



Cosmeceuticals



PERSONAL CARE

The Natural Sign

extraits de plantes standardisés objectivés
objectivized standardized plant extracts

BECARRE Natural

May 2024

4 CBD now from stock in Europe (GVB) - Quality and reactivity

To supply the food supplement, cosmetic and pharmaceutical markets, Becarre Natural now delivers hemp extracts from stock in Europe, available even from 1KG packages.



Vertical integration is a key operational strategy at GVB Biopharma, and starts with the quality control of the seed from a selection of seeds, cultivation areas, and continues at each stage of processing and development. Using proprietary extraction processes, in collaboration with Biosylx group for even more secured sourcing network and long-term supply-chain, GVB Biopharma is recognized to offer stable and high quality extract (Isolate, distillate, water soluble, crude oil).



The origin you can trust from the leading and trusted historical supplier.

A study on the new therapeutic opportunities of topical cannabidiol (CBD) in skin pathology (Lehlohonolo M.), describes the elements of the endocannabinoid system (ECS), "extensively documented in epidermal keratinocytes, melanocytes, mast cells and cutaneous immune regulatory system". CBD were shown to "suppress in vitro proliferation (and differentiation) of cultured epidermal keratinocytes, alter pain and stimulate wound healing, and have anti-microbial and pruritic properties".

The properties of CBD are therefore **multiple in cosmetics**, from **pain** (CBD can help relieve pain and swelling related to arthritis) and **inflammation**, to **anti-microbial** activities (acne, psoriasis, eczema, management of the sebum production of the epidermis). CBD can also function as an antioxidant and facilitate anti-aging properties.



4 Glabridin 98 Licorice Skin Lightening

from 4% Glabridin licorice extract, to the purified 98% Glabridin.

Glabridin is renowned for its ability to inhibit tyrosinase and its anti-inflammatory properties, achieved through the inhibition of cyclo-oxygenase in the arachidonic acid cascade.

4 LactoSporin® Novel Probiotic Anti Acne vs benzoyl peroxide, Metabolite for Skin and Hair

LactoSporin® is the postbiotic for cosmeceutical products that has anti-acne, anti-microbial, anti-oxidant, anti-inflammatory, and anti-collagenase properties, and shows protective efficacy against UV radiation, environmental pollutants, and prevents microbial bio film formation, induces hair growth, and prevents accelerated skin aging...

As one of the first systematic clinical studies of a probiotic metabolite, the research demonstrates the efficacy of LactoSporin® 2% w/w cream in reducing the severity of acne in human volunteers, with the effects comparable to benzoyl peroxide 2.5% gel.

LactoSporin® is prepared by a patented technology in a defined growth media. It is standardized preparation for antimicrobial activity with a broad spectrum of activity against gram-positive and gram-negative bacteria.

LactoSporin® is an ingredient for cosmeceutical products that has numerous properties, and shows protective efficacy against UV radiation, environmental pollutants, and prevents microbial bio film formation, induces hair growth, and prevents accelerated skin aging – so diverse exciting applications of LactoSporin®.



4 Boswellin® in the Management of Psoriasis

Sabinsa's Boswellia extract cream can be used to manage mild to moderate psoriasis through its anti-inflammatory effects.

The cream with Boswellin® - standardized for 5% of 95% 3O Acetyl-11 Keto Beta Boswellic Acid (AKBBA) - was studied in an open label, multi centered phase III clinical trial, **evaluating 200 psoriatic patients** with application of AKBBA cream three times daily for a period of 12 weeks. "Clinical evaluation of AKBBA in the management of psoriasis"



4 Studies with pTeroWhite® SPF, Anti-Aging, Skin Brightening

Two studies on the topical benefits of Sabinsa's pTeroWhite® - natural pterostilbene - isolated and purified from *Pterocarpus marsupium* heartwood and formulated as a cream. The studies further the body of science into pTeroWhite®'s value as a cosmeceutical ingredient for anti-aging, skin brightening, and as a natural SPF agent (studies at 0.4% pTeroWhite® in a cream).

Skin Brightening and Anti Aging - 38 people, dermatological assessment, together with instrumental and image analysis. It improves **skin brightness, elasticity**, reduces the appearance of **under-eye** fine lines, **wrinkles**, and improves **skin texture**. Positive change at all time points in skin hydration and elasticity in both male and female subjects

Sun Protection Factor - 12 and 25 people. In vivo SPF value of 6.2 ± 1.30 (8.84 ± 0.01 cream in vitro, and 21.73 ± 0.06 as the ingredient pTeroWhite®).

Further, the study demonstrated the potent antioxidant effects of pTeroWhite® in various in vitro and cellular test systems. The cream was found to be safe and non-irritant (25 people).

4 TetraPure® Skin, Hair & Nails

TetraPure® is Natural anti-fungal remedy for Skin, Hair (anti-dandruff) & Nails. It's a white to off white crystalline powder, composed of Tetrahydrocurcuminoides - as from *Curcuma longa*, but white.

TetraPure® shows great anti-mycosis and anti-dandruff activities. It completely inhibits the growth of *dermatophytes Trichophyton rubrum*, *Microsporum gypseum* and *Epidermophyton floccosum*.

It enhances the activity against *Malassezia furfur* at all tested concentration. It reduces the colony counts of *Candida albicans* to less than 100cfu / ml. This product can be used as an antioxidant.

As other actives of the family of THC, TetraPure shows tyrosinase inhibition as well as great inhibition of Melamin.

4 New study builds Evidence of C3 Reduct® in Oral Care Application

Naturally extracted from Curcuma, C3 Reduct® THCs completely cured all canker sore patients of their painful ulcerous lesions.

In a recent clinical trial involving 30 canker sore patients and 29 patients with gingivitis, treatment with Curcumin C3 Reduct® (efficient as chewable tablets or as a cream) over a three week period led to excellent abatement of pain, numbness, ulcer formation, dryness with no staining or allergic symptoms.



4 Sabinsa got three Attestations COSMOS

Sabinsa got three attestations granted by ECOCERT Greenlife for compliance to the standard COSMOS.

This presently concerns the **Saberry®** (*Emblica Officinalis* Fruit Extract for hair care, anti ageing and anti glycation products), **Cococin®** (*Cocos Nucifera* Liquid Endosperm for hair and skin care products) and **Nigellin®** Amber (Black seed extract - *Nigella Sativa* Seed Extract, for hair care products).

4 Cococin®, Fresh and Long moisturizer

A clinical study on Sabinsa's patented hair serum formulation was found to significantly improve hair fall and thinning, and Cococin® is now Cosmos approved.

The serum, a multi-patented composition of amla extract (Saberry®), freeze-dried coconut water (Cococin®), and the micronutrient selenium (PeptiSelect® (γ- L-Glutamyl-L-selenomethionine) along with sandalwood and peanut shell extract, was evaluated in 42 subjects for

a period of 90 days. Cococin® is a tender coconut extract, produced by a unique lyophilisation process to ensure that the solids retain optimum biological activity.



Becarre Natural represents, distributes and develops natural actives supported by sciences for nutrition, cosmeceutical and pharmaceutical purposes from manufacturers selected for their seriousness, quality and competencies.



Becarre Natural acts as the centralized sales and marketing organization for selected manufacturers of plants extracts, either as your local contact or through appointed distributors who are then in direct contact with the manufacturers but followed up by Becarre Natural.

Because industrials are more looking for reliability and know-how than an immeasurable list of products, Becarre Natural focuses on a specific origin of activities: standardized actives extracted from the nature under very strict process of production, with proven efficacy and sustainable resources. As per today, Becarre Natural represents by agreement different manufacturers, including Sabinsa Corp., Nektium, Isocell, GVB Biopharma, ... besides few others specific extracts from reputed sources.

As the right note at the right time makes the music, the right product in the right formulation makes your success. 'Becarre' - that you may pronounce 'be care' - is the French word for the musical mark which cancels the alterations such sharp sign or flat signs. The English translation is 'the natural sign'.

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Reach the post-biotic time with LactoSporin®, studied for Skin care, Acne, Oral, UV protection



The new Post-Biotic, Skin (Acne), Hair, Oral care



Source: Bacillus / **Inci :** Bacillus Ferment Filtrate Extract / **Antimicrobial activity :** nlt 200 AU / ml against Micrococcus luteus / **Protein :** nlt 1.0 w/v (Lowry's Method)



Dosage : recommended 0.5% w/w



Pale yellow to brown color clear to hazy liquid with characteristic odor, It is an ingredient for cosmeceutical products that has **antimicrobial, antioxidant, anti-inflammatory, and anti-collagenase** properties, shows protective efficacy **against UV radiation, environmental pollutants,** and prevents microbial biofilm formation, induces hair growth, and prevents accelerated skin aging – so diverse exciting applications of LactoSporin.



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• **Skin care : antiacne,** showed potent antioxidant, anti-inflammatory, anti-collagenase and UV protection potential, thus playing a protective role to the skin - LactoSporin 2% w/w cream in reducing the severity of acne in human volunteers, with the effects comparable to benzoyl peroxide 2.5% gel.

A new study published : "Novel Topical Application of a Postbiotic, LactoSporin®, in Mild to Moderate Acne

- **Hair Care :** stimulated the anagen phase of follicular cell growth by increasing the proliferation of dermal papilla cells and by inhibiting 5 α -reductase activity.
- **Oral Care :** significant reduction (for about 12 hours) in the growth, rate of pH drop (prevention from detrimental acidic environment) and glucan production was observed in *S. mutans* within 5 minutes of the LactoSporin. A study has been published in 2018 by an external organism on action against *Gardnerella vaginalis* : "Mode of action and safety of lactosporin, a novel antimicrobial protein produced by Bacillus coagulans ATCC 7050". It says as conclusion : "Lactosporin potentially exerts its antimicrobial activity by selective dissipation of Δ pH and/or by causing leakage of ions from the sensitive cells. Safety studies suggest that lactosporin is a non-cytotoxic antimicrobial for vaginal application"
- A new study published : "Novel Topical Application of a Postbiotic, LactoSporin®, in **Mild to Moderate Acne:** A Randomized, Comparative Clinical Study to Evaluate its Efficacy, Tolerability and Safety" : (...) LactoSporin is equivalent to benzoyl peroxide in the treatment of mild-to-moderate acne lesions and better than benzoyl peroxide for reducing the sebaceous secretion and oily, greasy nature of the skin, implying its efficacy in other seborrheic conditions.
- **" Skin Protective Activity of LactoSporin-**the Extracellular Metabolite from Bacillus coagulans MTCC 5856" : LactoSporin® has shown antioxidant activity and has been shown to protect skin cells from UV-induced apoptosis. It inhibited collagenase, elastase, and hyaluronidase activity and upregulated expression of hyaluronan synthase, which are associated with the integrity of the extracellular matrix.



Extracts for every facet

Dual mechanism of action of new pentapeptide Olepent®



Skin firming & repairing peptide, the newest ingredients in premium anti-aging skin care.



INCI Name: Oleanoyl sh-Pentapeptide-4



Off white powder, slightly hygroscopic



Olepent® by Sabinsa is a unique patented pentapeptide complexed with Oleanolic acid. It is a **skin firming and repairing peptide** complexed with natural triterpenoid that has the potential to **stimulate the skin's natural production of collagen**, restore **structure of the skin** and minimize the effect of degrading enzymes.



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Peptides play major role in regeneration of collagen to reduce wrinkles and aid in plumping up the skin cells. The combination of oleanolic acid (known for its antioxidant, anti-inflammatory & wound healing properties) with a pentapeptide act synergistically in reducing the appearance of fine expression lines and wrinkles, for better anti-aging potential like elastase inhibition, collagenase inhibition.

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Dermatologist's evaluation

- A significant improvement in hydration and smoothness
- Skin clarity was achieved by 33.4% of subjects
- Improvement in overall skin tone and reduction in frown lines

Reduction in wrinkles

- A significant reduction in both right and left crow's feet area from baseline to day 56

Moisturization effects

- A significant moisturization effects (right cheek and forehead)

Reduction in percent wrinkle area and spots

- A significant reduction in percent wrinkle area

PteroWhite®



Anti-Aging, Skin Brightening, and SPF Benefits



Source: *Pterocarpus marsupium*



Inci : A Pterocarpus Marsupium Wood Extract



Dose : 0.1-0.5% in creams / lotions / gels



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• An Open-Label Single-Arm, Monocentric Study Assessing the Efficacy and Safety for **Skin Brightening and Anti-aging Effects**, published, was conducted as an open-label, single-arm, monocentric efficacy investigation with a cream containing 0.4% pterostilbene for eight weeks : **pTeroWhite® cream effectively improves skin brightness, elasticity, reduces the appearance of fine lines, wrinkles, and improves skin texture.**

- **A second clinical study,** A Randomized Study to Determine the **Sun Protection Factor**, demonstrated the effect of pTeroWhite® as a natural SPF ingredient in a cream formulation containing 0.4% of pTeroWhite®. The cream was found to be safe and non irritant and showed an SPF of 8.84 \pm 0.01 in vitro, while pTeroWhite® as an ingredient had an SPF value of 21.73 \pm 0.06.

Further, the study demonstrated the potent antioxidant effects of pTeroWhite® in various in vitro and cellular test systems.

Hemp extracts - CBD



Isolate, distillate, crude oil - CBD, CBC, THC free Water soluble powder



Main non-psychoactive cannabinoid extracted from hemp, the cannabidiol or CBD molecule (identified in 1963) is derived from *Cannabis sativa* which contains more than 100 chemical compounds (mainly Cannabidiol [CBD], Cannabinol [CBN], Cannabichromene [CBC], Cannabigerol [CBG]).



GVB Biopharma is a leading and trusted historical supplier of cannabinoid extracts, fully integrated to offer high quality products, continuously controlled, optimal traceability and price competitive. Their extracts (CBD-I / CBD-C) are renowned for their high quality and stability : their hemp cannabinoid products are most probably behind the product you know.



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SabiWhite® / C3 Reduct®

Skin lightener, Evening skin tone, UVB protectant, Nutricosmetic, Gingivitis

Source: *Curcuma longa*

Inci : Tetrahydrodiferuloylmethane

Dose : 0.05-2.0% in creams / lotions

Bio-active ingredients: 95% Tetrahydrocurcumin

Patented color-free natural extract derived from turmeric roots with **proven luminosity boosting** and **skin tone lightening** effects. A potent inhibitor of melanogenesis, and antioxidant protection benefiting skin tone, texture and integrity. A double blind placebo controlled clinical study with Fairness cream with 0.2% proved the significant decrease in melanin content.

A new study for oral care showed that C3 Reduct® cured all canker sore patients of their painful ulcerous lesions / gingivitis

C3 Reduct® allows to use the active form of natural turmeric curcuminoids from *Curcuma longa*. Last study on end of 2020 proved the efficacy for the **treatment of canker sore and gingivitis**. C3 Reduct® has also been the first metabolites to be approved by EFSA for use in food supplements products (end 2021).

BeTheanine® L-Theanine 100% Natural 100% Green tea Natural low EtOH extraction

Skin inflammation, Emollient, Anti-aging

Source: *Camellia sinensis leaves*

Inci : Theanine, Camellia Sinensis Leaf extract

Dose : 0.5-2%

Bio-active ingredients: L-theanine

L-theanine, the most abundant free amino acid in tea, has been documented to possess many different bioactive properties through oral or intragastric delivery.

BeTheanine® is an extract **100% from selected green tea, without any carrier** or compounds other than from the extraction of green tea, using low ethanol.

In a recent study (Wei-JieZeng et al.), a single-dose local pretreatment of L-theanine before TPA time (12-O-tetradecanoylphorbol-13-acetate, 2.5 µg/ear), suppressed the increases in both skin thickness and weight, therefore ameliorated TPA-induced erythema, vascular permeability increase, epidermal and dermal hyperplasia, and the production of pro-inflammatory cytokines.

L-theanine provides also different other health benefits, and improve mental focus and better sleep quality. Indeed, L-theanine may affect the levels of certain chemicals in the brain. These include serotonin and dopamine, which influence **mood, sleep, and emotion**, and cortisol, which helps the body deal with stress.

Glabridine 98

Skin lightening, Anti-aging

Source: *Glycyrrhiza glabra*

Inci : Glycyrrhiza Glabra (Licorice) Root Extract, Glabridin

Dose : 0.06% to 0.25% in creams / lotions / gels

White and stable powder, it provides 98% Glabridin by HPLC, what **inhibits melanogenesis** by one of two mechanisms:

- Inhibition of the production of active oxygen species
- Inhibition of tyrosine

It has also been shown **16 times more efficacious than hydroquinone**. Licorice used topically is also documented to reduce the amount of corticosteroids in dermatological infections.

Two studies with Tetrapure® Anti-Aging, Skin Brightening, and SPF Benefits

Natural anti-fungal remedy and protection for Skin, Hair (anti-dandruff) & Nails

Source: Synthesis (Vanillin and Acetylacetone)

Inci: Tetrahydrodiferuloylmethane

Dose : 0.1-0.5% w/w (Skin Lightening), 0.15% w/w (Anti-fungal)

Bio-active ingredients: 99% Tetrahydrocurcumin

Research reveals that Tetrahydrocurcumin (THC) is one of the major metabolites of Curcumin. THC is reported to exhibit many of the same physiological and pharmacological actions as Curcumin, in some systems, better. It can be used safely (tests available) in shampoo, cream, lotion, spray or powder form.

Anti-Fungal activity: TetraPure® shows **anti-mycosis** and **anti-dandruff** activities.

- It **completely inhibits** the growth of dermatophytes *Trichophyton rubrum*, *Microsporum gypseum* and *Epidermophyton floccosum*
- It **enhances** the activity against *Malassezia furfur*
- It **reduces** the colony counts of *Candida albicans* to less than 100cfu / ml.

so... it's also an **anti-dandruff**

Tetrahydrocurcumin adapts a two pronged approach to the free radical onslaught (ORAC > 10 000 / g)

- Prevention of free radical formation.
- Intervention whereby already preformed radicals are quenched by THC.

Skin Lightening : as other actives of the family of THC, Tetrapure shows a tyrosinase inhibition of 1.8 IC50µg/ml - so much better than Kojic acid (7) or Vitamin C (9.33), as well as great inhibition of Melamin (better than Vit. C - 25 - or Kojic ro Arbutin - 100).

The nourishment factor Cococin® Green coconuts water

**Hair Growth, Moisturizer
Restore the skin health in aged and damaged skin**

Source: Fresh tender coconuts *Cocos Nucifera*

Cosmos approved

Inci : *Cocos Nucifera* (Coconut) Fruit Juice

Dose : 0.5% - 2.0%

Cococin™ is « **The Nourishment Factor®** » that provides a valuable nutrient pool for enhancing food and beverage, as well as cosmetic product formulations. Cococin™ can be safely used in oral care as well as lip care compositions.

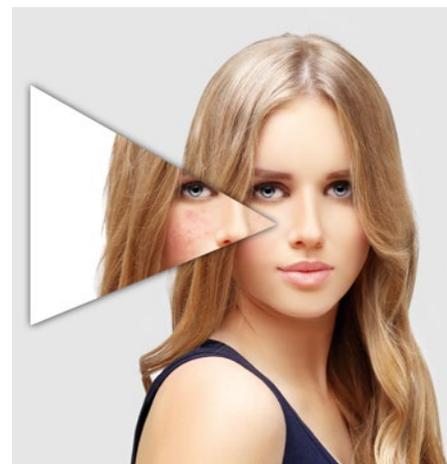
Helps **restore the skin health in aged and damaged skin** : Coconut water is rich in quinic acid and shikimic acid which acts as free radical scavenger and play important role in biosynthesis of polyphenols

Augments new cell growth while **promoting healthy tissues / hair**: Cococin® has been evaluated for its efficacy as a hair growth promoter, in comparison with Minoxidil as standard

Helps in wound healing : Coconut water also contains **cytokinins**, which are also involved in healthy cell growth and differentiation for additional skin restoration

Helps in skin hydration : It provides reservoir of vitamins, minerals, RNA phosphates and organic acids that support tissue health. Nutrition and reviving skin, and healthy tissue.

Sabinsa has developed and **patented Cococin™ + Saberry®**, synergistic formulation to promote healthy **hair growth** granted patent for «*Protective Compositions for Dermal Papilla Cells*».



Boswellin®



Under eye, Puffiness, Night repair, Age-defying, Anti-ageing



Psoriasis - Anti-inflammatory



Source: *Boswellia serrata* gum

Inci : Boswellia Serrata Resin Extract



Dose : 0.5-2%



Bio-active ingredients: AKBBA, β -boswellic acids



Anti-inflammatory : Boswellin® is a natural extract from the gum resin. Boswellin® contains **boswellic acids** that **inhibit two pro-inflammatory enzymes** 5-lipoxygenase and elastase, thereby supporting skin texture and integrity. Inhibiting inflammation is known to be an effective approach to slow skin aging. Trials on 22 women, for 4 weeks

There was a **reduction of dark circles** on application of the cream vs. application of placebo : a double blind placebo controlled clinical study was conducted on 21 healthy female subjects in the age group of 20-35 years. The subjects were provided with "Under Eye cream" containing 1% of Boswellin (and other natural ingredients) and a placebo, to be applied under each eye twice a day for a period of 4 weeks. The appearance of dark circles and puffiness was assessed by a dermatologist at predetermined time intervals

A new clinical study of AKBBA in the **management of psoriasis** has been published in Clinical Dermatology : open label, multi centered phase III clinical trial, evaluating **200 psoriatic patients** with application of AKBBA cream three times daily for a period of 12 weeks. This concerns a specific grade of Boswellia extract standardized for 90-95% of 3-O Acetyl-11 Keto Beta Boswellic Acid (AKBBA).

Centellin® CG



Wound healing, aged skin, dermal itch, cracked feet and heels



Source: *Centella asiatica*, Inci : Centella Asiatica Extract

Dose : 0.5-2.0% in soothing creams / lotions



Bio-active ingredients: 40% Saponins Triterpenes



Well-known activity for wound healing, studies with Centellin CG showed an increase by 40% of the dermal fibroblast proliferation, and up to 20% collagen synthesis.

Cracked feet : Recent study published has evaluated the efficacy and safety of a formulation with Centellin® CG in a foot care cream, and demonstrated it helps in healing of cracks, reducing scaling and pain, without any reports of hypersensitivity reactions (24 participants presenting cracks or fissure in feet, especially in the heel region).

Venocin® 90



Blood Circulation, Wound Healing Effects, Anti-inflammatory



Source: *Aesculus hippocastanum*

Inci : Aesculus Hippocastanum Seed Extract

Dose : 1-3.0% in creams / lotions / gels

Bio-active ingredients: 90.0% Triterpene glycosides as **Escin** Escin is a mixture of saponins that is known to help maintain healthy blood circulation and **strengthen the capillaries and veins**.

Horse chestnut extract is clinically proven to be beneficial to people suffering from varicose veins, spider veins, hemorrhoids and related circulatory problems or "chronic venous insufficiency" (CVI).

Saberry®



Water soluble skin lightening agent, Hair care (serum), Antioxidant



Source: *Emblica officinalis* fruits (Amla)

Inci : Emblica Officinalis Fruit Extract

Dose : 0.2-1% w/w



Bio-active ingredients: 10% b-Glucogallin, 50% gallates (tanins)



Amla extract helps protect the skin from the damaging effects of free radicals and heavy-metal induced oxidative stress. It also increases pro-collagen type I C-peptide and tissue inhibitor of metallo-proteinase 1 (TIMP-1) production, and decreases MMP-1 production, concomitant with elevated mitochondrial activity in the fibroblast, in a concentration-dependant manner.

Skin Whitening : Skin lightening by inhibition of melanin formation, stronger melanin than ascorbic acid. Melanogenesis inhibitory activity against both MSH and cAMP induced melanogenesis at IC50 14µg/ml

MMP-1 Inhibitor : Amla Extract has been reported to inhibit MMP-1 production from fibroblasts. Saberry also showed mild anti-tyrosinase activity compared to Kojic acid, using the mushroom tyrosinase activity assay (Saberry IC50 321 µg/ml)

ORAC hydro: 267 800 µmol TE/100g / Orac lipo: 400 µmol TE/100g
HORAC: 34 500 µmol CAE/100g / **NORAC**: 90 00 µmol TE/100g
SORAC: 10 200 µmol kunitsSODEq/100g / **SOAC**: 135 100 µmol VitE/100g

UV Protector : Protects the fibroblast cells from UV radiation, with activity higher than ascorbic acid at same concentration.

5- α reductase inhibitory activity (about 80%)

NUTRACOSMECEUTICALS - BEAUTY THAT REFLECTS ON THE EXTERIOR

Hence, getting the "beauty from within" concept depends upon the integrity and functioning of various processes, inside and outside. Although many plant extracts have combined actions - good inner health, good digestion, good blood circulation... can be seen on the skin and face - here is a list of extracts specifically intended for nutri-cosmeceuticals, because of both oral and topical studies.

VEGCOL™: collagen of plant origin, crafted to bio mimic Type I & III collagen. Collagen peptides supported by its own studies (wrinkles, skin, etc...), soluble

SABERRY™: Amla (ie. *Emblica officinalis*) fruit, with potent antioxidant capabilities (melanogenesis inhibition, antioxidant, UV protection)

C3 REDUCT® : colorless hydrogenated product from *Curcuma longa* (whitening, lightening, antiglycation, antioxidant, oral care)

BETHEANINE®: L-Theanine extracted from Green tea *Camillia sinensis* (skin inflammation, emollient, anti-aging, stress and sleep)

COCOCIN™: The 'Nourishment Factor' from Fresh tender coconuts *Cocos Nucifera* (hair, healing, moisturizer, skin health, phytonutrients)

CBD, HEMP CRUDE OIL: Cannabinoids (pain, inflammation, sebum, antimicrobial)

ELLAGIC ACID: Polyphenol extracted from *Punica granatum* (melanin formation, hyper-pigmentation management, antioxidant)

SILBINOL®: pterostilbene from *Pterocarpus marsupium*, as the pTeroWhite® (suppressor of AGEs, cardiovascular and peroxidation, UV protection)

ROSEMARY: from dried leaves of *Rosmarinus officinalis*, rosmarinic and carnosid acids (antioxidant)

LACTO SPORE® / LACTO SPORIN®: probiotic and postbiotic from *Bacillus coagulans* (anti-acne, skin and hair, digestion, IBS). LactoSpore® brings sporulated form as the probiotic, when LactoSporin® brings postbiotic (antimicrobial).

RESVERATROL, OXYRESVERATROL: from *Polygonum cuspidatum*, *Artocarpus lakkochocha* (Artonox®), inhibition of tyrosinase, melanogenesis inhibitory activity, antioxidant)



LactoSporin® is a non-living microbial cell product having biological activity. It is purified from the culture supernatant of probiotic strain, *B. coagulans* MTCC 5856 (LactoSpore®) with an INCI name - Bacillus Ferment Filtrate Extract.

Skin microbiome

The normal human skin is a microbiome colonized by 10,000 – 1,000,000 beneficial microorganisms, especially bacterial units/cm² that prevent the growth of pathogenic organisms and maintain the immunity of the skin and nourish the skin optimally with an established safety profile.

Skin microbiome protect the skin by :

- They act as a protective shield by preventing pathogenic microorganisms from provoking an immune reaction
- They produce antimicrobial metabolites to combat pathogenic bacteria
- They boost the skin's functionality in dealing with external damaging factors including free radicals, sun, and pollution
- They help the skin stay hydrated
- Restore a healthy pH balance in the skin

These functions creates a calming environment for the skin, help to reduce inflammation, flare ups and prevents premature aging.

Next level postbiotics

These are the water soluble, non-living microbial cell products, fractions, lysates or metabolites obtained from microorganisms possessing biological activity (Patel and Denning 2013). It has various advantages over probiotics (Aguilar-Toalá et al., 2018).

- Biological activity in non-viable state
- Lower chance for microbial translocation
- Lower chance for microbial infection
- Improved inflammatory defence
- Favourable physiochemical properties (solubility)
- Favorable pharmacokinetic properties (absorption, distribution, metabolism, and excretion)

LactoSporin®

- A standardized antimicrobial product
- It's an extracellular protein metabolite obtained from the supernatant of probiotic strain, *B. coagulans* MTCC 5856 (LactoSpore®)
- Pale yellow to brown color clear to hazy liquid with characteristic odor
- Completely soluble in water
- It acts against other pathological organisms
- It can be a potent next-generation probiotic in skin care application. Thus, eliminating the usage of live microorganisms in various biological streams
- Patents EP : "Method of producing partially purified extracellular metabolite products from *Bacillus coagulans* and biological applications thereof"

Anti-aging effects of LactoSporin®

Anti-collagenase activity : UV radiation induces the collagen degradation by enhancing the activity of collagenases, a type of matrix metalloproteases (MMPs) (Sanches Silveira and Myaki Pedroso 2014).

LactoSporin® inhibited the collagenase activity (percentage inhibition) in a dose-dependent manner with an IC50 of 1.8% v/v. Thus, LactoSporin® can preserve the extracellular matrix of the skin and prevent wrinkle formation and skin sagging.

Antioxidant activity : Reactive oxygen species (ROS), the major contributor for ageing is generated from mitochondria (Rinnerthaler et al., 2015). It acts as the major factor in developing the oxidative stress that exceeds the antioxidant defence of the target cell. UV radiations are the major extrinsic factor that generates the ROS leading to sun-induced skin ageing (photo-ageing) (Poljšak and Dahmane 2012; Xu et al., 2017).

LactoSporin® showed dose-dependent DPPH scavenging effect with an IC50 of 0.43%. This result emphasises the role of LactoSporin® as a potent antioxidant in cosmetic preparations.

Anti-glycation effect : Glycation is the process of undesired cross-linking of collagen proteins with sugar molecules, eventually impairing the function of collagen fibres, making the skin hard and aged in appearance (Chaudhuri et al., 2018). The anti-glycation effect of LactoSporin® was performed using ribose sugar and bovine serum albumin.

LactoSporin® was found to inhibit the formation of AGEs by 50% with an IC50 of 0.7% v/v. Thus, inhibition of AGE formation by the retardation of the collagen fibres glycation provides the skin with youthful and aesthetically pleasant appearance (83% Inhibition at 2%, 56% @1%, 36% @0.5%)

UV protection effect : Humans are mostly affected by UV-A followed by UV-B. UV-B being shorter in wavelength and higher power radiation can easily penetrates deeper into the tissues of the skin. Thus, causing structural damage to the DNA and induce apoptosis. Whereas, UV-A radiation is mostly responsible for the generation of ROS such as superoxide anion, hydrogen peroxide and singlet oxygen, causing ROS-mediated inflammatory skin damage (Sanches Silveira and Myaki Pedroso 2014). The phototoxic (UV-A and UV-B light-induced toxicity) preventive effects of LactoSporin® was studied using mouse fibroblast cell line (Balb/C 3T3).

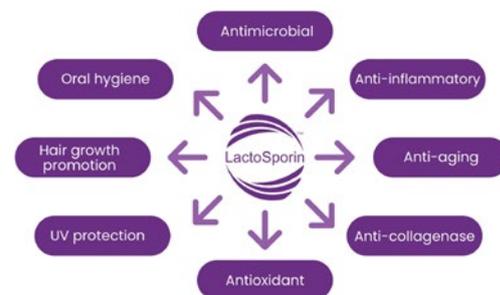
LactoSporin® showed notable protection from UV-A as well as UV-B-induced cell death (protection against UV radiation-induced toxicity).

Anti-inflammatory effect : LactoSporin® tested at various concentrations showed a dose-dependent anti-inflammation activity, so potentiality of LactoSporin® against the skin inflammation induced by pro-inflammatory environmental insults (inhibition of Lipopolysaccharide induced secretion, TNF-α on human cell line THP-1).

LactoSporin® is a non-living microbial cell product having biological activity : Antimicrobial activity, antiageing effects and hair growth promotion

Beneficial effects of LactoSporin®

LactoSporin® has wide applicability starting from oral health to UV protection, anti-collagenase, and anti-inflammatory:



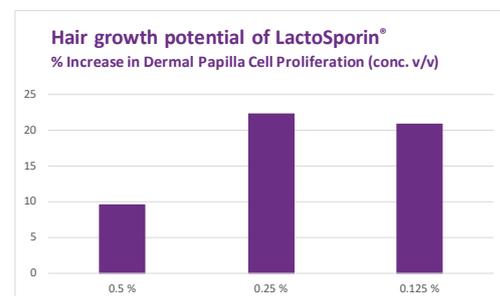
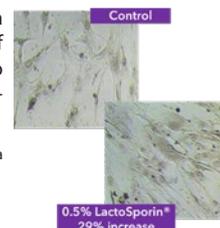
Hair growth promotion with LactoSporin®

Hair is one of the fastest growing tissues of the human body. Hair follicles undergo repetitive regenerative cycles consisting of anagen (rapid growth, active stage), catagen (regression, physiological involution stage), and telogen (resting stage). Hair proliferation is controlled by androgen hormones (e.g. testosterone). Androgens shorten the anagen phase by targeting dermal papilla cells (DPCs) of the hair follicle. The 5α-dihydrotestosterone (potent active metabolite generated by 5α-reductase) has greater affinity towards androgen receptors in DPCs. Thus, extending the anagen phase is an effective treatment for the prevention of hair loss.

LactoSporin® capability of hair growth promotion was assessed by estimating the proliferation of Human Follicle Dermal Papilla cells (HFDPC) in vitro.

LactoSporin® induced 29.7% proliferation of dermal papilla cells and 16.2% inhibition of 5α-reductase activity in vitro at 0.5% v/v LactoSporin® concentration.

(picture : proliferation of dermal papilla cells with LactoSporin®)



Olepent[®] Skin Firming and repairing peptide

Firming Peptide

- Stimulated the skin's natural production of collagen
- Restores the structure of the skin and smoothen wrinkles
- Minimizes the effect of degrading enzymes

Repairing Peptide

- Provides anti-inflammatory support
- Helps in repairing skin barrier dysfunction
- Repairs skin injury caused by wound or photo-damage

INCI Name : Oleanoyl sh-Pentapeptide-4

Description : Off-white powder, slightly hygroscopic

Purity Oleanyl Pentapeptide (HPLC) ≥90% w/w

Shelf-life : 2 years

Olepent[™] is a innovative and unique patented pentapeptide complexed with oleanolic acid, with dual mechanism

Peptides are the newest ingredient in anti-ageing skin care that are highly effective actives and are utilized in the most premium skin care products.

Olepent[®] has a dual mechanism both as firming and repairing peptide.

Skin Care

The triterpenoid group in Olepent[®] acts by preventing oxidation and excess activity of serine proteases like elastase and collagenase that result in the wrinkling of skin.

Olepent[®] has a significantly better anti-ageing potential like elastase inhibition, collagenase inhibition, Transforming Growth Factor beta (TGF-β) increase, Fibroblast Growth Factor (FGF) increase and antioxidant activity which makes it a promising ingredient in the segment of anti-ageing.

80% ELASTASE INHIBITION
Increase elasticity

80% ELASTASE INHIBITION
Increase elasticity

90% TGF-β INCREASE
Rebuilds collagen

86% Collagenase INHIBITION
Repairs wrinkles

40% FGF INCREASE
Repairs skin/reduces scarring

30% ANTIOXIDANT POTENTIAL
More luminous complex to skin



LactoSpurin[®]

(... CONTINUED)

Anti-acne / Antimicrobial activity

The efficacy of LactoSpurin was equivalent to benzoyl peroxide in the treatment of mild-to-moderate acne lesions and has an advantage over benzoyl peroxide in individuals with oily skin.

According to Riaz et al., LactoSpurin[®] might exert antimicrobial action by targeting the plasma membrane of sensitive microbial cells and forming transient pores followed by leakage of intracellular contents and dissipation of pH gradient component of proton motive force (PMF) - important for physiological processes such as ATP generation.

Results : LactoSpurin[®] was found to be highly active against the important skin pathogens such as *Staphylococcus aureus*, *Streptococcus epidermidis*, acne-causing bacterium - *Propionibacterium acne*, as well as against an opportunistic pathogen - *Pseudomonas aeruginosa*.

It exhibits a broad spectrum antimicrobial activity against both Gram-positive and Gram-negative bacteria. The MIC against various pathogenic groups was found to be in the range of 0.5 to 4.0% v/v. LactoSpurin[®] was effective in killing the tested harmful bacteria at varied pH and temperature ranges. Also, LactoSpurin[®] retained the antimicrobial efficacy in varied storage conditions (Stable & Accelerated condition).

"Novel Topical Application of a Postbiotic, LactoSpurin, in Mild to Moderate Acne": LactoSpurin 2% w/w cream is comparable to benzoyl peroxide 2.5% gel



Oral Hygiene

The surface of the tooth is covered by a biofilm of microorganism, especially bacteria. Tooth decay or dental caries results from the acids secreted by certain bacteria. *Streptococcus mutans* are the common type of acid-producing oral pathogen that is present mainly in the mouth, pharynx and intestine. It decays the tooth by secreting glucose polysaccharides known as glucans (Forssten et al., 2010).

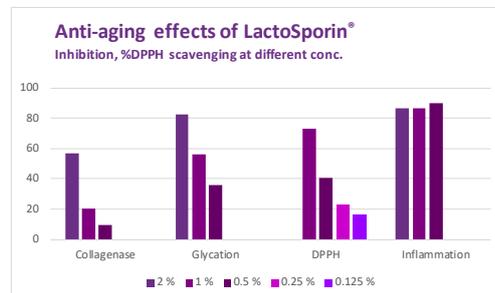
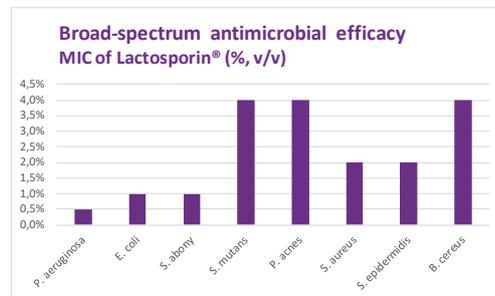
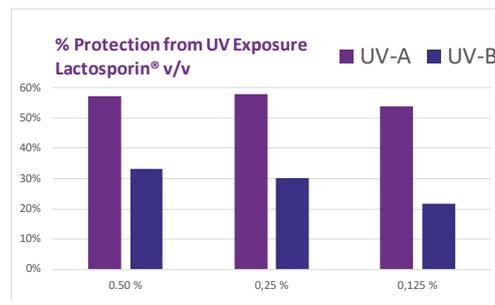
LactoSpurin[®] was evaluated for the effect of oral hygiene by assessing its impact on the growth and drop in pH level of *S. mutans*.

A significant reduction (for about 12 hours) in the growth, rate of pH drop (prevention from detrimental acidic environment) and glucan production was observed in *S. mutans* within 5 minutes of the LactoSpurin[®] treatment.

Biofilm inhibitory potential of LactoSpurin[®]

Biofilm, the extracellular matrix on living or non-living surfaces are less susceptible to antimicrobial agents. Thus, these associations

of microbial cells are difficult to target and treat (Donlan 2000). LactoSpurin[®] exhibited a concentration-dependent biofilm inhibitory effect against *S. mutans*, *S. aureus*, *P. aeruginosa* and *E. Coli* (broth micro-dilution method).



Two forms of melanin are produced in the epidermis: pheomelanin, which is red to yellow in color, and eumelanin which is dark brown to black. The relative proportions of these also influence skin color. In addition, individuals differ in the number and size of melanin particles. Skin pigmentation is influenced by several factors like:

- Hemoglobin in the blood vessels
- Carotenoids in the dermis
- Particularly, the dark pigment, melanin in the epidermis.

Production of Melanin

Melanin biosynthesis (melanogenesis) is influenced by genetics, environmental factors, diet and medication. The production of melanin by specialized cells called melanocytes (in the basal layer of the epidermis in light skinned people and in the basal as well as horny layer in dark skinned people) occurs through the action of the enzyme tyrosinase. The rate-limiting step in melanogenesis is the conversion of L-tyrosinase to melanin, through the action of tyrosinase. Copper and oxygen act as catalysts. Other enzymes also control melanin production, particularly in the presence of sulfur. These include the following:

- Dopachrome oxidoreductase which controls melanogenesis in the absence of tyrosinase. It helps to convert dopachrome into 5, 6-dihydroxyindole.
- Alpha-glutamyl transpeptidase which helps to maintain the balance in the biosynthesis of eumelanin and pheomelanin.

Variation in skin pigmentation is attributed to the levels of melanin produced and the number of melanocytes present. Although light skinned and dark skinned people may have the same number of melanocytes present, the rate of melanin production is greater in darker skin tones. Additionally, the melanin present in the epidermal layers of darker skins is resistant to enzymatic degradation. Increased production of melanin on one side of the skin and dramatically reduced decomposition of melanin on the other side results in darker skin tones, in light skinned people.

Melanin granules synthesized in the melanocytes are then transferred from the cytoplasm of the melanocytes to the basal cytoplasm of the keratinocytes. They thus form a protective covering in the inner layers of the epidermis, absorbing UV rays and inhibiting their penetration.

Controlling Melanin Synthesis

Various types of inflammatory mediators such as leukotrienes and prostaglandins, cytokines and growth factors may influence melanin synthesis by affecting the proliferation and functioning of melanocytes. This explains why inflammatory diseases often induce hypopigmentation or hyperpigmentation. The enzyme, protein kinase C that phosphorylates proteins may also influence the growth and differentiation of melanocytes.

Cytokines such as endothelins (also known as vasoconstrictive peptides) are also reported to accelerate melanogenesis.

Quick view of our Main Products

- **TetraPure and Sabiwhite** (tetrahydrocurcuminoids) : anti-tyrosinase activity along with High ORAC value, and Inhibition of Melanogenesis
- **Glabridine** (from 4% to 98% from licorice): the well-known whitening agent
- **pTeroWhite**: new studies on pterostilbene purified from *Pterocarpus marsupium*
- **Saberry** (β -glucogallin from Amla) : white water soluble Skin Whitening, MMP-1 Inhibitor, UV Protector
- **OxyResveratrol Artonox**: strong and dose dependent inhibition of Tyrosinase enzyme activity and melanogenesis inhibitory activity
- **Ellagic Acid** (pomegranate), lightening, UV protection, also in oral form
- **Fucoxanthine** (wakame) : lessened UVB-induced epidermal hypertrophy, VEGF, and MMP-13 expression
- **Soy extract** : lightening action in solar lentigenes (hyperpigmentation due to sun)

Skin lightening cosmeceuticals

The toxicity associated with hydroquinone use, induced researchers to identify less dangerous botanicals with comparable activity. The general modes of action include inhibition of the formation of melanosomes, inhibition of tyrosinase biosynthesis, and inhibition of melanin biosynthesis and interference of the transfer of melanosomes into the keratinocytes. Some agents also have a chemical effect on melanin with an increase in the degradation of melanosomes in the keratinocytes.

Antioxidants such as ascorbic acid and others help to decompose preformed melanin. Hyperpigmentation due to UVA and UVB damage may also be addressed by preventive measures using antioxidant compounds with sunscreen effect and free radical scavenging action. Research efforts are generally aimed at achieving one or more of the following effects:

Artonox™

With Tetrapure® and Glabridin 98%, Artonox™ is a new comer in our range for skin brightening. Obtained from the dried wood of *Artocarpus lakoocha*, it provides 95% of Oxyresveratrol, an analog of Resveratrol (a stilbenol 2,3,4,5-tetrahydroxystilbene). Oxyresveratrol exhibits about 150 fold more potent skin lightening inhibitory effect than Resveratrol (3,4,5-trihydroxystilbene), and 32 more than Kojic.

Artonox™ is dedicated for:

- Skin lightening formulations
- Antioxidant
- Anti-aging formulations

The concept of skin lightening is not limited to decreasing melanin in skin but also encircles age spots, Melasma, Chloasma, Freckles, Post inflammatory hyperpigmentation, Sun induced pigmented blemishes.

pTeroWhite®

Two new studies recently published:

- An Open-Label Single-Arm, Monocentric Study Assessing the Efficacy and Safety of pTeroWhite® for Skin Brightening and Anti-aging Effects: significant improvement in under-eye fine lines at all-time points and in wrinkles, frown lines, and crow's feet area at the end of the study. The pterostilbene preparation was able to improve the skin luminosity with continuous application.
- A second clinical study, a randomized study to determine the Sun Protection Factor of pTeroWhite® demonstrated the effect as a natural SPF ingredient, the potent antioxidant effects in various in vitro and cellular test systems, and the safety.

- **Regulation/inhibition of tyrosinase**, dopachrome oxidoreductase and dopachrome tautomerase involved in melanogenesis
- **Regulation of cytokine** network including endothelin
- **Regulation of genes** related to melanogenesis
- **Combinations** of the above approaches

Skin Brightening

When Skin Needs Brightening

Optical properties modulate the appearance of skin. Skin needs brightening when:

- Too transparent or too highly pigmented skin appears spotted and unhealthy.
- When skin is dull. Dull skin is dehydrated skin which is to transparent or hyper pigmented.
- Early aged skin is also dull and rough due to loss of surface integrity.

What Skin Brightening Cosmeceuticals do

The effects of skin brighteners are:

- Radiant complexion.
- Beautiful skin glow.
- Even skin tone, without freckles, age spots or other types of discoloration.
- Rejuvenated, nourished and smooth skin

Other related products

Tyrosinase inhibitors such as Arbutin (from the leaves of the common bearberry), *Arctophylos urva ursi* and other plants, Glabridin from licorice (*Glycyrrhiza glabra* roots), ascorbic acid and its derivatives, Kojic acid (a bacterial carbohydrate metabolite) are better tolerated than hydroquinone. Aloresin is re-

Rich AKBBA Boswellin and Psoriasis

A new study on one of the most famous and powerful anti-inflammatory. Boswellic acids - and especially AKBBA - have been found to inhibit 5-lipoxygenase by one of two ways on 5-LO as well as (HLE) and psoriasis

Mean scores of arthritic symptoms as evaluated in an open field study of boswellic acids-containing topical analgesic Chilisin® (TM of Sabinsa Corp). In addition, a four week study as well as a three month toxicity study showed that administration of boswellic acids at 5 to 10 times the ED50 value did not cause side effects.

Inhibition of Leukotriene Synthesis

The presence of a specific AKBBA-binding site on 5-LO that is distinct from the arachidonate substrate-binding site was determined using photo affinity labeling. Among the several compounds classified as leukotriene synthesis inhibitors, nonredox inhibitors, such as boswellic acids, are preferred. Unlike redox type inhibitors they do not interact with other biological redox systems, lessening the likelihood of side-effects like methaemoglobin formation. AKBBA has been identified as the only leukotriene synthesis inhibitor so far that inhibits 5-LO activity by noncompetitive, nonredox mechanisms (3-5% of topical formulation as cream, lotion or gel)

Management of psoriasis

A study on Sabinsa's Boswellia cream for treatment of psoriasis, Clinical Evaluation of AKBBA in the management of psoriasis, was published in Clinical Dermatology 2014; 2 (1): 17---24. US clinical trials, intended to have AKBBA eventually approved as a drug by FDA for treatment of psoriasis, will begin in the near future. This will be a significant step for a nutraceutical company in USA.

The cream of *Boswellia serrata* Roxb extract standardized for 5% of 95% 3-O-Acetyl-11-Keto Beta Boswellic Acid (AKBBA) was studied in an open label, multi centered phase III clinical trial, evaluating 200 psoriatic patients with application of AKBBA cream three times daily for a period of 12 weeks. The researchers observed significant changes in LTB4 (p<0.001) & TNF alpha (p<0.01) values from the baseline along with significant changes (p<0.05) in VEGF & PGE2. Reduction in 'modified' PASI score from the baseline visit was in consensus with the global evaluations by physician and patients. The evidence shows superior anti-inflammatory responses rates, demonstrating that this non-toxic treatment is beneficial for those suffering from this condition.

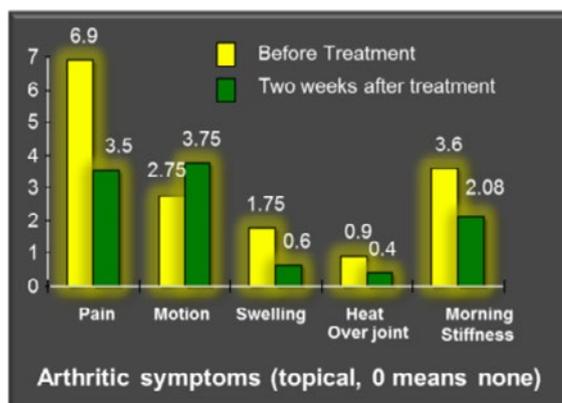
Although far from the scope of a dietary supplement, the exploratory process that has gone into such a traditional ingredient showcases Sabinsa's passion for applying modern day technology to

traditional botanicals to help create natural solutions for health.



"Our understanding of this ingredient, originating from one of the earliest compounds released by Sabinsa, called Boswellin®, is growing, and we want the world to know the positive research and the impact it has on human health," said Sabinsa founder Dr. Muhammed Majeed. "Such indications prevalent in Ayurvedic texts are now being proven by modern research, in terms of correctly standardizing, isolating the unique compound(s) and ultimately formulating safe and effective products." The cream product is sold and marketed as a drug in India. Sabinsa holds several patents for this and other uses of Boswellia.

Clinical evaluation of AKBBA in the management of psoriasis, Muhammed M., Nagabhushanam K., Sankaran N., Sood R., Karri S.K.



ported to be a non-competitive inhibitor, affecting the action of tyrosinase complex in the substratum and reducing the conversion of DOPA into melanin.

Arbutin and Kojic acid inhibit tyrosinase directly, while L-ascorbic acid and its derivatives are believed to act as reducing agents on intermediates

in melanin biosynthesis at various points in the oxidation chain reaction from tyrosine/DOPA to melanin. Our products are usually compared to Arbutin and to Kojic acid.

Green tea is also reported to be a competitive tyrosinase inhibitor through the gallic catechin moiety in the major catechin constituents epicatechin

gallate, epigallocatechin gallate and gallic catechin gallate.

Paper mulberry extract (from the root bark of *Broussonetia kazinoki* x *B. papyrifera*) also contains active depigmenting agents, which were shown to be more efficacious than hydroquinone (IC 50 of 2.5 mg/ml against 5.5 mg/ml for hydroquinone).

Comparative table sheet	Orac	DPPH	Tyrosinase	Melanin	Elastase	Collagenase	UV Protection
Artonox	19 735	2,700	0,049	12,000	120,000	92,000	n.c.
Glabridine 40%	3 256	49,000	0,250	3,000	n.c.	n.c.	n.c.
Pterowhite	12 508	4,900	6,900	0,550	n.c.	n.c.	30
Resveratrol	25 223	3,010	5,500	2,500	n.c.	n.c.	31
Saberry	2 682	n.c.	321,000	14,000	n.c.	n.c.	15 [UVA] 42 [UVB]
Sabiwhite	10 786	n.c.	1,770	3,000	n.c.	n.c.	n.c.
Tetrapure	10 212	1,300	1,800	3,200	n.c.	n.c.	n.c.
Kojic Acid	-	500,000	7,000	100,000	n.c.	n.c.	n.c.
Vitamin C	3 400	1,930	9,330	25,000	n.c.	n.c.	n.c.
Arbutin	-	500,000	193,600	100,000	n.c.	n.c.	n.c.

- ORAC Value : μmol Trolox equivalents/g (Higher is greater)
- DPPH Inhibition: IC50μg/ml (lower is greater)
- Tyrosinase Inhibition: IC50μg/ml (lower is greater)

- Melanin Inhibition: IC50μg/ml (lower is greater)
- Elastase Inhibition: IC50μg/ml (lower is greater)
- Collagenase Inhibition: IC50μg/ml (lower is greater)
- UV Protection: IC50μg/ml (lower is greater)

Acne is a common skin disorder which is a visible end result of hormonal, bacterial and inflammatory disturbances that take place at the level of the oil pore (*pilosebaceous follicle*). It is characterized by presence of open comedones (black heads) and closed comedones (microcysts).

Some of the common causes of acne

- Growth and multiplication of acne causing bacterium *Propionibacterium acnes*.
- Higher levels of Dihydrotestosterone by the activity of the enzyme 5- α reductase.
- Increase in androgens during puberty and adolescence which in turn, triggers an enlargement of the sebaceous glands.

Prevention of acne

Acne may be prevented by:

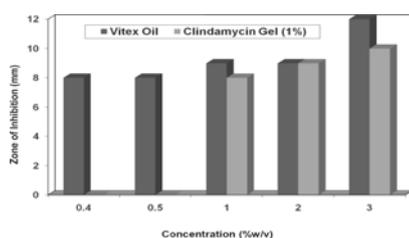
- Reducing sebum production (secreted by sebaceous glands)
- Reducing bacteria (*P. acnes*) on the skin
- Reducing the inflammation
- Exfoliation-peeling of the skin which unclogs pores

LactoSporin® - new postbiotic

Clinical study on anti-acne benefits of LactoSporin® (INCI: Bacillus Ferment Filtrate Extract), the probiotic metabolite derived from the company's probiotic LactoSpore: efficacy of LactoSporin 2% w/w cream in reducing the severity of acne in human volunteers, with the effects comparable to benzoyl peroxide 2.5% gel (see pages on LactoSporin®).

Anti-microbial Vitex

Vitex oil is extracted from the berries of *Vitex agnuscastus* and is standardized for 0.40% of Artemetin. It is made up of long chain fatty al-

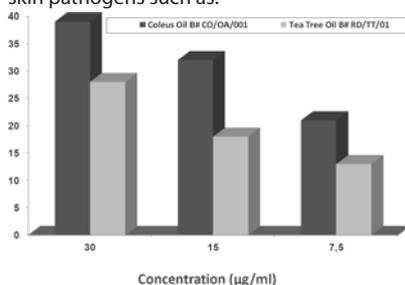


cohols and long chain fatty acids. Vitex oil inhibits the growth of *Propionibacterium acnes* (anaerobic bacteria), *E. coli* (from 0.1%) and *S. aureus* (aerobic bacteria, from 0.5%).

At concentrations above 0.4%, it effectively inhibits the *P. acnes* bacteria and the activity is well comparable to 1% Clindamycin gel.

Anti-microbial Coleus oil

Coleus oil is an oil obtained from the fresh roots of *Coleus forskohlii*. It is standardized to 15% Bornyl acetate and 15% Decanal. The oil having good anti-microbial activity is a potent anti-acne ingredient. Coleus oil was found to effectively inhibit the growth of skin pathogens such as:



- *Propionibacterium acnes*: Inhibition of more than 25% at 1.25µg/ml (versus 15% for tea tree oil), and still 15% at 0,5 mg/ml
- *Staphylococcus aureus* (a bacterial strain found in infected wounds and skin eruptions): Inhibition by 40% at 30µg/ml, so about 3x more than tea tree oil, and still 30% at 7,5 mg/ml when tea tree oil is then not active anymore
- *Staphylococcus epidermidis* (a bacterial strain occurring in a variety of opportunistic bacterial skin infections): inhibition by ca. 30% at 30µg/ml, so double than tea tree oil, and still 15% at 7,5 mg/ml when there's no more activity from tea tree oil.
- *Candida albicans*: Inhibition by 40% at 30µg/ml and ca. 20% at 15µg/ml, so always more than Tea Tree Oil, without unpleasant odor.

Sebum control Policosanol

Policosanol is a mixture of fatty alcohols derived from waxy extract of sugarcane. It contains a minimum of 55 – 60% Octacosanol. Policosanol was found to have anti-microbial

Unique formulation to fight the various form of acne and work on the sebum control

LactoSporin®, the new postbiotic (probiotic metabolite derived from LactoSpore®) reduce the severity of acne

Vitex oil from *Vitex agnuscastus* and standardized for 0.40% of Artemetin

Coleus oil is from fresh roots of *Coleus* standardized to Bornyl acetate and Decanal.

Policosanol derived from waxy extract of sugarcane, for 55 – 60% Octacosanol

CosmoPerine® for a better efficacy, or Monolaurin, potent against *P. acnes*

and sebum control effects that are potentially useful in managing inflammatory skin conditions, particularly acne.

In a 2 week study on 16 human subjects between 8 and 25 yrs of age, 2% and 5% Policosanol colloidal solutions were found to be safe for local application. Topical applications of the Policosanol colloidal solutions were found to decrease the sebum secretion in a concentration dependent manner. (Reduction from 11.6% to 27.6%). Policosanol effectively compared with Clindamycin.



Cosmoperine

Cosmoperine is a 95% tetrahydropiperine, prepared from pepper by a patented proprietary process. It may operate by increasing the membrane fluidity and affinity of drug / nutrient to the cell membrane, for a broad range of delivery through the skin.

Cosmoperine has been subject to various studies: for instance, it has been found to enhance the Tetrahydrocurcuminoids (THC) due to increase penetration by min. 30% of the active across the barrier. Even at the highest dilution of 0.0001%. Other actives such as green tea polyphenols, synthetic

Cosmoperine Tetrahydropiperine (THP) as enhancers of nutrient and drug bioavailability

pyrethroid, Albendazole, Betamethasone Dipropionate, etc... have been also performed with same proofs of efficacy (absorbed faster rate and more completely)

Recommended use : 0.01% to 0.1%

Cococin - Nourishment Factor®

Cococin™, The Nourishment Factor® captures the goodness of green coconut water in a convenient powder form. Coconut water is the nutrient-rich liquid endosperm of coconut abounding in proteins, amino acids, sugars, vitamins, minerals and growth hormones that support healthy cell growth & hydration. Coconut water solids are freeze-dried using a special process that preserves the activity of nutrients...

Coconut water is often described as a «natural isotonic sports drink», providing higher amounts of electrolytes such as potassium and magnesium than conventional sports drinks. Coconut water solids also have a prebiotic role, and beneficially influence the balance of microflora in the gastrointestinal tract. When topically applied, coconut water solids nourish the skin and hair, supporting healthy cell growth.

Cococin®, The Nourishment Factor® captures the goodness of coconut water in a convenient, free flowing, and powder form. Recently affirmed GRAS for use in foods and clinically validated for its topical benefits, Cococin finds multifunctional applications in cosmetic, personal care and food and beverage compositions.

Produced under a patented lyophilization process, the amorphous nature of the solid produced by this process protects the protein components and environment sensitive actives during subsequent pulverization and storage. During storage, the material transforms to the more stable, less hygroscopic, crystalline state.

Cococin blends seamlessly with cosmetic compositions, and easily disperses in water, making it a compact and versatile nutrient pool for use in topical formulations, as well as in functional foods & beverages that nurture from the inside out.

Between starting to grow and falling out years later, each hair passes through three distinct stages : Anagen (the growing phase), Catagen (the intermediate phase), Telogen (the shedding phase).

Cococin™ has been evaluated for its efficacy as a hair growth promoter, in comparison with Minoxidil as standard : Histological evaluation of the skin biopsies showed that the hair follicles were transformed from Telogen to Anagen phase of hair growth in the animals... showing a response to the topical application of formulations containing Cococin™ with hair growth promoting activity.

Animals treated with reference standard viz 2% minoxidil showed telogen to anagen transition in more than 70% animals. The maximal induction of Anagen was observed with 2% Cococin™ cream ,which equaled that of the reference standard (2% minoxidil) in the experimental conditions of this study (see picture).

Reducing the appearance of skin aging

Twenty-two females in good health of ages 20-35 years old were subjects in a double blind placebo controlled clinical study (Research Report Sami Labs Ltd., 2005). A cream containing 1% coconut water solids (Cococin INCI: Cocos nucifera (coconut) fruit juice was applied onto the left arm of each subject, and the cream base was applied onto the corresponding area of the right arm, to serve as control. 200 mg of the cream and cream base was applied daily for eight weeks, to the marked areas on the left arm and right arm respectively (see figure)

Nutritionally versatile

It is important to differentiate between coconut milk and coconut water. The ratio of RNA-phosphorus to DNA- phosphorus is significantly lower in the liquid endosperm of mature coconuts as compared to that of green coconuts.

RNA plays an important role in amino acid transport and respiratory metabolism in living cells. Coconut water used to make Cococin is obtained from green coconuts at the optimal stage of maturity, to ensure a high content of RNA and growth factors, including shikimic acid, quinic acid and indole-3-acetic acid, along with essential vitamins, amino acids, and minerals. At the completion of growth, the solid endosperm and the last of the coconut water provide nourishment for the forming embryo and seedling.

Thus, coconut water serves the role as a reservoir of nutrients to support tissue growth (Tulecke, et. al; 1961).

Coconut water has been used in the tropics as a nutritive and rehydrating agent to restore electrolyte balance in cases of diarrhea (Adams, et al; 1992). A published research report mentions that coconut water can be used as a short term intravenous (IV) fluid (Campbell-Falck et al; 2000). Other reported applications include use in total parenteral nutrition (TPN) (Petraianu, et al; 2004), and sports beverages (FAO, 1998)0

Moisturizer

Promotes healthy cell / hair growth
Supports blood circulation

Cosmetics and nutricosmetics

Cococin is The Nourishment Factor® that provides a valuable nutrient pool for enhancing food and beverage, as well as cosmetic product formulations. Cococin can be safely used in oral care as well as lip care compositions.

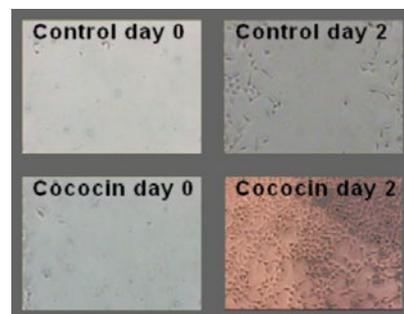
- Helps restore the skin health in aged and damaged skin
- Augments new cell growth while promoting healthy tissues
- Helps in wound healing
- Helps in skin hydration

Cell Proliferation enhancement

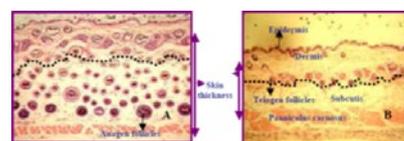
Cococin was used in the growth medium for fibroblast cell lines in an in vitro study (in Swiss 3T3 fibroblast cell line). Cell proliferation was significantly enhanced in cells treated with Cococin containing nutrient medium as compared to controls receiving standard nutrient medium.

Hair Growth

Each individual hair is formed inside a hair bulb deep in a hair follicle. The follicle is a tiny but powerful factory, which throughout many people's lifetime hardly ever stops working. From a baby's birth for many decades, as much as a century in some people, the follicle continues to produce hairs. Finally the hair spontaneously falls out. The follicle rests for a little while, and then starts to produce yet another new hair.

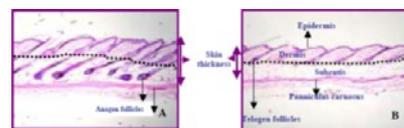


Cell Proliferation enhancement in Swiss 3T3 fibroblast cell line



A) Anagen phase of hair growth -The hair bulb is rigid and is present deep in the subcutis layer. Presence of anagenic hair follicles in subcutis is accompanied by increase in skin thickness.
B) Telogen phase of hair growth -The hair bulb is shrunken and is present only in the dermis, while no follicle is present in subcutis layer.

Hair growth Histopathological (transversal) sections of animals



A) Anagen phase of hair growth -The hair bulb is rigid and is present deep in the subcutis layer.
B) Telogen phase of hair growth -The hair bulb is shrunken and is present in the dermis above the subcutis layer.

Hair growth Histopathological (longitudinal) sections of animals

Powerful Cannabinoids [CBD]

GVB Biopharma is a trusted supplier to leading CBD and cannabinoid brands. Vertical integration is a key operational strategy, and every GVB product is continuously tested throughout the production process. This begins with seeds from a reputable supplier tested rigorously to ensure that GVB grow only the finest hemp. After seed testing, quality control takes place in the field to ensure they are developing high levels of cannabinoids that are free of all contaminants.

Cannabidiol

Main non-psychoactive cannabinoid extracted from hemp, the cannabidiol or CBD molecule (identified in 1963) is derived from *Cannabis sativa* which contains more than 100 chemical compounds (mainly Cannabidiol [CBD], Cannabinol [CBN], Cannabichromene [CBC], Cannabigerol [CBG]). Also, CBD is rapidly becoming the focus of many uses in the pharmaceutical, cosmetic and of course dietary supplement fields.

Anti-inflammatory

CBD is reported to eliminate inflammatory cytokines and chemokines. The benefits of cosmetics

Known for its anti-stress, pain-relieving and anti-inflammatory properties, CBD is often used for therapeutic or medical purposes for its anti-inflammatory properties, and so anti-stress and pain-relieving. More recently, it is increasingly present in cosmetic products such as skincare, lotion, creams, masks, oils, etc...

with CBD therefore may help the body to stay in balance, by preventing inflammation.

Antibacterial

CBD has antibacterial properties, which allows it to defeat infections and eliminate the bacteria that cause annoying skin breakouts (acne) to solve many problems that affect the skin, especially caused by excessive sebum production. Also related to inflammation, scientific studies report that CBD is particularly effective in reducing inflammation, even when other treatments fail - and the accumulation of inflammatory cells or excessive angiogenesis of the dermis found in psoriasis or eczema (another study discusses the action of CBD on mast cell activation).

Sebum / Acne

CBD acts on sebum reduction linked mainly to oily skin – and also still linked to inflammation. As it regulates excess sebum, it reduces pore clogging and soothes inflammation. Because it acts on the inflammatory response of the epidermis, CBD works also on regenerating the damaged cell at the same time.

Anti-ageing

CBD is a natural antioxidant, as effective than many other compounds – often chemical. It acts against the deterioration of the skin and the formation of wrinkles, resulting in particular from the oxidizing action of free radicals. It boosts collagen production and keeps the skin firm and elastic.



Rhodiola: Stress Support and Wrinkles

While *Rhodiola* as a genus may have originated in the mountainous regions of Southwest China and the Himalayas, In central and Northern Asia, the genus is distributed from the Altai Mountains across Mongolia into many parts of Siberia.



Rhodiola rosea used for the production of RhodioliLife® is collected and now also cultivated (Nektium was a pioneer) from this part. Altai Mountains represents a pristine area free from contamination in of the most well preserved and remote natural environments.

Nektium is involved from the early beginning in the collection practices, with SOPs describing the stage of the plant growth, best time of collection and ecologically non-destructive systems.

Stress

Stress is a well-known triggering factor in the appearance or exacerbation of psoriasis, alopecia areata, atopic dermatitis, acne, and other skin disorders. *Rhodiola rosea* enhances parasympathetic function and fortifies the stress response system, improving our ability to overcome stress and reducing our risk of stress-related health problems.

Anti-aging properties

Application of *Rhodiola rosea* extract as a useful method of retarding the signs of photoaging and protecting the skin from UV damage. Photoaging can include signs of aging such as skin atrophy and means the thinning and/or general degradation of the dermis caused by free radicals damage which is often characterized by an alteration and degradation of collagen and/or elastin.

Rhodiola rosea extract can help in the prevention or retarding skin aging, including wrinkles lines appearance, skin atrophy and thinning appearance reduction.

Those properties are associated with:

- DNA Repair
- Collagen synthesis
- Oxidant scavenger
- UV Radiation absorption (significantly reduces UVB induced sunburn)
- Antioxidant and Stress Support

Rhodiola rosea is also known historically as “Golden Root” from the “Golden Mountains” (Mongolian word ‘Altan’)

Wrinkles

Enhances Skin Barriers : first, preventing your skin from wrinkling is protecting it from sun damage, which is the chief culprit in pre-mature aging of the skin. Extracts of *Rhodiola rosea* improved the skin's defensive barrier functions against the stress of UV rays.

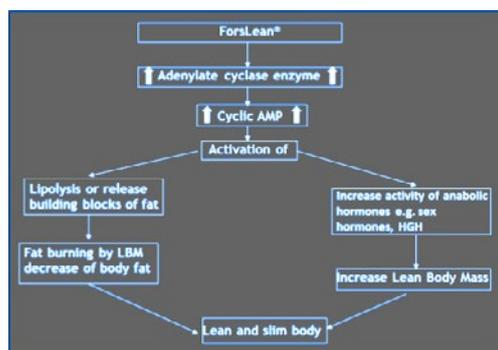
Supports Elastin Production : Elastin is the rubber band effect in the skin that enables it to bounce back instead of sagging or wrinkling. Applying *Rhodiola rosea* extract to delicate areas of the skin may help prevent premature wrinkling as the herb increases two types of molecular components needed by the body to create elastin.

Supports Collagen Production

The dermis is the second of three layers of skin, sitting just below the epidermis. It consists of collective tissues, including elastin and collagen, which support the skin and provide its flexibility. When in good supply, elastin and collagen prevent sagging and wrinkling. *Rhodiola rosea* elevates the number of hydroxyproline and hexosamine molecules, which are necessary for the body to make collagen.

Forslean Coleus

Forslean® is manufactured by a proprietary process and is a standardized extract from the roots of the *Coleus forskohlii* plant, the only known plant source of forskohlin. ForsLean® is a registered trademark of Sabinsa Corporation.



Sustainability

Sabinsa is growing Coleus in part of its 44 000 acres, and do the extraction in its own plant selection fully dedicated to the production of Coleus extracts, to provide you the best quality and the best sustainability.

TetraPure® is standardized for a minimum of 99% of Tetrahydrocurcumin (INCI Name: Tetrahydrodiferuloylmethane): research reveals that Tetrahydrocurcumin (THC) is one of the major metabolites of Curcumin, reported to exhibit many of the same physiological and pharmacological actions as Curcumin, in some systems, better.

Fungal infection of the skin is the 4th most common skin disease in 2014 Effecting more than 1.2 billion people around the world. A mycosis is a fungal infection of animals, including humans. Mycosis are common, and a variety of environmental and physiological conditions can contribute to the development of fungal diseases.

Human mycoses may be broadly classified as:

- Superficial, cutaneous and subcutaneous
- Systemic

Dermatophytes

It is observed that TetraPure® inhibits the growth of dermatophytes *Trichophyton rubrum*, *Microsporum gypseum* and *Epidermophyton floccosum* at all tested concentration (from 0.15%, Antifungal Efficacy – Agar Dilution Method).

Forslean® is Sabinsa's new proprietary composition extract of *Coleus forskohlii* root, standardized for Forskolin. Forslean® has shown promising results in three areas; enhancing lean body mass, promoting fat loss and promoting weight loss. In September of 1998 Sabinsa was granted a use patent for this application of Forskolin in its Forslean® composition.

Mechanism of Action

The mechanism of action on how Forslean® works is well defined: «Forskohlin, the active compound in Forslean®, is recognized as an adenylate cyclase activator. Adenylate cyclase is the enzyme involved in the production of cyclic adenosine monophosphate (cAMP), a significant biochemical agent in metabolic processes. The role of cyclic AMP is indispensable to many body functions. It induces a chain reaction of biochemical events that trigger metabolic processes and diet induced thermogenesis, thereby providing the means to maintain healthy body composition and lean body mass levels.

Cosmeceutical applications

Topical fat reduction in specific areas of the body is a common concern for women. Ronsard popularized the term "cellulite" to describe the dimpling and "orange peel" external appearance of the thighs, the cause of which was attributed to the aging process by later researchers. The structure of subcutaneous adipose tissue accounts for the development of the "orange peel" appearance. Groups of fat cells are attached to the

underside of the dermis by fibrous connective tissue. As fat cells enlarge, the fibers are stretched and pull down on the underlying skin. This causes the indentation or dimpling of the skin called cellulite.

It has been demonstrated that adipose tissue metabolism varies from one region of the body to another, for example, in severely obese women losing weight after the jejunoileal bypass surgery, fat was seen to be absorbed more slowly in the thigh region than the abdominal region¹⁰. These differences lead to the hypothesis that localized application of agents that trigger lipolysis or fat breakdown could help in cases of fat accumulation at specific subcutaneous sites.

Forskolin accelerates lipolysis through the activation of hormone-sensitive lipase — adrenoreceptors playing important roles in the regulation of lipolysis (adrenoreceptors are neurons that are activated by adrenaline (epinephrine) or similar substance). Based on clinical studies reported in literature, Coleus forskohlii extract 95% is potentially useful in dislodging localized fat deposits immediately under the skin, when applied topically.

As an alternative to **tanning** by exposure to the sun that can cause skin cancer, topical application of forskolin induces tanning and is safer to use.

Dosage Form

The recommended levels of use as a skin conditioning agent: 0.1 to 0.5% of a topical formulation, such as an ointment, cream or lotion.

TetraPure® remedy for Skin, Hair & Nails

Malassezia furfur

Checking the activity against MF (Agar Dilution Method - Sabourauds Dextrose Agar with an overlay of coconut oil), it is observed that TetraPure® enhanced the activity at all tested concentration.

Candida Species

It is observed that TetraPure® at 0.15%, reduces the colony counts of *Candida albicans* NCIM3471 (Yeast) from 14.6×10^5 to less than 100 cfu/ml with an overall percentage reduction of 99.99% over a test interval time of 28 days.

Anti-fungal formulation: 0.15%w/w
Skin lightening form: 0.1 - 0.5%w/w

Disease	Causative Organism	Incidence
Pityriasis versicolor Seborrhoeic dermatitis including Dandruff and Follicular pityriasis»	<i>Malassezia furfur</i>	Common
Tinea nigra	<i>Exophiala werneckii</i>	Rare
White piedra	<i>Trichosporon beigellii</i>	Common
Black piedra	<i>Piedraia hortae</i>	Rare
«Dermatophytosis Ringworm of the scalp, glabrous, skin and nails.»	Dermatophytes (<i>Microsporum</i> , <i>Trichophyton</i> , <i>Epidermophyton</i>)	Common
Candidiasis of skin, mucous membranes and nails	<i>Candida albicans</i>	Common
Dermatomycesis	Non-dermatophyte moulds <i>Hendersonula toruloidea</i> , <i>Scytalidium hyalium</i> , <i>Scopulariopsis brevicaulis</i>	Rare
Tetrapure® inhibits superficial and cutaneous mycosis		