
Editorial

Cultural Traits and Traditions in the Use of Cosmetics

The main focus of this number of Vidurava is on the use of cosmetics, perfumes and detergents in Sri Lanka. The authors of the articles have taken great pains to describe in detail all aspects concerning the formulation, production, marketing and application of the range of products that fall under cosmetics, perfumes and detergents. The likely pitfalls as well as the pros and cons in the regular use of these products have also been explained, and hence this vital information deserves the widest possible publicity. The gamut of goods and services delivered or provided through these products appears almost incredible. It is almost certain that a majority of the user clients of these products are ignorant of the good, bad and worst scenarios in the regular application of these substances.

Cosmetics and perfumes had been popular, and in common use during the great ancient civilizations of the Middle and West Asian countries. Sri Lanka though located in close proximity to the ancient shipping lanes of the Eastern Seaboard, and had entertained trans-continental trade, and even offered trans-shipment facilities to West Asian visitors from around 250 BC, does not seem to have been influenced by the glamour, or the flamboyance of this West Asian culture. The Island nation was also known to have established diplomatic relations and exchanged information, gifts and pleasantries way back in the First Century AD with the Roman Emperor Claudius Ceasar (41 – 54 AD). However, there are hardly any references

to the use of cosmetics by our ancestors in the historical and literary works of classical Western writers. Thus despite such inter-relationships and personal interactions with perpetual users of cosmetics, Sri Lankans do not seem to have been attracted or cherished this art in ancient times. Nevertheless, the expressions of beauty and glamour of ‘noble women’ of ancient Sri Lanka appear to have been displayed through the use of exquisitely designed ornaments and jewellery made of gold, silver, tortoise shell and occasionally ivory. Classical historians such as Robert Knox (1681), Robert Percival (1803) and Charles Sirr (1850) have described in great detail the attire and apparel worn by all classes of men and women. The only reference to the use of a cosmetic is the anointing of the hair with coconut oil to bring its sheen and lustre to the fore. However, D.M.A. Jayaweera (1985), in his treatise titled ‘Medicinal Plants Used in Ceylon’ published in 5 parts, mentions *Suduhandun* (sandalwood), *Lapnaran* (Citron), *Agaru* (Aloes wood), *Kalu-duru* (black cumin), *Sevendera* (Khus-khus), and *Hinguru-piyali*, cultivated in Sri Lanka for medicinal purposes, as also being used as ingredients of local perfumes. Thus there appears to have been a distinct cultural trait and tradition amongst the womenfolk of ancient, medieval, and the early colonial periods of Sri Lanka in respect of the use high profile cosmetics, a feature that had apparently disappeared in the late colonial era, when the use of commercially produced cosmetics, perfumes and detergents had begun to spread throughout the country.

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Natural Cosmetics and Perfumes

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Introduction

The word cosmetics is defined as “Substances of diverse origin, scientifically compounded and used to cleanse, allay skin troubles, cover up imperfections and beautify”. The history of cosmetics spans at least 6000 years of human history, and almost every human society on earth. The ancient science of cosmetology is believed to have originated in Egypt and India, but the earliest records of cosmetic substances and their application dates back to circa 2500 and 1550 B.C, to the Indus valley civilization. Some argue that cosmetic body art was the earliest form of ritual in human culture, dating back to over 100,000 years from the African Middle Stone Age. The evidence for this comes in the form of utilized red mineral pigments (red ochre) including crayons associated with the emergence of *Homo sapiens* in Africa.

Archaeological evidence of cosmetics certainly dates from ancient Egypt and Greece civilizations. According to a source, early major developments include the use of castor oil in ancient

Egypt as a protective balm and skin creams made of beeswax, olive oil, and rose water described by the Romans. The Ancient Greeks also used cosmetics.

The role played by Natural Products from plants in cosmetics is numerous. Whole plants, leaves, flowers and other parts of the flowers have been incooperated in to cosmetics. In addition to facilitating the reproduction of flowering plants, flowers have long been admired and used by humans to enhance the beauty of their environment, as objects of romance, ritual, religious activities,

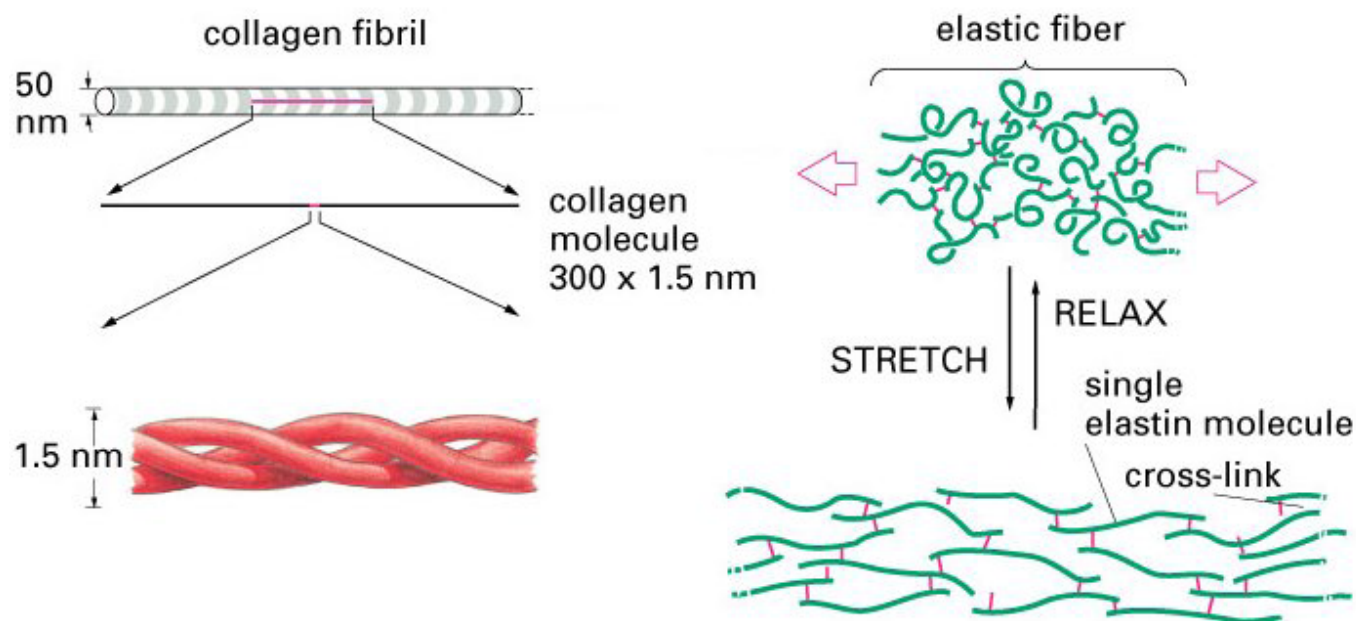
recreational purposes, medicinal applications, as a source of food and the cosmetics and perfumery applications.

Application of Natural Products in Cosmetics

The majority of cosmetics are associated with skin and therefore brief description of association between connective tissues, aging and anti-aging mechanisms are outlined.

Skin and Extra-Cellular Matrix Connective tissues, particularly skin, undergo significant alterations





fibrous proteins

during aging. These alterations are characterized by epidermal thinning and appearance of facial lines and furrows. The reason for these alterations lies in morphological changes in the extra-cellular matrix (ECM). ECM is made up of glycosaminoglycans, interwoven with fibrous matrix proteins like collagen, elastin and fibronectin forming a cross linked meshwork that gives ECM strength and resilience

Collagen

Collagen is made of protein and is the main component of connective tissues such as skin, tendons, ligaments, cartilage, blood vessels and bone. There are five types of collagen fibers, with the type 1 variety the most common in the human body. Collagen is the important structural

component of skin that represents 70% to 80% of the dry weight.

Elastin

Elastin is also a protein found in connective tissues that allows for stretching and elastic properties. Its elastic properties are especially useful for the skin, large arteries, ligaments, bladder and lungs. Elastin is usually combined with collagen fibers to form collagen bundles. To make elastin, the body needs the same amino acids as for collagen, namely lysine and proline, as well as a few other basic amino

acids found in a variety of foods. Hyaluronic acid and copper are needed to bind the collagen and elastin fibers together to form collagen bundles and for repairing and replacing collagen fibers. Elastin accounts for only about 1-2% of the dry weight of skin but it is important for the maintenance of skin's elasticity and resilience.

Hyaluronic Acid

Hyaluronic acid is mucopolysaccharide that holds the water and keeps the body moist, lubricated and smooth.

These connective tissue proteins are constantly attacked by several enzymes like collagenases, elastases and matrix metalloproteinases, which leads to decrease in thickness of skin which consequently, becomes dry and wrinkled. To maintain the youthful appearance



of the skin, there are two methods, to promote the synthesis of matrix proteins in the skin, or to inhibit matrix protein degrading enzymes like hyaluronidase and elastase. As people age and their skins are exposed to environmental pollutants and the sun's ultraviolet rays, the cells gradually lose the ability to produce hyaluronic acid. Skin begins to thin and become more fragile. Wrinkles develop as collagen, elastin and hyaluronic acid break down, causing the skin to lose elasticity and volume.

Skin and Pigmentation

Melanogenesis has been defined as the entire process leading to the formation of dark macromolecular pigments, i.e., melanin. Melanin is formed by a combination of enzymatically catalyzed and chemical reactions. Melanogenesis is initiated with the first step of tyrosine oxidation to dopaquinone, catalyzed by tyrosinase. This first step is the rate-limiting step in melanin synthesis because the remainder of the reaction sequence can proceed spontaneously at a physiological pH value.

Therefore the key enzyme responsible for the skin pigmentation is tyrosinase. Tyrosinase is a multifunctional, glycosylated and copper-containing enzyme, which catalyzes the first two steps in mammalian melanogenesis, and is responsible for enzymatic browning reactions in

damaged fruits during post-harvest handling and processing. Neither hyperpigmentation in human skin nor enzymatic browning in fruits is desirable. These phenomena have encouraged researchers to seek new potent tyrosinase inhibitors for use in foods and cosmetics.



Anti-collagenase, Anti-elastase, Anti-hyaluronidase and Anti-tyrosinase Enzyme Activities

The basis of selection of any natural products including plant material is to find out whether the material exhibit the anti-collagenase, anti-elastase, anti-hyaluronidase and anti-tyrosinase activities. In cosmetic science anti-collagenase, anti-elastase, anti-hyaluronidase activities are known as anti-aging properties. The anti-tyrosinase activity is mainly connected with

skin-whitening properties.

Chemical Composition of Natural Products used in Cosmetics

Plants are the richest sources of secondary metabolites, while flowers also contain a wide array of chemical constituents that belong to different chemical classes. Among these the group polyphenol or flavonoids plays the major role imparting inhibition of collagenase, elastase and hyaluronidase activities as anti-aging properties. Anti-tyrosinase activity, another cosmetically significant enzyme inhibition is shown by many flavonoid and related compounds.

The chemical composition of plants is the major contributory factor to its use in cosmetics and perfumery. Therefore, chemical constituents responsible for cosmetological application are outlined as plant

pigments and have been widely studied, particularly from the genetical point of view, and much information is now available about them. The most important group of plant and flower pigments are the flavonoids, since they contribute cyanic colours (orange, red to blue) as well as yellow and white. The only other major groups are the carotenoids, which provide principally yellow colours with some oranges and reds. The same compounds that impart an attractive colour to flowers are also full of antioxidant properties which

contribute to the anti-elastase, anti-collagenase, anti-hyaluronidase, anti-tyrosinase activities.

Flavonoids are one of the main determinants of leaf and flower colours. The biochemistry and genetics of flavonoids predominantly decide the colour of a flower. Flavonoids in flowers also provide protection against UV irradiation and may serve as chemical defense compounds against pathogens, similar to their roles in other parts of the plant. In addition, a group of flavonoids has been identified to be important for pollen germination thus playing central roles in the primary purpose of flowers, i.e. plant reproduction.

Among flavonoids, anthocyanins, flavonols (kaempferol, quercetin, myricetin, luteolins and apigenin) and related compounds are the major compounds that impart cosmetological properties to flowers. In addition carotenoid pigments in flowers containing beta-carotene, zeaxanthin, lycopene, flavoxanthin, crocein also add to chemical constituents in flowers that have been proven to have the above mentioned cosmetological effects.

Application of Flowers in Perfumery

The word perfume is derived from the Latin word *per fume* meaning "through smoke". In its modern meaning perfume is a concentrated essence of fragrant material diluted in minimum amount of high grade alcohol.

People have used perfume and oil on their bodies for thousands

of years in lesser or greater amounts dependant on fashion whims. The early Egyptians used perfumed balms as part of religious ceremonies, and later as part of pre love making preparations. It is interesting to note that perfume has come through a full circle today as more and many of us seek out high quality aromatherapy perfumed oils to use in exactly the same way as our ancestors did.



The late 19th century was the first real era of perfumes when new scents were created because of advances in organic chemistry knowledge. Synthetic perfume products were used in place of certain hard to find or expensive ingredients.

Grasse in Provence, France became a centre for flower and herb growing for the perfume industry. The men who treated leathers in the same area found the smells so bad that they perfumed themselves and the leathers. They were knowledgeable about making the botanical essences and were the early perfume noses.

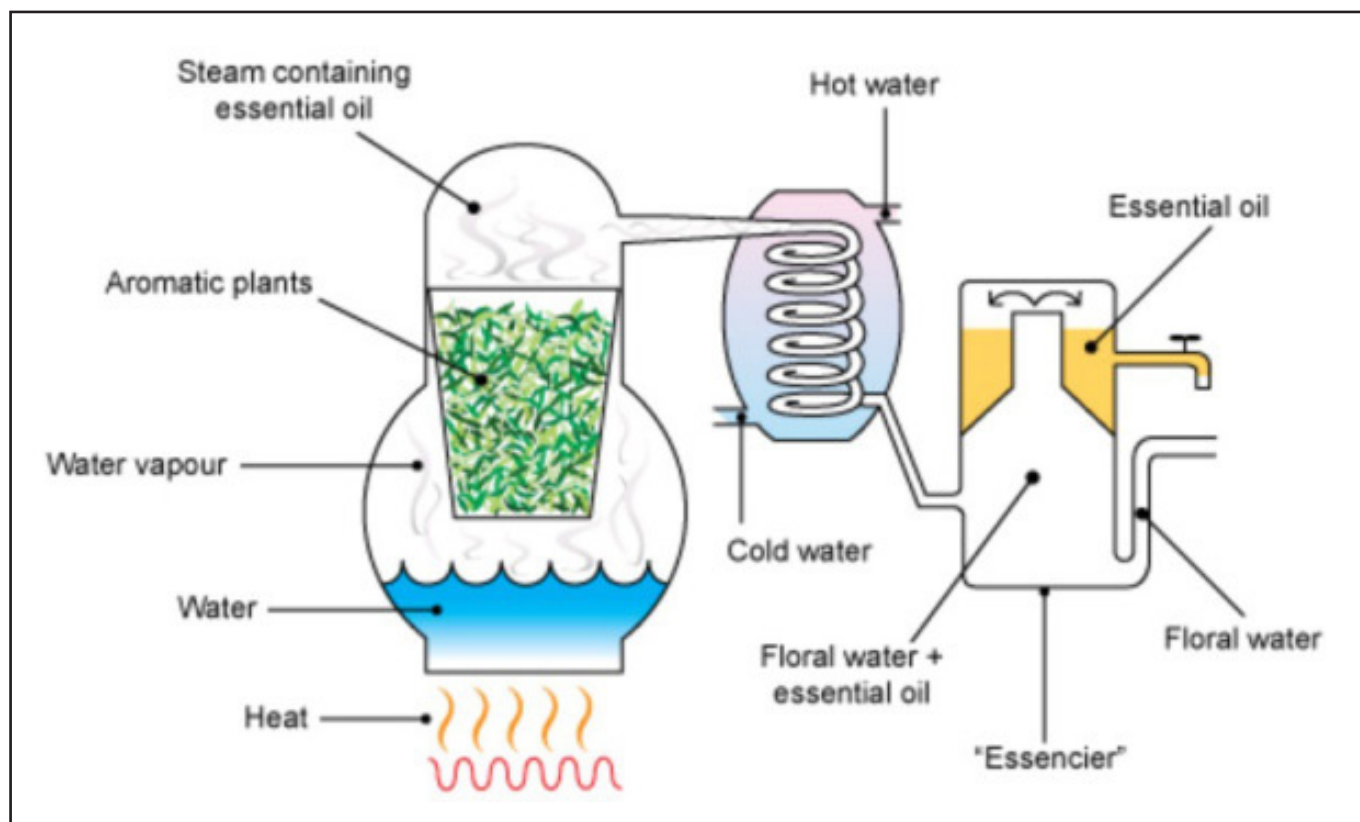
The essential oils of many flowers are used in the making of perfumes. The scents of flowers are affected by characteristics of the soil and the climate in which they are grown. Oils are often extracted by distilling them. Although there are numerous flowers that are used in perfumes, some are more frequently chosen for their strong fragrance. The most popular flowers include roses, jasmine, violets, lilies, orange flowers and plumeria. Others that are used include lavender, magnolia, moonflower, chamomile, rosemary and sweet pea.

Many flowers are still used in perfumes as essential ingredients. Actually, the perfume comes from the essential oils extracted from the flowers. The oils are extracted by a special distillation process.

Plants create fragrance by producing organic compounds on their surfaces. Fragrant flowers produce their perfume in glands on the petals known as "osmophores", to attract pollinators. Some plants have scented foliage. The smell comes from water-repellent essential oils produced by glandular leaf hairs known as "trichomes", to repel leaf-eating predators, especially insects

Important Flowers Used in Perfumery Industry

Although many flowers are fragrant, some flowers gained popularity because of their exceptional fragrances. Some flowers with high fragrances include the following:



Rose - In the history of perfumery it is recorded that the credit goes to Geronimo Rossie who discovered roses in 1574. From ancient times the essential oil of roses was an important commodity in perfumery. Until the modern method of solvent extraction was developed rose oil was obtained mainly by distillation. One of the most valuable elements of a fine perfume is provided by the rose, which is known as the “queen of flowers”. Rose perfumes were very popular with the Romans and the Greeks. Rose flowers are gathered at night since they carry fragrance before sunrise. The two main species of roses used in perfume are the *Rosa centifolia*, found in South of France, and the *Rosa damascena* (Damask Rose) located primarily in Arab countries. The damask rose is most widely grown for perfumery.

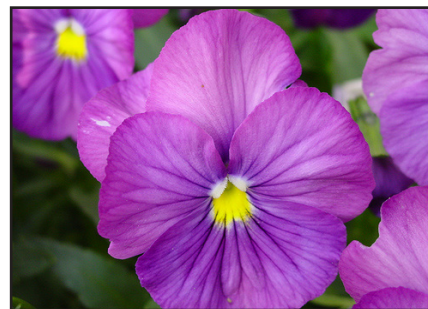
Jasmine - Jasmine is prepared from

the flowers of *Jasminum gradiflorum*. The oil obtained through distillation was not of good quality. Therefore, solvent extraction was adopted. Jasmine, another “absolute,” or pure essence, gives a perfume with a well-rounded, finished quality. Jasmine flowers are harvested when their fragrance is at its peak just before dawn. The flowers must be processed immediately before their freshness and fragrances fade away.

Orange - For orange flower oil the process of distillation was widely used. But today this is being practiced by solvent extraction with acetone or isopropyl alcohol. Quality of oil obtained is very high. Orange flower oil or Neroli was named after the Italian princess of Neroli, because it is believed that she was the first to use the oil for scented gloves. Neroli oil is plentiful and widely used in finer

citrus colognes. Orange flowers are grown in the south of France, Spain, Italy and North Africa. Violets - The victoria violet and the parma violet are used most often in perfume. Violets have been used in perfumes throughout the ages because of their varied fragrances. They used violets in both perfumes and medicines. Violets produce only a scant amount of essential oils, and are rarely used today. A synthetic replacement for violet is most commonly used, along with other essential oils resembling the violet.

Lilies - There are many varieties of lilies and their scents differ as well. General types of lilies include asiatic, trumpet, aurelian and oriental. One of the most frequently used in perfumes is Lily of the Valley. The Lily (*Lillium*) is a hearty bulb that can be planted in fall or spring. In the entire lily



spectrum, there is something for everyone, from easy-to-grow, long-lived garden plants to the more difficult and rare species. Their summer blooms are the highlight of the garden, and they are long-lasting as cut flowers. Most lilies bloom between June and August, and the large, trumpet shaped flowers feature a variety of colours, designs and fragrances.

Ylang-ylang -Ylang-ylang is widely used for fine fragrance. This flower is found throughout South-East Asia. The ylang-ylang is not picked until the buds have remained open for two to three weeks. After they have been gathered, they must be processed quickly. This oil is commonly used, but synthetic versions and cananga oil is often substituted in less expensive perfumes.

Chemistry of Natural Perfumes

There is a wide array of fragrant compounds produced by flowers. Most of these compounds belong to the chemical group of terpenoids. The chemical composition of floral scents has been extensively investigated for hundreds of years because of the commercial value of floral volatiles in perfumery. More recently, several ecological studies have examined the roles of floral scent in the biology of the plant. However, in contrast to the chemical emphasis of the perfumers and the organismal emphasis of the

ecologists, until recently, there have been few studies concerning the biochemical synthesis of floral scent compounds, as well as the enzymes and genes that control these processes.

Flower fragrance is a composite character that is determined by a complex mixture of low-molecular-mass volatile molecules. For many years, research into flower fragrance focused on its chemical elucidation and as a result, hundreds of compounds were identified. Most of these compounds belong to three major biosynthetic pathways: phenylpropanoids, fatty acid derivatives, and terpenoids. Although the complete pathways leading to the final products have not been characterized, common modifications such as hydroxylation, acetylation, and methylation have been described.

Floral scent compounds belong to seven major compound classes, of which the aliphatics, the benzenoids and phenylpropanoids, and among the terpenes, the mono- and sesquiterpenes occur in most orders of seeds plants. C5-branched compounds, irregular terpenes, nitrogen-containing compounds and a class of miscellaneous cyclic compounds have been recorded in about two-thirds of the orders. Sulfur-containing compounds occur in a third of the orders, whereas diterpenes have been reported

from three orders only. The most common single compounds in floral scent are the monoterpenes limonene, (E)- β -ocimene, myrcene, linalool, α - and β -pinene, and the benzenoids benzaldehyde, methyl 2-hydroxybenzoate (methyl salicylate), benzyl alcohol, and 2-phenyl ethanol, which occur in 54-71% of the families investigated so far. The sesquiterpenecaryophyllene and the irregular terpene 6-methyl-5-hepten-2-one are also common and occur in more than 50% of the families.

Therefore it could be concluded that the application of Natural Products from plants in cosmetics and perfumery is numerous. The Natural Products should be harnessed while protecting the precious environment.



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Cosmetics: Are they safe to use

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According to Plautus, the renowned Roman philosopher, “A woman without paint is like food without salt.” From ancient days of history there have been numerous evidences as to how cosmetics have been routine requirements in the day to day lives of people. Chinese people began to stain their fingernails with gum arabic, gelatin, beeswax, and egg while Grecian women used to paint their faces with white lead and apply crushed mulberries as rouge. European women also used white lead paint, including a variety of other products, in an attempt to lighten their skin.

Among traditional cosmetic trends which are applicable within various countries in the modern context, the application of fake eyebrows, often made of oxen hair, as well as mehndi which is an art form originating from India are still prevalent. “Mehndi” is painted in complex and ornamental designs on hands and feet, particularly on brides at Hindu weddings. Cosmetic trends such as these, also comprise of “henna” which is used in India

as a hair dye and in some North African cultures as well. Just as salt is an essential ingredient in order to relish delicious Sri Lankan cuisine, women have used natural and organic dyes throughout the years in order to beautify themselves. At present using hair dyes and other diverse facial cosmetic products are not only common among women but also among men. People use

artificial dyes nowadays to colour their hair, at times even to match the garments that they wear. It has particularly become a popular fashion trend among women to use bright colours which directly contrast with their natural hair as well as to dye their hair in muted rainbow coloured pastel dyes. Grey hair is merely a change which manifests within the natural cycle of life. However, as human beings



almost every individual feels the need to retain even a semblance of their youth. The age of men and women appear young forever, is one of the chief reasons why using hair dye to hide grey hair has become common place among both men and women.

All the materials so far mentioned in this article are commonly known as Cosmetics. Cosmetics in general are classified as substances that are used to enhance the appearance, or dispel the odor of the human body.

How many times do we use cosmetics per day? From morning after you wake up to do your daily hygienic morning routine, till the moment you go to sleep, how many cosmetic products do you generally use? An average person uses cosmetics at least seven times a day, which is in fact a higher number of times than for daily food consumption. This confirms the importance we place on cosmetics in order to carry on with our daily routines. Thus it is necessary that we accumulate more information about these products, and to know how they affect us. Many of us are very concerned about our daily food consumption, since unsuitable, unhygienic and bad quality food can be a threat to our health. In doing so we overlook on how cosmetics can have an impact on our health, and continue to utilize cosmetics without paying

much attention to its quality and proper use.

According to the US Food and Drug Administration (FDA), cosmetics are defined as “articles intended to be



applied to the human body for cleansing, beautifying, promoting attractiveness or altering the appearance without affecting the body's structure or functions”. The FDA definition for drugs is, “articles that alter the structure or function of the body. Intended to diagnose, treat, care, mitigate or

prevent disease”.

Thus, the FDA clearly defines the difference between cosmetics and drugs. According to this definition shampoo, toothpaste, skin cream, lotions, hair dye, face uplift product, nail beautifying product etc. are some examples of cosmetics. On the one hand, it is important to note that drugs are used to cure illnesses and are mostly prescribed by medical practitioners to use for a temporary period. In addition to this, many authorities dedicate an exceedingly high amount of time and effort in researching into

these drugs, and to guarantee their safety, for the purpose of lowering the risk against the health of the consumer as much as possible. On the other hand, cosmetics are used daily and frequently. Also unlike drugs most cosmetics come to the market without many barriers against them. Therefore, consumer risk for cosmetics is always high.

These facts clearly focus our attention to consider the safety and use of many cosmetics which are available at the market. Cosmetic manufacturing companies in the world spend just 2–3% of their sales on research and development, compared to the 15% spent by pharmaceutical companies.

However Cosmetic manufacturing companies spend 20–25% on advertizing and promotion. It is apparent that cosmetic companies spend much money in order to advertise their products. It should be able to understand that safety should be the priority in using these products. In this article many facts will be presented which can be used to decide on how we can use cosmetics both safely and effectively.

There are more than 5000 chemicals used in cosmetic industries, and according to regulations these chemicals are either permitted or restricted. In a given cosmetic the list of ingredients is very long with many chemicals. Why is it necessary to use so many chemicals in a particular cosmetic product? When a cosmetic item is placed in the market, it should fulfill the customer's expectations. The stability of the product, the attractive colour in the contents, the pleasant odour of the product and the ease of application (the correct reology and viscosity) are

necessary in addition to what is expected after using the product. To satisfy all these requirements, the cosmetic product will contain many chemicals other than the active ingredients that are needed in the product. Other than that the customer expects a multipurpose utility in the cosmetic product they purchase. For example, a moisturizing cream that is purchased has an attractive colour as well as a distinguishable smell. According to regulations there are chemicals designated as prohibited chemicals, and these should not be used in cosmetics. These include heavy metals like Hg, Pb or their compounds.

How does one identify a given product as a drug or a cosmetic? The legal classification is based on three criteria identified as purpose of use, site of application and composition of the product. The purpose of use of a cosmetic product would be to clean, to perfume, to change appearance, to correct body odour, to protect, and keep the body in a good condition. If the main purposes of the

product are not to perform at least one of these functions, it is unlikely to be an effective cosmetic item. For example, a product intended to be applied as a treatment for blemish is not a cosmetic, but a product intended to be applied to a blemish in order to conceal it, then it is considered a cosmetic. On the other hand a product offered to conceal a blemish, but also has the secondary purpose of preventing the formation of further blemishes is also a cosmetic.

The site of the application shall be epidermis, hair system, nails, lips, external genital organs, teeth or mucous membrane of the oral cavity. If not, the product is unlikely to be regarded as a cosmetic. For example, eye drops, vaginal douches, nose drops and orally ingested tablets intended to improve appearance, are not cosmetics.

The composition of the product should conform to the Cosmetic Directive and the Cosmetic Products (Safety) Regulations. According to regulations there are



certain chemicals used in cosmetics which are either prohibited or restricted, and such chemicals should not be used or used within permitted levels. For example, teeth-whitening products are cosmetics. However, there is a limit of 0.1% of Hydrogen Peroxide permitted in the product released for use. A tooth-whitener with

hydrogen peroxide present in excess of this limit is an illegal cosmetic. Cosmetics represent a global industry with their main markets found in the European Union (EU), United States (US) and Japan. The rapid development of cosmetic products has forced the authorities of different countries to regulate these products to ensure consumer safety. Thus to ensure safety and efficacy, cosmetic products are regulated and controlled worldwide.

These regulations change from time to time. For some examples, due to the concerns about organ-system toxicity and endocrine disruption, led the European Union to prohibit the preservative butylatedhydroxyanisole (BHA) from cosmetics. This was also true with Diethanolamine (DEA)

widely used in cosmetics. The European Union prohibited use of DEA in cosmetics due to concerns about formation of carcinogenic nitrosamines. Toluene found in nail polish and hair dyes, is now restricted in the European Union, but not in the United States.

Triclosan, which has been linked to hormone disruption and antibiotic resistance, is found in soaps, detergents, toothpastes, deodorants, and more.

However,

purchasing a cosmetic product. It is very important to know what chemicals are being applied on your body. Certain people tend to show allergic reaction when certain chemicals come in contact with their body. Therefore it is very important to know the chemicals present in the cosmetic product that is being used.

How many users of these cosmetics go through the list given in the container? When one selects a cosmetic product it is customary to look at its appearance such as homogeneity, colour and its odor, but we never look at the list of the chemicals known as ingredients given in the label. It should also be mentioned that, some individuals are allergic to certain classes of compounds; therefore they should take special attention to go through

the ingredient list carefully before applying cosmetics. Reading the product label will give a breakdown of individual ingredients, but even this information is ultimately useless unless you know off hand what these chemicals are.

As an example, some individuals are allergic to citrus compounds but many cosmetics use citrus compound in order to give better odour, and to provide stability to the product, since most of these compounds are antioxidants. Another example is the whitening cream. Mercury-containing cosmetic preparations have been



this chemical is not used by many cosmetic industries at present.

By regulations all the chemicals used in a particular cosmetic product should be given in the label. But they are usually in very small fonts, and could not be read easily unless a magnifying glass is used. Companies however do not make it any easier by cramming 84 ingredients into one tiny 8pt paragraph. Anyhow very few people take the trouble to go through these labels when



used for years as skin-bleaching agents in many countries, but nowadays mercury is no longer permitted, because of the known hazards and its questionable efficacy as a skin-bleaching agent. The same applies for the EU as well because they do not allow the use of mercury compounds. It is however, essential to find out if the whitening products available in the market now contain mercury or not. Who looks after the regulation of these products? Many youngsters in Sri Lanka as well as those of Asian and African countries are very keen to keep their skin fair. This question should draw the attention of the relevant authorities. Another example that can be deliberated upon is the use of Hydroquinone derivatives. These products are considered as pharmaceuticals instead of as cosmetics. In case the toxicity of chemicals in the list of the ingredient given in the label is not known, it can be tested with a spot

test. It is very important to carry out a spot test before applying any cosmetic.

The CDDRA which is an authority to control and regulate the cosmetic products in Sri Lanka in terms of the gazette notification of the Democratic Socialist Republic of Sri Lanka (Extraordinary) No. 378 of 1985, requires the pre-market approval of any product going to the market. According to this Act all cosmetics manufactured, imported, sold and distributed, and



offered for sale in Sri Lanka should be registered under the provisions of the Act. Also the cosmetic manufacturers and importers within or outside Sri Lanka intending to market their products in Sri Lanka should register their products. However, this Act does not prevent fraud or stop illegal products from reaching the market. Registration time often delays the launch of cosmetics, the composition of which are likely to change with new developments in technology and/or fashion. In any case, in-market surveillance is needed to monitor the system, implying a duplication of enforcement procedures. It restricts the availability of new products on the market.

Time-consuming procedures and high-registration costs imply higher cost for companies and consequently more expensive products. Due to the lack of human resources the expected outcome of the Act was not realized. However, in 2015 this gazette was withdrawn and a new gazette was issued. According to this new gazette notification the authority to regulate has been called the National Medical Regulatory, NMR. However, in this gazette notification the cosmetic part has been taken out, and at present there is no authority to regulate cosmetic products in Sri Lanka. Actually Sri Lanka may be the only country without a regulatory body in the world. Recently many injuries, damages and even deaths have taken place due to the misuse of cosmetics. This is a very critical

situation and the authorities should take action immediately to regulate cosmetics in Sri Lanka.

In any street in Sri Lanka how many vendors are present for cosmetics, and how many beauty parlors are available? Are they selling or using quality cosmetic products? Who are the manufactures of the cosmetics that are put out for sale? What is the efficacy of these cosmetics? What is the guarantee that these products are not fraudulent? Who is responsible to answer these questions? Since the beauty industry in Sri Lanka is largely unregulated, it is up to the clients to do their own research to find the safest products. At present in Sri Lanka there are no legal standards for personal care products that are labeled as “pure”, “natural”, “organic,” or “herbal”. So look beyond the marketing claims and read labels carefully. Choose products with simpler ingredient lists and fewer synthetic chemicals. Avoid synthetic fragrance by



skipping products with “fragrance” on the label, and use fewer products overall.

Some personal care products are easy to make yourself, and this can be a great project for a party. Read labels for specific information on a product's ingredients, rather than relying on claims like “organic” or “natural.” Even though a product claimed to be “natural” or “herbal” there is plenty of room

for inclusion of harmful synthetics. Although it is merely one single word, on the ingredient label, “fragrance” means dozens of chemicals including hormone-disrupting phthalates and synthetic musks. Fragrance manufacturers claim the formulae are confidential business information and therefore these chemicals may not be given in the label. Even fragrances that purport to be natural can contain chemicals of concern, so choose products that disclose every ingredient.

One great way to know exactly what is in your product is to make your own, often out of everyday ingredients you have in your cupboards or refrigerator. Look for natural beauty products or make your own out of common household ingredients. Finally I would strongly like to suggest that, when using cosmetics to make yourself beautiful and attractive, either make them yourself or use them in minimum quantities. In addition do not forget to do the spot test before you use them. Have a beautiful life.



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New Developments of Cosmetics, Perfumes and other Detergents

Melani M. Fernando



We live in an age where staying clean, healthy and beautiful is becoming more and more important. Therefore cosmetics, perfumes and other detergent items are getting growing attention within the industrial sector and is being heavily backed by the latest science and technologies. However, beauty is not a modern concern. Its existence dates way beyond the ancient times of Kings and Queens. Hence, the use of cosmetics in order to improve the external appearance of one's self and perfuming the skin to leave behind a pleasant trail even when you are no longer present, simply are traditions descending through the generations.

Perfume is derived from the Greek word 'per fumum' which means 'through the smoke'. The earliest kind of perfumes were the resins burnt on fire to honour the Gods, and it is believed that perfume was discovered during the ages when fire was discovered. The first perfumers were priests, and legend states that the traditions for perfumes originated from

ancient Egypt before it influenced the western world through trade. Similarly it is believed that make-up was first used during high-court trials back in the days of the kings. Through the application of make-up it was possible for the victims to hide their true emotions behind the thick make-up they wore. And looking back at our own roots and traditions there are many traditional skin treatments and ayurvedic mixtures intended to improve the appearance of a person. Therefore personal care and hygiene is a field which is way older than many other fields of industry.

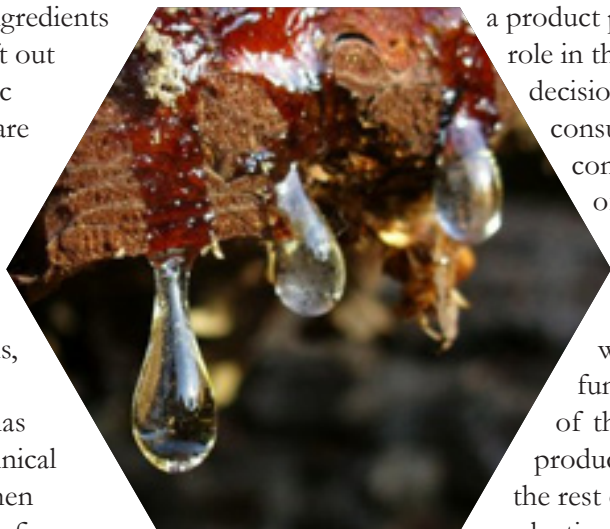
Talking about perfumes, it is important to understand the wide varieties of fragrances in existence.

It is natural to think of fine fragrances the moment one hears the term perfumes, however there is a larger market for the consumer fragrances, which are found

in mass market products such as shampoo, body wash, bar soaps, fabric conditioner, detergents, dish washing liquids, hand washes etc. This is also known as functional perfumery. In the case of fine fragrances, the raw materials are mixed in an alcoholic base to create the final complex perfume. And mostly the raw materials used are very expensive and are often natural extracts. Therefore there is rarely budget limitations for fine fragrance projects, hence the price of the final products. In contrast, when it comes to functional perfumery or consumer fragrances, the bases are no longer an alcoholic base, and the fragrance created has to be tested for additional stability. Also as the functional fragrances are aimed at



mass market products, the budget for the creation of the fragrances is very tight, and is around 8 euros per fragrance in general. Therefore, expensive ingredients are often left out and synthetic ingredients are mostly used instead of natural extracts. Due to these reasons, functional perfumery has a lot of technical struggles when compared to fine fragrances, however that is where the glamour lies.



Resins

New molecule discovery is very important in this regard to come up with bold new smells such as aldehyde C14 which made Chanel No.5 the best-selling perfume in the world. A single ingredient, if strong, even if it is present in minute amounts, is enough to bring about a magical change to a fragrance composition. A great example for this is the discovery of a molecule called 'Hedione' credited by Firmenich, the second largest flavour and fragrance house in the world. Individuals called 'Perfumers' or often known as 'noses' within the industry, work for these commercially less known flavour fragrance houses; Givaudan, International Flavours and Fragrances, Symrise and Takasago are among the other big players. These houses produce the fragrances for briefs provided by brands, be it fine fragrances and lifestyle brands such as Chanel,

Dior, Calvin Klein etc, or consumer fragrances for household brands from companies like Procter and Gamble or Unilever. The smell of a product plays a key role in the purchase decision of the consumer. The contribution of the smell is often more than 80%, where the functionality of the product takes the rest of the evaluation. The use of room fragrances and air fresheners

in order to increase consumer traffic in to showrooms and stores, is now practiced by many large brand houses as a luxury marketing strategy. The smell of the environment will make the consumers hang around the showroom longer, increasing the chances of purchase. This is all at a subconscious level. Therefore smell has evolved in to very different avenues lately. Have you ever guessed why the coffee shops smell so strong even when we walk on the road? Or why some of the hotel bathrooms smell of certain kinds of spices? Or why some clothes smell like they were sun-dried even if it was a cloudy day? Smell can easily deceive you!!

Microencapsulation is also one of the latest techniques developed for the functional fragrance products. The theory here is that capsules of fragrance are made to be absorbed by certain surfaces and they later

release these fragrances under the influence of motion. For example, when clothes are washed using detergent and then perfumed by the use of a fabric conditioner which comes with microcapsules, these capsules get absorbed on to the clothes, and release the fragrances for instance, when they are being folded, ironed, being worn or if it gets rubbed somewhere. This is because the capsules are only broken due to some external stress in order to release the fragrance. This technique is now tried on deodorants as well, where they believe that additional perfume will be released under the pressure created by movement, which makes it ideal for the function of a deodorant. Reebok's motion sense antiperspirant is a good example for this.

Well, if you think those are the greatest tricks of the industry, you need to test yourself where the cosmetics would lead you. The cosmetics industry has found refuge in science and technology like never before creating innovative products at the speed of a blink of an eye. The market has become quite competitive and saturated, and this is seen very clearly in mature markets such as the United



States and Europe, where it is more of a lifestyle. However, you would be surprised to hear if I told you that the country which is most advanced in cosmetics is a non-western country and is in the East. It is Korea! It is said that a Korean woman on average would use close to 25-30 different cosmetic products and the on average men would use around 15 products or more keeping the numbers to a minimum. The Korean researchers are the ones who introduce most of the latest technologies to the cosmetics market. They invented the BB cream, the CC cream you name it!! The latest of its kind is a cream called the 'Blur Cream' which contains a special silicon compound capable of reflecting light in all directions. Therefore all the imperfections on the skin would seem to disappear in an instant, providing the instant satisfaction of a 'WOW' look that every woman craves to see before she leaves the house in the morning. It also comes in a universal colour tone, where one neutral colour suits all skin types and colours. But looking in to the function of the cream, it doesn't provide any corrective support for the skin, it only deceives the eyes of the people who see you. So the boys need to watch out more than ever before! Ha ha!

However when looking at cosmetics, it is not only the beauty products that matter but also the products that provide care and treatment to the skin, thereby helping to preserve the true beauty.

Sun care products are an important category in this regard, where many active ingredients are used to avoid the harmful rays being absorbed by the skin and causing skin cancers, premature skin aging etc. And talking about skin aging, it is also a vast category with products for



all ages. Starting from anti free radical creams and lotions to anti-aging creams to global anti-aging creams for 60+ years. Furthermore, there are new products for men as well, to keep their skin hydrated, smooth and young-looking. When it comes to aging, the phases of aging differ depending on gender and also nationality. For instance wrinkles appear early in white skin whereas dark spots appear first for darker skin. And aging is quite interesting when based on gender. It is believed that women start to age when they reach 25 years and in contrast men age only when they reach 40 years. Quite unfair for us women, but that's how nature rewards. Yet, women will only carry mild wrinkles whereas men will carry deeper wrinkles. Also the aging process for women is more gradual whereas it is more of a sudden experience for men, where they would wake up one day in the

morning to find out that they look old.

Now looking back at this industry of personal care products, beauty and grooming, one can bet that it is only getting bigger and better. Therefore the fragrance and

cosmetics industry has a lot of potential for young scientists in the STEM fields and there are lots of creative career opportunities ahead. This industry can be thought of as a perfect marriage between science and creativity. So for those of you out there with the brains to come up with the next big idea in this fast paced world

of discoveries and those of you who also want to put your creative skills to test and bring a smile on someone's face be it through the sensuality of a new perfume, the caring smell of a fabric conditioner or the confidence of a young girl dressed up with make-up, this is the field you might want to get in. After all, there's not a single day to regret when you do what you love!!



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Hazardous effects of Cosmetics, Perfumes and Detergents

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Cosmetic products, which are used in cleansing, improving or altering the skin, hair, lips, nails or teeth have been used by humans for a long time. These include a wide range of products like skin cream, hair dyes, perfume and lipstick. Cosmetics are in different forms, have different uses and different levels of exposure. Some cosmetics such as shampoo and toothpastes are rinsed off immediately after application while some others are left on for several hours eg: perfumes, body lotions, lipsticks. Some are applied on larger surface areas (eg: body lotion) and some are applied on small areas like lips. According to a survey on the use of personal care products done in 2004, an average adult in Europe uses nine personal care products daily with 126 unique chemical ingredients to clean or beautify themselves, change appearance and enhance the odour. It is highly important that these cosmetic products do not cause any adverse health effects on consumers. However, dermatologists consider cosmetics are more harmful than good.

Are we aware of the danger? In the past it was believed that cosmetics would always remain on the surface of the skin, and therefore there was not much concern on the safety of cosmetics. Later it was found that some of the compounds in cosmetics could penetrate through human skin giving various localized effects (these include skin creams, shampoos, powders). Some people are sensitive to different types of skin care products and produce immediate allergic reactions such as itching. Body sprays and perfumes are volatile in nature and therefore the users are exposed to them at a higher level through inhalation while lipsticks give the risk of direct oral ingestion.

Even if any kind of reaction is not encountered by applying cosmetic products, there can be long term effects after their absorption through skin, ingestion or inhalation. The nature and the severity of these effects depend on the cosmetic ingredients present and the time/level of exposure. Therefore, the safety of user has

become an important concern and regulatory criteria which should be fulfilled in respect of ingredients used in cosmetics has been introduced. In addition to toxicity of ingredients, likely routes of exposure and potential health effects to humans are considered as main factors when deciding regulatory criteria for cosmetics. The regulatory standards on cosmetics vary from country to country. Some countries and Unions (eg EU) have imposed very strict regulations while some countries have no such strict regulations and hence there are vast range of cosmetics in the market that do not comply with the accepted standards. Therefore, it is the sole responsibility of the user to choose good quality products from reputed brands that comply with accepted norms and regulations in the production of cosmetics and perfumes.

Cosmetic ingredients

Reports say that the global market for skincare and colour cosmetics exceeded 53 billion dollars in

2002. Global cosmetic producers introduce new products to the market at a rapid rate and they use vast array of ingredients (chemicals or compounds) in making new products or in the improvements of existing products. Over the years the ingredients that are used in cosmetics have changed dramatically. The dictionary of this Cosmetics Toiletries and Fragrance Association (CTFA - New Zealand) lists more than 10,000 raw materials that are being used in the production, and every year hundreds of new ingredients are added to this list. In addition, these chemicals can be carried into the product as contaminants, by products of the manufacturing process, residuals of starting materials or as processing aids. Although the ingredients used in cosmetics have to be safe to use, cosmetic companies produce and market products with ingredients that are poorly studied, not studied at all, or worse, known to pose potentially serious health risks such as cancer, birth defects, reproductive and developmental problems, allergies and respiratory ailments, as well as other health problems. Many of these harmful chemicals have been detected in human bodies and even in human breast milk.

According to the European Union standards, more than 1000 substances including formaldehyde

and its releasers (common in shampoos), lead and its compounds (an ingredient in men's hair coloring product), acrylamide polymers (found in foundation and skin lotions), some phthalates (commonly found in a large variety of products), and heavy metals have been prohibited in cosmetics due to toxicity. However, US Food and Drug Administration (FDA) has banned only 9 chemicals including only 1 toxic metal, Hg. Consumers should be aware that a variety of hazardous ingredients are used in cosmetics in the form of colourants, preservatives and antimicrobials, UV filtering agents, emulsifiers, solvents, and plasticizers.

Colourants

Colourants are added to cosmetic products to colour the product itself or to colour hair, skin or nails for decorative purposes. Even though natural substances have been used to colour cosmetics in the past, synthetic dyes are widely used in cosmetics at present. Synthetic dyes can be further categorized into azo, triaryl methane, xanthene, indigo and quinolone classes. For colorants the main route of human exposure is dermal contact, although for oral products like lipsticks, ingestion also is a route of exposure. Some

of the adverse health effects of commonly used colorants are shown in the table 1.

Even though azo group dyes have the potential to cause cancer and genetic mutations, they are widely used in cosmetics due to their low price. Paraphenylenediamine (PPD), is a known irritant and allergen found in many permanent and some semi-permanent hair dyes. Therefore, use of such dangerous colorants have to be controlled.

Preservatives and anti-microbial agents

Preservatives and anti-microbial agents are added to increase the life time of cosmetic products by destroying or inhibiting the growth of microorganisms. The most widely used family of preservatives is 'parabens' (methyl-, ethyl-, propyl-, butyl-, isobutyl- and other parabens) and listed in Table 2. Other preservatives and anti-microbial agents used in cosmetics include Isothiazolinones, Formaldehyde releasing agents and Triclosan.

Parabens are found in many cosmetics: foaming cleanser, body mist, body lotion, lipstick, body cream, facial cream, body and shower gel, skin cream, hand lotion,

moisturizers, and lip gloss that are in widespread use by girls and women. Isothiazolinones and Formaldehyde releasing agents

Table 1. Health hazards of Colourants

Colouring agent	Potential Health Effects
Pigments (Organic or mineral)	Cause cancer, respiratory diseases
Triarylmethane-dyes	Enter blood stream
Azo dyes	Cause cancer and genetic mutations
Paraphenylenediamine	Cause allergic reactions and irritation

Table 2. Health hazards of preservatives and anti-microbials

Preservative	Potential health effects
Parabens	
Butyl Parabens	Have the possibility to produce carcinogenic nitrosoamines, Endocrine disruption
Isothiazolinones	
Methylisothiazolinone	Can cause skin allergic responses when contacted with skin, Prolonged exposure can cause neurotoxicity (can harm nervous system)
Chloromethylisothiazolinone	Can cause skin allergic responses when contacted with skin
Other preservatives	
Formaldehyde releasing agents	Can cause cancer
Triclosan	Skin and eye irritation, Can disrupt thyroid function
Iodopropynyl Butylcarbamate (IPBC)	Can cause acute inhalation toxicity

are mainly used in hair products and moisturizers, while triclosan is widely used in deodorants and sanitizers.

UV filtering agents

UV filters are used to protect the skin against UV radiation by absorbing, reflecting or scattering UV radiation. These are mainly used in sunscreen products, although their use in daily skin creams and lip balms is also increasing.

UV filters can be categorized as physical filters and chemical filters. Physical filters mainly consist of metal oxides. Chemical filters are organic compounds which contain aromatic structures, Carbon-Carbon double bonds and/or

carbonyl groups. These chemical filters have the ability to penetrate the skin and therefore they can cause various dermatological side effects. Some of the hazardous UV filtering agents used in cosmetics are shown in Table 3.

Emulsifiers

Emulsifiers are used to hold insoluble particles in suspension. Most of the emulsifiers contain surfactants which change the surface tension of water. Some of the compounds included in emulsifiers can be harmful to humans as shown in Table 4. However, the most dangerous compound in emulsifiers is 1,4-dioxane, which may be present as an impurity in most emulsifiers and is a known carcinogenic.

Solvents

Some of the solvents used in cosmetics are hazardous to humans. Since most of the solvents are volatile they also increase the risk of exposure by inhalation. Some of the widely used solvents and their hazardous effects are shown in the Table 5. Out of these solvents, 1,4-dioxane has been banned from being used as an intentional ingredient in cosmetics, but it still can be found as an impurity in most cosmetic products.

Table 3. Health hazards of UV filtering agents

Compound	Potential Health Effects
Octyl methoxycinnamate	Endocrine disruption, reproductive problems
Benzophenone	Can cause cancer, endocrine disruption
Homosalate	Endocrine disruption, birth defects

Table 4. Health hazards of emulsifiers

Compound	Potential Health Effects
Polyethylene glycol (PEG)	Kidney damages, skin irritation, suspected carcinogen
Triethanolamine (TEA)	Can cause allergic reactions, suspected carcinogen
Diethanolamine (DEA)	Suspected carcinogen

Plasticizers

A variety of Phthalates including dibutyl phthalate and diethylhexyl phthalate are used as plasticizers in cosmetics. They are used mostly in nail polish in order to impart flexibility to nail polish after it dries. Although use of phthalates in cosmetics have been banned or limited in some countries, investigations have shown that most cosmetics contain more than the safe level of phthalates. Health hazards of phthalates include

- Reproductive disorders
- Disruption of endocrine system
- Birth defects
- Cancer

Moisturizers and anti-moisturizers

Moisturizers and anti-moisturizers are used to increase and decrease the moisture of cosmetics respectively. Some moisturizers and anti-moisturizers and their effects are shown in Table 6.

Table 6. Health hazards of moisturizers and anti-moisturizers

Compound	Application	Health Effects
Siloxanes	Softening and moistening	Endocrine disruption, reproduction disorders
Talc	Reducing moisture	Lung cancer, ovarian cancer

Heavy Metals

Toxic heavy metals present in cosmetics include Antimony (Sb), Arsenic (As), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Mercury (Hg), Nickel (Ni) and Lead (Pb). It is reported that even if these heavy metals are not

Table 5. Health hazards of solvents used in cosmetics

Solvent	Potential Health Effects
Chloroform	Skin irritation, damages to the nervous system
1,4 – dioxane	Carcinogenic, damages to nervous system, liver and kidney damage
Polyethylene Glycol (PEG)	Kidney damages, skin irritation, suspected carcinogen
Dibutyl phthalate	Liver and kidney damage, reproductive disorders, birth defects

used intentionally in cosmetics production, they can be present as impurities. Some countries have introduced ‘Technically avoidable limits’ for those heavy metals. It

is considered that if the amount of metal present as an impurity is lower than the technically avoidable limit, it is generally safe for the consumers.

However, these technically avoidable limits also may not be safe because heavy metals can accumulate inside the body and cause long term health effects like cancer, reproductive problems, kidney diseases etc. In addition researches have revealed that some of the cosmetic products in market contain heavy metals in much higher concentrations than the technically avoidable limit.

Details of some of the heavy metals present in cosmetics and their potential health effects are given in table 7.

Among these heavy metals Hg and Pb are the most dangerous. Hg is a very toxic metal and extremely high concentrations of Hg has been found in skin creams, which can cause severe health hazards to consumers. Pb is also dangerous because it can affect small children

Table 7. Heavy metals present in cosmetics

Heavy Metal	Applications in cosmetics	Potential Health Effects	Maximum allowable limit	Presence in cosmetic products
Arsenic (As)	Arsenic is a highly toxic carcinogenic and is not added as an intentional ingredient in cosmetics	•Inhalation – lung cancer, nervous disorders •Ingestion – urinary tract cancers •Skin contact – skin cancers, skin eruption	3-5 µg/g	lipsticks, lipgloss and skin creams contain more than permissible level of As.
Antimony (Sb)	Black paint for eyebrows Vermillion, yellow or blue pigments	•Inhalation – respiratory diseases •Ingestion – vomiting, diarrhea, ulcers •Skin contact – skin lesions	5-10 µg/g	Lipsticks
Cadmium (Cd)		•Inhalation – lung cancer •Ingestion – kidney diseases	3-5 µg/g	unbranded lipsticks (as high as 400-3390 µg/g)
Chromium (Cr)		cancer and allergic reactions	1 µg/g	eye shadows (as high as 5470 µg/g)
Cobalt (Co)		Cobalt can cause severe skin allergies and has been identified as possibly carcinogenic	1 µg/g	eye shadows
Lead (Pb)	White pigments	Can harm fetuses and small children, have the possibility of causing cancer	10-20 µg/g	eye shadows, some hair dyes, lipsticks and lip gloss
Mercury (Hg)	skin creams and soaps preservatives in eye make-up cleansers and mascara	Hg is carcinogenic and can also cause kidney failures and neurological diseases	1-3 µg/g 5 µg/g	skin lightening creams (as high as 35824 µg/g) very high concentrations of Hg-ammonium chloride, a very toxic substance has been found in skin creams
Nickel (Ni)	Used as a pigment	Can cause severe allergic reactions when contacted with skin have the possibility of causing cancer		eye make up

and fetuses severely. The presence of Pb in the lipsticks used by pregnant women can be highly hazardous to fetuses. In addition, high concentrations of Cr, Co and Ni in cosmetics is also a concern because they can cause severe allergic reactions

Other hazardous chemicals present in cosmetics

In addition to the above mentioned substances and heavy metals, there are some other hazardous compounds which are used in cosmetic industry. Such compounds and their applications are shown in Table 8.

Adverse Health effects of perfumes and deodourants

Perfumes contains exclusive fragrances and different alcohols that can stimulate receptors in the nose. Chemicals used in fragrances are synthetic compounds derived

from petroleum. They include benzene derivatives, aldehydes and many other known toxins and sensitizers - capable of causing asthma or migraine headaches, cancer, birth defects, central nervous system disorders and allergic reactions. Alcohol content in perfumes is about 80 per cent and alcohols are reported to cause breast cells to produce excessive amounts of estrogen which can lead to development of breast cancers.

Skin rashes, swelling, redness and itching are the commonest forms of perfume allergies reported. Jasmin synthetic, cinnamic alcohol and hydroxycitronellal are the most commonly found allergens in perfume. In some countries, use of perfumes and fragranced products are banned in public places. Like passive smoking of cigarette smoke, perfumes and fragranced products can cause major health problems to the non-users mainly

due to their volatile nature.

Deodorants are used to disguise and reduce body odour created by the activity of microbes and these contain perfume and antimicrobials. Deodourants are widely used, as sprays, creams, sticks or rollons. Deodourants can reduce the amount of sweat produce in the body due the presence of antiperspirants which are typically metal (aluminium) salts. These metal salts can obstruct the sweat glands in the arm pit preventing the production of sweat that removes toxins from the body.

Adverse Health and Environmental Effects of Detergents

Detergents are another group of widely used substances which can be hazardous to humans. According to recent investigations exposures to detergents have been most frequent among children, and ingestion has been the likely route of

Table 8. Other hazardous compounds used in cosmetics

Compound	Applications	Potential Health Effects
Mineral oil	As a moisture retaining agent in skin creams and lotions	Skin cancer, liver damage, diarrhea
Sodium Lauryl	Bubbling agent in shampoos, cleansers	Liver damage, respi ratory Sulphate difficulty, eye and skin irritation
Hydroquinone	Skin lightening creams	Can cause cancer, skin irritation
Salicylic acid	Skin creams	Skin irritation, vomiting, respiratory diseases
Acrylates	As an adhesive in nail polish	Can cause cancer, irritation

Table 9. Health hazards of detergents

Component	Potential Health Effects
Alkyl benzene sulfonate (ABS)	Vomiting, gastrointestinal irritation
Ammonium germicides	Vomiting, collapse, gastrointestinal irritation, convulsions, muscle weakness
Sodium tripolyphosphate	Vomiting, diarrhea
Polymeric Polyphosphates	Hypocalcemia
Pine oil	Eye irritation, gastrointestinal irritation, respiratory difficulties
Sodium hypochlorite	Respiratory difficulties, cough, eye inflammation

exposure. However, in some cases contact with skin or eyes also have caused adverse health effects. While the components in detergents are not generally considered as toxic, they have the ability to cause various health effects at high concentrations. Detergents in powder form are generally more toxic compared to liquid detergents. Some of the potentially hazardous compounds in detergents are shown in Table 9.

However, most of these compounds are likely to be hazardous only if they are ingested. Therefore, it is recommended to keep small children away from detergents to avoid accidental ingestion.

In addition to health concerns,

detergents are also a source of environmental pollution. Alkyl benzene sulfonate (ABS) is the compound responsible for the most of the environmental issues caused by detergents. ABS is used as a surfactant, and therefore it has the ability to cause excessive foaming in water. Even an ABS concentration as low as 1 ppm can cause very high amount of foaming. This is a very serious issue because foaming

in water bodies can damage aquatic species, and foaming during water treatment process can cause difficulties in water treatment.

Two statements made by renowned toxicologist Philip W. Harvey: “Absence of evidence is not evidence of absence of a harmful effect” and “These chemicals are being directly applied daily, by

very large numbers of people, and the long-term health effects of exposure are essentially unknown”, depict the seriousness of this issue. As intelligent consumers, it is our responsibility to be conscious about the health effects of cosmetic products and always select products which comply with the regulatory standards.



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Nobel Prize Winners - 2015

Thusitha Malalasekara



The 10th of last December, King Carl XVI Gustaf of Sweden handed over the Nobel Medals (hand made in 18 carat-green gold plated with 24 carat gold) Nobel Diploma and a document confirming the Nobel Prize amount to Nobel laureates in Stockhome. Meanwhile King Harold of Norway handed over the peace prize laureates their noble peace prize in oslo.

Nobel prizes the full value of each amounting to nearly Swedish Kronav (SK) 8.0 million) are donated from the money earned from the safe securities invested

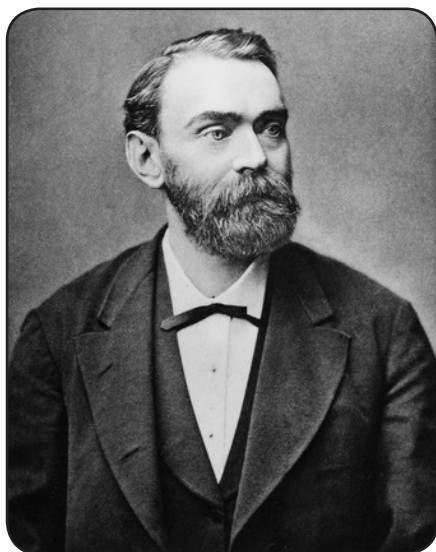
from the estate of Alfred Nobel. Sir Alfred Nobel (Born on 21st October 1833 and died on 10th December 1896) was a chemical engineer, innovator and an armament manufacturer. Among his 350 different patents, Dynamite was the most famous. The wealth he earned through dynamite and other armament manufacture was used posthumously to institute the Nobel Prizes. Nobel signed his last will on 27th November 1885 and set aside the bulk of his estate to establish Nobel Prizes for chemistry, physics, physiology or medicine, literature and peace. Each Nobel Prize has to provide an equal amount of money and to be awarded annually without distinction of nationality. The sixth Nobel Prize for economics was included in the year 2001 on the request of Peter Nobel, a grand nephew of Alfred Nobel, made to the Bank of Sweden. It was termed as a prize in Alfred Nobel's memory. By giving his consent to award "Nobel Prizes" Alfred Nobel who was at that time referred to as "The merchant of death" is today

remembered as a person who contributed to recognize the global development of Peace, Literature and Sciences.

The following are the Nobel Lauretes nominated by the Norwegian Nobel Committee and other authorities to receive Nobel prizes for the year 2015.

Chemistry

The 2015 Nobel Prize for chemistry was awarded to three eminent scientists for their mechanistic studies of DNA repair. They are Aziz Sancar a Turkish-American Biochemist and Molecular Biologist. His speciality being the DNA repair cell cycle check points and circadian clock, was born in Savur, Turkey in 1946. Presently he is attached to the University of North Carolina, USA. Paul Lawrence Modrich a Professor of Biochemistry at-Duke University and an investigator at-Howard Huges Medical Institute, shares the 2015 Nobel Prize for chemistry with Aziz Sancar and Thomas Lindahl. Modrich was born in 1946,



Alfred Nobel



while

Aziz Sancar - Paul Modrich - Thomas Lindahl

Thomas Lindahl who was born in 1938, Stockholm, Sweden is a Swedish scientist specializing in cancer. At present he is attached to the Francis Crick Institute and Clare Wall Laboratory both at Hertfordshire, United Kingdom. Scientists Paul Modrich, Aziz Sancar are fellows of the American academy of Arts and Science, while Thomas Lindahl is a member of the Norwegian Academy of Science and Letters.

Physics

Arthur Bruce McDonald, an astrophysicist of the Queen's University, Kingston, Canada was awarded the 2015 Nobel Prize in Physics jointly with Japanese Physicist Takaki Kajita, Arthur McDonald, born in 1943 in Sydney, Canada, investigated whether or not neutrinos have mass, and the experiments done

to date suggest that the neutrinos may have a mass. Recently it was suggested by MacDonald and co-scientists that electron neutrinos from the sun were really oscillating into muon and tau neutrinos. He is the director of the Sudbury Neutrino Institute of the Queens University.

The other Nobel laureate who is jointly sharing the noble prize in physics with McDonald is Takaki Kajita a Japanese Physicist widely respected as an expert in neutrino experiments. Kajita was born in 1959 in Higashimatsuyama in Japan. Presently he is working for the University of Tokyo, Kashiwa, Japan.

Physiology and Medicine

You Yon Tu, a Chinese medical scientist, pharmaceutical chemist, pharmacist and educator is one of the three scientists who were jointly

awarded the 2015, Nobel Prize for Physiology or Medicine.

You Yon is credited for discovering artemisinin and dihydroartemisinin, drugs that revolutionized the treatment of malaria, saving millions of lives in South Asia, South Africa and South America regions.

You Yon Tu was born in Zhejiang Ningpo, in China in 1930. At present she is working in China Academy of Chinese Traditional Medicine in Beijing, China. In 2012



William P Campbell



Svetlana Alexeandrovna

she was recognized as one of the ten national outstanding females of the Peoples Republic of China.

Satoshi Omura, the Japanese biochemist who is presently working at-Kita Sato University in Tokyo, Japan, is one of the other two scientists who were awarded the 2015 Nobel Prize for Physiology or Medicine.

Omura is known for the discovery and development of various pharmaceuticals originally occurring in microorganisms. Satoshi Omura is an expert in bioorganic Chemistry, and discovered many bio active chemicals occurring in microorganisms.

Born in 1935 in Yamanoshi Prefectuar, Japan, he is considered as a world expert on macrolide antibiotics.

The Irish born American biologist and parasitologist, the 3rd scientist who shared the 2015 Nobel Prize for Medicine or Physiology with You Yon and Omura, is William P.Campbell. The award was presented to him for his discoveries about a novel therapy against roundworm infection.

Born in 1930 in Ramelton, Ireland, he is presently working at Drew

University, Michigan, New Jersey, USA.

Economics

British economist Stewart Deaton who analysed consumption, poverty and welfare was awarded the 2015 Nobel Memorial Prize in Economics.

He was born in 1945 in Edinburgh, United Kingdom, and is presently serving in the Princeton University in Princeton, New Jersey in United States of America. He has written a number of books on economics including the Great Escape: Health, Wealth and the Origins of Inequity.

Literature

Belarusian investigative journalist



Satoshi Omura

and non fiction prose writer Svetlana Alexeandrovna Alexeievich who writes in the in Russian language, was awarded the 2015, Nobel Prize for Literature. The award was presented to her “for her polyphonic writings, a monument to suffering and courage in our times”.

Svetlana was born in Ivano-Frankivska in Ukraine on 31st May 1948.

Peace

“For its decisive contribution to the building of a pluralistic democracy in Tunisia in the wake of the Jasmine Revolution of 2011”, was the prize motivational prepared for the Tunisian National Dialogue Quartet which is a group of four organizations that were central in the attempts to build a pleuralistic democracy in Tunisia when it was awarded the 2015 Nobel Peace Prize.

The quartet formed in 2013, comprises the following civil society organizations in Tunisia.

- The Tunisian General Labour Union.
- The Tunisian Confederation of Industry Trade and Handicraft.
- The Tunisian Human Rights League.
- The Tunisian Order of Lawyers.



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