Skin radiance improvement with *Hylocereus undatus* fruit extract influencing the skin microbiota.

Fabien Havas¹, Shlomo Krispin¹, Nofit Borenstein¹,
Arlety Perolat³, Joan Attia³, Estelle Loing²

¹IBR Ltd. - A Lucas Meyer Cosmetics company, Yavne, Israel. ²Lucas Meyer Cosmetics, Quebec, QC, Canada.

³Lucas Meyer Cosmetics, Toulouse, France.

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INTRODUCTION AND BACKGROUND

Commensal bacteria living on human skin may play an active role in host defense, e.g. by limiting the growth of harmful species. Competition between microbial species, maintaining a healthy microbiota, may contribute to maintaining healthy-looking skin. A disrupted microbial balance has been linked with skin inflammation, erythema and dullness, compromised barrier function, and skin dryness.^a Conversely, increased *s. epidermidis* levels on skin have been shown to significantly improve skin barrier function and hydration.^b Dragon fruit (*Hylocereus undatus*) is a superfruit rich in several key nutrients, including carbohydrates previously shown to have prebiotic effects on the gut microbiome.^{c,d}

Here we show that a *Hylocereus undatus* fruit extract may positively influence skin microbiota balance, as well as improve skin tone, skin barrier function, and skin porphyrin levels – key markers of healthy and beautiful skin.

IN-VITRO COMPETITIVE MODEL OF THE PREBIOTIC EFFECT

Methods

- Four bacterial strains (2 beneficial: *s. epidermidis*, *s. hominis*; and 2 harmful: *s. aureus*, *p. acnes*) were grown together in minimal (nutrient-poor) medium containing 0.25% or 0.5% of *Hylocereus undatus* extract.
- Samples were collected at 0, 24 and 48h, and incubated in conditions allowing for colony counts of each bacterial strain.
- Controls: untreated (minimal medium without extract); and optimal conditions (full strain growth medium).

Results

- Hylocereus undatus* extract at 0.25% and 0.5% was shown to increase bacterial growth overall – to levels comparable to optimal conditions (full medium).
- Growth of *s. epidermidis* and *s. hominis* (beneficial strains) was optimal.
- At the same time, 0.25% and 0.5% *Hylocereus undatus* extract seemed lethal to harmful strains *s. aureus* and *p. acnes*.

CONCLUSION

The results presented above constitute evidence that an aqueous *Hylocereus undatus* extract can **have prebiotic effects** on the skin microbiota. Further, we show that the same extract can support **well-hydrated and radiant, i.e. healthier and healthier-looking skin**.

REFERENCES

^a Kim, J. E. and Kim, H.S., *J. Clin. Med.*, **2019**, 8, 444.
^b Nodake, Y. et al., *J. Dermatol. Sci.*, **2015**, 79, 119.
^c Elmarzugi, N.A. et al., *Nanomed. Nanotechnol.*, **2016**, 1, 1.
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CLINICAL DEMONSTRATION OF SKIN BENEFITS

Methods

- 1% *Hylocereus undatus* extract was included in a simple formulation.
- Trial design was double-blind, placebo-controlled, and randomized split-face (left/right).
- Inclusion criteria (n=26): female, 35-55 years of age, phototype II - III, with aging signs (including yellowish skin) in the periocular area.
- Application 2x/day, 28 days. Measurements taken on D0 and D28:
- Skin tone was assessed by Chromameter® (CR200 Minolta Japan), expressed as Luminance (L*) and Individual Typological Angle (ITA°, skin tone index calculated based on L* and b* values).
- Skin barrier function was assessed by TEWL (Tewameter™, Courage & Khazaka).
- Porphyrin levels were evaluated by image analysis (under UV illumination, Visia®-CA, Canfield).

Results

After 28 days' application, 1% *Hylocereus undatus* extract in cream:

- Significantly increased the L* and ITA° – attesting to a skin brightening effect.
- Significantly decreased the TEWL – showing enhanced skin barrier function.
- Significantly decreased porphyrin counts and area, corroborating a possible reduction in *p. acnes* growth.