

A NEW DESQUAMATING AGENT RESPECTFUL OF EPIDERMAL HOMEOSTASIS AS A COMPLEMENTARY APPROACH TO TRADITIONAL PEELING PROCEDURES

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OBJECTIVE

The Andean food crop quinoa (*Chenopodium quinoa* Willd.) is known to be rich in bioactive compounds. The outer husk of the grain, which is removed before consumption, is particularly rich in saponins. We aimed to identify a novel, gentle cosmetically applicable exfoliation extract from quinoa husks as an alternative to dermatological peeling.

METHODS

Chenopodium Quinoa co-product (CQC) was analyzed by HPLC. Its desquamating potential was evaluated by two methods.

- **Desmoglein test** quantified the release of desmoglein 1 fragments from powder of plantar SC incubated with CQC solution at 0,1% during 10 min. After a washing step and 2h of incubation with TBS, desmoglein 1 fragments were measured by Elisa kit. Reference compounds are pyrrolidone carboxylic acid and salicylic acid.
- **SC cohesion** was studied on human excised skin sample. CQC solution at 0,5%, 5% and 10% were applied topically for 2 days. Histo-morphological sections were analyzed and scored to evaluate SC cohesion (0 high cohesion to 4 detachment of SC). Reference compound of the test was L'Oréal salicylic derivative.
- **Irritation potential** of the extract was evaluated *in vitro* using a reconstructed human epidermis Episkin™. CQC was applied during 15 min on the epidermis. After washing and 42h of incubation, cell viability was evaluated by MTT test (J. Cotovio et Al; ATLA 33, 329–349, 2005).
- A thermal analysis of the SC lipid structure using DSC Perkin Elmer device (Differential Scanning Calorimetry) was carried to study the interaction with SC lipids involved in the barrier function.

RESULTS

1 CQC STIMULATES THE RELEASE OF DESMOGLEIN I IN PLANTAR SC, MOST LIKELY BY ACTIVATING DESQUAMATING ENZYMES.

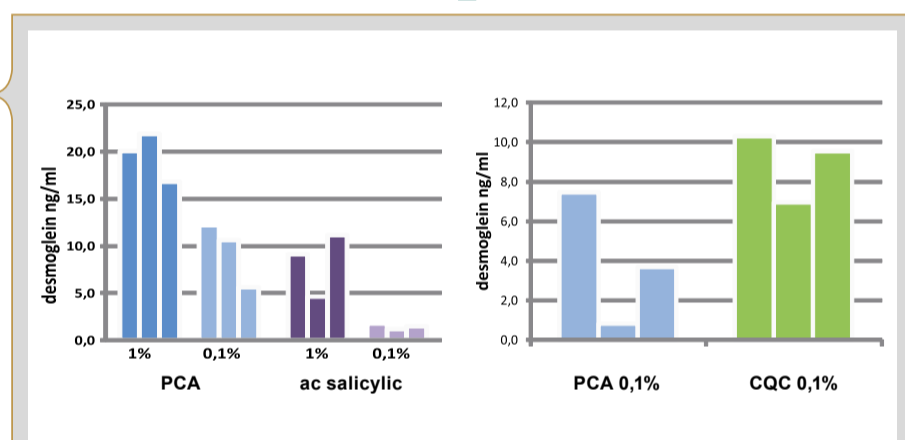


Figure 1: Release of Desmoglein I fragments (n=3 samples 2 independent experiments)
 PCA: pyrrolidone carboxylic acid/salicylic Acid/CQC

3 DSC DATA SHOW THAT THE SC LIPID TRANSITIONS TEMPERATURE (AROUND 71°C AND 85°C) IS PRESERVED, INDICATING THAT CQC HAD NO OR ONLY VERY LITTLE IMPACT ON THE SKIN BARRIER FUNCTION.

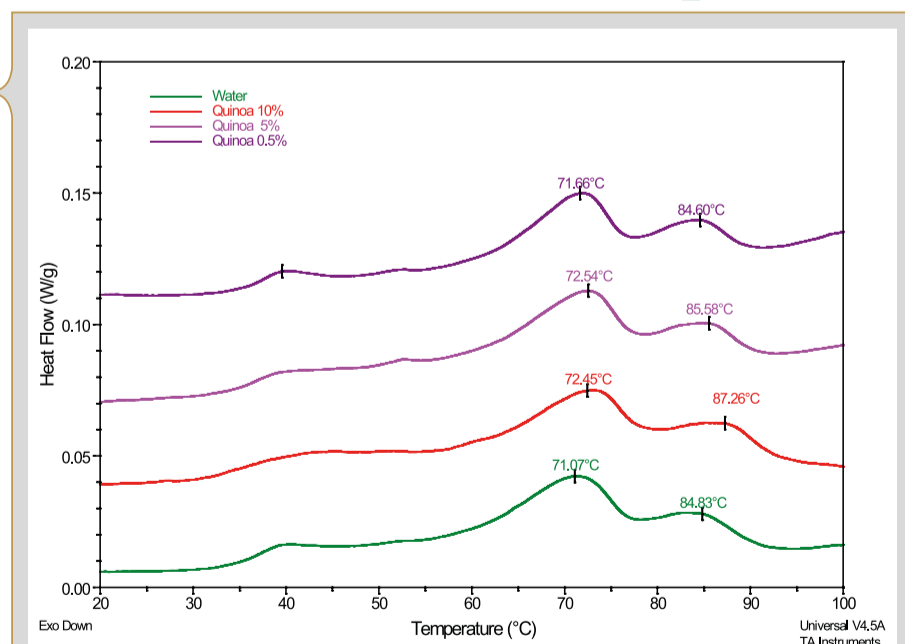


Figure 4: Thermograms of intercellular lipids of isolated human SC treated by CQC solutions (n=2)

2 CQC REDUCES CORNEOCYTES COHESION IN HUMAN SKIN EXPLANTS WITH A DOSE EFFECT.

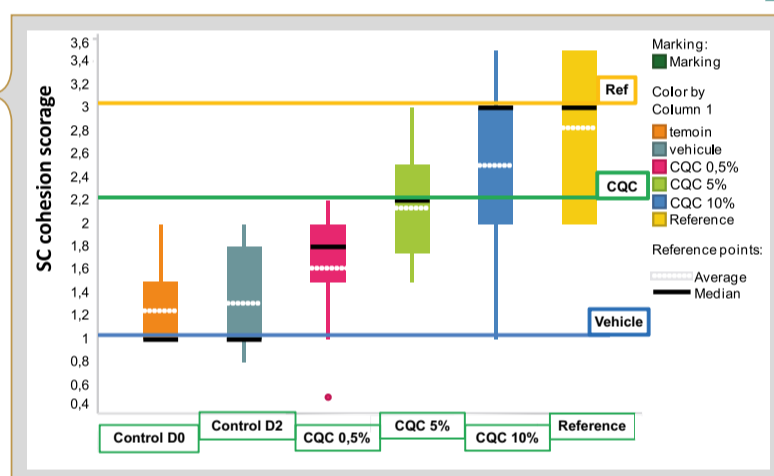


Figure 2: Means and medians of score of SC cohesion treated with CQC solutions (n=9)

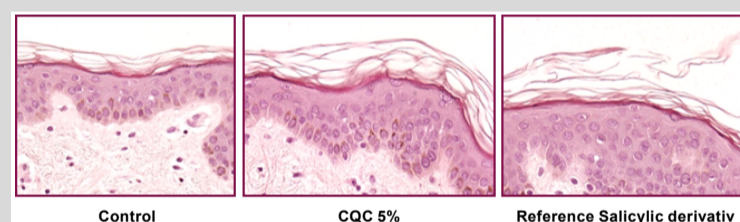


Figure 3: histological slides of treated excised skin samples of one skin donor

4 CQC TREATMENT OF RECONSTRUCTED HUMAN EPIDERMIS REVEALED NO IRRITATION POTENTIAL USING EPISKIN™ SKIN IRRITATION TEST.

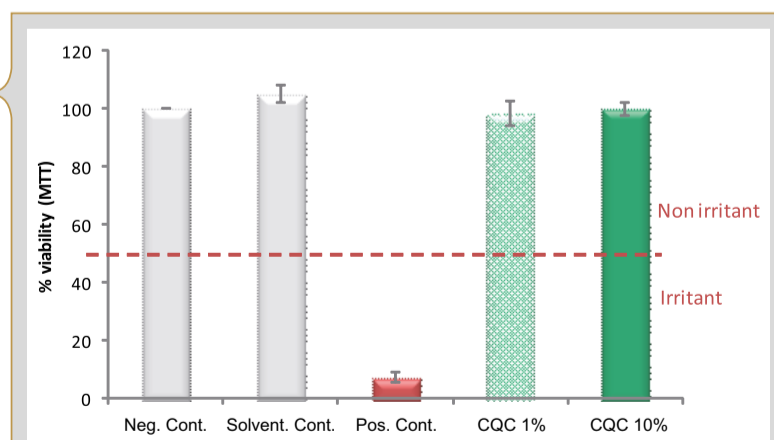


Figure 5: Episkin™ validated skin irritation test based on MTT reduction assay (n=3)

CONCLUSION

Our data shows that CQC reduces SC cohesion, most likely by activating desquamating proteases, without modifying inter-corneocyte lipid structures. Its excellent safety profile makes it a promising candidate for safe and gentle cosmetic formulas.

The authors declare no conflict of interest