

# HydraGeneration Papyrus

*The restauration of the hydrolipidic balance*



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## A STORY

The papyrus | *Cyperus papyrus, Cyperaceae*  
**A symbol of the Nile and of the ancient Egypt**

*As an African aquatic plant, papyrus lives with roots immersed by fresh water, and always in the sun. Today it is an endangered species in the Delta of the Nile. Handmade from 2500 B.C., papyrus sheets were the writing medium of the ancient Egypt civilization. Papyrus was both a royal symbol in the Low-Egypt and a symbol of life coming from the primordial waters, as many architectural and ornamental elements show. That species was a god symbol too, the «hathoric» symbol of power (as Hathor is the mother of all Egyptian gods).*

## Key points

### An active plant cell

Developed to deliver the highest amount of original active molecules.

### A high tech natural ingredient

Created to preserve and improve the benefits of a natural product.

### A complete moisturizing action

Improves hydration in a short and long term, reinforces the protective part of skin.

Because skin hydration consists in a good balance between water and lipids in epidermis.

To keep longer a smoother and a more supple skin.

And a better dehydration-fighter skin.



## PRODUCT BENEFITS

### Hydrating

#### Moisturizing

Maintains water in the epidermis, helps to keep the NMF and lipids quantities in the stratum corneum.

#### Protecting

Reinforces the stratum corneum, helps to restore the skin barrier.

#### Regenerating

Increases the cell regeneration, helps to rebuild the hydrolipidic film.

*To be used in skincare or make-up products like cream, fluid, serum, balm, lotion, milk, foundation, concealer, etc. In any cosmetic or skincare product dedicated to maintain or to reinforce skin hydration.*

## HOW IT WORKS

# HydraGeneration Papyrus: to reinforce the natural mechanisms to maintain water in the epidermis

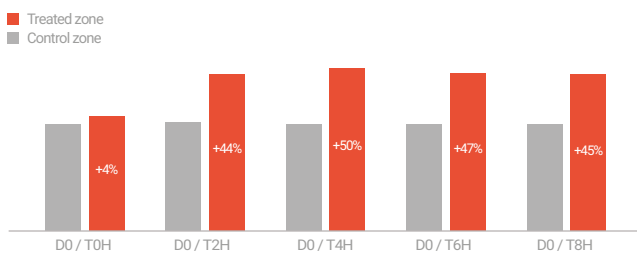
HydraGeneration Papyrus has a quick action on the water circulating in epidermis and avoids its evaporation. In the same time, it restores the hydric circuit thanks to a stimulation of the cell renewal. Moreover, it contributes to the creation of lipids like free fatty acids, cholesterol, ceramids, etc., elements which are in the stratum corneum of the epidermis and help to keep corneocytes together. Those cells of the stratum corneum play precisely a skin barrier part.

Thanks to that better hydrolipidic balance, epidermis limits dryness process and provides a better protection against outside aggressions.

## Clinical tests results

### A significant hydrating effect on face in 28 days

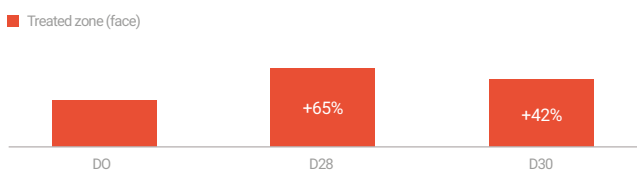
AVERAGE DATA OF CORNEOMETRIC VALUES (UA) TREATED + CONTROL ZONE AFTER SINGLE USE



Hydrating effect for 8 hours after single use

Increase of corneometric values - legs - by 45%

AVERAGE DATA OF CORNEOMETRIC VALUES (UA) AFTER 28 DAYS OF TREATMENT



Hydrating effect after 28 days of treatment

Increase of corneometric values - face - by 65% (and by 42% after 30 days)

#### Study conditions:

- Survey made on 20 women during 30 days
- Emulsion with 0.1% of HydraGeneration Papyrus (powder)

## Technical information on the formulation of HydraGeneration Papyrus

**INCI name of cells**  
cyperus papyrus leaf cell extract

**form**  
powder of cells (100%)

**aspect**  
beige powder

**concentration**  
starting at 0.1%

**dispersible**  
in any formulation

## In vitro tests results

### Maintaining water in the epidermis

Skin contains between 60% to 80% water according to age; stratum corneum contains 13% to 15%. Skin is considered as hydrated when that percentage goes beyond 10%, and dehydrated when the percentage is below 10%, stratum corneum becomes rough, flaking and loses its integrity. Most water is actually in the dermis thanks to proteoglycans that are fixed to big quantities of water.

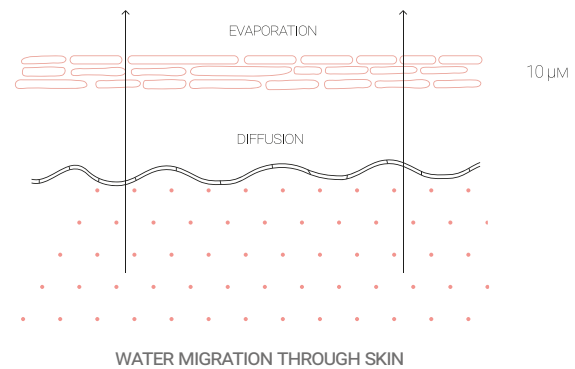
Therefore there are 2 types of water in the epidermis:

- A static water, that can't move, located in stratum corneum, or called "water linked to corneocytes" thanks to the NMF (Natural Moisturizing Factor) and between corneocytes, where water is trapped by lipids, especially ceramides, that are located in the hydrolipidic film (cf. cell renewal). It gives elasticity and suppleness to skin.
- A dynamic water that moves, circulates from the dermis to the several layers of the epidermis, called also transepidermic flux. That water from the dermis is essential to the epidermis nutrition for the nutrients it brings. It helps to protection and homeostasis in the epidermis.

As hydration depends on the value of the transepidermic flow, on the balance between diffusion and evaporation, and the ability of stratum corneum to be fixed with water, Naolys studied both the action of HydraGeneration Papyrus on dynamic water and on static water in the epidermis, but also on the cohesion between corneocytes.

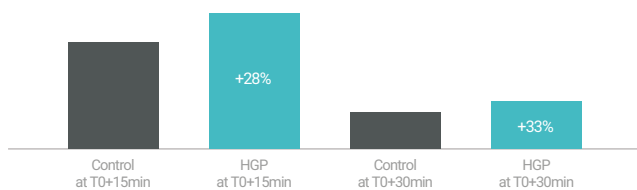
Water follows a path from beneath the skin to its surface, when it arrives at the surface, the water evaporates. This occurs at a rate of about 5g water/m<sup>2</sup>/hour.

The evaporation of water is from 300 to 500 ml/24 hours, and its main obstacle is the skin barrier, as its integrity should be perfect (cf. cell renewal). This depends on external factors such as temperature, humidity, and internal factors, such as the state of stratum corneum, the water gradient in the different layers of the epidermis and the integrity of the lipidic network between corneocytes. It doesn't depend on the quantity of static water in the stratum corneum.



#### Study of static water - epidermis

(H)-H<sub>2</sub>O (CPM)

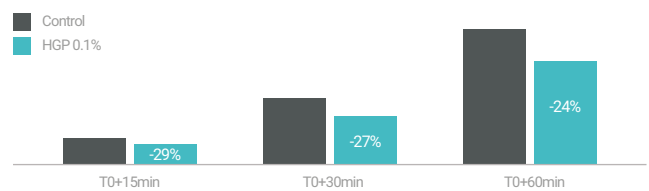


##### Increase of water retention

→ At concentration of 0.1%, increase of water retention in dehydrated epidermis by 28% at T0+15 min, and by 33% at T0+30 min.

#### Study of dynamic water - epidermis

(H)-H<sub>2</sub>O (CPM)

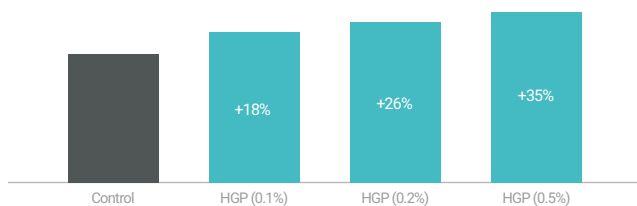


##### Decrease of transepidermic tritiated water

→ At concentration of 0.1%, decrease of the transepidermic tritiated water by 29% at T0+15min, by 27% at T0+30 min and by 24% at T0+60 min.

#### Study of corneocyte cohesion

INCORPORATION OF [<sup>14</sup>C]-ACETIC ACID



##### Increase of free fatty acids

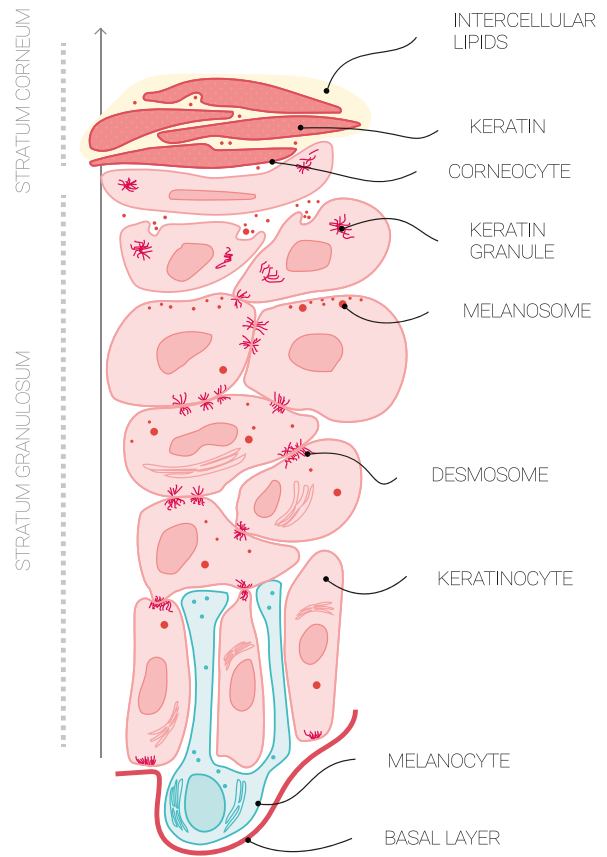
→ At concentrations of 0.1%, 0.2% and 0.5%, increase of free fatty acids respectively by 18%, 26% and 35%.

## Strengthening the skin barrier

The epidermis, the superficial layer of skin, is first made of cells called keratinocytes which renew non stop according to a 21-day cycle. That renewal of the epidermis is made thanks to the cell proliferation and the differentiation that keep the balance of adult tissues, therefore keratinocytes, divide at the level of the basal layer of the epidermis, which is mainly made of non differentiated cells and migrate to the surface changing their form: they lose their nuclei and load hard filaments of keratine. When they reach the cornified layer, they become corneocytes, dead cells that create a solid membran (thanks to keratine) impermeable and protective: the protective natural barrier of the epidermis. Those built up corneocytes will naturally break away and be shed.

Keratine contains several substances, especially the NMF (Natural Moisturizing Factor) between cells; it is a mix of hygroscopic substances that enable corneocytes to be fixed with water: free amin acids (40%), pyrrolidon carboxylic acid (12%), lactates (12%), urea, sugars and meral salts. In the same time, during the keratinisation process, keratinocytes release a fraction of epidermis lipids which, associated with the secretion of sebaceous glands and water coming from sudoral secretions, consist in a hydrolipidic film, an emulsion located in the stratum corneum.

By helping cell renewal, HydraGeneration Papyrus contributes not only to the production of keratine, which is like a barrier to skin, but also to the production of NMF and the hydrolipidic film. Both of them keep dynamic water diffused in the corneocytes inside epidermis.



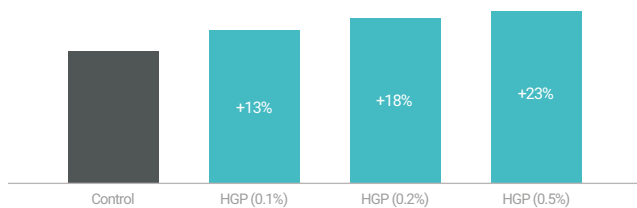
THE EPIDERMIS AND KERATINISATION PROCESS

### Study of the proliferation and the differentiation of epidermis cells

In order to show that the balance of tissues has been maintained, Naolys studied both proliferation and differentiation of epidermis cell. KI67 is an anti-gene to mark cell proliferation and filaggrin is a protein to mark cell differentiation. Studies have been made on reconstructed epidermis.

#### Study of epidermis cell proliferation

NUMBER OF LABELLED CELLS (KI67)

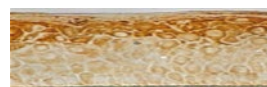


#### Increase of KI67

→ At concentrations of 0.1%, 0.2% and 0.5%, stimulation of the proliferation of keratinocytes in the basal layer for treated epidermis respectively by 13%, 18% and 23%.

#### Study of epidermis cell differentiation

LABELLING OF FILAGGRIN:  
CONTROL EPIDERMIS



LABELLING OF FILAGGRIN:  
EPIDERMIS TREATED WITH HYDRAGENERATION  
PAPYRUS AT 0.1%



#### Decrease of the epidermis differentiation

→ Decrease of the epidermis differentiation that is translated by a decrease of the labelling of filaggrin that is less intense but uniform at the level of the granule layer.

