PANTODIUM Natural VIT B5 produced by your own skin



Benefits of Vit B5 for the skin

HERO MOLECULE

From inflammation to skin ageing Vitamin B5, or pantothenic acid, has a wide range of benefits for the skin.

DIFFERENCE BETWEEN VIT B5, PANTOTHENIC ACID AND D-PANTHENOL Vitamin B5 or pantothenic acid is unstable in the formula. It is therefore its precursor, D-panthenol, most often of synthetic origin, that is used in cosmetics.

EXAMPLES OF CLAIMS ON THE MARKET



4.PANTHENOL & LA ROCHE-POSAY: OUR PRODUCTS FOR HYDRATION & REPAIR

Ideal for daily use in most types of sensitive skin, from normal to dry, Hyalu B5 Serum combines moisture-binding hyaluronic acid with panthenol and madecassoside for superior hydrating and soothing activity. With a fresh, water-gle formula, it helps to replenish, re-plump and smooth the skin. For additional hydration and comfort, it can be followed with the Hyalu B5 Moisturies;

Providing intense hydration and nourishment to the face and body. Cicanlast Baume 85 Balm is a multi-repairing balm, formulated with 5% parthenol and soothing madecassoside. Dermatologically tested and fragrance-free for sensitive skin, it can be used as needed to visibly relieve dryness in infants through to adults.

For dry or dehydrated sensitive skin in need of a pampering treat, the new Cicaplast BS Mask, soothes and replenishes with Provitamin BS. Made with 100% biodegradable cotton, the hydrating sheet mask is also infused with prebiolic, antioxidant La Roche-Posay Thermat Spring Water and madecassoside for enhanced Vitamin B5 is widely used in cosmetics as a moisturiser, healing agent, protector and soother.



SERUMS
Deep hydration



MOISTURIZERS
Long-lasting hydration + skin barrier



FACE MASKS
Soothing + hydration



SUNSCREEN & AFTER-SUN PRODUCTS
Soothing + hydration + repairing



BALMS AND OINTMENTS
Soothing + Healing + Reduces scarring



INNOVATION CODIF LABORATORIES

Your Skin, Producer of HERO molecule

"We have developed the first ingredient that enables the skin to synthesise VITAMIN B5 itself, and at the right dose".

SCIENTIFIC WORK 2022 - 2024

Using metabolomics tools, our researchers have demonstrated the capacity of our skin microbiota to produce Vitamin B5 daily from a fermented seaweed extract, at physiological doses.

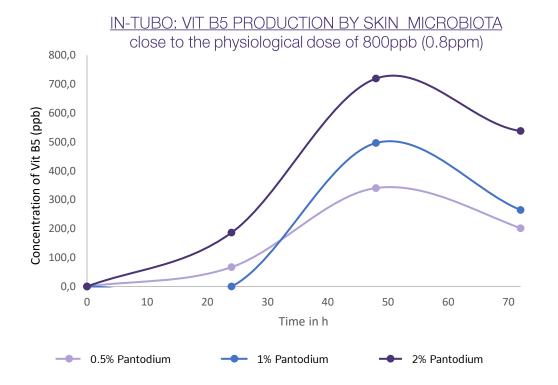
Our microbiota is being transformed into a biotechnological tool. We call this the Skinbiotech Factory.

This discovery represents a revolution in skin regeneration strategies.

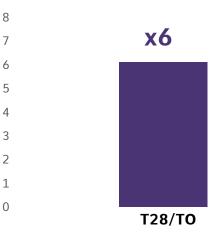




The skin microbiota feeds on Pantodium to produce Vit B5



IN-VIVO: PRODUCTION OF VIT B5 IN THE SKIN T28/T0 comparison after 28 days of application



10

9

T28/TO ratio in Vitamin B5 (ppb)

6X more natural vitamin B5 with Pantodium measured on average on the skin's surface in 28 days

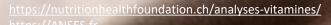
STUDY IN-TUBO IN-VIVO 5%

IN-TUBO PROTOCOL

6 volunteers. Skin microbiota sampled and cultured in a medium supplemented with Pantodium

IN-VIVO PROTOCOL

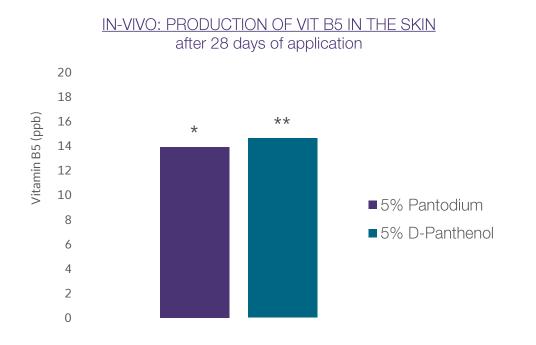
3 volunteers. Hemiface application of 5% Pantodium and 5% D-Panthenol. 2 applications/day for 28 days. Swabing and analysis of Vit B5 content.



https://doi.org/10.3390/nu13030821 https://doi.org/10.4103/2277-9531.106636



The skin microbiota feeds on Pantodium to produce Vit B5 with the same efficacy than D-Panthenol



Pantodium is « panthenol-like » BUT

Secondly, it boosts the properties of the vitamin B5 obtained by +70%.

For a Vit B5 with tenfold powers!!!



STUDY IN-TUBO IN-VIVO 5%

IN-TUBO PROTOCOL

6 volunteers. Skin microbiota sampled and cultured in a medium supplemented with Pantodium

IN-VIVO PROTOCOL

3 volunteers. Hemiface application of 5% Pantodium and 5% D-Panthenol. 2 applications/day for 28 days. Swabing and analysis of Vit B5 content.

https://nutritionhealthfoundation.ch/analyses-vitamines/

https://ANSES.fr

https://doi.org/10.3390/nu13030821

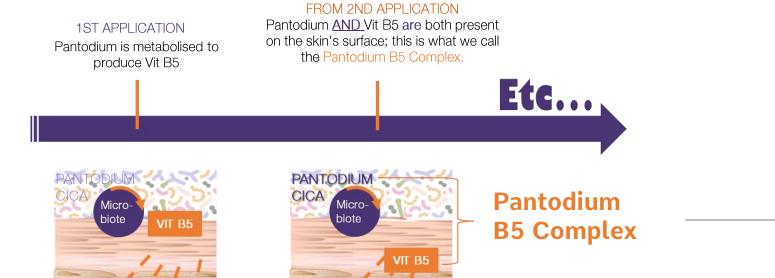
https://doi.org/10.4103/2277-9531.106636



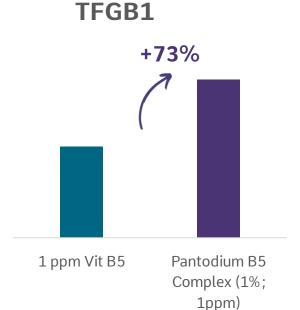
SKINBIOTECH FACTORY

Pantodium: MORE than Panthenol alternative.

Synergy effect, more powerful than Vit B5 alone



Synergistic effect on growth factor





SKINBIOTECH FACTORY

Pantodium versus D-Panthenol

Sourcing advantages versus D-Panthenol



Versus synthetic molecule for D-Panthenol

Benefits of action mechanism versus D-Panthenol

VIT B5
Produced in situ at physiological

SYNERGY EFFECT
With the formation of Pantodium
B5 Complex.

dose

Versus Vit B5 precursor for D-Panthenol

Skin benefits

REGENERATION & REPARATION

HYDRATION - IMPERFECTIONS
- SKIN REACTIVITY - SKIN
QUALITY - HEALING



Sourcing and Inspiration

CODIUM TOMENTOSUM:

A GIANT UNICELLULAR ALGA WITH REGENERATIVE POWERS

Also known as the "Giant Cell" algae, Codium tomentosum belongs to the family of siphonous algae.

Codium tomentosum takes the form of tubes (or siphons) arranged in elaborate networks, all with a single cell.

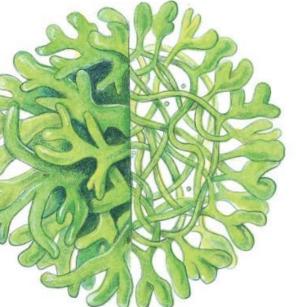
While most plant or animal cells are measured in micrometres, Codium's giant cell is several million times larger.

Codium's capacity for regeneration, i.e. rapid repair of the damaged site, can be explained by the high viscosity of its cytoplasm and rapid closure of its membrane.



Did you say Giant Cell?

If all of Codium's 20g siphons were unrolled and placed endto-end, they would stretch for almost 30km.

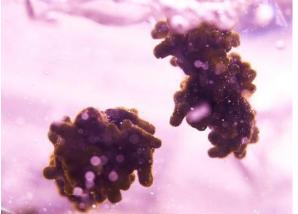




Sourcing and Inspiration

GROWING & HARVESTING - ORGANIC CERTIFICATION
Grown in Aveiro, Portugal by our partner ALGAPLUS.
Initiation of cultures in the laboratory (2-4 weeks)
Outdoor pond culture (11-15 weeks)
Harvested by hand, washed in sea water, dried at 30°c











Transformation process

FERMENTATION USING THE HOLOBIONT

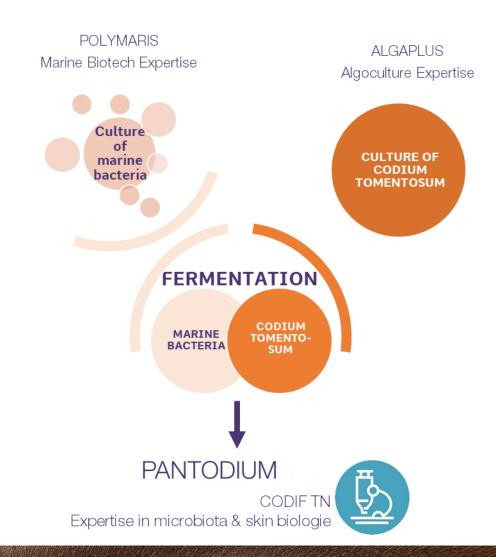
Holobiont refers to algae and all the micro-organisms that live in symbiosis with it.

We have selected a marine bacterium that lives in symbiosis with *Codium tomentosum* to carry out our fermentation stage.

SHARING SKILLS

The development of this ingredient highlights the collaborative work of 3 CODIF Group research centres.

The algae and its symbiotic bacteria are grown separately and then brought into contact during the algae fermentation stage in the bioreactor.





MECHANISM OF ACTION

Regeneration & Repair: biological processes

STRENGTHENING THE DEJ TO PROVIDE BETTER SUPPORT FOR EPIDERMAL REGENERATION

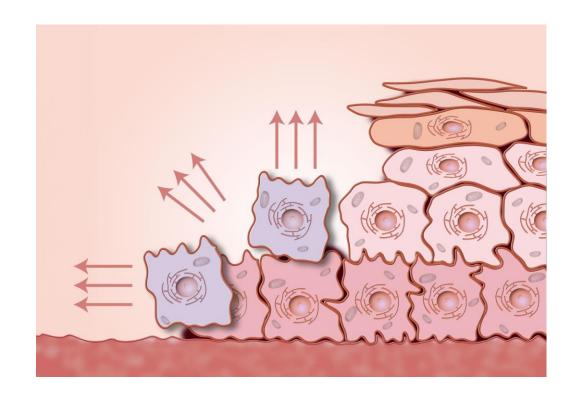
The Dermo-Epidermal Junction (DEJ) is the direct adhesion support for keratinocytes in the skin. Guaranteeing the best quality support improves the epidermal regeneration process.

CELL DIVISION = REGENERATION STAGE

Replaces damaged epidermis by activating the division of keratinocytes via an increase in growth factors.

CELL DIFFERENTIATION = FINISHING STAGE

Stage during which the processes linked to differentiation are activated: synthesis of adhesion proteins, epidermal lipids and components of the cornified envelope.





ACTION ZONES

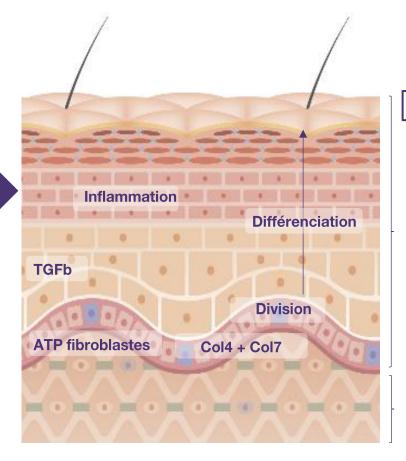
Mechanism of action

FOCUS ON:

- 1- Prepare the regeneration process: importance of DEJ (Col4, Col7, SDC1), growth factors (TGFb)
- 2- Regeneration of the epidermis: division of keratinocytes
- 3- Finishes: differentiation
- 4- Soothing action: inflammatory mediators



- REDUCED WATER LOSSES
- SKIN HYDRATION
- REDUCING REDNESS AND REPAIRING DAMAGED SKIN
- OPTIMISING THE HEALING PROCESS



Corneal layer

Epidermis

Dermal-epidermal junction

Dermis



Pantodium boosts DEJ and increases TGFb





3D culture model of keratinocytes. Gene expression analysis after 24 hours of contact with the product.





Pantodium boosts keratinocyte division

STAGE 1: CELL DIVISION

When they are cultured in a petri dish, the keratinocytes begin by dividing to cover the entire bottom of the dish, forming a cell carpet (horizontal expansion).

After 48 hours of culture, areas without cell mats were still identified in the untreated control.

In contrast, the cell mat obtained after 48 hours of treatment with Pantodium showed smaller, tighter cells, indicating a higher cell density.

Pantodium boosts cell division by 25% compared with the untreated control.

Areas without cell mat



IN-VITRO TEST 0.5%

PROTOCOL

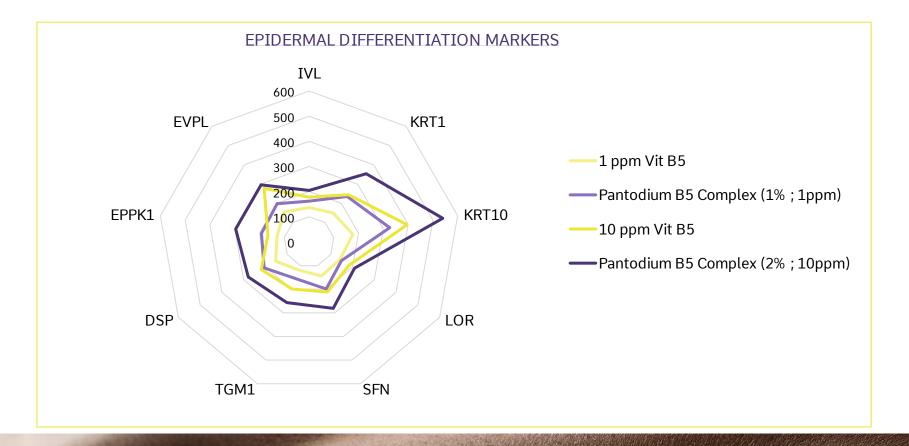
Keratinocyte monolayer culture. Microscopic observations.

cell density

***p<0,001 Student test

3 - CELL DIFFERENTIATION

Pantodium increases cell differentiation factors



IN-VITRO TEST 1 & 2%

PROTOCOL

3D keratinocyte culture model. Gene expression analysis.

IVL: Involucrine KRT1: Keratin 1 KRT10: Keratin 10 LOR: Loricrine SFN: Stratifine TGM1: Trans-Glutaminase 1

DSP: Desmoplakine EPPK1: Epiplakin 1 EVPL: Envoplakine



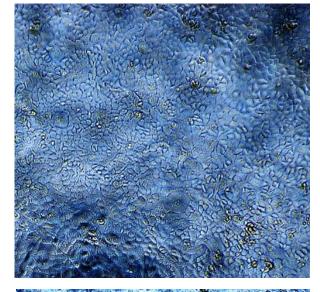
Pantodium boosts keratinocyte differentiation

Once the keratinocytes have formed an attractive cell carpet, they begin to differentiate to reconstitute an epidermis with several cell layers (vertical expansion).

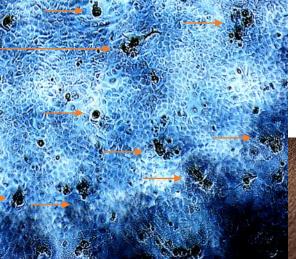
After 96 hours in culture, the Pantodium -treated culture showed much darker areas of cells, indicating the accumulation of several layers of cells and therefore evidence of ongoing differentiation.

In contrast, the untreated control showed no cell clusters characteristic of the differentiation process.

Pantodium boosts the epidermal differentiation process.



Clusters of differenciated keratinocytes



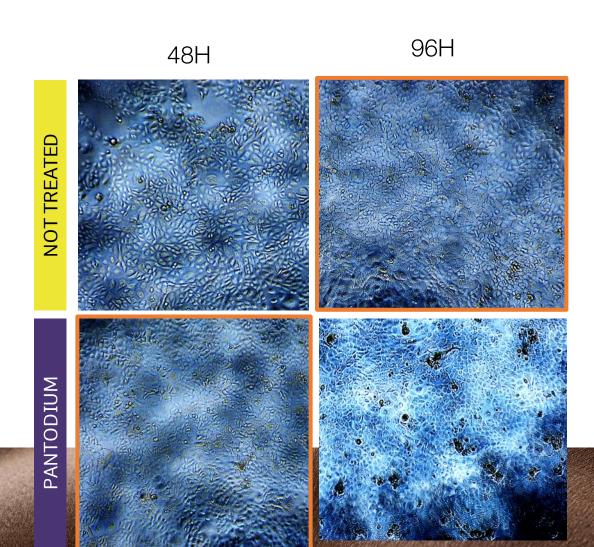
I- PANTODIUM

96H- NOT TREATED

Pantodium boosts the skin's regeneration process

Pantodium boosts the epidermal regeneration process by acting on both cell division and differentiation.

In 48 hours, Pantodium helps to reach a phase of the regeneration process that normally takes 96 hours.

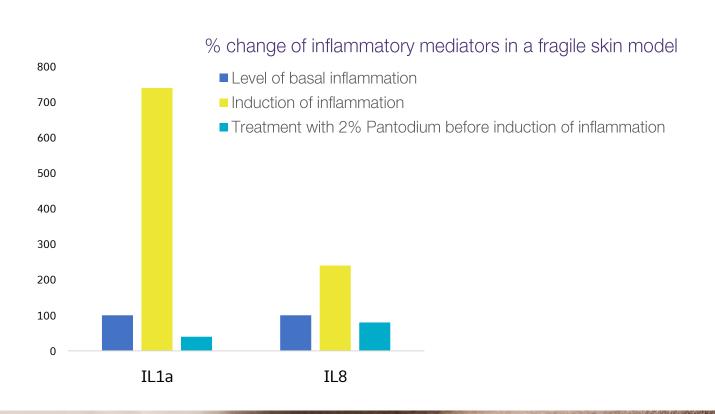


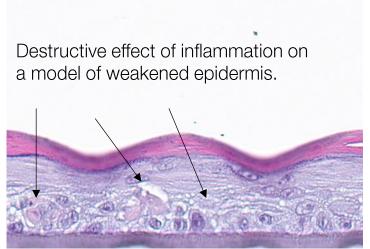
PROTOCOL

Keratinocyte monolayer culture. Microscopic observations.

IN-VITRO TEST 2% - 24H

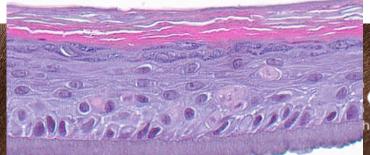
Pantodium protects fragile skin from inflammation





PROTOCOL Reconstituted fragile human epidermis model (with immature barrier function), treated with or without Pantodium for 14 hours and then exposed to an SLS solution for 6 hours to generate inflammation. Quantification of IL1a and IL8 by ELISA assay.

Protective effect of Pantodium under the same conditions.





IN VIVO STUDY

Benefits of Pantodium for daily &

Optimum hydration

For all kind of skin

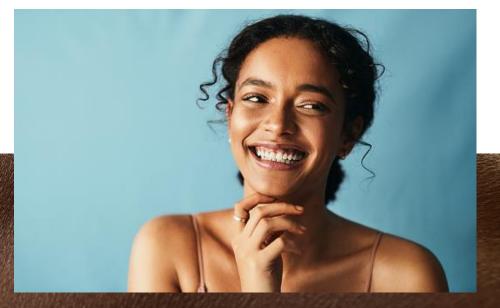
To use from 0.5% to 1% depending on skin dryness



SERUMS
Deep hydration



MOISTURIZERS
Long-lasting hydration + skin barrier



IN VIVO TEST 0.5 & 1% 7 DAYS

Hydration & Regeneration of the barrier function



25 volunteers 18-65 years



Dry skin



- 0.5% PANTODIUM
- 1% PANTODIUM
- PLACEBO



PARAMETERS ANALYSED

- Moisturising effect measured by corneometry
- Restructuring/repair effect by measuring Trans-Epidermal Water Loss after destructuring the skin barrier (SLS patch).



Technologie naturelle

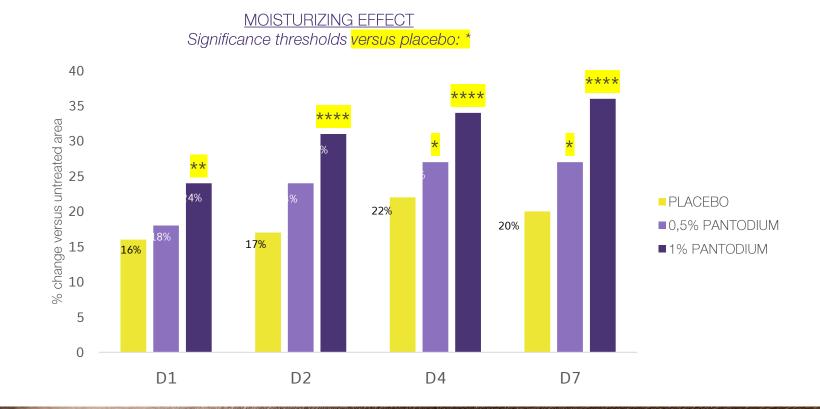
Pantodium moisturises dry skin

0.5% Pantodium

- versus untreated area: significant hydration at D1*, D2*, D4** and D7**
- versus placebo: significant hydration at D4* and D7*

1% Pantodium

- versus untreated area: significant hydration at D1*, D2**, D4** and D7**
- versus placebo: significant hydration at D1**, D2****, D4**** and D7****





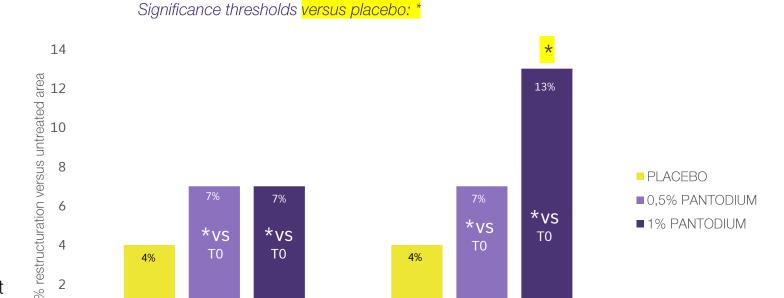
Pantodium restructures and repairs dry skin

0.5% Pantodium

- versus untreated area: significant restructuring effect at D2* and D7*
- versus placebo: non-significant restructuring effect

1% Pantodium

- versus untreated area: significant restructuring effect at D2* and D7*
- <u>versus placebo</u>: significant restructuring effect at D7*



D7

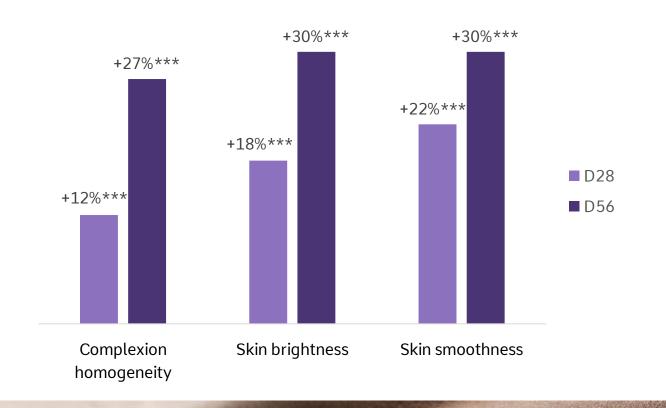
RESTRUCTURING EFFECT

D2



IN VIVO TEST 1% 56 DAYS

Pantodium improves skin quality





60 volunteers - 18-65 years



visible imperfections, uneven skin texture

PARAMETERS ANALYSED

- Inclusive study carried out in South Africa and China
- 20 Caucasian subjects + 20 African subjects + 20 Asian subjects
- Scoring of skin benefits by volunteers using a scale numbered from 1 to 6

IN VIVO STUDY

Benefits of Pantodium for Sensitive & fragile skins

For any kind of skin; at any age. To use at 1%.



MOISTURIZERS
Long-lasting hydration + skin barrier



FACE MASKS
Soothing + hydration



SUNSCREEN & AFTER-SUN PRODUCTS
Soothing + hydration + repairing



HOME USE TEST

Repair of sensitive and damaged skin





60 volunteers 18-65 years



Damaged skin (acne scars, visible imperfections, uneven skin texture)



1% Pantodium



PARAMETERS ANALYSED

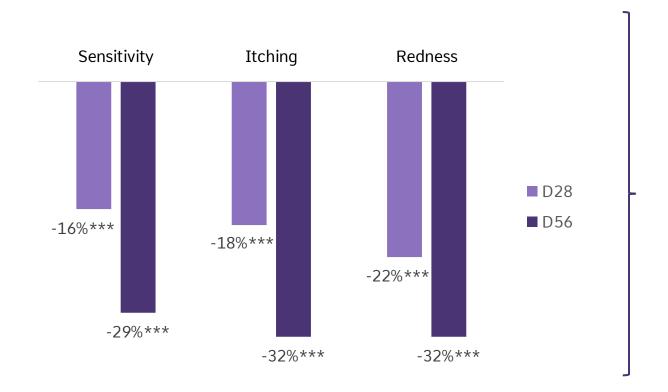
- Inclusive study carried out in South Africa and China
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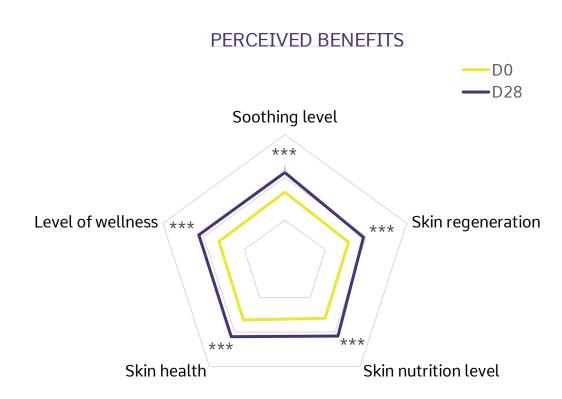


HOME USE TEST

IN VIVO TEST 1% 56 DAYS

Pantodium soothes sensitive and reactive skin

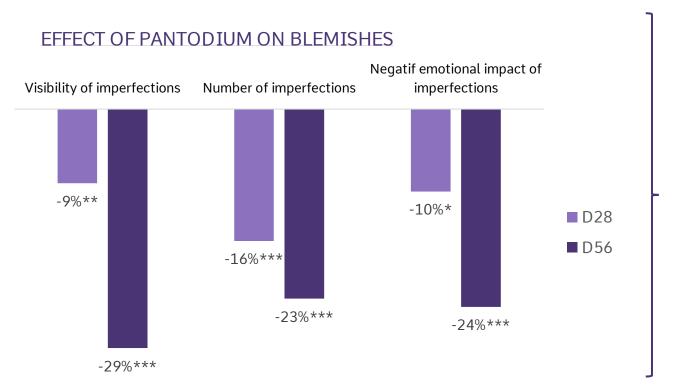




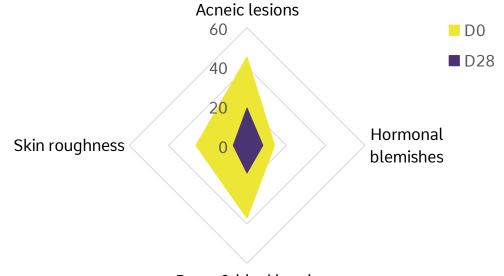


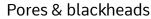
IN VIVO TEST 1% 56 DAYS

Pantodium reduces blemishes



DETAILS OF VISIBLE IMPERFECTIONS AND NUMBER OF SUBJECTS WITH THESE IMPERFECTIONS

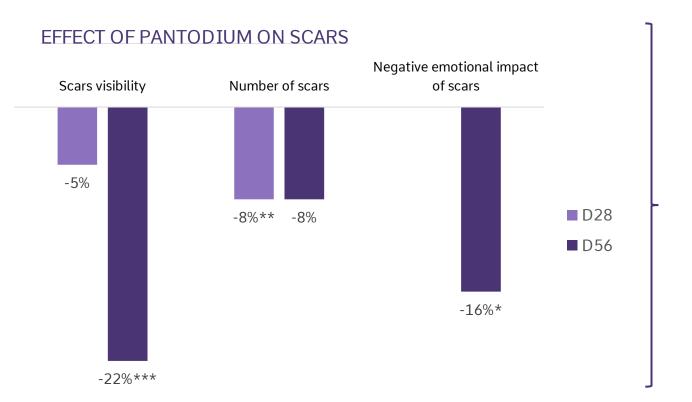




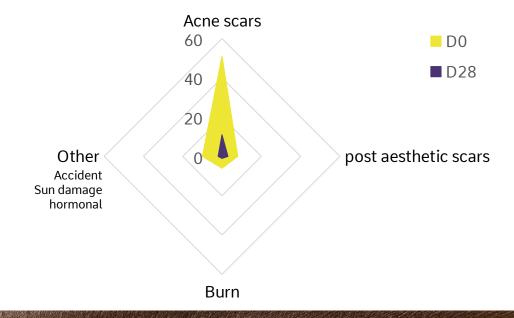


IN VIVO TEST 1% 56 DAYS

Pantodium reduces scarring



DETAILS OF SCARS AND NUMBER OF SUBJECTS WITH SCARS

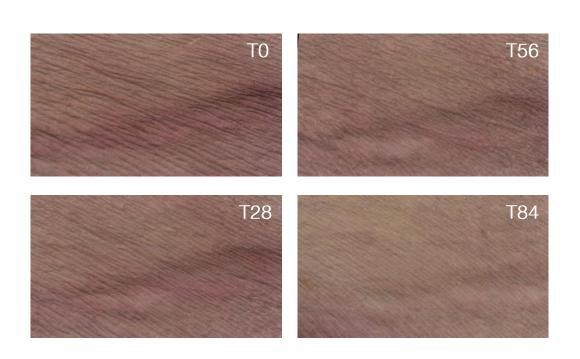




CLINICAL STUDY

IN VIVO TEST 2% 84 DAYS

Visualization of the benefits of Pantodium on damaged skin





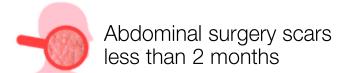




IN VIVO STUDY

Benefits of Pantodium For damaged skins











CLINICAL STUDY

Improved healing process

IN VIVO TEST 2% 84 DAYS

Benefits with placebo









Benefits with Pantodium









TO FORMULATE FROM 0.5 TO 1% IN A DAILY SKIN CARE

To moisturise dry skin, soothe sensitive skin and maintain a healthy, glowing complexion

PANTODIUM

TO FORMULATE AT 1% IN A CREAM FOR FRAGILE AND SENSITIVE SKINS

To erase imperfections, acne scars and irregularities.

TO FORMULATE AT 2% IN A REPAIRING BALM

To improve the skin's healing process.



Scientific communications



IFSCC 2022

Application of metabolomics for cosmetics. CODIF International



IFSCC 2023

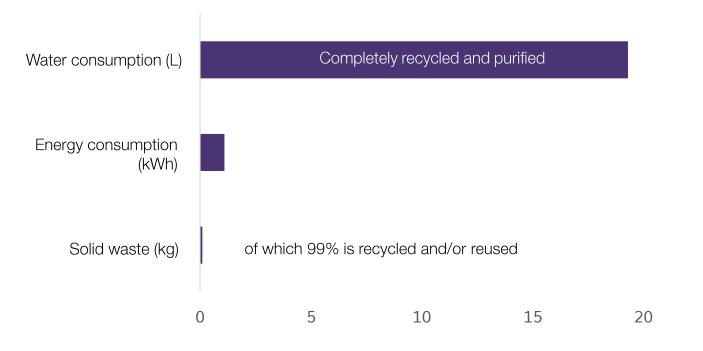
Demonstration of vitamin-b5 production by skin microbiome using in-vivo metabolomics.

CODIF International



Good for the planet

ENVIRONMENTAL INDICATORS FOR 1KG OF MANUFACTURED ACTIVE INGREDIENT



PANTODIUM CICA PENT

NC: 90%

NOC: 100% OC: 20,25%

OOC: 20,25%

NC : Natural Content

NOC: Natural Origin Content

OC : Organic Content

OOC : Organic Origin Content



25

Pantodium

PANTODIUM CICA

ORIGIN







Fermented cultivated seaweed

Biotech extract

BENEFITS



Stimulates the production of Vit B5 by the skin's microbiota

Boosts epidermal regeneration processes

TARGETS



Mature skin
Sensitive skin
Damaged skin

TRAINING



Water-soluble

T°: up-to 80°C

pH: 3-7,5

%: 0.5-2%

Formulation guide available on request

INCI

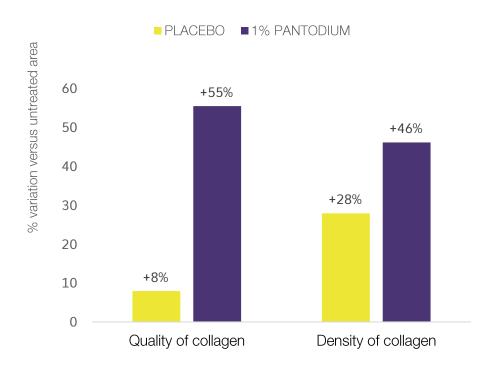
Codium tomentosum extract (and) Seawater (and) Pentylene glycol.

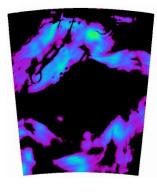
% USE 0.5 -2%

COSMOS ORGANIC CERTIFICATION

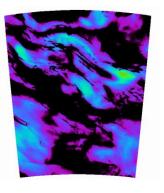


Pantodium improves the density and structural organisation of the Extra-Cellular Matrix

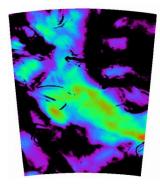








D7 PLACEBO



D7 1% PANTODIUM

PROTOCOL

Human skin explants from a 38-year-old donor. Topical application of Pantodium 1% on D1, D3 and D5. Qualitative analysis of dermal tissue organisation on explants at D7. KAMAX technology.



PANTODIUM Natural VIT B5

produced by your own skin

