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An innovative technology for the reconstruction of the dermo-epidermal junction in anti-aging skin care

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Introduction

The dermo-epidermal junction (DEJ) does not only ensure the skin's structural stability and play a role in cell signaling, but it also serves as a transport barrier, limiting and enabling transport of the particles between epidermis and dermis. It also affects the skin healing and reconstruction processes as well as its general condition and appearance. Wavy structure of DEJ flattens with time and as a result, less nutrients reach the epidermis. The production of skin fibers decreases dramatically, and the skin's barrier function becomes less effective, and the process of dehydration occurs. Consequently, cellular renewal processes are slower, and the skin becomes thinner and less elastic.
The aim of the study was to examine safety and anti-ageing efficacy of face serum (5555) containing peptides (hexapeptide-9, acetyl-heptapeptide-9), *Glycine soja* extract (GSE), naringenin and trehalose. GSE softens and plasticizes the cell membranes and enables receptor recognition by anti-aging peptides.

Materials and Methods

In vivo test was performed in a group of 24 female volunteers (38-73 y. o.), with visible signs of facial aging. All the participants applied product on face, twice a day for 4 weeks. Additionally, measurements were taken among group of 12 females at the baseline and after 4 weeks of product application. Instrumental skin evaluation (erythema, skin smoothness, firmness, elasticity, wrinkles, irregularities, pores, porphyrins, discolorations and UV spots) were performed. In addition, a self-evaluation questionnaire was performed. Moreover, confocal microscopy (Vivascope™) analysis was conduced in additional group of 20 patients (48-62 y. o.).

Results – confocal microscopy analysis of DEJ papillae

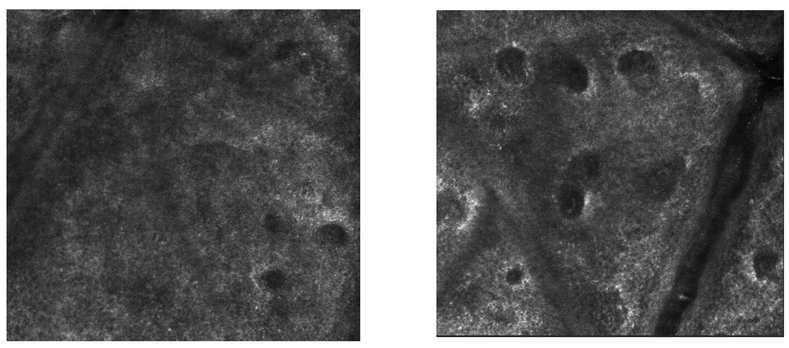

Figure 1. Instrumental evaluation of DEJ papillae using confocal microscopy (Vivascope). Photographs were taken in a female subject (age 52) before (left) and after 4 weeks of using tested product (right). Increase in the number of DEJ papillae was observed.

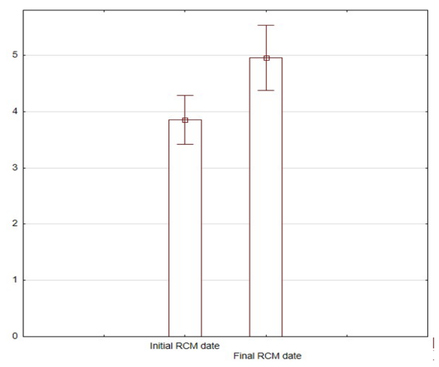

Figure 2. Comparison of the number of DEJ papillae between the "Initial RCM" and "Final RCM" periods showed a significant increase in numer of papillae at the end of the test.

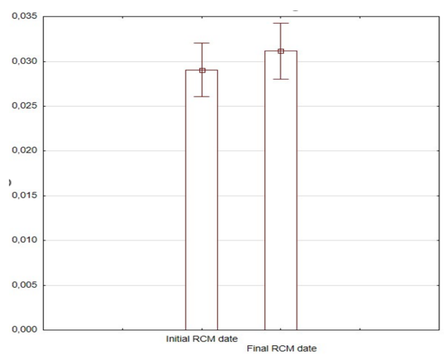

Figure 3. Comparison of DEJ papillae diameter between „Initial RCM" and "Final RCM" periods showed a slight increase in diameter at the end of the study, however without statistical significance.

Results – *in vivo* study

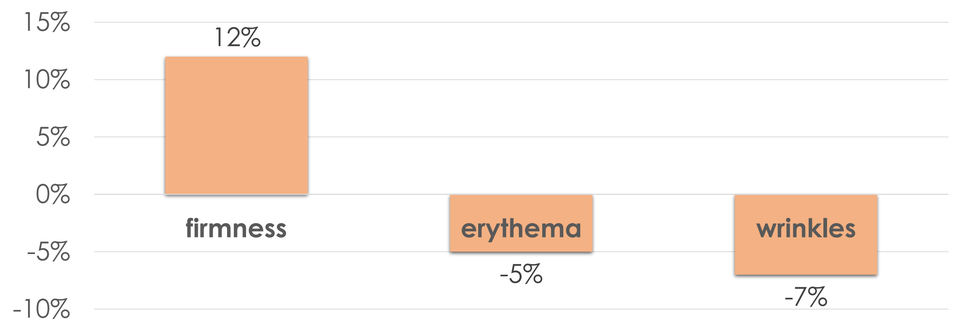

Figure 4. Objective measurements showed improvement in skin firmness (by 12%), reduction in wrinkles and erythema reduction by 7% and 5%, respectively. Skin parameters measured: firmness – Cutometer Dual MPA 580, erythema – Mexameter MX 18, wrinkles – Visioscan VC 20 plus.

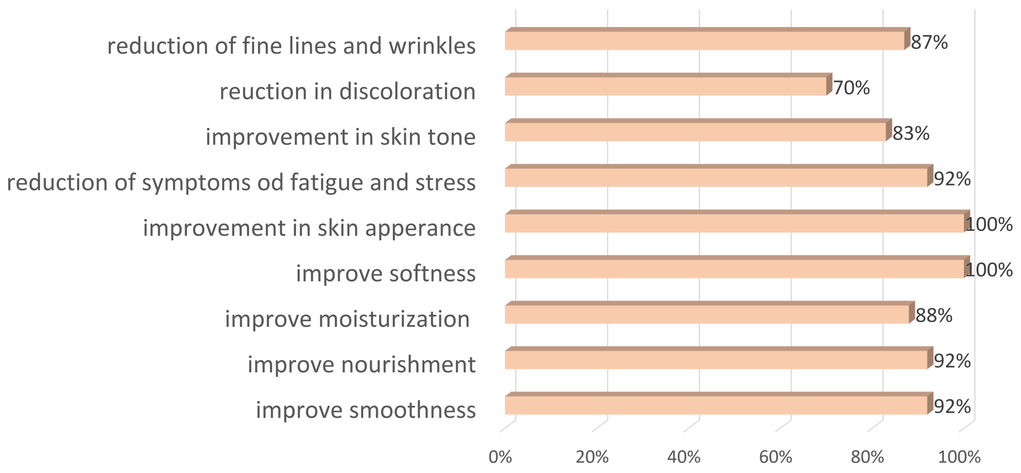

Figure 8. After 4 weeks of serum usage, all volunteers self-reported a noticeable improvement in skin smoothness, nourishment and moisturization. All participants noticed improvement in skin softness and general skin appearance. Moreover, respondents confirmed reduction of symptoms of fatigue and stress, improvement in skin tone, as well as reduction in skin discoloration. The product reduces (fills) fine lines and wrinkles.

Figure 5. Female subject (age 61). Instrumental analysis showed a reduction in number and volume of wrinkles (by 63% and 15%, respectively) after 4 weeks of serum application (Visia).

Figure 6. Female subject (age 38). Instrumental analysis showed a reduction in number and volume of uneveness (by 50% and 52%, respectively) after 4 weeks of serum application (Visia).

Figure 7. Female subject (age 73). Instrumental analysis showed a reduction in number and intensity of discolorations by 19% after 4 weeks of serum application (Visia).

Table 1. Instrumental evaluation of skin condition before and after 4 weeks test of product usage. Skin parameters were measured by Visia (Canfield).

Instrumental evaluation of skin condition (n=12)	
Skin parameter	**Results**
unevennes	Reduction by 21% in 67% of volunteers reduction by 11% in the whole group
discolorations	Reduction by 12% in 67% of volunteers reduction by 6% in the whole group
UV spots	Reduction by 5% in 50% of volunteers
wrinkles	Reduction by 22% in 58% of volunteers
pores	Reduction by 11% in 58% of volunteers reduction by 3% in the whole group

Conclusions

Novel combination of active ingredients (two peptides, GSE in combination with trehalose and naringenin) used in tested cosmetic formulations showed very good properties in case of rejuvenating effect on mature skin with aberrations of DEJ structure.