BODY

LACTOPHYT®

ANTI-ODOR

BIOTECHNOLOGIES
GREENTECH

Synopsis

Characteristics:

- Protects against odor
- Reduces bacteria responsible for bad odors
- Maintains the diversity of bacteria
- Limits armpit and feet bad odors

INCI name:

Aqua, Propanediol, Glyceryl caprylate, Lactococcus ferment extract, Decyl glucoside

Registered in China – CFDA approved

Cosmetic Benefits

While preserving beneficial bacteria to respect microbiota balance, axillary and feet bad odors disappear. LACTOPHYT® brings a sensation of comfort and freshness.

Cosmetic uses

- **Deodorant**
- **Hygiene products**

Toxicology

- Cutaneous irritation (Tested at 2%): Very good skin compatibility (Patch test)
- Sensitization (Tested at 2%): Very good skin compatibility (HRIPT)
- Eye irritation (Tested at 2%): Slightly non-irritant (HETCAM-CFIO test)

Formulation guidelines

Add to emulsions, at the end of the preparation process, either cold or at 35-40 °C, during cooling.

Recommended pH: 4.00-6.00

Recommendation use level

2%

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1. Introduction

The skin is an interface with the outside environment and, as such, is colonized by a diverse microbiota community. Some bacterial species present in the axillary community have the capability to transform non-odorous substances into volatile odorous substances by the action of enzymes. We can mention a very special involvement of *Corynebacterium spp.* and *Staphylococcus spp*.

The repeated use of deodorant to destroy the bacterial flora of the axillary microbiota does not appear to be the appropriate solution: bacterial abundance is decreased and led to the proliferation of inappropriate bacterial community when classical deodorants are stopped. For this reason, GREENTECH designed a new active, which limits proliferation of bad odors responsible bacteria without suppressing the other strains.

A. The skin microbiome

Because of it interfaces with the environment, skin is colonized by a diverse microbiota community, known as the skin microbiome (Figure 1) (Chen and Tsao, 2013). Many of these microorganisms are harmless and provide vital functions. For example, certain species of *Staphylococcus* are essential to counteract the colonization of skin pathogens through nutrient competition and the production of antimicrobial peptides (Iwase et al., 2010).

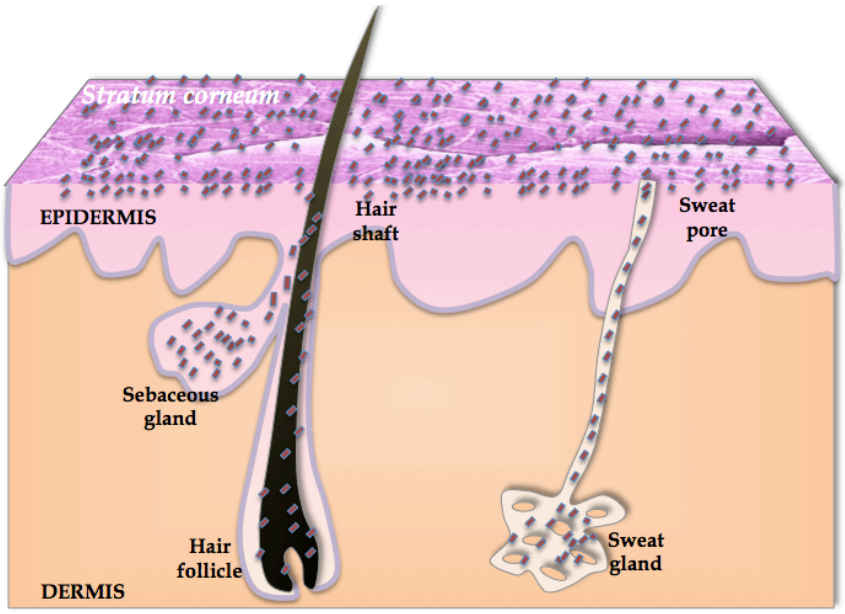


Figure 1 : The human skin microbiome refers to the entire collection of microbes – bacteria, archaea, fungi, viruses, and mites – that reside in and on human skin.

Skin microbiome varies between different anatomical sites since it is dependent on the microenvironment (Figure 2 and 3). In fact, specific bacteria have been described in moist, dry and oily sites. They also depend on the availability of nutrients and the presence of bacterial and host-derived antimicrobial peptides.

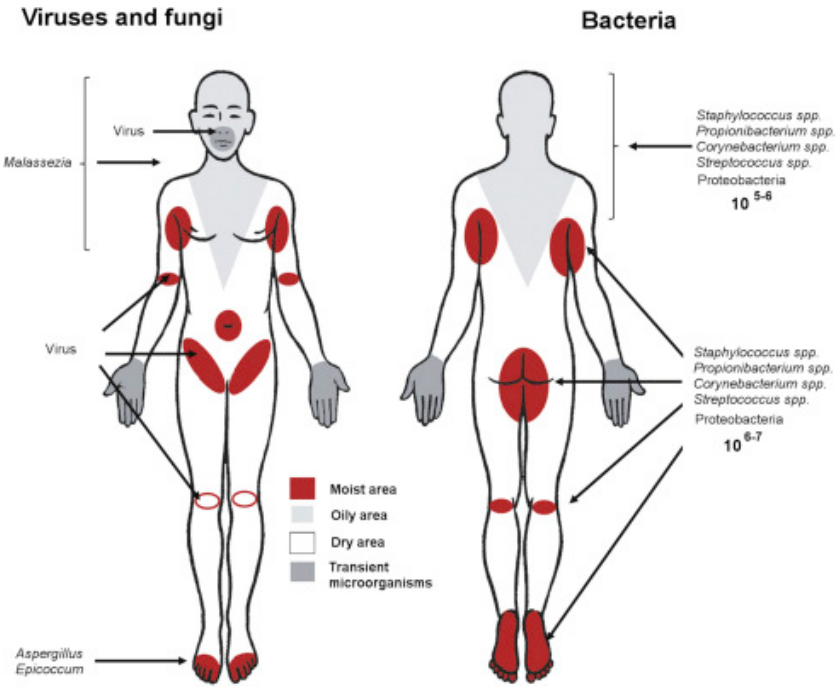


Figure 2 : Colonization is driven by the ecology of the skin surface, which is highly variable depending on topographical location, endogenous host factors and exogenous environmental factors.

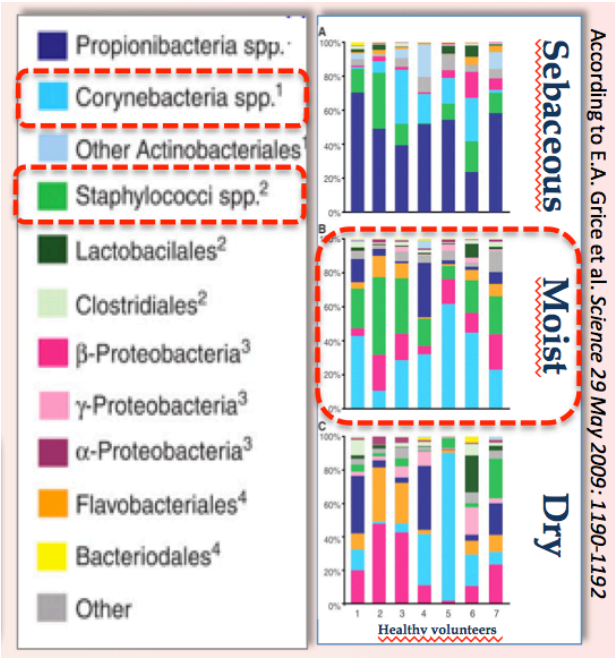


Figure 3 : Predominant bacteria at various anatomical locations in adults

The elucidation of the human skin microbiome has allowed understanding the formation of body odor in, for instance, the axillary region. The human axillae correspond to a specific moist and warm region, characterized by the presence of hair follicles, sebaceous glands and high density of sweat glands (including eccrine, apocrine and apoeccrine sweat glands). Sebaceous and particularly sweat glands secrete many components including salts, proteins, squalene, sterols, sterol esters, wax esters, lipids and fatty acids, that correspond to an important source of nutrient for resident bacteria. Therefore, the human armpit has one of

the highest densities of microorganisms on body surface, estimated to one million bacteria per square centimetre.

B. The microbiota of the axillary skin is responsible for body odor

The sweat itself does not smell. It is actually the important microbial community of the human axilla that plays a key role in the formation of axillary odor by transformation of odorless natural secretions into volatile odorous molecules. For decades, culture-dependent techniques have been used to characterize the axillary microbial community. Thus, *Corynebacterium*, *Micrococcus*, *Staphylococcus*, *Propionibacterium*, and *Brevibacterium* have been mainly cultivated (Jackman and Noble, 1983; Leyden et al., 1981). Earlier, the presence of *Brevibacterium epidermidis* and *Corynebacterium xerosis* have been linked to the production of body odour (Lukacs et al., 1995). More recently, the use of 16S rRNA gene sequences to study bacterial phylogeny, identified that in moist areas such as the human axillary sites, *Corynebacterium spp.* and *Staphylococcus spp.* dominate the resident flora (Callewaert et al., 2013).

C. Identification of human axillary odor

Axillary odor involves sulfanylalkanols, steroid derivatives, and volatile short-chain fatty acids, whose combination and ratios account for the intensity of human axillary odor. For instance, volatile sulfur compounds, exhibit a low olfactory threshold with a typical onion-like and musky malodor (Troccaz et al., 2004). Additionally, long-chain fatty acids converted to volatile short-fatty acids through enzymes produced by corynebacteria, are responsible of cumin spice-like odor and as hircine, which means "of or characteristic of a goat" (Figure 4) (Fredrich et al., 2013).

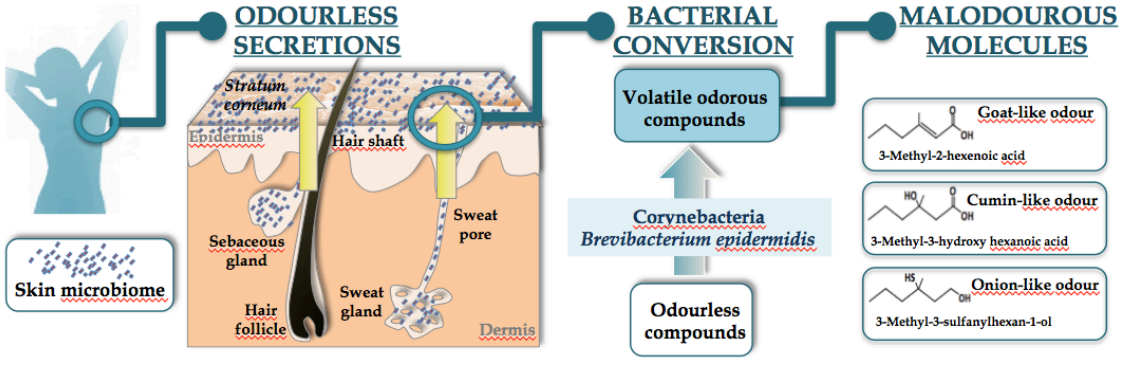


Figure 4 : Axillary region contain its specific microbiome, responsible for production of perspiration odor

D. Actual solutions to treat axillary odor

Body odor emanating from a person can be an embarrassing problem in many cultures; therefore it remains an important problem to treat. The classic functional mechanism of deodorants is the depletion of cutaneous bacteria employing unspecific antimicrobial agents. Consequently, they indiscriminately destroy both bacteria involved in axillary odor and beneficial bacteria essential for skin homeostasis.

The balance of skin microbiome is essential for human health and well-being. Actually, the disturbance of the skin microbiome can have deleterious consequences. It can disrupt antimicrobial defences against pathogens and thus promote proliferation of opportunistic pathogens. Furthermore, disturbance of skin microbiome has been associated with several skin diseases, such as acne, psoriasis, rosacea or atopic dermatitis (Cho and Blaser, 2012; Cox et al., 2013). For these reasons, GREENTECH developed LACTOPHYT® a new innovative deodorant active that targets bacteria responsible for the production of odorous molecules, while respecting the beneficial bacteria (Figure 5).

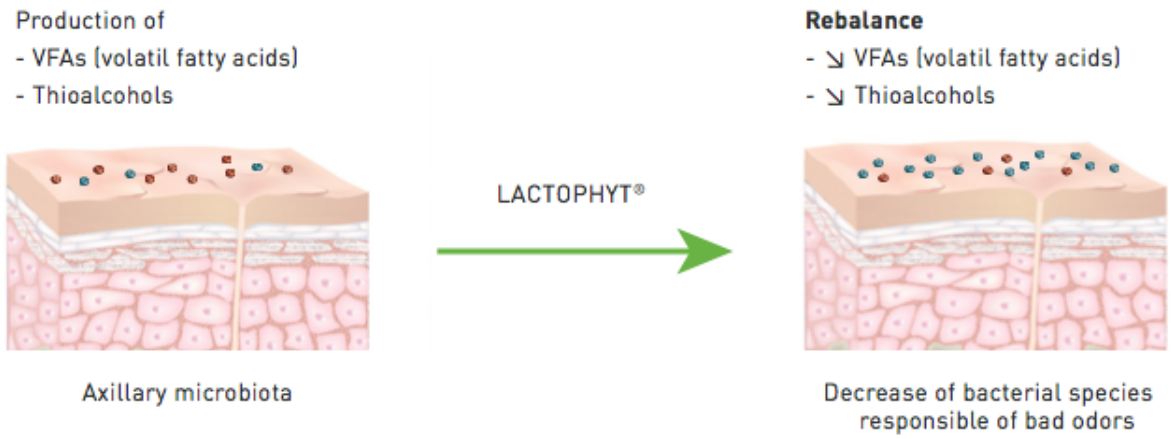


Figure 5 : LACTOPHYT® targets specially strains involved in the formation of malodor compounds

E. LACTOPHYT® is issued from specific fermentation process

GREENTECH has combined its expertise in fermentation technology and the numerous advantages of lactic acid bacteria to develop LACTOPHYT®. Lactic acid bacteria display numerous antimicrobial activities. Firstly, screening approach allowed the identification of *Lactococcus lactis* for its antimicrobial potential. Next, best growth conditions, using specific metabolic situations (temperature, nutrients...) were determined to enhance antimicrobial activity of *Lactococcus lactis*.

2. LACTOPHYT®: a new active ultra-concentrated in anti-odor bioactive compounds

A. Effect of LACTOPHYT® on *S. hominis* and *S. epidermidis*

Staphylococcus hominis is a coagulase-negative member of the bacterial genus *Staphylococcus*, consisting of Gram-positive, spherical cells in clusters. It occurs very commonly as a harmless commensal on human and animal skin and is known for producing thioalcohol compounds that contribute to body odor.

Staphylococcus epidermidis is a Gram-positive bacterium member of the bacterial genus *Staphylococcus*. It is part of the normal human flora. It is a facultative anaerobic bacterium. Although *S. epidermidis* is not usually pathogenic.

Protocol

Study of LACTOPHYT®'s effect (at 2%) on the strains *S. epidermidis* and *S. hominis* growths (Figure 6 and 7). Initial bacterial concentration is 10^5 CFU.mL^{-1}. Results are obtained after 8, 24 and 32 hours of incubation at 37°C.

Results

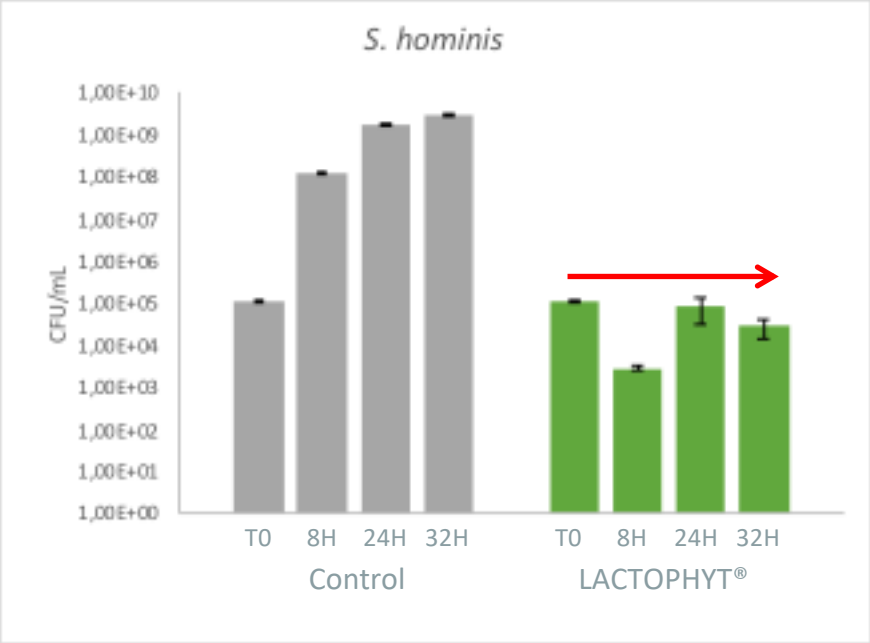


Figure 6: In grey, control of S. hominis growth without LACTOPHYT®. In green, LACTOPHYT®'s effect on S. hominis growth.

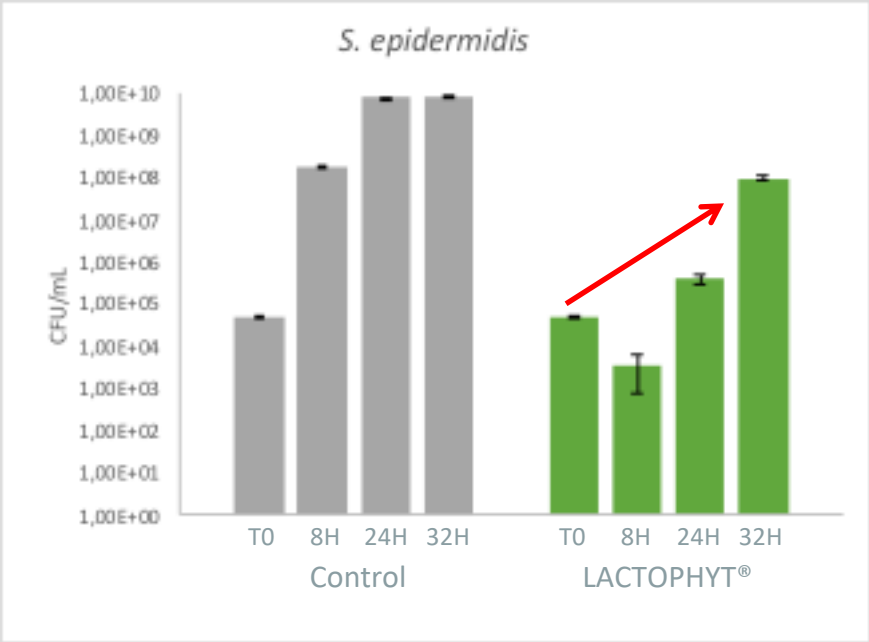


Figure 7: **In grey, control of S. epidermidis growth without LACTOPHYT®. In green, LACTOPHYT®'s effect on S. epidermidis growth.**

Conclusion

During the first hours of exposure to LACTOPHYT® at 2% (v/v), the two species appear to be sensitive to its presence. In the case of *S. epidermidis*, growth starts after 8 hours of incubation. On the other hand, after an 8-hour latency period, the growth of *S. hominis* was maintained at the initial concentration (10^5 CFU.mL^{-1}) and showed no growth (inhibitory effect). The use of LACTOPHYT® showed the growth of a commensal strain such as *S. epidermidis* and the inhibition of a strain associated with the formation of odors at the axillary level as *S. hominis*. Although these species are similar because they belong to the same bacterial genus, these results demonstrate the selectivity of LACTOPHYT®.

B. Effect of LACTOPHYT® on *C. xerosis*

Corynebacterium xerosis is an aerobic and Gram-positive bacterium member of the genus *Corynebacterium*. They are bacilli (rod-shaped), and in some phases of life they are, more particularly, club-shaped, which inspired the genus name (coryneform means "club-shaped").

Protocol

Study of LACTOPHYT®'s effect (at 2%) on the strain *C. xerosis* growth (Figure 8). Initial bacterial concentration is 10^5 CFU.mL^{-1}. Results are obtained after 8, 24 and 32 hours of incubation at 37°C.

Results

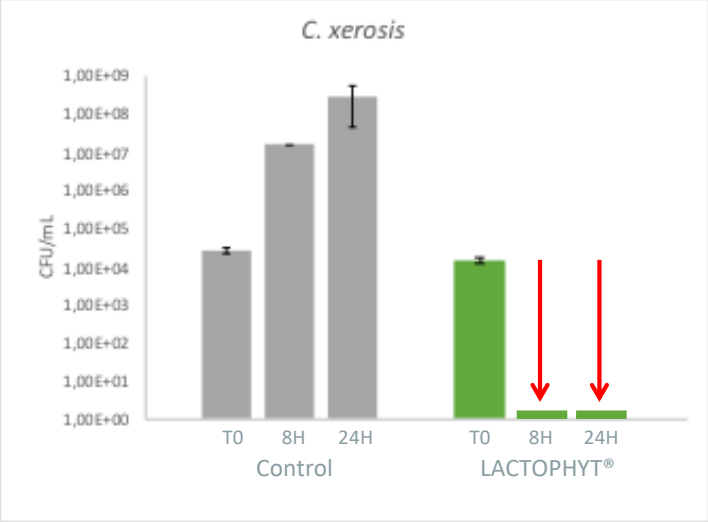


Figure 8 : In grey, control of C. xerosis growth without LACTOPHYT®. In green, LACTOPHYT®'s effect on C. xerosis growth

Conclusion

LACTOPHYT® completely inhibits the proliferation of *C. xerosis*, responsible for bad odors.

3. LACTOPHYT® protects from unpleasant odor *in vivo*

A. CLINICAL STUDY – Comparison with placebo

The objective of this study was to evaluate LACTOPHYT® vs placebo in order to confirm and complement the global anti-odor proven efficacy of LACTOPHYT®.

Protocol

The study was performed in double blind test with 18 volunteers (8 women and 10 men) from 24 to 50 years old. Study was performed during 3 days.
Application: Under the arms (application area of a deodorant cosmetic product)
Method: application of an amount evaluated by the panelist according to his personal habits versus a placebo product.
One daily application on armpit with LACTOPHYT® 2%, versus an active formula containing talc and a perfume (here named placebo).
A self-evaluation by sniff test at 3h, 6h and 8h after the application was then asked to the latter according to the following notation:

- 0: no smell
- 2: slight smell
- 4: medium to strong smell (which could only be disturbing for oneself)
- 6: very strong smell (can be felt and disturbing for others)

Results

The data was evaluated using SPSS software version 19.0. A repeated measures analysis of variance (ANOVA) followed by a Bonferroni test was carried out for each day and for each product in order to perceive the evolution of values over time. A significance at $p < 0.05$ was retained.

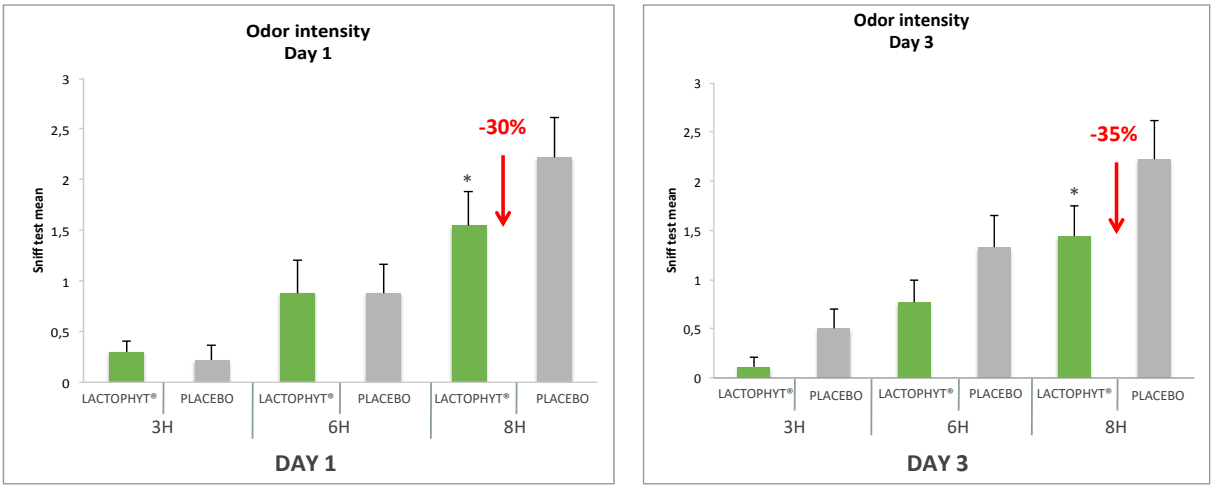


Figure 9 : Comparison of odor intensity LACTOPHYT® 2% vs Placebo at DAY 1 and DAY 3 * p <0.05

The odor 8h after application is significantly lower under LACTOPHYT® than placebo (-30%, p <0.05) on DAY 1 (Figure 9).

On DAY 3, the intensity of the odor with Placebo is not significantly higher (+78% at 3H, +42% at 6H versus LACTOPHYT®, Figure 9).

The odor 8h after application is significantly lower under LACTOPHYT® than placebo (-35%: Figure 9, p <0.05).

Conclusion

In view of the results obtained we can conclude that LACTOPHYT® has a deodorant power compared to a placebo containing Talc known for its absorbency.

From the first day a significant difference is noted at p <0.05 to 8H. Indeed, the intensity of the odor under the arms where the Placebo is 30% greater than that under the arms where the LACTOPHYT® asset is

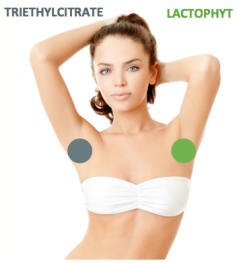
It should be noted that LACTOPHYT® protects against bad odors from the first hours of application. Indeed, on the third day, and 3H and 6H after application, the intensity of the odor is greater under the arms where Placebo is respectively 50% and 54% on day 2 and 78% and 42% on day 3.

LACTOPHYT® has a higher deodorant power than placebo.

B. CLINICAL STUDY – Comparison with triethylcitrate

The objectives of this study was to evaluate LACTOPHYT® vs TRITHYLCITRATE in order to confirm and complement the global anti-odor proven efficacy of LACTOPHYT®.

Protocol



The study was performed in double blind test with 20 volunteers from 24 to 50 years old. Study was performed during 3 days.
Application: Under the arms (application area of a deodorant cosmetic product)
Method: application of an amount evaluated by the panelist according to his personal habits versus a placebo product.

One daily application on armpit with LACTOPHYT® 2%, versus an active formula containing TRIETHYLCITRATE.
A self-evaluation by sniff test at 3h, 6h and 8h after the application was then asked to the latter according to the following notation:

- 0: no smell
- 2: slight smell
- 4: medium to strong smell (which could only be disturbing for oneself)
- 6: very strong smell (can be felt and disturbing for others)

Results

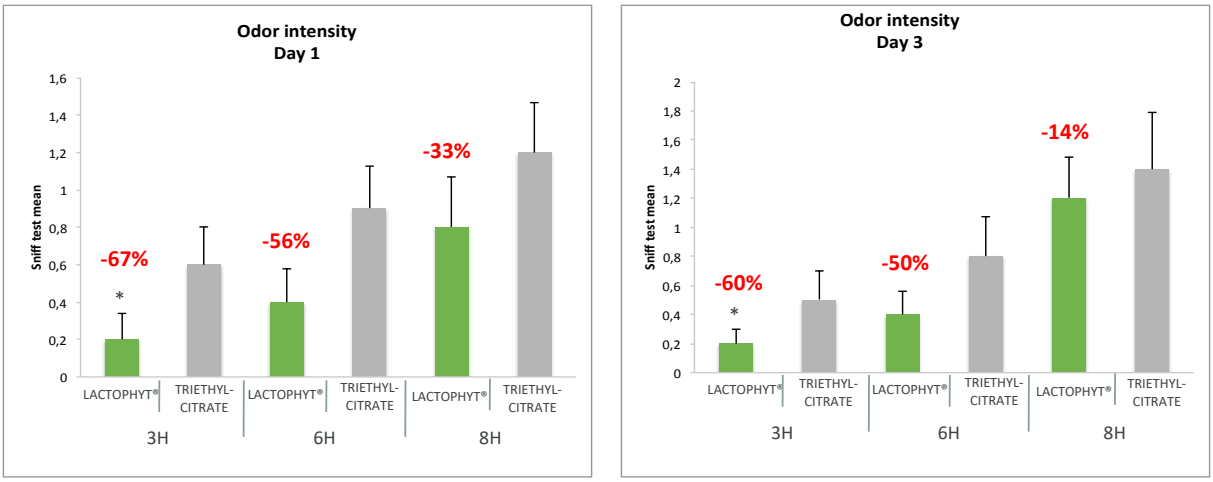


Figure 10 : Comparison of odor intensity LACTOPHYT® 2% vs TRIETHYLCITRATE at DAY 1 and DAY 3 * p <0.05

The odor 3h after the application is significantly less intense with LACTOPHYT® with TRIETHYLCITRATE (-67%, p <0.05: Figure 10) at DAY1.

The intensity of the odor 6h and 8h after the application corresponds to the same trend as 3h respectively (-56%: Figure 10) and (-33%: Figure 10) to D1.

On DAY 3, the odor 3h after application is significantly less intense with Lactophyt than with Triethylcitrate (-60%, p <0.05: Figure 10).

The intensity of the odor 6h and 8h after the application follows the same trend as at 3h (respectively -50% and -14%: Figure 10) at DAY 3.

Conclusion

In view of the results obtained, we can conclude that the LACTOPHYT® active has a stronger deodorant power than the Triethylcitrate.

From the first day, we notice a significant difference at 3h (p <0.05). Indeed, the intensity of the odor under the arms where the Lactophyt is found is 67% less intense than that where the active Triethylcitrate is.

A trend is confirmed throughout the day with a less intense smell that is found with the use of Lactophyt.

The same evolution is observed on the following days with significance after 3h on the third day of testing.

LACTOPHYT® has the same deodorant power as Triethylcitrate currently use on the market.

4. Complementary activity on feet bad odors

A. Bacterial strains involved in bad odor on feet

The bad odor on feet is the consequence of the transformation of compounds present in the sweat by bacterial strains naturally present in the feet cutaneous flora.

Brevibacterium epidermidis is the bacterium that contributes most to the formation of malodorous compound on the feet. This strain consumes the dead cells, which leads to the transformation of methionine into methanethiol (MT), the compound responsible for the characteristic sulfurized and cheesy odor (Wood et al., 2010, Sharquie et al., 2013).

Cutibacterium acnes is also responsible for the odor of feet by forming propionic acid responsible for the characteristic odor of vinegar (Wood et al., 2010, Ara et al., 2005, Sharquie et al., 2013).

Bacillus subtilis also contributes to the bad odor of feet by forming isovaleric acid from leucine (Wood et al., 2010, Ara et al., 2005).

B. Effect of LACTOPHYT® on strains involved in feet bad odors

Protocol

Study of LACTOPHYT®'s effect (at several concentrations) on the strains *Brevibacterium epidermidis (B. epidermidis), Cutibacterium acnes (C. acnes)* and *Bacillus subtilis (B. subtilis)* growths. Initial bacterial concentration is 10^5 CFU.mL^{-1}. Results are obtained after 72 hours of incubation at 30°C for *B. epidermidis* and *B. subtilis* and at 37°C for *C. acnes*.

Results

Without LACTOPHYT®, the optical density (OD) is 5.4. In the presence of LACTOPHYT® the OD decreases until the complete death of the strain (Figure 11), meaning that it is able to inhibit the strain growth.

The minimum inhibitory concentration (OD <0.1) of LACTOPHYT® *on Brevibacterium epidermidis* is 1.6%.

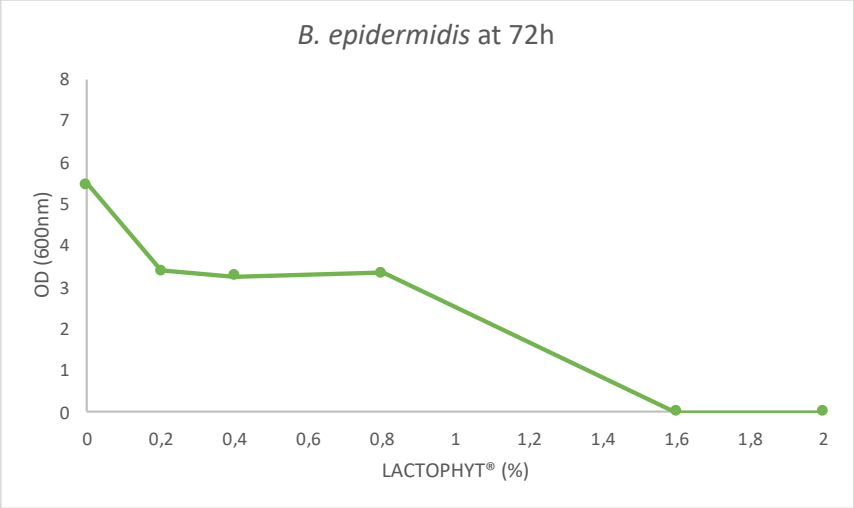


Figure 11: Effect of LACTOPHYT® at several concentrations (from 0 to 2%) on *B. epidermidis* growth measured by optical density at 600nm

Without LACTOPHYT®, the optical density (OD) is 1.5. In the presence of LACTOPHYT® the OD decreases until the complete death of the strain (Figure 12), meaning that it is able to inhibit the strain growth.

The minimum inhibitory concentration (OD <0.1) of LACTOPHYT® *on Cutibacterium acnes* is 0.4%.

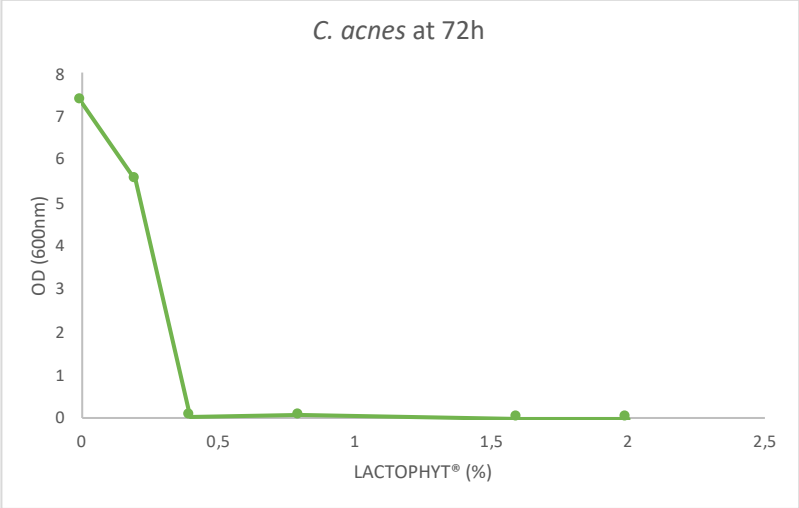


Figure 12: Effect of LACTOPHYT® at several concentrations (from 0 to 2%) on *C. acnes* growth measured by optical density at 600nm

Without LACTOPHYT®, the optical density (OD) is 5.4. In the presence of LACTOPHYT® the OD decreases (Figure 13), meaning that it is able to limit the strain growth.

LACTOPHYT® does not totally inhibit *B. subtilis* growth at the tested concentrations.

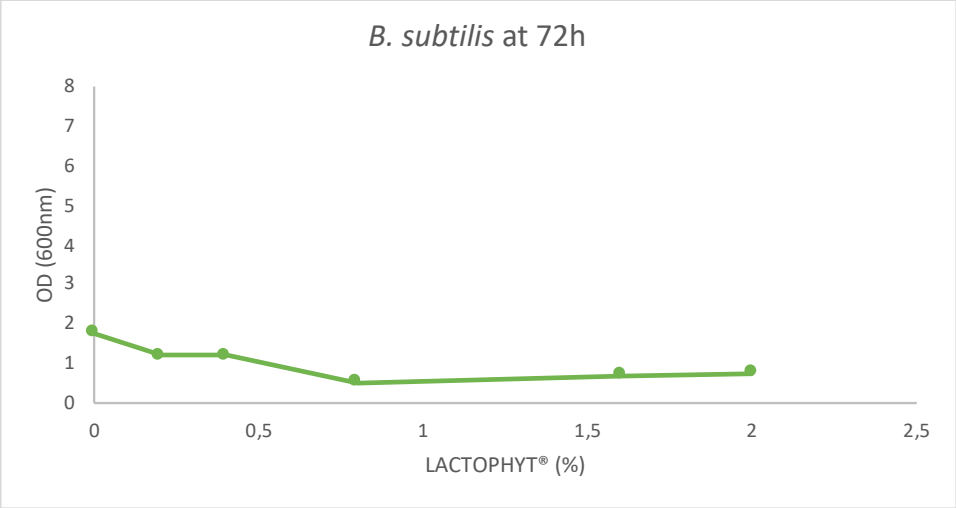


Figure 13: **Effect of LACTOPHYT® at several concentrations (from 0 to 2%) on *B. subtilis* growth measured by optical density at 600nm**

Conclusion

LACTOPHYT® has an antibacterial activity on *B. epidermidis* and *C. acnes* strains. The common MIC to both strains is 1.6%. At the same time LACTOPHYT® limits the growth of *B. subtilis*.

Given these results, LACTOPHYT® is able to reduce the formation of malodorous compounds.

C. CLINICAL STUDY – Comparison with placebo

The objective of this study was to evaluate LACTOPHYT® vs placebo in order to confirm and complement the global anti-odor proven efficacy of LACTOPHYT®.

Protocol

The study was performed in double blind test with 14 volunteers (12 women and 2 men – mean 30 years old). Study was performed on 1 day. 11 volunteers continue the study during 2 days more to follow the activity.
Application: On the feet
Method: application of a usual quantity evaluated by the panelist according to his personal habits versus a placebo product.
One daily application on foot with LACTOPHYT® 2%, versus an active formula containing talc and a perfume (here named placebo).
A self-evaluation by sniff test at 4h and 12h after the application was then asked to the latter according to the following notation:

- 0: no smell
- 2: slight smell
- 4: medium to strong smell (which could only be disturbing for oneself)
- 6: very strong smell (can be felt and disturbing for others)

The data was evaluated using SPSS software version 21. The evolution over time of the odor was evaluated using the Friedman test (non-parametric test) followed by a Wilcoxon test. LACTOPHYT® versus Placebo comparisons were performed using a Wilcoxon test. A significance at $p<0.05$ was retained.

Results

On the first day, LACTOPHYT® is more efficient than the placebo, a decrease in the perceived odor (-42% at 4h and -23% at 12h) being noted as compared to placebo (Figure 14).

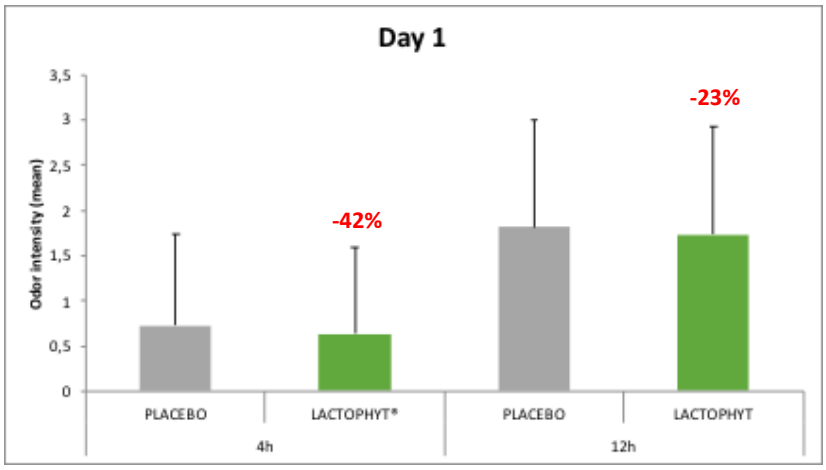


Figure 14: Comparison of odor intensity LACTOPHYT® 2% vs placebo on the first day

Concerning, the day 2 and 3, the same tendency is observed, LACTOPHYT® being more efficient as compared to placebo to decrease bad odor (Figure 15).

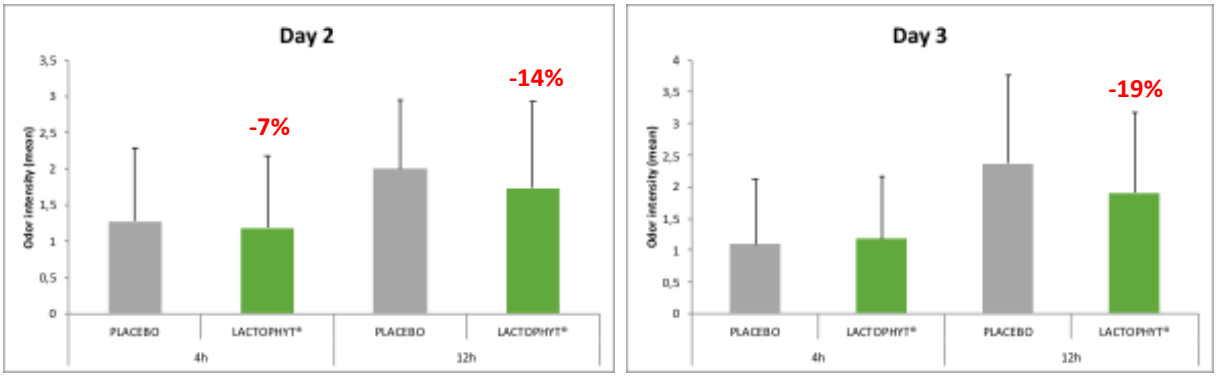


Figure 15 : Comparison of odor intensity LACTOPHYT® 2% vs placebo on day 2 and 3

Conclusion

In light of the results obtained, we can conclude that LACTOPHYT® has a deodorant power on the feet higher than placebo, especially on the first day of use. The number of panelists did not allow us to highlight any significance but only positive trends. It can be hypothesized that, in view of these trends and the views of large standard deviations, an increase in the number of panelists would be significant.

5. Conclusion

In order to preserve the axillary microbiota while selectively reducing the bacteria involved in the production of unpleasant odors (Table 1), GREENTECH has developed a product combining the defense potential of a lactic bacterial strain and an emollient. LACTOPHYT® has for mission to respect the axillary microbiota by guiding the bacterial populations towards a new equilibrium.

In parallel, we proved the efficacy of LACTOPHYT® on strains involved in feet bad odors.

Table 1 : Impact of LACTOPHYT® on the production of bacteria no directly involved in bad odors and the other ones positively correlated with olfactory descriptor.

Correlation between bacteria and bad odors	LACTOPHYT® AT 2% (v/v)			
	Strain	24h	48h	72h
Not directly involved	*S. epidermidis*	+	+	+
Positively correlated with olfactory descriptor (global, spivy or fresh onion)	*S. hominis*	-	-	+
	C. xerosis	-	-	-
	C. tuberculostearicum	-	-	-

6. Formulation guide

Formulation recommendations: Using at 35-40°C for emulsions, while cooling and any time in cold preparation. Use at 2%.
This active is liquid and partially soluble in water (10%). Its color is slightly yellow.
After various tests we didn't see any big incompatibility problem. However it will be better to work between a pH of 4 to 6.
If the formulation contains alcohol it's better not to exceed 15% and not to increase the pH above 6.
Keep in a dark place, in the original packaging, at ambient temperature between 15 and 25 °C.
The formulation presented below are the formulas used for the clinical studies.

1) PLACEBO CREAM (PLA-060-01)

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CREME LACTOPHYT TEST PLACEBO (PLA-060-01)

Phase	*Material name*	*Inci*	*Supplier*	*Properties*	*% Material*
A	DEMINERALIZED WATER	AQUA (WATER)	-	-	68,98
	MICROCARE SB	AQUA (WATER) (AND) SODIUM BENZOATE (AND) POTASSIUM SORBATE	-	preservative	1
	GLYCERIN	GLYCERIN	OLEON	humectant	5
	CARBOPOL ULTREZ 20	ACRYLATES/C10-30 ALKYL ACRYLATE CROSSPOLYMER	LUBRIZOL	gelling agent	0,4
B	DEMINERALIZED WATER	AQUA (WATER)	-	-	1
	SODIUM HYDROXIDE	SODIUM HYDROXIDE	UNIVAR	neutralizer	0,12
C	EASYNOV ™	OCTYLDODECANOL (AND) OCTYLDODECYL XYLOSIDE (AND) PEG-30 DIPOLYHYDROXYSTEARATE	SEPPIC	emusifier W/O	2
	DUB GMS CARE	GLYCERYL STEARATE	STEARINERIE ET DUBOIS	Co-emulsifier	2
	RADIAMULUS MCT 2106	CAPRILYC/CAPRIC TRIGLYCERIDES	OLEON	emollient	14
	TALC	TALC	COOPER	absorbant	5
D	Base 2452 1608983	PARFUM (FRAGRANCE)	EXPRESSIONS PARFUMEES	perfume	0,5
					100

OPERATING INSTRUCTIONS

Phase A :
-Disperse Microcare SB and Glycerin mix 5 min
- Sprinkle Carbopol ultrez 20, let hydrate and mix 10 min
-Neutralize with B
- Heat to 75°C

Phase C :
- Separately add all the ingredients and heat to 75°C under stirring

Emulsification :
-Add C into A + B under strong homogenisation for 10 min

Finally cool to 25°C and add the perfume. Mix 5 min

pH : 5,59 Viscosity (Brookfield R6V20) : 3400 cPs

2) LACTOPHYT® CREAM (PFP-003-01) batch PFP180611-D1

BIOTECHNOLOGIES
GREENTECH

CREME LACTOPHYT (PFP-003-01) batch PFP180611-D1

Phase	*Material name*	*Inci*	*Supplier*	*Properties*	*% Material*
A	DEMINERALIZED WATER	AQUA (WATER)	-	-	66,98
	MICROCARE SB	AQUA (WATER) (AND) SODIUM BENZOATE (AND) POTASSIUM SORBATE	-	preservative	1
	GLYCERIN	GLYCERIN	OLEON	humectant	5
	CARBOPOL ULTREZ 20	ACRYLATES/C10-30 ALKYL ACRYLATE CROSSPOLYMER	LUBRIZOL	gelling agent	0,4
B	DEMINERALIZED WATER	AQUA (WATER)	-	-	1
	SODIUM HYDROXIDE	SODIUM HYDROXIDE	UNIVAR	neutralizer	0,12
C	EASYNOV ™	OCTYLDODECANOL (AND) OCTYLDODECYL XYLOSIDE (AND) PEG-30 DIPOLYHYDROXYSTEARATE	SEPPIC	emusifier W/O	2
	DUB GMS CARE	GLYCERYL STEARATE	STEARINERIE ET DUBOIS	Co-emulsifier	2
	RADIAMULUS MCT 2106	CAPRILYC/CAPRIC TRIGLYCERIDES	OLEON	emollient	14
	LACTOPHYT (001207)	**AQUA (WATER) (AND) PROPANEDIOL (AND) GLYCERYL CAPRYLATE (AND) LACTOCOCCUS FERMENT EXTRACT (AND) DECYL GLUCOSIDE**	**GREENTECH**	**active**	**2**
	TALC	TALC	COOPER	absorbant	5
D	Base 2452 1608983	PARFUM (FRAGRANCE)	EXPRESSIONS PARFUMEES	perfum	0,5
					100

OPERATING INSTRUCTIONS

Phase A :
-Disperse Microcare SB and Glycerin mix 5 min
- Sprinkle Carbopol ultrez 20, let hydrate and mix 10 min
-Neutralize with B
- Heat to 75°C

Phase C :
- Separately add all the ingredients and heat to 75°C under stirring

Emulsification :
-Add C into A + B under strong homogenisation for 10 min

Finally cool to 25°C and add the active and the perfume. Mix 5 min

pH : 5,34 Viscosity (Brookfield R6V20) : cPs

3) TRIETHYLCITRATE CREAM (TRI-003-01) batch TRI180611-D1

BIOTECHNOLOGIES
GREENTECH

CREME TRIETHYLCITRATE (99%) (TRI-003-01) batch TRI180611-D1

Phase	*Material name*	*Inci*	*Supplier*	*Properties*	*% Material*
A	DEMINERALIZED WATER	AQUA (WATER)	-	-	67,98
	MICROCARE SB	AQUA (WATER) (AND) SODIUM BENZOATE (AND) POTASSIUM SORBATE	-	preservative	1
	GLYCERIN	GLYCERIN	OLEON	humectant	5
	CARBOPOL ULTREZ 20	ACRYLATES/C10-30 ALKYL ACRYLATE CROSSPOLYMER	LUBRIZOL	gelling agent	0,4
B	DEMINERALIZED WATER	AQUA (WATER)	-	-	1
	SODIUM HYDROXIDE	SODIUM HYDROXIDE	UNIVAR	neutralizer	0,12
C	EASYNOV ™	OCTYLDODECANOL (AND) OCTYLDODECYL XYLOSIDE (AND) PEG-30 DIPOLYHYDROXYSTEARATE	SEPPIC	emusifier W/O	2
	DUB GMS CARE	GLYCERYL STEARATE	STEARINERIE ET DUBOIS	Co-emulsifier	2
	RADIAMULUS MCT 2106	CAPRILYC/CAPRIC TRIGLYCERIDES	OLEON	emollient	14
	TRIETHYL CITRATE (99%) A0387565	**TRIETHYL CITRATE**	**ACROS ORGANICS**	**active**	**1**
	TALC	TALC	COOPER	absorbant	5
D	Base 2452 1608983	PARFUM (FRAGRANCE)	EXPRESSIONS PARFUMEES	perfum	0,5
					100

OPERATING INSTRUCTIONS

Phase A :
-Disperse Microcare SB and Glycerin mix 5 min
- Sprinkle Carbopol ultrez 20, let hydrate and mix 10 min
-Neutralize with B
- Heat to 75°C

Phase C :
- Separately add all the ingredients and heat to 75°C under stirring

Emulsification :
-Add C into A + B under strong homogenisation for 10 min

Finally cool to 25°C and add the active and the perfume. Mix 5 min

pH : 5,29 Viscosity (Brookfield R6V20) : cPs

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