Comprehensive Microbiome Evaluation of Gentle Cleanser and Moisturizer with Prebiotic, Paraprobiotic, Probiotic and Postbiotic Actives as Non-prescription Alternative For Atopic Dermatitis Treatment

Zahratunnisa, Hani[1]; Utami, Diyah[1]; Christianti, Margareta Anindya[1].; Safitri, Ade Fany[1]; Utami, Sarah Tania[1]; Hendra, Amelia[1]; Fajrin, Anita[1]

[1]PT Paragon Technology and Innovation, Tangerang, Indonesia

Poster ID #23

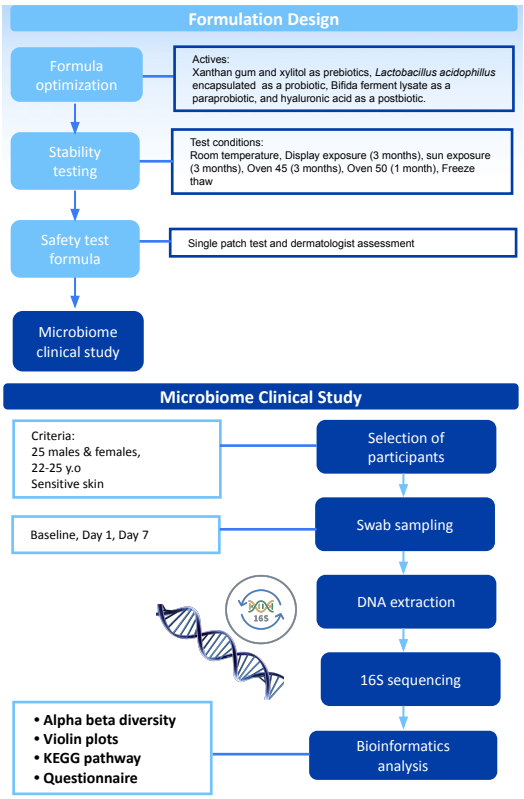
Introduction

A common treatment for atopic dermatitis (AD) is usually a prescription-based steroid or topical steroids (TS) treatment, which has side effects such as dryness, burning, stinging, and bright red skin (skin thinning). AD is a skin disease that is related to a disbalance microbiome and has very dry and sensitive skin symptoms. The alteration of the skin microbiome can significantly affect the skin's immunological system and barrier. Balancing the skin microbiome, especially on sensitive skin will be one of the approaches to treat AD without TS. This underscores the need of a proven non-steroidal treatments as an optimal alternative for managing AD.

In this study, we focus on cleanser and moisturizer as alternatives for AD treatment. A gentle cleanser is important for AD treatment to cleanse the skin from irritants without stripping skin barrier, while moisturizer is crucial to repair dried AD skin and deeply moisturize skin.

Clinical evidence is needed to prove AD treatment alternatives doesn't disrupt the skin microbiome balance and irritate skin. This study aims to assess the impact of gentle cleanser and moisturizer formulated with prebiotic, paraprobiotic, probiotic, and postbiotic on skin microbiome balance.

Materials & Methods



Results & Discussion

The surfactant-based cleanser and moisturizing cream was formulated by using selective materials and considered safe according to EU regulation and MOS calculation. The accelerated stability test showed that the formulas remain stable in all conditions. Product safety was evaluated by a single patch test and dermatological assessment which proved that the formula passed as non-irritant with no clinical issue.

Bioinformatics analysis showed that the top 10 microorganisms did not change significantly between time points across all taxa. Additionally, alpha beta diversity also confirms these findings. It demonstrates that the treatment sufficiently maintains the microbiome in vivo.

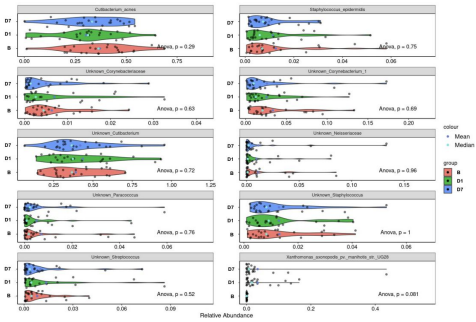


Fig 1. Violin plots of Species relative abundances

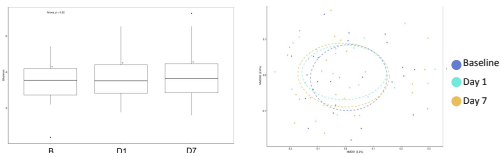


Fig 2. Shannon Alpha diversity index (left) and Simpson Beta diversity index (right) at baseline, Day 1, Day 7

KEGG ortholog revealed that the top microbiome profile was actively associated with 3 main pathways on human skin: membrane transport, metabolism of cofactors and vitamins, and nucleotide metabolism (DNA repair).

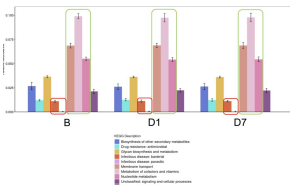


Fig 3. KEGG ortholog pathway analysis

It proves that the treatment maintains function for lipid and protein metabolism and function in vivo. Furthermore, participants reported a statistically significant improvement in skin texture and hydration.

Conclusions

According to the scientific hypotheses and results provided, the tested products containing prebiotic, paraprobiotic, probiotic, and postbiotic were successful in maintaining skin microbiome and can be used as non-prescription alternatives for AD treatment.

Acknowledgements

The Authors would like to thank Paragon Technology and Innovation for supporting this study

References:

Dewi, Dian & Perdiyana, Angki & Wiliantari, Ni & Nadhira, Farrasila & Arkania, Nabila & Salsabila, Cut & Allun, Clara & Allatib, Arohid & Dewantara, Kelvin. (2023). Managing the Skin Microbiome as a New Bacteriotherapy for Inflammatory Atopic Dermatitis. Cureus. 15. 10.7759/cureus.48803.

Dou, Jianhua; Zeng, Jinrong; Wu, Kathy; Tan, Wenbin; Gao, Lihua; Lu, Jianyun (2019). Microbiosis in pathogenesis and intervention of atopic dermatitis. International Immunopharmacology, 69(), 263–269. doi:10.1016/j.intimp.2019.01.030.

National Eczema Association. (2021). Education Announcement: Use of Topical Steroids For Eczema. Accessed on April 29th 2024, from https://nationaleczema.org/blog/warnings-for-topical-steroids-eczema/