cosmetics

MDPI

Article

Clinical and Instrumental Evaluation of a Topical Cream Containing 4% Aliophen® in Women with Facial Skin Aging: A 56-Day Exploratory Open-Label Study

Alessandro Colletti [1,2,*], Carmela Spagnuolo [3], Gloria Roveda [4], Marzia Pellizzato [2], Eva Adabbo [3], Gian Luigi Russo [3] and Giancarlo Cravotto [1,2,*]

1 Department of Drug Science and Technology, University of Turin, 10125 Turin, Italy
2 Italian Society of Nutraceutical Formulators (SIFNut), 31033 Treviso, Italy
3 National Research Council, Institute of Food Sciences, 83100 Avellino, Italy; carmela.spagnuolo@cnr.it (C.S.); gianluigi.russo@cnr.it (G.L.R.)
4 Clinical Trial Department, Complife Italia S.r.l., 27028 San Martino Siccomario, Italy
* Correspondence: alessandro.colletti@unito.it (A.C.); giancarlo.cravotto@unito.it (G.C.); Tel.: +39-011-6707183 (G.C.)

Abstract

Background: Facial skin aging is a multifactorial process characterized by wrinkles, pigmentary alterations, reduced elasticity, and dermal structural changes, in which oxidative stress and low-grade inflammation play key roles. Polyphenols have gained interest in cosmetic science due to their antioxidant and skin-protective properties. Objective: We evaluated the antioxidant activity, clinical–instrumental performance, and tolerability of a topical cream containing 4% *w*/*w* Aliophen®, a polyphenol-rich malt–hop extract, after 56 days of twice-daily application. Methods: Antioxidant activity was assessed in HaCaT keratinocytes exposed to tert-butyl hydroperoxide (tBHP, 500 µM), with intracellular reactive oxygen species (ROS) measured by DCFH-DA assay after Aliophen® treatment (4–16 mg/mL). A prospective, single-center, open-label study included 20 women aged 45–65 years with facial aging signs. Instrumental assessments included wrinkle depth (PrimosCR SF), pigmentation (ITA°), skin biomechanics (Cutometer® R0, R2), and dermal echogenicity (50 MHz ultrasound) at baseline, Day 28, and Day 56. A small subgroup with mild-to-moderate atopic skin (N = 5) was descriptively monitored using SCORAD. Results: Aliophen® significantly reduced ROS in a dose-dependent manner. Wrinkle depth decreased at Day 28 (−8.1%; $p = 0.003$) and Day 56 (−15.9%; $p < 0.001$). ITA° increased (+11.5% and +18.2%; $p \leq 0.003$). Skin biomechanics improved (R0 −5.3%; R2 +5.5%; $p \leq 0.004$). Dermal echogenicity increased at Day 56 (+1.38; $p = 0.002$). SCORAD showed descriptive improvement. No serious adverse events occurred. Conclusions: A topical cream containing 4% Aliophen® improved instrumental markers of facial aging with good tolerability, supporting further randomized, vehicle-controlled studies.

Keywords: skin aging; photoaging; polyphenols; Aliophen®; instrumental assessment; wrinkle profilometry; atopic skin; antioxidant effect

Academic Editor: Enzo Berardesca

Received: 21 March 2026
Revised: 28 April 2026
Accepted: 29 April 2026
Published: 3 May 2026

1. Introduction

Skin aging represents a complex, multifactorial biological process driven by the interplay of intrinsic factors (chronological aging, hormonal changes, genomic instability, and cellular senescence) and extrinsic stimuli, among which ultraviolet (UV) radiation

quality. Accordingly, a 56-day prospective home-use study was conducted to assess the clinical–instrumental performance and tolerability of MěiLùx Intensive Restoring Cream. A standardized panel of non-invasive techniques was employed, including wrinkle profilometry, reflectance colorimetry, cutometric biomechanical analysis, and high-frequency ultrasound imaging, to quantify changes in crow's feet wrinkle depth, pigmentary spot appearance, skin viscoelastic properties, and dermal density (Figure 1). To our knowledge, this represents one of the few exploratory investigations of a malt–hop polyphenol-based topical formulation integrating assessments of both surface and deeper skin aging parameters.

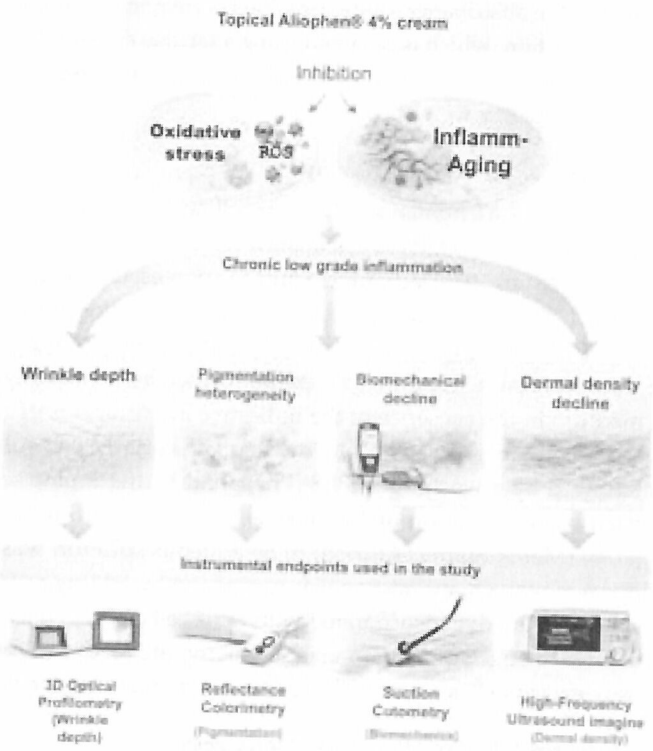

Figure 1. Conceptual framework of the study. Oxidative stress and inflammaging contribute to key age-related skin alterations. The topical formulation evaluated in this study (MěiLùx Intensive Restoring Cream formulated with 4% *w*/*w* Aliophen®) was assessed using an integrated non-invasive instrumental panel, including profilometry-based wrinkle analysis, reflectance colorimetry, cutometric biomechanical assessment, and high-frequency ultrasound imaging.

2. Materials and Methods

2.1. Materials

Aliophen® was kindly provided by Aliopharm Srl (Milan, Italy). The investigational product, MěiLùx Intensive Restoring Cream (Body, Face, Hand), containing 4% *w*/*w* Aliophen®, was supplied as a finished formulation and used without modifications. Unless otherwise stated, all reagents employed in the present study were of pure analytical grade.

2.2. Polyphenols Content and Antioxidant Capacity

The total polyphenols content of the fraction was determined using the Folin–Ciocâlteu [14] procedure. Briefly, 1 µL of the sample was mixed with an aqueous solution containing Folin–Ciocâlteu phenol reagent (5%) (Merck-Sigma/Aldrich, Milan, Italy) and sodium carbonate 20% in water (10%). The mixture was incubated for 2 h at room temperature. Absorbance was measured at 760 nm using a microplate reader (Synergy HT

2.6. Study Design and Procedures

2.6.1. Study Design and Participants

This prospective, single-centre, open-label home-use study was designed to investigate the clinical and instrumental efficacy, as well as the tolerability, of a topical restorative cream (MěiLùx) applied over 56 consecutive days. The study was conducted in accordance with the principles of the Declaration of Helsinki, and written informed consent was obtained from all participants prior to enrolment.

A total of 25 female Caucasian subjects were enrolled and assigned to two groups according to predefined inclusion criteria:

(i) Antiaging group (Group 1, N = 20): women aged 45–65 years showing visible signs of facial aging, including crow's feet wrinkles and reduced skin firmness/elasticity, and presenting at least one hyperpigmented spot suitable for objective colorimetric evaluation.

(ii) Inflammation-prone skin group (Group 2, N = 5): women aged ≥18 years with mild-to-moderate atopic dermatitis, defined by a baseline SCORAD score between 15 and 40.

Exclusion criteria included pregnancy or lactation, known hypersensitivity to product ingredients, active dermatological conditions potentially interfering with study endpoints (except atopic dermatitis in Group 2), use of topical/systemic treatments affecting skin inflammation or appearance within a predefined wash-out period, and excessive UV exposure or use of tanning devices during the study period.

Clinical and instrumental assessments were scheduled at baseline (T0), Day 28 (T28), and Day 56 (T56), according to endpoint-specific procedures.

2.6.2. Treatment

All participants were instructed to apply MěiLùx Intensive Restoring Cream (Body, Face, Hand) formulated with 4% *w*/*w* Aliophen® to the designated skin areas under real-life conditions for 56 consecutive days. Product application was performed on clean, dry skin, gently massaging until full absorption, according to manufacturer instructions. Participants applied the product twice daily (morning and evening) using a standardized dosing scheme based on the airless pump dispenser (one pump per application for the face; additional pumps were allowed for hands and body areas as needed to ensure uniform coverage; 1 pump ≈ 0.15 mL).

Participants were asked to avoid introducing new topical products with potential antiaging, depigmenting, anti-inflammatory, or barrier-enhancing activity on the treated areas throughout the study. Compliance was assessed by subject interview and diary review at follow-up visits.

2.6.3. Assessment of Efficacy

Efficacy of MěiLùx Intensive Restoring Cream was evaluated through a predefined panel of objective clinical–instrumental endpoints designed to capture the multidimensional nature of skin aging and skin quality changes over time. In the antiaging group, periocular wrinkle morphology was quantified on the crow's feet region by three-dimensional optical profilometry using a structured-light projection system (PrimosCR SF, Canfield Scientific Europe, Utrecht, The Netherlands), which provides non-contact in vivo reconstruction of skin microrelief and enables standardized longitudinal assessment of wrinkle depth under controlled acquisition conditions [18]. In parallel, pigmentary alterations were objectively assessed on predefined hyperpigmented spots by reflectance colorimetry (CM-700d, Konica Minolta, Tokyo, Japan), with color coordinates acquired in the CIE Lab* color space and converted into Individual Typology Angle (ITA°) values, a validated and operator-independent metric to quantify pigmentation intensity and its modulation over time [19].

values. For the main repeated instrumental outcomes, 95% confidence intervals (CI) were calculated for the mean change versus baseline; for wrinkle depth, ITA°, R0, and R2 these are presented as mean relative changes, whereas for dermal density the 95% CI refers to the absolute mean change from T0 to T56. Given the exploratory nature of the inflammation-prone subgroup and its very limited sample size, SCORAD outcomes were summarized descriptively only. No formal correction for multiple comparisons was applied.

For the in vitro experiments, results are presented as mean ± SD from three independent experiments. Statistical analyses were performed using GraphPad Prism version 9.5.1 (GraphPad Software, San Diego, CA, USA). Differences among groups were evaluated by one-way analysis of variance (ANOVA), followed by Tukey's multiple comparisons test. A p-value < 0.05 was considered statistically significant. Significance levels are indicated in the figure legends as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, and **** $p < 0.0001$.

3. Results

3.1. Polyphenolic Content and Antioxidant Capacity of Aliophen®

The total phenolic content of the Aliophen® formulation, quantified using the Folin–Ciocalteu method, was measured at 3.6 ± 0.15 mg EqQ/g dry weight, a value consistent with the original characterization reported by Tedesco et al. [13]. As expected, this phenolic profile aligned with the antioxidant performance of the formulation. In vitro antioxidant capacity, assessed through the FRAP assay, yielded a value of 6.79 ± 0.55 mg Fe^{++}/g dry weight, which falls within the same range observed across multiple Aliophen® batches produced over recent years. These findings confirm the chemical stability of the formulation and reinforce the relationship between its polyphenol content and its overall antioxidant efficacy.

3.2. Aliophen® Exerts Antioxidant Activity on HaCaT Cells

To investigate the potential effects of Aliophen® on skin cells, the immortalized human keratinocyte cell line HaCaT was employed. This cell line is widely recognized as a robust and reliable in vitro model for investigating epidermal biology and for the screening of dermo-cosmetic active ingredients [16,25]. Keratinocytes represent the predominant cell type of epidermis and play a pivotal role in maintaining cutaneous homeostasis, epidermal barrier integrity, and cellular responses to environmental stressors.

As an initial step, the cytocompatibility of Aliophen® was evaluated in HaCaT cells. As shown in Figure 2, treatment with Aliophen® did not induce cytotoxic effects at the tested concentrations of 4–8 mg/mL. Cell viability, assessed by Crystal Violet staining after 24 h of treatment, remained comparable to that of untreated controls, indicating that the formulation is well tolerated by epidermal cells. Only at the highest concentration applied, 16 mg/mL, a slight reduction in cell viability, lower than 18%, was measured.

To assess the antioxidant potential of Aliophen®, cells were pre-incubated with the formulation at a concentration of 4–16 mg/mL and subsequently with the pro-oxidant tBHP. Intracellular ROS production was quantified using the DCF-DA fluorescent probe. The indicated concentrations were selected considering that, in the final MëiLùx cream, Aliophen® represents 4% w/w, and that a standard 100 mL body cream weighs approximately 96 g [26]. Therefore, the Aliophen® concentrations applied in our cellular assays remained within the range of those employed in the clinical test. The results demonstrated that Aliophen® markedly and dose dependently attenuated the tBHP-induced oxidative burst (Figure 3), leading to a significant reduction in intracellular peroxide levels. These findings indicate that Aliophen® enhances the redox resilience of keratinocytes and contributes to cellular protection against oxidative stress.

Table 1. Study population and group allocation.

Groups	Population	N	Main Eligibility Criteria	Endpoints
Group 1	Antiaging	20	Female (45–65 y), crow's feet wrinkles and/or reduced firmness/elasticity; ≥1 hyperpigmented spot suitable for instrumental assessment	PRIMOS 3D, ITA°, Cutometer (R0, R2), HF ultrasound density
Group 2	Inflammation-prone	5	Female ≥ 18 y, mild-to-moderate atopic dermatitis (baseline SCORAD 15–40)	SCORAD (descriptive)
Total	Overall population	25	—	—

3.3.1. Antiaging Group

As shown in Table 2, statistically significant improvements versus baseline were observed across all instrumental endpoints, with progressive effects over the 56-day treatment period.

Table 2. Instrumental efficacy outcomes in the antiaging group (Group 1; N = 20). Data are expressed as mean ± SD; 95% confidence intervals (CI) are reported in parentheses. Changes for wrinkle depth, dark-spot color, skin firmness, and skin elasticity are expressed as mean relative variation versus baseline. Dermal density is reported as absolute mean change versus baseline because assessment was performed only at T0 and T56.

Endpoint	T0	T28	T56	Change at T28 vs. T0 (95% CI)	*p*-Value	Change at T56 vs. T0 (95% CI)	*p*-Value
Wrinkle depth (crow's feet, µm)	322.3 ± 88.7	295.6 ± 83.7	272.6 ± 84.7	−8.1% (−12.9 to −3.3)	0.003	−15.9% (−20.1 to −11.6)	<0.001
Dark-spot color (ITA°, °)	21.29 ± 9.72	22.99 ± 9.09	23.87 ± 8.66	+11.5% (+4.1 to +18.9)	0.003	+18.2% (+10.7 to +25.8)	<0.001
Skin firmness (R0, Uf)	0.453 ± 0.041	0.438 ± 0.040	0.428 ± 0.041	−3.1% (−5.9 to −0.3)	0.038	−5.3% (−7.9 to −2.8)	0.004
Skin elasticity (R2, Ua/Uf)	0.607 ± 0.039	0.636 ± 0.049	0.640 ± 0.045	+5.0% (+2.3 to +7.6)	0.001	+5.5% (+2.9 to +8.0)	<0.001
Dermal density (ultrasound signal, %)	17.01 ± 2.64	—	18.40 ± 2.58	—	—	+1.38 (+0.57 to +2.19)	0.002

Periocular Wrinkle Depth (Crow's Feet)

Three-dimensional optical profilometry demonstrated a progressive reduction in crow's feet wrinkle depth over the 56-day period. Mean wrinkle depth decreased from 322.3 ± 88.7 µm at baseline to 295.6 ± 83.7 µm at day 28 (−8.1% vs. baseline; $p = 0.003$) and further improved to 272.6 ± 84.7 µm at day 56 (−15.9% vs. baseline; $p < 0.001$), indicating a time-dependent improvement in periocular wrinkle severity with sustained topical use. Consistent with instrumental profilometry, representative clinical photographs showed a visible reduction in periocular wrinkle appearance over time (Figure 4).

Table 3. Safety and local tolerability summary (Overall population; N = 25).

Category	Finding
Serious adverse events	None reported
Discontinuations due to intolerance	None reported
Local reactions (investigator-assessed)	No clinically meaningful intolerance pattern observed
Subject-reported symptoms	No consistent treatment-limiting discomfort reported
Overall tolerability	Favourable under real-life home-use conditions

4. Discussion

This prospective clinical–instrumental study suggests that twice-daily application of a topical restorative cream formulated with 4% *w*/*w* Aliophen® may provide measurable benefits across multiple dimensions of facial skin aging and skin quality, as quantified by objective endpoints. Over the 56-day period, significant improvements were observed in periocular wrinkle depth, pigmentation of hyperpigmented spots, biomechanical properties including firmness and elasticity, as well as ultrasound-derived dermal density. Collectively, these findings support the concept that a nutraceutical-based topical strategy may exert pleiotropic effects relevant to both surface microrelief and deeper structural/functional features of aging skin.

A key aspect of the present results is the progressive time-dependent trajectory, with early improvements detected at Day 28 and further enhancement by Day 56, which is consistent with the kinetics typically observed in topical antiaging interventions where cumulative barrier reinforcement, oxidative stress attenuation, and gradual modulation of dermal microenvironment may contribute to sustained clinical–instrumental changes. Similar effects have been reported in clinical cosmetic studies testing polyphenol-rich botanical formulations, where instrumental assessments documented concurrent improvements in wrinkle-related parameters, pigmentation indices, and skin biomechanical properties [27]. More specifically, the present findings are consistent with previous human studies investigating topical polyphenol-based skin care interventions. In a 12-week clinical study, a nighttime antioxidant formulation containing resveratrol, baicalin, and vitamin E significantly improved fine lines and wrinkles, skin firmness, elasticity, laxity, hyperpigmentation, radiance, and roughness, while ultrasound measurements showed an average 18.9% increase in periorbital dermal thickness, suggesting remodeling of deeper skin compartments [12]. Likewise, an 8-week clinical–instrumental study of a 2% resveratrol emulsion documented significant reductions in skin roughness together with improvements in Cutometer-derived firmness/elasticity parameters and a trend toward increased ultrasound skin density [11]. These observations are relevant because they are consistent with the pattern observed in the present trial, in which wrinkle depth, pigmentation, biomechanical performance, and ultrasound-derived dermal density changed in parallel, suggesting that topical polyphenols may affect both superficial and deeper features of skin aging.

Comparable, although not identical, trajectories have also been described with other phenolic antioxidants. In a clinical study of ferulic acid combined with vitamins C and E, significant improvements in skin texture, firmness, and smoothness were already evident after 4 weeks, whereas improvement in fine lines became apparent by 8 weeks and profilometric wrinkle changes were confirmed later during follow-up [28]. This progressive pattern is coherent with the time-dependent kinetics observed in our study. At the same time, not all polyphenol-based interventions produce rapid visible changes: in a double-blind placebo-controlled trial, combined topical and oral green tea extracts improved histologic elastic tissue content but did not yield clearly detectable short-term clinical superiority after 8 weeks, indicating that efficacy may depend substantially on formulation

tation signalling, and barrier homeostasis [13]. To support this view, it is worthwhile to note that some of the compounds identified in Aliophen® [13], such as protocatechuic acid, vanillic acid, catechin, chlorogenic acid, caffeic acid, p-coumaric acid, sinapic acid, ferulic acid show meaningful skin anti-aging activity. More in details, protocatechuic acid is one of the best-documented: it increases type I collagen, inhibits MMP-1, and reduces wrinkle severity in vivo, confirming its anti-wrinkle and antioxidant efficacy. Protocatechuic acid derivatives further contribute antioxidant and skin-brightening effects by reducing oxidative stress and melanogenesis in skin cells [32,33]. Vanillic acid supports anti-aging mainly through antioxidant protection, helping defend skin from UV-induced oxidative damage and improving overall skin texture and resilience. Its presence in vanilla essential oil is also linked to decreased wrinkle depth and improved skin appearance in clinical observations [34]. Among flavonoids, catechins (including catechin and epicatechin) show strong antioxidant, anti-inflammatory, and UV-protective benefits, helping preserve collagen and reduce signs of aging. Epicatechin specifically boosts COL1A1 and FGF-2 while reducing MMP-1 and oxidative damage in UV-induced fibroblasts, underscoring its anti-aging potential [35]. Chlorogenic acid demonstrates robust anti-photoaging activity by increasing collagen I, reducing MMP-1/MMP-3, lowering ROS, and protecting fibroblasts from UVA-induced DNA damage and apoptosis. It also reduces UV-induced inflammation and supports extracellular matrix integrity [36]. Caffeic acid acts as a powerful antioxidant that protects collagen and elastin, stimulates collagen synthesis, suppresses MMP activity, calms inflammation, and brightens skin, contributing meaningfully to anti-aging effects [37,38]. p-Coumaric acid offers antioxidant and anti-inflammatory benefits and demonstrates clear protective action in human skin, where it significantly reduces UV-induced erythema and pigmentation, mechanisms closely tied to photoaging reduction [39]. Sinapic acid also exhibits notable anti-aging promise: it protects against UV-induced damage, reduces ROS, and decreases pro-inflammatory cytokines in keratinocytes, confirming both antioxidant and anti-inflammatory activity relevant to wrinkle prevention [40]. Finally, ferulic acid, especially when delivered through optimized nanocarriers, penetrates the skin effectively and provides strong antioxidant and anti-wrinkle benefits, making it a well-established anti-aging ingredient in modern skincare [41]. Overall, the phenolic acids and flavonoid-related compounds identified in Aliophen® provide a strong biological rationale for the observed clinical–instrumental improvements, supporting the potential of the finished topical formulation containing 4% *w*/*w* Aliophen® as a multi-target cosmetic approach capable of improving wrinkles, pigmentation heterogeneity, biomechanical performance, and ultrasound-derived dermal features. The overall phytocomplex of malt- and hop-derived compounds may plausibly contribute to these effects through convergent antioxidant, anti-inflammatory, extracellular matrix-protective, and pigmentation-modulating pathways. However, further studies are required to establish a definitive cause–effect relationship between the active concentrations of these compounds in MěiLùx Intensive Restoring Cream and the anti-aging effects observed in the present study.

Study Limitations

Several limitations should be acknowledged. First, this was a single-centre, open-label exploratory study with a relatively small sample size, which limits the strength of causal inference and may introduce observer- or participant-related bias. The absence of a randomized, double-blind, vehicle-controlled comparator also prevents definitive attribution of the observed effects specifically to Aliophen® 4%, since improvements may have been partially influenced by the vehicle, emollient effects, regular skincare application, or contextual factors. Second, the study population was restricted to female Caucasian participants, mainly within a defined age range for the antiaging cohort, thereby limiting the generalizability of

Conflicts of Interest: G.L.R. is co-inventor of the patent PCT/IB2018/056283. G.R. is the employee of Complife Italia S.r.l. The funding source from Aliopharm S.r.l. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

References

1. Naharro-Rodriguez, J.; Bacci, S.; Hernandez-Bule, M.L.; Perez-Gonzalez, A.; Fernandez-Guarino, M. Decoding Skin Aging: A Review of Mechanisms, Markers, and Modern Therapies. *Cosmetics* **2025**, *12*, 144. [CrossRef]
2. Shin, S.H.; Lee, Y.H.; Rho, N.K.; Park, K.Y. Skin aging from mechanisms to interventions: Focusing on dermal aging. *Front. Physiol.* **2023**, *14*, 1195272. [CrossRef]
3. Chaudhary, M.; Khan, A.; Gupta, M. Skin Ageing: Pathophysiology and Current Market Treatment Approaches. *Curr. Aging Sci.* **2020**, *13*, 22–30. [CrossRef]
4. Feng, C.; Chen, X.; Yin, X.; Jiang, Y.; Zhao, C. Matrix Metalloproteinases on Skin Photoaging. *J. Cosmet. Dermatol.* **2024**, *23*, 3847–3862. [CrossRef] [PubMed]
5. Fitsiou, E.; Pulido, T.; Campisi, J.; Alimirah, F.; Demaria, M. Cellular Senescence and the Senescence-Associated Secretory Phenotype as Drivers of Skin Photoaging. *J. Investig. Dermatol.* **2021**, *141*, 1119–1126. [CrossRef]
6. Salminen, A.; Kaarniranta, K.; Kauppinen, A. Photoaging: UV radiation-induced inflammation and immunosuppression accelerate the aging process in the skin. *Inflamm. Res.* **2022**, *71*, 817–831. [CrossRef]
7. Abbas, D.B.; Lavin, C.V.; Fahy, E.J.; Griffin, M.; Guardino, N.; King, M.; Chen, K.; Lorenz, P.H.; Gurtner, G.C.; Longaker, M.T.; et al. Standardizing Dimensionless Cutometer Parameters to Determine In Vivo Elasticity of Human Skin. *Adv. Wound Care* **2022**, *11*, 297–310. [CrossRef]
8. Farhan, M. The Promising Role of Polyphenols in Skin Disorders. *Molecules* **2024**, *29*, 865. [CrossRef]
9. Bharadvaja, N.; Gautam, S.; Singh, H. Natural polyphenols: A promising bioactive compounds for skin care and cosmetics. *Mol. Biol. Rep.* **2023**, *50*, 1817–1828. [CrossRef] [PubMed]
10. Dwevedi, D.; Srivastava, A. Molecular Mechanisms of Polyphenols in Management of Skin Aging. *Curr. Aging Sci.* **2024**, *17*, 180–188. [CrossRef]
11. Brinke, A.S.T.; Janssens-Böcker, C.; Kerscher, M. Skin Anti-Aging Benefits of a 2% Resveratrol Emulsion. *Cosmet. Dermatol. Sci. Appl.* **2021**, *11*, 155–168. [CrossRef]
12. Farris, P.; Yatskayer, M.; Chen, N.; Krol, Y.; Oresajo, C. Evaluation of efficacy and tolerance of a nighttime topical antioxidant containing resveratrol, baicalin, and vitamin e for treatment of mild to moderately photodamaged skin. *J. Drugs Dermatol.* **2014**, *13*, 1467–1472.
13. Tedesco, I.; Spagnuolo, C.; Bilotto, S.; Izzo, A.A.; Borrelli, F.; Rigano, D.; Russo, M.; Tarricone, F.; Russo, G.L. Antioxidant and Chemopreventive Effect of Aliophen® Formulation Based on Malts and Hops. *Antioxidants* **2020**, *10*, 29. [CrossRef] [PubMed]
14. Singleton, V.L.; Orthofer, R.; Lamuela-Raventós, R.M. Analysis of Total Phenols and Other Oxidation Substrates and Antioxidants by Means of Folin-Ciocalteu Reagent. *Methods Enzymol.* **1999**, *299*, 152–178. [CrossRef]
15. Benzie, I.F.F.; Strain, J.J. The Ferric Reducing Ability of Plasma (FRAP) as a Measure of "Antioxidant Power": The FRAP Assay. *Anal. Biochem.* **1996**, *239*, 70–76. [CrossRef]
16. Boukamp, P.; Petrussevska, R.T.; Breitkreutz, D.; Hornung, J.; Markham, A.; Fusenig, N.E. Normal keratinization in a spontaneously immortalized aneuploid human keratinocyte cell line. *J. Cell Biol.* **1988**, *106*, 761–771. [CrossRef]
17. Feoktistova, M.; Geserick, P.; Leverkus, M. Crystal Violet Assay for Determining Viability of Cultured Cells. *Cold Spring Harb. Protoc.* **2016**, *2016*, 087379. [CrossRef]
18. Friedman, P.M.; Skover, G.R.; Payonk, G.; Kauvar, A.N.; Geronemus, R.G. 3D in-vivo optical skin imaging for topographical quantitative assessment of non-ablative laser technology. *Dermatol. Surg.* **2002**, *28*, 199–204. [CrossRef]
19. Ly, B.C.K.; Dyer, E.B.; Feig, J.L.; Chien, A.L.; Del Bino, S. Research Techniques Made Simple: Cutaneous Colorimetry: A Reliable Technique for Objective Skin Color Measurement. *J. Investig. Dermatol.* **2020**, *140*, 3–12.e1. [CrossRef]
20. Kawalkiewicz, W.; Matthews-Kozanecka, M.; Janus-Kubiak, M.; Kubisz, L.; Hojan-Jezierska, D. Instrumental diagnosis of facial skin—A necessity or a pretreatment recommendation in esthetic medicine. *J. Cosmet. Dermatol.* **2021**, *20*, 875–883. [CrossRef] [PubMed]
21. Argalia, G.; Reginelli, A.; Molinelli, E.; Russo, A.; Michelucci, A.; Sechi, A.; Marzano, A.V.; Desyatnikova, S.; Fogante, M.; Patanè, V.; et al. High-Frequency and Ultra-High-Frequency Ultrasound in Dermatologic Diseases and Aesthetic Medicine. *Medicina* **2025**, *61*, 220. [CrossRef]