YERBALUXE®-PEARL

Discover the secret of skin’s oxygen revival

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swiss expertise

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Imagine your skin feeling lifeless and fatigued

Experience the transformative power of YERBALUXE®-PEARL and let your skin shine with renewed energy and brilliance.

YERBALUXE®-PEARL energises and revitalises your skin, swiftly enhancing its appearance, whether you are male or female, young or mature, with Caucasian or Asian skin. It is derived from upcycled mate dust, a by-product of mate tea production, and is rich in caffeine and powerful antioxidants.

In today's fast-paced world, stress and environmental factors can deplete our skin's energy, leading to dullness and fatigue. YERBALUXE®-PEARL harnesses the power of mate tea to deliver unparalleled skin oxygenation and improve microcirculation. With 13 times more polyphenols, 2 times more caffeine, and 8 times more rutin than regular mate tea, this biohacking energy drink for the skin revitalizes and ensures a youthful and vibrant appearance. The result is a radiant, firm, and elastic complexion that defies the signs of aging.

Clinical studies have demonstrated that YERBALUXE®-PEARL enhances microcirculation and energises the skin by elevating oxygen levels, even reducing skin reddening. YERBALUXE®-PEARL rapidly fortifies the skin barrier, hydrates the skin, and imparts a natural, healthy glow. Additionally, it improves skin firmness and elasticity and diminishes the appearance of wrinkles, particularly in the crow's feet area. The product was tested on a Caucasian study panel, including some African subjects for long-term efficacy, and on a Chinese panel for instant and short-term efficacy.

In-vitro studies have shown protective activity for mitochondrial health and an increase in ceramide production, contributing to a superior skin barrier.

Scientifically substantiated claims

- Increases microcirculation by 60 %
- Increases skin oxygenation by 40 %
- Improves the skin tone uniformity
- Instantly improves gloss by 18 %
- Increases skin hydration and strengthens the skin barrier

Applications

Face and body care:
- Skin energizing cosmetics
- Even complexion, luminous skin
- Hydrating
- Anti-Ageing / Holistic beauty

Recommended use level
0.5 – 1 %

INCI PCPC
Water, Pentylene Glycol, Ilex Paraguariensis Leaf Extract, Citric Acid

CHINA NAGOYA NATURAL HALAL

What is “skin energy” in the cosmetics world?

In the realm of cosmetics, “skin energy” is a term often used to describe the vitality, radiance, and overall health of the skin. It refers to the skin’s ability to regenerate, repair itself, and maintain a youthful appearance. High “skin energy” is associated with a bright, luminous complexion, whereas low “skin energy” can indicate fatigue, dullness, and signs of ageing.

Skin energy: not an easy task for cosmetics

Skincare products frequently utilise various active ingredients to enhance skin energy. Key ingredients include:

- **Niacinamide (Vitamin B3):** Enhances the skin’s barrier function, increases elasticity, and improves overall tone and texture by boosting cellular energy production.
- **Coenzyme Q10 (Ubiquinone):** Reduces the appearance of fine lines and wrinkles, improves skin softness, acts as an antioxidant and supports cellular energy production in the mitochondria.
- **Vitamin C (Ascorbic acid):** Brightens the skin, reduces hyperpigmentation, and promotes collagen synthesis. It provides antioxidant protection and stimulates collagen production, essential for maintaining the skin’s structure and firmness.
- **Adenosine:** Smooths the skin, reduces the appearance of wrinkles, and improves elasticity. It increases cellular energy (ATP) and has anti-inflammatory properties.
- **Hyaluronic Acid:** Intensely moisturises the skin and reduces the appearance of fine lines by attracting and retaining moisture, thus improving hydration and overall skin vitality.
- **Retinoids (Vitamin A derivatives):** Stimulate the production of new skin cells and collagen, promoting skin renewal and repair. They reduce the appearance of fine lines and wrinkles and improve firmness and elasticity.
- **Ginseng Extract:** Revitalises the skin, reduces signs of ageing, and improves complexion by enhancing microcirculation and providing antioxidant protection, promoting overall skin vitality.

In essence, increased skin energy translates into enhanced microcirculation, refined skin texture, improved mitochondrial health, better hydration, increased firmness and elasticity and reduced wrinkles. It is associated with a more radiant and luminous complexion.

What if we could combine all these effects in a single active ingredient? Is that impossible? Well, not with YERBALUXE®-PEARL. YERBALUXE®-PEARL boosts the skin’s energy by enhancing microcirculation and oxygenation while protecting mitochondria. It hydrates the skin, fortifies the skin barrier, and creates a luminous, uniform appearance. It increases firmness and elasticity and reduces fine lines.

What is “skin energy” to the skin?

How is skin supplied with oxygen?
The skin serves as the boundary layer between the external environment and our internal organs. While all organs and tissues in the body receive oxygen via the bloodstream (except the lungs, of course), the skin has a unique feature. It is also supplied with oxygen and nutrients through fine capillaries (Figure 1). However, this occurs only up to the stratum papillare of the dermis. According to current data, the epidermis itself is primarily supplied with oxygen from the surrounding air, which diffuses throughout the living epidermis. The minimum oxygen partial pressure is likely in the basal layer of the epidermis and the papillary layer of the dermis [1, 2]. As both the basal and papillary layers are the most metabolically active areas of the skin, a good supply of oxygen is essential for a healthy skin structure [3].

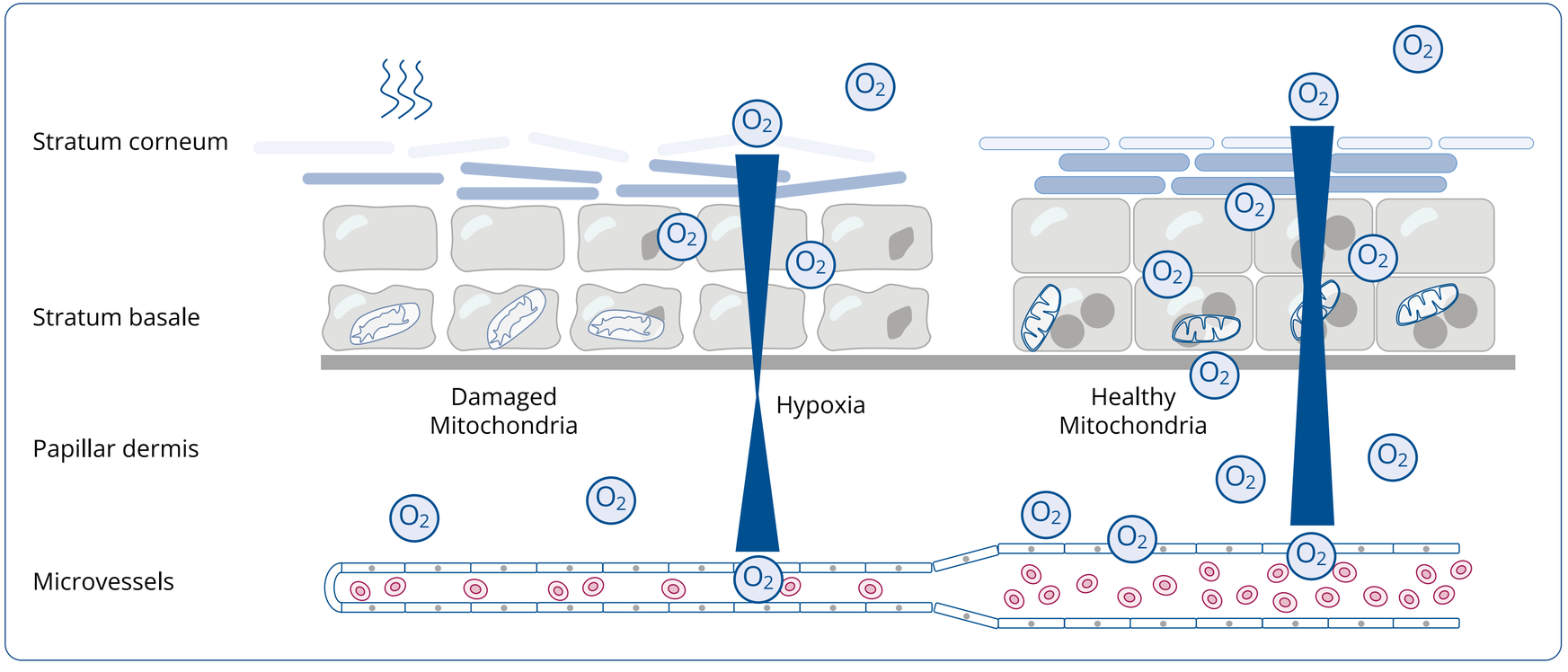


Figure 1: Skin oxygenation comes from air oxygen and capillary oxygen. Both sources create an oxygen gradient with a minimum in the area of the stratum basale of the epidermis and the stratum papillare of the dermis. Poor microcirculation can lead to hypoxia (low oxygen partial pressure). Increasing microcirculation can strengthen the internal oxygen supply.

Let your skin do the exercise

The only way to increase skin oxygenation is to enhance microcirculation, as the oxygen concentration in the outside air remains constant (unless you revitalise your skin with an oxygen shower). By boosting microcirculation, more oxygen-rich blood reaches the tissue, better supplying the cells. This occurs naturally during exercise, which increases microcirculation [4]. As muscles require more energy, they receive more blood, benefiting the skin as well [5]. The partial oxygen pressure in the skin has been shown to increase during physical activity. While this effect is not evident in all studies, an increase in microcirculation significantly correlates with skin oxygenation [6]. Thus, increased microcirculation and subsequent oxygenation can be considered a workout for the skin, explaining why active individuals often appear younger than those who are less active.

Oxygen supply is key for skin energy

What causes oxygen in skin?

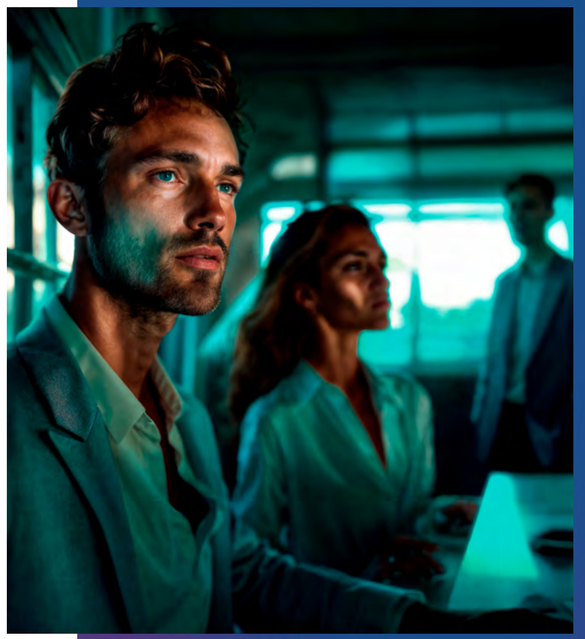
Enhanced oxygenation aids the skin in regenerating more swiftly and functioning optimally. It can also decelerate the ageing process, as older skin tends to have a lower partial oxygen pressure [7]. In conditions of hypoxia (low oxygen saturation), fibroblasts produce less collagen [8]. Various factors can lead to a decline in microcirculation. For instance, it has been demonstrated that prolonged mental stress impairs blood flow [9]. It is, therefore, unsurprising that stress can lead to long-term health issues, with the skin reflecting these conditions. Poor nutrition and a sedentary lifestyle can also contribute to these effects. More severe conditions are evident in diabetes and chronic smoking.

What is oxygen needed for?

At the cellular level, oxygen is essential for cellular respiration. During this process, oxygen reacts with protons to form water in the mitochondrial respiratory chain. The energy generated is utilised to create a proton gradient across the mitochondrial membrane, which then drives ATP synthase to produce ATP, the cellular energy currency and life's fuel.

The most energetic phase in a keratinocyte's life is its transformation in the stratum granulosum. Here, all non-essential cellular components are broken down and recycled into the functional building blocks of the skin barrier. Alongside the keratinised envelope of the corneocytes and the natural moisturising factor, these include the lipids of the skin barrier, 50% of which are ceramides. Thus, a good supply of oxygen is fundamental for a fully functional skin barrier.

Moreover, an adequate oxygen supply enables cells to effectively manage stress factors such as radical-generating radiation like UV. This protection preserves the valuable mitochondria and maintains the cells' energy levels consistently high.



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Sourcing and environment

The raw material used to create YERBALUXE®-PEARL originates from the yerba mate (mate tea; “yerba” means “herb” in Spanish) production at the Pindo Farm in Argentina. Here, the mate bush, *Ilex paraguariensis*, is cultivated organically, with the leaves being harvested and processed locally on the farm. Traditionally, the leaves are dried over fire to inactivate enzymes that would otherwise initiate fermentation, similar to the process used in black tea production. However, the Pindo Farm employs a unique proprietary method to prevent the formation of polycyclic aromatic hydrocarbons (PAH), which are undesirable toxic compounds. Consequently, YERBALUXE®-PEARL is free from these potential impurities. Only the residuals from the leaf processing, which are unsuitable for tea production, are utilised to create YERBALUXE®-PEARL. As this material is typically discarded, YERBALUXE®-PEARL is considered an upcycled product.

Yerba mate is native to South America and is traditionally consumed in Brazil, Argentina, Uruguay, and Paraguay (hence the name *Ilex paraguariensis*). It is renowned for its stimulating effect on the central nervous system, containing on average about 55 mg/100 ml of caffeine [10], making it comparable to coffee, which contains 23 mg – 143 mg/100 ml caffeine [11].

Due to these properties, yerba mate is currently recognised as a natural energiser and is gaining popularity as an alternative to taurine and caffeine-containing energy drinks. Yerba mate is also reputed to strengthen the immune system, promote general health, possess detoxifying properties, relieve exhaustion, aid digestion, and even treat skin problems.

In addition to caffeine, yerba mate contains potent antioxidants in the form of polyphenols, such as caffeoylquinic acids, which can protect mitochondria [12, 13], and rutin. Rutin is also known to stimulate microcirculation and acts as an antioxidant and anti-inflammatory agent [14].

YERBALUXE®-PEARL contains approximately 13 times the amount of polyphenols, twice the amount of caffeine, and about 8 times the amount of rutin compared to freshly brewed yerba mate tea [10]. With YERBALUXE®-PEARL, we deliver this powerful, traditional energising drink in a highly concentrated form to the skin, offering extraordinary benefits.

	Brasilian mate tea [10]	YERBALUXE®-PEARL*
Compound(s)	Amount (mg/100 ml)	Amount (mg/100 ml)
Total polyphenols	101	1350
Caffeine	55	135
Rutin	8	67

*representative values, batch to batch variations may occur.

Table 1: Amount of active ingredients in freshly brewed mate tea and YERBALUXE®-PEARL.

Product Carbon Footprint

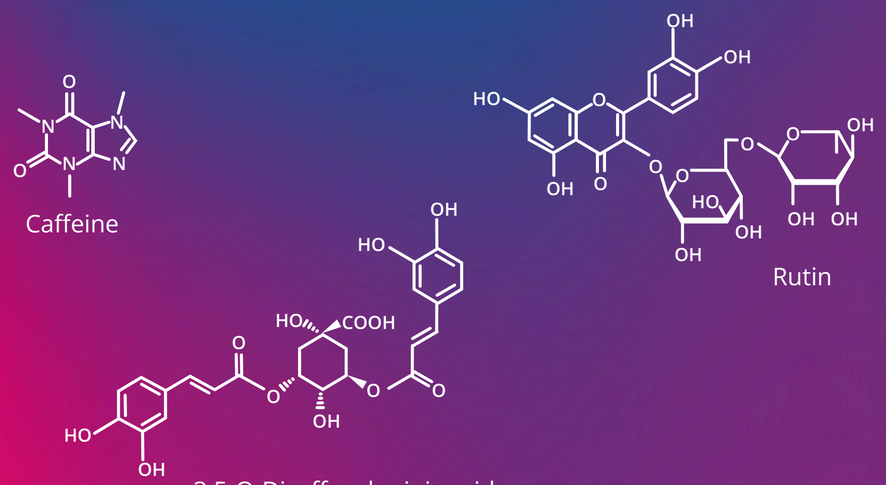
This RAHN-Cosmetic Actives product is ClimatePartner certified. The label is a transparent disclosure of the comprehensive corporate climate action strategy, emission reduction targets and measures, carbon footprint, and financial contribution towards climate projects worldwide.

Product carbon emissions have been calculated in accordance with the “Greenhouse Gas Protocol Product Life Cycle Accounting and Reporting Standard”. A “cradle-to-customer plus waste” approach has been used. Extraction, pre-processing of raw materials, packaging, manufacturing, delivery of the product to the customer’s factory gate and all relevant disposal emissions for the product and its packaging have been considered.

Where possible, primary data has been used. Otherwise, the underlying emission factors were derived from international databases such as Ecoinvent or GEMIS. Carbon emissions have been offset through two sustainability projects that support a range of UN Sustainability Goals.

Do you want to discover how RAHN-Group manages sustainability? Go to Sustainability - Rahn AG (rahn-group.com)

Figure 2: *Ilex paraguariensis* is endemic to South America. Its leaves are consumed as yerba mate or mate tea. It contains caffeine, polyphenols and rutin.



Claim substantiation

YERBALUXE®-PEARL ENERGISES SKIN AND PROMOTES A YOUTHFUL APPEARANCE (*in-vivo* study)

Aim

To show that YERBALUXE®-PEARL can energise the skin by increasing microcirculation and oxygenation of the tissue. Caffeine, as present in YERBALUXE®-PERAL, is known to stimulate the blood flow in capillaries. This is supported by rutin, which in addition is also a strong anti-oxidant. Polyphenols and especially caffeoylquinic acids act as strong antioxidants and anti-inflammatory agents. The combination of these ingredients should lead to an increase of microcirculation.

Method

To evaluate the efficacy of YERBALUXE®-PEARL on the face, an emulsion containing 0.5% YERBALUXE®-PEARL or without active ingredient (placebo) was applied once daily for 28 days. Measurements were taken after 14 days and 28 days, some parameters were also assessed after 30 minutes. Subjects were selected from a **Caucasian panel** including 4 subjects with **African background**.

Skin microcirculation and partial oxygen pressure ($TcPO_2$) was assessed using a Laser Doppler Flowmeter (Periflux LDPM PF5000 with laser channel PF 5010, Perimed, Sweden). The tissue was illuminated with a monochromatic laser at 780 nm. The average penetration is 1.5 mm, which allows detection of the blood flow at the superficial dermal plexus. For skin oxygenation, the laser channel PF 5040 $tcpO_2$/$tcpCO_2$ was used.

Skin redness was evaluated using the red channel of the VISIA-CR. Wrinkles and roughness was measured with the VISIA-CR as well. Skin hydration and transepidermal water loss were measured using a Corneometer CM825 or TEWAmeter TM300 (Courage+Khazaka Electronic GmbH, Germany), respectively. Firmness and elasticity were measured by cutometry.

Implementation

Test design	Double-blind, placebo-controlled *in-vivo* study
Test subjects	52 female subjects (48 Caucasian skin type, 4 African skin type), aged 30–59 years (average 53.8)
Test formulations	Emulsion containing 0% YERBALUXE®-PEARL Emulsion containing 0.5% YERBALUXE®-PEARL See “Test formulations for the efficacy studies” at the end of this brochure (700551.0001/700551.0002)
Application area	Face
Application period	28 days
Application frequency	Once daily
Endpoints	Skin microcirculation and oxygenation: Periflux LDPM PF5000 Laser Doppler Flowmeter Skin redness: VISIA-CR Skin hydration: Corneometer CM825 TEWL: TEWAmeter TM300 Roughness and wrinkles: VISIA-CR Firmness/Elasticity: Cutometer dual MPA 580

Results

Skin microcirculation and oxygenation: 0.5 % YERBALUXE®-PEARL increases the microcirculation with a strong tendency of plus 29.3 % 30 minutes after application (Figure 3). After 14 days of daily application, YERBALUXE®-PEARL increased microcirculation by 23.9 %, reaching significance after 28 days with 59.1 %. In parallel, skin tissue oxygenation increased by 12.2 %, 7.8 % and 40.5 %, respectively (Figure 4). This increase was significant 30 minutes after application and after 28 days daily use. After 28 days, YERBALUXE®-PEARL outperformed placebo significantly by 190 %. In average, The $tcpO_2$ value increased from 43.5 mmHg to 59.3 mmHg when 0.5 % YERBALUXE®-PEARL was applied.

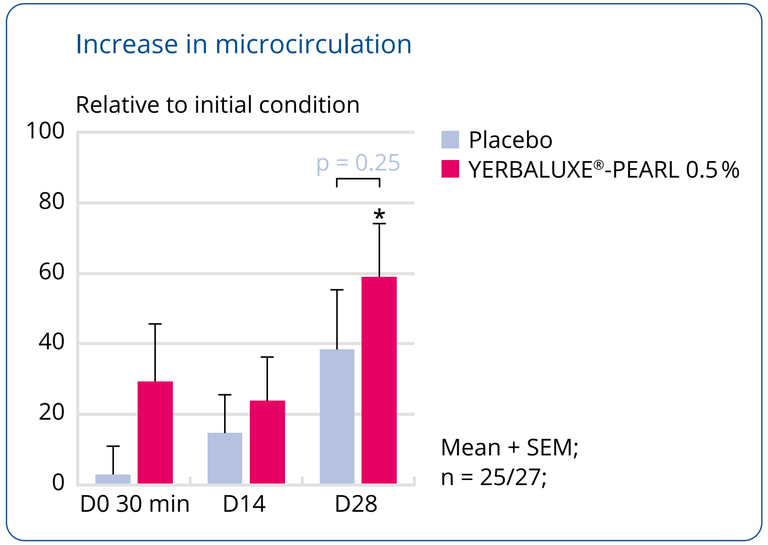


Figure 3: YERBALUXE®-PEARL increases skin microcirculation. Laser Doppler analysis of skin microcirculation revealed a decent increase after 30 minutes and a significant increase after 28 days with limit significance over placebo. Miogenic and NO-contribution to microcirculation was highly significant over placebo ($p < 0.001$). Student's t-test.

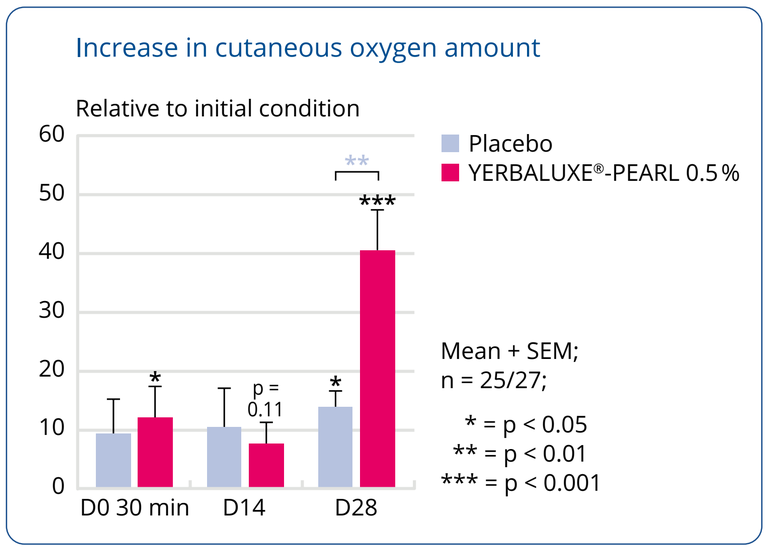


Figure 4: YERBALUXE®-PEARL increases transcutaneous partial oxygen pressure. Laser Doppler analysis of transcutaneous partial oxygen pressure revealed a significant increase after 30 minutes and after 28 days a significant increase over placebo as well. Wilcoxon signed rank test.

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Skin redness: The increase in microcirculation did not show increased skin redness. In contrast, redness was visibly reduced by 1.6 % after 14 days and 3.1 % after 28 days. As such, YERBALUXE®-PEARL can invigorate the skin without signs of reddening and inflammation.

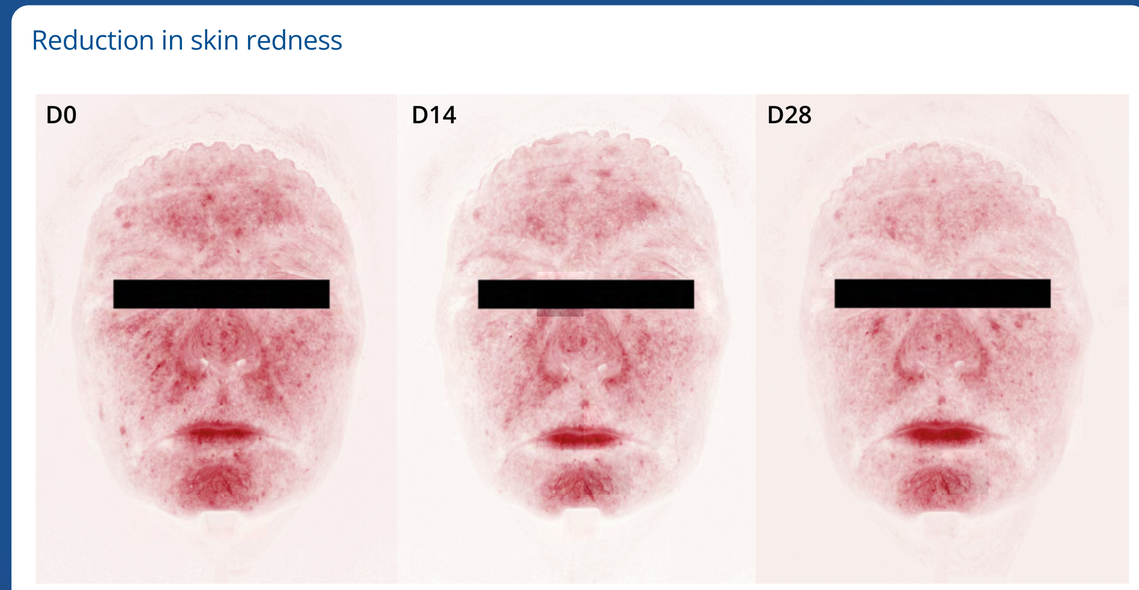

Figure 5: YERBALUXE®-PEARL decreases skin redness. VISIA analysis of the red channel revealed a visible reduction of skin redness after 14 and 28 days. This is an unexpected result as YERBALUXE®-PEARL increases microcirculation which is typically causing skin redness. #24A, female, age 59 years, YERBALUXE®-PEARL 0.5 %.

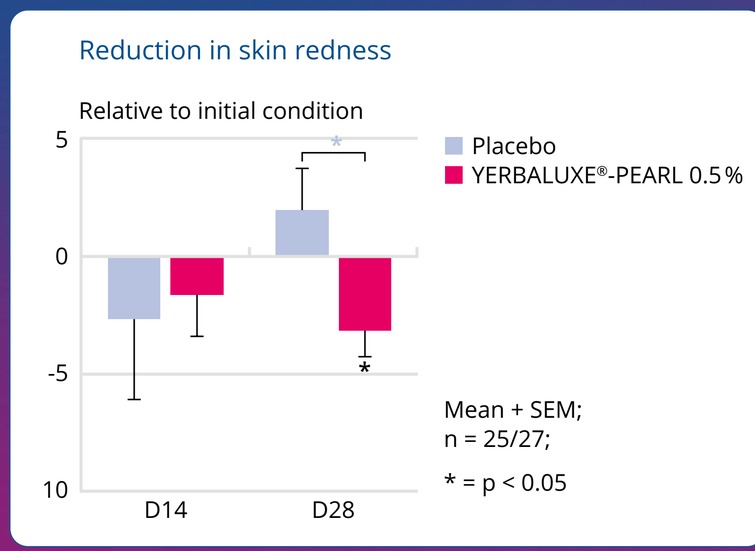

Figure 6: YERBALUXE®-PEARL decreases skin redness. VISIA quantification of skin redness revealed a significant reduction after 28 days over baseline and placebo. Student's t-test.

Skin hydration and transepidermal water loss: Skin hydration was significantly increased by 10.6 % or 26.9 % after 14 and 28 days. Transepidermal water loss was reduced by 5 % or 10.5 %, respectively.

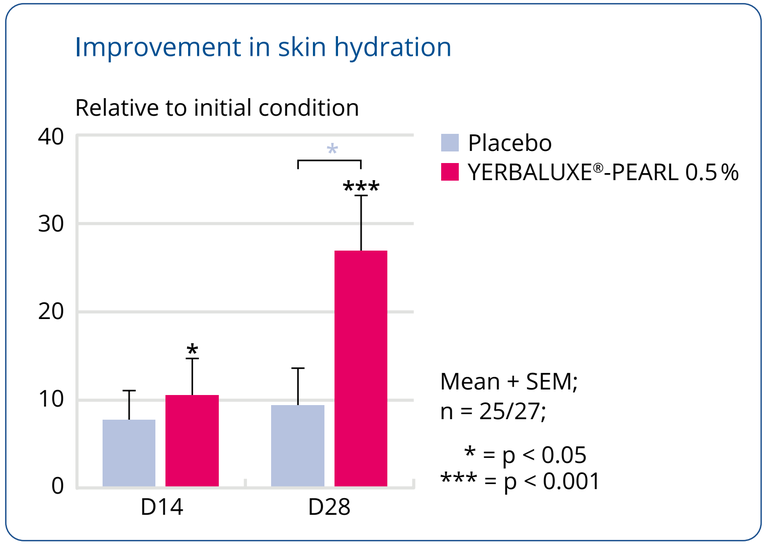

Figure 7: YERBALUXE®-PEARL increases skin hydration.
Corneometry revealed a significant increase of skin hydration after 14 days, which became significant over placebo after 28 days, as well. Student's t-test.

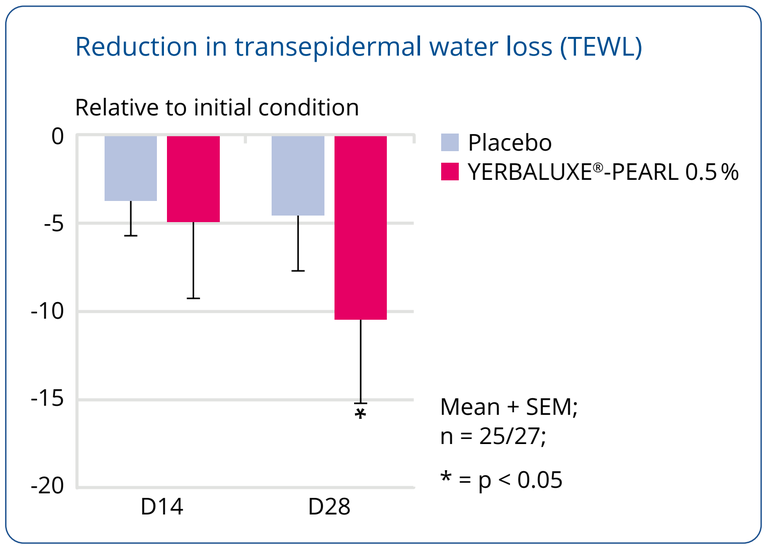

Figure 8: YERBALUXE®-PEARL decreases transepidermal water loss.
TEWAmetry revealed a decrease in TEWL after 14 days, which became significant after 28 days. Student's t-test.

Firmness and elasticity: Firmness was increased by 5.2% and 12.6% after 14 or 28 days. Elasticity was increased by 14.5% or 20.4%, respectively. While significance over placebo was reached already after 14 days for elasticity, it was reached after 28 days for firmness (limit significance with p = 0.06 after 14 days).

Skin roughness and wrinkles: Skin roughness was reduced by 5% or 8.7% after 14 or 28 days. Wrinkles in the crow's feet area were significantly reduced by 32.9% or 37.2%, respectively. Roughness and wrinkle reduction reached significance over placebo after 28 days.

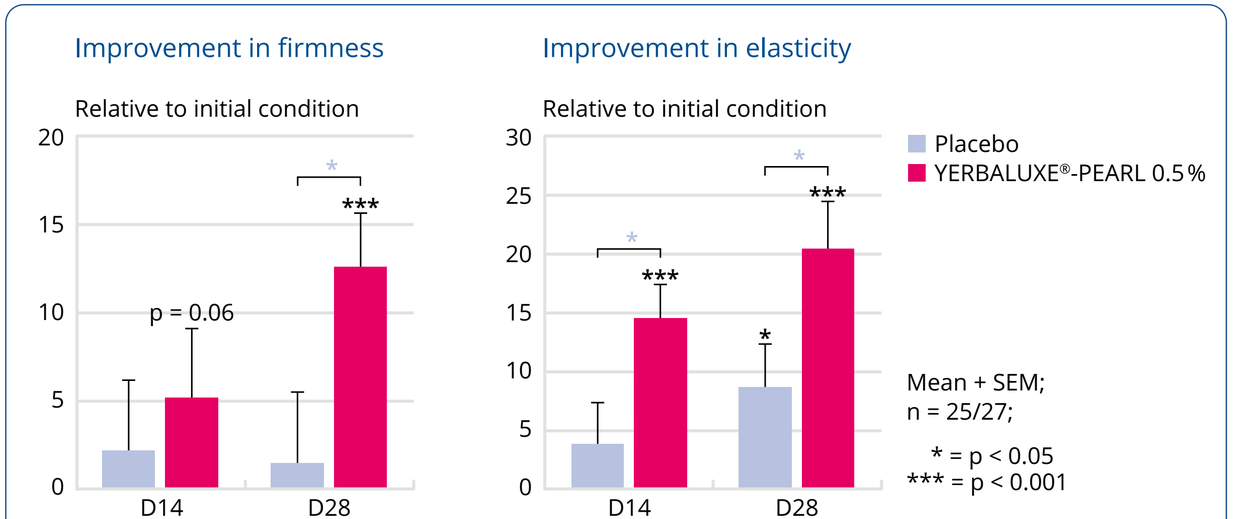

Figure 9: YERBALUXE®-PEARL increases firmness and elasticity. Cutometry showed a significant increase in firmness (left panel) and elasticity (right panel) already after 14 days, which increased further after 28 days. YERBALUXE®-PEARL was significantly superior over placebo at all time points (limit significance at D14 for firmness. Student's t-test.

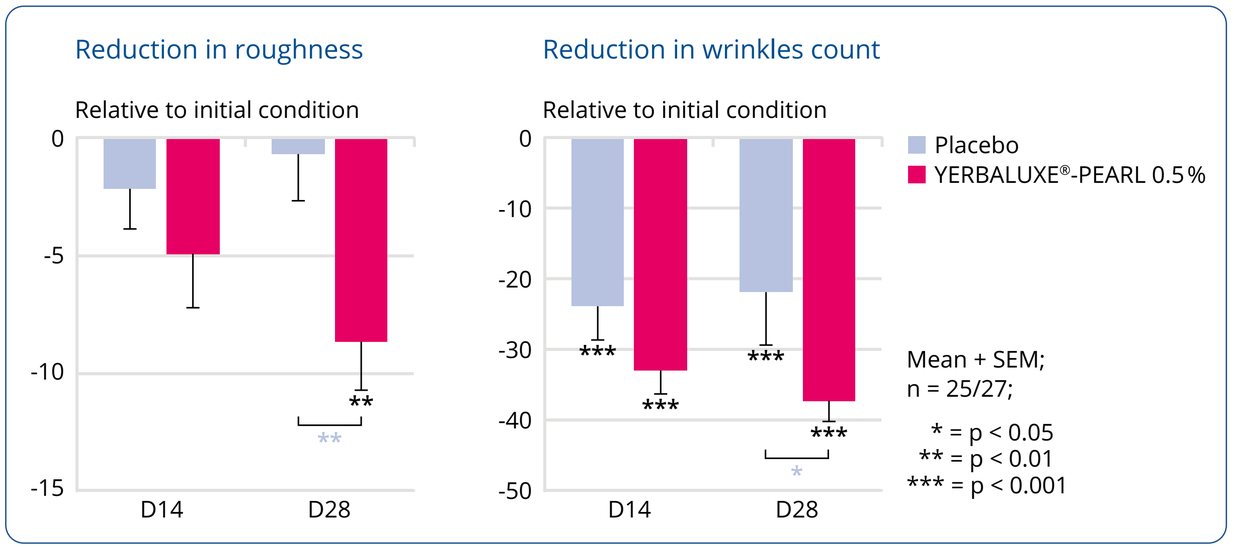

Figure 10: YERBALUXE®-PEARL decreases roughness and wrinkles count. VISIA-CR analysis showed a clear reduction of roughness (left panel) after 14 days, which became significant over baseline and placebo after 28 days. Wrinkles count (right panel) decreased significantly already after 14 days and significantly over placebo after 28 days. Student's t-test or Wilcoxon signed rank test, respectively

YERBALUXE®-PEARL SHOWS IMMEDIATE EFFICACY (*in-vivo* study)

Aim

To show that YERBALUXE®-PEARL has immediate effects after a single application. The previous study gave indication that YERBALUXE®-PEARL had immediate effects after 30 minutes in a predominantly Caucasian panel. Here, we aimed on measuring instant effects of different parameters in a **Chinese panel**.

Method

To evaluate the efficacy of YERBALUXE®-PEARL on the face, an emulsion containing 1 % YERBALUXE®-PEARL or without active ingredient (placebo) was applied in a single application. Measurements were taken after 30 minutes and 1 day after application.

Skin hydration and transepidermal water loss was measured using a Corneometer CM825 or TEWAmeter TM300 (Courage+Khazaka Electronic GmbH, Germany), respectively. Gloss was analysed using the GL 200 Glossymeter. Skin redness and uniformity was evaluated using the VISIA-CR.

Implementation

Test design	Double-blind, placebo-controlled, hemiface *in-vivo* study
Test object	31 Chinese subjects (22 female, 9 male), aged 27–55 years (average 44.4)
Test formulations	Emulsion containing 0 % YERBALUXE®-PEARL Emulsion containing 1 % YERBALUXE®-PEARL See “Test formulations for the efficacy studies” at the end of this brochure (700551.0001 / 700551.0003)
Application area	Face
Application period	Single application
Application frequency	Once
Endpoints	Skin hydration: Corneometer CM825 TEWL: TEWAmeter TM300 Skin redness and uniformity: VISIA-CR Gloss: Glossymeter GL 200

Results

Skin hydration and transepidermal water loss: Skin hydration was significantly increased by 66.8 % after 30 minutes and stayed elevated by 40 % after 1 day. Transepidermal water loss was significantly reduced by 12.4 % or 13.3 %, respectively.

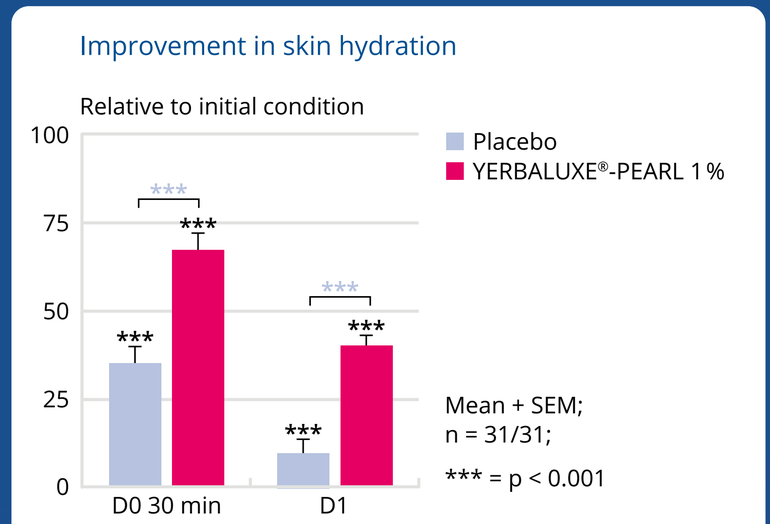

Figure 11: YERBALUXE®-PEARL creates lasting skin hydration after a single application. Corneometer readings 30 minutes after application of 1 % YERBALURE®-PEARL resulted in a significant hydration increase of 67 %, which lasted for at least 24 hours (+40 %). Wilcoxon signed rank test / Student's t-test.

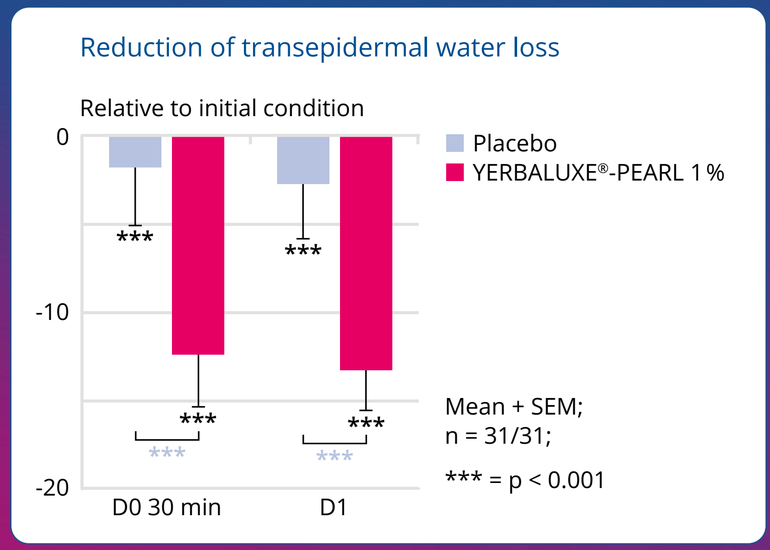

Figure 12: YERBALUXE®-PEARL instantly decreases transepidermal water loss. TEWAmetry revealed a significant decrease in TEWL 30 minutes after application, which lasts at least for 24 hours. Wilcoxon signed rank test / Student's t-test.

Skin redness and uniformity: After 30 minutes, skin redness area was significantly reduced by 9.4 %. After 1 day, redness was still significantly reduced by 7.3 %. Skin gained uniformity 30 minutes after application by 11.6 % which still was elevated by 8.1 % after 1 day (see next page).

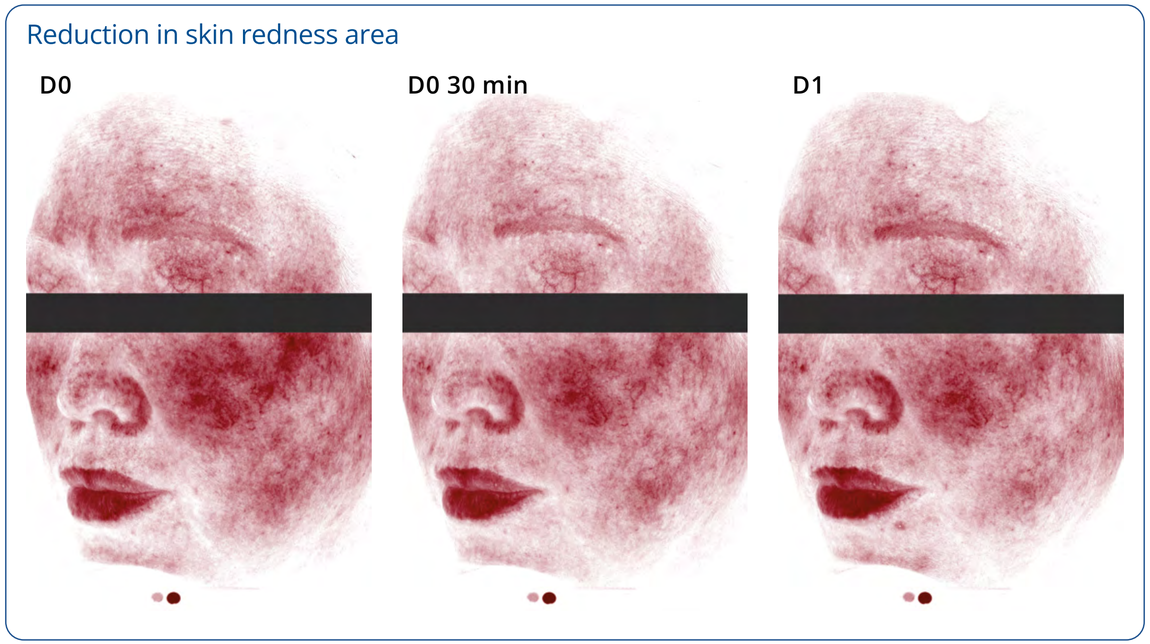

Figure 13: YERBALUXE®-PEARL decreases skin redness. VISIA analysis of the red channel revealed a visible reduction of skin redness 30 minutes after application. #16, female, age 44 years. YERBALUXE®-PEARL 1 %.

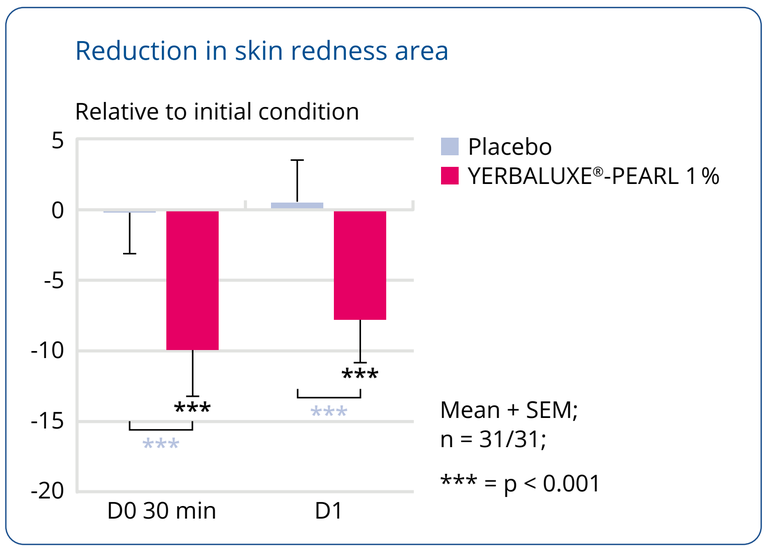

Figure 14: YERBALUXE®-PEARL decreases skin redness. VISIA quantification of skin redness revealed a significant reduction 30 minutes after application which lasts for at least 24 hours. Placebo did not show any effect. Wilcoxon signed rank test / Student's t-test.

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Figure 15: YERBALUXE®-PEARL increases skin uniformity. VISIA analysis in the visible channel shows a better skin tone uniformity 30 minutes after application. Note the reduction in redness as well. #20, female, age 37 years. YERBALUXE®-PEARL 1 %.

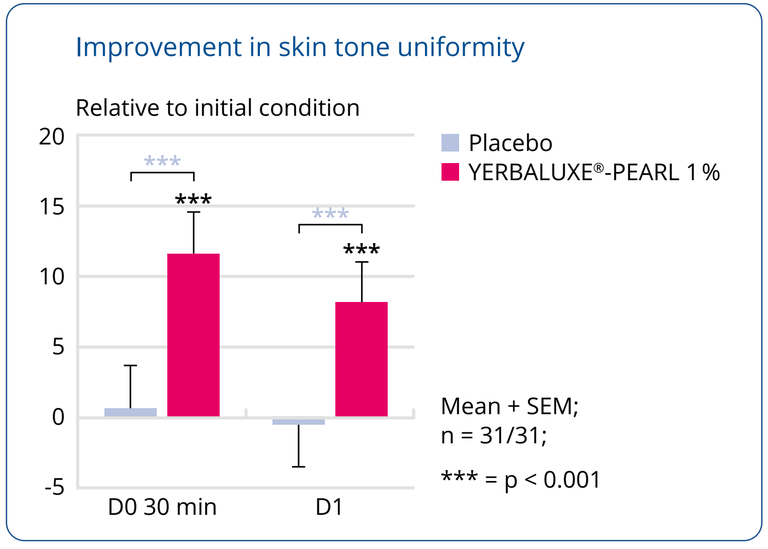

Figure 16: YERBALUXE®-PEARL increases skin uniformity. VISIA quantification shows a significant result after 30 minutes and 24 hours. Placebo did not show an effect. Wilcoxon signed rank test / Student's t-test.

Gloss: Skin gloss increased by 18 % 30 minutes after application and stayed increased (17 %) after 1 day. These measurements by the glossymeter were visually confirmed in the VISIA-CR images.

Figure 17: YERBALUXE®-PEARL increases skin gloss. VISIA images in the visible channel show a decent increase in skin gloss after 30 minutes and 1 day. #4, female, age 46 years. YERBALUXE®-PEARL 1 %.

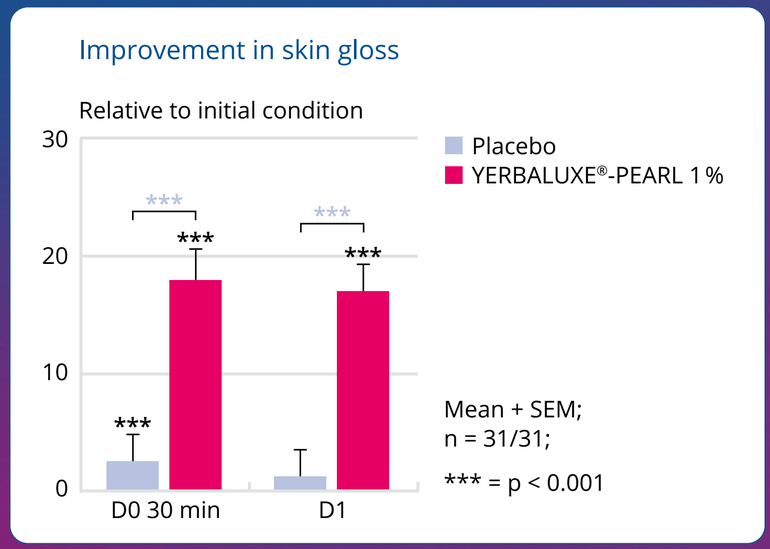

Figure 18: YERBALUXE®-PEARL increases skin gloss. Glossymeter readings confirmed the findings of the VISIA-CR. YERBALUXE®-PEARL significantly increased gloss after 30 minutes and 24 hours. Wilcoxon signed rank test / Student's t-test.

YERBALUXE®-PEARL PROTECTS MITOCHONDRIA (*ex-vivo* study)

Aim

To show that YERBALUXE®-PEARL can protect mitochondria from UV-A irradiation. A lesser content of mitochondria leads to less energetic skin with signs of skin ageing.

Method

To evaluate the protective potential of YERBALUXE®-PEARL for mitochondrial damage after UV-A irradiation, *ex-vivo* skin explants were stained against the marker protein PINK1. PINK1 accumulates in damaged mitochondria and flags them for mitophagy. Protected mitochondria will accumulate less PINK1 as they stay in healthy condition. UV-A irradiation was done with a UV simulator (Vilbert Lourmat RMX 3W with a dose of 18 J/cm², corresponding to 4 MEDs)

Implementation

Test design	*Ex-vivo* immunohistochemical staining
Test object	Skin explants from abdominoplasty (39 year old female Caucasian)
Test formulations	Culture medium with 0% or 0.1% YERBALUXE®-PEARL UV-A irradiation 0 or 18 J/cm²
Application period	5 days
Application frequency	Every second day
Endpoints	PINK1 accumulation: Immune histochemical staining with monoclonal anti-PINK1 antibody

Results

UV-A irradiation lead to a pronounced increase in PINK1 staining in the epidermis of the skin explants, indicative for mitochondrial damage and induced mitophagy (Figures 19, 20). Application of 0.1 % YERBALUXE®-PEARL was able to reduce PINK1 accumulation back to basal level.

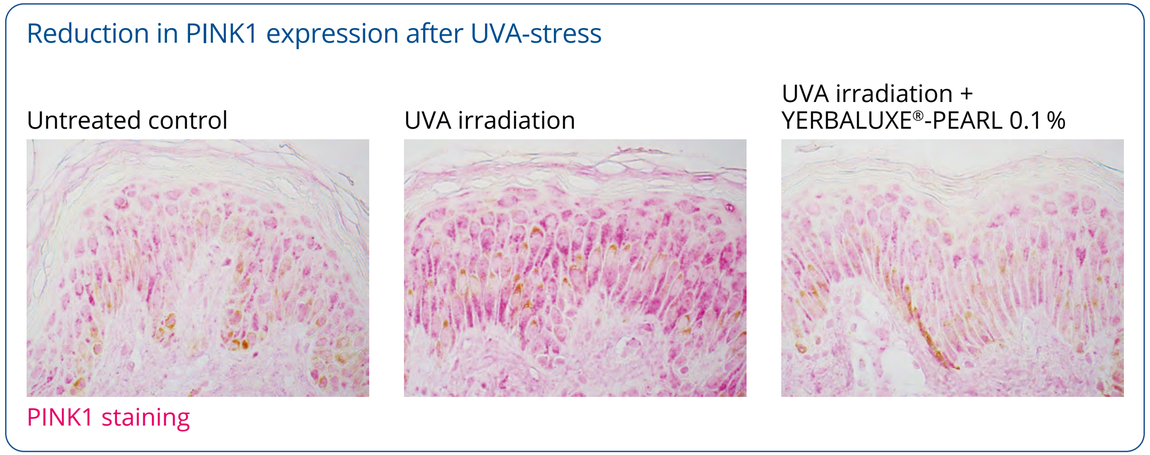

Figure 19: YERBALUXE®-PEARL protects mitochondria from UV-A radiation. Semiquantitative PINK1 staining of skin explants show a marked increase when exposed to UV-A radiation. This is reduced back to non-radiated condition when 0.1 % YERBALUXE-PEARL was used.

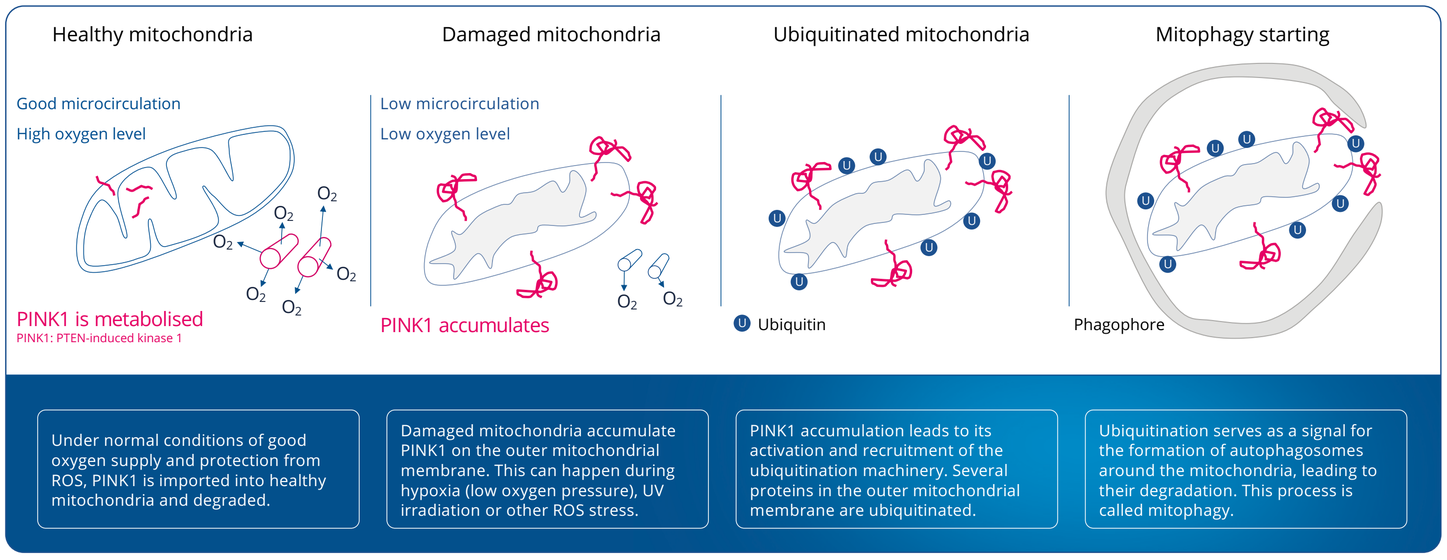

Figure 20: The process of mitophagy. Damaged and dysfunctional mitochondria are not capable of processing a protein called PINK1, which then accumulates in the membrane of the mitochondria. This flag is the signal for ubiquitination, which in turn starts the mitophagy process.

YERBALUXE®-PEARL STRENGTHENS THE SKIN BARRIER (*in-vitro* study)

Aim

The *in-vivo* studies showed a quick and sustainable improvement of the skin barrier, indicated by a decreased transepidermal water loss. Here, we aimed to show that YERBALUXE®-PEARL can strengthen the skin barrier by increasing the amount of ceramides.

Method

Immune-histologic staining of ceramides with an anti-ceramide antibody on 3D reconstructed human epidermis (SkinEthic™ Model).

After reconstruction, the model was topically treated twice daily with 0.01 % YERBALUXE®-PEARL or not. Ceramides staining was performed after 4 days.

Implementation

Test design	*In-vitro* immune-fluorescent staining
Test object	Reconstructed human 3D skin equivalents (SkinEthic™ RHE/S/17)
Test formulations	Topical application of 0.01 % YERBALUXE®-PEARL
Application period	4 days
Application frequency	Twice daily
Endpoints	Ceramides: Immune fluorescent staining with anti-ceramide antibody

Results

Topical application of 0.01 % YERBALUXE®-PEARL to the reconstructed 3D epidermal skin models resulted in a significant 25.8 % increase of ceramides deposition (Figure 21). Ceramides are pivotal for a healthy, functional skin and make up to 50 % of the lipids in the skin barrier. A 25.8 % increase is a significant improvement to combat transepidermal water loss and keep the skin moist.

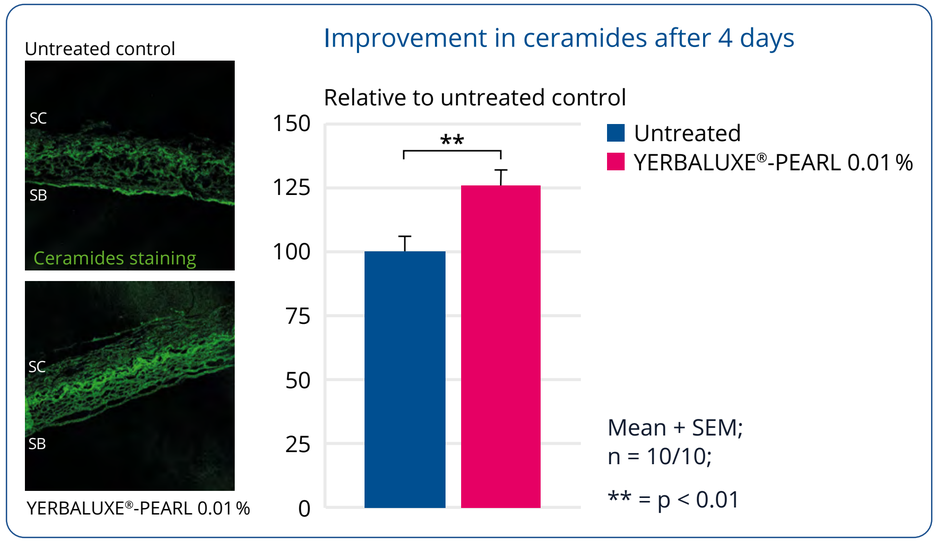

Figure 21: YERBALUXE®-PEARL increases ceramides production. Quantitative immune fluorescent staining of ceramides in the epidermis of a skin explant 3D reconstructed epidermis shows a significant increase in ceramides deposition after 4 days compared to untreated (placebo) condition. **Left panels:** stainings with anti-ceramides antibody, **right panel:** quantification. SB: Stratum basale, SC: Stratum corneum. Unpaired Student's t-test.

Test formulations for the efficacy studies

YERBALUXE®-PEARL 1 (700551.0001 | 700551.0002)

St	Substance	INCI Name USA	% [w/w]	Manufacturer
1	Water demin.	Water	ad 100	several
2	Verstatil PC	Phenoxyethanol, Caprylyl Glycol	1.10	Evonik, DE
	WITARIX MCT 60/40	Caprylic/Capric Triglyceride	10.00	IOI OLEO GmbH, DE
	Keltrol CG-SFT	Xanthan Gum	0.50	CP Kelco, US
	Dermofeel GSC	Glyceryl Stearate Citrate	2.50	Evonik, DE
	Tego Alkanol 1618	Cetearyl Alcohol	2.00	Evonik, DE
3	Citric Acid solution 10%	Citric Acid, Water	0.20	several
4	YERBALUXE®-PEARL	Water, Pentylene Glycol, Ilex Paraguariensis Leaf Extract, Citric Acid	0.00 or 0.50 or 1.00	RAHN AG, CH

Production:

Heat 1 to 75°C while stirring. Heat 2 to 75°C while stirring. Add 2 to 1 while stirring, homogenise. Add 3 to the emulsion while stirring, homogenise and cool to 40°C.
Add 4 to the emulsion while stirring, homogenise. Cool to 25°C while stirring. Production under vacuum is recommended, adjusting of pH may be necessary. Make sure that all phases are homogenous before emulsifying.

RAHN
COSMETIC ACTIVES

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If you have any further questions, please contact me! We look forward to the conversation with you.

Barbara Obermayer, Head of RAHN-Cosmetic Actives

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