ISCC

NEWSUPDATE

A ROUND UP OF NEWS FROM INDIA AND AROUND THE WORLD

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Contents

Indian Society of Cosmetic Chemists

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Presidents Message:

Are we utilizing our ISCC membership?

Last two months have again has been challenging for us , Covid again kept us grounded at home with widespread cases and loss of our colleagues, family and fraternity members. The loss of our young Fraternity members really shocked us all. On behalf of ISCC I would like to extend sincere homage to the lost souls who were budding scientists, budding marketing and sales talent but to top it all were our family members whose loss will always be mourned by us.

These two months have also been thought provoking months. When sitting at home and going through the lockdown again gave a lot of free time to ponder on thoughts. During one of these pondering sessions, we realized that our members are not utilizing the facilities they are getting through ISCC. When I say this, it means how many of us are actually reading the KOSMET Newsletter, how many of us are referring to the books and research documents available on line for the IFSCC members. Are any of our members applying for IFSCC awards through ISCC?

With so many bright industrial members how many research papers have been presented from India in the international Cosmetic Conferences? How many Young Scientist are writing assays and getting the travel awards for conferences?

Actually, if we look at the available data, I can say that hardly one or two papers are presented every year from India on the international IFSCC platform and hardly one or two young scientists have applied for and written assays . Does this mean we do not have research happening in India?

Actually, in reality we are doing research, but we are not utilizing the resources available to us. Actually, when you are an ISCC member you are sitting on a knowledge treasure with access to Free books and research papers in KOSMET. We can also apply for International awards through ISCC and look at the brighter prospects available globally for us.

We have to change our thinking pattern and come up with more research papers, create more scientific database for India, Today the research's that are happening in India are just being kept inside the fore wall of the institute I understand we have to keep it secret but out of 100 research activity only 80 activities might be important for the companies the rest 20 activities can be scientifically captured and published so that it can be added to our Indian cosmetic Industry research database. This research knowledge can then be further utilized by people in the industry for the growth of our next generation.

Hence I would like to just sum up with request to all the members that please realize the treasure that you have by becoming the ISCC member and utilize the membership to the fullest not only by accessing the free books and research papers but also by applying for the monetary and honorary awards given by IFSCC and by participating in various poster and paper competitions.

ISCC Activities- March 2021

ISCC - AGM

The 13th Annual General Body Meeting of the Indian Society of Cosmetic Chemists (ISCC) was held Online via ZOOM on Friday, 19th March, 2021 at 7.00 p.m.

The members present were updated about the work done by the society for the past year and apprised the members of the growth of the society, the various programmes/activities held as well as the response even in this pandemic situation. They were also informed on the various programmes undertaken by ISCC as well as IFSCC in order to keep all of us abreast with the advances in the industry.

ISCC office bearers requested the members and the cosmetic fraternity to avail the various opportunities available by becoming members of ISCC and in turn avail all the benefits of IFSCC.

Webinar

ISCC successfully organized a webinar titled "Cosmetic Rules 2020" on 04th March 2021. This webinar was arranged in order to create awareness and educate the members with a birds eye view of the new cosmetic rules and regulations which have come up recently. Our Speaker Ms. Vrinda Rajwade- Senior Regulatory Affairs Manager Hindustan Unilever Ltd., explained and updated the changes in the rules relating to import, manufacture, labelling, sale and distribution of cosmetic in India.

The webinar was a huge success with over 180 registered participants of which almost 90 attended the same.

Student Membership Drive May 2021:

A student membership drive was taken by ISCC. On behalf of ISCC our President in ISCC introduction speech was made at the conference held by Kamla Nehru College on Recent Advances in Cosmetic Science. The student members took the opportunity and became members of the society.

Essay Competition

Keeping in view of our motto to help the students showcase their knowledge, experience and exposure and to mark a new beginning in 2021 we at ISCC had organised an Essay writing competition for students and researchers.

This competition was held in three categories with three different topics :
1.Under Graduate: Nanotechnology:Boon or Bane in Cosmetics
2. Post Graduate : Sustainability avenues in Cosmetics
3.Research Students: Novel Drug Delivery systems in Cosmetics

We had received tremendous response from all over the country. There were more than 100 entries for all the three categories. All these essays were evaluated by the expert panel comprising of 8 judges from the academics and industry and the results were announced during the ISCC AGM held on 19th of March 2021.

Following is the list of winners in various categories:

Category - Research Students

Mr. Pradip Thakor – NIPER Hyderabad
Mr. Anand Chourasia – Punjab University, Punjab

Category – Post Graduate

Ms. Ayushi Chandekar – LAD College, Nagpur
Ms. Tuba Khot – B K Birla College, Kalyan
Ms. Mrudula Sonawane – ICT, Mumbai

Category – Under Graduate

Ms. Sonam Pasi – Dr. L H Hiranandani College of Pharmacy, Mumbai
Mr. Manas Mahale – Bombay College of Pharmacy, Mumbai

Minimalist Beauty.

U. K. Dasgupta, Freelance Consultant info@ukdasgupta.com

Minimalism in beauty has been steadily increasing in popularity over the past few years.

But what is minimalist beauty? Is it just the front presented through elegant, simple packaging and good marketing, based solely on aesthetic, or does it have something to do with the products and formulations themselves?
Opinion is significantly varied over the spectrum of people, be it Dermatologists or Beauty Influencers or Skin Care Experts or Cosmetic Surgeons. It will be interesting to explore what consumers think as minimalistic beauty actually is and what it should be.

So, what really is Minimalistic Beauty?
This subject requires some more exploration! Many products that are considered to be minimalist are actually the opposite camouflaged under pristine looking packaging with quite a complex of ingredients within the formulation.What we first need to talk about is chemophobia. This extreme fear of chemicals comes from not knowing and not understanding one's safety from chemicals, what should be feared and what shouldn't.This fear is understandable when industry and nature combine to give us chemistry and products that turn out to be the world's biggest killers.
As scientists, it is our role to understand and educate our customers, explain what is safe, tell them the truth and advise them on what to do. To do that, we must understand the chemistry and educate ourselves.
As Einstein famously said: "If you can't explain it to a six-year-old, you don't really understand it."
It is, therefore, critical that welook at the back panel of the packaging to understand the, sometimes, unpronounceable names of ingredients mentioned therein. Minimalist beauty is quite complex. Though the definition of Minimalistic Beauty is still not completely clear but appears to move towards excluding a lot of superfluous ingredients. It has also to do with using lesser number of products to achieve the desired results.Minimalist beauty is also about transparency of the ingredients in the product.

There is no doubt that Covid 19 has reshaped the landscape of the cosmetic industry, forcing many companies to reduce the number of SKU's in their product ranges. The health crisis has slowed down innovation and market launches, leaving many products in the evaluation stage. While consumer desires in terms of primary functions have not changed with the global pandemic, we are seeing a shift towards naturalness in cosmetic products. Though going only natural does not necessarily match with being minimalistic. Therefore, it would tend to suggest the 'Clean' way to go. Clean does not mean the green or natural way to go using a load of Ecocert/Cosmos/Natural classified ingredients. We are all aware that Synthetic Fragrances are not 'safe' but natural fragrances can, sometimes, be even more dangerous than synthetic ingredients. However, the standard exclusions would include parabens, SLS, SLES, Phthalates, Fragrances (Natural or Synthetic) and some petrochemicals. It is also especially important to remember here that all Ecocert/Cosmos/Natural are not devoid of probable idiosyncratic reactions in consumers. Some non-sulphate surfactants can cause significant dryness of the skin if used in a high concentration in a formula. Standalone natural gums or combinations of natural gums provided significant skin soothing effects to counter such irritants. Creating the right balance within the formulation should be the endeavour of all formulators.

While 'Less is More' is the mantra for minimalism, there are many products that could be perceived to be minimalist, but their formulations could be quite complex. Examples of such products will be a BB cream which can do away with the use of multiple products like a foundation, a sunscreen and a moisturising/hydration product or a multi-purpose 3 in 1 colour product which work as colour corrector, eyeshadow and lip colour or all over colour products. To achieve the multi-purpose effects for a single product does involve a multitudinous number of ingredients to achieve the 3 in 1 effect.Another example of multi-use product would be a face wash which can also double up as a make-up remover. Such a product could be used comfortably at any time of the day or night. They should, definitely, exclude superfluous ingredients like fillers, fragrances and actives at emotive levels to just enhance the marketing story.Minimalist packaging could be smaller easily re-usable packs with pristine decoration and followed up with refill packs for the products, which are recyclable. This will not only help to declutter the environment but will be more eco-friendly and reduce significant inventories at the industry level to make them more profitable. On the lighter side, it will also declutter the dressing tables and purses.

The consensus for minimalist beauty is definitely 'minimum number of ingredients' with maximum benefits to create a product which is easy to apply and provides a natural looking finish. As mentioned earlier in the article regarding balance of formulation, natural and sustainable materials are bio-degradable, which also mean that they could create free radicals when in contact with humid and warm skin, which will, in turn, damage the skin. For that reason, synthetic materials are important, to prevent such undesirable effect. Mineral make-ups should effectively be the powder with the colours to create the tint required whether they are pressed or baked or loose. Skin Care products could be formulated using, maybe upto 2, synergistic actives (at therapeutic levels) and another 3 – 4 ingredients to create a base. This would be the way to go with minimalistic concepts. Providing some details (not the marketing jargon) of the various ingredients used on the back panel would ensure transparency of the ingredients. Therefore, a minimalist formulation will be a balanced combination of Ecocert/Cosmos/Natural ingredients with synthetic ingredients.

Minimalist products should endeavour to enhance one's natural beauty and not overdo it. The final result should be restrained and natural and this will be the future of the beauty industry for some time to come.

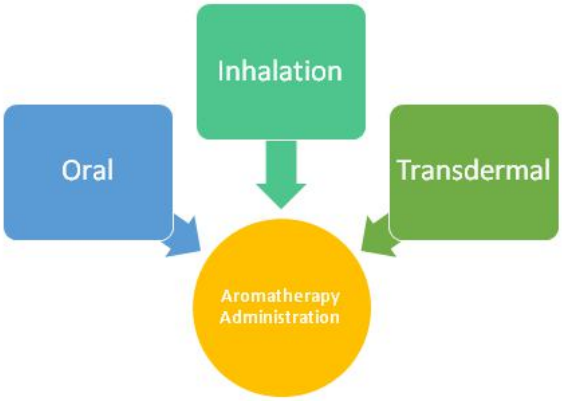
Aromatherapy and Artificial Intelligence:

By Dr. Renuka Thergaonkar

Wellness has become the main theme of the consumers habits and the FMCG market. Today everything revolves around wellness. Post covid consumers have suddenly become more health consciousand are searching for wellness products to use at home i.e. all natural and organic skin care brands, aromatherapy products. The ever-increasing demand for healthier products leads to stores scrambling to provide increased availability of natural and organic products. This has led the companies to look at Wellness wheel which they are trying to bring in to all the parts of the FMCG market

Industry is talking about Wellness wheel Aromatherapy is an Art as well as a Science . It has for ages been considered as holistic therapy. Aromatherapy acts upon holistic principles to awaken and strengthen energies and to promote self-healing. Aromatherapy Art or Science, Aromatherapy is the use of essential oils for therapeutic or medical purposes (Buckle, 2003).. Buchbauer defined aromatherapy as-therapeutic uses of fragrances to cure, mitigate or prevent diseases, infections and indispositions by means of inhalation. The main component of aroma therapy is essential oils also called as volatile oils . They have an aromatic odour . Aromatherapy is generally used for treatment of common problems like headache, cough, cold, sleep related issues, stress, anxiety etc. Advanced practitioners are using aromatherapy in treating psychological as well as various physiological issues.

Routes of administration: Aromatherapy is generally administered by three ways in a patient:



a. Oral route: The essential oils are generally administered orally in form of oils or as seasoning in products. The oils are Bitter tasting and may irritate mucosal lining. But this mode of application is suitable only under supervision of experienced practitioners as Continuous ingestion for long duration leads to hepatotoxicity. Oils often formulated as capsules and then consumed orally.

b. Transdermal route: Lipid solubility of essential oils allows for better penetration in the skin. Easy penetration generally happens maximum behind ears, eyelids, inside wrist followed by soles, palms, forehead, scalp, armpits and the least in legs, buttocks, trunk, abdomen. The oils are often applied by rubbing or by massaging. The oils are generally incorporated in the Carrier oils, gels or creams and then massaged on the skin.

c. Inhalation: This is the most common and effective route of administration and is regarded as “true aromatherapy”. The Incidence of adverse effects are very rare. Various methods of administrations like spraying on cloth using an aroma diffuser or just by spraying.

Essential oils : The main component of aroma therapy is essential oils also called as volatile oils .These essential oils are obtained naturally from the plant source as well as animal source and are used for treatments. Essential oil plays a role in plant metabolism and are also used in plants for communication.It Serves to attract beneficial insects and repel the others. Essential oils allow plants to send and receive signals. Chemical communication requires specific signals that can be clearly recognized and interpreted. These chemicals are mostly in combinations like acetal and ester and not alone or are in enantiomeric form e.g. bisabolo is in two enantiomeric forms like (+) bisabolo and (-) bisabolo. Essential oils contain two main groups according to their biochemical origin

1. Terpenes & Higher Monologues
2. Phenylpropane derivatives (cinnamic acid & aldehyde)

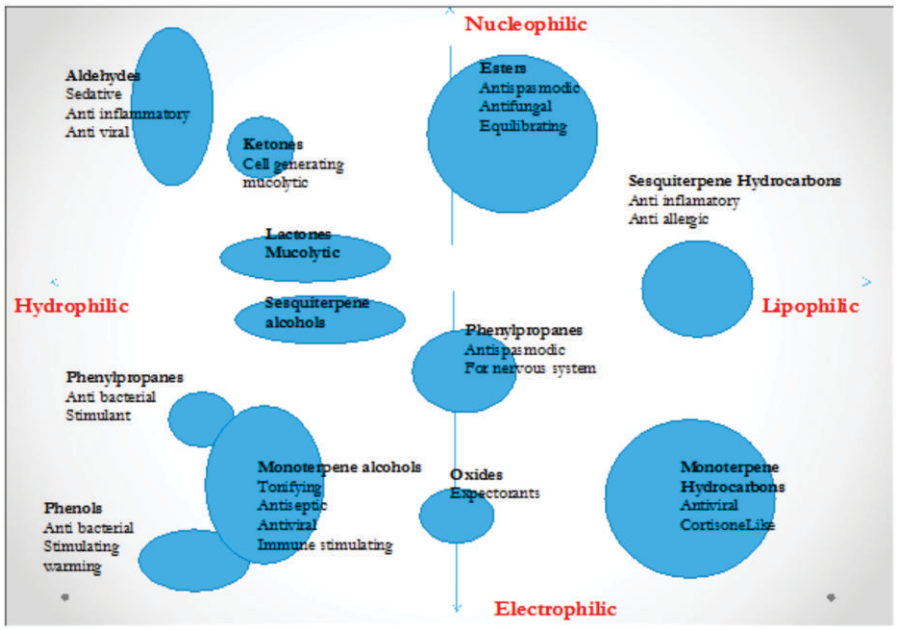
Oils whose main constituents belong to the same group exhibit similar effects but again each oil will exhibit different characteristics apart from these similar effects. Terpenes & Higher homologues(other molecules based on terpenes)- e.g. geraniol(terpenen alcohol-antiseptic and tonic), Farnesol (Sesquiterpene alcohol) etc

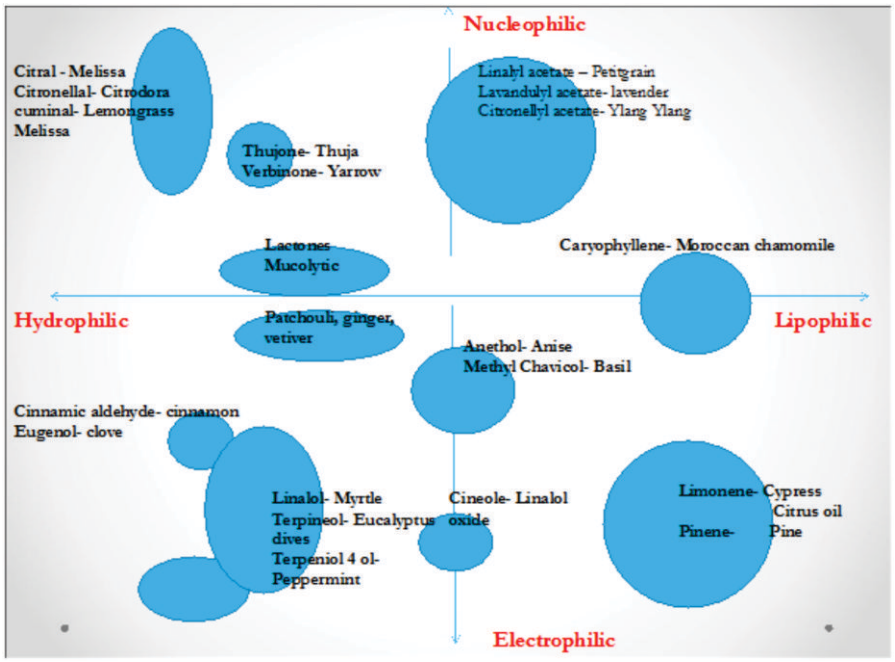
Essential oils contain mostly mono and sesquiterpenes. Mono terpenes are smaller molecules and its high content in oil gives more clarity, less viscosity and more volatality e.g. eucalyptus oil. Sesquiterpenes are larger molecular weight and makes the oil coloured (yellow/dark yellow/brown) and more viscous e.g. sandalwood, patchouli. Phenylpropane derivatives (cinnamic acid & aldehyde)- are by-products of the amino acid metabolism. These breakdown to form substances like anethol (antispasmodal, stabilizing effects), eugenol (stimulant, irritant & antiseptic property) etc.

There is a relationship between the chemical components and the effects of essential oils. The specific effects of essential oils can be attributed to the main components of essential oils. Due to particular mix of main components essential oils show specific effects like the electrophillic nature of the oils generally make them powerful, stimulating agents, the nucleophillic nature generally exerts calming and relaxing influence. But still these oils are complex mixtures hence apart from the main effect they have other effects.

Aromatherapy mechanism: Aromatherapy is the use of essential oil from plant for healing. Whether inhale or applied on the skin, essential oils are gaining new attention as an alternative treatment for infections, stress or other health problems. Two basic mechanisms are offered to explain:
1. First is the influence of the aroma in the brain, especially the limbic system through the olfactory system.
2. The other is a direct pharmacological effects of essential oils.

Once the oils are circulating in the blood, they are carried to target organ, where they exert a therapeutic effect on the specific tissues. e.g. Juniper oil targets the urinary tract and kidneys in particular, with secondary effects on the Digestive, Respiratory and Reproductive Systems. Chamomile Oil targets the Nervous





System via which it exert a broad effect on body Systems, like Digestive Tract etc.Example of therapies applied and absorbed through the skin are; stress relieving therapies and motion sickness patches.

The global fragrance industry has shown affirmation that essential oils can affect the mood, boost the productivity, help in restful sleep, alter psychological conditions of human beings, increase productivity, elevate the mood and modify human behaviour on regular and subconscious level. Artificial intelligence Technology:Artificial intelligence and data-driven algorithms are heralding a new era for the fragrance industry, which is being transformed by machine learning. The AI technology can be used to analyze the current data inferences, patterns and learnings and use them to create new blends of beneficial aromatherapy formulas which can then be used by the entrepreneurs, Retailers and other small and medium companies to create awareness and bring in more customers. The AI system can be created by using Python.

Advantages of AI in aromatherapy Industry:

1. Creation of new modern blends
2. Will help the entrepreneur in creating standard me too formulations
3. Can create Personalized blends as per consumer needs
4. Can help several retailers to give the consumers exact essential oil of there choice
5. Cost effective as will help in saving raw material and energy cost earlier used in trial and errors.

This AI system will help to learn and predict the following attributes:

- ► Possible alternative raw material complements and substitutes for a formula
- ► Appropriate ratios of raw materials (based on usage patterns)
- ► Formula efficacy success rate (based on consumer feedback)
- ► A definition of what it means to be a particular formula for a particular cause

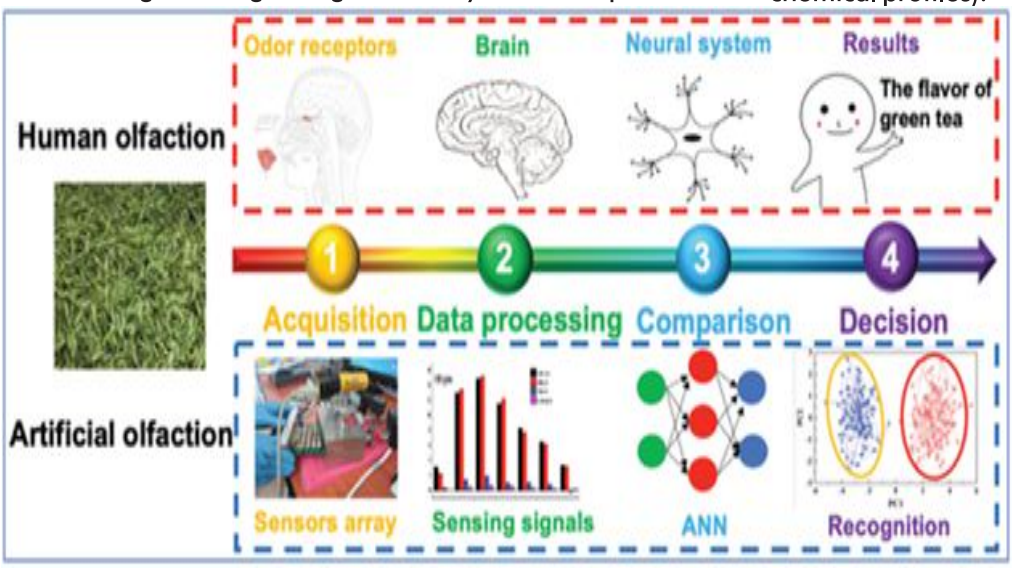
Artificial intelligence can be used in aromatherapy for:

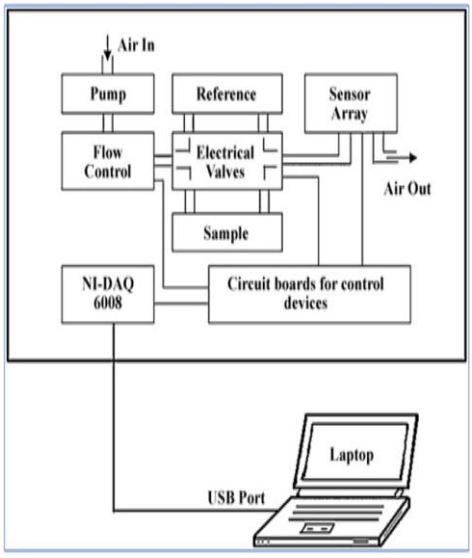
1. Evaluating and diagnosing the anxiety levels and problems in patients
2. Evaluating the chemical constituents of essential oils
3. Finding out the potential antimicrobial ability of essential oils
4. Finding out the purity and level of adulteration by E-nose and further finding out the ability of the particular oil in treating a certain health condition
5. AI can be used in creating a shopping app for the customers to help them in selecting the correct oil or combinations of oils for the treatment of particular issue they are facing

To create the programs and systems a combination of Artificial intelligence and E-nose can be used to collate the data and create data sets which will be helpful in further designing.

E nose: Use of Artificial olfaction, i.e., E-nose, plays a critical function in robotics by mimicking the human olfactory organ that can recognize different smells.

The E-nose through mimicking the olfactory receptors with the programmed algorithm of the artificial neural network helps in the recognition of the pattern of odors (i.e., their chemical profiles).





Advantages of E Nose:

- ► Monitor the shelf life of natural perfumery herbs by sensing the aromatic VOCs due to post-harvesting, respiration, fermentation, and phenolic oxidation.
- ► Detection of off notes in an essential oil
- ► Detection of adulteration in a pure oil
- ► Detection of impact of factors on the stability of blends
- ► Quality of raw materials
- ► Identification of raw materials used in perfumery
- ► Detection of adulteration in a blend

Today if we look at the Indian Aromatherapy market it is still lagging behind in terms of quality, blend creation. Indian fragrance industry is still looked down upon by the global industry as lacking in quality and substance. Especially the small companies dealing with the creation of aromatherapy blends. This is due to the aspect that Indian business owners in this field are still not well versed in the technical nitty-gritties and lack the advanced technical knowledge in creating these products. After looking at the global data in the fragrance and aromatherapy industry we can say that if we bring in the Artificial intelligence technologies in India then they can be used in the Indian scenario to :

a. Improve the standard of aromatherapy Industry in India
b. Help in improving the quality of aromatherapy blends
c. Help the small and medium scale industries to upgrade themselves
d. Aid the industry in creating a tool for the upliftment of aromatherapy sector in India.
e. Provide more employment

Hence looking at where the industry and technology is leading us India should aim at developing its own technology which will help several companies to utilize the new program in development of the new trends in Aromatherapy.

Award Winning Essays

Novel drug delivery system in cosmetics

ISCC Essay competition Research Category First Prize winner
Thakor Pradipkumar Mansinh - PhD research scholar NIPER Hyderabad
Gmail address: thakor.pradip291@gmail.com Under the guidance of Dr. Neelesh Mehara

Abstract
The science of formulating cosmetic ingredients has always been a challenge because it relies heavily on a carrier mechanism and the selective nature of the skin barrier to release active ingredients. The skin's major impediment lies in the epidermis, and many active elements have difficulty crossing it. While used widely, traditional creams and gels are still effective. This work is based on the efficient delivery of cosmetic agents through nanospecific new formulation strategies. Novel strategies like nanoemulsion, nanogels, liposomes, aquasomes, niosomes, dendrimers and fullerenes have paved way for successful delivery of dermal formulations to desire depths in the skin. This assay paper collects the recent updates regarding the use of novel nanomaterials in cosmetics. The applications of nanomaterials, their special characteristics and the advantages of nanoparticles compared to non-nano-scale products are given a particular emphasis in the cosmetic industry.The latest practices are also included for nanomaterial physicochemical and toxicological properties.In addition, the existing regulation and Safety Assessments on the use of nanomaterials in cosmetics are given special attention-the new 2019 European guidance for the safety assessment of nanomaterials in cosmetics, together with the new proposed methodologies for the toxicity evaluation of nanomaterials.

Introduction

World customers now concentrate more on their wellbeing and look. This trend generates increased demand for natural and nutraceutical ingredients products.At present, there is a growing demand for products which have multiple advantages and minimal effort due to increased consumer interest in healthy-looking skin. Modern consumers demand advancement in technology, innovative formulations that contain various proven actives. A significant number of innovative formulations are now being used in personal care with real consumer-perceivable benefits and optimized sensory attributes, resulting in an economic uplift of cosmetic industry.

The application of traditional dosage forms locally is, instead, not capable of continuous controlled release of cosmetic agents and may not be efficient at the diseased site to overcome the anatomical barrier effect . The emergence of cosmetic nanotechnology delivery proved a promising tool to overcome these difficulties. Advances in nanotechnology have contributed to the delivery of topical drugs by offering possibilities for continuous controlled release of cosmetic agents, stabilization of active materials, improved localized effects by overcoming natural barriers and reduced toxicity. Studies of various cosmetic novel drug delivery systems such as dendriners, cubosomes, nanoparticles with solid lipids, liposomes, nanostructured lipid carriers, nanoemulsions and nanocristals have been continuously done by researchers. In the pharmaceutical industry nanomaterials are increasingly being used in cosmetic formulation. The sales of nanomaterial goods in 2012 and 2015 were approximately $155.8 billion and $2.6 billion respectively, expected at over $55.3 billion in 2022.

Limitation of conventional topical formulation

The application of conventional dosage forms locally is, instead, not capable of continuous medication release and may not be effective at the diseased site to overcome the anatomical barrier effect. Conventional topical systems of supply are subject to several inconveniences, such as frequency of repeated dosing, fluctuation of flow, etc., which limit their consideration as effective topical product. The traditional topical drug delivery systems have another issue with allergic reactions that make them less effective.

Advantages of nanocarriers system

Novel cosmetics delivery systems are being explored, primarily through enhancing cosmetic agents penetration through skin, in order to solve the various problems associated with traditional systems. The goal of the new systems is to provide controlled release of cosmetic agents, which reduces repeated use of pharmaceutical products, reduce undesirable side effects and protects the deterioration of encapsulated medicines. The very small size of the nano particles increases the surface area, so that the active ingredients are transported into the skins. Occlusion improves penetration and increases hydration of the skin. Cosmeceuticals are more stable than conventional cosmetics and have high entrapment efficiency and good sensory properties. Novel nanocarriers system are carrier for both hydrophilic and lipophilic cosmetic agents.

Nanotechnology-driven drug delivery systems aid in site-specific skin targeting, which might result in greater cosmetic agent retention at the target site. Nanoscience has shown promising results in the last few decades of the management of ocular diseases through controlled release of cosmetic agents, reduction of irritation to the eye, and the compatibility of the ocular tissues. Many nanosystems with a specific design can be supplied to both the anterior and posterior segments of the eye. The negative surface charge of skin epithelial cells is supposed to result in a simple interaction with the cells between cosmetic-supplied systems, which has positive charge and contributes to improved drug permeability.

There have been reported number of novel cosmetic delivery in literature as well as in market. It was briefly discussed below and given into table 1 & 2.

Liposomes

Liposomes are widely used to provide managed and targeted distribution to specific skin layers as vehicles in pharmaceutical and cosmetic products. Since liposomes have an amphiphilic environment, hydrophilic substances may be embedded in their lipid bilayer in the aqueous core and lipophilic substances in lipid bilayers. Liposomes can also act as dermal carriers due to their being small, unilamellar, and designed with membrane flexibility. Therefore, liposomes are typically used as protective mechanisms for active ingredients or for their hydrating properties in dermal applications. The liposomal lipid contains moisture and hence moisture is added to the skin surface as the liposomal bladder ruptures provides hydration. Because of these properties liposomes are an excellent choice for cosmetic formulations designed especially for dry skin. Liposomes not only moisturize cells in the skin, but also form a barrier around the skin area. Liposomal vesicles form an occlusive layer adhering to the skin surface. The occlusion allows the embedded active ingredients to penetration into the skin and avoids external stressors like sunlight and sweat Larger vitamins, such as vitamin E, water-soluble vitamins, fat-soluble amino acids, and even chemically formulated active ingredients, can also be encapsulated into these liposomes successfully to formulate various skin care products.

CoQ10 can inhibit skin lipid oxidation, thereby nurturing and activating the skin. Due to its unsaturated double bond in the molecular structure of CoQ10, CoQ10 is highly unstable, easily oxidized and decomposed in the environment by oxygen and light The contents of CoQ10 in products are therefore diminished and CoQ10 activity is soon lost and the consistency and actual impact of the products are adversely affected. Then C prepared a spongiamine containing CoQ10 preliposome. The present innovation would improve the stability of CoQ10 and will make it versatile, convenient and more flexible. It was found that Spongiamine can further facilitate the percutaneous absorption and improve the effect of CoQ10 in cosmetics.

Nanoemulsions (NE)

Smaller droplet size in NE meets all critical requirements, such as optical stability, rheological and distribution characteristics needed by an impactful delivery system, because traditional emulsions do not meet these requirements. Greater penetration abilities make NE an ideal alternative, whether using synthetic cosmetics or cosmeceuticals, for both skin and hair care products. Enhancing the stability of a number of cosmetic components by using NE nanotechnology in cosmetic applications, such as unsaturation of fatty acids, vitamins and nanoparticular antioxidants, increasing penetration rates of certain constituents such as vitamins and other antioxidants reported patent relates to an oil-in-water emulsion for cosmetic use, wherein the oil particles have an average diameter ranging from 50 to 200 nm (nanometers). The nanoemulsion comprises an emulsifying system having components such as ceteareth-20, ceteareth-12, glyceryl stearate, cetearyl alcohol and cetyl palmitate. This composition imparts to the nanoemulsion an opaque coloration, besides providing to the skin inherent properties of the nanoemulsion(19).

Cubosomes

Cubosomes in sizes between 10 and 500 nm and pore in sizes between 5 and 10 nm give great potential for encapsulation of various forms of active ingredients, such as hydrophilic, hydrophobic, and amphiphilic molecules. Its use as carrier mainly has two major advantages, including the solubilization of poorly water soluble drug or controlled release of loaded active ingredient .In an attempt to trap hydroxypropyl cyclodextrin (HPCD)–minoxidil (MXD) complex, researchers developed GMO-based cubosoms. Compared to MXD in propylene glycol–water–ethanol solution, in Vitro skin permeation of MXD-loaded cubosomes was increased .Furthermore, silver-loaded cubosomes with sulfadiazine (SSD), is used for topically treatment of infected burns. It was found from study that itimproved compliance and outstanding healing results with less side effects compared with the commercially available product.

Nanopigments

Nanopigments are one of the most advanced and robust cosmetic nanocarriers. Nanopigments are commonly accepted as UV blocker and used easily in sunscreens, but beyond the sunscreen there are enough applications. Researchers patented in 2014 a new composition consisting of an efficient number of nanoparticles combined with a pigment in a vehicle that had a film former, in order to produce optical effects which would increase the esthetic look of biological surfaces. A cosmetic pigment composition containing gold and silver nanoparticles was patented by Bong Hyun Jung et al. in 2008. Gold nanoparticles were developed by the designers with a red and blue colour, silver yellow nanoparticles and combined with each other in an appropriate ratio in order to create different colors for use in color cosmetics, such as lipsticks colours.

Nanostructured Lipid Carriers (NLC)

Nanostructured lipid carrier benefits from the precise and accurate release of drugs over a pre-defined period of time, maintaining high levels of stability, interposition and loading performance over traditional lipid carriers. Because of the lipophilic center, active ingredients, such as coenzyme Q10 and retinol, are more efficiently trapped and hydrophilic active ingredients also integrate in NLCs via combined lipids which form conjugates. This prevents the skin from having moisture out as it forms an occlusive skin layer . Inventors in 2009 patented a dermatologic formulation to be used for the treatment of skin disorders such as hypersensitivity, atopic dermatitis and psoriasis as supportive skin care. Composition included lipid nanoparticles along with silver nanoparticle. The product was based on the synergistic effect of silver particles and lipid particles.

Toxicity of novel cosmetics drug delivery systems

There is also danger to the customer for the special characteristics of any specific nanomaterial which can contribute to the desired function/property of the cosmetic product. In this respect the standard safety assessment of all nanomaterials, including nano-characteristics test is important. Potential routes of exposure for NMs should be identified and toxicological information should be given in vitro and in vivo, including dermal and inhalation studies, studies of genotoxicological activity and potential studies on skin and eye irritation. Some investigators documented unwanted skin penetration and systemic circulation of nanoparticles. The sunscreen products are shown to penetrate intact skin and impose unintended biological damage by zinc oxide and titanium dioxide nanoparticles of between 10 and 200 nm. Zinc oxide nanoparticles have also been shown to be neurotoxic to neural mouse stem cells (NSCs) in vitro. The penetration of these nanoparticles within deeper and more viable skin and general circulation increases significantly with eczema, acne, wound, psoriasis and UV damage.

Regulation

In the EU, EC Regulation 1223/2009 is the principal regulatory mechanism for cosmetics. Based on this system, the user should have a list of all the NMs (nanomaterials) used in cosmetics. There were 29 NMs in the last revised catalogue .Quite recently (October 2019), with the aid of the SCCS guidelines on the safety evaluation of nanomaterials in cosmetics (SCCS/1611/19), the EC has revised the current guidelines for nanomaterials in cosmetics . The FDA's 2007 Task Force on Nanotechnology[83] published an evaluation of scientific and regulatory issues on the safety and efficacy of NM products. In 2014, the FDA released the Industry Guidance on the Protection of Nanomaterials in Cosmetical Products, entitled 'Final Guidance for Industry', which discusses safety concerns and offers guidances for the cosmetics industries.

Table 1: reported novel cosmetics formulation case studies.

Cosmetic agent	Formulation type	Problem	Application
Rutin	Nanocrystal	Solubility and permeation problem	Improved 3 to 5 times solubility and improved permeation 10 to 50 times as compared pure drugs
Hersperidin	Nanocrystal	Penetration problem	Improved penetration and absorption
Vitamin C	Liposomes	Stability problem	Increased stability and antioxidant activity
Coenzyme Q	NLC	Stability, solubility and penetration problem	Improved stability and penetration of cosmetic agent into skin
Opuntia ficus - indica	Nanoemulsion	Thermal stability and moisturizing efficacy	Improved thermal stability as well as moisturizing efficacy for 60 days
Oleanolic Acid	Micelle	Solubility and skin permeation rate, skin irritation	Improved skin permeation rate as compare to other solution, reduced skin irritation
Poria cocos, Thuja Orietalis, Espinosilla	Cubosomes	Problem in skin permeation	Increased skin permeation

Table 2:Marketed Novel cosmetics formulation

Product name	Formulation	Marketed by	Use
Orogold 24K Nano Ultra Silk Serum	Gold nanoparticles	Orogold	Restores loss of moisture, improves wrinkles
Nuvoderm Nano Gold Anti-Aging Lifing Serum	Gold nanoparticles	Nuvoderm	Reduces appearance of signs of aging
Nanovital Vitanics Crystal Moiture Cream	Nanoemulsion	Vitacos Cosmetics	Skin moisturizing, elastic, and lightening efects
Vitacos Vita-Herb Nona-Vital Skin Toner	Nanoemulsion	Vitacos Cosmetics	Moisturizer
Cutanova-Cream Nanorepair Q10	NLC	Dr. Rimpler	Smoothing of fine lines
Iope Supervital Extra Moist Sofner	NLC	Amore Pacifc	Moisturizes dry and rough skin
Capture Totale	Liposomes	Dior	Removes wrinkles and dark spots
Dermosome Allure Body Cream	Liposomes Solid lipid nanoparticles	Microfuidics Chanel	Moisturizer Body moisturizer
Anti-Age Response Cream	Niosomes	Simply Man Match	Treatment of wrinkles

Award Winning Essays

SUSTAINABILITY AVENUES IN Cosmetics.

ISCC Essay competition Post Graduate Category First Prize winner

AYUSHI. S. CHANDEKAR – RTMNU University (Pursuing M.Tech in cosmetic technology from L.A.D. college Nagpur)

In this day and age, **"Sustainable Cosmetics is not a trend but a future".**

Firstly the main objective of the current topic is to highlight sustainable development from the perspective of the cosmetic industry producing eco-friendly products. In the last decades and enhancing interest is being experienced towards sustainable development among cosmetics manufacturing companies, scientific research and development (R&D) laboratories as well as green consumers in the need for natural products safer for health and less toxic for the environment. It goes with saying that, ***"Beauty should be good for the planet too".***

Another point worth noting is ***"You can't go back and change the beginning, but you can start where you are and change the ending"***. So I as a Cosmetologist would like to work more on green formulations and highly sustainable cosmetics that will be both environmental friendly and human friendly. Moreover, we as consumers have so much power to change the world by just being careful in what we buy.

On top of that the word 'sustainability' has come to the fore in cosmetics and personal care Industry. Sustainability is derived from the Latin word 'Sustinere'.More precisely the word sustain can mean "maintain", "support" or "endure". Often tied up with the word sustainability which is the concept of "sustainable development," which was initially put forward in the "World Conservation Strategy" by IUCN (International Union for Conservation of Nature and Natural Resources), UNEP (United Nations Environment Program), and WWF (World Wildlife Fund) in 1980. Thus sustainability means "making every day better for people and the planet through how we innovate and how we act".

Nowadays consumers are increasingly demanding sustainable products that are not toxic to themselves or the environment. Also the organic and sustainable market is growing exponentially.

Why buy natural, green and sustainable cosmetics?

1. Environmental Responsibility
2. Increased effectiveness
3. Long-term health and beauty

More than ever before consumers aren't interested in your product - they are interested in your process. As public interest in sustainability continues to climb, many cosmetic manufacturers are seeking more natural and environmental friendly emulsifiers, ingredients and raw materials for their products. However the benefits of "green" beauty products extend beyond trends and toxicity of conventional cosmetics and the green cosmetics market continues to grow rapidly and consistently.

Secondly, sustainable cosmetics not only include green products, sustainable products or natural products manufacturing but refer to the sustainable packaging as well. The introduction of eco-friendly packaging into cosmetic brands production strategy encourages brand awareness and is a crucial step to a sustainable future. Thus "Good design is a sustainable design"

What defines sustainable and ethical beauty or sustainable cosmetic product?

There is a lot of beauty and sustainable related terms out there, some of which overlap and others where there are gaps. Since these terms are not related, they can mean just about anything. A brand might claim they are ethical or sustainable, what is that just marketing or green washing or they practice what they preach?

What makes a brand or product truly ethical and sustainable can depend on number of factors. Here are some points below which sets out the key criteria for eco-friendly and conscious brand and product.

1) **Sustainable and ethical ingredients** Some really well-known certifications and labelling are considered ethical and sustainable.

a) Cruelty Free
b) Vegan
c) Non-toxic
d) Palm oil free

Buying any cosmetic product that ticks one of the above sustainable criteria is no doubt a positive step in the right direction.

But does that make the product or brand ethical? What if you bought a product that ticks two criteria but not the other two or three criteria but not the last one? Let's discuss below:-

a) Cruelty Free
Products with ingredients that have not been tested on animals at any stage in development are cruelty free. Sometimes product might be cruelty-free and still contains animal ingredients. If this doesn't sound quite right to you then that's good because it shouldn't.
This begs the question, is that product or brand cruelty free? No, it's not. The product may also contain palm oil, which is responsible for devastation of rain forest and also endangered species. So again the product is not cruelty free.

b) Vegan
Products that do not contain any animal ingredients are vegan.
Vegan products may contain Palm oil, which is not an animal by-product or ingredient. But the growth and harvesting of the oilseed crop is directly responsible for the destruction of rain forest and death and displacement of millions of species.
It may also contain ingredients which are not organic or natural and the production of which are also harmful to our environment and animals.
Shockingly, some vegan beauty products may actually be tested on animals, which is just insane considering the ethos behind veganism.

c) Non-toxic
Products that do not contain any genetically modified organisms, manufactured herbicides, artificial fertilisers, preservatives, parabens or any other toxic ingredients are said to be non-toxic products.

d) Palm-oil free
The product that do not contain the environmentally devastating palm oil or any of its derivatives are said to be palm oil free. Consumption of Palm oil by various industries and brands leads to endangered species that are affected by palm oil also leads to deforestation.
Furthermore, after reading the above criteria it's not possible to always get all the criteria's tick, often it's just one or two. But that one or two can drastically make more of an impact on environment especially over a lifetime.

2) Sustainable and ethical business practices
What does it mean to have sustainable and ethical business practices?
The concept of sustainable and ethical business practices is an evolving one. In beauty and personal care industry, the following key practices are indicative of truly sustainable and ethical business ethos, something which is rather hard to find!

a) Thoughtful packaging:-
Thoughtful packaging is crucial! Waste is a major problem for the planet. However, "waste isn't waste until we waste it".
There are some brands that really do well on packaging and allow consumers to reuse their existing packaging or use compostable packaging.
How about zero waste options? It is not yet available for the average busy shoppers. So some brands use post-consumer recycled materials and packaging that is widely recycled.
Example: - Glass, Aluminium
Nowadays consumers prefer products with biodegradable, recyclable or returnable packaging. Therefore, choosing natural materials for packaging will cement your brand as a safe choice both environmentally and economically.

b) Ethical sourcing:-
A brand that is committed to ethical ingredient sourcing is one of the single most important signs of a sustainable company.
It means that a lot of care and thought has gone into thinking beyond the ingredients themselves but who was involved in obtaining them and were they treated fairly.
It requires the brand to be aware of what is going on in their supply chains, to pay a fair price for the raw materials and goods to ensure that their supplies are committed to positive environmental and social impact and providing safe working environments.

c) Resource and waste management:-
Brand that truly care about the impact they are having go to great lengths to ensure they have excellent waste and resources management policies in place.

This includes but is not limited to:-
· Water and energy management
· Buying energy from sustainable sources (or renewable energy like solar)
· Minimizing any new manufacturing by-products (e.g. zero waste policies)
· Carbon offsets
· Office recycling programs

d) Charitable giving:-
It's inspiring to see that a lot of ethical brands have a dedicated giving policy.
There are some that are certified B crops. Others are fellow 1% for the planet members, committing to give 1% of their earnings to charity.

Some aren't members of the program but emulate this Philosophy and give a portion to charity every year. Others give what they can to charities they are passionate about.
Finally, some have set up their own charities to drive impactful work in areas they care about most.
These for profit but socially conscious brands get our attention!

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Furthermore, after reading the above criteria it's not possible to always get all the criteria's tick, often it's just one or two. But that one or two can drastically make more of an impact on environment especially over a lifetime.

In addition, research has found that sustainability in the cosmetic sectors is as follows.

Examples of few ingredients that aren't sustainable:-
- BHA & BHT
- Coal for dyes
- Formaldehyde - releasing preservatives
- Aluminium
- Dibutyl Phthalate

Examples of sustainable cosmetic ingredients:-
- Fatty acids
- Castor oil
- MCT Coconut oil
- DMDM Hydantoin
- Phenoxyethanol

Examples of good sustainable packaging
- Compostable Packaging
- Biodegradable plastic alternatives
- Plantable packaging
- Edible Packaging
- Plant based Packaging
- Recyclable Packaging
- Avoid over packaging
- Ship in smaller packaging

Why produce green and sustainable cosmetics?
Creating environmentally friendly products doesn't mean justifying quality or profits. But with the public and consumer's eye and demand that is increasingly focusing on corporate ethics, small steps towards sustainability can significantly improve public opinion, boost sales, marketing and save environment for present and for future. Also,
1. Improved product quality
2. Enhances brand reputation
3. Increase corporate responsibility

How about the future of sustainable cosmetics?
Manufacturers shifting to sustainable cosmetics production have a promising future. The growing interest in sustainable cosmetics has had a significant effect on the cosmetic market. With an increasing number of consumers and retailers demanding cosmetics with natural or sustainable ingredients, the green cosmetics market has experienced a 15% annual growth rate. And by 2025, the organic beauty market will reach 25.11 billion.

Scientifically there are some set of logos, badges and icons for sustainable cosmetics.

Despite the fact that sustainable cosmetics have increasing demand and market in the entire world.But how long will the consumers be satisfied by this sustainability? I mean, every organic product has some pros and cons.For example,

	Pros		Cons
1.	You can wear it after any procedure (Plastic surgeons etc.)	1.	Sometimes organic makeup isn't waterproof
2.	It's widely available and more affordable than ever	2.	No preservatives
3.	It doesn't contain endocrine disruptors	3.	Not as many colour options
4.	It's good for the environment	4.	It's not safe for everyone

Similarly,Environmentalist might question the use of earth's resources for vanity products like cosmetics, rather than using it for more meaningful products, as the replenishment of earth's resources is far slower than the rate of human consumption.

►Conclusion
Last but not the least, weighing of both the sides of the title, the word "sustainability" has been given more and more importance by companies and consumers as well. However the analysis reveals that cosmetics sustainability as a complex and multifaceted issue that cannot be evaluated considering single aspect, but using an integrated assessment about the environmental, social and economic dimensions and also about the final product quality and performance.
" Buy less. Choose well. Make it last".

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