32nd IFSCC Congress London 19-22 September 2022

Poster ID 188

A Study on the Skin Barrier Function Recovery and Moisturizing Effect of *Sasa quelpaertensis* Fermented Extract

DAEBONG Life Science

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Introduction:

Fermentation in cosmetics removes fermentation bacteria in the process of fermenting microorganisms, and at the same time extracts active ingredients in addition to enzymes to double the efficacy and help the ingredients to be quickly absorbed into the skin. Fermented cosmetics containing fermented ingredients are known to double the skin's various functions, such as antioxidants that reduce wrinkles and aging, free radicals, and cellular activity of the skin, collagen synthesis, whitening, and moisturizing.

Sasa quelpaertensis is a Jeju endemic plant that grows mostly in the Halla Mountain. According to previous studies, *Sasa quelpaertensis* contains various active compounds such as polyphenol, tannin, and flavonoid, which have reported biological active effects such as antioxidant, antibacterial, and anticancer effects. Recently, studies have been conducted in various fields such as functional raw materials and cosmetics using *Sasa quelpaertensis*, but there is no research on skin barrier improvement and moisturizing effects. Therefore, in this study, the fermented extract of *Sasa quelpaertensis* was used to examination the skin barrier improvement and moisturizing effects, and the possibility of development as a functional raw material was reviewed.

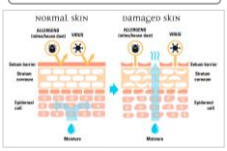
Materials & Methods:

Materials

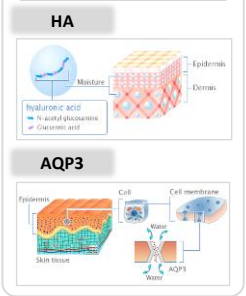
- **Scientific name :** *Sasa quelpaertensis*
- **English name :** Northern bamboo
- **Korea name :** 조릿대(joritdae)
- **Distribution :** Korea, Japan

Natural fermentation

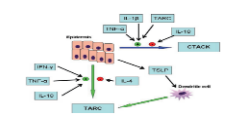
Skin barrier function recovery



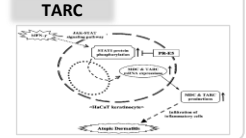
Moisturizing effects



Pruritus improvement



TARC



Results & Discussion:

Skin barrier function recovery

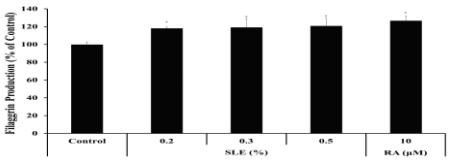


Figure 1. Effects of SLE on filaggrin production in HaCaT cells. The cells were treated with various concentrations of SLE for 24 h. At the end of incubation, cell lysate were analyzed for the presence of FLG using an enzyme linked immunosorbent assay (ELISA) kit. Retinoic acid (RA) was used as a positive control for FLG production at concentration 10 μM. The data represent the mean ± SD of triplicate experiments. *p < 0.05

Moisturizing effects

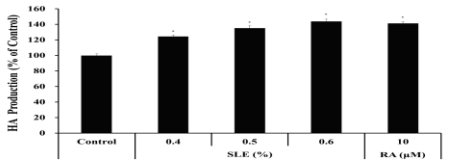


Figure 2. Effects of SLE on hyaluronic acid production in HaCaT cells. The cells were treated with various concentrations of SLE for 24 h. At the end of incubation, supernatants were analyzed for the presence of HA using an enzyme linked immunosorbent assay (ELISA) kit. Retinoic acid (RA) was used as a positive control for HA production at concentration 10 μM. The data represent the mean ± SD of triplicate experiments. *p < 0.05

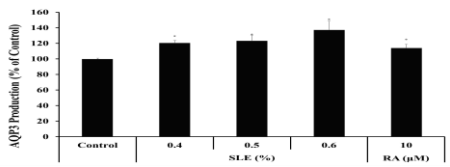


Figure 3. Effects of SLE on aquaporin-3 production in HaCaT cells. The cells were treated with various concentrations of SLE for 24 h. At the end of incubation, cell lysate were analyzed for the presence of AQP3 using an enzyme linked immunosorbent assay (ELISA) kit. Retinoic acid (RA) was used as a positive control for AQP3 production at concentration 10 μM. The data represent the mean ± SD of triplicate experiments. *p < 0.05

Pruritus improvement

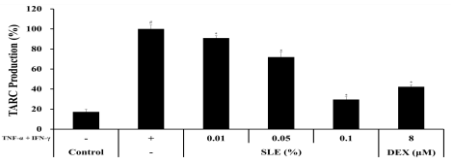


Figure 4. Effects of SLE on human thymus and activation-regulated chemokine inhibition in HaCaT cells. The cells were treated with various concentrations of SLE for 24 h. At the end of incubation, supernatants were analyzed for the presence of TARC using an enzyme linked immunosorbent assay (ELISA) kit. Dexamethasone (DEX) was used as a positive control for TARC inhibition at concentration 8 μM. The data represent the mean ± SD of triplicate experiments. # P<0.01 vs negative control, *p < 0.05 vs TNF- α and IFN- γ treated control

Conclusions:

These results suggest that SLE could be a good candidate at cosmetic ingredient on skin barrier function recovery and moisturizing effects. The based on these results, it was suggested that SLE could be potentially applicable as cosmeceutical ingredients in cosmetic industries.

References:

1) Park S. Y. And So Y. J. (2021) A study on acne improvement effect of fermented *Rhus verniciflua* stokes and *Orostachys japonicus* A. Berger complex extract cosmetics. J. Kor. Soc. Cosmetol. 27:1021-1027
2) Kim K. R. and Mo J.H. (2012) Comparison in improving effectiveness of fermented *Salicornia herbacea* and *S. herbacea* cosmetics on acne skin. Journal of Investigative Cosmetology. 8:195-193
3) Lee S. H. and Lee M. S. (2017) The research on antioxidative effect of *Sasa quelpaertensis* extractum and assessment of cytotoxicity. Journal of the Korea Academia-Industrial cooperation Society. 18:687-693.
4) Lee J. Y. and Ko H. C. et al. (2016) Preparation and Characterization of phytochemical-rich extract from *Sasa quelpaertensis* leaf. Journal of Life Science. 26:1330-1335
5) Lee J. Y., Song H. and Ko H. C. at al. (2018) Anti-oxidant and anti-inflammatory potentials of *Sasa quelpaertensis* leaf residue extracs. Journal of Life Science. 28:738-744
6) Kim J. H. and Kim M. Y. (2014) Antiproliferative and apoptotic effects of *Sasa quelpaertensis* Nakai in human cancer cells. Journal of Life Science. 24:903-909
7) Hsu M. F. and Chiang B. H. (2009) Stimulating effects of Bacillus subtilis natto-fermented Radix astragali on hyaluronic acid production in human skin cells. Journal of Ethnopharmacology. 125:474–481.
8) Scharschmidt TC et al. (2009) Filaggrin deficiency confers a paracellular barrier abnormality that reduces inflammatory thresholds to irritants and haptens. J Allergy Clin Immunol 124:496–506
9) Park et al. (2013) Ethanol Extract of Astragalus membranaceus Bunge Induces Aquaporin-3 Expression in HaCaT Cells. Korean Society for Biotechnology and Bioengineering Journal 28:394-399
10) Nakahigash et al. (2010) Upregulation of Aquaporin-3 Is Involved in Keratinocyte Proliferation and Epidermal Hyperplasia. Journal of Investigative Dermatology 131:865–873