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CENTRE FOR SCIENCE AND RESEARCH

Anti-Aging Efficacy of Algae Extract-Infused Creams: Enhancing Pro-Collagen I and Elastin for Improved Skin Elasticity and Wrinkle Reduction

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BACKGROUND

Aging skin undergoes structural degradation due to reduced levels of pro-collagen I and elastin, leading to diminished elasticity and the formation of wrinkles. Algae extracts, rich in bioactive compounds, have demonstrated potential in promoting skin health. This study investigates the anti-aging potential of a combination of four algae extract (*Laminaria ochroleuca*, *Undaria pinnatifida*, *Cystoseira tamariscifolia, Lithothamnium calcareum*) in topical formulations. The efficacy of two algae extract-enriched creams: 2911 (night cream) and 2915 (eye cream), in enhancing skin elasticity and reducing wrinkles through the stimulation of collagen and elastin production was evaluated. To the best of our knowledge, this is the first combination of those algae extracts in cosmetic formulations aimed at improving skin condition.

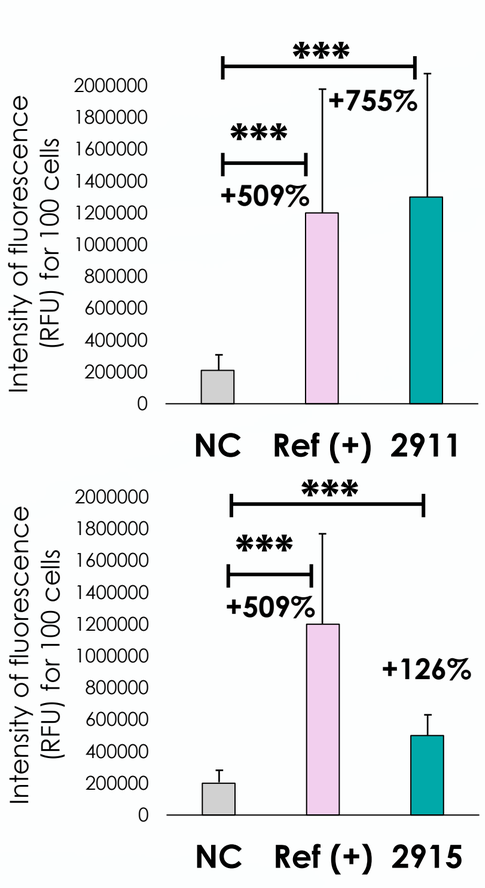
METHODS

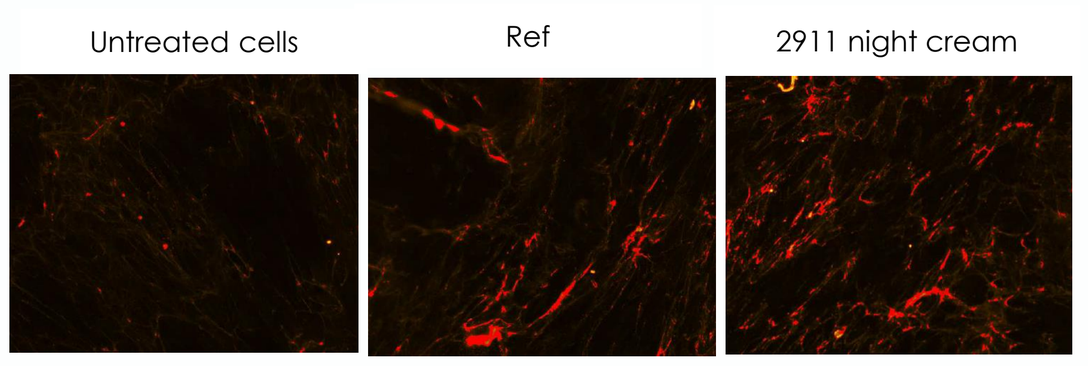
In vitro assays utilized primary human dermal fibroblasts treated with creams 2911 and 2915. Pro-collagen I levels were quantified using enzyme-linked immunosorbent assay (ELISA), while elastin content was evaluated through immunofluorescence labeling and imaging. For *in vivo* analysis, a study was conducted with 24 participants (35–78 years old). Participants' skin types were diverse, with predominance of dry, prone to redness. Parameters of skin condition were assessed using Cutometer-MPA-580 and Visioscan, and wrinkle count was analyzed using 3D imaging after 4 weeks of daily application of the creams.

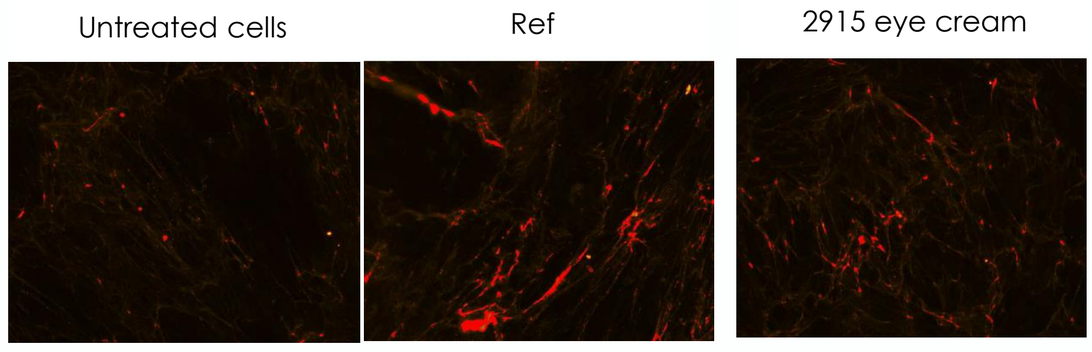
RESULTS

In vitro results demonstrated significant increases in pro-collagen I and elastin production. Treatment with cream 2911 led to a 76% increase in pro-collagen I levels and a 755% increase in elastin content. Cream 2915 enhanced pro-collagen I by 45% and elastin by 126%. These findings were supported by *in vivo* results, where cream 2911 improved skin elasticity by 22%, and cream 2915 by 33%. Both formulations also significantly reduced wrinkle number, with visible improvements in treated areas observed during the study. The study showed that there is a correlation between *in vitro* and *in vivo* results. Notable enhancement of production of skin supporting fibers *in vitro* was associated with increased elasticity in *in vivo* assessments.

In vitro evaluation of elastin content (immunofluorescent labelling)

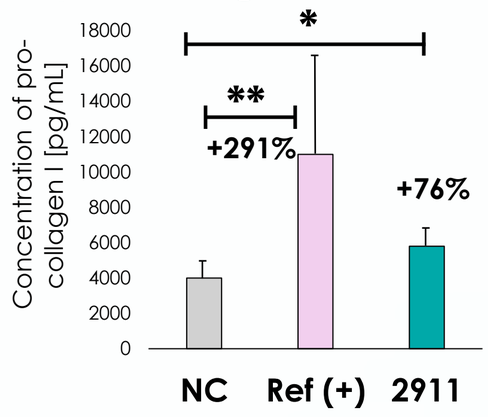


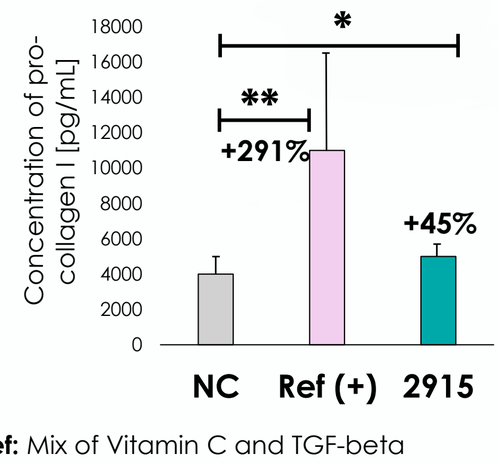




Ref: Mix of Vitamin C and TGF-beta
**p<0.01, ***p<0.001

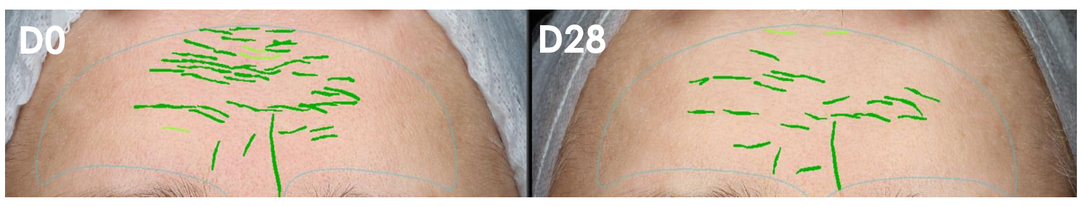
Evaluation of procollagen I content





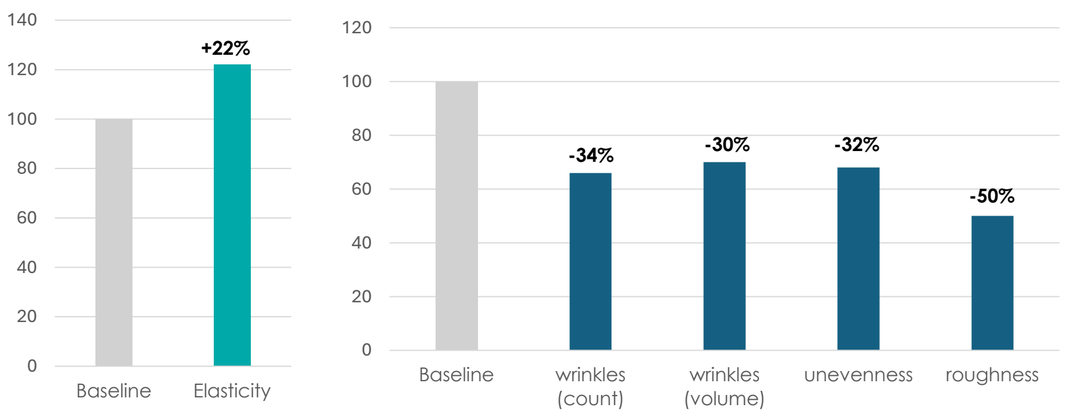
Ref: Mix of Vitamin C and TGF-beta
**p<0.01, ***p<0.001

2911



Female volunteer (age: 52) before (D0) and after 4 weeks (D28). Reduction in number of wrinkles by 47% and their volume by 45%.

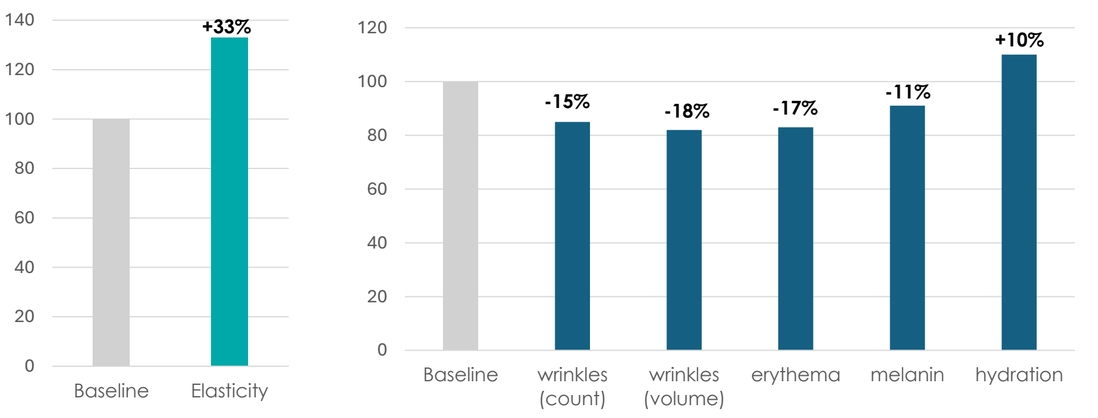
Female volunteer (age: 54) before (D0) and after 4 weeks (D28). Reduction in number of wrinkles by 28% and their volume by 30%.



2915

Female volunteer before (D0) and after 4 weeks (D28). Reduction in number of wrinkles by 25% and their intensity by 23%.

Female volunteer before (D0) and after 4 weeks (D28). Reduction in number of wrinkles by 13%.



CONCLUSIONS

The incorporation of algae extracts in creams 2911 and 2915 effectively promotes the synthesis of essential extracellular matrix proteins, enhancing skin elasticity and reducing visible wrinkles. These findings highlight the anti-aging potential of these formulations, offering a promising approach for improving skin structure and appearance. Further investigation is recommended to elucidate the mechanisms driving these effects and assess long-term benefits

IMPACT OF THE STUDY

The findings from this study have significant implications for the practice of aesthetic medicine. By demonstrating the efficacy of algae extract-enriched creams 2911 and 2915 in boosting pro-collagen I and elastin levels, these formulations offer a non-invasive, effective alternative or complement to traditional aesthetic treatments, such as dermal fillers and collagen-stimulating injections.