OPEN ACCESS

BBR BIOMEDICAL AND BIOPHARMACEUTICAL RESEARCH

VOLUME 22, ISSUE 2 (2025)
10.19277/bbr.22.2.362
ISSN 2182-2379 (digital)

INVESTIGAÇÃO BIOMÉDICA E BIOFARMACÊUTICA IBB

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# ABSTRACT TITLES

# ORAL ABSTRACTS

**O02**

| | |
|---|---|
| *Title* | **EVALUATION OF A BLEACHING ROUTINE BY DAMAGE MAPPING AND SEM MICROSCOPY- A CORRELATION BETWEEN METHODS** |
| *Authors* | **Angela Cristina Vargas Calle*[1]**, Nathana Cindy Ramos[1], Alzira Dini[1], Viviane Albarici[1], Mayara Miranda Ferreira[1], Adriano Pinheiro[1] |
| *Affiliations* | 1 - Grupo Kosmoscience, Ciência e Tecnologia Cosmética Ltda, Valinhos, SP, Brasil |
| *Abstract* | Hair damage refers to the weakening and deterioration of the hair structure, leading to issues such as breakage, split ends, and surface roughness. This damage can affect various parts of the hair and is caused by factors such as poor nutrition, chemical treatments, excessive grooming, and environmental stress. Among these, bleaching is one of the most aggressive processes, as it destroys melanin and, in the process, cleaves disulfide bonds that are critical components of hair structure. Therefore, understanding the exact locations where damage occurs is important for developing cosmetic products that aims repairing the hair. To better understand and quantify damage, on this study was employed a fluorescent cationic dye as a damage marker, allowing for a precise assessment of bleaching-induced damage from root to tip. The technique, known as Damage Mapping, utilized software to overlay fluorescence intensity results onto hair images, producing a color-coded visual representation of damage levels. As this method was recently developed by the authors, an additional well-known methodology, scanning electron microscopy (SEM), was used to examine surface damage caused by two different bleaching powder formulas. The damage level caused by the bleached treatments were compared statistically between them and in comparison, with a nonbleached group of hair of the same batch. The correlation between fluorescence mapping and SEM results was significant, demonstrating the reliability of these methodologies in evaluating hair damage. This combined approach provides a comprehensive way to assess the effects of bleaching in different points along the hair length and supports the development of cosmetic products aimed at preventing or reducing hair damage selectively, in the places where it is necessary. |

**O05**

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| *Title* | **ERITEMA-FREE ALTERNATIVE METHOD FOR EVALUATING PHOTOPROTECTIVE EFFICACY IN BLACK AND CAUCASIAN INDIVIDUALS: PRELIMINARY APPLICATION OF THE HPLC-TBARS-EVSC PROTOCOL** |
| *Authors* | Michelle Maria Gonçalves Barão de Aguiar *, Isabella Bezana, Pedro Ivo de Souza Macedo, Camila Faustino Hiraishi, Gabriela de Argollo Marques, Claudinéia Aparecida Sales de Oliveira Pinto, Maria Valéria Robles Velasco, André Rolim Baby |
| *Affiliations* | Department of Pharmacy, Faculty of Pharmaceutical Sciences, University of São Paulo, São Paulo, SP, Brazil |
| *Abstract* | Brazil is a country formed by a significant miscegenation of enslaved African peoples, Europeans, and indigenous peoples. Currently, according to the latest census, 45.3% of the population self identifies as mixed-race (pardos); 10.2% as black (pretos); 43.5% as white; 0.8% as indigenous; and 0.4% as Asian (amarelos). In Brazil, individuals who identify as pardos and pretos are considered “Black” (negros). Regardless of skin color, the use of sunscreens is recommended to protect against the harmful effects of ultraviolet radiation (UVR). However, the in vivo efficacy assessment of sunscreens follows protocols based on erythema formation, and participants must belong to phototypes I, II, and III (Caucasians). Therefore, the sun protection factor does not include black individuals (phototypes IV, V and VI), who have a greater tanning ability and lower erythema formation. Given the above, the objective of this investigation was to evaluate the photoprotective efficacy of the UV filters ethylhexyl methoxycinnamate (EHMC) and methylene bis-benzotriazolyl tetramethylbutylphenol (MBBT) in Black and Caucasian individuals using the HPLC-TBARS-EVSC protocol (high-performance liquid chromatography quantification of thiobarbituric acid-reactive substances), an erythema-free method based on the quantification of lipid peroxidation in the stratum corneum (SC) ex vivo after UVR-induced stress (approved by the ethics committee). Treated and untreated SC samples from participants were collected by tape stripping and irradiated in a photostability chamber. As a biomarker, the malondialdehyde thiobarbituric acid adduct (MDA-$TBA_2$) was quantified by liquid chromatography. Exposure to UVR resulted in an increase in lipid peroxides in the SC of 268% for Caucasian individuals and 458% for Black individuals, indicating the generation of free radicals in both phototypes, with a significant increase for Black participants. The EHMC and MBBT filters reduced these levels by 13.04% and 8.04%, respectively, in Blacks, and by 14.93% (EHMC) and 23.00% (MBBT) in Caucasians. The HPLC-TBARS-EVSC protocol enabled the identification of distinct efficacy profiles for EHMC and MBBT across different phototypes, providing an objective and quantitative assessment of photoprotection and standing out as an inclusive alternative to the current erythema-based method. The results suggest that sunscreens may offer different levels of protection for Black individuals, reinforcing the need for further research to develop safer, more effective, and phototype-specific products. |

**O12**

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| *Title* | **IMPACT OF FUNCTIONAL FILLER STRUCTURE IN COSMETIC FORMULATION ON SKIN REFLECTION CONSIDERING DIFFERENT SKIN TONES** |
| *Authors* | **Natalia R. Castro**[1*], Danilo I. Souza[1]; João M. Russo[1], Soraya B. Moura[1] |
| *Affiliations* | 1 - Innovation and Application, Merck S.A, São Paulo, Brasil; |
| *Abstract* | Skin reflection is an optical phenomenon related to the ability of the skin surface to reflect light, influencing the perception of its healthy appearance. The incorporation of fillers in cosmetic formulations improves the optical attributes of the skin, providing a uniform finish, enhanced texture, and luminosity. The morphology of fillers, including platelets or spherical particles and surface characteristics, affects light reflection, impacting the skin's finish. In this study, cosmetic emulsions containing different fillers were evaluated through in vivo analysis, considering various skin tones, to compare the impact of structures on skin reflection. Six types of fillers were analyzed in 7% emulsions, varying in structure and composition. The flat structures included boron nitride plates (PLB), smooth alumina (PLA), and porous alumina (PPA), while the spherical structures consisted of silica spheres with distinct coatings (PSA and PSB) and a microplastic Nylon 12 sphere (PEM). The haze and transmittance properties of the emulsions were measured using the Haze-Gard-1 from BYK. For the in vivo assessment of skin reflectance, facial photographs of 16 volunteers (phototypes II-V) were compared before and after product application, using image analysis with ImageJ software. Instrumental measurements indicated that the presence of particles in the emulsion impacted the diffusion of reflected light, resulting in a significant increase in haze compared to the placebo. Samples containing ESB and PLB exhibited lower transmittance values, making them less suitable for darker skin tones due to the whitish residue. Skin reflection was evaluated through the mean and standard deviation of the image histograms. The mean related to subsurface reflection, with noticeable differences in PLB and ESB, while the standard deviation indicated an increase in superficial reflection caused by PLA and a reduction by ESA. Spherical and porous structures influence light scattering capacity, resulting in diffuse reflection, while plate-like particles generate greater specular reflection. These results demonstrate the influence of filler structures on the finish for different skin tones, acting as excellent optical modifiers in cosmetics. |

**O18**

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| *Title* | **EFFECTS OF REPEATED EXPOSURE TO OZONATED WATER ON HAIR FIBER STRUCTURE AND INTEGRITY** |
| *Authors* | Pedro Augusto Laurindo Igreja Marrafa[1,2,3 *], Shamish Ganpule[1], Vanessa Castro-Haly[1], Adriana Barrinha Fernandes[2,3], Ernesta Malinauskyte [1], Carlos Jose de Lima[2,3] |
| *Affiliations* | 1 - Textile Research Institute (TRI) – Princeton, Princeton, NJ<br>2 - Instituto de engenharia biomédica, Universidade Anhembi Morumbi, São José dos Campos, SP<br>3 - Centro de Inovação, Tecnologia e Educação (CITÉ), São José dos Campos, SP |
| *Abstract* | For humans, hair is a structure that lost its primary functional importance long ago over the course of evolution. However, its emotional, psychological, and social relevance remains substantial. While modern developments in the industry have led to an unprecedented range of choices for hair beautification, a thirst for novelty has prompted practitioners to explore unusual candidates for improving hair quality. Ozone ($O_3$) is a highly reactive gas with oxidative properties that have been widely studied in medical and industrial applications. Its use has expanded to beauty salons and aesthetic clinics, initially treating scalp conditions and, more recently, as hair treatment, promoted for revitalizing the strands and enhancing their shine and softness. Due to ozone's oxidative nature, in-depth research is needed to fully understand its effects. Therefore, this study aims to evaluate the impact of repeated exposure of hair fibers to ozonated water. To analyze structural and chemical changes in the hair fiber, various analytical techniques were employed, including Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), fluorescence microscopy, differential scanning calorimetry (DSC), dry combing test, and shine and color fade analyses. FTIR spectra revealed significant changes associated with fiber oxidation, resulting in damage to disulfide bonds. The chemical alterations in the fiber's outermost region were accompanied by morphological changes seen in SEM and fluorescence micrographs, findings further supported by the dry combing test. The ozone effects extended beyond surface level: DSC data indicated changes in hair crosslinking density and in the relative amount of secondary proteins. The improvement in shine and lightening of the hair color were the only positive contributions of ozone to the appearance of virgin brown hair. Future research should investigate how changes in amino acid and lipid composition translate to mechanical property differences. |

**O19**

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| *Title* | **INNOVATIVE METHODOLOGY FOR ASSESSING BOTULINUM TOXIN-LIKE EFFECTS USING TISSUE ENGINEERING** |
| *Authors* | Bibiana Matte[1], Gabriela Verza[1,2], Helouise Medeiros[1] |
| *Affiliations* | 1 - Núcleo Vitro Serviços Científicos Ltda, Porto Alegre, RS, Brasil<br>2 - Universidade Federal de Ciências de Saúde de Porto Alegre, Porto Alegre, RS, Brasil |
| *Abstract* | **Introduction:** The search for non-invasive alternatives to aesthetic procedures has driven the development of topical cosmetics with muscle-relaxing action that mimic the effects of botulinum toxin. These products aim to modulate muscle contractility topically, promoting the smoothing of expression lines without the need for injections. However, effective in vitro methods to evaluate this type of action are still scarce.<br><br>**Objective:** To develop an innovative and reproducible methodology for evaluating the potential of topical cosmetic products to reduce muscle cell contractility, using tissue engineering technology with a three-dimensional model and myoblasts.<br><br>**Methodology:** A protein-based three-dimensional matrix embedded with contractile myoblasts was developed. After gel polymerization and cell stabilization, the cosmetic product was applied topically to the model. Botulinum toxin was used as a positive control, and the negative control group received only culture medium. As an assay control, gels without cells were also prepared. Cellular contractility was inferred by analyzing the final volume of the matrix and images, with greater cell contraction corresponding to a greater reduction in gel volume. Additionally, images of each gel were acquired. Quantitative analysis and statistical evaluation were performed using One-Way ANOVA followed by Bonferroni's post-hoc test.<br><br>**Results:** In the control group, a significant reduction in matrix volume was observed due to cell contraction, and this was normalized to 100%. In the group treated with botulinum toxin, a 51.4% increase in matrix volume was observed, indicating inhibition of contractility. In the group treated with the cosmetic product, a 35.4% increase in volume was observed compared to the control group, suggesting partial inhibition of cell contraction. The positive control and cosmetic product groups were statistically different from the control group ($p < 0.05$).<br><br>**Conclusion:** The developed methodology demonstrated sensitivity in detecting changes in myoblast contractility in response to topical stimuli. The model is promising for the screening of cosmetic ingredients with muscle-relaxing action, offering an ethical, effective, and translational approach for the development of innovative products in the cosmetic sector. |

**O20**

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| *Title* | **FROM CERRADO TO THE SKIN: FUNCTIONAL MAKEUP WITH NATURAL PIGMENTS AND BIOACTIVE ACTION** |
| *Authors* | Joyce S. Quenca Guillen, Claudinéia Ap. Sales de Oliveira Pinto, André Rolim Baby, Maria Valéria Robles Velasco |
| *Affiliations* | Faculdade de Ciências Farmacêuticas/ Universidade de São Paulo |
| *Abstract* | **Introduction.** The Cerrado is the second largest biome in Brazil, covering approximately 22% of the national territory. It represents a rich plant biodiversity with a strategic reservoir of bioactive compounds with potential for applications in several areas, including cosmetics. The valorization of plant waste through upcycling has emerged as a sustainable and innovative strategy in the cosmetics industry and, part of this process, involves the transformation of by-products such as seed husks and residual pulps into high added-value active ingredients.<br><br>**Objectives:** To develop powdered makeup using plant pigments obtained through the upcycling of plant parts from Brazilian biodiversity.<br><br>**Material and Methods:** Characterization analyses of the species and quantification of bioactive compounds of the Guazuma ulmifolia (mutamba) and Cedrela fissilis species regarding antioxidant activity were performed using the DPPH and beta-carotene methods. After developing the powdered formulations with the species, the normal stability test (TEN) was conducted under various storage conditions for 90 days, involving analyses: organoleptic characteristics, particle size, loss on drying and in vitro photoprotection, as well as safety analysis to support the claim “dermatologically tested” and in vivo photoprotection with the selected formulation.<br><br>**Results and Discussion.** It was found that the extract of the plants G. ulmifolia (mutamba) and C. fissilis (cedar rosa) demonstrated high concentration of bioactive compounds, such as: phenolic compounds, flavonoids, tannins and saponins. The antioxidant activity of the species and formulations was proven (superior for mutamba), and in TEN it remained acceptable in the three conditions (90 days) and superior in the formulations with mutamba alone or associated with cedar rosa. The minimum in vitro SPF was 39 in TEN and 32 in vivo, minimum critical λ 370 nm (effective protection against UVA) and UVA/UVB ratio above 0.7 (broad protection against UVA and UVB). The safety test indicated that the formulation with mutamba did not present irritant or sensitizing potential and can be considered safe under the conditions evaluated.<br><br>**Conclusion.** The use of the studied pigments obtained from the mutamba and pink cedar plants were effective and safe for use in makeup in powder form, with a multifunctional effect and enhanced Brazilian biodiversity. |

**O24**

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| *Title* | **CELLULAR SENESCENCE AND SKIN HEALTH: CLINICAL RESULTS OF TOPICAL INTERVENTION IN A DIVERSE COHORT** |
| *Authors* | Pedro Paulo Soldati[1], Fabiana Paes[1], Juliana Carvalhães Lago-Nold[1], Alanis Costa[1], Melissa Dibbernn Ganzerla[1], Ana Luisa Abrahao Dias[1], Priscila Carollo Moncayo[1] |
| *Affiliations* | 1 - Natura Cosméticos, São Paulo, Brasil |
| *Abstract* | Skin undergoes significant physiological changes with aging, resulting in chronic inflammation, compromised barrier function, and impaired production of collagen and elastic fibers. A key factor in these changes is the accumulation of senescent cells that contribute to the visible aging of the skin. Preventing the formation of this cell type emerges as a promising strategy to combat aging and improve skin health. The present study investigates the efficacy of two plant extracts, Casearia sylvestris and Hymenaea courbaril extract, in the treatment of skin changes related to different ages, in a diverse population, targeting senescence pathways. Previous studies by our research group have shown the ability of both extracts to act on cellular senescence pathways and to stimulate the production of elastin and collagen, using primary human dermal fibroblasts irradiated with UVB radiation. For this, a clinical trial was carried out with 302 Brazilian women (aged between 30 and 90 years, Fitzpatrick phototypes II to VI), divided into four age groups. Participants applied a cosmetic formulation containing the extracts once a day for 28 days. Skin parameters evaluated included hydration, pH, barrier function, wrinkle depth, in vivo stimulation of collagen and elastin, and skin responsiveness. After 28 days, significant improvements were observed in all age groups. Skin hydration and barrier function were increased, while pH levels remained constant. Wrinkle analysis revealed a visible reduction and in vivo collagen and elastin synthesis increased significantly after treatment. The findings pave the way for the development of targeted solutions to prevent cellular senescence and promote skin health, providing significant benefits. |

# POSTER ABSTRACTS

**P02**

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| *Title* | **DESIGN OF EXPERIMENTS APPLIED TO THE OPTIMIZATION OF BIOACTIVE EXTRACTION PROCESSES FROM COFFEE (Coffea arabica) WASTE IN SOUTHWESTERN BAHIA** |
| *Authors* | Maria Clara Botelho de Sousa[1], Amanda Vitoria Pereira Teles[1], Júlia Victoria Vieira de Castro[1], Letícia Meira da Silva Queiroz[1], Juliano Geraldo Amaral[1], Gabriel Azevedo de Brito Damasceno[1] |
| *Affiliations* | 1 - Instituto Multidisciplinar em Saúde, Universidade Federal da Bahia, Vitória da Conquista-BA, Brasil |
| *Abstract* | Coffee industrial processing by-product, called "*palha melosa",* contains polysaccharides, lipids, and phenolic compounds in its chemical composition, which exhibit potential cosmetic activities. In the context of innovations in bioactives and products, the design of experiments (DOE) has been increasingly applied, as it allows for the evaluation of the influence of multiple factors with fewer experiments and reduced costs. Thus, the aim of this study was to optimize the extraction of bioactives from *Coffea arabica* waste through DOE. The residue was donated by coffee producers from the Barra do Choça-BA region, dried, ground, and subjected to particle size standardization. The DOE evaluated the influence of the extraction method (turbulence or ultrasound-assisted extraction (UAE)), the solvent used (water or 50% ethanol v/v), the residue condition (dried or fresh), and the extraction time (5 or 15 minutes). As response variables, the yield, antioxidant activity (DPPH) and total flavonoid concentration of the extracts were evaluated. After extract preparation, samples were subjected to centrifugation (3000 rpm / 30 minutes), filtration, ethanol evaporation when applicable, and drying. It was observed that the residue condition, extraction method, and solvent type significantly influenced the evaluated parameters, whereas the extraction time had no statistically significant impact on any of the variables. The UAE and the use of dried residue resulted in higher yield compared to the other factors. Compared to other methods, UAE offers advantages such as low cost, reduced time and energy consumption, as well as lower solvent usage. Furthermore, the use of dried residue and 50% ethanol resulted in higher antioxidant activity, with this solvent also promoting the extraction of a greater flavonoid content. Therefore, through DOE, it was possible to optimize the most appropriate conditions for obtaining "*palha melosa"* extract, which were UAE of dried residue in 50% ethanol for 5 minutes. This approach employs a modern and rapid method, enabling the development of a new phytoingredient with various potential cosmetic activities. |

**P03**

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| *Title* | **MULTIFUNCTIONAL SUNSCREEN FOR OILY SKIN: CLINICAL EFFICACY AND TOLERABILITY EVALUATION** |
| *Authors* | Layane Melody da Silva Reis Cavalcante[1], Lara Adel Nasser[1], Vanessa Alves Pires dos Santos[1], Giulia Okamoto Maciente[1], Mauricio Frazilho[1], Marisa Keiko Uema Sacuragui[1], Juliane Dias Piotto Juabre[1], Ana Lúcia Tabarini Alves Pinheiro[2], Mayara Miranda Ferreira[2], Viviane Cristina Albarici[2], Gabriela Vannucci Nogueira[2], Juliana Rodrigues Pinto[2]* |
| *Affiliations* | 1 - Mantecorp Skin Care, Hynova, Alphaville/SP – Brasil<br>2 - Grupo Kosmoscience, Valinhos/SP - Brasil |
| *Abstract* | Oily skin is a dermatological condition characterized by excess sebum and enlarged pores, which may be associated with disorders such as acne and seborrheic dermatitis. In addition to aesthetic impacts, this condition can affect self-image and lead to psychosocial consequences.<br><br>This study evaluated the effects of Sunscreen DC-230013-11 on the reduction of oiliness and pore intensity, improvement of skin hydration, and efficiency of the skin barrier, using biophysical techniques and imaging analysis, for up to 10 hours after application. Resistance to transfer to fabrics, ocular tolerability, comedogenic and acnegenic potential, as well as the efficacy perceived by participants, were also analyzed. The study was approved by the Research Ethics Committee under the opinions 6.219.240, 6.277.371, and 6.334.190, linked to CAAE 70815223.9.0000.5514, 73192123.1.0000.5514, and 74012723.2.0000.5514.<br><br>The DC-230013-11 resulted in a significant reduction of facial oiliness for up to 12 hours compared to the control (water), as well as reducing pore intensity from 15 minutes to 8 hours after application. A significant increase in skin hydration was observed, reaching 42% immediately after application and 3% after 10 hours. The efficiency of the skin barrier was also enhanced, with a significant reduction in transepidermal water loss (TEWL) for up to 10 hours and skin barrier restructuring confirmed by the tape-stripping study. The product showed good ocular tolerability, with no runoff or discomfort, and did not transfer or stain fabrics. Additionally, it demonstrated anti-comedogenic potential (reduction of comedones) and was non-acnegenic (no change in the number of papules or pustules). In subjective evaluation, it was well accepted by participants, particularly for its dry touch, anti-shine effect, quick absorption, ultra-light texture, and refreshing sensation.<br><br>In conclusion, DC-230013-11 demonstrated efficacy in reducing and controlling oiliness, as well as reducing pore intensity, in addition to providing moisturizing action, improving skin barrier function, and showing good ocular tolerability. The product showed anti-comedogenic and non-acnegenic potential, along with high sensory acceptability, highlighted by its dry touch, matte effect, and ultra-light texture. These results suggest that DC-230013-11 represents an effective and well-tolerated alternative for the protection and care of oily skin. |

**P04**

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| *Title* | **ORNAMENTAL PLANTS AS ALTERNATIVE SOURCES FOR SUNSCREEN DEVELOPMENT: METABOLOMIC AND IN VITRO PHOTOPROTECTIVE EVALUATION** |
| *Authors* | Aline Mello Carvalho, Michelle Maria Gonçalves Barão de Aguiar, Claudinéia Aparecida Sales de Oliveira Pinto, Daniel Pecoraro Demarque♦, André Rolim Baby♦ |
| *Affiliations* | Departamento de Farmácia, Faculdade de Ciências Farmacêuticas, Universidade de São Paulo (FCF-USP), São Paulo, SP, Brasil. |
| *Abstract* | Excessive exposure of unprotected skin to solar radiation is a significant concern due to its cumulative and harmful effects, which may lead to severe dermatological conditions. Sunscreen formulations play a crucial role in mitigating these effects when used correctly and with an appropriate sun protection factor (SPF). However, concerns have emerged regarding the limited photostability and potential toxicity of certain ultraviolet (UV) filters, as well as their environmental impact. Therefore, it is essential to explore alternative strategies with improved photostability, safety, and reduced ecological footprint, such as bioactive compounds from natural sources. Ornamental plants represent promising yet underexplored sources of phenolic compounds, which act as potent antioxidants by reducing oxidative stress, one of the primary detrimental effects of UV radiation exposure. Moreover, these compounds can enhance the efficacy, photostability, and overall performance of sunscreen formulations by acting synergistically with conventional UV filters, leading to multifunctional products. This study aimed to evaluate the phytochemical composition of two ornamental plant species, *Ctenanthe setosa* and *Cordyline fruticosa*, through LC-MS analysis combined with metabolomic approaches for compound annotation and identification. The photoprotective potential of the extracts, in combination with avobenzone (5.0%) and octyl methoxycinnamate (10.0%), was assessed using diffuse reflectance spectrophotometry with an integrating sphere (Labsphere UV2000S Ultraviolet Transmittance Analyzer) by determining the in vitro SPF, UVA protection factor (UVAPF), and critical wavelength (nm). The confirmed presence of phenolic compounds highlights their relevance for incorporation into photoprotective formulations. Sunscreen formulations containing the extracts demonstrated promising results, with an in vitro SPF value nearly three times higher than that of the control (containing only the UV filter mixture). Furthermore, the presence of the extracts enhanced light absorption in the visible spectrum, a desirable characteristic in this class of dermocosmetics. However, despite these favorable characteristics, the inclusion of the extracts did not significantly affect the UVAPF or critical wavelength of the formulations, besides demonstrating low photostability. Future studies should investigate additional ornamental species to assess their photoprotective and antioxidant potential, as well as optimize sunscreen formulations through targeted selection of the most promising plant extracts. |

**P05**

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| *Title* | **THERMAL WATER AS A POTENTIAL ADJUVANT DERMOCOSMETIC INGREDIENT FOR ATOPIC DERMATITIS: IN VITRO EVALUATION OF DERMOCALMING AND ANTIOXIDANT PROPERTIES** |
| *Authors* | Ana Carolina Chaves Anechi[1], Ana Paula Goedert Winckler[2], André Rolim Baby[3], Paulo Eduardo Narcizo de Souza[4], Fabiana Vieira Lima Solino Pessoa[5] |
| *Affiliations* | 1 - Engenharia Química, Universidade Federal do Espírito Santo, São Mateus 29932-540, Brazil.<br>2 - CEO, Minéraux Beauty, Santa Catarina 88015-702, Brazil<br>3 - Departamento de Farmácia, Faculdade de Ciências Farmacêuticas, Universidade de São Paulo, São Paulo 05508-900, Brazil<br>4 - Universidade de Brasília, Instituto de Física, Núcleo de Física Aplicada, Brasília DF, Brazil<br>5 - Departamento de Ciências da Saúde, Universidade Federal do Espírito Santo, São Mateus 29932-540, Brazil. |
| *Abstract* | Atopic dermatitis (AD) is a chronic inflammatory skin disease with significant prevalence in children, whose pharmacological approach often requires combined treatments. Recent studies suggest that complementary therapies, such as hydrotherapy with thermal waters, may enhance the effects of traditional medicines. A previous study reported that the thermal water herein investigated showed promising results in the clinical improvement of pediatric patients with severe AD, used as an adjunct to dupilumab, pointing out benefits in lesion resolution and skin hydration. However, the mechanisms by which thermal water exerts such benefits still need to be clarified. In this context, our research evaluated in vitro the dermo calming and antioxidant potential of Thermal Water-Águas Mornas, state of Santa Catarina, through the analysis of gene expression of interleukins related to the inflammatory process and antioxidant activity by cupric reducing antioxidant capacity (CUPRAC) and electron paramagnetic resonance (EPR) methods. For dermo calming evaluation, human keratinocyte culture was used, analyzing the relative expression of interleukins IL-4, IL-31, and tumor necrosis factor-alpha (TNF-α) by RT-qPCR after 48 hours of cell exposure with the sample. A significant reduction in the gene expression of the markers IL-4 (65.7 + 1.5%), IL-31 (61.4 + 1.24%), and TNF-α (38.3 + 3.6%) was observed compared to the control, suggesting relevant anti- inflammatory and dermo calming potential. By the CUPRAC method, thermal water demonstrated antioxidant capacity corresponding to 3.28% of the Trolox standard without significant difference (p-value = 0.7421) compared to the control (purified water). However, by EPR, the sample demonstrated moderate antioxidant capacity at a concentration of 20 µL/mL, inhibiting 12.9% of the stable free radical DPPH (250 µM) (p-value = 0,047). The results highlighted the potential of this thermal water as a promising active ingredient in cosmetic formulations with dermo calming and antioxidant properties, reinforcing the importance of additional studies for clinical validation and understanding of the mechanisms of action involved. |

**P06**

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| *Title* | **EVALUATION OF THE SYNERGY BETWEEN GANODERMA LUCIDUM EXTRACT AND BOSWELLIA SERRATA ESSENTIAL OIL IN CUTANEOUS CELLULAR REGENERATION** |
| *Authors* | Luciana Carla Panegalli[1, 2], Patricia Antonio[2] |
| *Affiliations* | 1 - Kahnon – Cosméticos Naturais - Chapecó, Brasil.<br>2 - Instituto Racine de Educação Superior - São Paulo, Brasil. |
| *Abstract* | Severe skin injuries represent a significant challenge in regenerative dermatology. This study aims to evaluate the effectiveness of combining Ganoderma lucidum (Reishi) extract and Boswellia serrata (frankincense) essential oil in the cellular regeneration of injured skin. Ganoderma lucidum is known for its therapeutic properties, mainly due to the presence of polysaccharides and triterpenes. Studies have shown that the oil extracted from its spores accelerates burn wound healing in murine models by promoting collagen fiber regeneration and activating specific signaling pathways (TIE et al., 2012). Additionally, ethanolic extracts of this mushroom enhance keratinocyte proliferation and increase the expression of proteins essential for tissue remodeling (LEE et al., 2020). The essential oil of Boswellia serrata has anti-inflammatory and healing properties. Topical applications of this oil have been shown to accelerate wound healing and improve skin texture (SILVA et al., 2019). This study hypothesizes that the combination of these two natural actives may enhance cutaneous cellular regeneration, offering an effective alternative for the treatment of severe skin injuries. Cosmetic formulations containing both components will be developed, and their efficacy will be evaluated through clinical and histological studies. |

**P07**

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| *Title* | **EVALUATION OF THE ANTIOXIDANT ACTIVITY OF SUNSCREEN AGENTS USING THE CUPRIC ION REDUCING ANTIOXIDANT CAPACITY (CUPRAC) METHOD AND ELECTRON PARAMAGNETIC RESONANCE (EPR)** |
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| *Abstract* | The growing concern about the harmful effects of ultraviolet (UV) radiation on the skin has stimulated the development of sunscreens that, in addition to providing protection against UV radiation, offer protection against oxidative stress resulting from sun exposure. This study assessed the antioxidant activity of the sunscreens benzophenone-3 (BZF3), octyl methoxycinnamate (MCO), octocrylene (OCT), and avobenzone (AVO) using the cupric ion reduction (CUPRAC) method and free radical scavenging (DPPH) by Electron Paramagnetic Resonance (EPR). The CUPRAC method was validated for linearity, precision, and detection and quantification limits, with the results expressed as Trolox equivalents (TEAC). The EPR technique, using the DPPH radical (250 µM), was employed to measure the inhibition (%inib) of free radicals. For the CUPRAC method, at a concentration of 100 µg/mL, the TEAC values for the sunscreens were: 3.58, 7.72, 12.86, and 5.5 for BZF3, MCO, OCT, and AVO, respectively. The EPR analysis, for samples evaluated at a concentration of 20 µg/mL, showed that the %inib of OCT (0.38%) did not differ in the amount of free radicals compared to the DPPH solution. BZF3 (4.80%) and MCO (8.20%) exhibited the same inhibition potential, while AVO (42.92%) demonstrated the highest inhibitory activity, significantly differing from the others (ANOVA followed by Tukey's test). Compared to Trolox, the UV filters showed modest antioxidant activity; however, greater antioxidant activity was observed for OCT in the CUPRAC method and for AVO in the EPR method. The antioxidant activity identified for the best-performing samples suggests that these filters could provide complementary protection against damage caused by free radicals. This study found that UV filters might have complementary antioxidant activity, and this property should be further explored by other methods to enhance the understanding and practical application of this attribute. |

**P08**

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| *Title* | **MULTIFUNCTIONAL REPELLENT DERMOCOSMETICS: DETERMINATION OF IN VITRO FOTOPROTECTIVE EFFICACY AND IN VIVO CUTANEOUS ATTRIBUTES** |
| *Authors* | Bruna S.O. Silva*, Maria Valéria R. Velasco, André Rolim Baby |
| *Affiliations* | Departamento de Farmácia, Faculdade de Ciências Farmacêuticas, Universidade de São Paulo (FCF-USP), São Paulo, SP, Brasil |
| *Abstract* | Mosquitoes are vectors of arboviruses, such as dengue, Zika virus, chikungunya and yellow fever. Which cannot be prevented by vaccination, and still lack specific treatment. With increasing urbanization and climate change, there is a trend of rising infection rates. To mitigate these problems caused by mosquito bites, the use of repellent cosmetic formulations are recommended. This investigation aimed to determine the solar protection factor (SPF) in vitro of repellent formulations containing IR3535 (IR) (commercially used repellent molecule with lower toxicity); benzophenone-3 (BZ3) (ultraviolet filter (UV)); and a commercial combination of polysaccharides trehalose and arabinogalactan (PS), which exhibit potential film formation properties on the skin surface and topic anti-inflammatory effects. SPF was determined by diffuse reflectance spectrophotometry using an integrating sphere (Labsphere UV 2000S Ultraviolet Transmittance Analyzer), while cutaneous attributes were evaluated in vivo by quantification of superficial cutaneous hydration by Corneometer CM 825 e transepidermal water loss (TEWL) by Tewameter TM Hex (Courage-Khazaka). The assay on participants was previously submitted for approval by the local ethics committee. The formulation IR+PS (10,0 and 3,0%, respectively) presented an SPF value of 41 ± 7,4, while the sample containing IR and without PS reached an SPF value of 45 ± 9,2. The formulation containing only BZ3 had an SPF of 12 ± 1,2. Preliminary in vivo results for the evaluation of skin surface hydration and TEWL suggested improvement of these attributes through treatment of participants with formulations containing IR. The sample containing PS without IR promoted an increase of 70,0 ± 1,1% in skin hydration, while the IR+PS formulation raised this parameter by 96,0 ± 1,8% after 2 hours of application. Regarding TEWL, the IR+PS formulation promoted a reduction equal to 37,5 ± 1,5%, indicating an improvement in skin barrier function. In conclusion, IR not only increased the in vitro SPF of BZ3, but also improved the skin hydration and reduced cutaneous water loss. The results suggest that formulations combining IR3535 with skin beneficial ingredients can offer comprehensive protection against arboviruses and sun damage, while improving skin health. |

**P09**

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| *Title* | **ENHANCING SUNSCREEN PERFORMANCE WITH PERESKIA ACULEATA (ORA-PRO-NÓBIS) EXTRACT: AN IN VITRO STUDY** |
| *Authors* | **Rayan de Sousa Ferreira**[1], Claudinéia Aparecida Sales de Oliveira Pinto[1], Maria Valéria Robles Velasco[1], Fabiana Vieira Lima Solino Pessoa[2], Tércio Elyan Azevedo Martins[3], Márcia Eugenia Del Llano Archondo[4], André Rolim Baby[1] |
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| *Abstract* | The growing public awareness regarding cutaneous protection against ultraviolet (UV) radiation-induced damage has driven research into safe and effective alternatives for improved prevention of harmful effects resulting from solar radiation exposure. In this context, natural active ingredients with adjuvant photoprotective properties have gained prominence due to the demand for more sustainable products. Pereskia aculeata Mill., popularly known as Ora-Pro-Nóbis, is a plant of Latin America, recognized for its therapeutic and nutritional properties. P. aculeata possesses bioactive compounds, such as flavonoids, which confer antioxidant action to its extracts, important for topical use. This investigation aimed to incorporate the glycolic extract of P. aculeata Mill. into a photoprotective formulation, evaluate its preliminary stability, and determine its in vitro efficacy by diffuse reflectance spectrophotometry with an integrating sphere. Emulsified sunscreens containing the filters avobenzone (5.0% w/w) and octyl methoxycinnamate (10.0% w/w) were prepared in the absence and presence of the glycolic extract of P. aculeata at 5.0 and 10.0%, with their preliminary stability established by centrifugation and thermal stress tests. The in vitro photoprotective activity was performed using polymethylmethacrylate plates, with the results expressed as sun protection factor (SPF) and critical wavelength (nm). All emulsified sunscreens showed no signs of instability after the preliminary stability evaluation. The formulation without the extract showed an SPF of 35 ± 2 and a critical wavelength of 382 nm ± 0. The addition of the extract at 5.0% improved the performance of this sample for SPF (40 ± 1), but without interaction with the critical wavelength. The sunscreen with 10.0% extract generated an SPF of 45 ± 2 and a critical wavelength of 383 nm ± 0, being the sample with the best efficacy profile for the established parameters. The results suggested that all sunscreens were considered apparently stable and that the glycolic extract of P. Aculeata Mill. had the potential to enhance the efficacy of the samples, offering a promising natural alternative for the development of more effective and sustainable photoprotective products. |

**P10**

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| *Title* | **INNOVATIVE TiO2-BASED NANOMATERIAL: SPF BOOSTER WITH REDUCED OPACITY** |
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| *Abstract* | The protection against ultraviolet (UV) radiation is crucial to avoid the incidence of skin disorders, thus providing the maintenance of a healthy skin. The inorganic UV filters, TiO2 and ZnO, are semiconductor materials capable of reflecting, scattering and absorbing the incident UV radiation, preventing it to reach the skin. Nowadays, this type of UV filter is attracting great attention due to its eco-friendliness and reduced allergenic potential in comparison with their organic counterparts. However, formulations containing inorganic UV filters usually result in a chalky white aspect upon application, an aesthetic and sensorial drawback that can be solved by nanotechnology. In this investigation, the photoprotective properties and aesthetic characteristics of an innovative nanomaterial were evaluated giving insight into possible new applications. The in vitro sun protection factor (SPF) and critical wavelength (nm) of 10 wt% O/W dispersions containing the nano-TiO2 (NT) and commercial TiO2 (T1 and T2) were evaluated by Labsphere UV2000S with samples (1.3 mg/cm2) prepared on polymethylmethacrylate plates. The interaction of NT and commercial TiO2 was evaluated in 1:1 (5 wt% of both samples) mixtures by measuring their SPF in vitro. The colorimetric characterization of the samples on skin was performed with research participants with phototypes between III and IV by Chroma Meter CR-400 (REC FCF-USP 7.411.856). The NT sample presented SPF 10±1, T1 SPF 16±1, and T2 SPF 18±1. Interestingly, the SPF of samples prepared with 5 wt% of NT and 5 wt% of T1 (sample NT+T1) increased up to 130% to 30±4 indicating a synergic interaction. The NT sample exhibited reduced opacity on phototypes III and IV as indicated by DE* respectively of 1.7 and 6.2, whereas the highest values was measured for T2 (DE* 16.1 and 21.6). The sample NT+T1 presented a DE* of 6.0 and 8.9 on the mentioned phototypes. Although having an inferior performance than NT, NT+T1 had a better response profile in comparison with T2. In short, the 20 nm large nano-TiO2 with innovative characteristics, such as amorphous structure and high dispersibility in cosmetic formulations, can reduce the opaqueness and act as an effective SPF booster of sunscreens containing exclusively inorganic filters. |

**P11**

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| *Title* | **DEVELOPMENT OF MULTIFUNCTIONAL STICK SUNSCREENS** |
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| *Abstract* | The use of broad-spectrum sunscreens is recommended for the prevention of all skin neoplasms[1], being an essential product considering that, in Brazil, non melanoma skin cancer has the highest incidence[2]. In addition, sunscreens also protect against premature aging and the undesirable appearance of dark spots. Thus, the industry has been increasingly expanding its range of options, offering sunscreens in different forms such as lotions, gels, sprays, among others, aiming to reach diverse audiences and adapt to the habits and climates of each country[3]. Currently, solid formulations in stick format have been gaining prominence due to their ease of application, storage, and versatility. This study aimed to develop multifunctional stick sunscreens, both tinted, ensuring skin tone uniformity, and untinted, with a high sun protection factor, water resistance, and added emollient and moisturizing properties. Initially, the sun protection factor (SPF) was determined in silico using specific software. Then, through a literature review and experimental tests, waxes and butters that provided desirable physicochemical and sensory characteristics were selected, optimizing the formulation's texture and the solubility of the UV filters. Subsequently, the in vitro SPF was evaluated using the Labsphere system. Additionally, drop point tests were performed to estimate the melting point and ensure the usability of the stick even in tropical climates, occlusion tests were conducted to assess the hydration capacity on the skin, and in vitro water resistance tests were carried out, verifying the product's retention after exposure to moisture. As a future perspective, a stability study will be conducted to ensure the integrity of the formulation over time. |

**P12**

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| *Title* | **COMBINATION OF RETINOL AND NIACINAMIDE IN COSMETOLOGY: SCIENTIFIC EVIDENCE AND POTENTIAL BENEFITS** |
| *Authors* | **Rafaella Junqueira Merli**[1*] & Gislaine Ricci Leonardi[1] |
| *Affiliations* | 1 - Faculdade de Ciências Farmacêuticas da Universidade Estadual de Campinas (FCF - UNICAMP). |
| *Abstract* | The use of retinoid derivatives and niacinamide in personal care is already well-established and widely practiced in cosmetology. Retinol, or vitamin A, is the main representative of the retinoid class, a term that comprises a group of molecules of natural or synthetic source with important functions for the skin. In cosmetic products, topical use is mainly in the esterified form of this compound, giving rise to retinyl acetate, retinyl propionate, and retinyl palmitate. Among the functions of this class, notable effects include stimulation of cell renewal and collagen fiber synthesis, inhibiting matrix metalloproteinases (MMPs), and reducing oxidative stress in the epidermis. In parallel, niacinamide, or vitamin B3, is used in topical formulations in cosmetology due to its ability to reduce skin hyperpigmentation and inflammation, improve the skin barrier function, and help prevent UV-induced immunosuppression. Considering these characteristics, the combination of retinoids and niacinamide has been explored in the cosmetic market as a potentially synergistic approach. However, robust evidence supporting this association remains scarce. Given this scenario, this literature review aimed to identify and analyze studies that evaluated the combination of these active ingredients and explore their potential applications and benefits, considering the proven efficacy of each ingredient individually. For this purpose, an advanced search was conducted in "Google Scholar" and "PubMed" databases using the English terms “retinol” and “niacinamide” as well as “retinyl” and “niacinamide,” covering the last ten years (2015 to 2025). A total of six publications were found, of which only four were accessible through the University, and their findings were discussed in this study. Based on the evaluated results, there is a clear need and opportunity for further research on the combination of these active ingredients to provide evidence of the expected and discussed synergistic effects, as well as to confirm the safety, stability, and efficacy of using retinoids and niacinamide in the same formulation. |

**P13**

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| *Title* | **GREEN COFFEE SEED OIL (COFFEA ARABICA) AS A NATURAL ACTIVE INGREDIENT IN SUNSCREENS: IN VITRO EFFICACY AND PHOTOSTABILITY** |
| *Authors* | Camila Faustino Hiraishi[1],*, Claudinéia Aparecida Sales de Oliveira Pinto[1], Fabiana Vieira Lima Solino Pessoa[2], Maria Valéria Robles Velasco[1], André Rolim Baby[1] |
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| *Abstract* | Continuous exposure to ultraviolet (UV) radiation is associated with premature aging and an increased risk of skin cancer. This study evaluated the in vitro efficacy and photostability of sunscreens formulated with green coffee seed oil (Coffea arabica), a natural ingredient with antioxidant and emollient properties. Three oil-in-water photoprotective formulations were developed, differing in the presence and concentration of green coffee seed oil: a control sample, without the active ingredient, and two variations containing 5.0% and 10.0% w/w of the oil. All formulations contained avobenzone (5.0% w/w) and octyl methoxycinnamate (10.0% w/w). Preliminary stability was assessed through centrifugation and thermal stress tests. In vitro efficacy and photostability were determined using the Labsphere UV2000S and the Atlas Suntest CPS+ chamber, with results expressed as in vitro sun protection factor (SPF). The formulations containing 5.0% green coffee oil remained stable, whereas those with 10.0% showed signs of instability after centrifugation. Regarding efficacy and photostability, the control formulation exhibited a 47.29% reduction in SPF after irradiation, decreasing from 36.67±4.33 to 19.33±7.07. The formulation containing 5.0% green coffee seed oil showed a 40.44% reduction, while the one with 10.0% demonstrated the best performance, with a decrease of only 34.29%. Although signs of instability were observed in the 10.0% oil formulation, no phase separation occurred, and the tests indicated that the formulation remained apparently stable. The results highlight that green coffee seed oil positively influenced the response profile of the photoprotective system, enhancing its photostability. The superior performance of the formulation with 10.0% oil suggests its potential as a promising active ingredient for the development of more natural and multifunctional sunscreens. |

**P14**

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| *Title* | **MULTIFUNCTIONAL PHOTOPROTECTOR CONTAINING STRAWBERRY RESIDUE EXTRACT (FRAGARIA X ANANASSA DUCH.): IN VITRO EFFICACY AND FUNCTIONAL PHOTOSTABILITY** |
| *Authors* | Danilo Martini Rosolia[1], Gabriela Peres Salzedas[1]*, Daniel Pecoraro Demarque[1], Claudinéia Aparecida Sales de Oliveira Pinto[1], Maria Valéria Robles Velasco[1], André Rolim Baby[1] |
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| *Abstract* | Awareness of the harmful effects of ultraviolet (UV) radiation has significantly increased, reinforcing the need for the development of multifunctional photoprotectors capable of preventing and minimizing damage such as sunburn, free radical generation, photoaging, and skin cancer. Several bioactive compounds, such as polyphenols and vitamin C, present in natural products, have recognized antioxidant activity and potential adjuvant photoprotective effects. In this context, strawberries (*Fragaria* × *ananassa* Duchesne) stand out for their high concentration of these secondary metabolites, both in the pulp, used in food, and in the leaf crown, which is frequently discarded. Therefore, this study aimed to obtain and evaluate the *in vitro* efficacy of multifunctional sunscreens formulated with an extract obtained from strawberry residue, composed of fractions of the pulp, sepals, and peduncle (when present). The strawberry residue biomass was collected and subjected to ethanolic extraction, and the extract was incorporated into a photoprotective system containing avobenzone (5.0%) and octyl *p*-methoxycinnamate (10.0%). The developed formulations were analyzed for *in vitro* sun protection factor (SPF) using the Labsphere UV2000S equipment and for their photostability in an Atlas Suntest CPS+ exposure chamber. The results, obtained by diffuse reflectance spectrophotometry with an integrating sphere, showed that the strawberry residue extract represents a promising bioactive ingredient. Its incorporation into the photoprotective system increased the initial SPF and mitigated the reduction in photoprotective capacity throughout exposure to artificial UV radiation, highlighting its potential as an adjuvant in innovative photoprotective formulations. These results emphasize the potential of using by-products from the food industry in cosmetology, aligning with the principles of sustainability and circular economy. |

**P15**

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| *Title* | **ANTIOXIDANT ACTIVITY OF PHYLLANTHUS SPECIES PRESENT IN THE STATE OF MATO GROSSO DO SUL** |
| *Authors* | Mariana C. Nocetti[1,2], Camila S. Siqueira[1], Maira A. N. Medeiro [2], B. M. N. Souza[2], Matheus Y. D. Fontebasse[2], A. P. R. Vesco[2], Maria L. B. Gasques[2], Carlos A. Carollo[1], Aline R. H. Carollo[2]* |
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| *Abstract* | Plants of the Phyllanthus genus are ruderal and widely distributed, commonly known as "stone-breaker" because of their popular use as tea for urinary diseases. Worldwide, the most popular species are Phyllanthus niruri and P. amarus. However, in the state of Mato Grosso do Sul, mainly in the Morro do Paxixi and the Pantanal region, we can find other species such as P. orbiculatus, P. tenellus, and P. fluitans (an aquatic species). Some of the pharmacological actions of these species are related with antioxidant properties, which are important for anti-aging, anti-wrinkle, sun protection, anti-inflammatory, and antimicrobial actions. Objective: Identify the antioxidant activity of Phyllanthus species found in the state of Mato Grosso do Sul. Methodology: The aerial parts of 5 Phyllanthus species from Mato Grosso do Sul were collected, dried, and ground. Ultrasound-assisted extraction was performed, and DPPH were used to evaluate the reduction action of the extracts in a 96-well plate with spectrophotometric analysis at a wavelength of 520 nm. Results and discussion: Despite the greater traditional use of P. niruri and P. amarus, P. tenellus exhibited similar antioxidant activity, while P. orbiculatus showed superior activity compared to these three species. Conclusion: The Pantanal and Cerrado regions contain Phyllanthus species with outstanding antioxidant activity, highlighting the potential of this region for research and the development of cosmetic products. |

**P18**

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| *Title* | **DEVELOPMENT AND CHARACTERIZATION OF A TOPICAL FORMULATION CONTAINING RUTIN AND PASSION FRUIT OIL FOR PRESERVATION OF THE SKIN BARRIER IN PATIENTS UNDERGOING ANTINEOPLASTIC THERAPY** |
| *Authors* | Mariana Arrevolti[1], Briani Giselle Bigotto[2], Maria Antônia Pedrine Colabone Celligoi[3], Michele Georges Issa[4], Fernanda Belincanta Borghi Pangoni[5], Audrey Alesandra Stinghen García Lonni[1*] |
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| *Abstract* | **Introduction:** Cancer is one of the greatest public health challenges worldwide, and its treatments can cause adverse skin effects that impact patients' quality of life. In this scenario, topical formulations with natural active ingredients have stood out as auxiliary alternatives in protecting the skin barrier. Rutin (RU), a flavonoid with antioxidant and anti-inflammatory action, and passion fruit oil (OM), with moisturizing and regenerating properties, show therapeutic potential in this context. **Methodology:** Four formulations were developed based on a $2^2$ factorial design, varying the concentrations of rutin (0.3% and 0.5% w/w) and passion fruit oil (OM) (2.5% and 5.0% w/w). The formulations were named FRU1, FRU2, FRU3 and FRU4. In addition, three other formulations were prepared, namely FB (without active ingredients), FOM2.5 (containing 2.5% w/w OM), and FOM5.0 (containing 5.0% w/w OM). The formulations were characterized regarding pre-stability (in a centrifuge at 3200 rpm for 30 minutes), organoleptic properties (color, odor, and appearance), physicochemical properties (pH, density, and spreadability), determination of rutin by UV-VIS spectroscopy (360 nm), continuous shear rheology in a controlled gradient and shear stress rheometer (model MARS II – Thermo Haake®) at temperatures of 5, 15, and 34°C, and permeation evaluation by photoacoustic spectroscopy. All tests were performed in triplicate. **Results and Discussion:** The formulations presented a homogeneous appearance, a characteristic odor of OM, light, with a light yellow coloration for those containing RU. The formulations FB, FOM2.5 and FOM5 presented an opaque white coloration. The pH ranged from 5.3-6.0 ± 0.1 and average density of 9.0 ± 0.05 mg/mL for all formulations. In the analysis of rutin content, the formulation FRU1 presented a content of 47 µg/mL, FRU2 64 µg/mL of RU, FRU3 22 µg/mL and FRU4 presented a content of 54 µg/mL. In the preliminary test, the formulations were homogeneous, without phase separation. According to the results obtained from the physicochemical and organoleptic characterizations and content analysis, the formulations FRU2 and FRU4 presented the best performance and were subjected to rheological and permeation analyses by photoacoustic spectroscopy. Rheological analysis revealed pseudoplastic behavior with dependence on temperature and shear rate for both FRU2 and FRU4 formulations, which |

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| | favors topical application. Photoacoustic spectroscopy confirmed both epidermal and dermal penetration of rutin in both FRU2 and FRU4 formulations, evidenced by the increase in optical absorption between 300 and 500 nm. This behavior is related to the chemical structure of rutin, rich in conjugated aromatic structures, which favor absorption in this spectral range. On the other hand, the absence of a characteristic signal in the samples with the base formulation (FB) is directly related to the non-presence and penetration of rutin. **Conclusion:** Both formulations presented similar characteristics in the tests performed, thus future studies will be conducted to evaluate the performance of FRU2 and FRU4 formulations, with the objective of identifying which one presents better therapeutic performance and greater potential for clinical application for preserving the skin barrier in patients undergoing antineoplastic therapy. |

**P19**

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| *Title* | **MATHEMATICAL MODELING FOR DETERMINING THE WHITENING POTENTIAL OF AÇAÍ (EUTERPE OLERACEA) ETHANOLIC EXTRACT: AN IMPORTANT INNOVATIVE PROCESS FOR THE COSMETICS INDUSTRY** |
| *Authors* | Bibiana Matte[1], Gabriela Verza[1,2], Helouise Medeiros[1] |
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| *Abstract* | The cosmetics market has shown growing interest in natural ingredients rich in bioactives, such as polyphenols and flavonoids, due to their antioxidant and depigmenting potential. Açaí (Euterpe oleracea) stands out for its favorable chemical composition for inhibiting melanogenesis, making it a promising candidate for whitening cosmetic formulations. Computational modelling has been a valuable tool in the characterization of enzyme inhibitors, allowing kinetic parameters to be estimated, which help to understand the interaction between the extract and the enzyme reaction, aiding its rational application in cosmetic formulations. The aim of this study was to evaluate the inhibitory capacity of the ethanolic extract of açaí on tyrosinase and to characterize its kinetic parameters using computational modelling. The açaí was freeze-dried and subjected to alcoholic extraction at low temperature. The extract was concentrated and resuspended in different concentrations for the enzyme inhibition tests carried out by reading the absorbance in a microplate. Computational modeling was applied to estimate the inhibition constant (Ki), allowing it to be analyzed as a potential tyrosinase inhibitor. A reduction in absorbance values was observed compared to the control, a fact supported by the determination of Ki through computer modeling. The ethanolic extract of açaí showed inhibitory potential against tyrosinase, suggesting its possible application as a natural depigmenting active ingredient. Computational modeling complemented the experimental analysis, contributing to the kinetic characterization of the extract. These findings reinforce the relevance of Brazilian biodiversity in the development of cosmetics, as well as highlighting the importance of using innovative methodologies for the sector (SISGEN code AFB3134). |

**P21**

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| *Title* | **NATURALLY DERIVED SPF BOOSTER FOR MORE SUSTAINABLE SUNSCREEN DEVELOPMENT** |
| *Authors* | Claudia Teubner[1], Martina Issleib[1], Marek Busch[1], Lars Jung[1], Joana Lima[2*] |
| *Affiliations* | 1 - Symrise AG, Divisão de Ingredientes Cosméticos, Holzminden, Germany<br>2 - Symrise Brasil, Divisão de Ingredientes Cosméticos, Brasil. |
| *Abstract* | **Introduction:** In the current sunscreen development landscape, sun protection factor (SPF) boosters of natural origin play an important role in optimizing formulations. Such materials respond to the demands for products with high SPF, sustainable and safe. This study evaluates the SEUV material, a natural composition, based on hydrogenated palm oil and sugarcane (Saccharum officinarum) extract, as an SPF booster in different structures of sunscreen formulations. **Methods**: In vivo studies were conducted at a third-party institute to investigate the efficacy of the SEUV composition as an SPF booster used at 3% in different emulsions. The SPF boosting effect was compared to placebo according to FDA Monograph Standard 21CFR201.327, ISO 24444:2019 "In vivo determination of sun protection factor (SPF)" or "Determination of sun protection by HDRS". The impact of the SEUV composition on the viscosity of the formulations, on the sensorial and on the balance of the UV-A/UV-B ratio was also evaluated in in vitro methodology. **Results and Discussion:** The efficacy of the SEUV composition could be demonstrated in vitro with an ideal use dosage of 3%. In the formulations tested in vivo with different combinations of organic and mineral UV filters and in different test methods, the SEUV composition significantly increased the SPF by up to 71% (relative to placebo). The SEUV composition increases the absorbance curve uniformly over the entire wavelength range and thus maintains the balance between UV-A and UV-B protection. In physicochemical and organoleptic tests, the SEUV composition increases the viscosity of the formulations, without altering the sensory. **Conclusion:** The SEUV composition acts as an SPF booster with organic and mineral UV filters, proven in vivo, as well as increasing the absorption value of UV-A and UV-B, thus offering a broad-spectrum solution. It allows us to achieve higher sun protection factors with a constant amount of UV filters, reducing the viscosity donors of the formula without modifying the sensory. |

**P23**

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| *Title* | **EXTRACTS OF Malpighia emarginata (ACEROLA) POMACE AS PHYTO-INGREDIENTS IN MULTIFUNCTIONAL SUNSCREENS** |
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| *Abstract* | Valorization of agro-industrial waste in the cosmetic industry is a promising alternative to high environmental waste rates, aligned with new consumption patterns that aim for more natural and sustainable products. Acerola (*Malpighia emarginata*) generates approximately 27-41% of waste from the juice industry. Given its potential as an important source of bioactive compounds and the growing trend for new ingredients, this study aimed to obtain extracts from acerola pomace (wet and dry) and evaluate the *in vitro* photoprotective efficacy and *in vivo* superficial skin hydration of multifunctional sunscreen systems (tests on participants were previously submitted for approval by the local Ethics Committee). Acerola pomace was collected after pulp removal and used to produce two classes of extracts: wet pomace (WACE), and dry pomace (DACE). The extracts were obtained by ultrasound, using the plant drug at a ratio of 1:10 (w/v) with an ethanol:water mixture (1:1 v/v). The solvent was evaporated using a rotary evaporator. WACE or DACE extracts were combined with the sunscreen filters octyl methoxycinnamate (10,0%) and avobenzone (5,0%) in O/W emulsions. These systems were characterized by determining the *in vitro* sun protection factor (SPF) using a Labsphere UV2000S (diffuse reflectance spectrophotometry with integrating sphere), employing polymethylmethacrylate plates as substrates. WACE increased the SPF of the formulation by 80.8%. The sample containing DACE also promoted an increase in efficacy, although to a lesser extent, equal to 37.8%. Both samples containing the extracts were compared with the control (emulsion with UV filters, without extracts). This response profile can be attributed to the diversity of antioxidant bioactive compounds present in wet or dry pomace. However, both were able to enhance the performance of the photoprotective system. Furthermore, preliminary results suggested that these ingredients improved superficial skin hydration in participants. These results offer perspectives for researching this class of ingredients as cosmetic ingredients, with potential application in developing multifunctional products, valuing biodiversity, sustainability, and optimizing the production chain. |

**P24**

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| *Title* | **EFFICACY AND SAFETY OF A COSMETIC FORMULATION CONTAINING NIACINAMIDE, MANDELIC ACID, AND SALICYLIC ACID FOR BODY ACNE** |
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| *Abstract* | Acne affects both adolescents and adults, being a multifactorial condition characterized by an increase in the bacterium Cutibacterium acnes type 1, sebum production, obstruction of the pilosebaceous units, hyperkeratinization, and pro-inflammatory markers. Acne lesions occur mainly on the face but may also appear in other areas of the body, such as the back, chest, and shoulders. Therefore, it is important to develop cosmetic products that complement acne treatment. In this context, the present study aimed to evaluate the safety and efficacy of a cosmetic formulation for body acne care. To this end, a cosmetic formulation containing 2% niacinamide, 0.5% mandelic acid, 2% salicylic acid, and Agathosma betulina extract was developed. Clinical studies to evaluate skin tolerance and efficacy after 28 days of daily use were conducted following approval from the Research Ethics Committee (CAAE 83003024.6.0000.0063, opinion: 7.068.134). Forty participants, aged between 13 and 49 years, of both sexes, with combination to oily skin and grade II or III body acne (back, shoulders, and chest) took part in the study. The Human Repeated Insult Patch Test demonstrated that the product did not cause primary dermal irritation, cumulative irritation, or skin sensitization. The evaluation of skin tolerance during real-use conditions indicated high tolerance, with no adverse events. Quantitative assessment of acne lesions (Lucky, 1996) showed a statistically significant reduction ($p<0.05$) of 20% after 7 days, -27% after 14 days, and -28% after 28 days of daily use. Qualitative efficacy (grading scale) revealed a significant reduction ($p<0.006$) in erythema after 6 hours and a significant reduction ($p<0.05$) in edema after 8 hours following a single application. In the self-assessment questionnaire, 83% of participants reported that the product did not dry out their skin, 88% stated it did not leave the skin sticky, 85% felt a soothing effect, and 75% noticed a reduction in blemishes. In summary, the product was considered safe for acne-prone skin, effective in reducing acne signs, and showed excellent cosmetic acceptability. |

**P25**

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| *Title* | **EXPLORING THE EFFICACY OF MULTIFUNCTIONAL FILLER IN SUN PROTECTION: SPF INCREASE, WHITE CAST MINIMIZATION, AND SENSORY BENEFITS** |
| *Authors* | **João M. Russo[1*]**, Soraya Moura[1], Natalia Castro[1], Danilo Interlichia[1], Jutta ZurLage [2], Lilia Heider[2] |
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| *Abstract* | The importance of sunscreens in daily life is increasingly evident. To protect the skin, organic and inorganic UV filters are widely used in sun protection formulations. However, the discussion about the environmental and human health impacts of UV filters is growing. Inorganic filters are considered safe and effective, showing synergistic effects when combined with organic filters, also offering protection against blue light damage and infrared radiation. Despite this, a challenge is that these filters can leave a white residue, especially on darker skin, which limits their acceptance. Therefore, there is a continuous effort to develop formulations that are effective, safe, and highly transparent. As such, there is an increasing interest in ingredients that act as SPF "boosters," which do not provide sun protection on their own but enhance the sun protection capacity in combination with UV filters.<br>The study methodology evaluated the potential of a high-transparency inorganic spherical particle (PEIT) as an SPF booster, using a placebo oil-in-water emulsion with organic and inorganic filters (3% coated titanium dioxide - DTR). In version 1, 3% of PEIT was added, while in version 2, 2% of DTR was added. The SPF and PFA of the formulations were obtained through in vitro methodology. To assess white residue, the formulations were applied to artificial skin (BiodyPlate phototype V) and analyzed using standardized images, employing ImageJ software to measure the luminosity value (L*).<br>The results showed that version 1, with PEIT, generated an SPF increase comparable to that of version 2, which contained an additional 2% of inorganic filter. Moreover, version 1 exhibited a significantly lower increase in white residue compared to version 2, minimizing the white cast effect in the formulation. The PEIT particle, by dispersing UV radiation, enhances the efficacy of UV filters, broadening the radiation interaction with the filters before it reaches the skin. The synergy between the absorption of UV filters and light-dispersing particles is crucial for optimizing formulations and enhancing skin tolerance. |

**P26**

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| *Title* | **INFLUENCE OF IRON AND COPPER IONS IN WASH WATER ON HAIR FIBERS SUBJECTED TO BLEACHING/COLORING** |
| *Authors* | Domingo Melero Sancho, André Rolim Baby, Claudinéia Ap. Sales de Oliveira Pinto, Maria Valéria Robles Velasco |
| *Affiliations* | Faculty of Pharmaceutical Sciences, University of São Paulo (FCF-USP) |
| *Abstract* | **Introduction and Objectives**<br>This study investigated the effects of iron ($Fe^{3+}$) and copper ($Cu^{2+}$) ions in wash water on virgin, bleached, and colored hair. These metals catalyze oxidative reactions (e.g., Fenton reaction), leading to keratin degradation, color changes, loss of shine, and reduced mechanical strength, particularly in chemically treated hair.<br><br>**Methodology**<br>Brown virgin hair swatches were divided into four groups: virgin (**A**), bleached (**B**), brown-colored (**C**), and reddish-brown-colored (**D**). Samples underwent 10 wash cycles with three water types: purified (**Control**), simulated potable (0.3 mg/L Fe, 1.0 mg/L Cu), and high-metal-concentration water (2.0 mg/L Fe, 9.0 mg/L Cu). Each cycle included surfactant washing and conditioning. Evaluated parameters: combability, color, shine, and protein loss.<br><br>**Results**<br>• **Combability.** Bleached and colored hair required less combing force but showed reduced conditioning efficacy with high-metal water (20% improvement vs. 70% in purified water for reddish-brown hair), indicating cuticle damage.<br>• **Color.** Bleached and reddish-brown hair exhibited the highest color changes (ΔE* up to 14.68), especially with high-metal water. Virgin hair showed minimal changes.<br>• **Shine.** All groups lost shine, most notably bleached hair, suggesting cuticle damage.<br>• **Protein Loss.** Colored hair (**C, D**) had higher initial protein loss due to chemical treatments, but metal-rich wash water did not significantly worsen it.<br><br>**Conclusions**<br>High-metal water intensified oxidative damage in chemically treated hair, particularly affecting color stability (reddish-brown most sensitive) and combability. Conditioning mitigated effects but was less effective in metal-rich water.<br><br>**Relevance for the Cosmetic Industry**<br>Results highlight the need for chelating conditioners, water filters for colored hair, and formulations protecting against oxidative damage in hard water. |

**P27**

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| *Title* | **PRECLINICAL EVALUATION OF THE EFFICACY OF A PHOTOPROTECTOR IN REDUCING OXIDATIVE STRESS, SKIN AGING, AND PROMOTING SKIN LONGEVITY** |
| *Authors* | **Layane Melody da Silva Reis Cavalcante[1]**, Carla De Figueiredo Presti Favaro[1], Lucia De Fatima Holanda Paiva Araujo[1], Giulia Okamoto Maciente[1], Mauricio Frazilho[1], Marisa Keiko Uema Sacuragui[1], Juliane Dias Piotto Juabre[1], Gabriela da Silva Leite[2], Giovana Valim Albigesi[2], Bárbara de Freitas Carli[2], Gustavo Facchini[2], Ana Lúcia Tabarini Alves Pinheiro[2], Samara Eberlin[2]* |
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| *Abstract* | Skin aging is a multifactorial process whose main mechanism is the excessive production of free radicals, which generates an environment of oxidative stress after the skin is exposed to various external aggressions. The aim of this study was to evaluate the effects of a photoprotector (DC-180924-00) in preventing skin damage induced by ultraviolet (UV) and infrared-A (IR-A) radiations, using an experimental model of human skin culture. Human skin fragments obtained from elective plastic surgeries were treated with DC-180924-00 and subsequently exposed to UV or IR-A radiations to measure the production of reactive oxygen species (ROS), procollagen type 1 (pCOL1), elastin and matrix metalloproteinase type 1 (MMP-1). Additionally, the ability of the product to stimulate Ki67 production was evaluated. The results show that DC-180924-00 has a prophylactic effect by preventing both the increase in ROS production and the decrease in pCOL1 and elastin production induced by UV radiation. The formulation was also able to maintain MMP-1 levels similar to those observed under basal conditions, even under stress induced by IR-A radiation. These biological effects demonstrate the ability of the product to protect against oxidative stress and preserve the structure of the extracellular matrix – collagen, elastin and MMP-1, attenuating the skin aging process. In addition, significant increases in Ki67 protein synthesis were observed, suggesting an increase in epidermal proliferation/renewal, improvement in skin vitality/rejuvenation and, consequently, in skin anti-aging. These results indicate that DC-180924-00 has a broad anti-aging activity, effectively mitigating damage caused by external agents, such as UV and IR-A radiations, and promoting epidermal renewal. Thus, in addition to providing physical and chemical photoprotection, the product contributes to the longevity of skin health by balancing the production of essential biomarkers. As a result, it reduces tissue vulnerability to cumulative damage and prevents aesthetic changes associated with aging, favoring more resilient, functional and youthful skin over time. |

**P28**

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| *Title* | **IN VITRO AND IN VIVO INVESTIGATION OF THE MOISTURIZING POTENTIAL OF A DERMOCOSMETIC FORMULATION CONTAINING BOMBYX MORI SILK PROTEIN** |
| *Authors* | **Maria Vitória Ferreira da Silva[1];** Thays Amélio Bergamini[1]; Mariana Arrevolti[1]; Briani Giselle Bigotto[1]; Luís Fernando Cabeça[2]; Maria Antonia Pedrine Celligoi[3]; Renata da Rosa[4]; Cristianne Cordeiro Nascimento[5]; Sandra Helena Prudêncio[6]; Audrey Alesandra Stinghen Garcia Lonni[1] |
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| *Abstract* | **Introduction:** Silk produced by the silkworm (Bombyx mori L.) has as one of its components fibroin, a fibrous protein composed of the amino acids glycine, alanine and serine, biocompatible and biodegradable, which has innovative potential, as it acts as a support for cell adhesion in vitro and promotes tissue repair in vivo. Research into its potential has increased significantly due to its biocompatibility with various cell types. In view of its numerous benefits, a facial serum formulation using fibroin (FIB) was developed to investigate its skin hydration capacity, antioxidant activity, as well as sensory analysis.<br>**Methodology:** Chemical extraction of FIB was performed by dialysis, lyophilized and characterized according to X-ray Diffraction, Infrared and Scanning Electron Microscopy (SEM). Several formulations were developed using a two-factor factorial experimental design: formulation without the active ingredient (FB) and varying the active ingredient concentration (1.0% to 5.0% w/v). The stability of the formulations was evaluated by centrifugation and heat stress tests. Their organoleptic characteristics and pH were evaluated. Moisture retention and spreadability were evaluated by the gravimetric method and parallel plate test, respectively. The antioxidant effect was evaluated by the DPPH assay. The cytotoxicity of FIB and the formulations were determined by the MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-6-diphenyltetrazolium) assay. The double-blind clinical trial was conducted with FB and the best formulations, F1 (1.0% w/v) and F2 (2.0% w/v), conducted with volunteers who used the formulations approved in the in vitro test and coded for 7 consecutive days. The in vivo skin hydration evaluation was performed by bioimpedance.<br>**Results and Discussion:** After centrifugation and thermal stress, the formulations did not show macroscopic changes. The spreadability of the formulations was 6,350.6 mm2 (FB) to 7,991.8 mm2 (F2). The antioxidant activity was 31.0 ± 2.4% (FB) and 61.9 ± 2.9% (F2). The volunteers were satisfied with the sensory of the samples. |

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| | **Conclusion:** From the biological analyses, its safe use can be assured, resulting in the development of a facial moisturizing serum with significant cosmetic activities, with a light sensory and with the differential of silk protein. |

**P29**

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| *Title* | **SENSORY PROPERTIES AND CLINICAL EFFICACY OF COSMETIC FORMULATIONS CONTAINING A BLEND OF MEDITERRANEAN EXTRACTS FOR HYPERPIGMENTED SKIN** |
| *Authors* | G. F. Cadioli[1], T.M. Pinheiro[1], P. M. B. G. Maia Campos[1] |
| *Affiliations* | 1 - Faculdade de Ciências Farmacêuticas de Ribeirão Preto — USP, São Paulo, Brasil. |
| *Abstract* | Hyperpigmentation can cause significant psychological distress and impact on quality of life. Considering that caring for hyperpigmented skin can be complex and requires long periods, it is essential that products offer a pleasant sensory experience to encourage adherence to use. In this context, the aim of this study was to develop and evaluate the clinical efficacy of cosmetic formulations to improve facial skin hyperpigmentation using a blend of Mediterranean extracts — extracts from the fruit and peel of red orange (Citrus sinensis), caper buds (Capparis spinosa), olive leaves (Olea europaea) and rice grains (Oryza sativa). The developed formulation was evaluated for its mechanical and sensory properties. Ten subjects were recruited for the clinical efficacy study (CAAE 83685624.4.0000.5403). Measurements of stratum corneum water content, transepidermal water loss (TEWL), surface sebum content, skin microrelief and high resolution image analysis were performed before and after 7 days of application. The results showed that the addition of the extract blend to the formulation reduced the shear work compared to the vehicle, which may lead to improved sensory perception in terms of spreadability. According to the sensory analysis, the formulation containing the extract blend was better evaluated by the study participants, especially in terms of ease of application, spreadability and pleasant texture, which is consistent with the instrumental measurements of texture properties. In addition, the Mediterranean extract blend formulation effectively increased the water content of the stratum corneum, improved skin microrelief and reduced the $\Delta L$ parameter in high-resolution image analysis, indicating an improvement in skin hyperpigmentation. In this context, the proposed formulation demonstrated benefits in improving the condition of hyperpigmented skin, even within a short period of application. Furthermore, the sensory properties positively influenced participant's perception of the product and its efficacy, which is essential for adherence and achieving the desired benefits. Finally, the proposed blend represents a promising alternative for use in innovative cosmetic formulations for the care of hyperpigmented skin. |

**P30**

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| *Title* | **NATURAL COSMETIC INGREDIENT CONTAINING ROSEMARY EXTRACT FOR SEBUM REGULATION IN HUMAN SKIN** |
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| *Affiliations* | 1 - Symrise SAS, Cosmetic Ingredients Division, Clichy, France<br>2 - Symrise AG, Cosmetic Ingredients Division, Holzminden, Germany<br>3 - Symrise Brazil, Cosmetic Ingredients Division, Brazil |
| *Abstract* | **Introduction:** Oily skin, characterized by excessive sebum production from hyperactive sebaceous glands (SGs) due to increased sebocyte differentiation and disintegration, is frequently associated with enlarged pores and acne susceptibility. Rosemary (Rosmarinus officinalis), containing bioactive compounds including phenolic acids, diterpenes, and flavonoids, offers a natural help for sebum regulation and skin protection. This study aimed to evaluate the efficacy of a cosmetic ingredient containing rosemary extract helping the control sebum production, antioxidant activity, and soothing effects, providing a comprehensive solution for oily skin management.<br><br>**Methods:** Sebum modulation was assessed via a dual model validation in ex vivo microdissected human SGs (stimulated with linoleic acid) and in vitro IPSC induced sebocytes (lipid synthesis induced by arachidonic acid), analyzed via confocal microscopy and BODIPY staining. Antioxidant activity was quantified through ROS fluorescence and ABTS radical scavenging assays, while anti-inflammatory effects were measured via prostaglandin E2 (PGE2) reduction using ELISA.<br><br>**Results:** Application with the rosemary-based ingredient achieved outstanding results with participating in 78% (0,07% concentration) of lipid reduction in ex vivo SGs and 63.7% (0,07% concentration) in IPSC induced sebocytes. Dose-dependent antioxidant activity showed 93% ROS (1,7% concentration) and 99% ABTS (0,5% concentration) reduction. Soothing effects included 23% (0,001% concentration) and 36% (0,01% concentration) of PGE2 level decreases.<br><br>**Conclusion:** Rosemary extract demonstrates multifunctional efficacy in oily skin management, combining the help of sebum control, antioxidant, and soothing actions, positioning it as a first-class natural solution for sebum-related dermatological concerns. |

**P31**

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| *Title* | **DRY HYDROETHANOLIC EXTRACT OF *Eugenia uniflora* L.: A NATURAL INGREDIENT FOR ANTIOXIDANT FACIAL LOTIONS** |
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| *Abstract* | Skin aging is a multifactorial process accelerated by environmental factors, such as pollution and ultraviolet radiation, which promote oxidative stress. The use of natural antioxidants in the development of cosmetics has emerged as a sustainable and effective alternative to combat the damage caused by free radicals. In this study, the antioxidant potential of the dry hydroethanolic extract of the leaves of *Eugenia uniflora* L. and its application in a facial lotion were evaluated. The extract demonstrated high antioxidant activity in assays using the radical $DPPH^{\cdot}$ (0.00–13.50 µg/mL) and $ABTS^{\cdot+}$ (0.00–10.13 µg/mL) radicals, with results comparable to those of synthetic antioxidants widely used in the cosmetic industry. Furthermore, as it is an ingredient of plant origin with a history of use in traditional medicine, its potential for innovative cosmetic formulations is promising. The study of the stability of the facial lotion is ongoing, and it is expected that the product will be stable and viable for commercial applications, adding value to Brazilian biodiversity and further promoting the use of natural active ingredients in cosmetics. |

**P32**

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| *Title* | **SENSORY PROPERTIES AND CLINICAL EFFICACY OF A FORMULATION CONTAINING BRAZILIAN BERRY EXTRACT AND LIPOSOLUBLE VITAMIN C FOR OILY SKIN** |
| *Authors* | A.V. Luna [1]*; G. F. Cadioli [1], P. M. B. G. Maia Campos[1] |
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| *Abstract* | Oily skin is characterized by excessive sebum production, which can lead to the development of acne. Furthermore, post-inflammatory hyperpigmentation (PIH) is a common consequence of acne. In this context, Brazilian Berry extract (Plinia cauliflora), which has astringent, antioxidant and protective properties, has potential for application in cosmetic formulations to oily skin. In addition, the application of this extract in combination with the liposoluble vitamin C derivative, could improve the benefits of formulations for skin oiliness and PIH control. Thus, the aim of this study was to evaluate the stability, sensory and mechanical properties, as well as a clinical efficacy of cosmetic formulations for oily skin added with Brazilian Berry extract and ascorbyl tetraisopalmitate (ATIP). The studied formulation was a gel cream added or not (Vehicle – F1), with 4% of Brazilian Berry extract (F2), 3% of liposoluble vitamin C derivative – ATIP (F3), and 3% of ATIP in combination with 4% Brazilian Berry extract (F4). Rheological behavior, texture profile and spreadability were evaluated weekly during 90 days. A short term clinical efficacy study was performed to evaluate the benefits in the improvement of skin barrier function, hydration and oiliness control of F1 and F4 formulations. The results showed that formulations were stable, showing pseudoplastic behavior. Thus, the ATIP and the extract did not alter the mechanical properties of the formulations. However, only the formulations with the extract (F2 and F4) significantly improved the spreadability and provided a more pleasant sensory property. In addition, the F4 formulation containing both the extract and ATIP showed better spreadability compared to the vehicle (F1) and the formulation containing only ATIP (F3). The efficacy study showed that F4 significantly reduced the sebum amount when compared to F1. Also, this formulation reduced TEWL and improved the skin hydration when compared to baseline values. In conclusion, the proposed formulation containing the extract and ATIP (F4) presented good sensory properties and showed potential to apply in the development of innovative cosmetic formulations for the improvement of oily skin conditions. |

**P33**

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| *Title* | **NEW SUSTAINABLE GREEN ESTER TECHNOLOGY TO ACHIEVE STRONG DEODORANT ACTIVITY WITH BENEFITS FOR SENSITIVE SKIN** |
| *Authors* | Nordzieke Steffen, PhD.[1], Florian Genrich, PhD.[1], Beate Diesing[1], Ewa Maria Musiol-Kroll, PhD.[1], Rafael Albuquerque[2]* |
| *Affiliations* | 1 - Symrise AG, Divisão de Ingredientes Cosméticos, Holzminden, Germany<br>2 - Symrise Brasil, Divisão de Ingredientes Cosméticos, Cotia, São Paulo, Brasil |
| *Abstract* | **Introduction:** While there is a clear demand for more natural modern deodorants solutions, long-lasting effectiveness was the most relevant claim in 76% of deodorants launched in 2024, according to Mintel GNPD. Consequently, consumers are often disappointed by the weak odor protection offered by natural-claiming alternatives currently available on the market. This study aims to evaluate the efficacy of propanediol caprate (PMD), a sustainably manufactured compound, as a deodorant active ingredient for cosmetics. Additionally, the study investigates PMD's impact on the skin microbiome and its soothing potential for sensitive skin.<br><br>**Methods:** Odor reduction efficacy was first assessed ex vivo through sweat odor evaluation. This involved sniff tests and scoring by five trained expert evaluators, along with analytical quantification of short-chain fatty acids (SCFAs). In vivo efficacy was evaluated in 22 subjects, comparing PMD to placebo, a synthetic reference, and an untreated control. Sensory evaluations were conducted using a sniff test prior to application and at 6-, 24-, and 48-hours post-application by trained assessors. The impact of PMD on the sweat microbiome was assessed via 16S rRNA gene sequencing. Anti-inflammatory potential was analyzed by measuring interleukin-8 (IL-8) inhibition using a chemiluminescence-based luciferase assay on HEK293 cells.<br><br>**Results and Discussion:** Ex vivo analysis showed that PMD preserved the natural relative composition of the sweat microbiome, maintaining the typical ratios of gram-positive bacteria. PMD also reduced the formation of molecular odor markers such as SCFAs, while sustaining the concentration of their precursors. In vivo, PMD demonstrated equivalent efficacy to a synthetic benchmark, offering up to 48 hours of odor reduction. In vitro, PMD showed dose-dependent inhibition of IL-8, suggesting anti-inflammatory and soothing properties.<br><br>**Conclusion:** Propanediol caprate, a sustainably manufactured and naturally derived ingredient, demonstrated high deodorant efficacy comparable to synthetic options. It meets consumer demand for natural, sustainable, and multifunctional products by offering effective odor control, preserving the microbiome, and supporting sensitive skin care. |

**P34**

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| *Title* | **ANALYTICAL AND REGULATORY INVESTIGATION OF INSECT REPELLENTS CONTAINING DEET: DO THEY MEET QUALITY STANDARDS?** |
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| *Abstract* | In Brazil, topical insect repellents are classified as cosmetics by ANVISA and play a crucial role in protecting against insect bites, helping to prevent vector-borne diseases. These products can be formulated with natural substances, such as essential oils, or synthetic compounds. Among the most widely used repellents, N,N-Diethyl-m-toluamide (DEET) is the most globally consumed active ingredient. However, given its extensive history of use and widespread commercialization, it is essential to investigate the maintenance of its quality. This study assessed the compliance of insect repellents containing DEET with quality specifications and regulatory requirements. To achieve this, an analytical method using HPLC-DAD was developed and validated for the determination of DEET content. In addition to quantitative analysis, product labeling compliance with current legislation was evaluated, and pH values were verified against manufacturer specifications. Market-available products in lotion, gel, and spray forms were analyzed. The method was assessed based on analytical performance criteria, including selectivity, linearity, precision (repeatability and intermediate precision), accuracy, recovery, and robustness. A total of six products were analyzed, including one imported from Australia. Among them, two products—one gel and one spray—had labeling deficiencies: they failed to include the chemical composition in Portuguese, violating legal requirements. Additionally, the spray did not indicate the batch number, expiration date, or maximum daily application limit, thus failing to comply with current regulations. This same sample also exhibited a pH outside the specified range. Regarding DEET quantification, the imported formulation from Australia presented a content level outside the specification. The results demonstrated that the validated method was effective in quantifying DEET in various repellent formulations while also revealing non-conformities in certain products concerning regulatory requirements and quality specifications. These inadequacies highlight the need for continuous monitoring of such products to ensure their safety and efficacy. Furthermore, the detection of an out-of-specification DEET content in the imported sample underscores the importance of strict regulatory oversight. Thus, this study contributes to Public Health Surveillance by providing relevant data for the quality control of topical insect repellents. |

**P35**

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| *Title* | **SYNERGISTIC PLANT-BASED MOLECULES APPROACH TO MICROBIAL PROTECTION AND SKIN BENEFITS IN COSMETICS** |
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| *Abstract* | **Introduction:** For years, the cosmetic industry has faced the critical challenge of achieving robust, broad spectrum microbial protection while responding to increasing consumer demand for natural, plant-based ingredients. This study evaluates maltol (Ma) obtained from barley (Hordeum vulgare), cinnamal (Cin) obtained from cassia cinnamon (Cinnamomum cassia), anisic acid (AA) obtained from star anise (Illicium verum), and a combination of cinnamal and hinokitiol (CH), the last one obtained from Aomori hiba (Thujopsis dolabrata), and their synergistic potential as multifunctional ingredients for cosmetic product protection.<br><br>**Methods:** Chelating properties were assessed via spectrophotometric analysis by evaluating the prevention of chromophore formation with copper and iron ions, using 6-hydroxy-2,5,7,8-tetramethylchroman-2 carboxylic acid (Trolox®) as reference. Antioxidant activity was measured by the ABTS assay with spectrophotometric detection. Soothing efficacy was determined by an IL-8 reporter gene assay, with photometric quantification of interleukin-8 (IL-8) via antibody detection. The sebum-reducing potential of CH was tested in vitro on sebocytes through lipid quantification. Emulsion stability was assessed via particle size analysis (Malvern Mastersizer) and instability index (LumiSizer). The preservative efficacy test (PET) was performed on individual and combined molecules, in compliance with ISO 11930 and European Pharmacopeia (EUP) guidelines.<br><br>**Results and Discussion:** Ma, CH, and AA demonstrated chelating efficacy comparable to that of ethylenediaminetetraacetic acid (EDTA). Antioxidant assays revealed that Ma, Cin, and CH are effective radical scavengers. In the IL-8 assay, all tested molecules showed significant anti-inflammatory activity, with Cin achieving the highest inhibition (95%), followed by CH and Ma (both 65%). In sebocytes cultures, CH reduced lipid production by 41%. Regarding emulsion stabilization, Ma decreased the instability index by 47% and reduced average particle size. PET results confirmed that molecule combinations achieved high antimicrobial performance, meeting both ISO 11930 and EUP criteria A.<br><br>**Conclusion:** Maltol, cinnamal, the blend of cinnamal + hinokitiol, and anisic acid exhibit chelating, antioxidant, soothing, and sebum-regulating properties, along with strong antimicrobial performance comparable to synthetic preservatives. These multifunctional, plant-derived molecules offer an effective and sustainable alternative for modern cosmetic formulations, aligning with ecological goals and consumer demand for natural solutions. |

**P36**

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| *Title* | **EVALUATION OF THE EFFECTIVENESS AND PERSISTENCE OF COSMETIC PRODUCTS ON HAIR FIBERS BASED ON SPECULAR REFLECTION, COMPRESSIBILITY AND INFRARED SPECTROSCOPY** |
| *Authors* | Jussarah Viana da Silva[1]*, Wanderson Andenberg de Lima[1], Nathana Cindy Barros Silva Ramos[1], Alzira Xavier Pinto Dini[1], Adriano Pinheiro[1] |
| *Affiliations* | [1]Grupo Kosmoscience, Valinhos/SP – Brasil. |
| *Abstract* | Shine, softness and less damaged hair are attributes widely sought in the performance of cosmetic products.<br><br>The aim of this study was to evaluate the effectiveness and persistence of cosmetic products on hair fibers through the attributes of specular reflection, softness, and infrared spectroscopy.<br><br>Two types of hair were evaluated: natural Caucasian and double-bleached. Specular reflection, compressibility energy (softness), and infrared spectroscopy (FTIR-ATR) were measured before and after the application of three types of hair masks, as well as after one and two washes with shampoo without conditioning agents (SLES 10%).<br><br>For gloss measurements, a Glossmeter (BYK Gardner®) with a fixed incident angle of 85° was used; compressibility energy was measured using a universal testing equipament (Instron 23-2S), and cysteine oxidation was evaluated by FTIR-ATR.<br><br>After the treatments, an increase in the parameters of gloss and softness was observed, as well as a decrease in the cysteine oxidation band, highlighting the performance of the analyzed products. After washing, a significant reduction in product retention on the hair fiber was observed due to the tendency to return to the initial condition.<br><br>Therefore, it was possible to observe that, even after successive washes, the retention of the product and the persistence of active ingredients in the hair can be quantified, resulting in measurable benefits such as improved hair health and appearance, goals desired by the consumer. |

**P37**

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| *Title* | **A NOVEL BACILLUS-FERMENTED COSMETIC BIOPRODUCT WITH HYDRATING AND GENTLE SKIN RENEWING PROPERTIES** |
| *Authors* | Amanda Brentigani Pexe[1], Jonatas Vieira Freire[2], Claudia Nise Martins[1], Bruna Toledo Pandolpho[2], Isabella Lima de Sousa[1], Andrea Costa Fruet Mazzucco[1,2] |
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| *Abstract* | The market's growing interest in sustainable, environmentally friendly, and highly effective cosmetic ingredients has driven the development of biotechnology-based products derived from microbial metabolites. We developed a novel bioproduct through the fermentation of Bacillus sp. with glycerin and L-glutamic acid for 48 hours, resulting in the production of γ-polyglutamic acid (PGA), keratinolytic enzymes and a metabolite-rich postbiotic medium. The characterization and biological activity of the Bacillus-fermented cosmetic bioproduct (BFCP) were evaluated using electrophoresis gel, FTIR analysis, in vitro tests and clinical trials. Additionally, its clinical and environmental safety were assessed. The presence of PGA in BFCP was confirmed after extraction with trichloroacetic acid using electrophoresis gel and FTIR analysis of the dried extracted PGA. Short-chain PGA was used as a control. The keratinolytic and proliferative effects of BFCP were analyzed in a 2D cell culture model, where cells were exposed to 5% BFCP for 2 hours, resulting in cell detachment (10.2%, $p < 0.05$) and induction into the G2/M phase (29%, $p < 0.01$). The in vitro biological effects of 5% BFCP applied topically were further evaluated in reconstructed human epidermis using histology and RT-PCR. The results demonstrated that BFCP promotes desquamation of the outermost layer of the stratum corneum and significantly increases the expression of filaggrin (15x, $p < 0.01$), Ki-67 (53%, $p < 0.05$), and aquaporin-3 (9.2x, $p < 0.0001$). The exfoliating effect of BFCP was assessed through a clinical trial (approved by the clinical research ethics committee, CAAE 85339924.0.0000.5514) by analyzing corneocytes removed with Corneofix® after 14 and 28 days of treatment. BFCP reduced the number of corneocytes on adhesive tape by 6.3% and 11%, respectively. Additionally, BFCP reduced skin erythema (7.9% at D14 and 14.5% at D28) and hyperpigmentation (13.4% at D14 and 15.4% at D28) while enhancing skin elasticity (13% at D14 and 20% at D28) and hydration (9.9% at D14 and 14.0% at D28). Finally, BFCP demonstrated immediate biodegradability, achieving 60% degradation within the first 10 days and reaching a maximum degradation of 71.64% by the 27th day of testing. In conclusion, BFCP demonstrated multiple skin benefits, including enhanced exfoliation, renewal, and hydration, attributed to its keratinolytic enzymes and PGA content. |

**P38**

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| *Title* | **EVALUATION OF REACTIVE OXYGEN SPECIES PRODUCTION BY TAPE STRIPPING FLUORESCENT MICROSCOPY: A NONINVASIVE IN VIVO APPROACH** |
| *Authors* | Giovana Valim Albigesi *, Gustavo Facchini, Vânia Renata Gonçalves, Bárbara de Freitas Carli, Ana Lúcia Tabarini Alves Pinheiro, Adriano S. Pinheiro, Kelen Fabíola Arroteia, Samara Eberlin |
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| *Abstract* | Tape stripping is a noninvasive technique widely used for in vivo skin studies, commonly used to evaluate the regeneration and strengthening of the epidermal barrier, as well as transepidermal water loss (TEWL). Although consolidated in these contexts, its application in functional microscopic analyses remains little explored. In this study, we investigated the feasibility of staining intracellular markers with dichlorofluorescein diacetate (DCFH-DA), a marker of reactive oxygen species (ROS), in samples obtained by tape stripping, with the aim of establishing its use in imaging studies. Fifty sequential strips were collected from the forearm region of a healthy volunteer, using Corneofix® tapes (CK Electronic, Germany), a special adhesive tape developed to collect corneocytes (fragments of dead cells), but which also proved to be an excellent alternative for obtaining viable cells. Tape strips numbered 10 and 50 were selected for analysis, representing the most superficial layers of the stratum corneum and epidermis, respectively. After staining with DCFH-DA, the samples were analyzed by fluorescence microscopy. For each group (T10 and T50), three representative images were evaluated. Tape strips numbered 10 showed accumulation of stratum corneum residues, with an average of 1.3 fluorescent cells per field, while tape strips numbered 50 showed viable cells with preserved morphology and intracellular fluorescence, with an average of 2.67 cells per field. The results demonstrate that tape stripping can be an effective tool for in vivo microscopic analysis of intracellular markers, whose expression can be modulated by formulations or actives. Furthermore, the technique allows the investigation of the interaction of actives with the stratum corneum in a minimally invasive manner. This is an important advance compared to ex vivo models, whose tissue viability is limited to short experimental periods. The incorporation of imaging methodologies into tape stripping significantly expands its potential for application in dermatological and cosmetic studies, especially those focused on oxidative stress and epidermal cell dynamics. |

**P39**

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| *Title* | **IN VITRO MODEL FOR THE EVALUATION OF NATURAL DEFENSES IN KERATINOCYTES AND THEIR CORRELATION WITH THE SKIN MICROBIOME** |
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| *Abstract* | **Introduction:**<br>The skin is the body's main protective barrier and is constantly exposed to external factors such as UV radiation, pollution, and microorganisms. The integrity of the skin barrier, along with the activation of natural defense mechanisms, is essential for skin homeostasis and the balance of the microbiome. However, specific in vitro methods to assess these aspects remain limited.<br><br>**Objective:**<br>To develop a reproducible methodology for evaluating the potential of cosmetic ingredients to promote skin barrier integrity and stimulate natural defenses through gene expression analysis of specific markers in human keratinocytes.<br><br>**Methodology:**<br>Human keratinocytes were cultured and exposed to a cosmetic product. Gene expression of beta-defensin 1, beta-defensin 2, involucrin, filaggrin, and aquaporin-3 was evaluated using RT-qPCR. These markers were selected due to their relevance in natural defense responses, keratinocyte cohesion, hydration, and skin barrier integrity. Statistical analysis was performed using One-Way ANOVA followed by Bonferroni post-test. To validate the methodology, a reference cosmetic sample with known functional potential was used.<br><br>**Results:**<br>The methodology successfully detected significant changes in the expression of the evaluated genes, demonstrating sensitivity and reproducibility. The reference sample induced an increase in beta-defensin 1 and 2 expression, indicating activation of natural defenses and potential contribution to microbiome balance. Increases in involucrin and aquaporin-3 expression were also observed, associated with improved cell cohesion and skin hydration.<br><br>**Conclusion:**<br>The developed methodology proved to be effective in assessing the stimulation of genes related to the skin barrier and natural defenses. This model represents a promising tool for screening cosmetic ingredients aimed at skin protection and microbiome maintenance, supporting the development of innovative and safe products. |

**P40**

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| *Title* | **ANTIMICROBIAL POTENTIAL AND ANTIOXIDANT PROFILE OF Humulus lupulus L. VARIETY zeus** |
| *Authors* | Herllon Karllos Athaydes Kerr[1,3*], Sophia Carvalho Souza[1], Julia Vieira Moreira[1], Maurycio Côgo Pereira[1], Giovana Chieza Madeira[1], Juliana Ferreira Gois[1], Heitor Pinheiro de Souza Coutinho[1], Quézia Moura da Silva[1], Karla Lirio Soares[2], Marcella Leite Porto[1,3] |
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| *Abstract* | The increasing demand for natural active compounds as substitutes for synthetic ingredients in cosmetic and pharmaceutical formulations has driven the investigation of safe and effective functional compounds. In this context, hops (Humulus lupulus L. var. Zeus), widely used in the brewing industry for its sensory properties, has gained attention due to its antioxidant, antimicrobial, and anti-inflammatory effects, attributed to the presence of secondary metabolites such as alpha- and beta-acids, phenolic compounds, and essential oils. This study aimed to evaluate the antioxidant profile and antimicrobial potential of ethanolic hop extract cultivated in Brazil, targeting its application as a cosmetic ingredient. Antioxidant activity was assessed using three complementary methods (DPPH, ABTS, and FRAP), with N-acetylcysteine as the comparative standard. Antimicrobial activity was evaluated through bacterial growth inhibition assays against Staphylococcus aureus strains, including methicillin-sensitive (ATCC 25923) and methicillin-resistant (MRSA BA 01) isolates. The results demonstrated a high antioxidant potential of the extract, possibly related to the presence of xanthohumol, a flavonoid recognized for its redox activity and therapeutic properties. Additionally, inhibitory and bactericidal activity was observed against both sensitive and resistant S. aureus isolates (ATCC 25923 and MRSA BA 01). Thus, H. lupulus L. var. Zeus extract emerges as a promising active ingredient for cosmetic formulations, contributing to the prevention of oxidative stress associated with skin aging and acting as a natural preservative, with potential to reduce the concentration of synthetic preservatives in cosmetic products. |

**P41**

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| *Title* | **MICRONEEDLING AS A TOOL TO ENHANCE THE EFFICACY OF COSMETICS: A REVIEW** |
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| *Affiliations* | 1 - Programa de Pós-Graduação em Clínica Médica, Faculdade de Ciências Médicas, Universidade Estadual de Campinas (UNICAMP), Campinas, SP, Brasil<br>2 - Faculdade de Ciências Farmacêuticas, Universidade Estadual de Campinas (UNICAMP), Campinas, SP, Brasil |
| *Abstract* | Microneedling (MN) has emerged as a minimally invasive technique to optimize the delivery of cosmetic active ingredients into deeper skin layers, ensuring greater efficacy with a low risk of adverse effects. This study reviewed clinical trials and scientific articles evaluating the combination of MN with topical cosmetic formulations, focusing on protocols, efficacy, and limitations. In hyperpigmentation management, a formulation containing biomimetic peptides and antioxidants applied after MN in an area previously treated with Q-switched Nd:YAG laser demonstrated superior skin brightening and uniformity compared to no topical application. Dissolvable microneedles containing 3% tranexamic acid also showed visible facial spot lightening after four weeks of weekly use, with no reported adverse effects. For infraorbital dark circles, the application of nanomaterials containing phenylethyl resorcinol after MN enhanced brightening compared to topical application alone, with significant improvement in melanin index after 16 weeks. In skin rejuvenation, the combination of MN with 14% ferulic acid peels promoted increased skin elasticity and wrinkle reduction after eight weeks. Dissolvable microneedle patches containing acetyl hexapeptide-8 provided anti-aging effects with visible reduction in dynamic wrinkles. Another clinical study compared MN combined with hyaluronic acid (HA) to topical HA application alone over eight weeks. Improvement in dermal density and skin elasticity was superior to topical application, attributed to enhanced collagen stimulation and prolonged hydration. Despite promising results, the lack of standardization in protocols (e.g., needle depth, session frequency, and active ingredient concentration) still limits comparability between studies. It is concluded that MN is a versatile tool for enhancing the efficacy of cosmetics, but future research should focus on optimizing parameters to ensure reproducibility and safety. |

**P43**

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| *Title* | **CHARACTERIZATION AND STABILITY ASSESSMENT OF VITAMIN B12 (CYANOCOBALAMIN) FOR POTENTIAL COSMETIC APPLICATION** |
| *Authors* | Júlia Vieira Moreira[1]*, Herllon Karllos Athaydes Kerr[1,2], Alan Reinke Pereira[1,3], João Victor Macêdo De Almeida[1,3], Jullie Massi Magalhães Figueiredo[1,3], Nayara Araujo dos Santos[1,3], Hildegardo Seibert França[1], Wanderson Romão[1,3], Marcella Leite Porto[1,2] |
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| *Abstract* | Vitamin B12 (cyanocobalamin) is essential for various biochemical reactions in the human body, including DNA synthesis, methylation, and the maintenance of genomic stability. It also exhibits cytoprotective properties and potential anti-inflammatory activity. Recent studies have demonstrated its role in suppressing inflammatory cytokines and promoting cell proliferation, suggesting promising applications in cosmetic formulations aimed at skin regeneration and enhancement of the epidermal barrier. This study aimed to characterize cyanocobalamin and evaluate its stability for potential application in cosmetic products. The vitamin B12 sample was obtained through a partnership with the Receita Cidadã project, originating from a batch seized by the Brazilian Federal Revenue Service (Receita Federal). Initially, the sample underwent solubility tests in distilled water and methanol, followed by centrifugation and filtration through 0.70 µm and 0.22 µm membranes, respectively, to remove particulate impurities. The active compound was quantified using high-performance liquid chromatography (HPLC), employing a certified reference standard (Sigma-Aldrich®) to confirm the presence and concentration of cyanocobalamin in the samples. For the stability analysis, triplicate solutions were prepared and stored at -4°C, 8°C, and 25°C, then analyzed at three time points (0, 15, and 30 days) via HPLC. Chromatographic peak integrity and corresponding area were monitored to assess chemical stability. The results indicated that cyanocobalamin remained chemically stable under the tested conditions, with no significant degradation observed over the analyzed period. Notably, the detected concentration was higher than that stated on the product label. Sample characterization represents a critical step for subsequent research phases, which will include safety and efficacy assays using in vitro models. These findings reinforce the potential of cyanocobalamin as a stable and functional cosmetic active ingredient and underscore the relevance of institutional partnerships—such as with the Federal Revenue Service in enabling applied research and technological development through the reuse of seized raw materials. |

**P44**

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| *Title* | **COSMETIC SAFETY ASSESSMENT OF THE ETHANOLIC EXTRACT OF Humulus lupulus L. VAR. zeus IN FIBROBLAST CELLS** |
| *Authors* | **Sophia Carvalho Souza**[1*], Maurycio Côgo Pereira[1], Herllon Karllos Athaydes Kerr[1,3], Marcio Fronza[2], Glória Maria de Farias Viegas Aquije[1], Marcella Leite Porto[1,3] |
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| *Abstract* | The advancement of the cosmetic industry drives the development of new raw materials for innovative formulations. However, before the introduction of a new ingredient to the market, it is essential to ensure its safety. Resolution CONCEA No. 58 (2023) prohibits the use of animals for cosmetic testing, promoting the adoption of alternative methodologies, such as in vitro assays, in the toxicological evaluation of active ingredients. In this context, the present study aimed to investigate the safety of the ethanolic extract of Humulus lupulus L. var. zeus in L929 fibroblast cells, targeting its potential use as a cosmetic ingredient. To assess the safety of the extract, solutions at concentrations of 1, 5, 10, 25, 50, and 100 µg/mL were prepared and tested on L929 fibroblasts for 12 and 24 hours. Post-treatment cell viability was determined by the Trypan Blue Exclusion Assay, while the metabolic activity of viable cells was assessed using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Cell migration was evaluated using the Scratch Assay. Statistical analysis was performed using one-way and two-way ANOVA (for the scratch assay) in GraphPad Prism 8 software, with $p<0.05$ considered statistically significant. The results showed that the extract maintained cell viability above 90% at both incubation periods. In the MTT assay, all tested concentrations preserved metabolic activity above 75% after 12 hours; however, after 24 hours, a significant reduction was observed from 50 µg/mL onwards. In the Scratch Assay, the highest fibroblast migration rates were observed at concentrations of 1 µg/mL and 5 µg/mL. These findings indicate that the Humulus lupulus L. var. zeus extract presents a favorable safety profile, with high cell viability and preserved metabolic activity at concentrations up to 25 µg/mL. Moreover, the data suggest potential bioactivity in tissue regeneration at low concentrations. Preliminary assays indicate that the extract is safe for cosmetic use; however, further studies are required to validate its applicability in cosmetic formulations. |

**P45**

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| *Title* | **IN VITRO EVALUATION OF THE BIOLOGICAL AND FUNCTIONAL PROPERTIES OF Humulus lupulus L. VAR. teamaker EXTRACT** |
| *Authors* | **Maurycio Côgo Pereira**[1*], Sophia Carvalho Souza[1], Herllon Karllos Athaydes Kerr[1,3], André Assis Pires[1], Julia Vieira Moreira[1], Vitor Cezar Broetto Pegoretti[1], Karla Lirio Soares[3], Marcella Leite Porto[1,2] |
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| *Abstract* | Humulus lupulus L., commonly known as hops, belongs to the Cannabaceae family and is widely cultivated across Asia, Europe, and the Americas due to its adaptability to both temperate and tropical climates. Traditionally used in the brewing industry for its antimicrobial properties and bittering potential, hops contain bioactive compounds such as α-acids and β-acids, which have shown promise for cosmetic applications. In Brazil, one of the cultivated varieties is the teamaker hops, characterized by a distinct chemical profile that may influence its biological activity. Despite the recognized benefits of hops, studies focusing on their cosmetic potential remain limited, underscoring the need for scientific investigation. The ban on animal testing for cosmetic safety assessments in Brazil further emphasizes the importance of developing and validating in vitro methodologies. In this context, the present study aimed to evaluate the biological properties of the ethanolic extract of Humulus lupulus var. teamaker in fibroblast cultures, with a view toward its incorporation into cosmetic formulations. Cones were sourced from Fazenda Riad, dried, and subjected to ethanolic extraction, followed by the preparation of various concentrations for biological testing. In vitro assays were performed using L929 fibroblast cell lines. Cytotoxic activity was assessed through the MTT assay, while cell viability was determined using the Trypan Blue exclusion method. The extract's proliferative potential was investigated via a Scratch Assay, with exposure times of 12 and 24 hours. Results indicated that the extract did not induce cytotoxic effects or significantly compromise cell viability at the tested concentrations. A concentration-dependent reduction in cell migration was observed at higher doses, although without notable cell retraction. These findings support the safety profile of Humulus lupulus var. teamaker extract and suggest its potential as a cosmetic ingredient. Further studies are warranted to explore its functional properties and applications in innovative cosmetic formulations. |

**P46**

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| *Title* | **USE OF $^{1}$H NMR TO EVALUATE PRACAXI OIL QUALITY: A CORRELATION WITH TITRATION TECHNICS ACCESSIBLE TO COSMETICS INDUSTRY** |
| *Authors* | Jorge de Almeida Rodrigues Júnior[1, *], Marcella Yara Vasconcellos Brasiliense Cavalcanti[2], Daniele Noel Justen Pinheiro[2], Aline Luiza Machado Carlos[1] |
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| *Abstract* | Pracaxi oil (PCX), originated from the Amazon rainforest, has gained significant attention in the cosmetics industry due to its remarkable properties, especially for skin and hair care. All the interest in this raw material brings with it the need for quality control of this oil, which has a considerable market value. The iodine value (IV) is a parameter associated with the degree of unsaturation in oils and is usually determined by titration. PCX, rich in oleic acid, has an IV ranging from 50-77, while soybean oil, rich in linoleic acid, ranges from 120-135. Proton nuclear magnetic resonance ($^{1}$H NMR) is a sophisticated technique that quantitatively identifies different hydrogen atoms in organic compounds, enabling the acquisition of relevant structural information. In the case of vegetable oils, for example, $^{1}$H NMR allows the determination of both IV and the average molecular mass (MM). In this study, the $^{1}$H NMR technique was employed to assess various commercial PCX samples, as well as mixtures of PCX and soybean oil, with IV and MM being determined. A correlation curve was obtained between the PCX content and IV, through which the degree of contamination with soybean oil in a known sample of PCX can be determined. Since the IV of PCX shows significant variation when contaminated with soybean oil, the study also included contaminations using an oil with an IV similar to that of PCX, palm oil. In this case, although the IV of PCX did not undergo significant changes with contamination by palm oil, the average molecular mass showed significant variation, since the fatty chains of palm oil are generally smaller than those of PCX (which contains acids such as behenic and lignoceric, C22 and C24). Thus, the $^{1}$H NMR technique proved to be effective as a tool for verifying the quality of PCX samples and identifying potential malicious contaminations. Finally, it should be highlighted that the parameters obtained here by $^{1}$H NMR can be easily determined through simple titration techniques accessible to the cosmetics industry. |

**P48**

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| *Title* | **HEALTH EDUCATION IN THE FIGHT AGAINST DENGUE: PRODUCTION OF REPELLENT AS A PREVENTION STRATEGY IN THE PIPAS PROGRAM** |
| *Authors* | Giovana Chieza Madeira[1*], Julia Vieira Moreira[1], Herllon Karllos Athaydes Kerr[1,2], Sophia Carvalho Souza[1], Maurycio Côgo Pereira[1], Glória Maria de Farias Viegas Aquije[1], Marcella Leite Porto[1,2] |
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| *Abstract* | The Interdisciplinary Program for Health Promotion and Care (PIPAS), affiliated with the Federal Institute of Espírito Santo (Ifes), employs cosmetology as an educational tool for health promotion and disease prevention. In 2024, the program implemented health education initiatives focused on dengue prevention through theoretical and practical workshops aimed at elementary and high school students from both public and private institutions.These activities were conducted in the cosmetology laboratory and centered on the formulation of a repellent containing nanoicaridin, an active ingredient with proven efficacy against disease-vector mosquitoes. The formulation was developed with an emphasis on a light and pleasant sensory experience, encouraging the continuous and conscious use of the repellent as a preventive barrier. During the workshops, students engaged in various stages of the cosmetic production process, from handling raw materials to packaging, and were able to take the final products home, thus extending the acquired knowledge to their families and the wider community. As a complementary educational resource, a special edition of the Vintset scientific outreach magazine was produced in collaboration with the Extension Program of the Microscopy Study Group (GEM). This publication presented information about dengue, preventive measures, and the importance of repellents in the context of public health, all in accessible language. Throughout 2024, more than 3,200 students participated in PIPAS activities, highlighting the program's broad reach and relevance. The results demonstrate that the integration of cosmetic science with health education is an effective strategy for raising awareness about endemic diseases and promoting the adoption of preventive habits. The use of participatory practices and engaging, science-based educational materials further reinforce PIPAS's potential as a catalyst for social transformation and the civic development of young students. |

**P49**

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| *Title* | **DEVELOPMENT OF WATER-RESISTANT MULTIFUNCTIONAL SUNSCREEN EMULSIONS** |
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| *Abstract* | It is undeniable that sun exposure is currently one of the main contributors to skin aging, with an increased likelihood of developing skin cancer. As a result, there has been a noticeable need for the development of effective products that not only provide a high level of protection but also feature characteristics such as water resistance, anti-aging properties, and hydration. The research in the study "Multifunctional Sunscreen Emulsions" focused on the development and evaluation of preparations with broad-spectrum and multifunctional photoprotective action, in the form of emulsions containing sunscreen filters, emollient materials, and active ingredients that enhance the adherence of the formulations to the stratum corneum (guar gum, chitosan, and Behentrimonium Methosulfate - BTMS), thereby intensifying photoprotection over extended periods while maintaining hydration. Water resistance testing was performed by weight difference and SPF measurement, conducted in triplicate for each formulation. The formulations were subjected to in vitro SPF testing (Labsphere), validating the theoretical photoprotection factor results. The combination of filters that showed the best SPF was: Uvinul A Plus, Octocrylene, Benzophenone 3, Avobenzone, and Uvinul MC80, with a theoretical SPF of 42.3. Two tests were performed throughout the project, and it was concluded that among the three formulations, the one containing Quaternized Guar Gum and Behentrimonium Methosulfate achieved the best results, showing greater water resistance and better skin adhesion. This was due to the negative charge of the skin and the positive charge of the quaternized agent, resulting in improved fixation and greater adherence. |

**P50**

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| *Title* | **INTERFERENCE OF OLFACTORY STIMULUS ON COLOR PREFERENCE IN COSMETIC PACKAGING** |
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| *Abstract* | In an increasingly competitive cosmetics market, meeting basic safety and efficacy standards is no longer enough to stand out among countless new product launches. To achieve commercial success, capturing the consumer's attention in their very first interaction with the product is essential. This study explored the influence of olfactory perception on color selection for cosmetic packaging through a neurosensory and sensory analysis perspective, with a strong focus on consumer behavior and marketing implications.<br><br>The research was conducted in two main stages. In the first, participants attempted to identify 11 fragrances familiar to the Brazilian market without receiving any contextual clues. Results revealed a wide variation in identification accuracy, with mint being the most correctly identified (82%) and chamomile the least (1%). On average, participants identified only 2.74 fragrances each, confirming the difficulty of recognizing scents without additional context.<br><br>In the second stage, participants evaluated pairs of packaging designs featuring contrasting colors on the RGB scale for each fragrance. One color was associated with the fragrance source (e.g., cherry – red; its opposite – cyan). A strong preference for the associated colors was observed, with agreement rates exceeding 90% for all samples.<br><br>These findings highlight the importance of sensorial congruence in cosmetic packaging design. When color and fragrance are mismatched, the consumer may experience a sense of dissonance, potentially affecting their purchasing decisions. The results reinforce how sensory and neurosensory marketing strategies can be key tools in creating more appealing and effective product experiences. |

**P51**

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| *Title* | **BIOFABRICATION OF HUMAN EQUIVALENT SKIN AS AN ALTERNATIVE METHOD TO ANIMAL COSMETIC TESTING** |
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| *Abstract* | The ban on animal testing for cosmetics in the European Union and Brazil has driven the search for alternative methods to assess product safety. For decades, millions of animals have been subjected to painful and invasive procedures, resulting in suffering and, often, death. Beyond ethical concerns, animal testing presents limitations due to physiological differences from human skin, compromising the reliability of the results. Thus, the fabrication of human equivalent skin has emerged as a promising solution, enabling the replacement of such tests with more ethical and scientifically advanced methods. This study aims to produce human equivalent skin for use as an alternative method to animal testing in cosmetics. The skin constructs were prepared by incorporating approximately 4800 3T3 fibroblast cell spheroids per mL of bioink, followed by 3D bioprinting and crosslinking with $CaCl_2$ for 3 minutes. Stability, porosity, scanning electron microscopy (SEM), zeta potential, and cell viability analyses were performed. The bioprinted constructs demonstrated satisfactory structural stability over time, maintaining physical integrity. Porosity analysis revealed an interconnected network suitable for nutrient and oxygen diffusion, supporting cellular activity. Zeta potential measurement indicated colloidal stability of the bioink, with a value of -52.1 mV and low aggregation tendency, contributing to uniform cell distribution within the construct. Cell viability analysis showed a high rate of live cells after printing, with significant maintenance within the first 24 hours, reinforcing the biocompatibility of the formulation. Therefore, the results confirm the potential of the bioink and the bioprinted model as a promising platform for alternative toxicity and irritation testing. The use of human equivalent skin proved to be a viable and reliable alternative to animal testing in cosmetic and pharmaceutical research. In addition to meeting ethical regulations, this model can provide more accurate data on the interaction of chemical substances with human skin, contributing to advancements in product safety and innovation. |

**P53**

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| *Title* | **DEVELOPMENT OF CUPUAÇU BUTTER NANOPARTICLES ASSOCIATED WITH SACCHARIDES: PHYSICOCHEMICAL CHARACTERIZATION AND IN VITRO EVALUATION OF PREBIOTIC POTENTIAL ON HUMAN SKIN MICROORGANISMS** |
| *Authors* | Bruno Vincenzo Fiod Riccio[1], Bryan Wender Debiasi[1], Isadora de Jesus da Silva[1], Ludmilla Tonani[1], Maria Angélica dos Santos Cunha Chellegatti[1], Niege Araçari Jacometti Cardoso Furtado[1], Márcia Regina von Zeska Kress[1], Maria Vitória Badra Lopes Bentley[1], Lorena Rigo Gaspar[1] |
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| *Abstract* | The demand for prebiotic cosmetics has been increasing due to growing interest in modulating the skin microbiota. Lipids such as cupuaçu butter (CB) and saccharides like alpha-glucan and polydextrose have shown the ability to stimulate beneficial microorganisms and inhibit pathogens.<br><br>In this study, CB nanoparticles were developed, generating three formulations: FV (empty nanoparticles), FA (with alpha-glucan), and FP (with polydextrose). The formulations were characterized by dynamic light scattering (DLS) for size, polydispersity index (PdI), and zeta potential; nanoparticle tracking analysis (NTA) for particle concentration and average size; X-ray diffraction (XRD); differential scanning calorimetry (DSC); and transmission electron microscopy (TEM). The in vitro prebiotic potential was evaluated using Cutibacterium acnes, Staphylococcus epidermidis, Staphylococcus aureus, and the fungus Malassezia furfur, incubated in 96-well plates for 24 hours with or without the samples. Absorbance reading results were statistically analyzed using ANOVA test and Tukey's post-test ($p<0,05$).<br><br>The nanoparticles showed average sizes around 110 nm, PdI below 0.3, and zeta potentials near -15 mV, indicating favorable parameters for skin and biofilm interaction. NTA results corroborated DLS data, revealing concentrations of approximately $1.10\times10^{13}$ particles/mL. XRD analysis indicated saccharide amorphization and moderate CB crystallinity, which was reduced particularly in FA and FP, suggesting effective incorporation and a tendency toward sustained release. DSC revealed a glass transition at 38 °C, favoring relatively rapid fusion and release due to proximity to skin temperature. TEM images showed FV with round, poorly defined particles; FA with well-defined particles; and FP with a mixed profile, suggesting weak interaction between CB and polydextrose.<br><br>In the prebiotic evaluation, FA inhibited the growth of C. acnes, a pathogen associated with acne vulgaris, and stimulated the growth of S. epidermidis and M. furfur, commensal microorganisms linked to skin protection. None of the samples affected S. aureus.<br><br>Thus, the FA formulation stood out by promoting the growth of beneficial microorganisms, inhibiting pathogens, and presenting a more homogeneous particle distribution, which may favor uniform application. |

**P54**

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| *Title* | **CHANGING WITHOUT CHANGING – HOW TO PROTECT ESTABLISHED FRAGRANCES IN THE COSMETICS MARKET IN LIGHT OF THE EVOLVING LANDSCAPE OF FRAGRANCE INGREDIENT SAFETY** |
| *Authors* | Débora Isensee[1], Cesar Veiga[1], Camila Andreia Bernardon Urio[1], Talita Damaris Cucolotto Orizzi[1], Livia Spir[1], Larissa Miassaki[1] |
| *Affiliations* | 1 - Grupo Boticário |
| *Abstract* | The demand for prebiotic cosmetics has been increasing due to growing interest in modulating the skin microbiota. Lipids such as cupuaçu butter (CB) and saccharides like alpha-glucan and polydextrose have shown the ability to stimulate beneficial microorganisms and inhibit pathogens.<br><br>With the growing concern for consumer safety and the evolution of safety assessment methodologies in cosmetic products, an increasing number of ingredients from natural sources are being banned or restricted in fragrance formulas due to their significant allergenic potential. These ingredients, which are central to a perfumer's palette, play a key role in fragrance development, adding characteristics that captivate and charm consumers while bringing naturalness and sophistication to the olfactory composition.<br><br>As a result, new challenges are being posed to the fragrance industry, which must develop ingredients that possess the same olfactory properties but come from alternative sources. There is a need for investment in technologies capable of creating alternative ingredients with the same olfactory characteristics and quality, derived from synthetic, technological, or other alternative sources.<br><br>These challenges also extend to B2C industries, which must make substitutions in products already on the market, ensuring the same fragrance and quality are delivered to the end consumer.<br><br>In summary, this study aims to demonstrate that, in light of the complexity and challenges, the synergy between fragrance houses and robust, suitable evaluation protocols helps minimize and reduce the impact on quality as perceived by consumers, while also ensuring compliance with new regulatory guidelines. |

**P55**

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| *Title* | **DEVELOPMENT OF MICROEMULSIONS CONTAINING PLANT-BASED SURFACTANTS FOR USE IN COSMETIC FORMULATIONS** |
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| *Abstract* | The use of microemulsions in developing nanotechnological cosmetics presents advantages in optimizing formulations containing compounds with low aqueous solubility, such as providing protection to the active ingredients and ensuring greater stability. Within this scenario, lauryl glucoside, a non-ionic surfactant of plant origin obtained from palm oil and corn glucose, emerges as a viable alternative for developing new microemulsified, biocompatible, and biodegradable products. This study aimed to develop and characterize microemulsions containing lauryl glucoside as a surfactant. For this purpose, a pseudoternary diagram with 81 points was prepared, whose formulation included lauryl glucoside, glycerin, oleic acid, and distilled water. The formulations obtained were categorized according to translucency, fluidity, and homogeneity. Two formulations were selected and analyzed for pH, turbidity, conductivity, and droplet size distribution from this characterization. The selected formulations were characterized as homogeneous, fluid, and translucent, named F2 and F5. These samples presented: pH = 6.04 ± 0.01 and 7.06 ± 0.02, turbidity = 423 ± 26 and 79 ± 2 NTU, conductivity = 2.42 ± 0.09 and 3.28 ± 0.08 mS/cm, mean diameter = 98 ± 2 and 28 ± 1 nm and Polydispersity Index (PdI)= 0.151 ± 0.012 and 0.156 ± 0.017, respectively. Both formulations were colloidal dispersions, with droplet diameters ranging from 10 to 100 nm and a PdI ≤ 0.2, indicative of formulations with greater stability. In addition, the pH of the samples ranged from 6.0 to 7.0, which ensures safety for topical use since it remained within the appropriate range for skin pH (4.5 to 7.0). Therefore, it is possible to obtain microemulsions containing lauryl glucoside as a surfactant of natural origin, being an alternative for developing innovative and more sustainable cosmetics. |

**P58**

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| *Title* | **DEVELOPMENT AND EVALUATION OF IN VITRO ANTIOXIDANT ACTIVITY OF TOPICAL EMULSION WITH PRACAXI OIL FOR THE TREATMENT OF ROSÁCEA** |
| *Authors* | Leticia O. Queiroz[1], Gabriela M. Bueno[1], Leticia C. Cefali[1] |
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| *Abstract* | The growing demand for natural and effective products opens opportunities for the development of new formulations. Pracaxi oil, a natural active ingredient from the Amazon, has promising properties for combating free radicals, as it is rich in fatty acids, such as oleic and behenic acids, and antioxidant bioactives. In addition, rosacea is a chronic inflammatory skin condition that mainly affects the central facial region, and the growing demand for specific cosmetics to help improve skin with rosacea drives the development of products with the presence of soothing and antioxidant active components. Objective: Therefore, the objective of the study was to develop a cosmetic formulation containing pracaxi oil to be used in the treatment of rosacea. Methods: To evaluate the pracaxi oil, a commercial oil with a high degree of purity was purchased and used. Tests were performed to identify tannins, flavonoids and alkaloids, in addition to the quantification of flavonoids such as quercetin by spectrophotometer in the ultraviolet region. Furthermore, the antioxidant activity of the oil was evaluated by capturing the DPPH free radical in vitro. The cosmetic was developed using Pentaclethra macroloba oil (5%), water (69%), glycerin (5%), caprylic capric acid triglyceride (2%), phenoxyethanol (0.5%), polysorbate 80 (5%); PPG-3 benzyl ether myristate (1%), hydroxyethylcellulose (0.5%), cetostearyl alcohol (6%) and ethoxylated cetostearyl alcohol (6%). After preparing the emulsion, 5% of pracaxi oil was added until a homogeneous emulsion was obtained. The developed formulation was subjected to a centrifugation test to evaluate its stability and verify physicochemical parameters. Results: Pracaxi oil showed the presence of tannins, flavonoids and alkaloids, with a concentration of 0.250 µg/ml of quercetin; for antioxidant activity against the DPPH radical, the IC50 calculation was performed with a result of 51.36 µg/ml. The formulation, in turn, presented a creamy appearance, pleasant touch, white color, pH of 5.98, density of 1.016 g/ml, viscosity of 6.02 Pa.s, after 30 seconds of analysis at 60 rpm and showed no phase separation after the centrifugation test. Conclusion: The formulation containing pracaxi oil is promising for aiding in the treatment of rosacea, as it is rich in components with antioxidant and anti-inflammatory action. |

**P59**

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| *Title* | **EXPLORING THE POTENTIAL OF HOP WASTE (HUMULUS LUPULUS LINNAEUS) FOR THE PRODUCTION OF MORE NATURAL SUNSCREENS** |
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| *Abstract* | Ultraviolet (UV) radiation is extensively studied due to its harmful effects on the organism, making the use of photoprotectors relevant to minimize such effects. The incorporation of natural products derived from plants in photoprotectors has shown promising results, as they present compounds with antioxidant and anti-inflammatory activity, offering protection against UV radiation. This enables the cosmetic industry to develop sunscreens with a lower concentration of organic and inorganic filters. Humulus lupulus Linnaeus, hop, is a climbing plant from the Cannabaceae family, composed of complex chemical compounds with important functions and widely used in the brewing industry. After the beer manufacturing process, the processed hop residue is generally discarded. With the aim of elucidating the potential protective effect of pure and reused H. lupulus extract, a phytochemical assay was performed by high-performance liquid chromatography coupled to ESI-qTOF mass spectrometry for the qualitative characterization of the compounds present in both extracts. Emulsified formulations containing avobenzone (5.0%) and octyl methoxycinnamate (10.0%), with and without the incorporation of pure and reused extracts (10.0%) of H. lupulusLinnaeus, were evaluated for in vitro photoprotective efficacy by diffuse reflectance spectrophotometry with an integrating sphere. Both extracts showed similar α acid compounds, but only the reused extract demonstrated the presence of xanthohumol, a polyphenol with antioxidant activity. The formulation without extract showed an in vitro sun protection factor (SPF) of 53.68 ± 9.63 and a critical wavelength of 382.0 ± 0.3 nm. The addition of the pure extract improved the sample's performance regarding SPF (117.48 ± 13.28), without altering the critical wavelength. The formulation containing the reused extract obtained an SPF of 178 ± 21.5, superior to the performance of the pure extract, but again, the critical wavelength was not changed. The results suggest that both extracts have the potential to increase the efficacy of photoprotective emulsions, providing a significant increase in the in vitro SPF value. However, the reused extract demonstrated a differentiated performance, indicating it to be a natural and sustainable alternative for the development of more natural photoprotective products. |

**P60**

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| *Title* | **BIOTECHNOLOGICAL ANTIOXIDANT PIGMENT FOR HAIR AND MAKEUP COLOR ENHANCEMENT AND PROTECTION** |
| *Authors* | Euler E.L. Moura, Roberta Riéffel, Henrique A. Brito, Roberta S.B. Rodrigues, Marilene H. Vainstein, Renata V. Contri, Alexandre M. Fuentefria, Irene C. Külkamp-Guerreiro* |
| *Affiliations* | Federal University of Rio Grande do Sul, UFRGS, Porto Alegre, Brazil |
| *Abstract* | The interest in natural pigments for both makeup and hair treatments has been growing, mainly due to consumers' concerns regarding the potential toxic effects of synthetic dyes, as popularized by mainstream media. The filamentous fungus Monascus purpureus stands out for producing an intense red pigment. In this context, the present study aimed to propose an alternative to conventional pigments by developing a natural fermented extract with the potential to be used as a multifunctional pigment for antioxidant protection and color enhancement in hair and makeup. This extract was prepared through the fermentation of olive pomace extract with Monascus purpureus to boost its antioxidant activity. The extract was obtained using pomace in a ratio of 1:15 (w:v) in water at 55°C for 20 minutes. Total phenolic compounds were determined by the Folin-Ciocalteu method, using a UV-Vis spectrophotometer at 765 nm, with gallic acid as the standard. Fermentation was performed in duplicates by adding $10^6$ CFU of Monascus purpureus to samples of the pure extract and extract with Potato Dextrose (PD) nutrient medium. Controls included Monascus purpureus in pure PD medium, pure extract, and pure PD medium under the same conditions. Fermentation lasted 28 days at 30°C and 200 rpm in a shaker, with samples collected before fermentation and on days 1, 7, and 28 to verify total phenolic compounds. The results indicated that the addition of a nutrient medium is necessary for red pigment production. The final product was obtained in a variety of shades depending on the substrate and concentration, with tone variation based on the concentration used. The fungus in pure PD medium did not produce phenolic compounds, while the fermented extract sample showed a 25% increase in phenolic compounds, demonstrating enhanced antioxidant activity in the olive pomace extract. The presence of phenolic compounds offers protection against oxidative damage caused by sun exposure, pollution, and heat, highlighting its potential to meet the growing demand for natural and organic products for functional makeup and hair care. |

**P62**

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| *Title* | **ANALYSIS OF EMULSIFIER PERFORMANCE IN SUNSCREEN FORMULATIONS USING COSMOPLEX AND COSMOMIC** |
| *Authors* | Débora B. Nobre[1], Maria Luísa de Sá Freire[1], Karla Emanuella Lima de Oliveira[1], Margareth de Fátima Formiga Melo Diniz[2], Melânia L. Cornélio[1]* |
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| *Abstract* | The skin's barrier properties are essential for evaluating the efficacy and safety of cosmetic products, especially in light of regulatory guidelines that ban animal testing. In this context, we employed the COSMOperm method, which estimates permeability through biomembranes and simulates various biological systems, including the black lipid membrane and in vitro skin models. The penetration of substances in sunscreen formulations is a crucial factor for product effectiveness, particularly regarding the stability and performance of UV filters. In this study, two different emulsifiers (solvents), potassium cetyl phosphate and cetearyl olivate, were evaluated in formulations containing the UVA filter avobenzone and the UVB filter homosalate. The objective was to analyze how these solvents influence the distribution and penetration of the UV filters into the skin, considering their properties and interaction with the stratum corneum. The research was conducted using the COSMOtherm software, which combines quantum chemistry and thermodynamics to calculate predictive liquid properties—such as activity coefficient, sigma potential, sigma profile, partition coefficient, and solubility—based on the COSMO-RS model. Using COSMOplex, the distribution profile of the final formulation volume across the skin was assessed through component distribution calculations in the phospholipid bilayer membrane, achieving a performance of $r^2 = 0.95$ and RMSD = 3.40 mN/m. The results showed that the emulsifiers influenced skin permeation differently in white and black skin models when using both selected filters. Solubility, assessed via the activity coefficient, indicated that potassium cetyl phosphate had higher solubility than cetearyl olivate. Regarding surface tension in the lipid membrane, cetearyl olivate exhibited higher tension compared to potassium cetyl phosphate. In the analysis of filter permeation across skin types, avobenzone was found to permeate more in black skin than in white skin, with homosalate showing a similar pattern. Based on the results, the COSMOtherm and COSMOplex models proved to be excellent tools for predicting the development of safe and effective cosmetic formulations. |

**P63**

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| *Title* | **ANALYSIS OF THE EXTRUSION PROCESS IN THE PRODUCTION OF LIPOSOMES FOR COSMETIC APPLICATION** |
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| *Abstract* | The use of liposomes as controlled release systems has driven innovation in the pharmaceutical field, improving the efficacy and stability of encapsulated active compounds. In the cosmetic industry, the structural similarity between liposomes and the plasma membrane allows the development of topical formulations that protect sensitive compounds and modulate skin penetration—provided that there is control and reproducibility of particle size. During development and production, the extrusion process is essential to ensure quality and reproducibility by homogenizing the average diameter of liposomal vesicles. In this study, two liposome formulations were developed with the following compositions: F1 (96% phospholipids, 2% cholesterol, and 2% natural surfactant—saponins) and F2 (95% phospholipids, 1% cholesterol, and 4% saponins), aiming to evaluate the average diameter and the relevance of the extrusion process. Liposomes were prepared by the ethanol injection method, followed by extrusion through a polycarbonate membrane. The average diameter of the extruded liposomes was determined using Dynamic Light Scattering (DLS). After extrusion, a 28-day stability study was conducted to monitor changes in liposome size. F1 showed an initial average diameter of 1327.33 ± 141.89 nm, while F2 presented 820.33 ± 30.89 nm. A significant reduction in vesicle size was observed after extrusion, resulting in 180.77 ± 0.90 nm (F1) and 128.14 ± 1.71 nm (F2). The smaller size of the liposomes may enhance both their stability and skin penetration, making them suitable for cosmetic formulations. The stability study demonstrated that the combination of phospholipids, cholesterol, and saponins in both formulations generated liposomes that remained stable over the evaluated period, with an average diameter of 177.42 ± 1.97 nm (F1) and 129.45 ± 0.45 nm (F2) after 28 days. The average diameter results are consistent with literature findings, confirming that the extrusion process effectively reduces liposome size. Together with the observed stability, this supports the potential use of the developed formulations as delivery systems for active ingredients in cosmetic applications. |

**P64**

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| *Title* | **CHARACTERIZATION OF LAVENDER ESSENTIAL OIL-BASED MICROEMULSIONS** |
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| *Abstract* | Allergic reactions and adverse effects of cosmetic products are a significant concern in dermatology. Essential oils (EOs) have emerged as promising alternatives in this context. Among them, lavender essential oil (Lavandula angustifolia) stands out due to its antimicrobial and wound-healing properties and lower allergenic and toxic potential, enhancing consumer acceptance. Simultaneously, nanotechnology has gained prominence in cosmetic formulation development, particularly through microemulsions, by enabling the encapsulation of bioactive compounds, thereby improving stability, enhancing skin permeation, enabling controlled release, and reducing potential adverse effects. This study aimed to characterize the physicochemical and morphological properties of microemulsions containing lavender essential oil. The control microemulsion (ME-BCO), composed of an organic phase (OP), an aqueous phase (AP), and a surfactant blend, was prepared using the phase inversion temperature (PIT) method under magnetic stirring at 50 °C. After heating, the AP was gradually added to the OP under constant agitation. Following 24 hours, lavender EO was incorporated into the system, also under magnetic stirring, resulting in the final microemulsion (ME-LA). The formulations were characterized by hydrodynamic droplet diameter (Z-ave), polydispersity index (PdI), pH, electrical conductivity, and turbidity. Both ME-BCO and ME-LA were fluid, translucent, and homogeneous, presenting nanoscale droplet sizes (45 ± 3 nm and 47 ± 6 nm) and low PdI values (0.22 ± 0.05 and 0.24 ± 0.07; $p > 0.05$, ANOVA, Tukey's test), respectively, indicating stable and monodisperse systems consistent with microemulsions described in the literature. The pH values (5.11 ± 0.03 and 5.14 ± 0.01) were compatible with the physiological pH of the skin. Electrical conductivity (39.9 ± 0.2 and 43.4 ± 1.5 µS/cm) confirmed the oil-in-water nature of the systems, and turbidity values (71.7 ± 4.4 and 105 ± 8.9 NTU) were consistent with the observed Z-ave results, supporting the translucent aspect of the formulations. In conclusion, the formulations demonstrated physicochemical and morphological properties suitable for topical application. Moreover, incorporating lavender essential oil into microemulsion systems proved feasible, representing a promising approach for developing safe and consumer-friendly cosmetic products. |

**P65**

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| *Title* | **DEVELOPMENT OF HAIR CARE FORMULATIONS CONTAINING Spondias purpurea L. EXTRACT AND EVALUATION OF ITS BENEFITS IN POST CHEMICAL TREATMENT** |
| *Authors* | Maria Luísa de S Freire[1], Débora Nobre Borges[1], Melânia L. Cornélio[1] |
| *Affiliations* | 1 - Chemical Engineering Department – CT/UFPB, Campus I, João Pessoa, Brazil |
| *Abstract* | The global cosmetics market, driven by the increasing demand for sustainable and natural products, has fostered the exploration of bioactive compounds from Brazilian biodiversity. In this context, the extract of seriguela (Spondias purpurea L.), a fruit predominantly cultivated in the Northeast region of Brazil, emerges as a promising alternative for application in hair care formulations due to its rich composition of bioactive constituents. The research was conducted in two stages: in the first stage, formulations containing three concentrations of the extract (0.5%, 1.5%, and 3.0% w/w) were applied to virgin hair strands of types 1A and 3B to identify the most effective concentration based on standardized mechanical testing. In the second stage, the most effective formulations were applied to chemically damaged hair strands subjected to acid straightening, bleaching, and dyeing processes. Combability, tensile strength, and shine (reflection magnitude) were evaluated using standardized instrumental methodologies. The results demonstrated that the fruit extract is capable of enhancing shine, reducing combing force, and increasing hair fiber strength in both virgin and chemically treated hair—particularly with the 3% extract formulation. This study is significant for the cosmetic bioprospecting of natural actives and highlights the potential of seriguela as a functional ingredient, contributing to innovation in the cosmetics sector and the economic valorization of Northeast Brazilian flora. |

**P67**

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| *Title* | **OBTAINING AND EVALUATING THE IN VITRO ANTIOXIDANT ACTIVITY OF PINK PEPPER OIL AND PREPARATION OF FORMULATIONS BY THE D-PHASE METHOD FOR ANTI-AGING ACTION** |
| *Authors* | Gabrielle Harumi Nakama[1], Leticia Caramori Cefali[1] |
| *Affiliations* | 1 - Centro de Ciências Biológicas e da Saúde, Universidade Presbiteriana Mackenzie, São Paulo, Brasil |
| *Abstract* | **Introduction:** Pink pepper (Schinus terebinthifolius) is rich in bioactive compounds, and its antioxidant oil is used in cosmetics to combat skin aging. In this context, nanoemulsions enhance its topical application and preserve its active components. **Objective:** This study aimed to extract pink pepper oil, evaluate its in vitro antioxidant activity, and develop formulations using a phase diagram, with pink pepper oil as the oil phase, to be used in the prevention of premature aging.<br>**Methods:** To obtain the oil, 30 g of fresh pink pepper fruits were subjected to the Clevenger extraction method. The oil was centrifuged, and the supernatant was collected and stored in the refrigerator. The antioxidant activity was evaluated in vitro using the DPPH free radical. For the phase diagram development, various formulations were prepared using the D-phase method with different amounts of pink pepper oil (5.0, 6.0, 8.5, and 9.0 g), polysorbate 80 (0.5 and 1.0 g), glycerin (0.2 g), initial water (0.3 and 1.8 mL), and residual water (0.5 mL). The D-phase technique involved two processes (A and B): in process A, the aqueous phase was homogenized and heated to 50 ± 0.5 °C at 250 rpm for 60 °C; in process B, the oil was heated to 50 ± 0.5 °C and slowly added dropwise to the aqueous phase under stirring at 250 rpm and 60 °C for 20 minutes. Finally, 0.5 mL of residual water heated to 50 °C was added dropwise under agitation.<br>**Results:** A total of 11.8 g of pink pepper oil was obtained, yielding 1.44%. The oil showed in vitro antioxidant activity against DPPH. The formulations prepared using the phase diagram showed different characteristics, with the formulation containing (8,5 g) of oil, (1 g) of polysorbate 80, (0,2 g) of glycerin, (0,3 mL) of initial water, and (0,5 mL) of residual water presenting a translucent appearance without phase separation, indicating a potential nanoemulsion.<br>**Conclusion:** It was possible to extract pink pepper oil using the described method, which showed antioxidant properties. Formulations using this oil and the D-phase method demonstrated potential for use in anti-aging skin treatments. |

**P70**

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| *Title* | **INFLUENCE OF PREBIOTIC AND PROBIOTIC USE IN THE TREATMENT OF PSORIASIS** |
| *Authors* | Michelle Kaori Turushima[1], Franciele de Almeida Nascimento[2]*, Tayline Figueiredo Candido[3], Jessica Bassi da Silva[2,3], Marli Miriam de Souza Lima[2,3]* |
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| *Abstract* | The human skin acts as a protective barrier against infectious agents and environmental aggressions. However, it can be affected by various diseases, including psoriasis - a chronic inflammatory and immunosuppressive condition characterized by scaly and reddish skin lesions. This disease can be triggered by environmental, genetic, immunological, and emotional factors, with stress being one of the main contributors. Scientific evidence suggests that biological disturbances, such as intestinal dysbiosis, contribute to T cell activation and the production of inflammatory cytokines, which affect peripheral tissues like the skin, worsening psoriasis. Thus, maintaining intestinal microbiota balance is also essential for skin health. This study aimed to review scientific publications addressing the use of prebiotics and probiotics as supportive agents in the treatment of psoriasis. A total of 11 articles published between 2021 and 2024 were selected from databases including PubMed, CAPES Journal Portal, ResearchGate, MDPI, and ScienceDirect, using descriptors related to the impact of probiotics on dermatological health. Traditionally, therapeutic approaches for psoriasis include oral, topical, and systemic treatments involving corticosteroids, phototherapy, and emotional management. The combination of prebiotics and probiotics has shown promise in modulating inflammatory responses and restoring the skin barrier, due to the gut-skin axis. This review highlights the therapeutic potential of topical formulations and oral supplementation with bacterial strains such as Bacillus spp., Lactobacillus spp., and Bifidobacterium spp. in psoriasis treatment. These strains help regulate the immune response by stimulating anti-inflammatory cytokines like IL-10 and reducing pro-inflammatory cytokines such as TNF-α and IL-6, which play key roles in the progression of skin diseases like psoriasis. Therefore, the use of prebiotics and probiotics may offer a complementary intervention to conventional therapies, with potential for fewer side effects and better patient acceptance due to easier application. Additionally, probiotics represent an innovative technology in cosmetology, enabling the development of therapeutic skincare products for the management of cutaneous disorders. |

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| *Title* | **STUDY OF COSMETIC FORMULATIONS WITH ROSEHIP OIL (ROSA CANINA L.) AND CUPUAÇU BUTTER (THEOBROMA GRANDIFLORUM)** |
| *Authors* | Stefany S. Pantoja[1], Arthur D.N. Lima[1], Ana C.S. Araújo[1], Artur Oliveira[1], Jerônimo Lameira[1], Carla C. Meneses[1], Claúdio N. Alves[1] |
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| *Abstract* | Cupuaçu butter hydrates and protects the skin, being rich in fatty acids. Rosehip oil regenerates and repairs the skin, with antioxidant propertie they offer hydration, protection, and regeneration. They are beneficial for dry, sensitive, or damaged skin. They promote cell renewal and improve skin elasticity. the present study investigated the cosmetic potential of rosehip oil and cupuaçu butter (Theobroma grandiflorum), focusing on sustainability and the valorization of resources from the Amazon bioeconomy. Considering the bioactive properties of these raw materials, the research aimed to develop stable and effective cosmetic formulations. The methodology involved the use of commercially sourced rosehip oil. Physicochemical analyses were carried out, including acid value, saponification, peroxide index, density, and refractive index, in addition to Raman spectroscopy. Oil-in-water (O/W) emulsions were prepared with and without additives, using the phase inversion method. The stability of the formulations was evaluated through centrifugation tests, thermal stress, pH analysis, and optical microscopy, with observations conducted at 24 hours, and after 7, 15, and 30 days. The results showed that both oils met the standards established by ANVISA, presenting good oxidative stability and appropriate physicochemical properties. The emulsions SSRMC-4 and SSRMC-2, both with and without additives, stood out for their physicochemical stability and uniform droplet distribution over time. The SSRMC-6 formulation, on the other hand, showed instability after 15 days and was disqualified. The addition of cupuaçu butter contributed to the homogeneity and stability of the emulsions. It is concluded that the developed formulations, especially those containing additives, are viable for cosmetic use, showing functional properties and satisfactory stability over time. |

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| *Title* | **CLINICAL EVALUATION, THROUGH CUTANEOUS ECHOGENICITY, OF THE EFFICACY OF A COSMETIC FORMULATION ASSOCIATED WITH 2.4 MHz RADIOFREQUENCY** |
| *Authors* | **Ana C. Leão Santos**[1], Fernando C. Alves[3], Gislaine R. Leonardi[1,2] * |
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| *Abstract* | Radiofrequency is known for its deep tissue heating properties and is a technique applied in aesthetic clinics to combat signs of skin aging, such as sagging, through the heating of tissues using alternating current. This study investigates the efficacy of a gel cosmetic formulation with active ingredients when combined with a radiofrequency treatment. For this study, images generated by high-frequency ultrasound (DUB SkinScanner HFUS 50MHz) from the dorsum of the hands of women aged 30 to 60 years who agreed to participate by signing an informed consent form were analyzed. The cosmetic gel was randomized when applied to the dorsum of the participants' hands, where one hand received the gel with active ingredients and the other hand received the gel without active ingredients. The radiofrequency technique was applied to both hands. The HFUS 50MHz was used to assess changes in skin echogenicity, dermal and epidermal thickness after the application of the formulation and treatment. The evaluated data demonstrates an increase in the thickness of the epidermis and dermis, as well as in the echogenicity value for both treatments; however, the treatment with cosmetic actives showed a more significant increase in these parameters, evidenced by the ratios of 0.3, 2, and 0.3 between the treatment with actives and the treatment without actives, respectively. |

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| *Title* | **NANOEMULSIONS AS AN APPROACH FOR ENHANCING AVOBENZONE PHOTOSTABILITY** |
| *Authors* | **Júlio Abreu Miranda**[1,2], Wógenes Nunes de Oliveira[1], Maureen D. Donovan[2], E. Sócrates T. Egito[1,2,*] |
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| *Abstract* | Avobenzone (AVO) is a widely used ultraviolet (UV) filter in photoprotective formulations due to its strong UVA absorption. However, its low photostability compromises sunscreen efficacy, as its molecular degradation reduces UV absorption capacity and may generate potentially harmful byproducts. To mitigate this instability and ensure the efficacy and safety of AVO in sunscreens, stabilizing agents and innovative strategies, such as incorporation into nanoemulsions, are essential. This study aims to evaluate the photostability of AVO when incorporated into nanoemulsions and in the presence of the UV-filter tris-biphenyl triazine (TBPT), which has potential photostabilizing properties. Nanoemulsions based on linseed oil (NEAVO) and Miglyol® 812N (NEMIGAVO), both containing 1% AVO, were developed, along with nanoemulsions combining the same oils with 8% TBPT (NEUVMIX and NEMIGUV, respectively). Additionally, control solutions of 1% AVO in linseed oil (AVO-LO) and Miglyol® 812N (AVO-MIG) were prepared. The samples (2 mg/cm2) were applied to TransporeTM 3M surgical tapes and irradiated with a xenon lamp at 750 W/m², simulating natural solar radiation, for predetermined exposure times ranging from 15 to 240 minutes. AVO degradation was monitored using a pre-validated HPLC method and fitted to kinetic models to determine its half-life (t½). The AVO-LO solution exhibited a half-life of 39.24 ± 0.52 minutes, indicating significant degradation, while the AVO-MIG solution showed a slight improvement (t½ = 43.05 ± 0.27 minutes). Incorporation into nanoemulsions considerably enhanced AVO photostability, with NEAVO achieving a half-life of 73.55 ± 2.73 minutes and NEMIGAVO reaching 95.17 ± 5.51 minutes. The addition of TBPT further improved AVO protection, extending its half-live to 144.57 ± 6.03 minutes in NEUVMIX and 134.34 ± 6.16 minutes in NEMIGUV. These findings demonstrated that nanoemulsions and TBPT effectively enhance AVO photostability, reducing its degradation. This approach contributes to the development of advanced sunscreen formulations capable of maintaining AVO's photoprotective efficacy over time. |

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| *Title* | ***IN VITRO* AND *IN VIVO* SPF AND PHOTOSTABILITY OF SUNSCREENS WITH NATURAL POLYPHENOLS FROM GRAPE POMACE EXTRACT** |
| *Authors* | Samara Delgado Andrade[1,*], Cassiano Carlos Escudeiro[2], Alexandra de Almeida Hübner[1], Michelle Maria Gonçalves Barão de Aguiar[1], Claudinéia Aparecida Sales de Oliveira Pinto[1], Daniel Pecoraro Demarque[1], Fabiana Vieira Lima Solino Pessoa[3], Maria Valéria Robles Velasco[1], André Rolim Baby[1] |
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| *Abstract* | Ultraviolet radiation (UV) is a primary agent responsible for damage to human skin exposed to sunlight. Although natural repair mechanisms are present, the application of photoprotective agents is essential to provide broad-spectrum protection. With increasing awareness of the environmental impacts and potential adverse health effects associated with synthetic active ingredients, there is growing interest in the development of formulations containing natural actives, which may offer a more sustainable and safer alternative. Previous research conducted by our group has demonstrated that grape pomace extract (*Vitis vinifera*), rich in polyphenols, has potential as an adjuvant in photoprotective formulations. Thus, this investigation aimed to evaluate the photoprotective efficacy *in vitro* and *in vivo*, as well as the photostability of sunscreens containing 10% w/w grape pomace extract in combination with UV filters – avobenzone (5.0% w/w) and octyl p-methoxycinnamate (10.0% w/w). *V. vinifera* pomace was processed according to the Brazilian Pharmacopoeia (5th ed.) protocol, and photoprotective formulations, with and without extract, were prepared as O/W emulsions. The sun protection factor (SPF) was determined *in vitro* by diffuse reflectance spectrophotometry using an integrating sphere (Labsphere UV2000S Ultraviolet Transmittance Analyzer) and *in vivo* by a globally recognized protocol (ISO 24444:2019), approved by the local Ethics Committee. The photostability of the samples was evaluated using a UV radiation simulator chamber with 2 hours of exposure. The results demonstrated that formulations containing exclusively grape pomace extract did not yield satisfactory efficacy (SPF 2 ± 0.2), while formulations containing only the UV filter mixture exhibited the expected performance. However, when the extract was combined with avobenzone and ethylhexyl *p*-methoxycinnamate, a significant improvement in photoprotective efficacy and photostability was observed, with a substantial increase in SPF. The *in vivo* evaluation revealed an SPF of 19.4 for the formulation containing only UV filters, while the formulation containing filters and grape pomace extract |

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| | showed a slightly lower SPF (19.2). This scenario suggests that, although the extract may contribute to the photostability and antioxidant protection of the formulations, its interaction with UV filters needs to be better understood to optimize photoprotection parameters, especially under real-world usage conditions. |

**P77**

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| *Title* | **APPLYING ENCAPSULATED RETINOL IN SKIN CARE PRODUCTS** |
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| *Abstract* | Retinol is one of the most common cosmetic actives, widely used to manage skin ageing and photo-related cutaneous damage. Retinol rapidly degrades, rendering its handling challenging and limited. A strategy to overcome the stability issue of retinol is to use encapsulation as a technology to promote protection for the active inside the lipid capsules. Formulating with encapsulated products may not be simple once the compatibility and the stability of the systems need to be studied. The aim of this research was to develop an encapsulated system of retinol and apply the capsules to final products aiming face skin care.<br><br>Encapsulated retinol was prepared applying lipid capsule technology at 3% (m/v). Physico-chemical full characterization was performed (pH, particle size, morphology, thermal analysis, dosage). For accelerated stability study, four batches were stored at RT, 40ºC and 50ºC. Release profile was evaluated using Franz cells and PVDF membranes. Skin permeation was evaluated using Raman spectroscopy. The encapsulated retinol was added to an emulsion with 13.5% oil phase, and its stability was monitored under different conditions (centrifugal, accelerated stability, and dosing).<br><br>After preparation of the encapsulated systems, samples were homogeneous, stable, without visible phase separation; color was pale/light yellow; pH was 8.2±0.1. Average DV(50) was 0.28±0.02µm and DV(90) was 0.46±0.01µm. Average retinol content was 3.58%±0.04. Accelerated stability demonstrated a significant reduction of temperature sensitivity and retinol degradation compared to free retinol. Encapsulated retinol released retinol in a slow and continuous process reaching higher retinol concentration over time and little degradation after 72h.<br><br>Encapsulated retinol was added to oil in water emulsions at different levels. The emulsions presented stability over time, maintaining retinol concentration. Skin permeation studies showed enhanced skin penetration and tissue distribution of encapsulated retinol making it more bioavailable compared to free retinol. Encapsulation allows a controlled release of retinol in the living epidermis until 100µm of depth, 24h after topical application.<br><br>Retinol is one of the widely used cosmetic anti-aging ingredients and very unstable and so, it was developed an encapsulated form of retinol, protected and stable, easy-to-formulate, highly bioavailable and well tolerated. Physico-chemical characterization showed s solid stable nanoparticle containing retinol. Stability studies performed against free retinol showed that encapsulation protects retinol from UV, air and temperature exposures. Release studies showed a stable retinol releasing in higher amount and slower than free retinol. Transcutaneous penetration studies showed controlled release of retinol by forming a reservoir in the *stratum corneum* before permeating into the living epidermis. |

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| *Title* | **IMPACT ON HUMAN AND ENVIRONMENTAL SAFETY OF THE USE OF COSMETIC PRODUCTS FOR HAND CARE IN THE POST-PANDEMIC PERIOD** |
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| *Abstract* | The COVID-19 pandemic has accelerated changes in consumer behaviour, with greater concern about personal hygiene and product safety. It is therefore of fundamental importance to understand the new needs of consumers in relation to cosmetic products for hygiene and hand care, as well as their relationship with the concept of 'Conscious Beauty', which emphasizes safety, sustainability and transparency. In this context, the aim of this study was to investigate the impact of these changes on the use of liquid and moisturising hand soaps, as well as to assess the human and environmental safety of these products in the face of new consumer needs in the post-pandemic context and to develop formulations that meet market demands for safe and sustainable products. To this end, a questionnaire was applied in Brazil, France and Japan to analyse consumer understanding of 'Conscious Beauty' and changes in the habits of using cosmetic products for the hands. Based on the answers to the questionnaire, liquid soap and moisturiser formulations were developed with ingredients selected on the basis of safety criteria to meet consumer desires. In addition, human and environmental hazard and risk assessments were carried out. The results obtained showed how the pandemic has influenced consumers in terms of hygiene and the use of liquid soaps and hand moisturisers, and it was possible to carry out an analysis for each country in which the questionnaire was applied. Furthermore, although 'Conscious Beauty' is a valued term, its concept is still not entirely clear to consumers. However, there is demand for products with sustainable packaging, safe ingredients and transparency in communication. In conclusion, the pandemic has fuelled the search for safe and sustainable personal care products. The cosmetics industry must therefore meet this growing demand by developing formulations that combine efficacy, safety and environmental responsibility. Finally, this study contributes to a better understanding of these changes with a view to developing products that meet new consumer expectations. |

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| *Title* | **IDENTIFICATION OF NON-CONFORMITIES IN INSECT REPELLENTS CONTAINING IR3535 BY ANALYTICAL METHOD DEVELOPED AND VALIDATED IN HPLC-DAD** |
| *Authors* | Fernanda Fernandes Farias[1,2]*, Maria Cristina Santa Bárbara[2], Mariana Sbaraglini Garcia Silva[2], Vanessa Cristina Martins Silva[2], Helena Miyoco Yano, Vânia Rodrigues Leite-Silva[1,3] |
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| *Abstract* | Insect repellents are widely used for protection against vector-borne diseases such as dengue, malaria, and chikungunya fever. Among the active ingredients used in these formulations, IR3535 stands out for its safe toxicological profile and broad recommendation for use, including for children from six months of age. However, to maintain the quality of these products, it is essential to ensure their efficacy and safety, making compliance verification with regulatory specifications crucial. Robust and validated analytical methods are essential tools for detecting potential non-conformities, enabling the accurate assessment of active ingredient concentration and the identification of deviations that may compromise the effectiveness of the repellent. In this context, this study presents the development and validation of a High-Performance Liquid Chromatography with Diode Array Detection (HPLC-DAD) method for the analysis of IR3535 in commercial repellents. The validation was conducted following the ICH Q2 (R2) guidelines, demonstrating excellent linearity ($R^2$ = 0.996), precision (RSD < 2%), accuracy (98–102%), and robustness. The method proved to be selective, with low limits of quantification (0.01 mg/mL) and detection (0.003 mg/mL). A commercial lotion sample containing 15% IR3535 was used for method validation. Subsequently, the method was applied to the analysis of other commercially available formulations, including spray, lotion, and gel. Among the five formulations analyzed, only two complied with the IR3535 content specifications established by ANVISA, while the remaining formulations exhibited concentrations below the recommended limit. The results demonstrate that the developed method is suitable for the quality control of IR3535-based repellents and served as a tool for identifying non-compliant products. Thus, this study significantly contributes to public health surveillance by providing a reliable analytical method for monitoring the quality of marketed repellents, reinforcing the importance of regulatory compliance in protecting public health. |

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| *Title* | **DEVELOPMENT AND CLINICAL EFFICACY IN REDUCING SKIN OILINESS AND COMEDONES OF A MOISTURIZING AND SEBUM-REGULATING COSMETIC FORMULATION** |
| *Authors* | Kathleen Sales[1], Renata Ribon[1], Ana Paula Fonseca* [1], Lucia Cascais[1], Patricia Maia Campos[2] |
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| *Abstract* | Oily skin is often associated with excessive sebum, enlarged pores, and comedones, leading to the misconception that it does not require hydration. However, dehydration can compromise the skin barrier, further stimulating sebum production. In Brazil, a large portion of the population has oily skin, especially due to the tropical climate. Moisturizing the skin is essential to prevent dehydration and maintain an intact skin barrier, preventing water loss and improving skin texture and appearance. Choosing an appropriate cosmetic formulation is of utmost importance, and the combination of moisturizing and sebum-regulating active ingredients promotes balance without clogging pores. In this context, the objective of this study was to evaluate the efficacy of a cosmetic formulation for oily skin in reducing oiliness and comedones, improving hydration, and preserving the skin barrier. After approval by the Ethics Committee (CAAE: 83003224.0.0000.0063), a clinical study was conducted with 44 participants, aged 12 to 40 years, with oily skin (≥120 µg/cm² of sebum), enlarged pores, and more than 10 facial comedones to assess the efficacy and safety of a gel cream cosmetic formulation containing 0.01% hyaluronic acid, 5% niacinamide, 2% lactobionic acid, and 1% of a prebiotic. The comedogenic efficacy was evaluated using the Sebumeter® 815 (C+K Electronics, Germany) to measure oiliness levels before and after 8 and 12 hours, and after 28 days of use. Participants also completed a questionnaire regarding their perception of efficacy. After 28 days of daily use, the formulation showed no adverse events and demonstrated a significant reduction in comedones by 50.12% ($p<0.001$). Additionally, it promoted a 47% reduction in skin oiliness after 8 hours of a single application, and by the end of 28 days, oiliness was reduced by 55%. The results were statistically significant ($p<0.01$) and showed that the developed formulation is safe and can help reduce skin oiliness and comedone formation. We emphasize the importance of hydration for oily skin to restore the balance of the hydrolipidic mantle, ensuring healthy skin. |

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| *Title* | **OLFACTORY PROFILE EVALUATION OF *SCHINUS TEREBINTHIFOLIA* RADDI. LEAF ESSENTIAL OIL IN COSMETIC FORMULATIONS** |
| *Authors* | Elisabeth W. Maier*, André Rolim Baby▲, Daniel P. Demarque▲ |
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| *Abstract* | The global beauty industry has experienced significant growth in the post-pandemic period, with projected revenues reaching $670.2 billion by 2025. In 2024, the global fragrance market reached $60.13 billion, with an annual growth rate of 3.3% (Statista). The essential oil extracted from the ripe fruits of *Schinus terebinthifolia* Raddi is widely used in the perfumery and cosmetics industries. This study focused on incorporating the essential oil extracted from *S. terebinthifolia* leaves into cosmetic formulations and evaluating the olfactory characteristics of essential oils obtained through different extraction methods. Techniques such as hydrodistillation, steam distillation, cold maceration, and percolation were employed, as they are essential for obtaining essential oils and plant extracts (concrete and absolute). These methodologies were optimized to preserve organoleptic, phytochemical, and biological properties while maximizing yield. Three individuals were selected based on promising olfactory descriptions and phytochemical profiles. The obtained essential oil, concrete, and absolute were incorporated into shampoo, conditioner, cream, and a 10% cologne (80˚GL ethanol solution), followed by olfactory evaluation. After this stage, one individual with a particularly promising olfactory profile was selected for further investigations. Hydrodistillation, steam distillation, and supercritical $CO_2$ extraction were compared to assess their impact on chemical composition and olfactory profile. The results of the olfactory evaluations and applications in cosmetic bases demonstrated that, among the three selected individuals, the one with the most promising olfactory profile exhibited the best incorporation, solubilization, and coverage of the cosmetic bases compared to the obtained essential oils. In contrast, the extracts showed variations in solubility and diffusion, indicating the need for further studies to optimize extraction and application processes. This study established optimized parameters and methods to ensure the chemical integrity and olfactory profile of the essential oil, positioning it as an innovative raw material with high commercial potential and broad applicability in the cosmetics and fragrance industry. |

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| *Title* | **IMPACT OF USING OIL-CONTROL SUNSCREEN IN INDIVIDUALS WITH OILY SKIN: EVALUATION OF CLINICAL EFFICACY AND PUBLIC ACCEPTABILITY FROM THE PERSPECTIVE OF A REPRESENTATIVE CLINICAL RESEARCH ORGANIZATION (CRO)** |
| *Authors* | Thais Pontes, MD, PhD, Barbara Fonseca, Ana Luiza Decotelli, Amanda Ornellas, Bianca Azevedo, Ester Maia, Ingrid Adão, Isadora Marcondes, Pedro Fernando-Silva, Samuel Costa, Ursula Cabral |
| *Affiliations* | ARTHA Research |
| *Abstract* | **Introduction:** Sunscreen is essential for daily skincare, protecting the skin against damage caused by UV rays and helping to prevent skin cancer. People with oily skin often resist incorporating facial care products into their routine if those products leave a shiny appearance or excessive oiliness. Low adherence to sunscreen use may be associated with the need for options that provide greater user satisfaction, including mattifying and non-comedogenic effects. Proper formulations and a standardized skincare routine, combined with photoprotection, can increase comfort, reduce undesirable effects, and encourage consistent use among those hesitant to regularly include sunscreen in their routine. In this study, we evaluated the efficacy of sunscreen formulations with oil-control properties and assessed participant satisfaction when adopting a standardized photoprotection routine aimed at reducing facial oiliness.<br>**Methods:** The study was conducted by a CRO (Clinical Research Organization) in Rio de Janeiro, involving a panel of 110 participants with oily skin. All participants used two sunscreen products with oil-control properties daily for 56 days. Instrumental equipment was used to assess sebaceous secretion, along with sebum-absorbing tapes, to provide both qualitative and quantitative analysis of sebum production after 7, 14, 28, and 56 days of standardized product use. Standardized facial photographs were also taken at each time point to illustrate the evolution and visual aspect of the skin during the study. Participant perception regarding their skin was collected through a self-assessment questionnaire following the adoption of the standardized routine.<br>**Results:** For the qualitative analysis, sebaceous spot count, percentage of area covered by spots, and sebum production gradient were evaluated. After 56 days, there was a significant reduction in the sebaceous spot count for both products, as well as a reduction in the percentage of area covered. Regarding the sebum production gradient, a significant reduction was observed at all time points compared to the baseline assessment. In terms of participant perceptions, the majority (>60%) agreed with all statements related to the positive impacts of the product on their skin after adopting daily use.<br>**Discussion and Conclusion**: The reduction in sebum production observed in the study analyses supports the oil-control claims associated with the use of these products. Moreover, participant perceptions and facial imagery demonstrated a positive perceived efficacy. These findings suggest that individuals with oily skin can incorporate sunscreen into their skincare routine by choosing specific formulations that offer benefits tailored to their skin type. |

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| *Title* | **EFFECTS ON INTEGRITY, REPAIR, AND REJUVENATION: UNVEILING UNIQUE BEAUTY THROUGH A BIOMIMETIC HYALURONIC ACID** |
| *Authors* | Jason Wu[1]*, Junjie Jiang[1], Luyan Wang[2], Yuhua Jiang[2], Tereza Peranovich[3] |
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| *Abstract* | Classic hyaluronic acid is known for hydration effect. A novel Biomimetic Hyaluronic Acid for Skin Cycling (BHA-SC), unveils its potential for skin renewal and rejuvenating skin barrier integrity. Skin cell turnover is important for maintaining skin's integrity and nice-looking appearance. A traditional skin cycling routine consists of 3 steps (resurfacing, repairing and rejuvenating) for 4 nights, using a variety of cosmetics. Skin barrier may be damaged due to overuse/misuse of cosmetic products. The use of one active ingredient BHA-SC can rejuvenate skin barrier integrity covering all 3 steps: resurfacing, repairing and rejuvenating. Such 3-step improvement was proven by in vitro trial on interleukin-1alpha (IL-1α), and ex vivo skin explant evaluation on number of stratum corneum cell layers, corneodesmosin (CDSN), cytokeratin-15 (CK15), hyaluronic acid binding protein (HABP), collagen type I and type III. Furthermore, a randomized, double-blind, placebo controlled short-term clinical study (24 hours) using BHA-SC showed positive effects on skin smoothness, desquamation and moisture; another randomized, double-blind, placebo-controlled medium-term clinical trial (14 days) indicated improvement of BHA-SC on skin moisture, transepidermal water loss (TEWL), redness, sebum secretion, skin firmness, skin texture (anisotropy) and skin luminance. The BHA-SC showed promising beauty potential to minimalist skin cycling routines by promoting skin's youthful appearance. |

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| *Title* | **EVALUATION OF THE FIRMNESS OF THE EYE REGION AFTER STIMULATION OF COLLAGEN XVII THROUGH A COSMETIC PRODUCT WITH ACTIVE INGREDIENTS FROM BRAZILIAN BIODIVERSITY** |
| *Authors* | Fabiana Paes, Pedro Soldati, Juliana Lago, Ana Luisa Dias, Anelise Polettini |
| *Affiliations* | 1 - Natura Cosméticos, São Paulo, Brasil |
| *Abstract* | Considering that collagen is the most abundant protein in the human body, it plays a crucial role in the structure and firmness of the skin. It is known that there are different types of collagen, among them Collagen type I and Collagen type III, which play an important role in the support and elasticity of connective tissues. Another type of collagen of great importance in skin aging is Collagen type XVII, being a transmembrane component of the dermal-epidermal anchoring complex, interacting with other extracellular matrix proteins, such as laminin and collagen type IV, forming anchoring complexes that keep the epidermal cells together. In addition to being directly involved in the quality control of epidermal stem cells during aging. The objective of the study was to evaluate the synergy of plant-based ingredients with synthetic ingredients in stimulating the collagens in question, where preclinical tests were carried out without human skin fragments, with fluorescence micrograph evaluation for the quantification of collagen I, III, and XVII. In addition to in vitro tests, clinical and instrumental tests were performed to evaluate skin hydration, firmness, and elasticity, as well as image analysis to assess wrinkles in the eye area and drooping eyelids. These studies showed an increase in all collagens analyzed, improved skin hydration by up to 74.8% within 48 hours after product application; increased firmness and elasticity by up to 15.2% after 28 days of use; significant reduction ($P<0.05$) of expression lines, periorbital, infraorbital, and supraorbital wrinkles, and reduction of drooping eyelids at all evaluated time points (7, 14, 28, and 60 days). Thus, it can be inferred that the product demonstrated a reduction in wrinkles and sagging, treatment for all types of wrinkles in the eye area, increased synthesis of collagen XVII, and immediate and progressive improvement in eyelid firmness and stimulation of the synthesis of 3 collagens. |

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