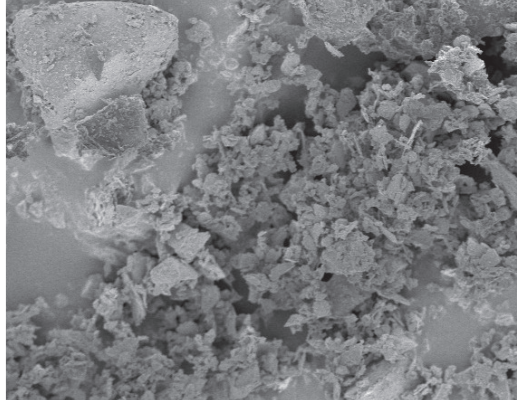


GENERAL  
PRESENTATION  
2021







# ORIGINS



**214 million years ago**, the Canadian Shield absorbed the impact of a meteorite that fell in what is now the Manicouagan region of Quebec and left a colossal imprint on the Earth's surface.

Over the course of the next eight glacial periods, igneous rock altered by that incredible force was naturally refined.

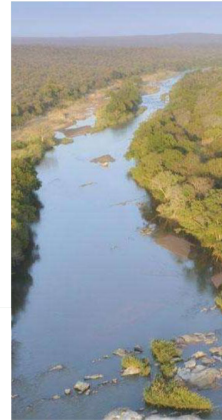
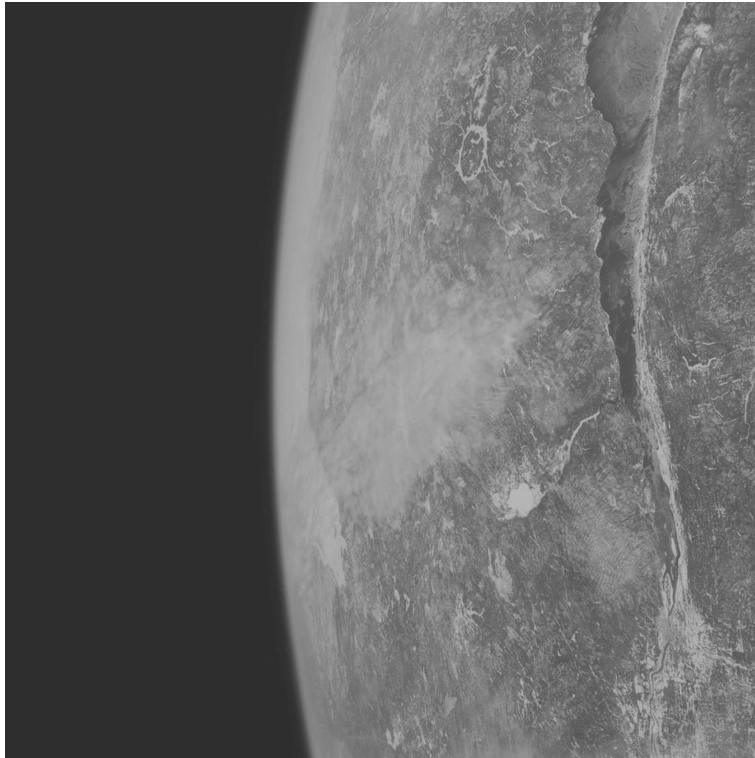
Movements of immense blocks of ice on the ground caused erosion and sediment deposits spread by way of all the friction.

The Goldthwait Sea, once home to a unique, rich ecosystem, gradually subsided around 12,000 years ago. The rocks, broken down into tiny particles, were carried to the Saint Lawrence River and, over the course of millennia, plied up into strata of sediments.

In this way, clay colloids measuring just five microns in diameter were formed.

*The mineral and chemical composition of Manicouagan Sea Minerals™ mud can be explained partly by the erosion and sediment deposits, which the Manicouagan and Outardes rivers have carried down to the peninsula over the course of millions of years.*

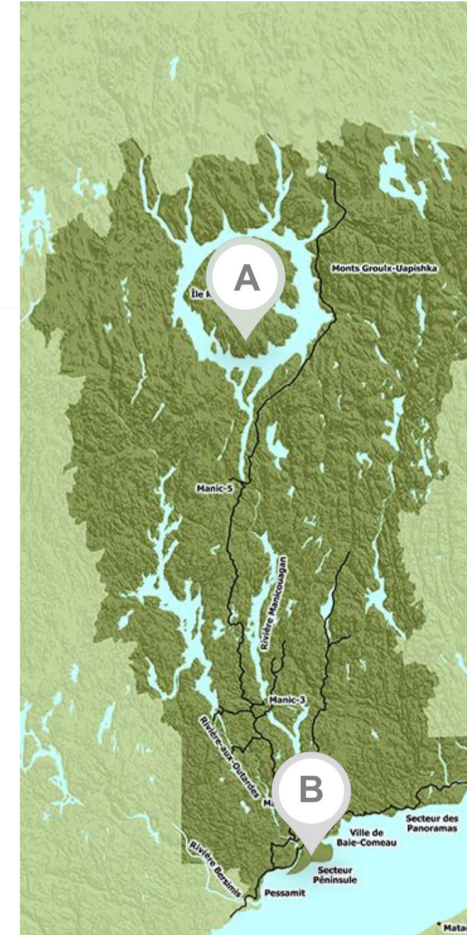
# MUD FORMATION



Outardes River



Goldthwait Sea

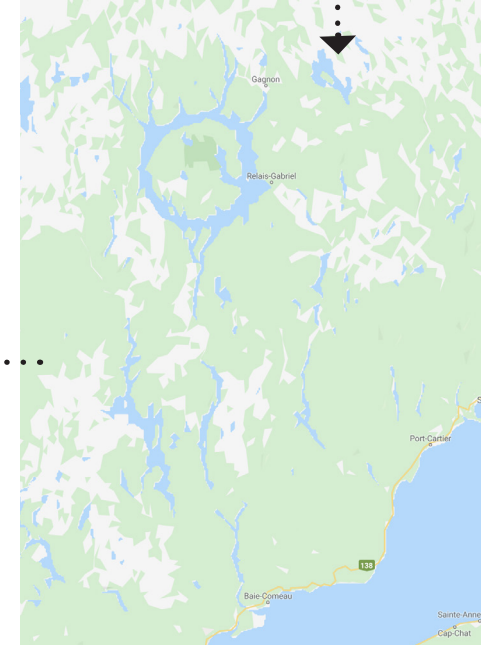
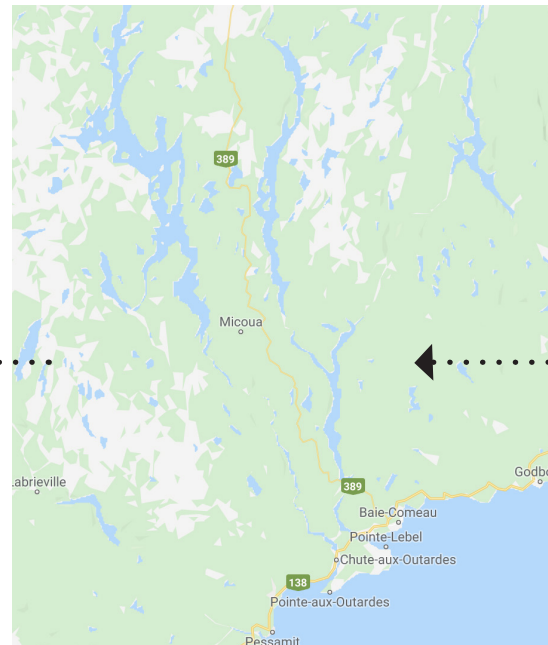
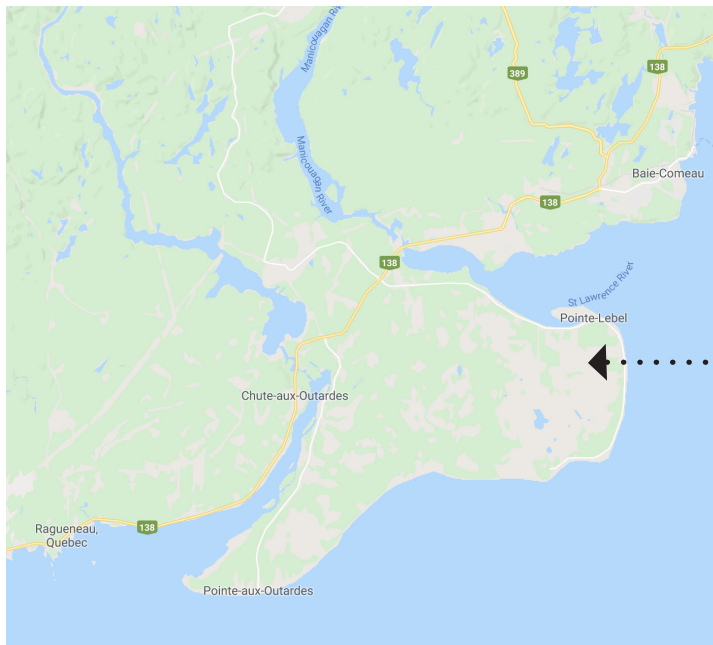
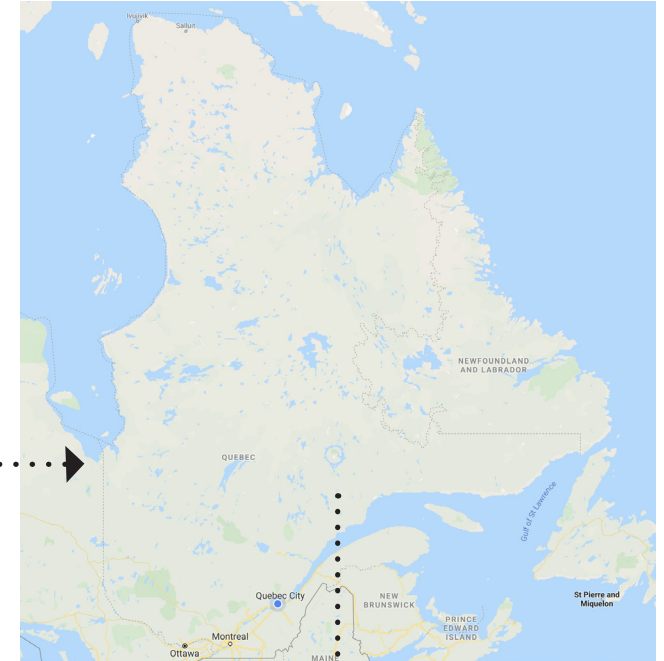


A - Manicouagan reservoir

B - Pointe-aux-Outardes



# GEOGRAPHICAL HISTORY







# HISTORY

In 1931, the Boulianne originally from Jonquière in southern Quebec, arrived on the shores of the Manicouagan peninsula by boat to colonize the Côte-Nord region of Quebec.

During their daily routine, the Bouliannes noticed that their horses would roll around in the clay if they suffered insect bites or even cuts or swelling.

The Bouliannes took up this simple instinct and got into the habit of administering the same treatment upon themselves. Clay-based treatments have actually been employed for countless generations by native cultures in the surrounding area, such as the Innu.

Three thousand years ago on the other side of the Atlantic, clay was used to treat inflammations, fractures and skin ulcers. Its antiseptic powers had already been recognized back then.

*In 2010, the original small-scale factory was revamped into a highly equipped modern processing plant with a cleanroom.*

*Manicouagan Minerals™ clay is made from 100% natural clay and contains more minerals, in higher concentrations, than clay from the Dead Sea.*





# DEPOSITS



The mineral-rich mud is extracted from under a layer of peat in the Manicouagan Peninsula along the edge of the Saint Lawrence River.

Mining always takes place during the winter, in order to conserve and protect the external environment as well as possible. Respecting the environment will be a primary concern of Manicouagan Mineral™, with a view to sustainable development.

The thick layer of peat is placed aside to enable cleaner extraction of the clay mud. Once extraction is complete, the layer of peat is put back in place, such that the mining process leaves 'zero footprint'.

It is important to note that the machinery used for mining is always lubricated with vegetable oils or grease, never with chemical hydraulic grease.

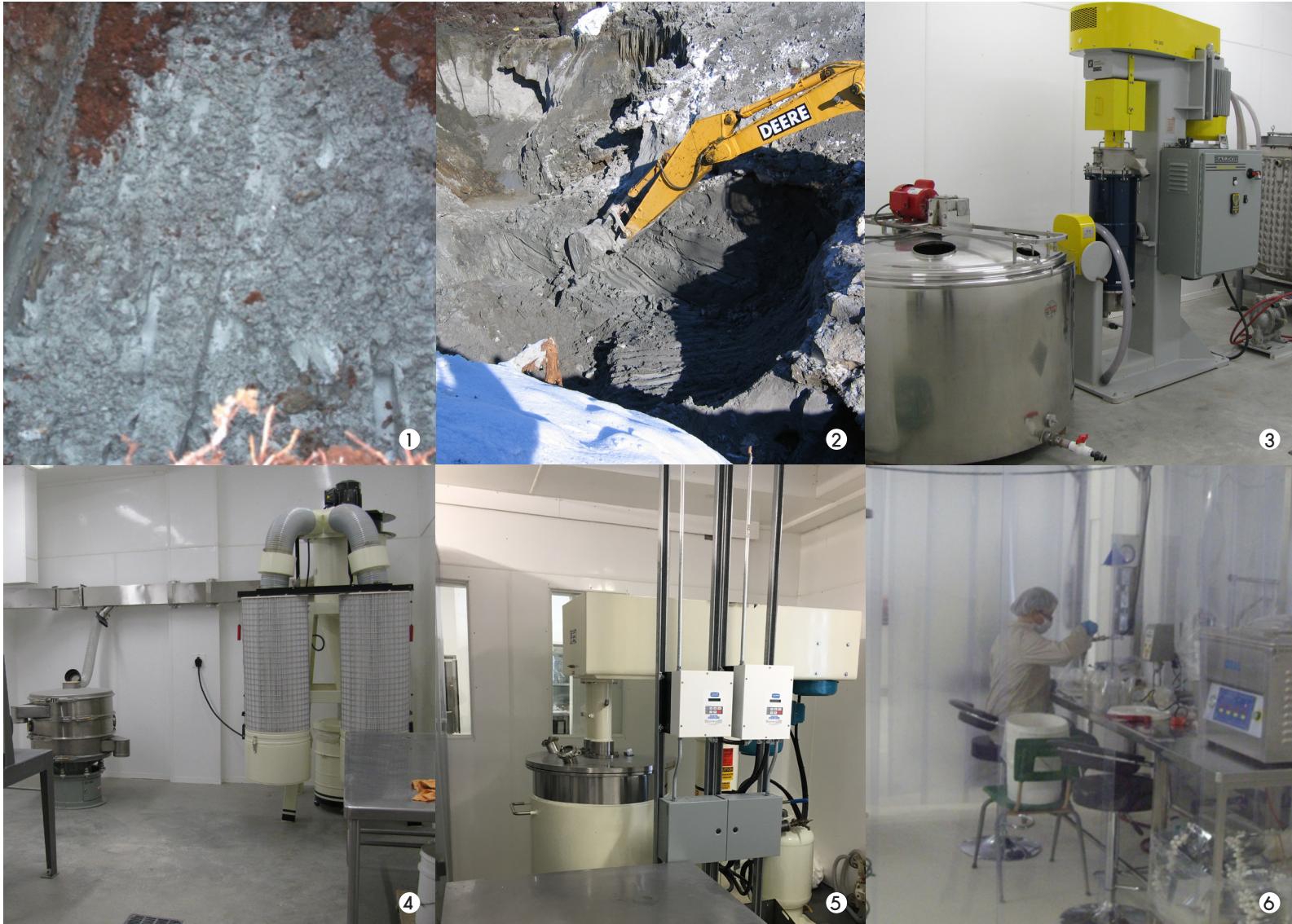
The mineral-rich mud is mined by AEM Lab, which since 2007 has held the Manicouagan-Uapishka UNESCO Biosphere Reserve's seal as a **certified environmentally responsible business**.

*This deposit of mineral marine mud is one of only a few known worldwide. It extends over more than 15 square kilometers and is naturally protected by a thick layer of peat.*

*The mud is therefore free of pollutants, unlike other known deposits.*



# EXTRACTION & PRODUCTION PROCESS



1: raw clay, 2: clay extraction, 3: mud grinding, 4: powder grinding, 5 & 6: sterilization and packaging



# SYNTHESIS OF MATTER

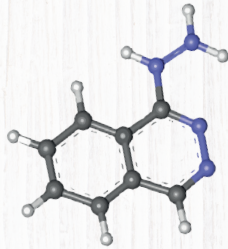


## MINERALS & CHEMICAL ELEMENTS

Rich in silicon dioxide ( $\text{SiO}_2$  59.80%), aluminum oxide ( $\text{Al}_2\text{O}_3$  16.20%), iron oxide ( $\text{Fe}_2\text{O}_3$  6.25%), iron (Fe 39100<sup>(1)</sup> ppm), calcium (Ca 30600<sup>(1)</sup> ppm), sodium (Na 33141<sup>(2)</sup> ppm), potassium (K 21751<sup>(2)</sup> ppm), magnesium (Mg 15970<sup>(2)</sup> ppm), zinc (Zn 66,2<sup>(1)</sup> ppm)

<sup>(1)</sup>Neutron Activation Analysis (NAA)

<sup>(2)</sup>Inductively Coupled Plasma (ICP)



## ORGANIC MATTER

Contains humic acid, chlorophyll, carotenoids, phycocyanin, phycoerythrin



Before  
(eczema & rashes)



After  
(7 days cure)



## MUD FORMATION

Meteorite impact 214 million years ago  
Air-glaciers  
The Goldthwait Sea



## MIXED WATERS

Since ice periods,  
enriched with mineral salts

## MINERAL CLAY

It exfoliates - moisturizes - revitalizes - cleanses skin deeply - helps stimulate circulation - helps wounds heal - regenerates - helps eliminate toxins.



MINERAL COMPOSITION							CHEMICAL COMPOSITION
Mineral	Quartz	Albite	Illite	Hornblende	Chlorite	Apatite	
Proportions (%)	21,36	29	31,16	15,06	1,5	0,5	100
SiO <sub>2</sub>	100	68	34	51	30	-	59,80
Al <sub>2</sub> O <sub>3</sub>	-	20	30	5	20	-	16,20
Fe <sub>2</sub> O <sub>3</sub>	-	-	18	3	16	-	6,25
MgO	-	-	2	15	22	-	3,34
CaO	-	-	-	24	1	58	3,92
Na <sub>2</sub> O	-	12	1	-		-	3,80
K <sub>2</sub> O	-	-	9	-	-	-	2,81
TiO <sub>2</sub>	-	-	2	-	-	-	0,66
P <sub>2</sub> O <sub>5</sub>	-	-	-	-	-	42	0,21
PAF	-	-	4	2	11	-	1,78



# CHEMICAL COMPOSITION

An oxide (**metallic** ou **non-metallic**) is un chemical compound resulting from the association of an oxygen atom and an atom of another element (**metallic** ou **non-metallic**).

## Silicon dioxide– Silica – $\text{SiO}_2$ - (59,80%)

The most abundant oxide in the earth's crust.  
Cosmetic applications: abrasive agent, absorbent agent, opacifier...

## Aluminum oxide -Alumina – $\text{Al}_2\text{O}_3$ (16,20%)

The 2nd most abundant oxide in the earth's crust  
Cosmetic applications: abrasive agent, absorbent agent, opacifier..

## Iron oxide (III) – $\text{Fe}_2\text{O}_3$ (6,25%)

Also called ferric oxide, hematite or Indian red.  
It is a 100% natural red pigment that has excellent UV resistance.

## Calcium oxide- $\text{CaO}$ (3,92%)

Cosmetic application : pH stabilizer.

## Sodium oxide- $\text{Na}_2\text{O}$ (3,80%)

Cosmetic application : pH stabilizer.

## Magnesium oxide – Magnesia - $\text{MgO}$ (3,34%)

Cosmetic applications: absorbent agent, pH stabilizer, opacifier.

## Potassium oxide– $\text{K}_2\text{O}$ (2,81%)

Cosmetic application : pH stabilizer.

## Titanium dioxide – $\text{TiO}_2$ (0,66%)

Cosmetic applications: opacifier, UV absorber, white colorant.

## Phosphorus pentoxide– $\text{P}_2\text{O}_5$ (0,21%)

Cosmetic application : pH stabilizer.

## Manganese dioxide– $\text{MnO}$ (0,09%)

Cosmetic application: UV absorber

## Chromium oxide– $\text{Cr}_2\text{O}_3$ (0,02%)

Cosmetic application: green colorant



# THE BENEFICIAL CHEMICALS ELEMENTS

## Micro-elements

- Mineral substances (extracted from the earth).
- Our body needs it => successful functioning.
- Necessary doses: slight => this is what distinguishes them from mineral salts, present in greater quantities in the human body.

### Manganese (Mn)

601 ppm <sup>(2)</sup>

### Copper (Cu)

24 ppm <sup>(2)</sup>

### Brome (Br)

0.72 ppm <sup>(1)</sup>

- Well-known antimicrobial agents.

### Chromium (Cr)

130 ppm <sup>(2)</sup>

- Beneficial contribution of chromium to diets: reduces hunger and sugar cravings.

### Strontium (Sr)

468 ppm <sup>(1)</sup>

- Naturally present in rocks, soil, water, air.
- Used in homeopathic medicines.

### Iron (Fe)

39100 ppm <sup>(1)</sup>

- Important in preventing infections and also in strengthening the immune system.

### Zinc (Zn)

66,2 ppm <sup>(1)</sup>

- micro-element
- rebalancing, soothing and purifying properties.

## Mineral salts

- Come from the rocks
- Necessary for the functioning of our body

### Sodium (Na)

33141 ppm <sup>(2)</sup>

- 1st mineral salt of our body.
- plays an important role in the body's hydration status.

### Potassium (K)

21751 <sup>(2)</sup> ppm

- 4th mineral of our organism.
- acts on the proper functioning of the kidneys.
- essential for **muscle contraction** and **heart muscle contraction**.

### Magnesium (Mg)

15970 ppm <sup>(2)</sup>

- 3rd mineral of our organism.
- Alleviates fatigue
- Recommended for the treatment of acne and psoriasis.
- Fighting itch and skin inflammation

### Calcium (Ca)

30600 ppm <sup>(1)</sup>

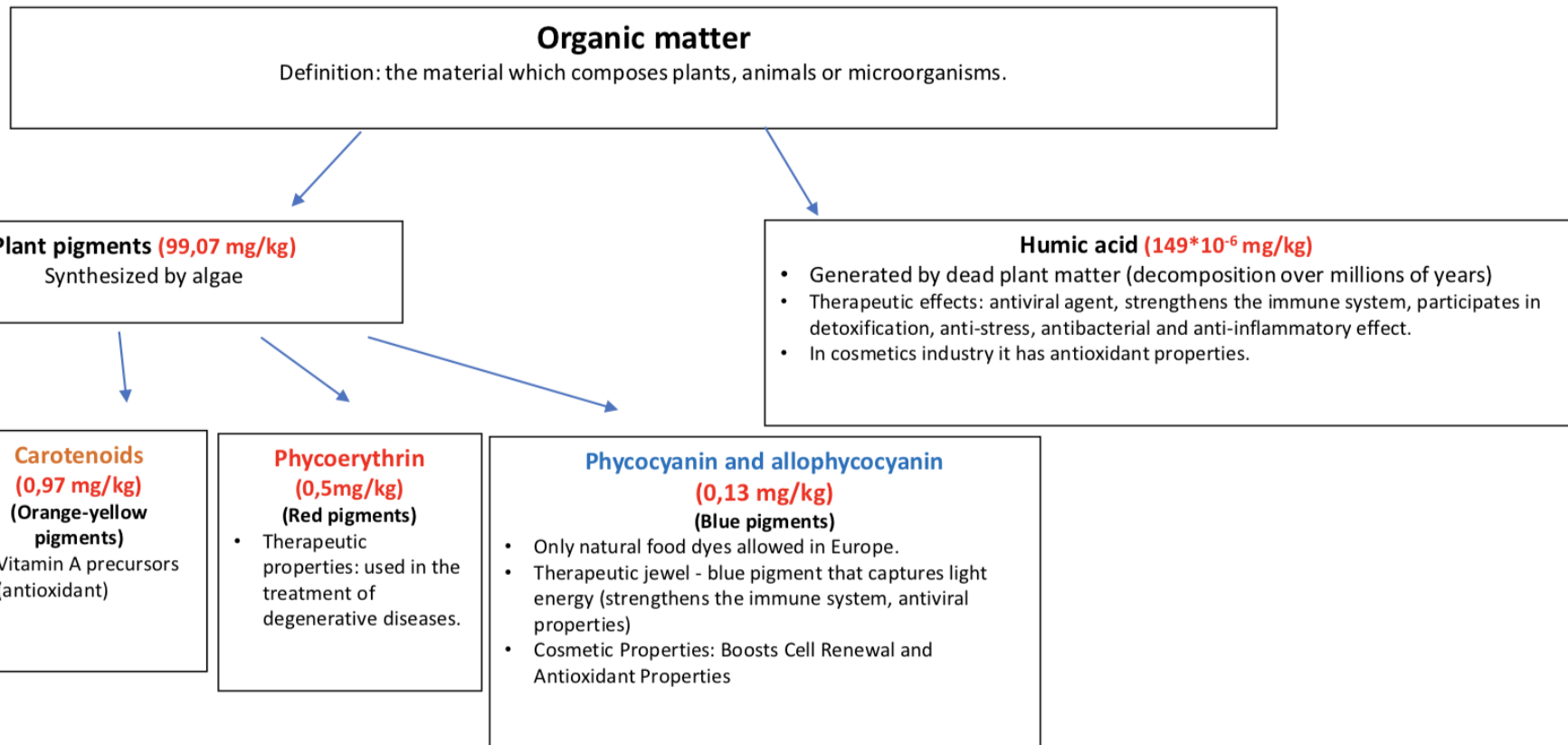
- 2nd mineral salt of our body.
- ensures the strength of the skeleton.
- helps to restore the skin deeply, protect the upper layers of the skin and promote lipid synthesis for better hydration.
- strengthens the skin's natural barrier and protects it.

(1) Neutron Activation Analysis (NAA)

(2) Inductively Coupled Plasma (ICP)



# ORGANIC MATTER





# MINERAL CLAY'S CHEMICAL ELEMENTS COMPARISON

Chemical elements (ppm)	Jeju volcanic ash	Manicouagan sea mud	Dead sea mud (datas to be confirmed)
Fe	35200	<b>39100</b> <sup>(1)</sup>	1,55
Ca	<b>34800</b>	30600 <sup>(1)</sup>	2050
Na	29700	<b>33141</b> <sup>(2)</sup>	22000
K	7600	21751 <sup>(2)</sup>	<b>180000</b>
Mg	22200	15970 <sup>(2)</sup>	115000
Sr	/	<b>468</b> <sup>(1)</sup>	37.5
Cr	/	<b>130</b> <sup>(2)</sup>	<1
Zn	/	66,2 <sup>(1)</sup>	<b>95</b>
Al	70100	<b>75948</b> <sup>(2)</sup>	/
Cu	/	<b>24</b> <sup>(2)</sup>	<1
Mn	/	<b>601</b> <sup>(2)</sup>	<1
Br	/	0.72 <sup>(1)</sup>	<b>5186</b>
(1) Neutron Activation Analysis (NAA)		(2) Inductively Coupled Plasma (ICP)	

1 ppm = 1mg/kg  
1 mg/g = 1000 ppm  
0,0001% = 1 ppm

Chemical composition (%)	Jeju volcanic ash (South of Korea)	Manicouagan sea mud (Canada)	Périgord Clay (France)	Ash (Japan)	Dead sea mud	Mud (South of Italia)	Mud (San Juan Argentina)
SiO <sub>2</sub>	53,6	59,80	56,73	58,6	24,50	60,1	<b>66,00</b>
TiO <sub>2</sub>	<b>2,06</b>	0,66	/	/	1,04	0,16	0,04
Al <sub>2</sub> O <sub>3</sub>	13,6	16,20	16,77	<b>17,4</b>	7,32	15,9	15,5
Fe <sub>2</sub> O <sub>3</sub>	10,7	6,25	5,76	<b>12,5</b>	2,96	3,5	1,5
MgO	<b>6,96</b>	3,34	2,09	1,1	5,96	5,0	3,2
CaO	<b>7,76</b>	3,92	4,70	3,6	<b>15,82</b>	3,6	1,02
Na <sub>2</sub> O	3,12	<b>3,80</b>	/	<b>0,5</b>	2,50	0,19	1,90
K <sub>2</sub> O	/	<b>2,81</b>	/	1,00	2,15	0,9	0,5
P <sub>2</sub> O <sub>5</sub>	/	<b>0,21</b>	0,032	/	/	/	0,02

# SYNTHESIS OF WATER

## Micro-elements

- Mineral substances (extracted from the earth).
- Our body needs it => successful functioning.
- Necessary doses: slight => this is what distinguishes them from mineral salts, present in greater quantities in the human body.

### Iron (Fe)

- **306.17 ppm**
- Important in preventing infections and also in strengthening the immune system.

## Mineral salts

- Necessary for the functioning of our body

### Sodium (Na)

- **79724 ppm**
- 1st mineral salt of our body.
- plays an important role in the body's hydration status.

### Potassium (K)

- **2714 ppm**
- 4th mineral of our organism.
- acts on the proper functioning of the kidneys.
- essential for **muscle contraction** and **heart muscle contraction**.

### Magnesium (Mg)

- **2581.97 ppm**
- 3rd mineral of our organism.
- Alleviates fatigue
- Recommended for the treatment of acne and psoriasis.
- Fighting itch and skin inflammation

### Calcium (Ca)

- **1326.26 ppm**
- 2nd mineral salt of our body.
- ensures the strength of the skeleton.
- helps to restore the skin deeply, protect the upper layers of the skin and promote lipid synthesis for better hydration.
- strengthens the skin's natural barrier and protects it.

= > Contains a variety of mineral salts such as sodium, calcium, potassium and magnesium. These are highly sought-after elements for body care and treatment. For example, the softening and firming of the skin with calcium.



# EFFICACY/PROPERTIES COMPARISON

<b>Product efficacy</b>	<b>Jeju volcanic ash</b>	<b>Manicouagan sea mud</b>	<b>Périgord Clay</b>	<b>Dead sea mud</b>
Sebum control	X	X	X	
Pore care	X	X		
Skin soothing		X	X	
Soft peeling (exfoliating)	X	X		
Healing properties		X	X	
Psoriasis/eczema treatment		X		X
Whitening		X		
Cleansing properties	X	X	X	
Reduce inflammation (muscles and joints)		X		X
Absorb odours		X		
Eliminates skin toxins (Detoxifies)		X	X	
Regenerating		X		X
Moisturising	X	X		X
Revitalizing		X		X
Anti-age/Antioxidant		X		



# MINERAL CLAY PROPERTIES



Manicouagan Minerals™ marine mud forms a silicate mineral complex composed of clay, water, and various minerals.

It is very rich in minerals, micronutrients and organic matter, which nourish the skin and stimulate the epidermis.

The humic acid content in Manicouagan Minerals™ clay also facilitates micro-circulation, strengthens the system and provides anti-stress, antibacterial and anti-inflammatory effects. As a cosmetic, it is used for its antioxidant qualities.

Chlorophyll, carotenoids, phycoerythrin, and phycocyanin are all substances with antioxidant, detoxifying and anti-aging properties, making this mineral-rich mud an outstanding, unique skin treatment.

A high concentration of oxides gives the mud exfoliating properties, which enhances its effectiveness.

## 100% natural mineral clay

Manicouagan Minerals™ is not processed and has 100% natural origins.

Consumers are increasingly seeking natural alternatives.



**COSMOS  
APPROVED**







## CLEANSING

Silicon and magnesium oxides in the mud react with and absorb grease on the skin, to help it dissolve in water. Electrically charged particles facilitate the elimination of accumulated sebum and dirt particles. The skin thus regains elasticity and a clearer tone.

## EXFOLIATING

Mechanic actions effectively purge dead cells from the surface of the skin.

## MOISTURIZING

The interstitial water contained in the clay hydrates cells on the skin's surface. This causes a firming and rejuvenating sensation in the skin.

## REVITALIZING

The mud contains micronutrients like sodium, calcium, iron, potassium, and zinc. When the skin absorbs these substances, they help beautify the epidermal layers.

## STIMULATING

The clay stimulates the epidermis, allowing it to retouch any visible signs of skin aging.



# POULTICE & RELIEF



## IT HELPS REDUCE INFLAMMATION

As it dries, the marine clay can also soak up excess water with its absorbing power. It's a balancing phenomenon where water flows towards the most deficient areas, and this counteracts inflammations. The tissues tighten up and secretions are flushed out.

## IT HELPS STIMULATE CIRCULATION

Thanks to an evaporation process, as well as through the transfer of water content to the cells it comes in contact with if those cells are water-deficient. In fact, when the marine clay dries out on the skin, it causes a loss of heat in the area. To compensate, blood flows toward the area. In this way, the skin feeds off of the sea salts, minerals, and water in the clay.

## IT HELPS ELIMINATE TOXINS

Manicouagan marine clay contains fine particles that are electrically charged, much like the static electricity we experience when brushing our hair. We have all noticed that hair is attracted by the brush. Similarly, the electrically charged particles in the clay attract toxins, many of which have opposite electrical charges. The sensitive marine clay can therefore stabilize these toxins and flush them out of the biological system.

## IT HELPS WOUNDS HEAL

The marine clay forms an air permeable bandage. Its antitoxic attributes filter impurities from the air and, at the same time, the clay lets oxygen through, which is essential to the healing process and the formation of new cells. Healing can even occur without leaving a mark, according to people who have already tried out Manicouagan marine clay.



# RESEARCH & DEVELOPMENT

Over \$ 2 million has been invested in research and development.

Manicouagan clay has aroused incredible interest among researchers. Canadian universities and colleges, as well as private and government research centers, are studying its beneficial properties.

A clinical study on hydration efficacy was launched in May 2019. See the summary of this study below.



\*7-day treatment with Manicouagan clay used overnight.

# CLINICAL STUDY SUMMARY

## Evaluation of the hydration efficacy \*

*\*under dermatological control*

Study made by ZURKO RESEARCH S.L. from 07/23/2019 to 09/02/2019



## SUMMARY OF THE STUDY

- **Product type:** Manicouagan clay.
- **Experimental area:** face, arms, legs, foot and hands.
- **Panel:** 20 volunteers with very dry skin, scaly skin
- **Duration of the study:** 14 days with dermatological and clinical controls (at D0, D+3, D+7, D+14)
- **Frequency of use:** Daily
- **Study objectives:** To determine the improvement capacity of dehydrated skin after the application of Manicouagan mud.

# RESULTS - DERMATOLOGICAL ASSESMENT OF TOLERANCE

Alterations due to the product (I)

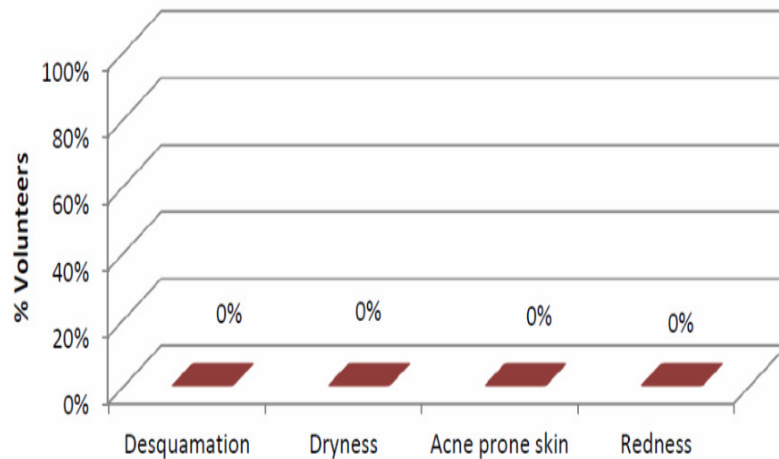


Figure 1. Alterations on the skin after the use of the product (n=22).

Alterations due to the product (II)

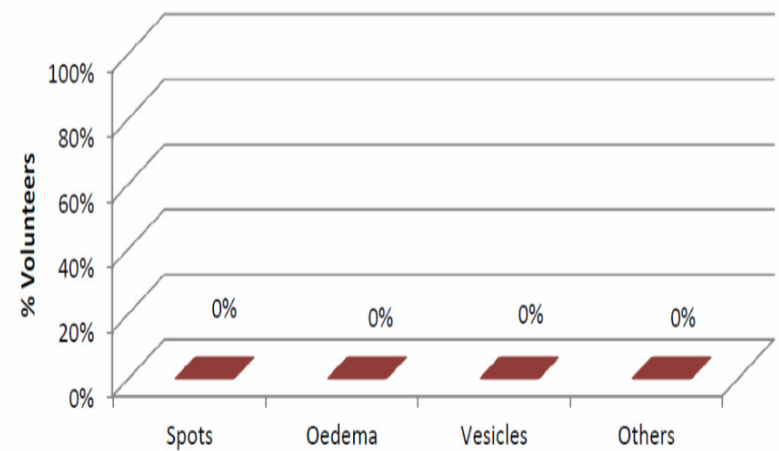


Figure 2. Alterations on the skin after the use of the product (n=22).

None of the volunteers showed any alterations after 14 days of continuous use of the product.

**The product can claim “Tested under dermatological control”**



# RESULTS – HYDRATION EFFICACY

HYDRATION EFFICACY				
	D0	D3	D7	D14
Average	15,49	18,56	24,18	25,24
Standard deviation	11,10	9,29	13,16	11,80
% of variation relative to D0	-	20%	56%	63%
% of volunteers with improvement	-	77%	95%	100%
LINEAR MIXED-EFFECTS MODELS				
	D0	D3	D7	D14
Predicted average	15,49	18,56	24,18	25,24
Standard error	2,20	0,95	1,03	0,85
p -value	-	0,00	0,00	0,00
Significance	-	S	S	S

Table 1. Descriptive results and statistics for skin hydration after 3, 7 and 14 days the use of the product (n=22).

- 3 days after the application of the product, the skin hydration increases an average of 20% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.
- 7 days after the application of the product, the skin hydration increases an average of 56% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.
- 14 days after the application of the product, the hydration increases an average of 63% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.

## RESULTS – HYDRATION EFFICACY

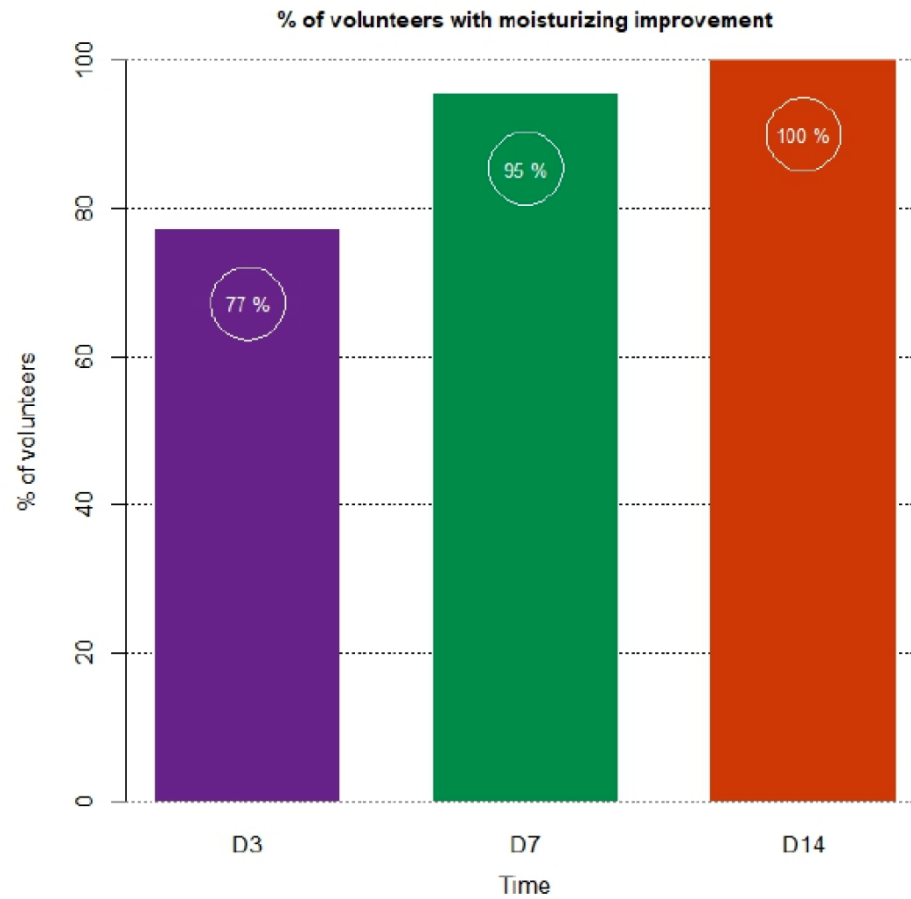
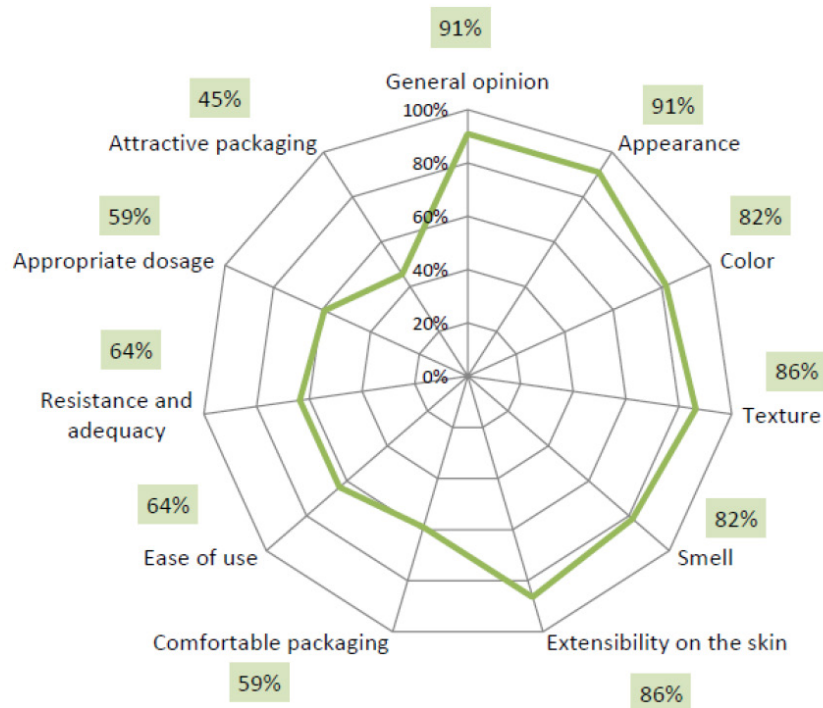


Figure 4. % of volunteers with improvement in skin moisturization.

# RESULTS

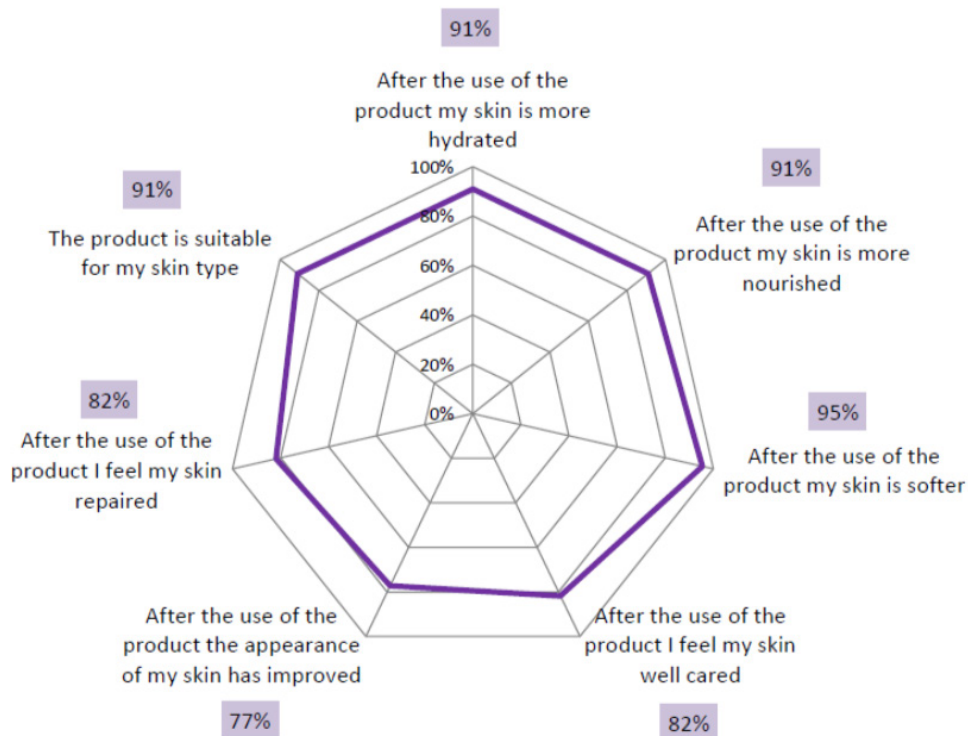
## Global appreciation and organoleptic characteristics (% Satisfied volunteers)



**91% like the appearance of the product**  
**82% like the color of the product**  
**86% like the texture of the product**  
**82% like the smell of the product**  
**86% like the extensibility on the skin**

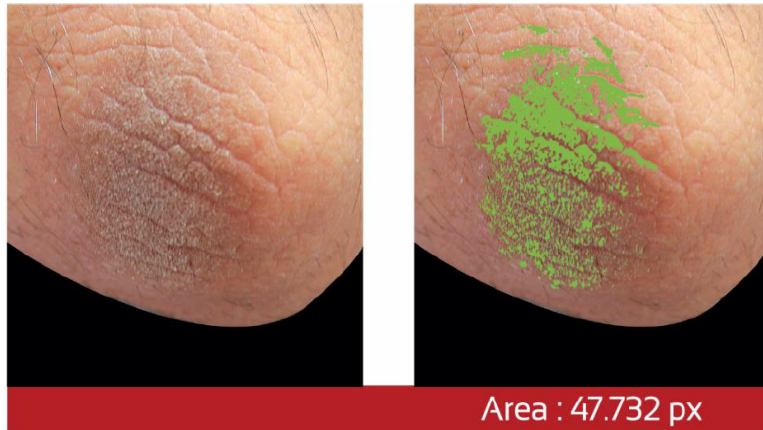


**Subjective Effectiveness**  
(% Satisfied volunteers)

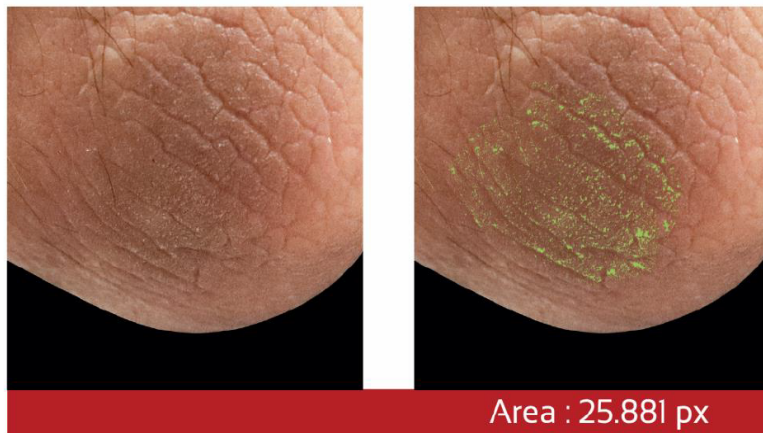
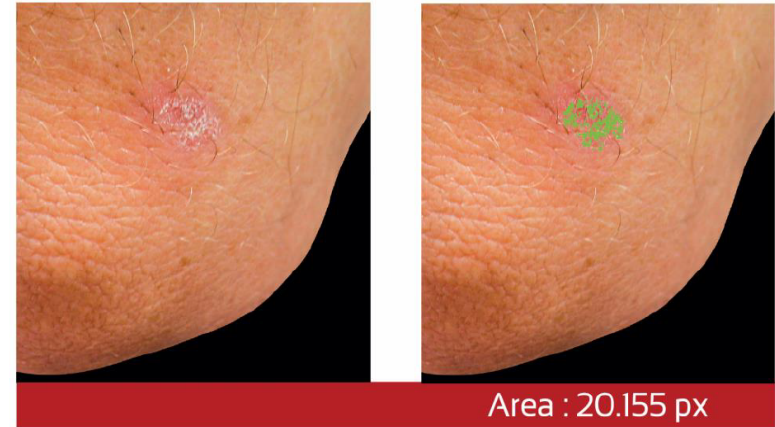


91% found their skin more hydrated after use  
91% found their skin more nourished after use  
95% found their skin more supple after use  
91% found the product suitable for their skin  
82% felt their skin repaired after use  
77% found that the use of the product improved the appearance of their skin  
**91% of panelists in the study with very dry skin say that the product has fulfilled their expectations**

## PICTURES



D0



D14



Decrease : 46%

Decrease : 96%

# TESTIMONIES

## BEFORE /AFTER Hair loss

Day 1



Day 70



\*70-day treatment with body care used as a poultice.



## BEFORE /AFTER

Elbow problem

Day 1



Day 28



\*28-day treatment with body care used as a poultice.

## BEFORE /AFTER

Foot problem

Day 1



Day 10



\*10-day treatment with body care used as a poultice.

# CLINICAL STUDY SUMMARY

## ASSESSMENT OF THE SEBUM REGULATORY EFFICACY AND MATTIFYING EFFECT OF MANICOUAGAN CLAY\*

*\*Under dermatological control*

Study performed by ZURKO RESEARCH S.L. from 01/10/2020 to 03/04/2020

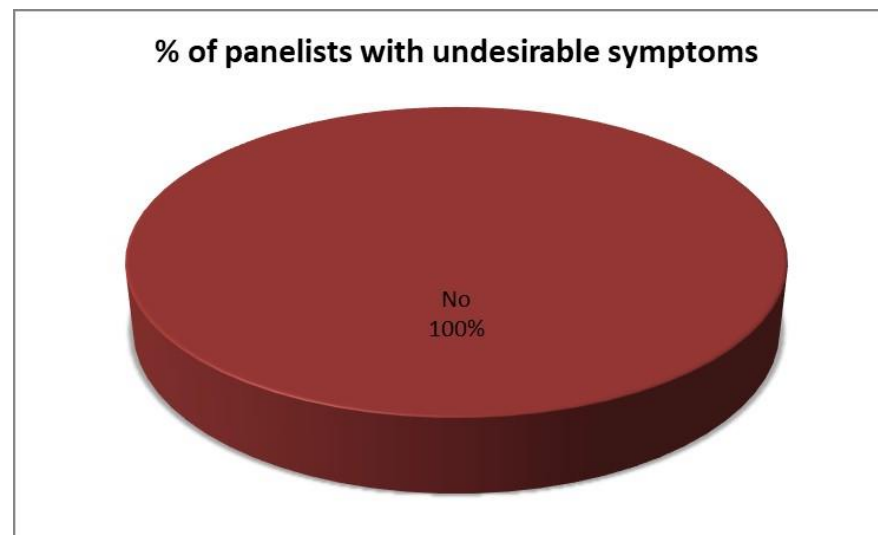


# SUMMARY OF THE STUDY

- **Product type:** Manicouagan clay (100% mud)
- **Experimental area:** face and neck.
- **Panel:** 21 panelists with oily skin.
- **Duration of the study:** 56 days
- **Frequency of use:** Every day during 56 days
- **Study objectives:** The objective of this study is to evaluate the sebum regulatory efficacy and the mattifying effect, as well as the acceptability, subjective efficacy for Manicouagan clay.

## RESULTS - DERMATOLOGICAL ASSESMENT OF TOLERANCE

- None of the panelists showed any alterations after 28 and 56 days of continuous use of the product.
- 100% of the panelists did not show any undesirable symptoms after 56 days of continuous use of the product.



## DERMATOLOGICAL ASSESSMENT OF NON-COMEDOGENICITY

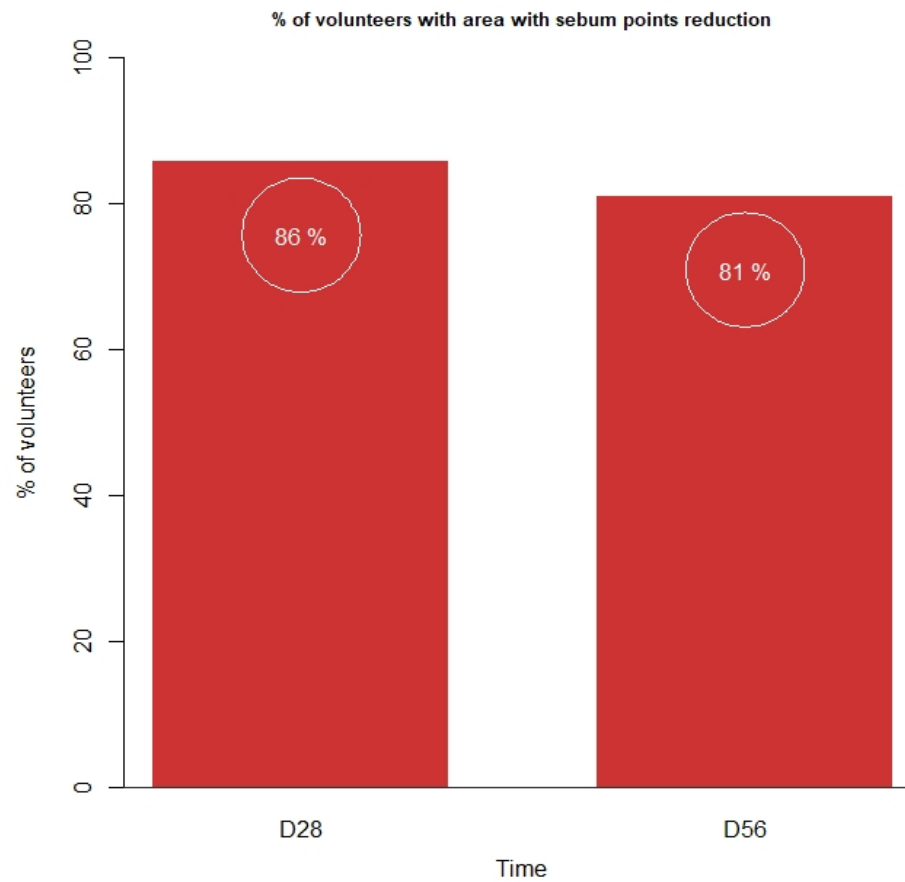
- None of the panelists developed new **open comedones and/or closed comedones** during the study.
- No panelist developed new **cysts** during the study.
- None of the panelists developed new **pustules and/or nodules** during the study.



## ASSESSMENT OF THE REDUCTION OF SEBUM

- 28 days after the application of the product, the percentage of area with sebum decreases an average of 20% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.
- 56 days after the application of the product, the percentage of area with sebum decreases an average of 56% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.

# ASSESSMENT OF THE REDUCTION OF SEBUM AREA

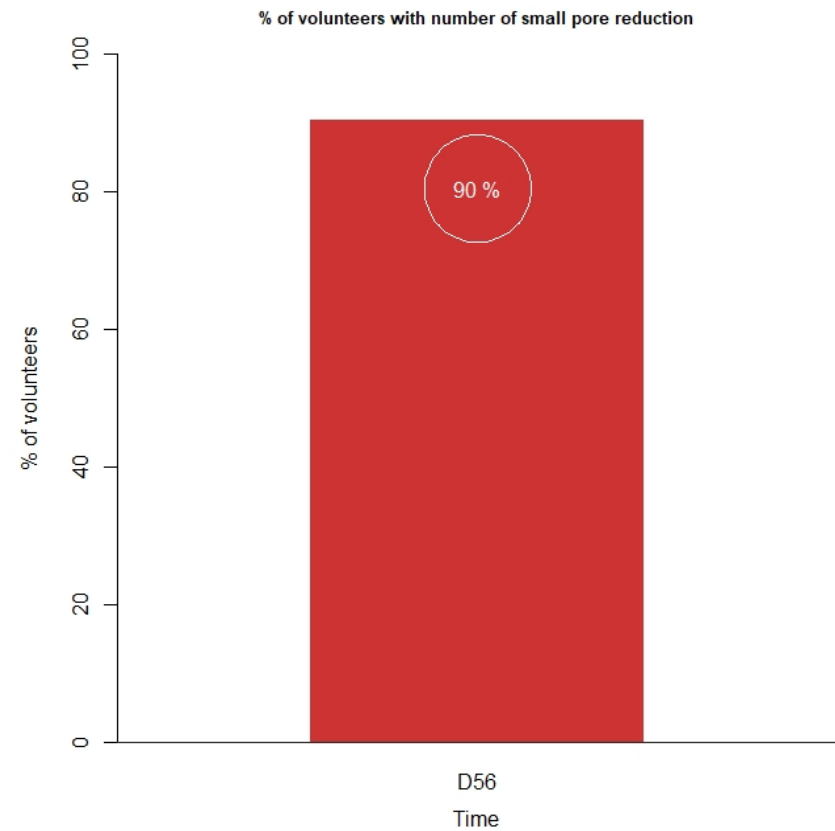
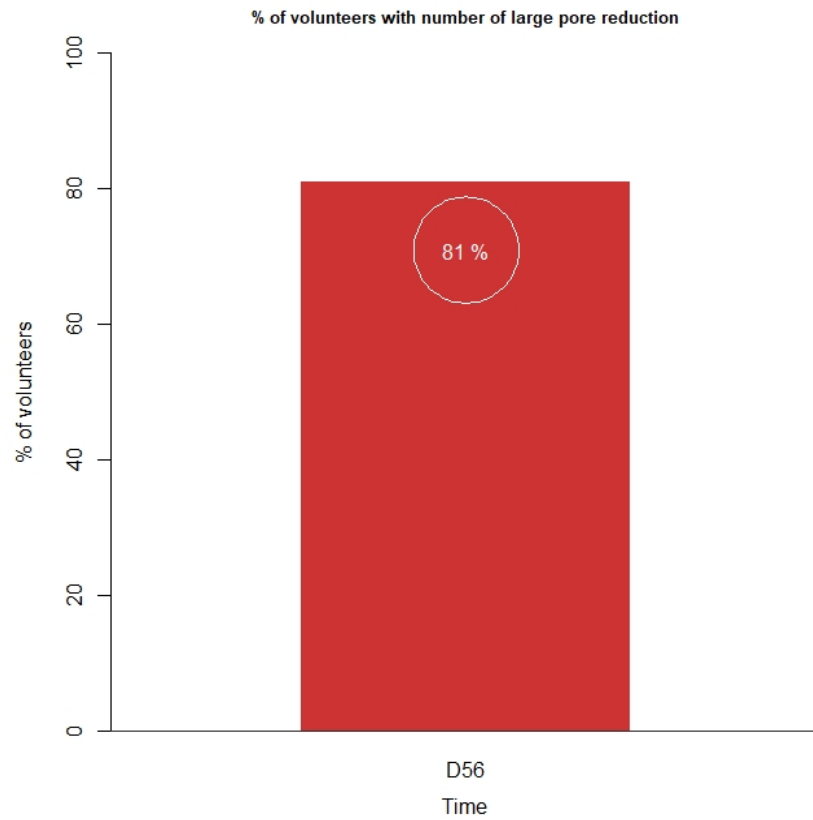


## ASSESSMENT OF PORE SIZE REDUCTION

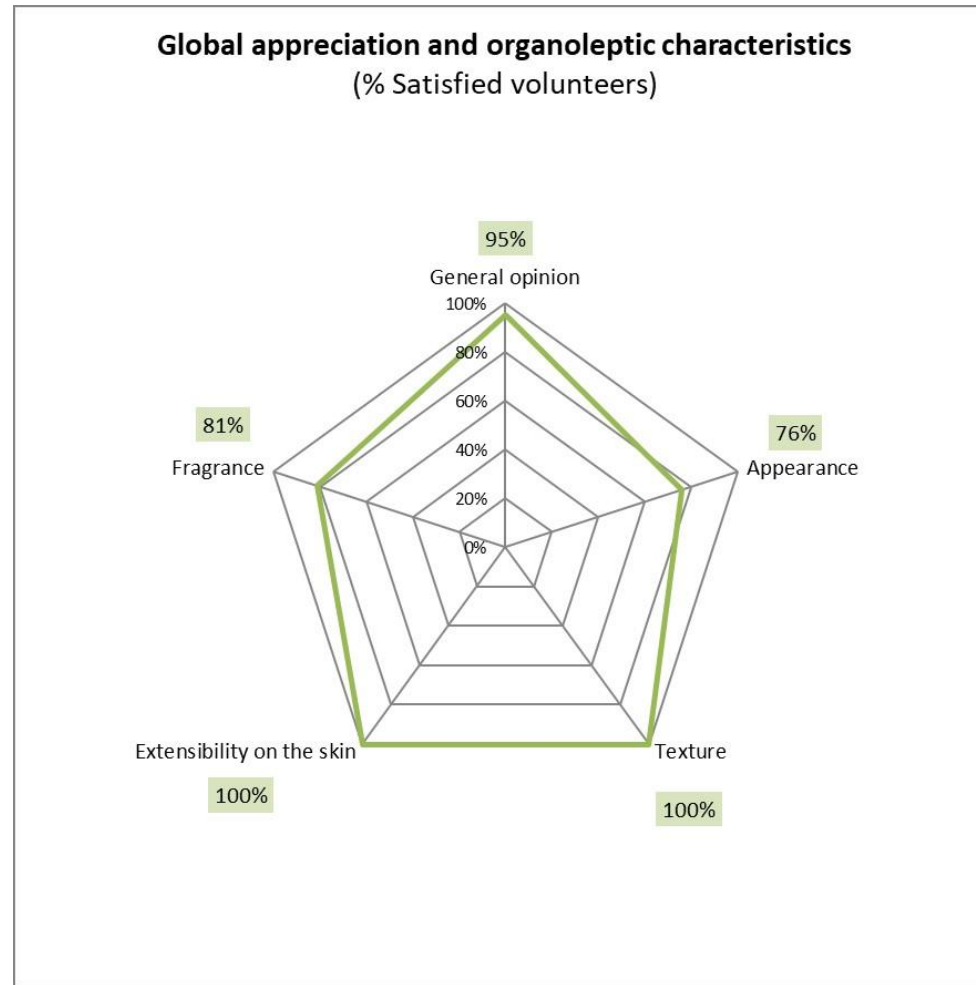
- Large pores: 56 days after the application of the product, the number of large pores decreases an average of 69% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.
- Small pores: 56 days after the application of the product, the number of small pores decreases an average of 46% in relation to baseline. This difference is statistically significant with a p-value lower than 0.05.



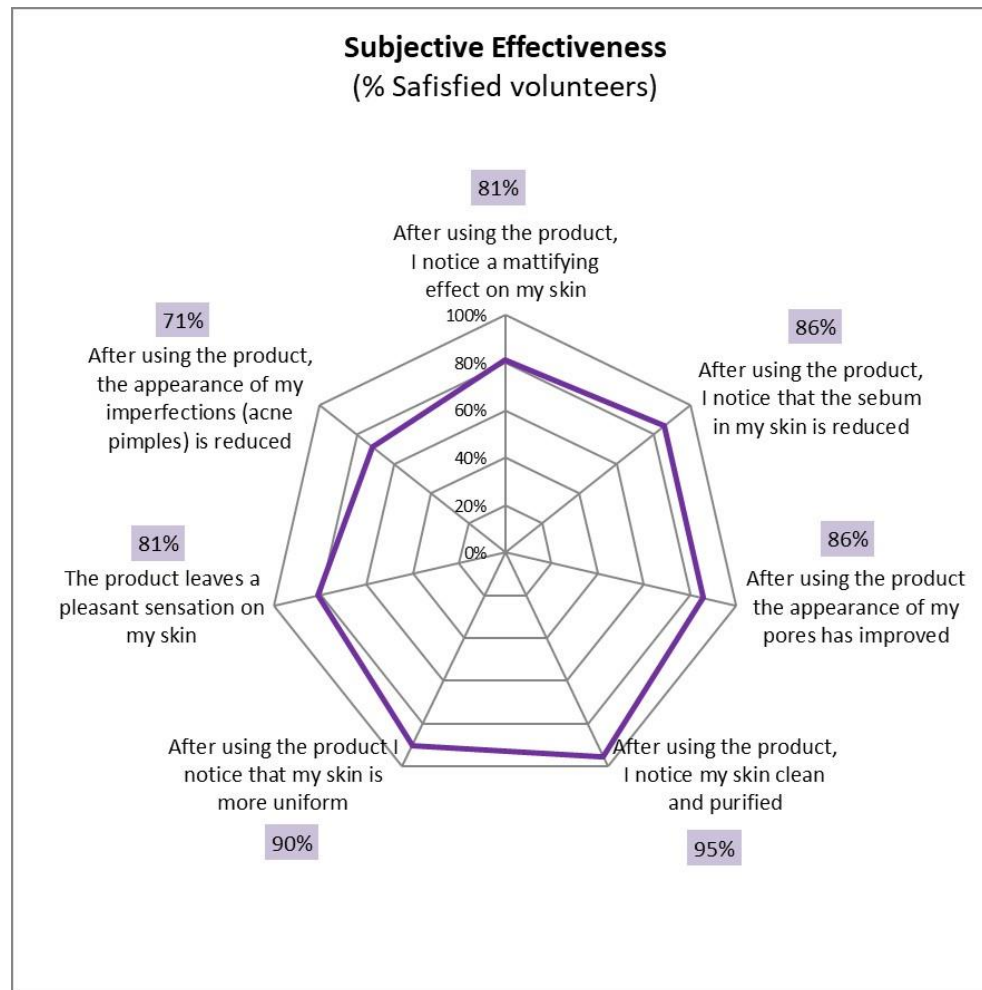
# ASSESSMENT OF PORE SIZE REDUCTION



# GLOBAL APPRECIATION AND ORGANOLEPTICS CHARACTERISTICS (% SATISFIED PANELISTS)

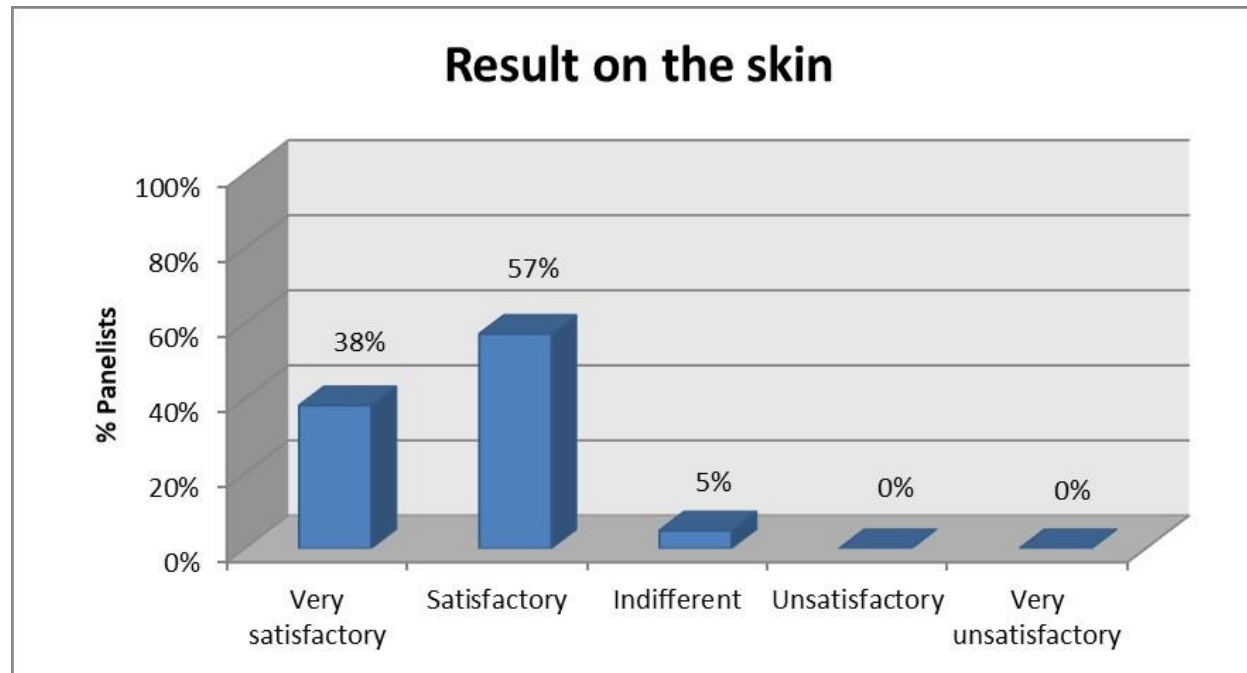


# SUBJECTIVE EFFECTIVENESS (% SATISFIED PANELISTS)

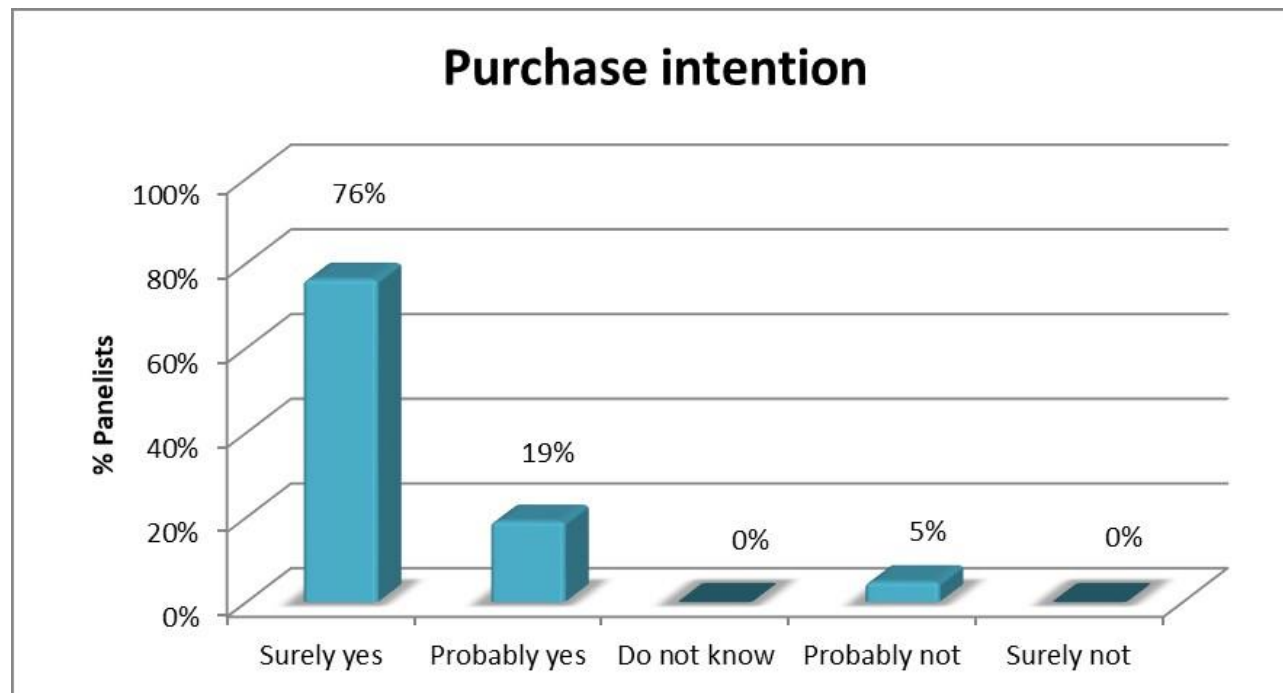




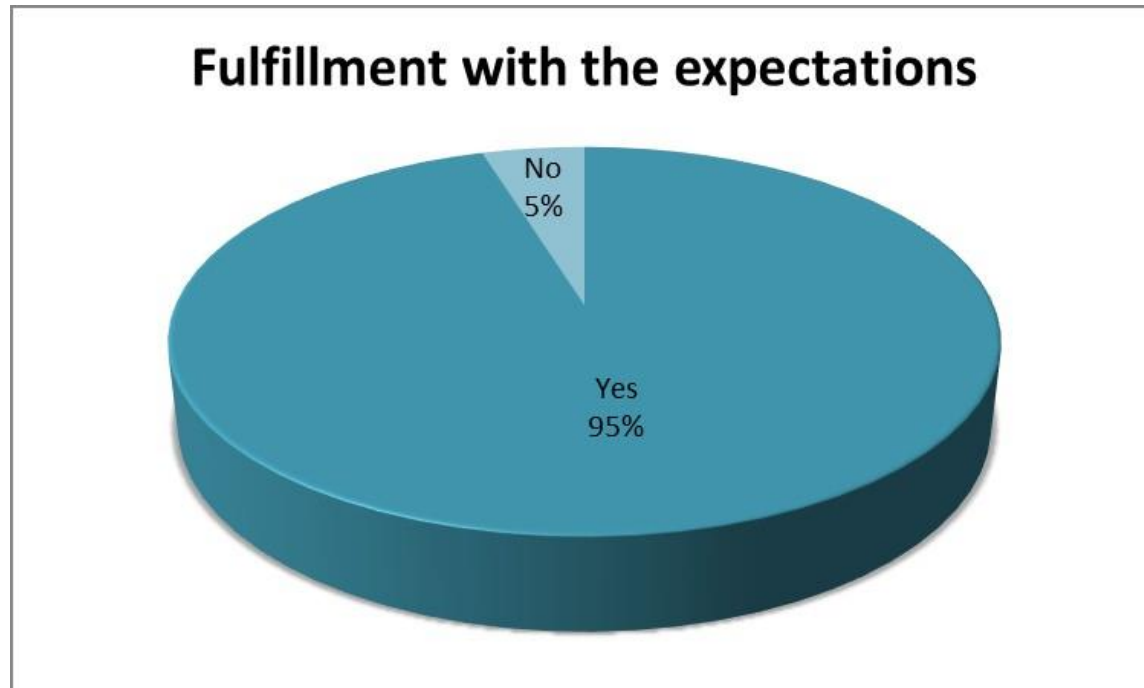
## % SATISFIED PANELISTS – GLOBAL APPRECIATION – RESULT ON THE SKIN



# % SATISFIED PANELISTS – GLOBAL APPRECIATION – PURCHASE INTENTION



# FULFILLMENT WITH THE EXPECTATIONS





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