medication reaction cannot be fully ruled out. Each regulatory agency made every effort to Almay and Clinique, producers of "hypoallergenic" cosmetics, swiftly filed a lawsuit against the new regulation with in U.S. District Court in the District of Columbia. FDA was affirmed by the court despite claims from the two companies that it lacked the authority to impose the regulation. Subsequently, the United States Court of Appeals ruled that cosmetic businesses may continue to use the phrase "hypoallergenic" on their labels. Yet, the manufacturers ought to make clear that their product was only partially guaranteed to be hypoallergenic. It is important to specify all of the substances used in the creation of cosmetic preparations in order to avoid any potential ADR associated with the use of hypoallergenic cosmetics. Those with reactive skin and hair may experience fewer severe allergic reactions thanks to this labeling technique (USFDA, 2021).

10. Medicinal uses of herbs

Herbs were used in former times for both medical and cosmetic purposes. They were utilized in both fresh form and dried form. They can be applied to the body directly after being mashed, either with or without the addition of other substances. In actuality, this was the only purpose for them in ancient times. But today, there are a few herbal product manufacturers in India who produce their extracts, decoctions, infusions, tinctures, steam distillates, *etc*. The following are some ways that herbs can be used (Bijauliya *et al.,* 2017).

10.1 Infusions

These are essentially powerful herbal teas that can be made in stainless steel or China clay pots. The use of aluminium vessels is discouraged because they can contaminate infusions. By briefly macerating, the raw medication using cold or boiling water, fresh infusions are created. The readily soluble components of crude medicines are present in these diluted solutions.

10.2 Decoctions

The herb and water are boiled to make these. In this procedure, the raw medication is boiled for a predetermined amount of time in a specific amount of water, cooled, and then filtered or refined. This method works well for extracting components that are heat- and water-stable. The "quath" or "kawath" Ayurvedic extracts are commonly prepared using this method. The initial ratio of crude medicine to water is fixed, *e.g*., 1:16 or 1:4, and throughout the extraction process, boiling reduces the volume to 1/4 of what it was initially. The purified extract is then either used as is or subjected to additional processing.

10.3 Leaf extract and flavorings

Extracts are often made using highly alcoholic hydrocarbon solvents. Extraction, as the term is used in the pharmaceutical industry, entails the consistent use of certain solvents to separate the medicinally active components of animal or plant cells from inactive or toxic parts extraction techniques. The somewhat impure liquids, semisolids, or powders produced in this way by plants are only fit for external or oral consumption. Decoctions, infusions, fluid extracts, tinctures, pilular (semisolyl) extracts, and powdered extracts are some of the preparation classes that fall under this category. These remedies are sometimes referred to as "galenicals," after the Greek physician Galen, who lived in the second century. Standardised extraction techniques are used to obtain the therapeutically required amount of crude medicines and to remove the inert material using a selective solvent called menstruum. The extract obtained in this manner might be ready.

10.4 Floral waters

These beverages are prepared similarly to infusions. You can use the same ratios of herbs to water (Shah and Quadry, 1985 and Kokate, 2004).

11. Benefits of natural cosmetics over conventional cosmetics

- They have no adverse side effects and do not cause allergic reactions.
- They blend seamlessly into skin and hair.
- These cosmetics are far more efficient than other small-quantity cosmetics.
- Plant extracts reduce the bulkiness of cosmetics and provide the right pharmacological effects.
- Easily accessible and present in a wide range of plants. They have more stability, purity, efficacy, with their herbal constituents.
- Simple to produce.
- Herbal cosmetics are easy to handle and store for a longer amount of time.
- Cost-effective (Kokate, 2004).

12. Raw materials used in herbal cosmetics (Asolkar, 1992)

12.1 Oils

Used in cosmetics, oils are produced from mineral and vegetable sources. Almond oil, avocado oil, canola oil, olive oil, and coconut oil are a few examples of vegetable oils. Paraffins, both light and heavy, are examples of mineral oils.

12.1.1 Almond oil

This fixed oil is made from the fruits of Prunes amygdalus, a member of the Rosaceae family. The oil has a distinctive smell and is a light golden colour. The primary active ingredients are a mixture of glycoside and oleic, linoleic, myristic, and palmitic acids. As it has a moisturizing effect, creams and lotions are made with it.

12.1.2 Arachis oil

This fixed oil is likewise made from the fruits of the Leguminoseae-family plant Aarchishypogea. The oil has a light nutty aroma and is golden yellow in colour. Refined groundnut oil has active ingredients like oleic and is colourless. A minor quantity of other acids, including linoleic acid. It is hazy at 3°C, and it solidifies at lower temperatures. It is employed in the creation of brilliantines and hair oils.

12.1.3 Castor oil

The Euphorbiaceae plant species *Ricinus communis* seeds are used to make castor oil. The grease is either colorless or yellow and has a faint odor. It is made up of a variety of glycosides, with ricinoleic acid making up the majority (80%) of the mixture. It turns into a transparent liquid at 0°C.

12.1.4 Olive oil

This oil is made first from fruit of the Oleaeuropea plant, which is a member of the Oleaceae family. The oil has a faint odor and appears to be bright yellow or green and yellow in colour. It is made up of oleic acid, stearic acid, linoleic acid, stearic acid, and myristic acid glycerides. It is solid or partially solid at a lower temperature. It has emollient and calming qualities. It is employed in the production of bath oils, lotions, and creams (Bhaskar and Sesharsri, 2020).

12.1.5 Coconut oil

The dried solid endosperm of the coconut, Cocosnucifera, family Palmea, is the source of this oil. In the winter, it turns into a white or plum unctuous mass, while in the summer, it is colorless.

12.1.6 Light liquid paraffin

It is a blend of hydrocarbons that has the consistency of an oily liquid and is flavorless and odorless. Light liquid paraffin has a low body fat per ml (0.83-0.87g) and viscosity (0.83-0.83). Because of its improved spread ability, it is utilized in the production of bath lubricants, hair oils, brilliantines, lotions, and creams.

12.1.7 Heavy liquid paraffin

This oily liquid is composed of an assortment of hydrocarbons and is colorless and odorless. It is utilized in moisturizers, lotions, brilliantines, hair oils, and bath oils because of its calming effect on the skin. From petroleum, heavy sticky paraffin is produced.

12.2 Waxes

Substances are the esters formed when high molecular weight single chain fatty acids condense with high

12.2.1 Beeswax

It is a pure wax that is extracted from the honey of Apismellifera bees, which are members of the Apidae family. 70% of the ester myricyl palmitate in beeswax is. It is solid, reddish brown in colour, and has a sweet aroma. It becomes brittle in cold weather and solidifies into a yellowish-white colour with a subtle distinctive odor when bleached. Beeswax has a melting range of 62°C to 65°C. Water is incorporated into beeswax to create an emulsion.

12.2.2 Sealant wax

This is made from the leaves of both the Copernicacerifera and a Brazilian wax palm that belongs to the Palmae family. There are various carnauba wax grades available. The highest grade is a light brown to bright yellow colour. It appears as a recognizable bland, a little bit grainy powder or flakes.

12.2.3 Paraffin wax

This substance is created by distilling petroleum. It is a mixture of e s and, to a lesser extent, their isomers, which make up the majority of the solid hydrocarbons. It is also referred to as hard paraffin wax. Physically, paraffin wax is a white, transparent, wax-like solid that is somewhat oily to the touch and is colorless, odorless, or has no discernible scent. Around 50°C to 57°C, paraffin wax melts.

A solid wax called spermaceti is extracted from the head, blubber, and ear case of the Physestercolodon sperm entirety, a member of the Physeteridae family. Cetylpalmitate and cetyimyristate gelatinous substances make up the majority of this solid wax, which is a transparent crystal, pale, unctuous mass with minimal flavour or smell. With a dry density of roughly 0.94, it dissolves. A blend of esters of major fatty solvents and saturated fat makes up the synthetic version of spermaceti, which is also offered for sale. White to off-white transparent flake with a crystal lattice and a pearly sheen are available as synthetic spermaceti. Synthetic spermaceti melt between 43°C and 47°C (Gavit and Pawar, 2022).

12.3 Colors

Humans have employed colors in cosmetics since the dawn of humanity. Fundamentally, the perceptions of sight, touch, and smell are what drive our urge to purchase cosmetics. Hence, one of the key components of cosmetic compositions is colour. A certain wavelength or a combination of wavelengths may be responsible for the visual sensation of colour, which can be produced by an entity through any one of the following phenomena: emission, reflection, refraction, or transmission. Here, a brief discussion of natural pigments including cochineal, saffron, and chlorophyll is provided (Chatterjee, 1997).

12.3.1 Cochineal

Dactilopiuscoccus, a dried female insect of the Coccidae family, is the source of the red dye known as cochineal. The primary coloring agent in cochineal is carminic acid. Carminic acid is produced during crystallisation.

The plant *Crocus sativa*, a member of the Iridaceae family, produces saffron, which is made up of the stereotyping and tips of the styles. This is a perennial herbaceous plant cultivated in India's Jammu and Kashmir.

12.3.2 Saffron powder

It is used as a flavoring and colour ingredient for food preparations because of its yellow colour and ease of solubilization in water. There are several carotenoids found in saffron, and crocin is a significant natural carotenoid. Picrocrocin, a flavourless bitter glycoside, is in charge of giving saffron its distinctive aroma.

12.3.3 Chlorophyll

This naturally occurring green pigment is a plentiful component of nature. Photosynthesis is made possible by this element. A green pigment called chlorophyll is present in plants. Green leafy vegetables, wheatgrass, green tea, potatoes, certain algae, and herbs are examples of food sources. Alfalfa, algae, and silkworm droppings are typical sources of chlorophyll used in dietary supplements. However, a molecule derived from chlorophyll called chlorophyllin is present in several "chlorophyll" supplements. There is not enough data to determine how chlorophyll might function. Chlorophyll is used to treat a variety of ailments, including hay fever, acne, and wound healing, but there is not any solid scientific proof to back up these claims.

12.3.4 Rose

Rosmarina officinalis, a plant belonging to the Labiatae family, is used to distil steam to create rose oil. We frequently overlook the fact that nature is teeming with possibilities that can be advantageous for our bodies in a variety of ways because there are so many skin care items readily accessible and readily available today. The rose plant's blossom is one such gift from nature. Although, roses are

frequently used as a symbol of love, did you know that the flower also offers several benefits for your skin? You were probably unaware of that. The flower is renowned because of its anti-inflammatory and antioxidant properties, in addition to its beauty and scent, making it the ideal element for skin care! The various vitamins, minerals, and oils included in the flower.

12.3.5 Lavender

It is made from the petals and stalk of the Labiatae family plant, *Lavandula officinalis*. According to some theories, the antibacterial and anti-inflammatory qualities of lavender oil can aid in the healing of small burns and insect bites. According to research, it might be helpful for treating anxiety, restlessness, depression, and sleeplessness. According to several studies, drinking lavender tea can relieve digestive problems such as nausea, bowel gas, diarrhoea, and abdominal puffiness. Lavender is used to ease discomfort from migraines, fractures, toothaches, and sores, in addition to aiding with digestive issues. Additionally, it can be applied to stop hair loss.

12.3.6 Tuberose

Often known as the "mistress of the night," the tuberose is a plant. The oil has a sweet, heavy, and seductive aroma and is a brown liquid. One of the most significant tropical ornamental bulbous blooming plants is tuberose (*Polianthes tuberosa* L.), which is grown for its long-lasting flower spikes. Its common names are Rajanigandha and Nishigandha. It originates in Mexico and is a member of the Amaryllidaceae family. Tube rose is an important industrial cutting and loose flowers crop due to its pleasant aroma, longer spike vase life, higher returns, and broad adaptability to various climates and soil. The aesthetic world holds them in high regard for their appeal and scent. The blooms have a nice scent and are lovely and exquisite. It has long been prized for the fragrant white flower oils that are derived from them. The year-round blooming tuberose has clustered spikes with fragrant flowers.

12.3.7 Geranium

A member of the Geraniaceae family, *Pelargonium graveolens* produces this oil from its flowers, leaves, and stalks. Its essence is extracted through distillation from the plant's blossoms and stems. The plant is referred to as geranium bourbon. Early in the 18th century, Dutch traders transported plants from South Africa that we now refer to as "geraniums" to Europe. Botanists misclassified these new plants into the same genus because they matched those hardy wild geraniums that are already present throughout Europe. Swedish scientist Carl Linnaeus classified them as belonging to the genus Ge in 1753.

12.3.8 Champa

Made from *Michelia champaka* plant blossoms. The colour of the flower ranges from yellow to deep red. A large, green tree with thin, long petals with fragrant blossoms is called a champa, or campaka in Sanskrit. The blossoms are available in a range of hues, from orange to creamy white. Because of its potent and distinct perfume, the champa flower has been an important part of Indian spiritual worship since the beginning of time. It is a deciduous tree with thin bark. The stem is coloured grey-green and fashioned like a sausage. Due to its deciduous nature, the stem is all that remains once the leaves have dropped throughout the winter.

12.3.9 Cinnamon

The leaves, bark, and roots of the cinnamon plant are used to make cinnamon oil. *Cinnamon zeylanicum* is a member of the Lauraceae family. The most valuable component of the bark is oil. The aroma of the oil is warm, spicy, and sweet. The inner bark of various tree species belonging to the genus Cinnamomum is used to make the spice cinnamon. In a wide range of cuisines, including sweet and savoury meals, cereal for breakfast, and snacks such as bagels, teas, and hot chocolate, cinnamon is mostly used as a fragrant condiment and flavouring addition.

12.3.10 Neroli

This essential oil is made from the bitter orange tree's bloom, which is extracted through distillation. It can be kept in the refrigerator in amber-colored bottles. An essential oil called neroli is made from the bitter orange tree's blossoms (*Citrus aurantium* subsp. *amara* or *bigaradia*). It has a sweet, honeyed, slightly metallic aroma with hints of green and spice. The same blossom yields an orange blossom extract, and both of these extracts are widely used in perfumery. When compared to neroli, orange blossom has a sweeter, cosier, and more floral scent. Because of the varied methods used to extract the essential oil from the flowers, neroli and orange blossom have different scents and are therefore given different names. Orange blossom is obtained using the enfleurage method, which is no longer commonly employed because of its high price, while neroli is extracted using steam distillation.

12.3.11 Clove

This herb, which is a member of the Myrataceae family, is harvested for its essential oils from the buds. The clove tree, *Syzygium aromaticum*, is indigenous to Indonesia. Aside from being a popular spice, powdered flower buds are also used in Ayurvedic and Chinese medicine. Medicine is made with dry flower buds, leaves, stems, and clove oils.

12.4 Protective agents

Silicones serve as protective agents in the production of creams; they can be combined with other boundary agents to create good barrier creams, such as petroleum jelly, beeswax, paraffin, and others.

12.4.1 Agents for bleaching

Here are listed the bleaching agents that are most frequently used.

Compounds of mercury: For their ability to bleach skin, mercury compounds like carbon tetrachloride, red cyanuric oxide and ammoniated mercury can be utilized. Today, cosmetics cannot include any mercury compounds.

12.4.2 Hydroquinones

At a strength of 1.5%-2%, they are mostly utilized as bleaching agents to temporarily lighten skin. If the concentration is 5%, redness and scorching may result. When exposed to sunshine, hydroquinones start acting in the opposite way. If hydroquinone is present in cosmetics

12.4.3 Catechol and its derived products

Catechol partially demonstrates the skin-lightening effect. 4- One of the most effective de-pigmenting agents has been discovered to be isopropy catechol. When present at quantities of 3% or more, they might irritate the skin and cause a sensitization reaction.

12.4.4 Vitamin C and its derivatives

Although, ascorbic acid has been confirmed to be safe to use, it does not appear to be particularly successful as a de-pigmenting agent. Most commonly, it is employed in bleaching creams that include hydroquinone as a stabilizer (antioxidant). Ascorbyloleate is used in skin lightening creams at concentrations of between 3% and 5% to lighten freckles on human skin (Devi *et al.,* 2018).

12.5 Oxidizing agencies

Hydrogen has been utilized in skin whitening creams as an oxidizing agent. An oxidizing agent, often known as an oxidant or an oxidant, is a type of chemical that has the tendency to breakdown other substances, increasing their oxidation state by causing them to lose electrons. Halogens are substances (which include chlorine as well as fluorine), oxygen, with hydrogen peroxide are typical examples of oxidizing agents.

12.6 Preservatives

- Formic acid, benzoic acid, and other organic acids.
- Alcohols: Isopropyl alcohol and ethanol.
- Aldehydes include cinnamic aldehyde and formaldehyde.
- Mercury: Thiomersol, nitromersol.
- Phenolics: Cresol, phenol.
- Esters: Methoxy p-hydroxy benzoate, ethyl p-hydroxy benzoate.
- Surface active agents: Benzalkonium chloride, cetylpyridinium chloride.
- Several substances, including vanillin and ethyl vanillin.

12.7 Antioxidants

During the refining process, natural antioxidants such as tocopherol that are prevalent in oil and fats are eliminated. Antioxidants must therefore be added to prevent the oxidative stress of oil and fat in cosmetics brought on by oxidative degradation. These are a few of the typical antioxidants used in cosmetic formulations.

- Amines: Lecithin and purines.
- Gallic acid and methyl gallate are phenols.
- Quinones: Hydroxychromans, tocopherols
- Di-lauryl thiopropionate esters
- Ascorbic acid is an organic acid.
- Alcohols include sorbitol and mannitol (Son *et al.,* 2020).

13. Herbal cosmetics classification (Wallis, 2003; Taylor, 1981)

- Cosmetics for the skin, including: Cream, Scrub, Lip balm, Powder, Lotion and Liniment, Face Pack, Deodorant and Antiperspirant, and Bath preparation .
- Hair products: Like shampoo, conditioners, and colorants .
- Toothpaste, toothpaste, and mouthwash.
- Nail care procedures.
- Preparations for shaving.
- Foot-related prepping.

14. Cosmetic applications of herbal products

Lavender Silk soaps, Lotions, Moisturizers, Face powders, Lavender Herb body powder, and 7 Skin care creams are examples of herbal skin care products (Pandey and Meshya, 2020).

Henna (*Lawsonia inermis*), Amla (*Emblica officinalis*), Shikakai (*Cassia concinna*), Brahmi (*Bacopa monnieri*), Brahmi (*Eclipta Alba*), and guar gum (*Cyamopsis tetragonoloba*) are examples of herbal hair care cosmetics (Kapoor, 2005).

14.1 Herbal lip care cosmetics, including natural lipstick, lip gloss, lip balm, and lip plumper

Aloe nourishing hand cream, Rich neck and Hand cream, and Herbal moisturizers are some of the herbal eye care products available.

Herbal oils are useful for treating baldness, hair loss, thinning hair, dandruff, irritation and itching of the scalp, uneven baldness, and maintaining fine hair. Herbal perfumes and aromas are also useful. Lemon fragrance: Citrus notes like bergamot, lemon, lemon, petitgrain, mandarin, and others provide a bright, fresh aroma that is frequently mixed with much more feminine fragrances (flowers, fruits and chypre).

14.2 Floral fragrance aroma: Based on a complex of woody, earthy, and floral notes that occasionally have charac-teristics (Yuylor, 1981; Pandey, 2010)

Table 1: Herbs for skin cosmetics

Latin name	Common name	Part used	Uses
Acorus calamus	Sweet flag	Rhizome	Dusting powder, skin lotions, and perfume
Allium sativum	Garlic	Bulb	Encourage skin healing, and be antibacterial
Aloe vera	Aloe	Leaf	Sunscreen, moisturizer, and emollient
Alpinia galangal	Galangal	Rhizome	Dusting and scented powder
Avena sativa	Oat	Fruit	Lotion and skin tonic
Azadirachta indica	Neem	Leaf	Minimize dark spots, antimicrobial, and antiseptic
Calendula officinalis	Marigold	Flower	Antiseptic, anti-inflammatory, and skin care
Centella asiatica	Gotu cola	Plant	Creams that promote healing and lessen stretch marks
Cichorium intybus	Chicory	Seed	Make skin free of blemishes

Citrus aurantium	Orange	Peel	Skin creams, acne treatments, and antibiotics
Curcuma longa	Turmeric	Rhizome	Creams that are antibacterial and antimicrobial
Cyperu srotundus	Nagarmotha	Roots	Astringent, anti-inflammatory, and tanning
Dauc uscarota	Carrot	Seed	Natural vitamin A sources and creams
Euphorbia hirta	Spurge herbs	Entire	Skin conditions, chapped lips
Rubia cordifolia	Manjistha	root	Healing of wounds and fading of pigmentation markings

Table 2: Herbs for hair

Latin name	Common name	Part used	Uses
Aloe vera	Aloe	Leaf	Lotions, shampoos
Azadirachta indica	Neem	Leaf	Anti-fatigue hair greying and alopecia
Bacopa monnei	Brahmi	Entire herb	Excellent for sleep, shampoos, and hair growth
Cerdus deodar	Deodar	Wood	Shampoos and soap
Centella asiatica	Gotu kola	Plant	Hair oil, hair care, and hair ageing
Citrus lemon	Lemon	peel	Stop hair loss
Eclipta alba	Bhringraj	Plant	Shampoos, hair oils, and hair growth promotion
Emblica officinalis	Amla	Fruits	Hair care, grey hair prevention, and anti-stress
Hibiscus rosasinesis	China rose	Flower	Enhances hair and delays the onset of grey hair
Lawsonia alba	Henna	Leaf	Growth of hair, natural condition
Marticaria chamomilla	Chamomile	Flower	Hair elixir
Moringa oleifera	Benjamin	seed	Oil for hair
Sapindus trifoliatus	Soap wort	Fruit	Natural shampoos and detergents
Triticum sativum	Wheat germ	Germ	Shampoos and natural sources of vitamin E
Wedeliac alendulaceae	Bhangra	Entire herb	Shampoos, hair products
Rosa centifolia	Gulab	Rose	Antifatigue, Coolant
Acacia concina	Shikakai	Pod	Detergent, natural cleaning agent

Table 3: Examples of drugs used for tooth preparation

Latin name	Common name	Part used	Uses
Acacia arabica	Babul	Bark	Dental issues
Azadirachita indica	Neem	Leaf	Carries toothache, antibacterial, dental
Barleria prionitis	Vajradanti	Entire herb	Tooth ache, teeth strengthening
Syzygium aromaticum	Clove	Bud	Antiseptic, Toothache
Salvadora persica	PIlu	Twigs	Antibacterial activity

15. Conclusion

When the negative consequences of food manufacturing and over medication have reached dangerous proportions, herbs play a crucial role, particularly in current pharmaceutical formulations. Increasingly, they are also being used in alternative medicines, foods, and beverages.

The drive for a change in lifestyle includes the growing interest in herbs. This concept is founded on the idea that plants have a huge potential for use as therapeutic agents.

Its lifeblood is cosmetic quality materials, thus it must be used with caution. The best way to reduce skin issues is with cosmetics items. The future is really bright for the cosmetics industry. For beauty salons, yearly shopping positions range from RS.4000 to 60,000, and a smaller percentage of annual purchase positions. Several of the ingredients used to make cosmetics have the potential to cause negative side effects when applied to the human body. Hence, utilizing cosmetics may not affect the body. The best and current option for beauty goods for those who need to take care of their sensitive skin is cosmetics. There is a huge demand for cosmetics and a lot of room for growth in the use of cosmetics in the coming year. The use of cosmetics has multiplied in the personal care system. As a result, I shall sum up by noting that while cosmetics are utilized by people of all sexes and play a significant role in daily life, their scope likewise plays a significant role.

Conflict of interest

The authors declare no conflict of interest relevant to these articles.

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