

Literature List

Skin-Glossymeter

*L. Sanchez, C. Thiebaut, **The natural solution for damaged and curly hair**, PERSONAL CARE, April 2021, p. 57-60*

Curly hair has particular characteristics in elasticity and shape that require a special and different care. Curly hair is more fragile than straight hair and therefore requires specific care. Every day, hair is exposed to a series of external aggressions: brushing, friction, straightening treatments, heat irons, colouring, perms, pollution, UV radiation, etc... Ethomega, with high content in Omega 3, is an excellent natural active ingredient for promoting faster and healthier hair growth, nourishing the follicles to stimulate their growth and shine. Ethomega has proven to restore the hair lipids barrier, increase gloss and avoid hair colour fade after UV irradiation, making hair more resistant to breakage and split ends. Ethomega has high concentrations of delta and gamma-tocopherol, difficult to find in other botanical oils. Both PUFA and tocopherol content, shield the hair fibres creating a protective film that prevents protein loss caused by UV damage, retaining moisture, preventing photooxidation, and providing the necessary lipids for the specificities of this type of hair.

*A. Roca, M. Perez-Aso, B. Martinez-Teipel, J. Bosch, **Glowing Review - Monk Fruit Encourages Epigenetic Well Aging**, Cosmetics & Toiletries, March 2021, p. 53-62*

Aging is characterized by the accumulation of macromolecular damage, impaired tissue renewal and progressive loss of physiological integrity. Over the past decade, a growing number of studies also has revealed that progressive changes to epigenetic information have a major influence on the aging process. Lifestyle habits, diet, pollution and other environmental factors all impact the human life span by altering epigenetic information. Therefore, given the reversible nature of epigenetic mechanisms, these studies provide promising avenues for healthy aging.

*C. Uhl, D. Khazaka, A. Pouladi, "**Classic**" **biophysical methods for hair & scalp**, PERSONAL CARE, March 2021, p. 23-26 and **Métodos biofísicos 'clásicos' de análisis capilar**, Revista técnica de la Industria Cosmética, Perfumería e Higiene Personal, Primavera 2021 No. 018, p. 34-37*

Hair is not only strands of horn made mainly of keratin. Hair indicates someone's personal beliefs or social status. The matter of hair care / grooming is not entirely all about women. For men, a well-kept, thick head of hair brings added good looks. However, there is more to it. Nowadays, social media, most of all Instagram, influences different generations. Besides skin, hair is the characteristic attribute for health, youth and attraction. Hair can even be a communication and political instrument. Just take as an example the men who let grow a moustache of their own style every November of a year, the so called Movember, to raise funds for men's health. Plenty of products and treatments are ready to fit the modern hair care market for thin, thick, curly, dry, oily, blonde, coloured, ethnic, young, or old hair. Imagine a claim, the product is already invented. As hair is unique, personalised products flood the hair care market. Respectively, a great number of claims around the various products exists. Hair care rituals can be complemented with food supplements and treatment devices.

Además de la piel, el cabello representa un atributo social característico de la salud, la juventud y la atracción. Multitud de productos y tratamientos están listos para ser adaptados al nuevo mercado de cuidado del cabello, específicamente para tratar cabellos finos, gruesos, rizados, secos, grasos, coloreados, jóvenes, envejecidos... Existe un gran número de afirmaciones en torno a los distintos productos existentes en el ámbito del cuidado capilar.

*A. Charpentier, **Clinically supporting 'antiage' and 'pro-age' claims**, PERSONAL CARE EUROPE, June 2020*

Claims of personal care evolve following trends and various innovations in the field of the active ingredient development, the finished product formulation and the way both are evaluated, demonstrating their performances. Since 2014, the cosmetics industry is gradually leaving the era of anti-ageing behind. Today, most consumers are more in the mood for a well ageing, slow ageing or pro ageing approach. The philosophy of the 'pro-ageing' movement has sought to remove all 'anti' claims because, according to this concept, women over 50 are not interested in looking younger; they want to look healthy and be honest about their age. Some brands have used the idea of "improves the appearance of skin quality", and "restore the skin comfort", for example. A new vocabulary of renewal, regeneration, plumpness and "glow" now dominates the language of the beauty industry.

*P. Rattanawiwatpong, R. Wanitphakdeedecha, A. Bumrungpert, M. Maiprasert, **Anti-aging and brightening effects of a topical treatment containing vitamin C, vitamin E, and raspberry leaf cell culture extract: A split-face, randomized controlled trial***, J Cosmet Dermatol. 2020 Jan

Background: Skin aging has many manifestations such as wrinkles, uneven skin tone, and dryness. Both intrinsic and extrinsic factors, especially ultraviolet light-induced oxidative radicals, contribute to the etiology of aging. Human skin requires both water- and lipid-soluble nutrient components, including hydrophilic and lipophilic antioxidants. Vitamins C and E have important protective effects in the aging process and require exogenous supply. Raspberry leaf extracts contain botanical actives that have the potential to hydrating and moisturizing skin. Topical products with these ingredients may therefore combine to provide improved anti-aging effects over single ingredients. Objectives: To evaluate the anti-aging and brightening effects of an encapsulated serum containing vitamin C (20% w/w), vitamin E, and European raspberry (*Rubus idaeus*) leaf cell culture extract. Methods: Fifty female volunteers aged 30-65 years were allocated one capsule of serum for topical application on one side of the face for 2 months, in addition to self-use of facial skin products. Both test (treated) and contralateral (untreated) sides were dermatologically assessed after 4 and 8 weeks. Skin color (melanin index), elasticity, radiance, moisture, and water evaporation were measured by Mexameter MX18[®], Cutometer[®], Glossymeter GL200[®], Corneometer CM825[®], and Tewameter TM300[®] instruments, respectively (Courage + Khazaka Electronic GmbH). Skin microtopography parameters, smoothness (SEsm), roughness (SEr), scaliness (SEsc), and wrinkles (SEw), were measured by Visioscan[®] VC98 USB (Courage + Khazaka Electronic GmbH), and gross lifting effects were measured by VECTRA[®] H1 (Canfield Scientific), and adverse reactions and satisfaction were also assessed. Results: Skin color, elasticity, and radiance were significantly improved. The smoothness, scaliness, and wrinkles were also revealed significant improvement. Mild adverse reactions were tingling and tightness. Conclusions: The vitamin C, vitamin E, and raspberry leaf cell culture extract serum has anti-aging and brightening effects of skin.

*L. Nakamura Silva, M.G. Almeida Leite, P.M.B.G. Maia Campos, **Development of hair care formulations containing *Spirulina platensis* and *Ascophyllum nodosum* extracts***, International Journal of Phytocosmetics and Natural Ingredients 2019;6:13

Introduction: Considering that oily skin and hair is a constant concern, the search for active substances that helps skin and hair oiliness control it is a challenge in the Research & Development of cosmetics. Seaweeds are much known for its use as foods and microalgae are a type of seaweeds that convert solar light in bioactive compounds attractive for commercial interest. *Spirulina platensis* and *Ascophyllum nodosum* are microalgae present potential to be applied in cosmetic formulations, due to its properties, such as antioxidant activity, skin hydration and skin and hair oiliness control. Thus, the aim of this study was to develop and evaluate the efficacy of hair care formulations containing *Spirulina platensis* and *Ascophyllum nodosum* extract. Methods: Shampoo and conditioner formulations supplement or not (vehicle) with *Spirulina platensis* and *Ascophyllum nodosum* extract were developed. Two hair samples of virgin brown hair with 10 g each were selected to perform the hair characterization tests and were evaluated in terms of Break force, combability and shine. After, 26 study participants were recruited for the clinical efficacy study and the sebum content were evaluated before and after 28 days of use. Results: After 28 days of application of the conditioner containing *Spirulina platensis* and *Ascophyllum nodosum*, a decrease of the combability force for the wet and dry hair sample and an increase of hair shine were observed. Conclusion: The formulation containing microalgae in combination presented benefits to the hair fiber, once the obtained results showed an improvement of hair mechanical properties and fibers surface.

*S. Laneri, R. di Lorenzo, A. Sacchi, I. Dini, **A New Protocol to Evaluate Waterproof Effect of Lip Gloss***, Biomed J Sci & Tech Res 19(5)-2019

A new method to evaluate lip gloss and lipstick waterproof level according to the COLIPA Guidelines for Evaluating Sunscreen Product Water Resistance in 2006 is proposed, moreover the

changes in color (L^* value) by Skin Colorimeter® CL 400 Courage & Khazaka was measured. Tests were carried out on 20 volunteers validating the efficiency of the used method by comparing non-waterproof lip gloss/lipstick and waterproof product results. The results indicated that the lip gloss/lipstick were waterproofs when their mean % WPR was lower than 50% and they were removed after two successive immersions in water for 20 minutes at $29^{\circ}\pm 2^{\circ}\text{C}$. Methods used to evaluate lip gloss and lipstick waterproof level has proved effective for assessing the desired goals.

Y. Song, Y. Pan, H. Wang, Q. Liu, H. Zhao, Mapping the face of young population in China: Influence of anatomical sites and gender on biophysical properties of facial skin, Skin Res Technol. 2019;25: p. 333-338

Background: Facial skin exhibits unique biophysical properties, which are influenced by anatomical regions and genders. The aim of this study was to comprehensively assess the regional and gender differences in facial skin biophysical parameters among Chinese population. Materials and Methods: The 12 skin biophysical parameters at four distinct facial skin sites (forehead, cheek, canthus and chin) were measured in a normal population ($n = 212$) with 42 males and 141 females aged 18-29 years living in Beijing. These parameters consisted of skin hydration, transepidermal water loss, sebum content, erythema/melanin indices, $L^*a^*b^*$ color, skin gloss and elasticity, all quantifying with non-invasive instruments. Results: The results demonstrated that the characteristics of the facial skin were significantly different between the regions and genders. The forehead had weaker skin barrier function but secreted the most sebum content, while the cheek was the driest and brightest region on the face. The canthus was the most hydrated area and the chin displayed higher sebum secretion, darker skin color and less elastic. The females showed more hydrated, less oil, lighter and more elastic facial skin compared with males. Conclusion: This study indicates that the young Chinese facial skin significantly varies with face anatomical regions and differs between genders.

P. Contreiras Pinto, R. Figueiredo, J. Pereira, A. Gomes, M. Fitas, Evaluation of gloss with two different systems: Glossometer and Visia - a comparative study, IFSCC Congress, Munich, September 2018

Gloss is a crucial attribute of visual texture perception and more specifically, the visual appearance of human skin. A glossy and radiant skin induces a healthy and youthful appearance while a lack of gloss can generate a dull and unhealthy appearance. Normally, a radiant skin reflects the light in a specular way while a dull skin tends to diffuse light more. Therefore, light reflection is a key point in the assessment of skin gloss and radiance. The present work aims to compare two methods of Gloss evaluation: Glossometer and Visia-CR.

C. Boutot, E. Ranouille, E. Bony, J.-Y. Berthon, E. Filaire, C. Leduc, P. Bedos, Schisandrachinensis combats pollution-induced stress, PERSONAL CARE ASIA, May 2018, p. 59-62

The human skin, and mainly the upper layer of the epidermis, plays the role of a barrier, but is also one of the first and major targets of air pollutants, pollutants contributing to wrinkle and dark spots occurrence through the redox imbalance. A possible approach to attack ROS-mediated disorders for both preventive and treatment means is based on the use of substances, which can be found in plants as secondary metabolites, lignans being a promise candidate. The present study was aimed to better understand the cellular mechanisms beyond the oxidative changes induced by urban pollution (Urban dust 1649b, NIST) and the effect of *Schisandra chinensis* (*S. chinensis*) extract in reconstructed human epidermis, by a transcriptomic approach and secondly through the evaluation of Nrf2, AhR, NF- κ B, and DJ-1 pathways using an *in vitro* model. Finally, we evaluated the effect of *S. chinensis* on skin hydration, homogeneity, radiance and luminosity in Chengdu (China). Urban dust (SOpg.mL 1) was able to activate the cytoplasmic expression of NF- κ B and AhR when compared to control. *S. chinensis* extract attenuated the urban dust-induced oxidative stress, the protective mechanism being associated, at least in part, with the modulation of the Nrf2 and AhR pathways and the activation of DJ-1. *S. chinensis* extract, named Urbalys® protects from prolonged pollution aggression since it improves hydration, protects skin homogeneity, increases skin radiance and attenuates skin spot intensity after 21 days of pollution exposition.

L. Salomão Calixto, C. Picard, G. Savary, P.M. Berardo Gonçalves Maia Campos, Application of Topical Formulations Containing Natural Origin Actives and UV-Filters in the Prevention of Photoaging in French and Brazilian Skin, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The study of skin from different populations brings an essential knowledge to the development of skin treatments. The aim of this study was to evaluate the immediate effects of topical formulations using biophysical techniques and to compare the skin biology of the participants.

Methodology: 36 subjects, 18 French and 18 Brazilians, were enrolled. Transepidermal water loss, stratum corneum water content, skin viscoelasticity and skin brightness were evaluated before and 60 minutes after formulations application. Results and Conclusions: Brazilian skin had a lower TEWL and less gloss on the skin surface when compared with French skin. There was no difference in hydration and viscoelastic profile. After 60 minutes, there was a significant increase in stratum corneum water content and skin brightness, a significant decrease in TEWL and no difference in skin viscoelasticity in both groups. In conclusion, biophysical differences were found on the groups and the formulations were effective in both populations.

Xi Li, C. Yuan, L. Xing, P. Humbert, Topographical diversity of common skin microflora and its association with skin environment type: An observational study in Chinese women, Scientific Reports, (2017) 7:18046

This study evaluated cutaneous microbial distribution, and microbial co-occurrence at different body sites and skin environments in Chinese women (39.6 ± 11.9 years, N= 100) during the winter season. Microbial distribution (*Propionibacterium acnes*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Lactobacillus*, Pseudomonadaceae, and *Malassezia furfur*), association with biomarkers (antimicrobial peptides: LL-37, α -defiensins [HBD-2, HBD-3]), and claudin-1) and skin biophysical parameters (transepidermal water loss, pH, skin scaliness and roughness, sebum and hydration levels) were also determined. Skin sites (glabella [GL], hand-back [HB], interdigital web-space [IS], antecubital fossa [AF], volar forearm [VF], back [BA]) were classified as normal, oily or dry based on two-step cluster analysis and exposed or unexposed (uncovered or covered by clothes, respectively) based on seasonal apparel. Pseudomonadaceae and *Staphylococcus aureus* had the highest and lowest detection rate respectively at all sites. Cluster analysis identified skin sites as 'normal' (HB, BA, AF, VF), 'dry' (IS) and 'oily' (GL). Bacterial alpha diversity was higher in exposed (HB, IS, and GL) compared with unexposed sites (BA, AF and VF). Co-occurrence of *Staphylococcus aureus* with any of the other five microorganisms was lower in dry and oily skin versus normal skin. Skin exposure, biophysical/barrier profile and biomarkers were found to be associated with bacterial distribution and co-occurrence.

C. Uhl, D. Khazaka, Test equipment supports anti-pollution claims, PERSONAL CARE ASIA PACIFIC, May 2017, p. 27-29 and PERSONAL CARE EUROPE, September 2017, p. 74-76

Pollution and its impact on the skin have recently become the main topic at all important cosmetic events, and products claiming to protect the skin from pollution effects are a major trend in the cosmetic and personal care industry.

A.C. da Silva Marques, Biometrologic Evaluation of Cosmetic Products, Dissertation in pharmaceutical sciences at the University of Coimbra, 2016

Given the growing importance that cosmetic products have on human's health and in our daily life, it is important to increase the control of these products, both in terms of safety and effectiveness. Taking into account that conducting animal tests for the production and validation of cosmetic products is prohibited by law, producers of these products have to resort to alternative methods. Biophysical methods have gained an important highlight in the scientific community, in particular the non-invasive methods. They allow a safe and faster evaluation of cosmetics. The purpose of this work is to describe some methods and equipments used at national and European level to test the effectiveness of cosmetic products and correlate the parameters evaluated with the alleged properties in the products. The methods include evaluation tests of the following skin properties: hydration, elasticity, coloring, sebum production and perspiration.

A. Sirvent, C. Charmel, F. Girard-Ory, Objectivation des produits maquillage, Évaluation Des produits cosmétiques, Lavoisier Paris, Tec & Doc, chapter 7, p. 110-126, 2016

Les produits de maquillage font partie intégrante de la grande famille des produits cosmétiques. Appliqués sur les parties superficielles du corps humain (épiderme, lèvres, ongles, cils), ils en modifient l'aspect dans un but majoritaire d'embellissement. Le maquillage, ou la peinture corporelle, a été utilisé dès la Préhistoire - pas seulement dans un but de séduction mais également pour des raisons rituelles ou guerrières. Du temps des pharaons, les égyptiens en ont fait une science sophistiquée, qui a été - par la suite- largement diffusée dans tout le bassin méditerranéen par les Grecs et les Phéniciens. Pour Charles Baudelaire, dans son «Éloge du maquillage» (1860), il permet aux femmes de «s'élever au-dessus de la nature pour mieux subjuguier les cœurs et frapper les esprits». L'industrie cosmétique moderne et le maquillage, tel qu'on le connaît aujourd'hui, ont pris leur essor au début du XX^e siècle. L'invention du mascara date de 1913 et le fond de teint mis au point par Max Factor pour les starlettes du cinéma hollywoodien a été plébiscité ensuite par toutes leurs fans! De grandes compagnies telles que L'Oréal, Maybelline, Revlon, Helena Rubinstein ou encore Estée Lauder ont été créées à cette

époque sur la base d'innovations majeures. Souvent présenté comme futile ou superficiel, le maquillage n'en reste pas moins efficace («qui remplit sa tâche, produit l'effet attendu» selon le dictionnaire Larousse). Personne ne contesterait le changement visuel produit par application d'un rouge à lèvres ou d'un vernis à ongles. Cette modification de aspect physique peut même revêtir un aspect thérapeutique, comme c'est le cas du maquillage correcteur, également dit de «camouflage», sur des lésions dermatologiques de type brûlures, cicatrices, angiomes, etc. Il faut également noter que, ces dernières années, le maquillage s'est adjoint une dimension «soin» avec la présence d'actifs hydratant, lissant, nourrissant, anti-UV, etc. Certains maquillages se positionnent également sur le marché des produits haute tolérance. Ces aspects n'étant pas spécifiques de cette catégorie de produits, nous focaliserons ce chapitre uniquement sur l'efficacité «decorative». Aussi, l'évaluation d'un produit de maquillage va reposer sur l'étude de: - son aspect sur la peau (couleur, brillance, homogénéité); - sa tenue dans le temps ou dans divers conditions d'environnement; - son impact sur la psyché de l'individu. Ce chapitre présente, dans un premier temps, la démarche d'approche globale pour d'évaluation du maquillage puis, dans un second temps, des méthodes d'évaluation des différentes catégories de produits de maquillage en fonction des revendications.

P. Humbert, A. Jeudy, F. Fanian, T. Lihoreau, Évaluation de l'éclat du teint, in: A.-M. Pénse-Lhéritier (Editor): *Évaluation des produits cosmétiques*, Lavoisier Paris, Tec & Doc, chapter 6, p. 98-109, 2016

L'éclat de la peau est difficile à définir car c'est un aspect de la peau qui reflète le bien-être. Le langage populaire parle de «bonne» ou de «mauvaise mine», qui est le reflet de l'existence, d'une souffrance ou d'une maladie sous-jacente. Les différents termes employés en anglais sont plus parlants: *complexion, radiance, glow of health*. Il est vrai que la peau est le reflet des émotions et son aspect fournit beaucoup d'informations au regard. Puisque la cosmétologie a pour vocation de protéger, réparer, parfumer, mais aussi parfaire la peau, il est logique que des produits cosmétiques revendiquent une efficacité dans ce domaine. En 2002, A. Petitjean, de l'équipe du Professeur Humbert (CHRU de Besançon), écrivait: «Nous sommes au début d'une nouvelle ère s'agissant de la prise en compte et de la mesure de l'éclat du teint», rappelant que la texture de la peau évoque la jeunesse, la santé et la joie.

C. Uhl, D. Khazaka, Claims and measurement methods for hair and scalp, Personal Care March 2015

Hair diversity (style, shape, growth pattern or colour) is one of the most important features to define us physically. Therefore, it is no surprise that the market of hair care products with a value of US\$39 billion is one of the most important sectors in the complete area of cosmetic products. Hair care products for women are the most frequently bought and used cosmetic products of all. Shampoos and conditioners are leading in the field. For men, hair care is the most important and favoured sector of all cosmetics.

R. Burgo, Y. He, L. Lampe, E. Mustafa, Natural polymer for modern colour applications, Personal Care February 2014

Abstract: Colour cosmetic formulations continue to seek new, novel ingredients that can allow brands to create differentiated products that meet the requirements of that latest trends in the marketplace. Inolex has created and introduces LipFeel Natural, a new, patented polymer suitable for many colour cosmetic applications, particularly lip products. LipFeel Natural is completely derived from renewable and sustainable plant sources, and is produced using green chemistry principles. In this article, Inolex shows the results of various testing to demonstrate how LipFeel Natural can confer many of the benefits sought in modern colour cosmetic applications.

A. Mondelli, G.F. Secchi, Plant's native proteins for hair conditioning and skin protection, Poster In-cosmetics, Paris 2013

Corneometer CM skin hydration was evaluated before and after application of test items twice a day on 6 female volunteers; the study was continued over a period of one week and test items were applied undiluted with standardized procedure and then rinsed.

C. Uhl, D. Khazaka, Techniques for globally approved skin testing, Personal Care April 2013

In efficacy testing and claim support for cosmetic products, objective measurement systems became indispensable long ago, especially since subjective clinical assessments are often prone to bias and inter-observer variation. Without suitable instrumentation it is close to impossible to determine what a product is really doing for the skin. Those objective measurement methods and subjective evaluations are mutually dependent. No measurement can be performed without the subjective evaluation of the results by the user of such instrumentation. However, a pure subjective evaluation of the skin without appropriate measurement techniques is not able to achieve accurate results either. This relationship

becomes clearer when looking for example at skin colour measurements. Subjectively, the human brain cannot process slight changes in colour, especially when the colours are not viewed side by side, but at different points in time. Instrumental measurement however will clearly detect such slight changes. The achieved result must then be interpreted in context with the expected outcome or the hypothesis. For this, you will always need a knowledgeable and experienced person because 'a fool with a tool is still a fool', as the late Albert Kligman used to say. This relationship between objective measurement and subjective evaluation is not only true for the determination of differences in skin colour, but also for all other skin measurement parameters important for the cosmetic industry.

S. Manon, A. Mondelli, G. Secchi, Hair Conditioning Effect of Vegetable Native Protein in Shampoo Formulations, SOFW-Journal, 138, 1 / 2 -2012, p. 38-42

Repetitive aggressive hair treatments or environmental conditions, unsuitable hair care products as well as stress, tension and particular physiological states may disturb the skin and scalp equilibrium. The irritated scalp usually reacts with frequent itching, redness, dandruff or tightness; in these cases, it's very important to use very gentle, specifically designed non sensitizing hair care products especially for those people who must wash their hair daily. Unfortunately; impaired scalps are often subject to be sensitized by commonly used surfactants and conditioning agents which have a high affinity for skin and hair and can cause or aggravate the symptoms of sensitive scalp and skin.

H. Dobrev, Products for Impure, Acne-Like Skin, J. Fluhr (ed.), Practical Aspects of Cosmetic Testing, Springer-Verlag Berlin Heidelberg 2011; p. 155-170

Many people suffer from impure, acne-like skin. This type of skin looks greasy and glossy, rough with enlarged pores, and has a tendency to develop comedones, pimples, and pustules. It feels unpleasant and may be a serious cosmetic problem. The effective control over the impure skin requires daily application of multifunctional cosmetic products for cleansing and intensive care of the skin. Market products should have a proven effect. Testing on human volunteers using sensorial self- and expert evaluation, instrumental skin bioengineering techniques, and questionnaires for quality-of-life assessment are the preferred ways to prove products claims.

A. Jeudy, J.-M. Sainthillier, T. Lihoreau, S. Mac-Mary, P. Humbert, Biometrological Assessment of the Skin Radiance, ISBS 2010, Buenos Aires, Argentina

Skin radiance is a clinical pattern without any precise definition and quantifiable data.