

The Impact on Trends and Future Prospects of Research and Development for the Indian Cosmetic Industry, Based on the ASCS Conference 2024

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INTRODUCTION

The ASCS is a non-profit organization established to promote the use of science in the Asian skincare industry. The aim of holding the conference in India was to foster an exchange of ideas among the cosmetic societies in Asia and to promote the advancement of cosmetic science and technology in the region. The President of ISCC, *Monisha Mullick*, mentioned that since it was the first time an ASCS Conference was held in India, the goal was to marry traditional Indian knowledge with modern cosmetic science & technology. This event provided Indian cosmetic technologists with an excellent opportunity to network with cosmetic experts from across the globe.

The ISCC is a non-profit organization established to promote and advance the use of science and technology in the field of cosmetics. ISCC offers a platform for researchers and professionals in India to exchange ideas and findings and discuss the latest trends and innovations in the industry. India's economy has bounced back post-COVID with high GDP growth. According to a recent UN report, India passed China to become the world's largest populated country by the end of June 2023. Therefore, the choice of India as a venue for this ASCS 2024 could not have come at a better time. The Indian beauty and personal care market is the 8th largest in the world, growing approximately 10% from USD 15 billion in 20/21 to about USD 30 billion in 2030, according to a Euromonitor study.

Abstract

The Asian Societies of Cosmetic Scientists Conference (ASCS) was held in Goa, India, from March 6-8, 2024.

The conference was organized by the Indian Society of Cosmetic Chemists (ISCC).

Over 200 participants from India and other Asian countries attended, with 28 podium presentations, including plenary and invited lectures, and two IFSCC lectures.

The poster session featured 35 posters on themes selected by the scientific committee, chaired by Dr. Anjan Ray.

Conference Aims and Discussions

The conference was divided into six categories as follows:

1. Evidence-based beauty and wellness through functional ingredients
2. New sensory trends in formulations
3. Next-generation perfumery and aroma chemicals
4. Evolving safety and regulatory landscape
5. Sustainable supply chains and circular economy
6. New and emerging science (poster session only)

Over 200 cosmetic scientists and professionals from India and Asia attended the conference, which included two notable speakers as part of the IFSCC International Speakers Program (ISP). *Dr. Tomonobu Ezure* from Shiseido (Japan) attended in person, presenting cutting-edge research on skin science – essential for driving innovation in cosmetics. *Prof. Roger McMullen*, Principal Scientist at Ashland LLC and Adjunct Professor

of Biochemistry at Fairleigh Dickinson University (USA), presented remotely, covering the history and role of natural ingredients in cosmetics.

The event featured oral and poster presentations that covered a wide range of topics, from skincare and haircare to various innovative approaches for the future development of cosmetic products, focusing on both efficacy and safety.

Sho Iguchi from Technoble (Japan) presented on the theme, "Improvement of Skin Roughness by Suppressing HMGB1 and ICAM1 Increased by Skin Inflammation Irradiated with Ultraviolet Rays." He discussed various causes of rough skin, with one of the main contributors being inflammatory signals. His findings revealed that HMGB1, secreted from human dermal fibroblasts, increases ICAM1, which plays a role in immunocyte recruitment to vascular endothelial cells. This process leads to neutrophil recruitment, which contributes to the breakdown of collagen fibers.

Steve Thomas Panakkal from L'Oréal (India) presented on the topic, "Decoding Skin Tightness: From Clinical Parameters to Biomarkers – Ceramides as the New Target." He explained that understanding the typology of tight skin has been a challenging objective. The study evaluated the facial skin of women who were prone and not prone to experiencing tightness, using instrumental, biological, and clinical methods.

Their results indicated a correlation between the perception of tightness and dryness. Hydration differences were measured using a corneometer and NMF (natural moisturizing factor) levels. The study concluded that this variation in rigidity could be attributed to differences in the composition of two specific ceramides, AP and NP, and the keratin matrix.

Kaito Takashima from Mandom (Japan) presented his research findings on the topic, "Development of Hair Styling Products for Creating Perm Styles Without a Perm Treatment, and the Elucidation of Their Functional Mechanism."

His team developed an innovative styling product – an aerosol foam containing carnauba wax and beeswax as the primary styling ingredients. By evaluating the functions of products with different waxes, they demonstrated that the melting points and compositions (specifically the ester and free fatty acid content) of the waxes can modulate the adhesive and hair-fixing properties of the product.

Their results suggested that it is possible to create various perm styles by combining waxes with specific properties. They believe these findings could lead to an innovative styling technology, offering a solution for achieving ideal perm styles without the fear of failure – something unavailable with current technologies.

Hedy Scheck from My Microbiome (Germany) reported that the microbiome and Ayurveda are interconnected fields, both focused on understanding the human body and its health, albeit from different perspectives. Ayurveda, an ancient system of medicine that originated in India thousands of years ago, contrasts with

the microbiome, a relatively recent area of scientific research focused on the trillions of microorganisms living in and on the human body. Both Ayurveda and microbiome science acknowledge the gut-skin connection, linking digestive health with skin conditions. Each body area hosts its unique skin microbiome, dominated by key microbes.

Scheck compared Ayurveda and microbiome science, emphasizing the importance of balance. Maintaining a balanced skin microbiome is crucial, as imbalances can lead to conditions such as acne, eczema, dry skin, psoriasis, dandruff, alopecia, rosacea, and atopic dermatitis. She concluded by highlighting that microbial diversity is an ancient treasure, offering holistic insights that should be preserved for the benefit of humanity—to create a better, microbiome-friendly world!

Kazal Boron Biswas from Ichimaru Pharcos (Japan) presented on the topic "A Holistic Approach of Inhibiting Skin Pigmentation by a Complex of Ingredients through Suppression of the Major Pigmentary Pathways." He explained that pigmentation is a multi-step process, tightly regulated in two significant types of epidermal cells: keratinocytes and melanocytes, and influenced by many factors.

Biswas proposed a novel mixture of ten individual cosmetic depigmenting ingredients, each with unique characteristics, designed to inhibit key pathways in the pigmentation process. The effects of individual ingredients and their combinations were evaluated in human keratinocytes, melanocytes, B16 cells, a 3D skin model, and directly on human skin. In a clinical study, the ingredient complex demonstrated anti-pigmentation efficacy, improving skin brightness, evenness of tone, glow, and radiance.

Poster presentations also contributed to the future of the cosmetic industry, showcasing new innovative developments. Some of the topics discussed in these presentations are summarized below.

Shiro Mukae from Shiseido (Japan) presented his study on "Non-Invasive Evalu-

ation of the Network of Dermal Collagen Using High-Frequency Ultrasound Microscopy." He explained that dermal collagen, the primary component of human skin, forms a complex network structure. Both the elastic properties of microscopic fibers and the morphology of the macroscopic network are considered to regulate skin elasticity. In this study, he introduced an evaluation technique for characterizing the collagen network using high-frequency ultrasound microscopy.

Non-invasive measurements were performed on human cheek skin, and the distribution of the elastic component was inferred by mapping ultrasound waves reflected from the elastic material. His findings revealed that the density of elastic materials decreases with age, and facial textures become finer, suggesting a macroscopic deterioration of the collagen network during the skin-aging process.

Devi Sirisha Janni from ITC Life Sciences & Technology (India) presented the theme, "Novel Surfactants Based on Succinic and Maleic Anhydride: Green Synthesis, Interfacial Properties and Potential Applications in Personal Care." She explained that anionic surfactants have gained significant attention from the scientific community in recent years, with their use expected to increase due to their unique physicochemical properties.

Janni discussed the improvement of new anionic surfactants with high surface activity, excellent adsorption abilities, and skin-friendly properties by judiciously tuning their molecular structure. Her presentation covered fundamental aspects of green synthesis, as well as the basic characteristics and physicochemical properties of these novel anionic surfactants, which are based on maleic and succinic acid.

Alif Meem Nurani from Shiseido (Japan) presented on the theme "Investigation of the Potential Efficacy of 4MSK in Improving Optical Aspects of Dullness in Asian Women." She explained that skin dullness is one of the top skin concerns, particularly in Asian countries. Previous studies have focused on the colorimetric aspects of dullness, and skin-brightening ingredients are

widely used to prevent it. They developed a new ingredient, 4-methoxysalicylic acid potassium salt (4MSK), which has been shown to effectively reduce melanin and prevent age spots.

Shradha K., from Keva Fragrances (India), presented "Conjugated Linolenic Acid (CLnA) from Pomegranate Seed Oil Protects Against Surfactant-Induced Skin Damage *in vivo*." Their research objective was to standardize pomegranate seed oil (PSO) and evaluate its *in vivo* efficacy in mitigating surfactant-induced skin damage.

She discussed the results of a human clinical study conducted to evaluate PSO. The pilot *in vivo* study involved 12 participants with skin conditions ranging from dry to normal skin during the winter and monsoon seasons. The study results indicated that pomegranate seed oil reduced skin damage by maintaining skin barrier integrity and improving hydration. The high content of CLnA (punicic acid) could be responsible for the *in vivo* moisturizing and skin-protective properties of PSO.

Satoshi Yoshimoto from Nikkol Group (Japan) presented "A Novel Bioprocessed Hydrolyzed Lysolecithin Improves Sensitive Skin through the Regulation of Epidermal Barrier Maturation." They discovered a whole-cell enzyme and developed the functional lysolecithin containing lyso-phosphatidic acid, a lipid mediator. This study aimed to evaluate the benefits of functional lysolecithin for the skin barrier using *in vitro* methods and clinical tests. The functional lysolecithin induced an increase in barrier-related gene expression. Their clinical study indicated that functional lysolecithin promotes improvement in sensitive skin through the regulation of epidermal barrier maturation.

Sudhakar DGS from L'Oréal (India) presented on the topic "A Novel Quantitative and Non-Destructive Method for Estimation of Secondary Metabolites in Plants by Reverse Iontophoresis, Case study: Citrus sinensis and Mangifera indica." He demonstrated a more efficient and less resource-intensive approach that is non-destructive and environmentally friendly. This method, referred to as reverse ionto-

phoretic (RI) sampling, offers a potential solution to this challenge.

Using fresh leaves of *Mangifera indica* and peels from *Citrus sinensis*, the biomarkers mangiferin and hesperidin were extracted *via* RI. The study concluded that RI represents a feasible approach for non-destructive, *in situ* measurement of phytochemical levels by identifying the optimal season for harvesting biomass.

Masakazu Hashimoto from Ichimaru Pharcos (Japan) presented "Novel Function of Watercress on the Anti-Graying of Hair *via* R-spondin1."

He explained that DKK1, secreted by dermal papilla cells, is an antagonist of Wnt signaling and acts as a factor contributing to hair loss. He noted that they had previously reported that watercress extract (WCE) improves hair loss by promoting the secretion of R-spondin 1, which is known to antagonize DKK1. Since DKK1 also inhibits melanin production in melanocytes, this study investigated the effect of WCE on gray hair.

A randomized, double-blind study was conducted in India over six months to evaluate the efficacy of a test lotion containing the extract, with changes in the amount of gray hair assessed. The clinical study results indicated an improvement in hair color, which was also confirmed by microscopic images, revealing the ingredient's effect on reversing gray hair. He concluded that the extract enhances Wnt signaling by suppressing DKK1 activity by promoting R-spondin 1 secretion, thereby restoring hair melanocyte function.

Jamal Solehati from Paragon (Indonesia) presented on the theme, "Comprehensive Evaluation of Reduction of Hyperpigmentation in Male Axillary Skin on Antiperspirant and Deodorant Application by Colorimetry, Imaging Analysis, and Clinical Dermatology."

He explained that treatments and care for the axillary skin area, such as shaving or plucking to remove unwanted hair and the use of antiperspirant deodorant (APDEO) to reduce excessive sweating and

odor, can lead to dryness, skin damage, and inflammation.

As a result, the axillary skin can become darker than the surrounding skin. To address this issue, they proposed an antiperspirant deodorant that also functions to reduce inflammation and hyperpigmentation in the axilla. They developed a special formulation of APDEO containing moisturizers, anti-inflammatory ingredients, and brightening actives, conducting a human clinical study on the axillary skin area. Measurements indicated a significant increase in the lightness of axillary skin, along with a notable decrease in skin redness.

Hitoshi Masaki from Ciel (Japan) presented the importance of hydration and pH of the stratum corneum (SC) in maintaining epidermal barrier function.

He explained that higher levels of sulfhydryl groups (SH) compared to disulfide bonds (SS) in corneocytes can lead to disruption of the epidermal barrier. In this study, they investigated the role of SS in corneocytes in relation to epidermal barrier function, focusing on the relationships between SH, SS, hydration, and pH. His results indicated that SS in corneocytes are regulated by hydration and pH. He concluded that maintaining adequate hydration and pH of the SC is crucial for the formation of SS bonds, which optimizes epidermal barrier function.

CONCLUSION

Over two days, a wide range of scientific sessions covered a broad spectrum of topics related to cosmetic science. The conference concluded with ISCC Awards for the best presentations at the ASCS Conference 2024. The technical jury awarded one prize for the podium presentations and three prizes for the poster presentations.

Due to the overall excellent quality of the posters, two special cash prizes were also awarded, as outlined below:

1. Best Podium Presentation:

Sho Iguchi (Research Scientist, Life Science General Institute, Technoble Co. Ltd, Osaka, Japan) for his remarkable presen-

tation on "Improvement of Skin Roughness by Suppressing HMGB1 and ICAM1 Increased by Skin Inflammation Irradiated with Ultraviolet Rays."

2. First Prize, Poster:

Shiro Mukae, PhD (Research Scientist, MIRAI Technology Institute, Shiseido, Japan) for his presentation on "Non-Invasive Evaluation of the Network of Dermal Collagen Using High-Frequency Ultrasound Microscopy."

3. Second Prize, Poster:

Sudhakar DGS (Research Scientist, Advanced Research, R&I, L'Oréal, Bangalore, India) for his presentation on "A Novel Quantitative and Non-Destructive Method for Estimation of Secondary Metabolites in Plants by Reverse Iontophoresis, Case Study: Citrus sinensis and Mangifera indica."

4. Third Prize, Poster:

Devi Sirisha Janni, PhD (Research Scientist, ITC Life Science, India) for her presentation on "Novel Surfactants Based on Succinic and Maleic Anhydride – Green Syntheses, Interfacial Properties & Potential Application in Personal Care."

5. Special Prize, Poster:

Shraddha K. (Cosmetic Product Formulator, India) for her significant presentation on "CLnA from Pomegranate Seed Oil Protects Against Surfactant Induced Skin Damage *in vivo*."

6. Special Prize, Poster:

Satoshi Yamamoto, PhD (Researcher, Nikko Chemicals Co., Ltd., Japan) for his significant presentation on "A Novel Bioprocessed Hydrolyzed Lysolecithin Improves Sensitive Skin Through the Regulation of Epidermal Barrier Maturation."

ASCS 2024 was the first purely scientific conference in the area of cosmetic technology held in India. A host of eminent keynote speakers from government research organizations highlighted the work being done in India across various fields related to cosmetics. Excellent feedback was received from both international and local participants regarding the quality of the scientific presentations, the arrangements for accommodations, and the hospitality they received. This conference will significantly promote further research and development in this field in India and Asia.

ISCC is truly grateful to ASCS for giving India the opportunity to host this conference in 2024.

Reference

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