

# In vivo performance of a socially and environmentally sustainable blend of Brazilian Kaolin

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## Introduction:

Clays have been used since the antiquity, for health protection, in cosmetic and pharmaceutical formulations. Clays are widely used in spas and for aesthetic cares as they provide cleaning, emulsification, beautifying and detox effects [1,2,3,4]. The work presented in this poster concerns clays sourced in Brazil. We used a sustainable process to extract the clays in order to preserve the environment and allow the recovery of the area from where it was extracted.

This process occurs properly with the inclusion of environmental metrics and certifications, such as Fair for Life and For Life, that ensure the proper process for the extracted area recovery, besides the fair trade and social organization.

In particular, a special care is taken during the organic soil removal concomitant with clays extraction process. The organic soil is stored out to be preserved during the extraction phase. Once the extraction process is finished, it is set back in place. It can then either be planted with native species or used for the formation of a lake with clean water and fishes. This allow the adequate recovery of the environment.

Several key elements need to be considered for responsible use of clays as a cosmetic ingredient : proper prices and fomenting a good interaction between people and communities who are involved in the extraction and environmental recovery.

The aim of this work was to determine if Brazilian kaolin clays can provide new biological properties which might be beneficial for skin care applications such as skin hydration, improvement of skin barrier function, skin tensor effect and to maintain sebum level on the skin .

## Materials & Methods:

Material evaluated (Kaolin clays) :

The Kaolin clays of different natural colors were blended and micronized together, bringing natural and stable colors, composed of soft particles lower than 12µm.



In vivo proof of concept evaluation's studies were performed at Beraca's Innovation Center (Brazil).

The participants were 27-62 years old (women), presenting a healthy skin. All measurements were done in a controlled environment (20°C±/-2°C and RH 50%±/- 5%).



**Kaolin at 10% in liquid foundation** vs. Placebo  
n=7 for immediate hydration evaluation  
n=8 for trans-epidermal water loss evaluation  
n=4 for skin oiliness and firmness evaluation

### Method

**For hydration and TEWL:** Product application on the forearm. Evaluation at T0 and after 4 hours.

**For oiliness and firmness:** Product applied on the half face. Evaluation at T0 and after 7 consecutive days of product application.

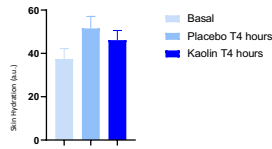


### Parameters studied

- Evaluation of skin hydration with Corneometer™.
- Evaluation of TEWL with Tewameter™
- Evaluation of skin firmness with Cutometer™
- Evaluation of skin oiliness with Sebumeter™

## Results & Discussion:

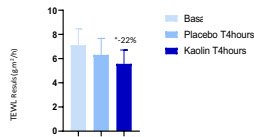
### Kaolin clays maintain skin hydrated



As a common sense, use of clays is conditioned to dehydration of the skin. However, we observed that skin hydration is maintained. This result highlight an unexpected result for clays, which can bring added value to skin care use.

Figure 1: Average of skin's hydration measurement through Corneometer™ after 4 hours of liquid foundation containing Kaolin applied at 10% and compared to the basal level.

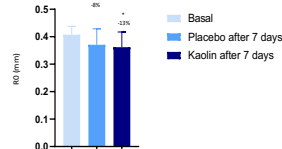
### Kaolin clays reinforce skin barrier function



To be sure that the skin barrier function is not due to a potential physical effect of clays, the foundation formula was removed before each TEWL measurement, and the measure was immediately performed. The results are better and significantly different from the Placebo, with a decrease on TEWL in 22% when compared to the basal level (T0)

Figure 2: Average of TEWL measurement through Tewameter™ after 4 hours of liquid foundation containing Kaolin applied at 10% and compared to the basal level. \*p<0.05

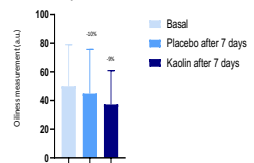
### Kaolin clays provide a skin tensor effect



R0 allows the determination of skin firmness properties. The lower the R0, the higher the firmness of the skin is.

Figure 3: Average of R0 measurement through Cutometer™ after 7 consecutive days of liquid foundation containing Kaolin applied at 10% use and compared to the basal level. \*p<0.05

### Kaolin clays maintain sebum level on the skin



Even with the constant use of the kaolin clays the skin homeostasis is maintained. The sebum level is balanced neither overproduced nor decreased. The rebound effect characterized by skin oiliness usually observed as a result of constant use of clays was not observed.

Figure 4: Average of sebum measurement through Sebumeter™ after 7 consecutive days of liquid foundation containing Kaolin applied at 10% use and compared to the basal level.

Kaolin clays present several biological beneficial properties to skin such as : maintenance of skin hydration, reinforcement of the skin barrier function, skin tensor effect and stability of sebum level. These properties are keys for skin care applications.

## Conclusions:

Thanks to its several positive attributes demonstrated in this proof-of-concept study, kaolin clays can be considered as a multifunctional ingredient through their capacity to maintain skin hydration, to reinforce skin barrier function, to improve skin firmness by providing a tensor effect and to maintain sebum level on the skin. These new biological properties discovered, confirm that kaolin clays can be used for skin care application.

Besides their sourcing, social and environmentally friendly; their rheological and stability properties, kaolin clays can be used also in face products and sunscreens.

## References:

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