Nutrition
STANDARDIZED PLANT EXTRACTS
Zynamite®

Boosting mental and physical energy

Zynamite® increases alertness and mental activation, and boost physical energy, without the undesirable side-effects of the caffeine.

Zynamite® is the healthy way to replace caffeine with a botanical ingredient without the side-effects of caffeine and actually works better than caffeine, while retaining the experiential effect. Zynamite® is the Nektium's patent-pending proprietary Mangifera indica extract, launched at vitafoods Europe 2018, and getting the Nutraingredient award.

Cognitive health (clinical studies)

• Rapid onset of mental activation
• Faster reaction time
• Increase performance

Sport Performance (clinical studies)

• Sustained energy
• Increase power
• Doping free

Safety & Information

• Own safety data: AMES, 14-day and 90-day Repeated Dose oral gavage toxicity study, NOAEL... and new soon coming.
• GMO, BSE/TSE free, Doping free, DNA barcode, Vegan, Kosher, Halal, traditionally used in food, registered in different countries in Europe, Australia, New Zealand, USA (self GRAS i.p.)

News & Innovations

Lycopen 10% / Tomato

Lycopen 10% UV from Lycopersicon esculentum (tomato), from a reliable and cost effective source. Lycopene, a carotenoid, is transported by the lipids of the blood and accumulates in certain organs, in particular in the liver and the prostate. Epidemiological studies have shown that lycopenes are powerful antioxidants that can provide protection against oxidative damage and limit the development and progression of many tumors.

Immune & Joint health

Red Marine Algae

Traditionally consumed as a sea vegetable, red marine algae is celebrated for its health benefits. The Red Marine Algae extract from Gigartina skottsbergii is rich in carrageenans and sulfated polysaccharides including fucoidan and is standardized to over 30% total polysaccharides (incl. sulfopoly saccharides). Publications indicate neuroprotection, reduced inflammation and degeneration of cartilage, improved sports performance, anti-fatigue activity (neuroprotection), prevention of obesity, immune stimulatory activity. It has also been shown to be a potent inhibitor of the in vitro replication of Herpes simplex virus.

Nutriform Business Days 2019

BECARRE is Gold Sponsor

BECARRE Natural is Gold Sponsor of the next edition of Nutriform Business Days, which will take place on 11th and 12th September 2019 in a convivial setting in Saint-Raphaël, in the Var. This symposium provides scientific and marketing solutions through a series of plenary sessions and interactive discussion groups that gives the opportunity to put any questions you may have to experts on each of the topics discussed. Networking areas helps save time and facilitates contact with partners operating within your profession, along with a series of meetings hosted by manufacturers.

During this symposium, BECARRE Natural will proceed to the launching of one - and maybe two - innovative plant extracts supported by studies.

See you in September 2019.

Newsroom

Latest news or studies published

Zynamite®: Zynamite® (Mangifera indica Leaf Extract) and Caffeine Act in a Synergistic Manner on Electrophysiological Parameters of Rat Central Nervous System

Zynamite®: Enhancement of Exercise Performance by 48 Hours, and 15-Day Supplementation with Mangiferin and Luteolin in Men


It aids in fat conversion into heat, a novel concept called energy balance. Forslean already got 3 patents, esp. for Lean Body mass

Shagandha®: Sabinsa Shagandha® Ashwagandha Root Extract 2.5% Designed to Meet USP Monograph, Verified by Prominent Botanical Testing Expert Alkemist Labs

Nigellin®: Comparative immunomodulatory activity of Nigella sativa L. preparations on proinflammatory mediators, Asthma Potent Favorable Immunomodulation in Asthma Inflammation

Lactospore®: Probiotic LactoSpore® may improve cholesterol levels, study suggests

Lactospore®: Irritable bowel syndrome: a randomised, double-blind, placebo controlled, multi-centre, pilot clinical study

C3 Complex®: New Diabetic Research on C3 Complex® and BioPerine® Combination Published

C3 Complex®: Research on Curcumin’s Positive Effects on Microbiome

DigeZyme®: Demonstrated Efficacy in Management of Dyspeptic Symptoms with Functional Dyspepsia: Published Clinical Study
Nektium’s new facility and ID Testing Program

Nektium opened on 2018 its new facility in las Palmas area. 10,000 m² manufacturing facility with a processing capacity of up to 20mT raw material per day and 350 m² in 3 laboratories (physico-chemical, cell and molecular biology).

ID Testing Assessment Program & Quality
• Nektium conducts rigorous identity procedures to each lot of plant material, including macroscopic, sensorial and UHPLC chromatographic profiles, combined with identity confirmation by DNA-barcode analysis.
• The PhD-qualified analytical chemists work in a dedicated physico-chemical laboratory with advanced analytical instrumentation, including UHPLC-DAD/MS and GC-MS.
• They have cGMP certification for the manufacturing of nutraceutical ingredients, and current Food Safety System Certification, FSSC 22000.

The products are Kosher and Halal certified.

Promond™ Almond protein powder for sport

Promond™ almond protein is a water-soluble 50% protein sourced from Indian variety of almonds. Promond™ is water extract) with a complete array of amino acids, including high levels of branched-chain amino acids (BCAAs). Although its amino acid profile is similar to whey and pea protein, it is particularly high in glutamate, arginine, aspartate, and phenylalanine. Those concerned about almonds grown in California because of heavy water use in drought conditions won’t have to worry, Promond™ is made from almonds sourced in northern India.

Papain / Bromelain

Papain and Bromelain enter our catalogue, processed in India by a dedicated company specialized on enzymes.

Papain is well known for improving digestion and treating infections, diarrhea, and allergies. It has also been used, with other protease to reduce pain, inflammation, and swelling. Grades: 1.5 to 3.5 FIP
Bromelain is a cysteine protease isolated from pineapple stem, for digestion, allergy and inflammation. In vitro and in vivo studies demonstrate that bromelain exhibits various fibrinolytic, anti-edematous, antithrombotic, and anti-inflammatory activities. Grades: 200 to 5 000 GDU

Correspondence in between the different units are mentioned in this brochure

BECARRE Natural gets Organic Certification

BECARRE Natural is proud to announce that Organic certified plant extracts are now part of our portfolio.

In the respect of our marketing view, we’ll still focus on standardized plant extracts, with high assay of actives, although we know that this will limit the number of available plant extracts to be promoted.

enXtra™ / Alertness and Focus

Clinically proven to improve alertness and focus up to 5 hours with and without caffeine

EnXtra™ can either replace caffeine, providing a non-caffeinated mental energy boost or it can accompany caffeine to Amplify Caffeine benefits and reduce caffeine induced crash. EnXtra™ is fully water soluble with mild taste and lovely tea color.

Extracted from rhizomes of Alpinia galanga, grown in pollution free hilly terrain, is a DNA-authenticated. EnXtra™ is ideal functional ingredient for energy drinks (with or without caffeine), and many other various forms.

Nigellin® / Asthma

A time honored remedy

Sabinsa’s Nigellin® BCS is obtained from the seeds of Nigella sativa (Black Cumin) and standardized to contain Thymoquinone, Thymohydroquinone, Hederagenin with added Rosmarinic acid.

A study has been published on end 2018 on the anti-inflammatory and immunomodulating properties, where Nigellin® is among the most valued in anti-asthma herbal products. Nigellin had the highest effects in suppressing the release of cytokines IL-2, IL-6 and PGE2 in T-lymphocytes and also in monocytes hindering the expression on IL-2 and PGE2. These are among the most active cytokines involved in asthmatic conditions. The investigators noted a positive relationship between the TQ level in the preparations and its inhibitory potency on IL-6 and PGE2... besides existing and proved properties: glycemic control, healthy blood pressure, lipid profile, male fertility.
### Nutritional products

<table>
<thead>
<tr>
<th>Last News</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why Becarre Natural</td>
<td>6</td>
</tr>
<tr>
<td>Products by properties</td>
<td>7</td>
</tr>
<tr>
<td>Inserts</td>
<td>10</td>
</tr>
<tr>
<td>Key Products</td>
<td>11</td>
</tr>
<tr>
<td>Plants list (Latin names)</td>
<td>17</td>
</tr>
<tr>
<td>Satireal</td>
<td>18</td>
</tr>
</tbody>
</table>

#### Satiereal
- Satisfaction and Good Mood

#### Zynamite
- Boosting mental and physical energy

#### Rhodiolife
- Memory, Immunity & Energy

#### Bacopa
- Revitalizes intellectual functions

#### Bromelain / Papain
- New enzymes in our range

#### Nigellin
- New Nigella sativa

#### Ellagic Acid
- Oral Ellagic Acid for Skin Lightening

#### GliSODin
- The Effective SOD for Health & Skin

#### Promond
- Water soluble proteins from Almonds

#### enXtra
- Antioxidant with or without caffeine

#### Boswellin
- Two Ways Anti-Inflammatory active

#### Pomegranate
- All Benefits from Pomegranate

#### Curcuma C³ Complex
- The most studied Curcuma

#### Lactospore
- Active probiotic Lactobacillus

#### Bioperine
- Ultimate Nutrients Enhancer

#### FruitOx
- Natural In-vivo Antioxidant with High Orac

#### Digizyme
- Enzymes for nutrition and sport

#### Forslean
- Slimming with Coleus Forslean

#### Cococin
- The Nourishment Factor

#### Elim‘Real
- Elimination & Detoxification

#### Some of previous news
- Plant Decree
- L’Arrêté Plante
- Some regulatory decrees
- Our Quality Partners
- What is an ‘extract’?

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**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 European 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 Nektium, Sabinsa Corp., Isocell, Inoreal, … besides few others specific extracts from reputed sources selected by us.

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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Especially recommended for sport, performances, muscles recovery (elderly, post-surgery) or muscles body mass or recovery. As sport induces a post-effort deficiency of the immune health, it may be interested to work on energy, power and after-sport.

- **Rhodiolof®** [Rhodiola rosea] Immunity post-exercise, protects muscle cells, improves endurance & recovery, adaptogenic, reduces fatigue, neurotransmission
- **Zynamite®** [Mangifera indica] Nutraingredient award 2018, higher peak power output, VO2 max and oxygenation, no jitters, nervousness, agitation
- **Promond®** [PhytoPharmica] 50% protein from Indian almonds, 100% natural and vegan, free-flowing powder, good taste. Glu, Arg, Asp, Phe
- **Digizeyme®** [Enzymes] Improves proteins intake, benefits on delayed onset muscle soreness
- **Beetroot** [Beta vulgaris] Natural nitrate, betalains & polyphenols (no nitrates nor synthetic nitrates), performance during heavy resistance exercise, stress tolerance
- **enXtra®** [Alpinia galanga] Energy booster by blocking adenosine (caffeine-like without side effects), release of dopamine, increases blood flow
- **C3 Complex®** [Curcuma longa] Anti-inflammatory, reduces muscle damage during exercise, optimizes recovery processes, weight and colesterol
- **Glissomin®** [Curcumin mela, Gladine] Immune system, protects against inflammation, DNA damages and induced lactate production, anti-inflammatory cytokine management
- **Capsaicin** [Capsicum annum] Aches & pains in muscles / joints (TRPV1), endurance, increases muscle protein synthesis and adrenaline secretion
- **Cococin®** [Cocos nucifera] Unique profile of nutrients from tender coconut, isonotic nutrients, blood circulation
- **Fenugreek** [Trigonella foenum graecum] Use of proteins in muscles rebuilt (increase deposition of prot., increasing muscle mass), muscle power, libido
- **Hesperidin** [Citrus sinensis] Inflammation reduction (S-LO, TNF-a, H202), vasodilator, better blood flow, improves exercise performance (NO production)
- **Bromelain** [Ananas comosus] Protein digestion, muscle repairment, inflammation management
- **Roswellia** [Roswellia serata] Decrease of inflammation, stimulation of immunity after exercise, muscle recovery, acts on 2 pro-inflammatory enzymes
- **Bioperine®** [Piper nigrum] Ultimate nutrient enhancer, only 5mg per dose to boost by 10% to 1 000% the bio assimilation
- **CaroTex®** [Daucus carota] Beta-carotene formulation with superior bioavailability for increased performance
- **Punicic** [Punica granatum] Adipose in muscles, anti-inflammatory (decrease in triacylglycerol deposits), produces a surge in testosterone, ClNa body weight
- **Resveratrol** [Polygonum cuspidatum] Antioxidant, inflammation, detoxifying
- **FruitDx** [Formulation] Strong and natural in-vivo antioxidant
- **Fucoxanthin** [Undaria] Fat burning in white adipose tissue, thermogenin
- **BGOV bis-glycinato oxo vanadium, organic complex. Building material of bones and teeth. Increases energy / endurance (body builders)
- **Chrysin** 97% Dihydrosayflavone, Anti-inflammatory, Antiolytic as well
- **Bacoside** [Bacopa monieri] microcirculation & neurotransmission
- **Tributtress terresit 45% saponins**

**Mental, Alertness**

The effects of stress on memory include interference with a person’s capacity to encode memory and the ability to retrieve information. Age, daily stress and daily needs of attention lead us to seek support to fight anxiety, and strengthen brain alertness. Also includes mental alertness and performance.

- **Zynamite®** [Mangifera indica] Nutraingredient award 2018, alertness, focus & concentration, faster reaction time, caffeine-like with no jitters, nervousness, agitation
- **Rhodiolof®** [Rhodiola rosea] Cognitive function under stress and fatigue, antidepressant effects, good mood, adaptogenic
- **Centellin®** [Centella asiatica] Memory and concentration while reducing anxiety, slows brain aging and helps regenerate neurons (cognitive impairment)
- **Satireal®** [Cucurbita sativa] Acts on the production of neurotransmitters and hormones (serotonin, melatonin and dopamine) via the adrenal glands (SRI)
- **EnXtra®** [Alpinia galanga] Caffeine amplifier, focus and mental energy, alertness (sharens alertness and focus for upto 5 hours), dopamine release
- **Glisomin®** [Curcumin mela L + Gladine] Prevents impairment memory induced by stress, promotes antioxidant defences in the brain
- **Bacopin®** [Bacopa monieri] Memory and neurotransmission enhancer, decrease anxiety level, increase dopamine level, neuroprotector effect
- **Shagandha®** [Withania somnifera] Increase GABA A receptors activity, reduces stress and relieve anxiety, neurons protection
- **Mucuna** [Mucuna pruriens] Natural source of L-dopa, precursor of dopamine, action on the nervous balance (mood disorders, age-related tremors, sleep ...)
- **Curcuma C3 Complex®** [Curcuma longa] Protective action (reduce inflammation in the brain), associated with Alzheimer’s disease / depression improvements
- **Saberry®** / Amla [Emblica officinalis] Excellent brain tonic, central nervous system
- **Alpha-lipoic acid** Powerful antioxidant, heavy metal chelator, essential cofactor
- **S-HTP** [Griffonia simplicifolia] Serotonin precursor (the Happiness hormone), involved in the regulation of sleep, appetite and mood
- **Ginkgo** [Ginkgo biloba] Reduces the symptoms of anxiety / dementia of vascular or degenerative origin, including memory loss, attention disorders and depression
- **SelenoMethione** Low plasma Se associated; selenity and cognitive decline
Inflammation

Inflammation is a complex process involving a series of actions and/or reactions and a broad range of biologically active substances triggered by the body's immunological response to tissue damage.

- Boswellin® (Boswellia serrata) Inhibits the synthesis of leukotrienes, constriction of the bronchi in response to allergens, AKBA reduced proliferation of leukemic cells
- C3 Complex® (Curcuma longa) Anti-inflammatory (COX 2 inhibitor, without side effects unlike NSAIDs), increases the speed of remission of cancerous cells (NF-kB)
- Nigellin® (Nigella sativa) Anti-inflammatory, positive effect in the context of asthmatic (stud.), anti-bacterial (Gram + germs), anti-fungal, anti-parasitic and anti-viral
- GlisODIN® (Curcumin melo, Gladine) Immune system, induction Th1-1, INF-α IL-4, regulate cytokines productions, DNA damages, red. allergic asthma and house dust
- Lactosperre® (Bacillus coagulans) Improves Gut Microflora, production of Short-chain Fatty Acids, beneficial activities in gastroenteritis or irritable bowel syndrome
- Hesperidin® (Citrus sinensis) Inhibition pain, oxidative stress, inflammatory cytokine production and TRPV1, reduction of allergy and hay fever symptoms
- Bromelain (Ananas comosus) Inflammation management of the gut and joints
- Andrographis® (Andrographis paniculata) Stimulates effects on the immune system, anti-inflammatory and antipryretic properties
- Mango [Mangifera indica] Inhibition of inflammatory modulators in the synovial tissues, hypo-osmotic effect (decrease serum urate levels)
- Puninic [Passiflora edulis] Anti-inflammatory (decrease in trycglycerol deposits), inhibit prostate cancer metastasis, pro-apoptotic
- Resveratrol (Polygonum cuspidatum) Antioxidant, anti-inflammatory effects (inhibition of NFκB and AP-1), mitochondrial activ, activation of the PPARγ pathway
- Capsaicin (Capsicum annum) Relieves pain by activating the TRPV1 receptor "subst. P", triggers apoptosis of cancer cells in the stomach, pancreas and colon
- Ginger [Zingiber officinale] Anti-inflammatory effect (leukotrienes, prostaglandins)
- Eldeberry (Sambucus nigra) Boosts immune system, sinus pain, excellent sources of antioxidants, helps reduce inflammation and oxidative tissue damage
- Polysyl helps manage inflammation and maintain mechanicals strengths of bones
- Ursolic /Ursolate Inhibition of histamine, lipoygenase and COX
- Pygeum alleviate discomfort caused by prostatic inflammation
- Xymenynic stimulates conversion of arachidonic into eicosanoids in the dermis

Protection, Allergy

The immune system's ability to fight infectious disease may be compromised by fatigue, aging, stress diseases (and some related medications), and even sport. Different plant extracts exist to strengthen the immune system and assist the body to increase its defenses.

- Rhodioll® [Rhodiola rosea] Stimulates and protects the immune system (homeostasis), increases the natural killer cells (NK), adaptogenic
- GlisOM® (Curcumin melo, Gladine) regulate the immune response induction of Th1, in-vivo studies on FIV infected system and children (allergy)
- Andrographis® [Andrographis paniculata] Indian Ph. for colds, flu, fever (even cancer), powerful antioxidant, anti inflammatory and immune
- C3 Complex® (Curcuma longa) anti-neoplastic and immune modulating (tyrosine)
- Nigellin® (Nigella Sativa) Anti-inflammatory, positive effect in the context of asthmatic (stud.), anti-bacterial (Gram + germs), anti-fungal anti-parasitic and anti-viral
- Hesperidin® (Citrus sinensis) Inhibition pain, oxidative stress, inflammatory, reduction of allergy and hay fever symptoms (inhib. histamine release)
- Hot SiP [Adhatoda vasica, Alpinia galanga, Glycyrrhiza glabra, Piper longum] Ayurvedic formulation cold and cough
- Red Marine Algae [Gigartina skottsberga] Improve functions of the human immune response by the sulfated polysaccharides
- Adhatoda management of breathlessness, cold and coughs, antimicrobial
- Eldeberry [Sambucus nigra] Boosts immune system, sinus pain, excellent sources of antioxidants, helps reduce inflammation and oxidative tissue damage
- Barley β-glucans [Hordeum vulgare] immunomodulator
- Lactosperre® (Bacillus coagulans) improves Gut Microflora, production of Short-chain Fatty Acids, beneficial activities in gastroenteritis or irritable bowel syndrome
- Selenomethionine Bioavailable and unique composition of selenium
- Ginger [Zingiber officinale] Anti-inflammatory (leukotrienes and prostaglandins)
- Fenosterol® [Trigoneila foenum graecum] Expectorant, anti-fungal and antiparasitic properties
- Shagandha® [Withania Somnifera] Adaptogenic

Digestion

Digestion may mean different actions, with possible combinations: Maximize the uptake of nutrients, Improvement of the digestive wellness, as well as the welfare of the intestinal tract, Allow people eating less or just make the most of their diet, Prevent hearthburn, ulcers, fatigue, nausea and irritations related to weak digestion + all adaptogenic products:

- Digezyme® (Multi-enzyme complex) Multi enzyme complex, studied enzymatic profile: α-Amylase, Protease, Lipase, Cellulase, Lactase
- Berberine (Berberis aristata) Indolent ulcers, stomach cancers (supports the healthy bacteria)
- Triphala [Terminalia belerica, Terminalia chebula & Emblica officinalis] support digestion
- Pomegranate (Punica granatum) useful against flatulence, difficult digestion, diarrhoea, bloating
- Safranal® (Nigella sativa) Draining effect helps in the elimination of toxins in the intestines and lungs, stimulates the digestive/intestinal systems
- Saberry® / Amla [Emblica officinalis] Stimulates gastric juices and also support detoxification, possess antisepticre, antitussic, and cytoprotective properties
- Curcuma C3 Complex® [Curcuma longa] Allows to make fat soluble for digestion and elimination of fat cells, helps cells with glucose absorption, remove gallstones
- Capsaicin® (Capsicum annum) Stimulates metabolism, increases fat burning, decreases appetite (inc. of GLP-1), anti-inflammatory on H, pylori-induced gastritis

Nutrition

Weight, Detox

Weight may be managed through different ways: ↓ Decrease of the amount of certain nutrients, especially fats (less intake, different degradation and digestion/absorption), ↓ Reduction of the bio transfer to the cells and muscles (education of the body), ↓ Decrease of the storage of the fats, including in the liver, ↓ Use of the stored fats.

- Satieal® [Cocus sativus] Moderate appetite, reduce compulsive snacking, significant and progressive reduction of weight
- Fucoxanthin [Undaria pinnatifida] Increase fat metabolism, detoxify the digestive system, facilitating transit, helps reduce appetite
- Elim’Real® [Plant Formulation] Help to detoxify the body, assist renal elimination, increase urinary elimination and volume
- Bromelain (Ananas comosus) Proteolytic activity, helps to better digest., reduces gastric acidity, reduces swelling and flatulence, reduces cellulite (anti-oedematous)
- Papain [Carica papaya] Proteolytic activity, helps digest proteins and fats, and antioxidant properties
- Forslein® [Coleus forskohlii] Decreased Body Fat, increased Lean Body Mass by increasing the production of Adenylate cyclase enzyme - CAMP
- Citrin® / Garcinia® [Garcinia cambogia] Reduction of carbohydrates in stored fat (slow down the conversion of carbohydrates), increases the use of fat
- Lactosperre® [Bacillus coagulans] Improves gut microflora, production of Short-chain Fatty Acids, beneficial activities in gastroenteritis or irritable bowel syndrome
- Gymnema [Gymnema sylvestre] Promotes the bodies production of insulin, also works on weight management ("sugar blocking" property), sweetness inhibitors
- Lemon fiber [Citrus limon] Dietary fiber, prebiotic, prevents and relieves constipation, normalizes bowel movements
- Fabenol® [Phaseolus vulgaris] Alpha-amylase inhibitor, "starch blocker", benefits in the maintenance of healthy blood sugar levels and optimal body composition
- Nigellin® [Nigella sativa] Draining effect helps in the elimination of toxins in the intestines and lungs, stimulates the digestive and intestinal systems
- Saberry® / Amla [Emblica officinalis] Stimulates gastric juices, also support detoxification, possess antisepticre, antitussic, and cytoprotective properties
- Curcuma C3 Complex® [Curcuma longa] Allows to make fat soluble for digestion and elimination of fat cells, helps cells with glucose absorption, remove gallstones
- Capsaicin (Capsicum annum) Stimulates metabolism, increases fat burning, decreases appetite (inc. of GLP-1), anti-inflammatory on H, pylori-induced gastritis

BECAPPE Natural • May 2019
Some products have been especially studied for their action on Metabolic Syndrome, besides those with properties against oxidative stress, cholesterol, blood sugar level and globally over-weight.

- **GISSODIN™** [Curcumin mela, Gladine] Reduces risk factor of cardiovascular disease, decrease carotid intima-media thickness.
- **Berberine** [Berberis aristata] Lower cholesterol similar to statins, Reduces blood sugar levels in Type II, lowers blood pressure by acting on AMPK
- **Venocin™** [Aesculus hippocastanum] Helps maintain healthy blood circulation and strengthen the capillaries and veins.
- **Curcuma C3 Complex™** [Curcuma longa] reduces serum concentration of LDL-C non-HDL-C, total cholesterol, TG and Lp(a), helps cells with glucose absorption
- **Centellin™** [Centella asiatica] Triterpenic fraction has beneficial effects in people with venous insufficiency and varicose veins, venotonic activity.
- **Hesperidin** [Citrus sinensis] Vasodilator action, improves the integrity of the blood vessels.
- **Gymnema** [Gymnema sylvestre] hypoglycemic effect, hypolipemic effect (improves lipids metabolism).
- **Saberry™** [Emblica officinalis] Hypcholesterolemia (reduction of LDLc and TC, with high increase in HDLC), improves glucose metabolism in Type II
- **Capsaicin** [Capsicum annuum] Increases the level of nitric oxide, reduction of sodium retention by the kidneys.
- **Fenumannans®** [Trigonella foenum graecum] improves the blood profile: reduction of LDL cholesterol and triglycerides.
- **Ellagic acid** [Punica granatum] Decreases the oxidation of LDLc, antioxidant effect, prevents the formation of atherosclerotic plaque (act on paraoxonase (PON 1))
- **Alpha Lipoic [Synthesis]** Sugar level, prevents from retinopathy and cardiopathy

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### Cardiovascular

#### Prostate, Oncology, Tumor

This is for information only based on available studies and literature, and has no purpose to suggest claim as we here speak of diseases.

- **Boswellin™** [Boswellia serrata] AKBA reduced viability and proliferation of leukemic cells, Inhibits DNA synthesis and cell growth of HL-60 and toposimase I and II.
- **C3 Complex™** [Curcuma longa] anti-inflammatory, increases the speed of remission of cancerous cells (downregulation of NF-kB, AP-1, IκK).
- **GISSODIN™** [Curcumin mela, Gladine] strong action on immune system, recent study on impact on radiation-induced Fibrosis (colon cancer).
- **Fenustero®** [Trigonella foenum graecum] protects against diseases related to premature aging of cells such as breast, prostate, colon and gallbladder cancer.
- **Amla [Emblica officinalis]** Studied on growth of cancer cells in mammary, pancreatic or prostate tumors (cell lines A549, HepG2, HeLa, MDA-MB-231 etc.)
- **Punicic** [Punica granatum] inhibitory effects on prostate cancer growth, angio- genesis and metastasis, pro-apoptotic.
- **Punicic** [Punica granatum] action on PC3 apability to arrest proliferation and stimulate apoptosis.
- **Capsaicin** [Capsicum annuum] triggers apoptosis of cancer cells in the stomach, pancreas and colon.
- **Shagandha™** [Withania Somnifera] Adaptogetic, delay the process of cellular aging, decrease the activity of acetylcholinesterase and slow down tumor cells divpt.
- **Centellin™** [Centella asiatica] Slow the development of solid and ascites tumors, induce apoptosis in different cancer cell lines (esp. MCF-7, breast).

- **Medicinal Plants and Cancer Chemoprevention**
- **Also…** Saw Palmetto, Pygeum, Rhodiola, Piperine, DIM, Nigellin (liver detox)

### NUTRITION

#### Minerals & Others

You may find the full list by properties or by sectors on the website. Just a quick look at some activities, not mentioned in others.

- **Bioperine**: the ultimate nutrient enhancer, only 5mg per dose to boost by 150% to 1000% the bio assimilation.
- **Minerals**: not the common… molybdenum, chromium, vanadium, ...
- **Respiratory support**: Andrographis, Centella, Elderberry, Adhatoda, Colesus, ...
- **Oils**: Coleus Forskholii Oil, Rosemarinic acid, Curcuma Turmeric Oil, Vitex Oil (Artemetin), Mustard seed, Policosanol, ...

### Adaptogen

Adaptogenic herbs demonstrate a nonspecific enhancement of the body’s ability to resist a stressor. Only the most common here:

- **Rhodiola**
- **Ashwagandha & Shagandha**
- **Asparagus (Shatavari)**
- **Amla** [Emblica officinalis or Indian gooseberry]
NUTRITION

The Natural Sign
Studied Plant Extracts

Our products, vitamins, minerals, and regulatory supplements are available on our website, as well as on our official site. Through a multi-dollar quality policy of at least 80% on the ingredients, our plant extracts have been approved by the FDA.

Best Natural Extract Product Provider – France

Rhodiolife® is a natural product that features properties and functions that have been reported in the literature. The product is made from three different grades of rhodiola (25% to 30%) and is available as a powder, capsules, and tablets.

Natural actives for physical improvements

Bioactive natural molecules are related to functional, nutritional, and pharmaceutical properties. All are produced using the highest quality and safety standards.

Ultimate Anti-aging Ingredient
Proven in published clinical research

Protects against DNA damage, premature aging, and aging-related diseases. GSK060, a patented anti-aging ingredient, has been shown to increase life span in both flies and mice. GSK060 is an easy-to-use, proven bioactive SOD thanks to its unique carrier and protection.

Zynamite®
Caffeine Replacement

Innovation launched at Vitafoods 2018

Marine algae from the planet are the source of caffeine. Zynamite®, a marine caffeine replacement, provides the same sense of alertness and energy as pure caffeine, but without the jitters and stomach upset. It is the perfect choice for those who need the energy boost of caffeine but prefer an alternative to traditional sources.
Zynamite

**Mental alertness, Performance, Power, Weight, Caffeine replacement**

**Nutraingredient Award Vitafoods 2018**

**Origin:** Nektium (Spain)

**Source:** Mangifera indica, Leaves

**Bio-active ingredients:** Mangiferine

**Dose:** 2 mg to replace 1mg caffeine, up to 2 x 300mg

Zynamite is the new product from Nektium, with proven efficacy on mental alertness and performance, as well as for sport, without jitters, nervousness, agitation usually linked to caffeine (2 mg to replace 1mg).

**Mental** : improves the alertness, focus and concentration - with faster reaction time, and with no jitters, nervousness, agitation. It activates brain waves and increases Long Term Potentiation in a remarkably similar pattern to caffeine, but without any of the know side-effects.

**Sport** : higher peak power output, V02 max and oxygenation, without change in blood pressure or heart rate.

Other beneficial effects of Mangiferia indica: Predclinical studies suggest that it may prevent tumor necrosis factor, with expression of some mediators and enzymes involved in inflammation, pain, oxidative stress and synaptic plasticity. Also reported: Weight management, antidiabetic, anti-infective, antimicrobial and antioxidant. Inhibition of 5-a reductase. Promote endothelial cell migration.

Rhodiolife

**Immunity, Adaptogen, Memory and attention**

**Energy, Aids in sports performance**

**Origin:** Rhodiola rosea – roots from Altai mountains

**Source:** Rhodiola rosea – roots from Altai mountains

**Bio-active ingredients:** rosavins 3-15%, salidroside 1-7%, spray dried or freeze-dried (comparison study), water or low ethanol extract. Highly selected profile from the roots to the end-extract.

**Dose:** 2 to 3 x 200mg based on 3%. Some studies starting from 50mg.

Rhodiola rosea has been considered a potent adaptogen for decades. Adaptogenic compounds help the body counteract the effects of stress, they are mostly not toxic to the body and their mechanism of action is non-specific meaning that various organs and systems are impacted upon to restore the body’s balance. Studies available and a complete monograph published by Nektium describes the origin and the efficacy.

Clinical trials with Rhodiola rosea extracts have shown significant improvements in fatigue, exercise capacity and mental performance under stressful conditions. It also reduce the level of C-reactive protein and creatinine kinase in the blood, and assists the immune system (2015) and improve memory and attention (2017).

Nigellin

**Blood Sugar, Liver, gut health, anti-inflammatory, proertility**

**Origin:** Sabinsa (India)

**Source:** Nigella sativa – Black cumin seed extract

**Bio-active ingredients:** Thymoquinone (TQ), Thymohydroquinone(THQ) and Hederagenin (H)

Nigellin® from Sabinsa, is a black cumin seed extract obtained by supercritical fluid extraction, standardized in thymoquinone.

Traditionally used in cases of nasal congestion, immune deficiency (and anti-cancer action by Cancer Immuno-Biology Laboratory of Hilton) of the liver, or still headache / throat / tooth. Sabinsa studied various activities including antimicrobial and antifungal activity (reported synergy with various antibiotics) as well as anti-parasitism, activity on the respiratory system (would act as a natural anti-elastase), or anti-Inflammatory and analgesic.

Black cumin is traditionally used in patients with diabetes. Rachid H and col. (2005) have shown that cumin seed has an effect on insulin secretion.

Another activity reported is the help with digestion: Carminative activities facilitate digestion and relieve gas problems in the stomach and intestines. It helps peristalsis and therefore elimination.

New Sabinsa study : Anti-inflammatory and immunomodulating properties are among the most valued in anti-asthma herbal products. Nigellin had the highest effects in suppressing the release of cytokines IL-2, IL-6 and PGE2 in T-lymphocytes and also in monocytes hindering the expression on IL-2 and PGE2. These are among the most active cytokines involved in asthmatic conditions. The investigators noted a positive relationship between the TQ level in the preparations and its inhibitory potency on IL-6 and PGE2.

Nigellin is available as oil (Nigellin BCS - Amber), and defatted black and white powders (Nigellin BCS - Onyx and Nigellin BCS - Pearl, respectively).

Berberine

**Statin-like, Prostate, antimicrobial**

**Origin:** India

**Source:** Berberis aristata

**Bio-active ingredients:** Berberine HCl

**Dose:** 50mg three times a day

Used and recognized for more than 2500 years in Chinese pharmacopoeia and Ayurvedic medicine, the berberine was traditionally recommended to reduce blood sugar levels and to lose weight. But berberine also has many other benefits, including acting on the cardiovascular system and intestinal flora.

The therapeutic effects of statins and berberine on the hyperlipemia have been widely studied.

Promond

**100% natural and vegan protein obtained from almonds**

**Origin:** Sabinsa (India)

**Source:** Prunus amygdalus

**Bio-active ingredients:** 50% Proteins

Promond almond protein is a water-soluble 50% protein sourced from Indian variety of almonds (water extract). It has a complete amino acid profile. It is having a complete array of amino acids, including high levels of branched-chain amino acids (BCAAs). Although its amino acid profile is similar to whey and pea protein, it is particularly high in glutamate, arginine, aspartate, and phenylalanine. Those concerned about almonds grown in California because of heavy water use in drought conditions won’t have to worry, Promond is made from almonds sourced in northern India.
**NUTRITION**

**GliSODin®**

*First orally proven effective SOD: Sun protection, Antiaging, Metabolic syndrome, Oxidative stress*

- **Origin**: France
- **Source**: Curcuma longa L., Gliadine
- **Bio-active ingredients**: SOD, Gliadine
- **Enzymatic activity**: Oral free SOD in the body is mainly totally destroyed within few minutes, despite the source, and can not produce the production of the SOD cascade by the cells. Usual studies based on free SOD cannot prove the efficacy, or at an incredibly high use (in-vivo). Thanks to its gliadin matrix, GliSODin® is orally effective unlike most existing SOD supplements.
- **Protection against sun**: Protection of cellular DNA, increased resistance to UV induced redness (Skin's protection against sun and improved tanning speed and quality)
- **Regulation of inflammation**: and decreases oxidative stress
- **Significant decline in lactic acid levels**
- **Etc...**

**Satiereal®**

*Innovative, patented, natural and safe appetite suppressor*

- **Origin**: France
- **Source**: Crocus sativus L. stigma, Mediterranean region
- **Bio-active ingredients**: Specific and studied unique profile of crocin, picrocrocin and safranal - it’s more than a saffron extract
- **The daily dose**: 176.5mg (2 X 88.25mg/d) used in tablets, capsules, beverages and instant drinks, confectioneries...
- **Satiereal®**: patented clinically proven satiety ingredient from saffron.
- **The satiated feeling induced by Satiereal® encourages weight loss while eliminating frustration.** This product has a unique mechanism that not only creates safety but helps avoid snacking and compulsive eating behaviors, which in turn leads to reduction in weight and inches. Satiereal® is a Serotonin Reuptake Inhibitor (SRI), working so on the general good mood. New studies regularly published.

**Bromelain**

*Inflammation, Allergy, Digestive aid*

- **Origin**: India
- **Source**: Ananas comosus - Stem
- **Bio-activity**: 1 200 to 5 000 GDU / g = 2,4 to 10 FIP / mg
- **Units**: 1 FIP/mg = 500 GDU/g
- **Dose**: 200 mg to 2g
- **Bromelain**: is a cysteine protease isolated from pineapple stem, Ananas comosus. Bromelain is a mixture of different thiol endopeptidases and other components like phosphatase, glucosidase, peroxidase, cellulase, escherasche, and several protease inhibitors. In vitro and in vivo studies demonstrate that bromelain exhibits various floriolytic, antiedematous, antithrombotic, and anti-inflammatory activities. When given to treat pain, it must be administered away from food, because it will act as a protein digestive enzyme if consumed with food.

**Fucoxanthin**

*Support healthy body weight / Liver, Antioxidant*

- **Origin**: Spain
- **Source**: Nektium (Spain)
- **Bio-active ingredients**: Fucoxanthin by UPLC, Fatty acids (PUFA), Fucoxanthin 10% UV powder
- **Dose**: 15 mg fucoxanthin
- **The scavenging activity of fucoxanthin is almost 8 times higher than that by fucoxanthinol, and more than 13 times higher than that by alpha-tocopherol.** Addition of Fucoxanthin to the diet in rats significantly suppressed the peroxidation level by 70-85% (plasma) and 24-72% (liver) as compared to beta-carotene (51-76%, 33-65%) over a period of 8 h. Fucoxanthin given topically or orally to mice once a day and UVB irradiation was applied for 14 days. Its topical application (1%) significantly suppressed mRNA expression of inflammation mediators. Oral application of fucoxanthin (10 mg/kg) significantly suppressed expression of COX-2, p75NTR, EP1 and MCHR.
- **Also related**: anti-inflammatory, anticancer, anti-obese, antiangiogenic and antimalarial activities.

**enXtra®**

*Energy, Performance, Focus - Caffeine Amplifier*

- **Origin**: India
- **Source**: Alpinia galanga
- **Bio-active ingredients**: Polyphenols, Flavonoids, Tannins
- **Dose**: 300 mg
- **enXtra™ can either replace caffeine, providing a non-cafetennated mental energy boost or it can accompany caffeine to Amplify Caffeine benefits and reduce caffeine induced crash.** EnXtra™ is fully water soluble with mild taste and lovely tea color. Extracted from rhizomes of Alpinia galanga, grown in pollution free hilly terrain, is a DNA-authenticated.
- **Application**: EnXtra™ is ideal functional ingredient for energy drinks (with or without caffeine), ready to drink beverages of all types, sports nutrition and workout formulations, energy bars, snacks, gums, fruit juices, chewing gum and stick packs.
- **Studies**: EnXtra™ is supported by 2 human clinical trials. In a 53-person, double-blind, double-dummy human clinical trial, EnXtra™ was shown to improve mental alertness and acuity for up to 5 hours without increasing heart rate or blood pressure.

**DigeZyme®**

*Multi-enzyme complex for Digestion and Nutrients*

- **Origin**: India
- **Source**: Sabinsa (India)
- **Dose**: 50 mg per dose, before eating
- **Multi-enzyme complex consisting of Amylase (starch digesting), Lipase (fat digesting enzyme), Cellulase, Protease (protein digesting enzyme) and an additional component is the enzyme lactase, which is useful for people suffering from lactose intolerance (positive opinion from EFSA).** DigeZyme helps in the digestion of carbohydrates, proteins and fats, which are poorly assimilated by our bodies in cases of unbalanced diets and impaired pancreatic function.

**Lycopene**

*Prostate, cardiovascular, antioxidant, sun protection*

- **Origin**: India
- **Source**: Tomato, Lycopersicon esculentum - Fruit
- **Dose**: 250mg twice a day in capsule form
- **Lycopene**: transport by the lipids of the blood and accumulates in certain organs, in particular in the liver and the prostate. Epidemiological studies have shown that lycopene are powerful antioxidants that can provide protection against oxidative damage and limit the development and progression of many tumors (included prostate, lung, colon, breast). Insoluble in water, liposoluble.
- **Prostate**: Studies showed that supplementation of 15mg of lycopene twice a day reduced the proliferation of the cancerous tumors. Lycopene would reduce the symptoms that are associated with prostate cancer, such as pain and urination disorders.
- **Cardiovascular**: Like other antioxidants, it prevents LDL (bad cholesterol) from oxidizing. Oxidized LDL is known to promote atherosclerosis or clogging of the arteries and may lead to myocardial infarction and stroke.
- **Sun**: Lycopene, in combination with other carotenoids, reduces the harmful effects of ultraviolet radiation on the skin. It is known that excessive exposure to sunlight can damage skin cells and even lead to skin cancer.

**Enzymatic activity**

- **Significant decline in lactic acid levels**
- **Comparison of the GliSODin versus SOD alone**
- **Protection of cellular DNA**
- **First orally proven effective SOD**
- **Protection against sun and improved tanning speed and quality**
- **Inflammation and decreases oxidative stress**
- **Regulation of inflammation**
- **Brain function**
- **Mood disorders**

**Inoreal (France)**

- **Origin**: Crocus sativus L. stigma, Mediterranean region
- **Bio-active ingredients**: Lycopene, a Carotenoid, is transported by the lipids of the blood and accumulates in certain organs, in particular in the liver and the prostate. Epidemiological studies have shown that lycopene are powerful antioxidants that can provide protection against oxidative damage and limit the development and progression of many tumors (included prostate, lung, colon, breast).
- **Lycopene**: transport by the lipids of the blood and accumulates in certain organs, in particular in the liver and the prostate. Epidemiological studies have shown that lycopene are powerful antioxidants that can provide protection against oxidative damage and limit the development and progression of many tumors (included prostate, lung, colon, breast).
- **Lycopene**: transport by the lipids of the blood and accumulates in certain organs, in particular in the liver and the prostate. Epidemiological studies have shown that lycopene are powerful antioxidants that can provide protection against oxidative damage and limit the development and progression of many tumors (included prostate, lung, colon, breast).
Boswellin®

The anti-inflammatory power of AKBBA
Origin: Sabina (India)
Source: Boswellia Serrata—Gum resin exudate from the tree
Bio-active ingredients: Acetyl-11-keto-b-boswellic acid, b-boswellic acids, boswellic acids
Dose: 75 to 200 mg once to twice a day depending on grades
Boswellin is the very powerful anti-inflammatory extract of Boswellia serrata gum, standardized for its content in not only boswellic acid but mainly AKBBA, acting on two path ways : 5-lipoxigenase and HLE (Human Leukocyte elastase). Topical or oral use (anti-inflammatory of course, but also anti-wrinkle, and skin firmness).

Grades are not titled as «total boswellic acid» - which means nothing in either since all acids are included - but specifically each beta-boswellic and AKBBA (Super grade is even up to 30% AKBBA), Oral Grades (HBD, Super, Forte, OS) and topical grade (OJ).

C₃ Complex

Antioxidant, Preservative, Antimicrobial, Immune system, Anti-inflammatory, Metabolic Syndrome
The original, and most studied Curcuma
Origin: Sabina (India)
Source: Curcuma longa—roots
Bio-active ingredients: FREE Curcuminoids (3 fractions) - and not the inactive metabolites as sulphate or glucorunonides
Usual dose: 3 x 400mg (alone) to 2 x 50mg, with possibly 5mg Bioperine.
Standard, Direct Compression or even Beadlets grades
The grade with its own safety data, and more than 100 published studies, mostly available on curcuminoids.com/index.php/benefits/clinical/evidence
Sabinsa is the world leading manufacturer of Curcuma extract 95%, processing in their dedicated plant (2 continuous batch extractors with food solvents), processing roots from their contracted fields. They control the 3 curcumin extracts they control with a methodology of synthetic curcuminoids (a 95% extract includes curcumin (70-75%), demethoxy (15-25%) and bis-demethoxy (2.5-6.5%).
Curcuma C3 Complex contains free curcuminoids only, and no inactive metabolites (glucorunonide for instance), because all form of curcuminoids are not equal. Some forms can be bioavailable, but unfortunately inactive. Bioperine - and its history of more than 20 years of use without any safety alert - improves the availability without changing the form.
A different significant study on Curcumin C3 Complex (in combination with Bio-perine®) has been published on end of 2014, showing the significantly greater effect of Curcuminoids in reducing the serum concentrations of LDL-C, non-HDL-C, total cholesterol, triglycerides and Lp(a), when serum HDL-C concentration was elevated significantly. Serum sdLDL levels were comparable to placebo and allows healthy allegations thanks to some of its components. It’s a plant formulation from Carvi’s seeds (Carum carvi), Meadowsweet Flower buds (Spirea ulmaria), Guaraná’s seeds (Paullinia cupana), Goldnord's plant (Solidago virgaurea), Fennel’s fruits (Foeniculum vulgare) and Dandelion’s leaves (Taraxacum dens leonis).

ElimReal®

Water elimination and detox, weight management
Origin: Inoreal (France)
Source: Plant formulation
Dose: 805 mg per day
ElimReal is a patented extract of different plants with complementary activities in detoxifying the body and assisting the renal elimination, which has clinically demonstrated its effectiveness (study on 95 women over 28 days, double-blind against placebo) and allows healthy allegations thanks to some of its components. It’s a plant formulation from Carvi’s seeds (Carum carvi), Meadowsweet Flower buds (Spirea ulmaria), Guaraná’s seeds (Paullinia cupana), Goldnord's plant (Solidago virgaurea), Fennel’s fruits (Foeniculum vulgare) and Dandelion’s leaves (Taraxacum dens leonis).
ElimReal is easy soluble in water, and may be used in any form of dietary supplements.

Bioperine®

Ultimate Nutrient Enhancer
Easy to use, well-known and efficient booster
Origin: Sabina (India)
Source: Piper nigrum L (black pepper)
Bio-active ingredients: piperine
The dose is 5mg per intake
Very well documented and patented (“use of piperine as a gastrointestinal absorption enhancer”), the Bioperine® increases the bio availability / bio adsorption of most of liposoluble compounds.
Many studies are available especially versus curcuminoids (> 10 times), beta caroten (+160%) and thereof other carotenoids, CoQ10 (+150%), Resveratrol (> 200%) and 10 times in serum), liposoluble vitamins (B6: +250%), Selenium (+145%), etc...
Although some competitors try to discredit Bioperine®, it’s today the most effective, the cheapest and most safe way to enhance bioavailability. It’s the only piperine confirmed non novel foods (2011) and not subject to EFSA since it’s a « nutritious enhancer ». The process uses exclusively ethanol (also for the oleoresin production).

Shagagadha®

Adaptogen, Rejuvenative tonic, also Antispasmodic and Anti inflammatory. Psychological endurance (NSIR), Hair
Origin: Sabina (India)
Source: Withania somnifera roots
Bio-active ingredients: Withanolides (>2.5% HPLC)
Dose: 300 mg per day
Ashwagandha, Withania somnifera, is one of the best-known Indian botanicals that has been used in Ayurvedic preparations since the Vedic era, dating back 3000-4000 years. In Ayurveda, ashwagandha is classified as a rasayana, meaning “rejuvenative tonic”. Also referred to by the common name of Indian ginseng (but nothing to see with). Ashwagandha have multiple therapeutic properties: tonic action, reduce stress and relieve anxiety, neurons protection, increase GABA A receptors activity, delay the process of cellular aging, reduce blood sugar levels, improve libido and decrease the activity of acetylcholinesterase and slow down development of tumor cells. Strengthen the cerebral cortex, the adrenals, the hypothalamus, the heart and the liver.
With Shagagadha™, Sabinsa assure the authenticity of its ashwagandha extract by complying with the US Pharmacopoeia-National Formulary monograph (USP-NF). The company has selected Akemist Labs, botanical specialist, to test the ingredient and confirm its compliance with the USP monograph.

Venocin Horse Chestnut

Anti-inflammatory, Blood circulation
Origin: Sabina (India)
Source: Aesculus Hippocastanum (seeds)
Bio-active ingredients: Escin (or aescin)
Escin is a mixture of saponins that is known to help maintain healthy blood circulation and strengthen the capillaries and veins.

Centellin®

Respiratory, Stress, Blood circulation
Origin: Sabina (India)
Source: Centella asiatica
Bio-active ingredients: Terpenes and asiaticosides
Traditionally use (also known as Gotu kola). Recent studies have validated its uses, especially as a psychotropic in the treatment of various mental disorders, such mental fatigue, epilepsy and hysteria. Centella asiatica could significantly improve the IQ of children and reduce the level of anxiety in adults. Venotonic activity linked to triterpens.
**Red Marine Algae**

**Neuroprotection, Inflammation, Immune, Joint, Sport**
**Origin**: Nektium (Spain)
**Source**: Gigartina skottsbergii - whole seaweed
**Bio-active ingredients**: polysaccharides (Sulfo-P)
Traditionally consumed as a sea vegetable, red marine algae is celebrated for its health benefits. This red marine algae extract is rich in carrageenans and sulfated polysaccharides including fucoidan and is standardized to over 30% total polysaccharides. Publications indicate neuroprotection, reduced inflammation and degeneration of cartilage, improved sports performance, anti-fatigue activity, prevention of obesity, immune stimulatory activity, ...

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**Lactospore®**

**Lactowize®**

**Health of the intestinal tract, Probiotic**
**Origin**: Nektium (Spain)
**Source**: Lactobacillus sporogenous (also called coagulans), in a 100% dedicated plant. Formulation with fibers (Lactowize™)
**Bio-active ingredients**: 6 to 15 billion spores
**Dose**: 100 to 200 Millions organisms per doses, 2-3 times a day, in tablets, capsules, chewing tablets, etc...
Digestion, cholesterol management, health of the intestinal tract, ... and can be formulated with probiotic easily, or choose our Lactowize® (15 Bll spores and >35% galacto-mannans)

After ingestion (medium for awakening), the spores revive and produce acid L (+)
Lactic, with the positive action on other micro-organisms. Virtually 100% of spores are revived, one reason for the choice of Bacillus coagulans, and specific drying method. Spores will not grow during their action, and disappear by natural ways after working, hence the need for regular intake.
Extra protection : Sabinsa provides a grade ‘EC’ Billions of Lactospore 15 (‘EC’ for Enteric Coated), a protected form for more targeted action.
It is used in dietary supplements in dairy products (studies currently being finalized), bakery products, or in tablets or vaginal ovules.

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**Forslean®**

**Helps to increase lean body mass, while decreasing body fat**
**Origin**: Sabinsa (India)
**Source**: Coleus forskohlii - roots
**Bio-active ingredients**: 10% forskohlin (oral grade) to 98% forskohlin (cosmetic grade)
**The daily dose** is 2 x 250 mg/d orally. Topical use is from 0.1% to 0.5% of a topical formulation, such as an ointment, cream or lotion

Forslean is the patented extract from Coleus forskohlii developed and proved by Sabinsa. Very well documented and subject of numerous studies showing the increase of the Lean Body Mass, and the use of fat by its action on the Adenylate Cyclase. It is used in nutrition, cosmetics or nutra cosmetics (toning of skin). It received first prize several times.

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**Pomegranate P40P**

**Cardiovascular health, Antioxidant, Weight, Inflammation**
**Origin**: Nektium (Spain)
**Source**: Punica granatum - mashed fruits
**Bio-active ingredients**: Total punicalicids ≥ 40%, Punicalagins A+B ≥ 30%, Total polyphenols ≥ 50%
**Dose**: 2 x 100mg to 300mg (based on the spectrum of the fruits).

Study published
Pomegranate is lauded since old ancient times as having many health benefits. Pomegranate’s potential benefits span many areas such as cardiovascular disease, diabetes, and cancer to name a few. It is widely accepted nowadays that the beneficial health effects of fruits and vegetables in the prevention of disease are due to the bioactive compounds they contain. Pomegranates contain significant amounts of said substances, such as phenolic acids, flavonoids, and tannins assuring them considerable nutritional value. Nektium extracts from mashed fruits taking care to preserve the Punicalagin - as in the fruit - and not Ellagic in the P40P (one molecule of punicalagin is hydrolyzed to two ellagic acids).
Additional studies show a stimulation of the growth of healthy bacteria in the gut, and an anti-inflammatory properties (action on COX-2 and lipoxigenase)

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**FruitOx®**

**In-vivo cellular antioxidant, ORAC > 1 000 000 µmol TE / 100g**
**Water soluble, no carrier**
**Origin**: Nektium (Spain)
**Source and Bio-active ingredients**: polyphenols and other actives compounds from plum, blueberry, apple, pomegranate, grape Leaves
**Dose from 3 x 100mg to 3 x 900mg (full spectrum for total lack of antioxidant)**

FruitOx® is a formulation based on polyphenols from different fruits and plants, developed by Nektium with the idea of a soluble product, fruits based, antioxidant, and offering a wide spectrum of anti-radical properties (hence the selection of only certain specific polyphenols from each source) and stimulation of cellular defenses. FruitOx™ has been controlled at its ORAC value of more than 1 000 000 (Trolox equivalent / 100g) - in French accredited laboratory. In a clinical trial with FruitOx, Abidov et al showed significantly improved blood lipid profiles along with significantly decreased oxidative stress markers in 22 obese volunteers compared with those taking placebo.
FruitOx™ positively promotes the antioxidant genes (key genes expression) while the genes causing oxidative stress were suppressed. Then, it has been the subject of several studies and research such as the upregulation of the expression of opioid receptors in brain cells (OPRD1). Efficiency of pharmacologically-active antioxidant phytochemistry Radical Fruits in treatment hypercholesteremia at men.
Cococin®

The ultimate nutrient
Healthy cell growth, Blood circulation, Nutrient
Origin: Sabinsa (India)
Source: Cocos nucifera
Freeze dried coconut water solids (obtained from tender green coconuts). Cococin is a natural reservoir of isotonic nutrients to promote tissue growth in the developing endosperm.

Amla Saberry™

Digestion, Blood sugar and Adaptogen
Nutricosmetics : Melanogenesis inhibition, UV Protection
Origin: Sabinsa (India)
Source: Emblica officinalis - fruits (Amla)
Bio-active ingredients: 10% b-Glucogallin, 50% gallates (tanins)
Dose : 90mg three times a day
Water extract of Emblica officinalis (Amla). The extract is widely used in digestive support and immune support applications (adaptogen). Blood sugar level. Liver support - b-Glucogallin has been studied by Sabinsa (metallo-proteinase inhibitor, studies : detoxification, e.g. heavy metals, pesticides). Amla helps in maintaining the anti-oxidant enzyme levels in the system. A beautiful fruit, well known for its rejuvenative properties. A light-colored powder prepared from the fruits of Emblica officinalis, commonly known as amla, and standardized to contain 10% b-glucogallin. Benefits of this component can largely be attributed to its potent antioxidant capabilities which is substantiated by its oxygen radical absorbance capacity (ORAC) value
ORAC hydro: 267 800 µmol TE/100g / Orac lipo: 400 µmol TE/100g
HORAC: 34 500 µmol CAE/100g / NORAC: 90 000 µmol TE/100g
SORAC: 10 200 µmol kunitsSODeq/100g / SOAC: 135 100 µmol VtE/100g

Capsallyl® / Capsaicin

Support healthy muscle mass
Origin: Sabinsa (India)
Source: Capsicum annuum, Brassica
Bio-active ingredients: Capsaicinoids (Allylisothiocyanate)
Dose : 250mg twice a day in capsule form
Capsaicinoids from Capsicum annum (with 1% Allylisothiocyanate in AITC), for weight management (actives are both pungent ingredients, well known to induce thermogenesis and decrease adipose tissue weight and TG) and to treat aches & pains in muscles & joints. Capsallyl is supplied in Beadlets, enteric coated.
Capsaion beadlets 2% enteric coated, to 90% total capsaicinoids HPLC

Garcitrin® & Citrin®

Slows conversion of carbohydrates to fat
Origin: Sabinsa (India)
Source: Garcinia cambogia —fruits
Bio-active ingredients: up to 60% Hydroxy citric acid
Dose: 250mg of (-) HCA before meals
Citrin® and Garcitrin® are two grades extracted from the fruit Garcinia cambogia. Sabinsa has highlighted the active (-HCA) and its use several years ago already. Citrin is a salt of the Hydroxycitric acid, named (-) HCA, and reduces the conversion of carbohydrates in stored fat and increasing the use of fat. Sabinsa has conducted numerous studies under the name Citrin 9b, proving its effectiveness and safety. After initial use in the field of sports products (induced action on amino acids, detoxifying the liver, etc...), its properties have led to slimming and weight management. Another reported activity of the Citrin is the prevention of urinary tract stones. A beverage grade is available : Citrin K BG (potassium salt)
Sabinsa has highlighted another molecule from Garcinia cambogia: the Garcinol, showing at a first glance anti-oxidant, anti carcinogenic or antimicrobial properties. Sabinsa has shown that the use of combined HCA and garcinol improves further the efficiency of HCA, the garcinol acting as a vector for the HCA to target cells.

Gymnema

Weight Management, Blood glucose
Origin: Sabinsa (India)
Source: Gymnema sylvestre leaves
Bio-active ingredients: Gymnemic acids 25% or 75%
Dose : 75mg (based on 75%) twice a day
Gymnema sylvestre is an herb native to the tropical forests of southern and central India. Chewing the leaves suppresses the sensation of sweet. It may suppress levels of leptin, insulin, dyslipidemia, apolipoproteins, lipids, visceral fat pad weights, and oxidative stress in obese rats fed with HFD. This effect is attributed to the presence of the eponymously named gymnemic acids. G. sylvestre has been used as a natural treatment for diabetes for nearly two millennia. Gymnemic acids have antidiabetic, antiseizure and anti-inflammatory activities. The antidiabetic array of molecules has been identified as a group of closely related gymnemic acids after it was successfully isolated and purified from the leaves of Gymnema sylvestre. Later, the phytoconstituents of Gymnema sylvestre were isolated, and their chemistry and structures were studied and elucidated. Increase production of Insulin in pancreas.

Bacopin®

Attention, stress, memory, circulation
Origin: India
Source: Bacopa monniera
Bio-active ingredients: 20% and 50% total Bacosides (as A & B), ethanolic extract
Dose : 3 x 50 mg (children) to 3 x 100 mg (adult)
• Bacosides can revitalize the intellectual functions in children and calm down the stressed mind, allowing for better brain function
• an be effective in elevating brain function by increasing concentration and more finely honing mental focus
• Anti-Convulsant and anti-cataleptic actions. Anxiety Neurosis Ayurvedic uses : Memory Enhancing, Anti-inflammatory, Analgesic, Anti-pyretic, Sedative, Anti-ulcerogenic, Anti-epileptic.

Fabenol®

Amylase inhibitory activity
Origin: Sabinsa (India)
Source: Phaseolus vulgaris
Bio-active ingredients: 8 000 units/g (Fabenol) or 20 000 units / g (Fabenol Max)
Dose: usually 1 000 - 5 000 units per dose, depending upon the starch content of the meal.
Fabenol® is an alpha-amyrase inhibitor naturally extract obtained from Phaseolus vulgaris (common bean, kidney bean) that blocks the digestion of dietary starch, thereby offering potential benefits in the maintenance of healthy blood sugar levels and optimal body composition. The seeds of Phaseolus vulgaris contain an inhibitor of alpha-amylase (two glycosylated protomers of 30 kDa, which are cleaved into two polypeptides of 16 and 14 kDa, respectively), identified in the protein fraction of the bean. This protein binds with the active sites of alpha-amylase and prevents the starch metabolizing activity, hence it is also called as «Starch Blocker».

DGL Deglycyrrhizinated

Digestion, Immunity
Origin: Sabinsa (India)
Source: Glycyrrhiza glabra
Dose : 380 mg 2-3 times / day
Treatment of gastric and duodenal ulcers. It is made from licorice from which the glycyrrhizin has been removed. Immune support and management of gastrointestinal problems.
**Andrographis**

**Cold, Jaunice, Liver, respiratory**

**Origin:** Sabinsa (India)

**Source:** *Andrographis paniculata* - leaves

**Bio-active ingredients:** 10% Andrographolides (50% and 90% available)

**Dose:** 250mg (of 10%) three times a day

*Used in the treatment of the common cold - paracetamol like - to reduce its symptoms and duration. Inhibitor of Nitric oxide production and synthesis of Endothelin (spot and pigmenting).*

---

**Echinacea**

**Common cold, Immune system**

**Origin:** Nektium (Spain)

**Source:** *Echinacea angustifolia* – root

**Bio-active ingredients:** Echinacosides 4 to 12% (HPLC)

**Dose:** 200 to 500mg per day

*Also named "devil's bones" because it "joints" bones much quicker after fracture, Cissus q. is used in Ayurveda medicine as a general tonic, analgesic and to heal bone fractures.*

- Anabolic and/or androgenic properties (glucocorticoid receptors)
- Weight loss (in combination with Irvingia g.)
- Analgesic: effective Analgesic vs aspirin; Cortisol reducer (Cortisol Antagonist)
- Anti-osteoporotic: femur ossification, mineralization, osteoblastic activity
- Anti-ucerogenic: comparison with Ranitidine, decrease gastric secretions
- Anti-oxidant: comparison to BHT, inhibition of DPPH, in-vivo trials
- Anti-microbial: trials versus tretacyclin

---

**R-α / α-Lipoic acid**

**Co-factor for number of key enzymes, Antioxidant**

**Origin:** Sabinsa (India)

**Source:** Synthesis (pure)

**Dose:** 25-50 mg Three times / day

*Alpha-Lipoic acid plays as a co-factor for a number of key enzymes that help in the conversion of glucose, fatty acids and other energy sources into ATP. It helps to regulate blood sugar and prevent diabetic retinopathy & cardiopathy.*

---

**Acticissus**

**Anti-osteoporotic, bones repair, Weight, Tonic**

**Origin:** Sabinsa (India)

**Source:** *Cissus quadrangularis* - aerial part

**Bio-active ingredients:** 10% Ketosterones, 1% Natural Calcium

**Dose:** 200 to 500mg per day

*Also named "devil's bones" because it "joints" bones much quicker after fracture, Cissus q. is used in Ayurveda medicine as a general tonic, analgesic and to heal bone fractures.*

---

**Organic elements**

**L-Selenomethionine, Chromium, Vanadium, Zinc, Magnesium, Cooper, Molybdenum**

---

**LeanGard**

**Healthy body composition, Weight management**

**Origin:** Sabinsa (India)

**Composition:** Forskolin, GarCitrin and BioPerine

**Bio-active ingredients:** Forskolin, hydroxycitric acid, garcinol, piperine

**Dose:** 500 mg per dose twice a day

*LeanGard is a proprietary blend of natural extract: Forskolin build lean body mass maintain healthy body composition*

- Garcritrin supports satiety, weight management and lean body mass
- Bioperine is a natural bioavailability enhancer
<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Actives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhatoda vasica</td>
<td>Vascine, Alkaloids</td>
</tr>
<tr>
<td>Aesculus hippocastanum</td>
<td>Venocin, Beta Esin, Terpenes</td>
</tr>
<tr>
<td>Allium sativum</td>
<td>Garlic, Allin</td>
</tr>
<tr>
<td>Amaranthus caudatus</td>
<td>Squalene</td>
</tr>
<tr>
<td>Andrographis paniculata</td>
<td>Andrographolides</td>
</tr>
<tr>
<td>Anethum graveolens</td>
<td>Dill, Fatty Acids</td>
</tr>
<tr>
<td>Apium graveolens</td>
<td>Celery, Butyrophilhalide</td>
</tr>
<tr>
<td>Asparagus racemosus</td>
<td>Shatavari, Saponins</td>
</tr>
<tr>
<td>Bacillus coagulans</td>
<td>LactoSpore, Prebiotic spores, Lactowize</td>
</tr>
<tr>
<td>Bacopa monniera</td>
<td>Bacopin, Bacosides</td>
</tr>
<tr>
<td>Berberis aristata</td>
<td>Berberine</td>
</tr>
<tr>
<td>Beta vulgaris</td>
<td>Beet Root, Nitrates</td>
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<tr>
<td>Boswellia serrata</td>
<td>Boswellin, Boswolvic Acid, AKBBA, Polysac.</td>
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<tr>
<td>Brassica juncea</td>
<td>Mustard Seed, Allylsothiyanate</td>
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<tr>
<td>Camellia sinensis</td>
<td>Green Tea, Catechins, Epigallocatechin</td>
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<td>Capsicum annum</td>
<td>Paprika, Capsaicin, Chiliendoids, Carotenoids</td>
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<tr>
<td>Cassia angustifolia</td>
<td>Sennosides</td>
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<td>Centella asiatica</td>
<td>Terpenes, Asiaticosides, Saponins</td>
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<tr>
<td>Cinnamomum cassia</td>
<td>Cinnamon, Proanthocyanidins, Polysaccharides</td>
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<tr>
<td>Cissus quadrangularis</td>
<td>ActiCissus, Ketosterones, Minerals</td>
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<tr>
<td>Citrus sinensis</td>
<td>Hesperidin, Hesperidin</td>
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<td>Cocculus nucifera</td>
<td>Cocomin, Carbohydrate, Minerals, Proteins</td>
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<td>CoEnzyme Q10</td>
<td>CoQ10, CoQ10</td>
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<td>Coleus forskohlii Oil</td>
<td>Forslean, Oil, Pinenes</td>
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<td>Commiphora mukul</td>
<td>Guggulipid, Gugglerstones</td>
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<tr>
<td>Cotaëa nervula</td>
<td>Cratavin, Saponins, Tannins</td>
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<tr>
<td>Cucurbita pepo</td>
<td>Pumpkin, Fatty Acids</td>
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<td>Cuminum cyminum</td>
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<td>Curcuma longa</td>
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<td>Curcumin melo, Giladin</td>
<td>GliSODo, Superoxydimutase, Enzymes</td>
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<td>Eclipta alba</td>
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<td>Embelia ribes</td>
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<td>Emblica officinalis</td>
<td>Saberry, Amla, betta-Glucoaglin, Tannins, Fibers</td>
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<tr>
<td>Enzymes</td>
<td>Digezyme, Dedicated enzymes formulation</td>
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<tr>
<td>Foeniculum vulgare</td>
<td>Fennel, Fatty acids</td>
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<tr>
<td>Garcinia cambogia</td>
<td>Citrin, Hydroxycitic Acid (Ca, Mg, K, …)</td>
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<td>Ginkgo biloba</td>
<td>Ginkgo Biloba, Flavone, Terpenes, Lactones</td>
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<tr>
<td>Glycine max</td>
<td>Soy, Isolflavones</td>
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<tr>
<td>Glycyrrhiza glabra</td>
<td>DGL, Deglycyrrhizinated Licorice</td>
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<tr>
<td>Griffonia simplicifolia</td>
<td>Griffonia, 5-HTP Hydroxytryptophan</td>
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<td>Gymnema sylvestre</td>
<td>Gymnema, Gymnemic Acids (25-75%)</td>
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<td>Hordeum vulgar</td>
<td>Hordeal, beta-Glucans</td>
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<td>Kaempheria galanga</td>
<td>Galanga, Cinnamate</td>
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<td>Laminaria japonica</td>
<td>Fucoaidan, Sulfopolysaccharides, Fucoidan</td>
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<tr>
<td>Linum usitatissimum</td>
<td>Flaxseed, Fibers, Polysaccharides</td>
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<tr>
<td>Mangifera indica</td>
<td>Mango, Mangiferin</td>
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<tr>
<td>Melia azadarachta</td>
<td>Neem, Bitter Principles</td>
</tr>
<tr>
<td>Melissa officinalis</td>
<td>Lemon Balm, Rosmarinic Acid</td>
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<tr>
<td>Minera pitch</td>
<td>Shilajit, Fulvic Acid</td>
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<tr>
<td>Momordica charantia</td>
<td>Momordica, Bitter Principles, Charantin</td>
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<tr>
<td>Momordica chinesis</td>
<td>Momordica, Lycopen, Beta-Caroten</td>
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<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Actives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phaseolus vulgaris</td>
<td>Fabenol, Enzymes Inhibitor</td>
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<tr>
<td>Phyllanthus amarus</td>
<td>Phyllanthus, Bitter Principles, Phyllanthin, Tannins</td>
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<tr>
<td>Picrorhiza kurrooa</td>
<td>Picroliv, Apocynin, Kutkin, Bitter Principles</td>
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<td>Piper longum</td>
<td>Pepper, Piperine</td>
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<td>Piper nigrum</td>
<td>BioPerine, Piperine</td>
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<td>Plant Formula</td>
<td>Fruit Ox, Antioxidant Polyphenols</td>
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<td>Plant Formula</td>
<td>ArthriBlend, Glucosamine, Boswellic Acids, Curcuminoids, Piperine</td>
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<td>Plant Formula</td>
<td>Hot Sip, Glycyrrhyzanic, Piperine, Alkaloids</td>
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<td>Plant Formula</td>
<td>LeanGard, Forskolin, Garcinol, Piperine</td>
</tr>
<tr>
<td>Plant Formula</td>
<td>Triphala, Tannins, Polyphenols</td>
</tr>
<tr>
<td>Plant Formula</td>
<td>Triphala, Tannins, Polyphenols</td>
</tr>
<tr>
<td>Puerariae radix</td>
<td>Rhodiolife, Rosavins, Salidrosides</td>
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<tr>
<td>Rosmarinus officinalis</td>
<td>Rosmarin, Carnosic, Ursolic, Rosmarinic Acids</td>
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<td>Saccharum officinarum</td>
<td>Policosanol, Policosanol</td>
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<tr>
<td>Salvia officinalis</td>
<td>Sage, Ursolic Acid, Na Ursolate</td>
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<tr>
<td>Serenoa repens</td>
<td>Sav Palmetto, Fatty Acids</td>
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<tr>
<td>Synthesis</td>
<td>Alpha Lipoic, Alpha Lipoic Acid</td>
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<td>Synthesis</td>
<td>Chrysin, Dichydroxyflavone</td>
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<td>Synthesis</td>
<td>Dim, Diindolylmethane</td>
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<tr>
<td>Synthesis</td>
<td>Glucosamine, Glucosamine</td>
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<tr>
<td>Synthesis</td>
<td>I3C, Indole - 3 - Carbinol (I3C)</td>
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<tr>
<td>Synthesis</td>
<td>Ipiriflave, Ipiriflave</td>
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<tr>
<td>Tagetes erecta</td>
<td>Lutein, Lutein</td>
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<tr>
<td>Terminalia arjuna</td>
<td>Arjunolic, Arjunolcic Acid, Saponins</td>
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<tr>
<td>Terminalia belerica</td>
<td>Terminalia, Tannins</td>
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<tr>
<td>Tinospora cordifolia</td>
<td>Tinosol, Bitter Principles</td>
</tr>
<tr>
<td>Tribulus terrestris</td>
<td>Tribullus, Saponins, Protodioscin, Steroids</td>
</tr>
<tr>
<td>Trigonella foenum-graecum</td>
<td>Fenufiber, Fibers</td>
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<td>Trigonella foenum-graecum</td>
<td>Fenufol, Galactomannans, Fenamannans</td>
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<tr>
<td>Trigonella foenum-graecum</td>
<td>Fenusterol, Saponins, Steroids, Protodioscin</td>
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<td>Tynophora indica</td>
<td>Tynophora, Alkaloids</td>
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<tr>
<td>Undaria pinnatifida</td>
<td>Fucoxanthin, Fucoxanthin</td>
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<tr>
<td>Vaccinium angustifolium</td>
<td>Blueberry, Chlorogenic Acid</td>
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<td>Vitex negundo</td>
<td>Vitek, Agruside</td>
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<tr>
<td>Withania somnifera</td>
<td>Ashwagandha, Withanolides, Alkaloids, Withafeerin</td>
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<tr>
<td>Zingiber officinalis</td>
<td>Ginger, Gingerols</td>
</tr>
<tr>
<td>Minerals</td>
<td>Seleno-methionine, Methyl Selenocysteine</td>
</tr>
<tr>
<td>Synthentic or enriched plants</td>
<td>Chromium Picolinate, L-Seleno-Methionine, Methyl Selenocysteine, Molybdenum Methionate, Gamma-Glutamyethyl-L-Selenomethionine, N-Acetyl L-Cyst., etc.</td>
</tr>
<tr>
<td>Flavors</td>
<td>Damascenone, Ally, Applethine, Isouegenol, Citronellyl, Galbador, Geranyl, Karanaor, Melonal, Naturanate, Saffiran, Sandanol, Super Santol, 1,2-Decanediol / 1,2 Hexanediol / 1,2-Octanediol, Metey Melonal</td>
</tr>
</tbody>
</table>
**Satiereal®** is a patented clinically proven satiety ingredient derived from saffron stigmas. The satiated feeling induced by Satiereal® encourages weight loss while eliminating frustration. This product has a unique mechanism that not only creates satiety but helps avoid snacking and compulsive eating behaviors, which in turn leads to reduction in weight and inches.

**What is unique about Satiereal®**

- It decreases your desire to snack
- It increases your sense of satiety or fullness (resulting in better portion control)
- It provides a good mood
- It can be used in any form or food

Satiereal® is derived from the stigma of saffron crocus, *Crocus sativus L.*, which is cultivated throughout the Mediterranean region. Historically, saffron was prized as a culinary spice, colorant and dye, and as a medicinal herb to ease digestion or to treat depression. These medicinal uses are usually curtailed by saffron's high cost. However, Satiereal® is made from a special crocus cultivation rich in active saffron constituents, so it is cost effective as a weight-loss formula.

**Specific Saffron Extract**

Satiereal® is a specific combination of Crocin (carotenoid dye, crocin [golden yellow-orange]), Picrocrocin (flavor, bitter glucoside, a truncated version of the carotenoid zeaxanthin) and Safranal (aroma, less bitter), definitely more than a Saffron extract of Safranal. Inoreal noticed that the efficacy of Satiereal® was linked to its unique ingredients providing a satiated feeling induced by the active ingredient. Safranal content shows a ratio that leads to reduction in weight and inches.

**Dosage**: 2 x 88.25mg a day

Two grades available:
- **SATIEREAL C**: Non water soluble, for tablets and hard gel capsules
- **SATIEREAL AWS**: Water soluble, homogeneous without change after heat treatment (110°C, 20mins for instance) for beverages,...

**Trademark awareness**: SATIEREAL® - on internet, plenty of testimonials, YouTube videos,...

consumer will search before purchasing and will rely on and look for the brand.

---

**Satiety and Good Mood**

Not a common Saffron! Satiereal®, a specific Saffron extract, works as a hunger suppressant and seems curb appetites by boosting serotonin levels.

The satiated feeling induced by Satiereal® encourages weight loss while eliminating frustration.

**Capsules and Tablets with Satiereal®**

Instant stick for instance coffee or coated tea, with 9.81% of Satiereal® AWS per stick of 1.8g (formulation checked by Inoreal).

**Meal replacement**: Problems with meal substitute is the snacking in between! Satiereal® provides a long feeling of satiety... better mood so feel better

- Replacing 1 meal/day « weight management after weight loss »
- Replacing 2 meals/days « weight loss contribution »

---

**Serotonin Reuptake Inhibitor**

Stress, anxiety, depression... influence food behavior, generally leading to compulsive overeating in reaction to stress. This phenomenon induces weight gain, subject feel guilty, trying to stop, thus generating stress for those who need consolation in carbohydrates intake!

This is mostly due to low Serotonin levels.

Satiereal® has been demonstrated to keep the neurotransmitter serotonin signal active, in other words serotonin reuptake inhibition in neurons (mechanism of many antidepressants). It is probable that this serotonin reuptake inhibition accounts for saffron's use in treating depression and “melancholia” in the medicinal traditions. Saffron extract has been shown to be as effective as the tricyclic antidepressant drug imipramine and the SSRI fluoxetine (Prozac) in managing depression — with no side effects.

Pharmaceutical SSRIs have varying effects on weight, but Satiereal helps keep excess body weight from accumulating. This is one advantage of Satiereal® over other dietary satiety ingredients: it needs only be used in small quantities, it is potent, it acts directly on neurotransmitters to relieve the cause of nibbling and hyperphagia, instead of just delaying it.

---

**Hyperprotein in milk beverage**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serovitamin milk</td>
<td>68.76%</td>
</tr>
<tr>
<td>Milk protein</td>
<td>6.50%</td>
</tr>
<tr>
<td>Sugar</td>
<td>2.70%</td>
</tr>
<tr>
<td>Cocoa powder</td>
<td>3.00%</td>
</tr>
<tr>
<td>Caramel flavor</td>
<td>0.60%</td>
</tr>
<tr>
<td>Satiereal®</td>
<td>0.085%</td>
</tr>
</tbody>
</table>

---

**Cereals Bars, biscuits: 1.18% of Satiereal® / bar of 14.9 g**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apricot / Coconut biscuit</td>
<td></td>
</tr>
<tr>
<td>Cereal</td>
<td></td>
</tr>
<tr>
<td>Biscuit</td>
<td></td>
</tr>
<tr>
<td>Unit weight/biscuit / 50g</td>
<td></td>
</tr>
<tr>
<td>Fat</td>
<td>31.0%</td>
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<tr>
<td>Brown Sugar</td>
<td>8.20%</td>
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<tr>
<td>Apple Powder</td>
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<tr>
<td>Butter</td>
<td>22.0%</td>
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<tr>
<td>Eggs</td>
<td>11.207%</td>
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<tr>
<td>Apricot pieces</td>
<td>8.0%</td>
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<tr>
<td>Coconut powder</td>
<td>5.0%</td>
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<tr>
<td>Baking powder</td>
<td>0.46%</td>
</tr>
<tr>
<td>Satiereal®</td>
<td>0.353%</td>
</tr>
</tbody>
</table>

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**Beverages and instant drinks**: 0.088% of Satiereal® AWS per bottle of 200g gives a clear, pleasant and efficient drink. Formulations with Raspberry, Hibiscus, Apple juice, Cranberry, Iced tea, ... or even only water (yellow translucide solution).

**Other possible associations**

(Additional claims) with for instance 500mg of Garcinia cambogia extract standardized to HCA (weight management), also in beverages, 200mg of Fucus powder.
Zynamite® is the healthy way to replace caffeine with a botanical ingredient without the side-effects of caffeine and actually works better than caffeine, while retaining the experiential effect. Zynamite® is the Nektium’s patent-pending proprietary Mangifera indica extract, launched at Vitafoods Europe 2018, and getting the Nutraingredient award.

Zynamite® gives sustained mental and physical energy and focus without any negative side effects.

What do tired people need? Stressed or fatigued people lack enthusiasm and mostly feel exhausted and desperate. What they desire is a sustained boost of energy and focus without any negative side effects.

The problem with caffeine. Because of the mental energy and focus provided by caffeine, billions of cups of coffee are consumed daily to assist people to cope. However, caffeine is addictive and most people consume too much of it and suffer from its negative side effects and withdrawal symptoms.

Caffeine in Sports Products. Many sports products contain caffeine to increase alertness and boost physical energy but these products inevitably lead people to experience jitters, anxiety, irregular pulse, insomnia and nausea - all physical and mental issues for concern, especially for sports performers. Zynamite® is the ideal alternative.

What is Zynamite®? Zynamite® is Nektium’s patent-pending proprietary Mangifera indica extract standardized to ≥ 60% mangiferin. Mangifera indica, the common mango tree, is cultivated extensively in the tropical and subtropical regions of the world. Infusions and decoctions of mango leaves are used extensively in traditional health systems and have been known for centuries for their health benefits.

How does Zynamite® work? Zynamite® activates brain waves and increases Long Term Potentiation in a remarkably similar pattern to caffeine. While caffeine antagonizes adenosine receptors, Zynamite® acts non-selectively to stimulate brain activity. The key active, mangiferin acts non-selectively to modulate multiple physiological and CNS targets.

Bio-actives of Zynamite®. The active principle of Zynamite® is mangiferin, a natural flavone polyphenol. Ultra-high-performance liquid chromatography (UHPLC) with photodiode array detection (PDA) is used to provide high-resolution separation, identification and quantification.

Benefits
Cognitive health (clinical studies)
- Rapid onset of mental activation
- Faster reaction time
- Increase performance
- Focus and concentration

Sport Performance (clinical studies)
- Sustained energy
- Increase power
- Doping free

Safety & Information
- Own safety data: Ames, 14-day and 90-day oral toxicity, NOAEL...and new soon coming.
- GMO, BSE/TSE free, DNA-barcode, Vegan, Kosher, Halal, traditionally used in food, registered in different countries in Europe, Australia, New Zealand, USA (self GRAS l.p.)

Mental Activity
Zynamite® has remarkably similar mental activation activity to caffeine in studies of brain electrical activity in vivo.

The pattern of electrical activation for both Zynamite® and caffeine are remarkably similar in the brain frontal cortex and in the hippocampus. (Preclinical study. Collaboration with Professor Witfried Dimpfel, Justus-Liebig-University, Giessen, Germany)

Mental Energy
The effect of a single dose of Zynamite® as caffeine-replacement was tested in 32 participants in a double-blind, randomized, placebo-controlled, 2-armed study with parallel design. Calculation performance Significantly improved cognitive performance. Reaction time Significantly faster reaction compared to placebo. (two clinical studies. Collaboration with Professor Witfried Dimpfel, Justus-Liebig-University, Giessen, Germany)

Sport Performance
The effect of 48 hour intake of Zynamite® on performance was tested in two sports formulations in a double-blind, placebo controlled cross-over cycling trial in 30 young physically active athletes. Mean peak power output reached in each sprint was significantly higher for both Zynamite® formulations compared to placebo. Peak power output developed in the 15-s sprint performed immediately after ischaemia was significantly higher for Zynamite®. Brain oxygenation measured with spatially resolved near-infrared spectroscopy in the female group of thirteen women was significantly higher for both Zynamite® formulations. (two clinical studies. Collaboration with Professor Jose Antonio López Cabet, University of Las Palmas, Spain)

References
1. Dimpfel W. et al. Synergy between Mango leaf extract (Zynamite®) and caffeine with respect to stimulation of the central nervous system in rats. Synergy Forum, 9-10 March 2018, Bonn, Germany
2. Mirjam Gelabot-Rebato, Jose A L Cabet. Mangifera indica L. leaf extract (Zynamite®) in combination with luteolin or quercetin enhances V02max and peak power output and preserves skeletal muscle function during ischemia-reperfusion in Humans. 23. European College of Sports Science ECSS, 4-7 July 2018, Dublin, Ireland
Rhodiola rosea, also known historically as “Golden Root” from the “Golden Montains” (Mongolian word ‘Altan’), is the most popular phyto-medicine traditional used to increase physical endurance, work productivity, longevity, memory and attention, resistance to high altitude sickness, fatigue, depression, and disorders of the nervous system.

Attention and Memory Cerebral activity

Rhodiola rosea is know to improve attention and cerebral performances.

On 2017, Nektium has conducted new studies: Electroencephalographic studies (EEG) showed that animal supplemented with Rhodiolife® have an increased neurotransmitter production in the studied areas. This effect lasts at least for 5 hours until the end of measurements, and so even more. Besides of a stimulatory effect, the results indicate an improve of memory and an increased activity in brain regions related to motivation and reward.

R. Rosea increases the bioelectrical activity of the brain which improves memory and brain energy. Another study also described the Acetylcholine Esterase Inhibitors in Rhodiola rosea. It helps the body adapt to stress by affecting the levels and activity of serotonin, dopamine, and noradrenaline, neurotransmitters found in different structures in the brain and influencing the central nervous system. Rhodiola inhibits the breakdown of these chemicals and facilitates the neurotransmitter transport within the brain. In addition to its impact on the central nervous system, it increases the chemicals that provide energy to the muscle of the heart and prevent the depletion of adrenal hormones induced by acute stress. (Tori Hudson, 2006)

All Rhodiola extracts are not equal

Nektium is one of the very few Nutra-ceutical companies which has been granted an Export License by the Russian Government for the exportation of Rhodiola rosea roots from the Altai (Alyat) region (Siberia). Nektium closely collaborates with its supplier implementing operating procedures that provide general technical guidance for the sustainable collection and processing of Rhodiola rosea roots, following the overall context of quality assurance and the WHO guidelines on Good Agricultural and Collection Practices (GACP). This includes the collection of the plants in the wild, as well as primary processing of the plant material, such as drying, packaging in bulk, storage and transport of the raw materials until it arrives to the Nektium factory. The impact of collection on the environment and ecological processes, and the welfare of local communities are also considered.

Then the salidroside and the 3 actives rosavins only are controled (rosavin, rosin, rosarin) by Ultra HPLC, and no other molecules as rosinidin or tyrosol for instance.

Grades are from 3% Rosavins (and related 1/3 salidroside), to 15%.

Active Ingredients

Activities related to Rhodiola rosea have been traditionally attributed to the presence of four principal active ingredients: salidroside, rosin, rosinavin and rosarin (Sokolov, 1985; Furmanova, 1998).

The root of R. rosea shows six distinct groups of chemical compounds. The Phenylalkanoids are the main contributors, incl. :

- **Phenylpropanoide**: Rosavins are products of the phenylpropanoide metabolism. Rosavins (ie. rosavin, rosin and rosarin) are specific to the root from Rhodiola rosea. The rosavins are the constituents currently most often selected as the marker compounds for standardization of extracts, although they are not necessarily the only pharmacologically active ingredients for its medicinal properties.

- **Principal phenylethanoids** consist of glycosides and salidroside has been reported as the most active tyrosol glycoside, being associated, together with rosavins, to the anti-depressive and anxiolytic effects (Maslowa, 1994; Tolonen, 2003). Other phenylethanoids have also been isolated but with today limited scientific literature concerning the bioactivity (Jiménez 1994).

A wide array of human health benefits related to mental health and physical performance has been clinically demonstrated using the unique phytomedical form of R. rosea extract specifically standardized to rosavins. Rhodiola rosea possesses valuable anti-fatigue, anti-stress, and anti-depressant properties; it stimulates the bioelectrical activity of the brain and improves memory and mental performance. In addition, it also increases stamina and accelerates the physical recovery processes after intense training workloads; it stimulates muscle energy status, improves glycogen synthesis in the muscles and liver and increases muscle protein synthesis and anabolic activity.

The right product from the right place at the right time

While Rhodiola as a genus may have originated in the mountainous regions of Southwest China and the Himalayas, botanists have established that Rhodiola rosea naturally displays a circumpolar distribution in mountainous regions in the higher latitudes and elevations of the Northern Hemisphere. 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 RhodiLife® is wildcraft collected from this part, under the Russian Government License. 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.

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Rhodiola: Memory, Immunity & Energy

- Phenylpropanoide: Rosavins are products of the phenylpropanoide metabolism. Rosavins (ie. rosavin, rosin and rosarin) are specific to the root from Rhodiola rosea. The rosavins are the constituents currently most often selected as the marker compounds for standardization of extracts, although they are not necessarily the only pharmacologically active ingredients for its medicinal properties.

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Immune System

The Rhodiola extract Rhodiolife® has clearly demonstrated its ability to protect cells from viral infection. This is the first time shown to be effective in the activation of the human immune system (launch and human in-vivo study April 2015 - Ahmed M, et al (2015) «Rhodiola rosea Exerts Antiviral Activity in Athletes Following a Competitive Marathon Race». Front Nutr. Jul 31;2:24).

It stimulates and protects the immune system (homeostasis), and increases the natural killer cells (NK) in the stomach and spleen. This action may be due to its ability to normalize hormones.

Cardiovascular: Linked to the anti-stress action (and decrease of catecholamines and corticosteroids released by the adrenal glands during stress), R. rosea decreases the amount of cyclic-AMP (c-AMP) released into cardiac cells, and so assist the uptake if free intracellular calcium for greater heart muscle contraction (regular beat).

Response to Stress

Rhodiola rosea balance the body's stress-response system. Adaptogenic plants naturally increase the body's non-specific resistance and normalise the functions of the body, with a more resourceful manner when facing stressful situation. R. rosea impacts central monoamine levels.

R. rosea is said to assist the transport of serotonin precursors, tryptophan and 5-HTP into the brain. (Studies show that serotonin brain neurotransmitter is involved in many functions such as pain perception, behavior, smooth muscle contraction, temperature regulation, appetite, etc...)

Case studies have reported that R. rosea helps with depressive syndromes, memory loss, anxiety, cognitive dysfunction and menopause related symptoms.

Bacosides extracted from Bacopa moniera (Brahmi) can revitalize the intellectual functions (in children) and calm down the stressed mind, allowing for better brain function.

Bacopa revitalizes intellectual functions

Chemical constituents

The pharmacological effects of Bacopa moniera are attributed to the presence of a number of bio-logically active compounds, including alkaloids, saponins and sterols. The compounds responsible for the memory enhancing effects of are triterpenoid saponins called «bacosides» (Bacoside A3, bacopaside 1, bacopaside 2, jujubogenin, bacosaponine C).

Properties

The biological effects of Bacopa moniera are well documented in traditional as well as scientific literature. The most important of these are the effects of the plant, plant extracts and isolated bacosides on cognition and memory functions, their anxiolytic effects and their role in the management of convulsive disorders.

On receiving signals, receptors of the hippocampus trigger an electric pulse, mediated through a change in protein composition.

The pulse is transmitted to the next neuron through the synapse. The process continue till the bond between neurons become strong and the memory is created.

However, continuous electrical activity wears out the synapses, impairing a new memory creation and causing loss of memory.

The bacosides help in restoring the synaptic activity of neurons.

Bacopin is a cognitive enhancer in cases of: Declining Memory Poor Concentration Attention Deficit Hyperactivity Disorder Anti-convulsive or Anxiety Neurosis

Dosage: 15 to 30 mg of Bacosides 3 times daily for 20% extract (dosage must be adapted to the grades 20% or 50%).

ATP & Energy

The effect of Rhodiola rosea (RR) supplementation on ATP content in muscles was studied in Sprague-Dawley rats, where 24 adult rats were divided 3 groups equally: control group, RR (50mg/Kg) and Rhodiola crenulata (50mg/Kg). Two sessions of forced swimming with 30-min intervals were carried out every day.

The decrease in ATP content in rats receiving R. rosea extract was statistically significantly less pronounced than the other groups (1). In a human trial, a total of 36 healthy untreated volunteers (21-24 years of age) were randomly, equally divided in 3 groups (control, placebo and RR extract). Individuals in the placebo and RR extract groups received 2 capsules a day of each treatment (placebo or 340 mg of RR extract) for 30 days before and 6 days after exhausting physical exercise was performed (computer aided bicycle ergometer with gradual increases of workload). Changes in biochemical markers of muscle damage and inflammation were significantly less pronounced in those taking RR supplementation (2).


Rhodiola rosea balance the body's stress-response system.

Rhodiola extract one hour before exercise significantly increases capacity for endurance exercise. It also shortens recovery time after long workouts, to increase strength, and anti-toxic action.

Rhodiola extract reduces levels of C-reactive protein, an inflammatory marker, and creatinine kinase of muscle damage (Abidov M & al., 2004). An other study from Nektium suggests that Rhodiola extract protects against peroxide-induced oxidative stress through the modulation of the molecular chaperone HSP70. (Hernández-Santana et al, 2014), Phytother Res. 2014 Apr;28(4):623-8.

Oxidative stress

Rhodiola root extract protects skeletal muscle cells against chemically induced oxidative stress by modulating heat shock protein 70 (HSP70) expression. The aim of this study was to analyze the efficacy of a Rhodiola root extract (Rhodiolife) in protecting murine skeletal muscle cells (C2 C12 myotubes) from chemically induced oxidative stress and to establish whether modulation of HSP70 expression is observed. C2 C12 cells treated with Rhodiolife did not experience any loss of viability (p < 0.05) at concentrations of 1-100 µg/mL for up to 24h. In control cultures, viability decreased 25% following exposure to 2 mM H2 O2 (1h). However, no significant decrease in viability in cells pre-treated with extract at concentrations as low as 1 µg/mL was observed. HSP70 mRNA levels were up-regulated two-fold in cell cultures treated with Rhodiolife (10µg/mL), and expression was further enhanced by exposure to H2 O2 (six-fold, p < 0.05). HSP70 protein levels were maintained in pre-treated cell cultures compared to controls but was significantly lower (50%) in cells lacking treatment exposed to H2 O2 . The present results indicate that Rhodiola protects C2 C12 myotubes against peroxide-induced oxidative stress through the modulation of the molecular chaperone HSP70. (Abidov M, et al, 2004), Bull Exp Biol Med. Jul;138(1):63-4.

Anti-inflammatory

Bromelain is a cysteine protease isolated from pineapple stem, Ananas comosus. Bromelain is a mixture of different thiol endopeptidases and other components like phosphatase, glucosidase, peroxidase, cellulase, escharase, and several protease inhibitors. In vitro and in vivo studies demonstrate that bromelain exhibits various fibrinolytic, antiedematous, antithrombotic, and anti-inflammatory activities.

**Properties**

Its effects are mainly a product of its proteolytic activity, which stimulates fibrinolysis by increasing plasmin, but bromelain also has been shown to prevent kinin production and to inhibit platelet aggregation. It is also used for preventing muscle soreness after intense exercise, and for facilitate digestion.

**Effect of Bromelain on inflammatory**

Bromelain have the ability to modulate surface adhesion molecules on T cells, macrophages and natural killer cells and also induce the secretion of IL-1β, IL-6, TNFα by peripheral blood mononuclear cells. Bromelain can block Raf-A and ERK-2 pathways by inhibiting the T cell signal transduction. This induces the decrease of the activation of CD4 T cell and reduce the expression of CD25.

**Osteoarthritis**

Bromelain is a food supplement that may provide an alternative treatment to nonsteroidal antiinflammatory drug (NSAIDs). It plays an important role in the pathogenesis of arthritis. Bromelain has analgesic properties which are thought to be the result of its direct influence on pain mediators such as bradykinin.

**Allergic airway disease**

Bromelain was found to attenuate development of allergic airway disease (AAD), while altering CD4+ to CD8+ T lymphocyte populations. From this reduction in AAD outcomes it was suggested that bromelain may have similar effects in the treatment of human asthma and hypersensitivity disorders.

**Inflammatory bowel disease**

Investigation on bromelain's anti-inflammatory action as a potential therapy for ulcerative colitis and Crohn's disease, 2 types inflammatory bowel disease. Bromelain discourages the release of inflammatory chemicals called cytokines and chemokines from diseased tissue (Test tube study; Duke University gastroenterology).

**Digestive Aid**

Bromelain is best known for its ability to break down proteins — making this enzyme a popular digestive aid. Bromelain has been used successfully as a digestive enzyme following pancreatectomy, in cases of exocrine pancreas insufficiency and in other intestinal disorders. Because of its wide pH range, bromelain has activity in the stomach as well as the small intestine. It has also been shown to be an adequate replacement for pepsin and trypsin in cases of deficiency.

**Papain**, a papaya (Carica papaya) fruit latex extract, is a cysteine protease that catalyzes the cleavage of peptide bonds using a catalytic triad involving a deprotonated cysteine residue. Papain is well known for improving digestion and treating infections, diarrhea, and allergies. It has also been used, with other protease to reduce pain, inflammation, and swelling. It’s also being studied for potential use in cancer and other diseases.

**Antimicrobial action**

Papain has shown antimicrobial activity against a number of microorganisms such as Bacillus subtilis, Enterobacter cloacae, E. coli, Salmonella Typhi, Staphylococcus aureus and Proteus vulgaris.

**Digestion / Slimness**

Papain is used to promote digestion: discomfort, ballooning. This use is based on in vivo studies of hydrolysis of different proteins in the presence of papain. This demonstrated a specificity of action of papain towards the peptide bonds containing lysine or arginine in acid media (pH 3-5).

By diffusing in the body the papain would allow the fractionation of the abnormally secreted proteins, like the collagen fibers of the cellulte, and facilitate their elimination as well as that of the greasy cellulte.

**Uses in association of systemic enzymes**

Accelerate recovery and healing of muscle damage

Numerous studies in Europe show that supplementation with proteolytic enzymes effectively speeds up recovery after physical exercise and injuries in athletes. It also speeds up tissue repair in patients who have undergone surgery.

In a study of footballers with ankle injuries, supplementation with proteolytic enzymes accelerated their healing and allowed players to return to the field 50% faster than placebo athletes. Several small trials in athletes have shown that enzymes can help reduce inflammation, and accelerate healing of tissue lesions (including fractures) and reduce overall recovery time compared to placebo athletes. In patients undergoing various reconstructive and facial procedures, treatment with proteolytic enzymes significantly reduced swelling and pain compared to placebo patients.

**Inflammation**

The use of systemic enzymes is particularly effective during inflammation because they hydrolyze the peptide bonds that unite amino acids to proteins, thus dissolving clumps of fibrin. This reduction in fibrin allows more oxygen to reach and reactivate the tissue cells. Excess fluid is also reabsorbed, reducing inflammation.

A double-blind German study of dentist patients showed the anti-inflammatory effects of a mixture of 100 mg pancreatin, 45 mg bromelain, 60 mg papain, 10 mg lipase, 24 mg trypsin and 1 mg of chymotrypsin. Patients took this mixture before and after a dental operation for several days. Three days after the operation, levels of C-reactive protein, a marker of inflammation, were three times higher in the control group.

**Other enzymes**

DigeZyme® is a unique proprietary blend of specific digestive enzymes that offers much more than just aiding proper digestion and better absorption of nutrients.

DigeZyme® consists of five GMO-free broad acting enzymes obtained from the fermentation process:

- Amylase: breaks down carbohydrates such as starch and glycogen, into smaller units
- Protease: Breaks down protein and supports immune function
- Lactase: Breaks down lactose (milk sugar) and useful for lactose intolerance
- Cellulase: Breaks down cellulose and chinin. It helps free nutrients in both fruits and vegetables
- Lipase: Breaks down lipids and improves fat utilization and also supports the most healthy gallbladder function

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**Bromelain**

**Source**: Ananas comosus - Stem

**Bio-activity**: 1,200 to 5,000 GDU / g

**Units correspondence**: 1 FIP/mg = 500 GDU/g

**Papain**

**Source**: Carica papaya

**Bio-activity**: 1.5 to 3.5 FIP / mg

**Units**: 1 FIP = 10 to 12,000 USP = 160-180 TU / 100 TU = 6,000 USP = 0.6 FIP
Sabinsa’s Nigellin™ is obtained from the seeds of *Nigella sativa* (Black Cumin) and standardized to contain Thymoquinone, Thymohydroquinone, Hederagenin.

Nigellin, popularly known as ‘black seed’ or ‘black cumin’, one of the most revered medicinal seeds in history of mankind, is indeed a gift from the Mother Nature—owing to its well-established, sanctified, and miraculous uses for over 3,000 years. Various medicinal and healing properties of black seed are directly mentioned in the Qur’an as ‘blessed food’. Black seed has also been mentioned in the Bible as the ‘curative’, used by Asian herbalists and the Romans for culinary purposes for centuries. Thus, it is not surprising that Prophet Muhammad had praised black cumin by saying that “Hold on to the use of the black seed for indeed it has a remedy for every disease except death.”

Chemical constituents

One of the reasons for considering black seeds as the main sources of nutrition and healthcare might be due to the complex chemical structure of the seeds. These little seeds contain more than 100 different chemical constituents, including carbohydrates, proteins, volatile and fixed oils, and are also an abundant source of all the essential fatty acids. Thymoquinone is proved to be the main active constituent of the volatile oil of the black seed and is known to have several medicinal properties.

A time-honored remedy

Though black seed has been recognized as one of the most popular herbs in many parts of the world for centuries, extensive research during last 40 years has further validated its potential health benefits, viz. maintain healthy inflammatory response (Muhdavi et al., 2016), asthma control support (Mo-shak et al., 2017), improved glycemic control in diabetic patients (Ramosa et al, 2016), protective role in diabetic nephropathy (Ansari et al., 2017), healthy blood pressure (Dehkhadi and Kamkhal, 2008) and lipid profile management (Satsgha-baei et al., 2012), helps boost male fertility (Marbat et al, 2013), Kishidozou et al., 2014).

**Asthma**

Recent research published in Frontiers of Pharmacology identified Nigellin™ BCS - Amber, Sabinsa’s Black Cumin (*Nigella sativa*) seed extract, as being the most effective of the 10 *Nigella* sativa (NS) extracts used in an in vitro study which suppressed the release of the most active cytokines and identified a proinflammatory with antiinflammatory properties which may possess a favorable effect in the context of asthmatic conditions (Comparative Immunomodulatory Activity of *Nigella sativa* L. Preparations on Proinflammatory Mediators: A Focus on Asthma, Front. Pharmacol, 02 October 2018).

Researchers evaluated 10 different NS extracts, and top ranked the extract provided by Sabinsa’s parent company and manufacturing arm, Sami Labs. It surpassed the second ranking extract in terms of the active constituent, thymoquinone (TQ), by more than 300%. Anti-inflammatory and immunomodulating properties are among the most valued in anti-asthma herbal products. Nigellin had the highest effects in suppressing the release of cytokines IL-2, IL-6 and PGE2 in T-lymphocytes and also in monocytes hindering the expression on IL-2 and PGE2. These are among the most active cytokines involved in asthmatic conditions. The investigators noted a positive relationship between the TQ level in the preparations and its inhibitory potency on IL-6 and PGE2.

However, PGE2 does exhibit beneficial bronchodilatory effects in human lung epithelial cells and Sabinsa’s extract showed an enhanced PGE2 expression in A549 human epithelial cells lines, demonstrating an interesting activity behavior of the maximum-TQ containing Sabinsa’s extract. The results presented in this paper formed the biochemical basis of a subsequently conducted clinical trial.

Asthma is a debilitating disease affecting 25 million people in the USA, alone and 334 million globally according to some estimates. It tends to flare up sharply due to external factors such as pollution and allergens.

*Nigella sativa* and its preparations have been referenced extensively in traditional healthcare systems ranging from Ayurvedic and Unani to Arabic and Prophetic for prevention and treatment of asthma, making it a candidate for study by modern researchers. Lack of standardization has, however, hampered researchers in evaluating the material’s efficacy in the past.

“This emerging antioxidant ingredient has traditionally been used in the management of numerous health conditions, with recent research beginning to validate historically reported benefits,”

**Elixir for Overall Health and Wellness**

**Ellagic Acid** is traditionally extracted from Pomegranate or Terminalia. Ellagic acid is known as skin lightening and brightening, repairing from sun damage, besides strong antioxidant properties and skin elasticity improver.

Ellagic acid is used in topical formulation for its lightening effect on UV induced hyperpigmentation. It’s know that Ellagic inhibits melanin formation by acting on tyrosinase.

**Oral Ellagic Acid for Skin Lightening**

Oral Administration of Ellagic Acid for skin lightening Oral administration of ellagic acid (alcoholic extraction followed by acid hydrolysis) has been studied, and its metabolites have been detected in urines and feces. A whitening effect on UV-induced pigmentation was observed, with a reduction in the number of DOPA-positive melanocytes (Mineka Yoshimura, 2006).

A double blind placebo clinical trials has evaluated the protective and ameliorative effect at 200mg and 100mg of ellagic acid per day, orally, followed by UV radiations. It’s so suggested that Ellagic acid orally administrated is absorbed into the body and the ellagic and/or its metabolites inhibits the proliferation of melanocytes in the skin.

Those studies have been performed in Japan, with products offered by Sabinsa Japan Corp.

Effects or Oral Administration of Ellagic Acid-rich pomegranate Extracts on UV induced pigmentation in the human skin, Kouichi Kasai, Mineka Yoshimura, Takuro Koga, Masayuki Ariti, Satoru Kawasaki, J Nutr Sci Vitaminol 52, March 2006.

The Effective SOD for Health & Skin

Thanks to its gliadin matrix, GliSODin® is orally effective unlike most existing SOD supplements. The gliadin is not only an enteric protection but more: a real vehicle for the SOD, thanks to its specific bio-adhesive properties with the epithelial cells in the small intestine. Vouldoukis et al. have shown ex vivo that prime activation of macrophages isolated from rodents with interferon-gamma (INF-gamma) subsequently challenged with IgGl/anti-IgG1 immune complexes leads to the significant production of superoxide anions. This production may be regulated, in a dose-dependent manner, in macrophages originating from rodents previously supplemented with GliSODin®. These results prove the potent in vivo activation of antioxidant activities made by the SOD-containing melon extract/gliadin biopolymer combination.

In an important proof concept in vivo study by Vouldoukis et al. using Balb/c mice receiving the SOD melon extract orally, either alone or combined with wheat gliadin (GliSODin®) for 28 weeks showed that only the gliadin–SOD complex resulted in a significant increase in circulating antioxidant levels. At the end of the study, the animals supplemented with GliSODin® had significantly lower levels of oxidative-stress induced DNA damage. Furthermore, the researchers found lower levels of apoptotic cells in the spinal fluid, thus showing a marked protective benefit.

Oxidative stress & DNA damages
GliSODin®'s protective benefits have been demonstrated in human interventional studies. GliSODin® was shown to protect against cellular oxidative stress damage in a dramatic human model. In this double-blind, placebo-controlled trial, twenty healthy volunteers were given pure oxygen in a hyperbaric chamber (HBO), which increased atmospheric pressure to 2.5 times normal, inducing intense oxidative stress. A measure of blood cell protection, looking at the integrity of the cellular DNA, was taken before and after exposure to measure the effect of oxidative stress. The GliSODin® group had significantly lower cellular DNA damage as evidenced by a test called “Comet Assay.” Also, these findings coincided with reduced blood isoprostane levels, another marker of oxidative stress. In the GliSODin group, the cell nucleus is intact, while the placebo group shows progressive nucleus damage with pronounced “comet tail.”

First orally effective SOD, GliSODin® is both a protected and targeted SOD, supported by more than 25 clinical and scientific studies.

- GliSODin®, a patented nutraceutical ingredient, has been shown in clinical research to:
  - Promote the production of the body’s own, natural antioxidants
  - Help maintain cellular health and protect against damage caused by oxidative stress
  - Support skin health against photo-oxidative stress
  - Reduce lactic acid buildup in humans under physical stress
  - Support healthy immune function
  - Prevent stress induced impairment of spatial memory

Anti-aging
- Protects against DNA damage
- Prevents oxidative stress
- Decreases troubles induced by ageing
- Improves cognitive functions
- Protects against photo aging
- Supports healthy immune function
- Reduces risk factors of cardiovascular disease
- Helps prevent light sun allergies

The enzymatic activity of oral free SOD in the body is mainly to totally destroyed within few minutes, despite the source, and can not promote the production of the SOD cascade by the cells and the related expected optimal activities. For this reason, usual studies based on free SOD cannot prove the efficacy, or at an incredibly high use (in-vivo).

Dose: 2 x 100mg to 2 x 250mg a day
GliSODin® was studied for its ability to regulate the immune response. Supplementation with GliSODin® had increased production of type 1 helper T lymphocytes (Th1) and INF-γ and IL-4. The immunoglobulin G (IgG) response – the predominant antibody used by the body to identify and neutralize foreign objects, while the response of IgE, the immunoglobulin associated with an allergic response was only marginally affected. Vouldoukis et al. proposed that the mechanism behind these effects was due to an activation of antigen presenting cells (APC), which results in the production of hydrogen peroxide (H2O2) and nitric oxide (NO), both of which are reactive oxygen species and upset the oxidant-antioxidant balance. In response to this, production of the antioxidant enzymes catalase and glutathione peroxidase is induced. This results in a polarized adaptive immune system, highlighting the benefits of GliSODin® since this polarization is a sign of the natural equilibrium of antioxidants in the cells. Rahaman et al. investigated the effect of receiving GliSODin®-containing supplements on quality of life and performance of 23 AIDS patients on HAART (significant benefits for the millions of people infected with the HIV-1 virus and receiving anti-retroviral therapy).

In an in vivo study, Vouldoukis et al. compared the effects on production of pro- and anti-inflammatory cytokines with SOD, Gliadine, heat inactivated GliSODin® and GliSODin®. Only GliSODin® reduced the production of the pro-inflammatory cytokine, tumor necrosis factor-alpha (TNF-α) and promoted production of the anti-inflammatory cytokine interleukin-10 (IL-10), compared to the other treatments. The anti-inflammatory effects of GliSODin® are significant since chronic inflammation is associated with the onset and progression of many chronic diseases. Okada et al. reported that administration of the gliadin-SOD complex could prevent cancer progression, promoted by inflammation. This result indicated that the antioxidant and anti-inflammatory properties of GliSODin® might have significant benefits for the prevention of tumor development and progression. A double-blind study included 19 participants who were participating in a training camp (2 capsules total 500 mg) of GliSODin®. SOD activity was significantly higher (p < 0.01) in the supplemented group at all measurement times, and post-exercise C-reactive protein was significantly lower in athletes receiving GliSODin®. Supplementation with an extract rich in SOD activity promoted antioxidant status and protected against increased inflammation in the serum of professional rowers. Hong et al. recruited 44 healthy individuals and assigned them to receive a daily GliSODin® dose of 1500 IU for four weeks. Healthy volunteers were then submitted to cycling or treadmill exercise but assigned into two distinctive groups: the severe exercise group (27 subjects) or the moderate exercise group (17 subjects). Only volunteers ranging from the severe exercise group showed a significant reduction in the exercise-induced lactate production, after the four-weeks of SOD supplementation.

### Sport & inflammation
- Anti-inflammatory effect: control C-Reactive Protein
- Decreases in-exercise lactate production
- Supports post-exercise immune function
- Improves recovery after strenuous exercise

### Cardiovascular health
- Reduces risk factors of cardiovascular disease
- Decreases carotid Intima-Media thickness (IMT)
- Prevents metabolic syndromerelated diseases

### Sun & skin health
- Increases the MED (Minimal Erythema Dose)
- Induces red skin rash
- Prepares the skin for sun exposure
- Reduces sunburn redness
- Faster recovery after sunburn and photo-inflammatory stress

A randomized double-blind clinical trial by Mac-Mary et al. showed that GliSODin® supplementation reduced skin-reddening when healthy fair-skinned volunteers were exposed to UV radiation. Fifty subjects were randomly assigned to receive a daily dose of GliSODin® (500 mg) or placebo four weeks. Subjects were exposed to UV radiation to induce sunburn on the inner forearms, and the susceptibility of the participants to sunburn (defined as the minimum erythematosus dose – MED) and a measure of the resulting redness (actinic erythema).

Supplementation with GliSODin® results in an increase in the minimum exposure to UV rays necessary to produce skin burn for fair-skinned people (phenotype II), compared to placebo. The induced redness also decreased quicker in the GliSODin®-supplemented group over the four-week period. These results confirmed the efficacy of the SOD-gliadin combination against the consequences of oxidative stress produced by exposure to UV radiation. In a later study of similar design with Type II (fair-skinned) participants, GliSODin significantly increased the MED in two weeks’ time with a dose of just 250mg.

A newly published, three-year study with GliSODin® supplementation showed significant benefits for cardiovascular health. Using ultrasound-B imaging to measure carotid artery intima thickness (IMT), a sign of hardening of the arteries (atherosclerosis), the researchers found a reduction in the progression of IMT in the SOD-supplemented group, compared to the group with the prescribed diet and lifestyle. This study showed that supplementation with GliSODin® could impact the antioxidant status and the inflammatory process. The study also showed clear benefits against atherosclerosis, which is a major risk factor for cardiovascular disease. GliSODin® promoted arterial health and function compared to the control group as measured by the thickness of the participants’ carotid arteries. Further, GliSODin® significantly improved the antioxidant status and provided a reduction in measures of lipid oxidation. The researchers called the results “remarkable” (Naito et al.) No significant differences in blood glucose levels or body weight were observed between the diabetic mice in the SOD-gliadin- supplemented group and the control group. In terms of kidney health, significant reductions in the levels of 8-hydroxydeoxyguanosine (8-OHdG), a marker of oxidative stress, had been observed in the SOD-gliadin-supplemented group.

### Immunity
- Supports healthy immune function
- Immune-modulating properties shown to be effective in children
- Acts as immune-modulator
- Regulates pro- and anti-inflammatory cytokines production
- Induction of Th-1 immune response

New published study with GliSODin®: in the present randomized, placebo-controlled, double-blind clinical trial, the clinical efficacy of GliSODin® in accelerating symptom relief in children with allergic asthma and house dust mite allergy (receiving house dust mite immunotherapy) was demonstrated. In summary, GliSODin® accelerates the symptom relief in asthmatic children allergic to house dust mite receiving house dust mite immunotherapy. For the first time GliSODin’s immune-modulating properties were shown to be effective in children!
Promond™ is a 100% natural and vegan protein obtained from almonds and standardized to contain not less than 50% protein. This off-white to cream, free-flowing powder has good taste compared to other protein powders.

It is having a complete array of amino acids, including high levels of branched-chain amino acids (BCAAs). Although its amino acid profile is similar to whey and pea protein, it is particularly high in glutamate, arginine, aspartate, and phenylalanine.

Almonds (Prunus amygdalus) are incredibly popular nuts worldwide, which belong to species related to cherries and plums, and are native to Middle East and South Asia. These highly nutritious and extremely healthy nuts are a rich source of proteins, dietary fiber, and other micronutrients.

<table>
<thead>
<tr>
<th>a.a. /100</th>
<th>a.a. /100</th>
<th>a.a. /100</th>
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<tbody>
<tr>
<td>Glu 26,3</td>
<td>Phe 4,5</td>
<td>Asp 12,0</td>
</tr>
<tr>
<td>His 4,0</td>
<td>Thr 1,9</td>
<td>Cys 0,2</td>
</tr>
<tr>
<td>Ile 3,5</td>
<td>Trp 0,4</td>
<td>Gly 8,5</td>
</tr>
<tr>
<td>Leu 6,3</td>
<td>Val 4,1</td>
<td>Pro 5,1</td>
</tr>
<tr>
<td>Lys 2,5</td>
<td>Ala 4,2</td>
<td>Ser 3,1</td>
</tr>
<tr>
<td>Met 0,2</td>
<td>Arg 10,6</td>
<td>Tyr 2,6</td>
</tr>
</tbody>
</table>

In recent years, extensive research on almonds has proved that this versatile nutrient food exerts an array of health benefits, including healthy heart support [maintaining healthy cholesterol levels (Wen et al., 2010), Berryman et al., 2015], it may reduce risk of coronary artery diseases (Jenkins, 2002 & 2006, Hu et al., 1998) and oxidative stress (Li et al., 2007), healthy blood sugar levels (Jenkins et al., 2006) and healthy weight management, and related complications (Wen et al., 2003, Berryman et al., 2015, Abazarfard et al., 2014).

enXtra™
Clinically proven to improve alertness and focus up to 5 hours with and without caffeine

EnXtra™ from Alpinia galanga is a DNA-authenticated, stim-free energy ingredient that provides fast, effective and safe energy with no crash. In a 53-person, double-blind, double-dummy human clinical trial, it was shown to improve mental alertness & acuity for up to 5 hours without increasing heart rate or blood pressure. It can be used as a replacement for caffeine or used with caffeine to prevent crash and prolong benefits. EnXtra is easy to formulate with, water soluble and has a pleasant taste profile.

EnXtra™ is a DNA-authenticated galangal extract that delivers fast, effective and safe results for improving mental alertness & acuity. It does not increase heart rate or blood pressure and is safe & effective for 5 hours without the caffeine crash.

EnXtra™ is water soluble and can be formulated with or without caffeine.

Supported by 2 human clinical trials
Pilot Study: Human Safety & Efficacy
300 mg of EnXtra Alpinia galanga demonstrated optimal improvement in alertness for up to 5 hours when compared to other extract groups (70 caffeine habituated subjects)

Second Human Study
Randomized, double blind, double dummy, placebo controlled crossover study design: 53 caffeine habituated individuals with 4 study arms
- Placebo
- Caffeine (200mg)
- EnXtra (300 mg)
- EnXtra (300 mg) + Caffeine (200mg)

Assessments were taken at 1-hour, 3-hour and 5-hour time intervals

Standard assessment tools:
- Attention Network Test
- Psychomotor Vigilance Task
- Karolinska Sleep Scale score

Study Findings
- Maximum increase in alertness from baseline was observed at 3 hour interval
- The combination of caffeine with EnXtra significantly reduced mean response time as compared to placebo
- Improved ability to achieve and maintain high arousal levels to better process new information.

Manufacturing
Gentle, solvent free extraction. Proprietary process controls for optimum bioactivities. More than 99% DNA match with authentic galangal

Sharpens alertness and focus for up to 5 hours
No increase in blood pressure or heart rate
Amplifies caffeine benefits without the “crash”
- Blocks Adenosine
- Dopamine Release
- Increase Blood Flow

Responsible Sourcing
- Skillful hands cultivating galanga for more than three generations
- Plants grown in hilly terrain away from industrial pollution
- Cultivated without pesticides
- Hand picked at optimal daytime temperature
- Natural drying on high altitude, stony land near farm
Two Ways Anti-Inflammatory Boswellin®

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 (direct interaction with 5-LO and Interacting with 5-LO activating proteins FLAP) as well as human leukocyte elastase (HLE).

**What effective Boswellic Acid?**

Boswellia extracts contain Boswellic acids. Grades of Boswellia are not titled as “total boswellic acid” which means nothing since all acids would be included. It’s important to see the real content of the actives acids: the β boswellic acids (by HPLC) and more specifically the more potent Acetyl-11-keto-β-boswellic acids.

**Biological activity of various derivatives of Boswellic Acids in inhibiting the enzyme 5-lipoxygenase**

1. β-boswellic acid
2. Acetyl-11-keto-β-boswellic acid
3. Acetyl-5-boswellic acid
4. β-boswellic acid
5. α-boswellic acid
6. 11-Keto-β-boswellic acid
7. Acetyl-α-boswellic acid

**Dual Inhibitory Action**

Boswellia extract inhibited S-LO by one of two ways:
- Directly interacting with S-LO
- Interacting with the five-lipoxygenase-activating protein (FLAP).

As well as, human leukocyte elastase (HLE), the serine protease produced and released by polymorphonuclear leukocytes (PMNLs) which has been suggested to play a role in several diseases (pulmonary emphysema, cystic fibrosis, chronic bronchitis, acute respiratory distress syndrome, glomerulonephritis, and rheumatic arthritis) due to its aggressive and destructive properties.

This dual inhibitory action of two pathophysiologically important enzyme activities (HLE and S-LO) is unique to the pentacyclic triterpenes from the boswellic acid series. Several leukotriene biosynthesis inhibitors furnished no HLE inhibitory activity: β-Boswellic acid, AKBA, ursolic acid, and amyrin significantly inhibited HLE. The HLE inhibition activity of AKBA and ursolic acid were comparable; however, ursolic acid’s mode of inhibition is competitive.

**Preclinical, in-vitro & Clinical studies**

**Anti-inflammatory Effects**

Wildfeurer and coworkers studied *Boswellia serrata* as a leukotriene synthesis inhibitor of intact human PMNLs and as an herbal medicine for guinea pigs suffering from experimental autoimmune encephalomyelitis (EAE). Mixed acetyl boswellic acids significantly inhibited the ionophore-stimulated release of leukotrienes LTB4.

**Study of Rheumatoid Arthritis (Clinical)**

**Conditions**: Rheumatoid Arthritis, Ankylosing spondylitis, Osteoarthritis

Total 175 Subjects, 1-6 years duration, 10-50 years.

**Results**: 67% Good & Excellent, 30% Fair, 3% Poor

**Inflammation and its Relationship to Glycosaminoglycans**

- Glycosaminoglycans in the body form a ground substance found in connective tissue, mucous secretions and synovial fluids.
- In the process of chronic inflammation of connective tissue, as exemplified by autoimmunological disorders, e.g. lupus erythematosus or rheumatoid arthritis, one of the first casualties of the destructive process of inflammation is the wasting away of the ground substance that is an integral element of the connective tissue. Thus the wasting away of the glycosamino-glycans in the joints leads to continuously worsening joint disfigurement and limited mobility.

**Apopotosis Induction by AKBA**

Apoptosis or programmed cell death (PCD) is an essential process in normal animal development and in the renewal of cell populations in the human body. The effects of AKBA were studied in two human cancer cell lines, HL-60 and CCRF-CEM. AKBA reduced the viability and proliferation of the leukemic cells from both lines in a dose-dependent manner.

**Antitumor Activity**

Shao and coworkers examined the antitumor activity of the four major pentacyclic triterpene acids of *Boswellia serrata* All the compounds exhibited inhibitory activity in a dose-dependent manner. Based on cell morphology and NBT (nitroblue tetrazolium) reduction, BC-4 induced monocytic differentiation in myeloid leukemia cells in all three cell lines. Clinical studies on Malignant Glioma, Ulcerative Colitis and Bronchial Asthma were also performed.

**Recommended dosage**

- **Oral**: 75 to 200 mg of extract - 2 to 3 times a day
- **Topical**: 3% to 5%

As it acts as a strong anti-inflammatory agent, BS extract may be used in stand alone or in combination with COX-2 inhibitors or nutrient enhancer (Bioperine®).

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**FOCUS**

**Boswellin® PS**

Boswellin PS from Sabinsa represents an improvement over the existing conventional *Boswellia serrata* extracts, providing manufacturers with a more water soluble version with enhanced joint health support potential. Boswellin® PS offers a unique release profile for Boswellin PS from Sabinsa represents an improvement over the existing conventional *Boswellia serrata* extracts, providing manufacturers with a more water soluble version with enhanced joint health support potential. Boswellin® PS offers a unique release profile for Boswellin PS from Sabinsa represents an improvement over the existing conventional *Boswellia serrata* extracts, providing manufacturers with a more water soluble version with enhanced joint health support potential. Boswellin® PS offers a unique release profile for...
The pomegranate (Punica granatum) is a fruit-bearing shrub or small tree that has been cultivated over the whole Mediterranean region and the Caucasus since ancient times. In the Northern Hemisphere, the fruit is typically in season from September to January while in the Southern Hemisphere, the season runs from March to May. The name itself derives from the Latin pomum (apple) and granatus (seeded) (Lloyd, 1897).

There is a great interest in the scientific community in the properties of pomegranate, which is considered by many as a functional food because it has valuable compounds in different parts of the fruit displaying beneficial effects on health such as antioxidant, antitumoral, antihepatotoxic, antimicrobial, anti-inflammatory, antiviral, antidiabetic and improving cardiovascular, oral, and skin health. However, few well-controlled clinical trials have been completed and these effects have not been solidly established (Viuda-Martos, 2010).

Pomegranate P40P

P40p™ is a unique product, carrier free, soluble in water and is standardized to a full spectrum of all of the essential compounds responsible for specific health promoting benefits of pomegranate juice, manufactured under strict GMP procedures.

<table>
<thead>
<tr>
<th>Composition</th>
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<tr>
<td>Total Punicosides (HPLC)</td>
<td>≥ 40%</td>
</tr>
<tr>
<td>Punicalagins A &amp; B (HPLC)</td>
<td>≥ 30%</td>
</tr>
<tr>
<td>Total Polyphenols Folin Denis</td>
<td>≥ 50%</td>
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</tbody>
</table>

The P40p™ extract is standardized to 40% punicosides with a minimum concentration of 30% punicalagins. Additionally, P40p™ guarantees a total polyphenol content of no less than 50% (Table 1). The final product is free of yeast and bacterial contamination, allergens, gluten, BSE, GMO and irradiated products. P40p™ is Kosher certified and suitable for vegans.

Nektium has been extracting Pomegranate in their GMP Silliker plant located at Las Palmas for years. The most studied grades:

- Pomegranate P40P brings bioactive compounds as punicosides and punicalagins A-B (strong antioxidant), and other polyphenols, carrier free: cardiovascular, antioxidant. Also some research on prostate health and joints.
- Pomegranate seed oil for body weight and antioxidant, contains Punicic acid, fatty CLNA.

Approximately, 30 mg of P40p™ provides an equivalent amount of bioactives than 50 ml of pomegranate juice.

Chemical Profile

The key bioactive compounds in pomegranate fruit are a group of hydroxylize ellagitannins generically called punicosides, including punicalins, punicalagins (A+B), ellagic acid glycoside and ellagic acid. Ellagic acid is commonly used to standardize commercial pomegranate extracts but this approach is unreliable, potentially misleading and vulnerable to adulteration (Zhang, 2009). Punicalagins have been identified as being responsible for most of the antioxidant activity present in the pomegranate fruit (Gil, 2000) and represent a more reliable means of standardization of commercially produced pomegranate extracts (Jimenez Del Rio, 2006).

Animal studies have shown that both ellagic acid and punicalagins are absorbed by the gastrointestinal track after oral ingestion of pomegranate juice or extract, with the concentration of the latter being higher. Punicalagins are not absorbed in vivo directly but reach the colon and release EA that is metabolised by the human microflora (Jarrosa, 2006).

Cardiovascular Health

Atherosclerosis is a collection of patchy plaques (called atheromas) in medium-sized and large arteries. These plaques contain lipids, inflammatory cells, smooth muscle cells, and connective tissue. Several investigators have studied the influence on cardiovascular health of pomegranate supplementation.

They have measured how pomegranate affects several markers involved in the development of atherosclerosis, such as plasma lipid profiles, lipid oxidation status, platelet aggregation, interaction between macrophages lipids, and stress to the arterial wall. More recently Rosemblat has also confirmed that pomegranate juice daily consumption improves plasma lipid oxidant profile in patients with diabetes by reducing lipid peroxide and cellular peroxides and increasing glutathione levels, factors that all contribute to development of atherosclerosis in these patients (Rosemblat, 2006).

Cancer

Cancer is an unregulated proliferation of cells which lose their normal controls, resulting in unregulated growth, lack of differentiation, local tissue invasion, and, often, metastasis. Dozens of information (angiogenesis, apoptosis, cells differentiation and signaling) gathered on cellular cultures and animal models have been collected.

Pantuck et al found that daily supplementation with pomegranate juice (PJ) led to a significant decrease in tumor progression in patients with prostate cancer that had undergone surgery or radiotherapy. They were able also to confirm in in vitro investigations that PJ induced apoptosis and decreased cell proliferation (Pantuck, 2006).

Nektium offers a range of Pomegranate extracts looking to preserve the totum of the fruits, as in the famous P40P, and not only ellagic acids which is finally in a very small amount in the fruits. From the seeds, they extract punicic acids, studied then for healthy body weight.

Pomegranate Seed Oil

Pomegranate seed oil (PSO) is rich in Punic Acid (PA) and contains other actives such as ellagic acid, other fatty acids and sterols (Schubert, 1999; Amakura, 2000; El Wahab, 1999). Nektium manufactures PSO with at least 80% content of PA.

Punicic acid

Punicic Acid (PA) is structurally related to Conjugated Linolenic Acid (CLNA), and their potential beneficial biological effects (for instance significant decrease in hepatic tryacylglycerol deposits, as well as levels of monounsaturated fatty acids).

In fact PA has been found in animal models to accumulate in liver and perirenal fat, increasing serum levels of tryacylglycerol and phospholipids, which suggest PA mobilizes fat out of their storage sites into the blood (Yamasaki, 2006), corroborated later on in ICR CD-1 mice.

At the molecular level, investigators have found that PA activates a class of receptors (PPARY) also activated by oral antidiabetic agents, which in principle could play an important role in glucose homeostasis and obesity related inflammation.

In summary, PSO has shown beneficial effects on the lipid storage and lipid serum profile in obesity animal models with a strong suggestion that it may also help uncontrolled blood glucose levels.

Pomegranate Seed Oil in Weight Management

PSO has been used in a formulation intended for weight management, together with fucoxanthin. In a clinical trial, investigators found that PSO acted synergistically with a fucoxanthin, increasing the resting energy expenditure (REE). Increase in REE leads to losing weight (Abidov, 2010). More recently, investigators have reported that PSO can down-regulate the expression of adipogenic genes (PPARY) in fat cells.
Sabinsa has developed a reputation for being a trusted and valued resource to academic and medical communities in providing C3 Complex® for a variety of research initiatives.

Feel quiet when using the Curcuma longa from the leading Cie

New Metabolic syndrome
A significant study on Curcumin C3 Complex® (in combination with Bioperine®) in patients with metabolic syndrome has been published on end of 2014, showing the significantly greater effect of Curcuminoids in reducing the serum concentrations of LDL-C, non-HDL-C, total cholesterol, triglycerides and Lp(a), when serum HDL-C concentration was elevated significantly. Serum sdLDL levels were comparable (randomized, double-blind, placebo, 117 patients, 8 weeks).

New - Osteoarthritis
Another study on 53 subjects for 8 weeks with C3 Complex and Bioperine shows that this combination brought a significant improvement in arthritic indices such as VAS (SVisual Analogue Scale), WOMAC (WOM Osteoarthritic Index) and LPFI (Pain Index).

Sabinsa’s Curcumin C3 Complex® enjoys a special place among curcumin extracts. C3 Complex is obtained from the dried rhizomes of Curcuma longa (tumeric) and standardized to min. 95% Curcuminoids. The name C3 Complex has reference to its three main chemical compounds – Curcumin (75-85% of the composition), Demethoxycurcumin and Bisdemethoxycurcumin – collectively known as Curcuminoids.

Traditional knowledge
The rhizome of turmeric has a rich history in India as a spice, food preservative and coloring agent, and has been used for centuries in the Ayurvedic system of medicine: well-documented for treatment of various respiratory conditions (e.g. asthma, bronchial hyperactivity and various allergies), liver disorders, poor appetite, rheumatism and influenza symptoms.

Pharmacological activity
Turmeric and more appropriately the components curcuminoids have been preclinically and/or clinically validate for their role in maintaining health and wellness. At the molecular level, the curcuminoids have been showed to inhibit nuclear factor kappaB (NFkB), a transcription factor that triggers inflammatory mediators. Curcumin C3 Complex counteract free radicals in 2 ways:
- Prevention of free radical formation
- Intervention whereby already preformed radicals are quenched by the curcuminoids.

Curcuminoids offer antioxidant, anti-inflammatory, and a healthy immune system support, and potential prevent connective tissue breakdown through inhibiting destructive enzymes, with benefits in healthy aging and all-related oxidative stress (including diabetes mellitus (and the secondary complications of the disease). Studies reported it protects the liver against several toxins both in vitro and in vivo. Various other researches are conducted especially against metabolic syndrome (see below), as well as Alzheimer (anti-amyloid b), and cancers (breast, bladder, pancreatic, skin) where curcuminoids act by inhibiting several processes.

Why Curcumin C3 Complex stands out from the crowd?
- Most clinically studied Curcumin-in brand: more than 65 scientific publications, including clinical trials, have been published, and more than 100 articles.
- Free curcuminoids only, and no inactive metabolites
- Most active form (independent comparison of various Curcuma 95)
- Most safety data conducted with C3 Complex and another curcuma extract. Only Curcumin in the market that has been reviewed and acknowledged by US FDA for GRAS status, a process which includes a comprehensive review of safety and toxicological data
- Most Patent-IP protection: Holds patent covering composition of curcuminoids, method of manufacture and uses
- Most consistent quality: C3 Complex has the same composition of the three Curcuminoids consistently in the same ratio in every batch
- It is known for its very low oxalic acid content (what caused kidney stones), heavy metal, ...
- Most stable supply chain: C3 Complex is promptly delivered from European buffer stock
- More proven bioavailability
- Dedicated unit: C3 Complex is processed all over the year in its dedicated unit on a continuous batch extractor, without risk of cross contamination, from known fields (traceability)
- Various awards
- Grades available Curcumin C3 Complex 95% Curcumin C3 Complex 95% DC (Direct Compression) Curcumin C3 Complex BW5 (with Bacosides) Curcumin C3 Complex Beadlets Water Soluble : uC3 CLEAR™ (New)

Full and Clear Water-Soluble now Available
Sabinsa introduce in 2015 a new form of Curcumin which is completely water soluble, a major breakthrough in Curcumin technology: uC3 CLEAR™, the nano-free water soluble curcumin.

Poor curcumin solubility and resulting sedimentation in beverage make it visually unappealing.

C3 CLEAR™ not only provides an improved, more convenient delivery system for Curcumin but also overcomes the challenges and limitations that can be present with solid dosage delivery systems such as poor disintegration, slow dissolution, or difficulty swallowing, thus enhancing the uptake of curcumin.
**FOCUS HINTS**

**FOCUS**

**Probiotic Lactobacillus Lactospore®**

Shelf-Stable Probiotic Lactospore®

Easy to use probiotic providing 15 billion Lactobacillus sporogenes spores (also called coagulans), stable. Activities are multiple, interacting for the whole body, including digestion, cholesterol management and health of the intestinal tract.

---

**LactoSpore®** is a lactic acid producing Bacillus preparation providing 15 billions of spores per gram.

After ingestion (medium for awakening), the spores revive and produce acid L (+) Lactic, with the positive action on other micro-organisms. Lactospore is used in dietary supplements, in dairy products, bakery products, in tablets or vaginal ovules and in veterinary products.

**Bacillus coagulans** as a probiotic

Clinical studies have revealed that L. sporogenes can be successfully implanted in the intestine: it satisfies the essential requirements of an efficient probiotic. Preparations of L. sporogenes in pharmaceutical dosage forms such as tablets, capsules, dried granules or powder have the following characteristics:

- Contain a large number of viable lactobacilli that retain viability during preparation in pharmaceutical dosage forms and during storage before consumption. The spores are thermostable as against viable L. acidophilus cells which may not withstand spray drying.
- Survive in gastric secretions and bile of the upper digestive tract and reach the intestine safely.

**Settle in the digestive tract and produce enough lactic acid** and other antagonistic substances to inhibit the growth of pathogenic bacteria.

Being sporulated, they germinate under favorable conditions and produce sufficient viable cells which proliferate and perform vital healthful functions as described earlier. In addition, L. sporogenes spores are semi-resident and are slowly excreted out of the body (7 days after discontinuation of administration).

**Clinical Studies**

Different studies are available, and detailed on the website. We just mention few of them.

- **Gastro-intestinal and associated effects**: administration of L. sporogenes markedly improved the general clinical condition of the subjects and provided relief from intestinal disorders and allergic skin conditions. Studies performed on patients suffering of gastro-intestinal disorders proved the efficacy on:
  - Acute and chronic intestinal catarrh
  - Diarrhea
  - Constipation
  - Abnormal intestinal fermentation
  - Dyspepsia infantum
  - Allergic skin diseases
  - Etc...

- **Hypcholesterolemic effects**: Total serum cholesterol, LDL-cholesterol and total cholesterol to HDL-cholesterol and LDL-cholesterol to HDL-cholesterol ratios (p < 0.001) was reduced significantly over a period of three months.

- **Non-specific vaginitis**: increase the vaginal acidity by the action of the lactic acid produced by Lactobacillus

**Veterinary probiotic** (weight gain, feces)

**Recommended dosage**

- **Stability**: The daily recommended dose is 100 to 200 Million organisms per dose. - 3 times daily. In tablets, capsules, chewable tablets, vaginal tablets or ovules, etc...

**New Safety, Stability And Efficacy Studies Published**

**LactoSpore**: Anti-diarrheal & Gastrointestinal motility study (International Journal of Pharma and Biosciences. 7 (1): 311-16. 2016)

The effect of Bacillus coagulans MTCC 5856 (LactoSpore) on castor oil induced diarrhoea and gastrointestinal (GI) motility using well established in vivo studies found LactoSpore exerted dose dependent anti-diarrhea activity and reduced the faecal output (33%). It also inhibited the gastrointestinal motility. The results suggested that LactoSpore possess significant anti-diarrheal activity and therefore could be a potential agent in the management of diarrhea.


A double blind placebo controlled multi-centered trial was conducted to evaluate the safety and efficacy of LactoSpore in diarrhea predominant Irritable Bowl Syndrome (IBS) patients. Thirty-six newly diagnosed diarrhea predominant IBS patients were enrolled in three clinical centers. Along with standard care of treatment, 18 patients in group one received placebo while in group two, 18 patients received LactoSpore for 90 days.

The study concluded that LactoSpore along with standard care of treatment was found to be safe and effective in diarrhea predominant IBS patients for 90 days of supplementation. Hence, LactoSpore could be a potential agent in the management of diarrhea predominant IBS patients.

**LactoSpore: Genetic and Phenotypic Consistency Findings (World Journal of Microbiology and Biotechnology 32:60. 2016)**

That B. coagulans strain is stable over multiple years of commercial production was clearly demonstrated through this study designed to evaluate probiotic potential, in-vitro safety, product stability, genetic and phenotypic consistency of the probiotic strain used for production of LactoSpore. Phenotypic and genotypic studies proved that the commercial preparations of LactoSpore contained the same strain of B. coagulans MTCC 5856 over multiple years of commercial production. B. coagulans MTCC 5856 strain showed probiotic potential and found to be non-mutagenic, non-cytotoxic, negative for enterotoxin genes and stable at ambient temperature (25 ± 2°C) for 36 months. Findings of this study provide confidence to use B. coagulans MTCC 5856 as a probiotic ingredient in various dietary and functional foods and health products.

**LactoSpore Safety Study (Journal of Clinical Toxicology 6: 283. 2016)**

A Double-Blind, Placebo-Controlled, Parallel clinical trial was conducted to evaluate the Safety and tolerability of B. coagulans MTCC 5856 at a dose of 2 billion spores per day in healthy adults. Safety and tolerability of B. coagulans MTCC 5856 was assessed over 30 days by safety laboratory parameters (blood hematolog and clinical chemistry parameters), anthropometric measures (weight, BMI, blood pressure and heart rate), adverse events, Bristol stool score, tolerability questionnaire and bowel habit diary.

**LactoSpore has recently obtained the approval as Natural Health Product (NHP) that allows formulators and marketing companies to market LactoSpore in Canada as NHP. This approval renders Canadian market readily accessible by US and Canadian marketing companies. Pre-approved NHP ingredients can reduce the review period of Product license application in Canada, where a pre-market approval system precedes actual marketing. LactoSpore's approval in natural health products in Canada is also supported by Sabinsa’s Utah facility, a registered foreign site for manufacturing the NHP for the Canadian market.**
BioPerine® is the product sourced out of piperine studied for its ability to increase the bioavailability of nutritional compounds. It is also the only source from piperine to have undergone clinical studies to substantiate its safety and efficacy for nutritional use.

**Bioavailable curcuminoïds**

Effect of BioPerine® on Serum Concentrations of Curcumin in Human Volunteers. The relative bioavailability is improved by more than 20 times when therapeutic effectiveness of curcumin is often limited due to its poor absorption from the GI tract.

**Bioavailable β-Caroten**

BioPerine® increased the absorption of co-administered beta-caroteine in human volunteers by 160%, using 5mg Bioperine®

**Bioavailable Selenium**

Effect of BioPerine® on serum selenium levels during a 6 week supplementation trial in human volunteers: increase by 145% of the selenium levels over the pre-supplementation value (50 µg of elemental selenium in the form of Selenomethionine versus 50µg+5mg Bioperine®).

**Bioavailable vitamins**

Efficacy of BioPerine® (5 mg) on the bioavailability of Vitamin B6 absorption in human volunteers: increase by 250% of the vitamin B6 serum level after 2 hours compared to control (100mg B6 / 100mg B6+Bioperine®).

**Bioavailable Resveratrol**

Many other studies have been conducted, the most recent one on the resveratrol : “We found that the degree of exposure (i.e. AUC) to resveratrol was enhanced to 229% and the maximum serum concentration (C max) was increased to 1544% with the addition of piperine” (Mol. Nutr. Food Res. 2011, 55, 1–8).Bioperine® has legitimate application in the field of nutrition, particularly since we are becoming increasingly aware of the impact of nutritional deficiencies on our health.

**Bioavailable CoQ10**

Effect of BioPerine® on serum CoQ10 levels during a 21 day supplementation trial (+150% in serum, 90mg CoQ10+5mg Bioperine®).

**BioPerine®**:
- is a standardized extract from the fruit of *Piper nigrum* L (black pepper)
- contains 95% of piperine
- may be co-administered with various nutrients for both human and animal health.
- is Nature’s Bioavailability Enhancing
  If you lack the one ingredient that can change the way your body looks, just go for BioPerine®
- has been studied by Sabinsa and many external labs
- is provided with full safety data

Get more for your body from this supplement.

**How does BioPerine® work?**

The metabolic process that generates energy at the cellular level in the human body is called thermogenesis. Though thermogenesis has been identified as a key factor in maintaining weight loss, it has also been identified as playing an integral role in utilizing the daily food and nutrients that the human body consumes. It sets in motion the mechanisms that lead to digestion and subsequent gastrointestinal absorption. Piperine, in the patented form of BioPerine® enhances the body’s natural thermogenic activity-hence the term Thermonutrient®. This enhancement may be explained as a means of increasing the thermal energy sufficient to ‘power up’ the mechanism related to thermogenesis. This in turn results in increased metabolic processes that create a «demand» for «supply» of a broad range of nutrients that contribute to metabolism, i.e. vitamins, minerals, herals, amino acids, etc. It is as if BioPerine® activates a metabolic paddle wheel, of sorts, that selectively provides a more efficient mode of nutrient transportation into the blood. Non specific possible mechanisms promoting rapid absorption of nutrients:
- Increases blood supply to the GI tract
- Increases emulsifying content of the gut
- Increases active nutrient transport

**Advantages of BioPerine®**

BioPerine® is the only product sourced out of piperine to obtain a patented status for its ability to increase the bioavailability of nutritional compounds. Secondly, it is the only source from piperine to have undergone clinical studies in the U.S. and in other countries to substantiate its safety and efficacy for nutritional use. It’s an objectivated product, with a lot of sciences behind, for your kind support.

**Bioavailability Enhancer**

Bioavailability is “the quantity of a substance, either nutrient, drug, or toxicant, that effectively reaches the target cells where it modifies, for good or bad, their metabolism and consequently their fate” (Basu, T.X). The nutritional materials which may be co-administered with BioPerine® are the following groups:
- Herbal extracts : (e.g.Curcumo, Boswellic acids, Ashwagandha, Ginkgo biloba and Capsaicin)
- Water-soluble vitamins : (e.g.Vitamin B1, Vitamin B2, Nicinamide, Vitamin B6, Vitamin B12, Folic acid and Vitamin C)
- Fat-soluble vitamins : (e.g. Vitamin A, Vitamin D, Vitamin E, and Vitamin K)
- Antioxidants : (e.g. Vitamin A, Vitamin C, Vitamin E, alpha-carotene, beta-carotene, beta-cryptoxanthin, lycopene, lutein/zeaxanthin, pine bark bioflavonoids complex, germanium, selenium and zinc).
- Amino acids : (e.g. lysine, isoleucine, leucine, threonine, valine, tryptophan, phenylalanine, and methionine)
- Minerals : (e.g calcium, iron, zinc, vanadium, selenium, chromium, iodine, potasium, manganese, copper and magnesium).

If one believes that since Bioperine® is sourced out of black pepper, all one need to do is increase the consumption of black pepper. Again you have gone wrong, for the direct intake of black pepper will not help achieve enhanced nutrient absorption.

**Dosage**

The recommended dosage is 5mg per serving dose.

Acute, subacute and chronic toxicity studies of piperine in laboratory animals indicate that piperine used even in a broad range of doses does not cause abnormalities in the general growth pattern, body to organ weight ratio, clinical symptomatology, or blood chemistry.

The dose of piperine considered to be bio enhancing for absorption of nutrients is calculated as 0.04 to 0.08 mg piperine/kg body weight. That dose is 4,000 times less than the LD50 dose (dose toxic to 50% animals tested) of piperine established in mice and rats. Incidentally, the dose of piperine, which increased the bioavailability of the actives studied, was several times lower than the estimated amount of piperine consumed daily in the diet by an average individual in the USA (Majeed, M. et al., 1999).

**BioPerine® is the only product sourced out of piperine studied for its ability to increase the bioavailability of nutritional compounds. It is also the only source from piperine to have undergone clinical studies to substantiate its safety and efficacy for nutritional use.**
FOCUS

In-vivo Antiox with Incredible Orac

FruitOx™ is the ingredient developed by Nektium with the idea of a fruits-based, water soluble and antioxidant natural extract, and offering a wide and effective spectrum of anti-radical properties and stimulation of cellular defenses. FruitOx™ can be easily used in all types of formulations for nutrition, or personal care.

100% water-soluble
100% natural, no carrier
Very high ORAC (Trolox) value
Stimulates cellular antioxidant defenses
Low cost impact
The natural power of fruit FruitOx™

Digezyme

Digezyme is an easy-ready-to-use multi enzyme complex to help in the digestion of components, and against muscle soreness.

The process of enzymatic digestion of food in the body may be impaired by several factors:
- Stress due to sudden changes in food consumption patterns, exposure to environmental pollutants, vagaries of the weather, extensive travel.
- Somatic diseases that necessitate treatment with surgical procedures, antibiotics and immunosuppressive drugs.
- The sites of enzyme-production, such as the pancreas could also be damaged, by disease or injury, leading to enzyme insufficiency.
- Some individuals may suffer from an inherent lack of specific enzyme generation systems, due to genetic factors, resulting in digestive and metabolic disorders.

Five enzymes
DigeZyme consists of five GMO-free broad acting enzymes obtained from the fermentation process:
- Amylase: breaks down carbohydrates such as starch and glycogen, into smaller units
- Protease: breaks down protein and supports immune function
- Lactase: breaks down lactose (milk sugar) and useful for lactose intolerance
- Cellulase: breaks down cellulose and chitin. It helps free nutrients in both fruits and vegetables
- Lipase: breaks down lipids and improves fat utilization and also supports healthy gallbladder function

This group of enzymes breaks carbohydrates, proteins and fats and all three groups of enzymes are resistant to the action of gastric juices, while retaining their digestive activity. DigeZyme is referenced in The Complete Book of Enzyme Therapy by Anthony J. Chichoke (Ref. 1). DigeZyme was also clinically evaluated for enhanced absorption of minerals and vitamins.

Why Digezyme?
This multi enzyme complex help in the digestion of components when poorly assimilated by our bodies in cases of unbalanced diets, fatigue, or impaired pancreatic function - or in case of intolerance. Digezyme helps to improve overall health and nutritional status:
- Reduce toxic load generated by undigested food materials
- Cleanse the colon
- Strengthen the immune system
- Facilitate restful sleep
- Benefits for Delayed Onset Muscle Soreness
- And other activities related to a good digestion:
  - Enhance mental capacity
  - Help shed excess weight and fat
  - Prevent aging of the skin
- Dose & Quality
  The daily dose is 50mg per dose, three times daily, in tablets, capsules or even powdered diet mixes.

Digezyme is easy to use: the activity starts when the enzymes meet the specific conditions (humidity, pH, substrate…) they need, with enough reaction time in presence.
Digezyme is a formulation of food enzymes (non-animal origin). It contains Lactase, what got an approval by Efsa (extra lactase may be needed for the claim, depending on the dosage of Digezyme).
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 forskolin. Fors-Lean® is a registered trademark of Sabinsa Corporation and is the only Coleus forskohlii preparation supported commonly by Patent.

**Mechanism of Action**

The mechanism of action on how Forslean® works is well defined: "Forskolin, the active compound in Forslean®, is recognized as an adenylyl cyclase activator. Adenylyl cyclase is the enzyme involved in the production of cyclic adenosine monophosphate (AMP), 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, hereby providing the means to maintain healthy body composition and lean body mass levels.

**Double blind studies**

Dozen studies are available. In one on 12 weeks, 25-45 y, 60 obese males and female volunteers, Forslean® treated volunteers shed an average 1.73 kg from their body weight, in comparison placebo group gained 0.25 kg. During the 12-week period of treatment volunteers treated with placebo gained 0.68% of body fat. On the other hand, the Forslean® treated group lost 0.46% of body fat.

In the group of volunteers that received Forslean®, there was an increase in the LBM as compared to the placebo group where, there was a decrease in LBM. HDL cholesterol showed a statistically significant increase in volunteers treated with Forslean®. Other serum lipid profiles remained statistically unaltered in the Forslean® and Placebo treated groups.

50 subjects, male and female, were randomized to receive 250 mg of Forslean® capsules daily for 12 weeks. A significant decrease in body weight and fat content and a significant increase in lean body mass were observed (Kamath, M.S. et al (2004)).

The mean percentage body fat content in the Forslean® group was 34% as compared to 39% in placebo receiving group at the end of the 12-week trial.

**Dosage Form**

Forslean® has been clinically evaluated at one dose, 250 mgs twice daily. This provides 50 mgs of forskolin, the primary active compound in Forslean®. Dosage has been in the form of a two piece, hard shell capsule.

**Toxicity**

Acute toxicity LD50: 2g / kg

Chronic toxicity: none at 1g / kg on 6 months

Mutagenicity: non-mutagenic (AMES). Salmonella t., and E. Coli also controlled.

**Safety**

A number of clinical studies investigating the efficacy of Forslean® for body composition management have been conducted, and parameters related to safety have been monitored. No significant changes in average systolic and diastolic pressures (12 weeks, 60 volunteers). None even on thyroid hormones.

There is a significant positive change (p<0.05) in the concentration of HDL.
Cococin is The Nourishment Factor® that provides a valuable nutrient pool for enhancing food and beverage, as well as cosmetic product formulations (see in the cosmetic part). Cococin can be safely used in oral care as well as lip care compositions.

Cytokinins and several important minerals in Major (mm/l: Ca,K,Mg,Na, ), or Minor (μm/l: B,Mn,Zn,…) or trace quantities (nm/l: Al, Cu,Mo,…) are found in coconut water.

The double-blind clinical study against placebo on 95 women for 1 month demonstrates its effectiveness.

- Increase urinary frequency (the subjects go to the toilet more often, a perfect marker of efficacy for subjects) 76,92% of the women who took ELIMREAL® under its tablet form observed an increase of their daily urination after 28 days.

- Increase volume of urinary excretion of the day, thus participating in de-congesting and detoxifying the body 58,34% of the women who took ELIMREAL® under its tablet form observed an increase of their 24h urinary volume after 14 days.

Coconut water, the liquid endosperm of green coconuts (Cocos nucifera), is a refreshing natural beverage, an oral re-hydrating agent, and a supplement in nutrient media for tissue culture. Cococin is even more than that...

Coconut water, the liquid endosperm of green coconuts (Cocos nucifera), is a refreshing natural beverage, an oral re-hydrating agent, and a supplement in nutrient media for tissue culture. Cococin is even more than that...

The natural patented proprietary formulation of 6 plant extracts (seeds and flowers), clinically proved for water elimination and detoxification. Water soluble, it’s the new solution for uses in beverages, sticks, as well as - or course - tablets.

ElimReal is covered by a patent for slimming applications, and promotes renal elimination functions (excretory function of the kidneys) / urinary elimination /urinary volumes, so works on detoxification and slimming.

ElimReal is supported by very strong allegations, especially linked to the contribution of fennel extract.

Recommended dosage / proofs of efficacy: a randomized clinical double blind versus placebo study demonstrated the efficacy of Elimreal at the dose of 805 mg/day)
Rhodiolife® and Muscle Soreness
Sabina's DigeZyme® shows benefit for delayed onset muscle soreness in published study. It was shown to have the potential for more rapid recovery from Delayed Onset Muscle Soreness (DOMS) in a study published in Sports Nutrition and Therapy: Multi−Enzyme Complex for the Management of Delayed Onset Muscle Soreness after Eccentric Exercise: A Randomized, Double Blind, Placebo Controlled Study. DigeZyme® is the proprietary well-known blend of non-animal enzymes. Beside the use to assist digestion, it was shown to have the potential for more rapid recovery from Delayed Onset Muscle Soreness (DOMS) in a study published in Sports Nutrition and Therapy: 20 healthy male subjects, DOMS compared to placebo.

Boswellin® osteoarthritis of the knee
Boswellin Super, our Boswellia serrata extract at 30% AKBBA, was found to alleviate knee pain in healthy adults in a new study. Results of the randomized, double-blind, placebo-controlled trial, published in the European Journal of Biomedical and Pharmaceutical Sciences, also suggest the boswellia extract inhibited secretion of hyaluronic acid into blood. In a double blind vs placebo controlled trial, results with Boswellin® shows great efficacy in the management of osteoarthritis of the knee. X-Ray of knee shows it increase the space between the knee joints. The pain also decreased, more and longer than with Valdecoxib. Different other parameters have been controlled (WOMAC, HS-CRP, etc...).

Rhodiolife® and the immune system
The Rhodiola extract Rhodiolife® has clearly demonstrated its ability to protect cells from viral infection. This is the first time shown to be effective in the activation of the human immune system - Ahmed M, et al (2015) «Rhodiola rosea Exerts Antiviral Activity in Athletes Following a Competitive Marathon Race». Front Nutr. Jul 31;2:24.). Rhodiolife® improves memory and increases brain activity

Rhodiola rosea is known to improve attention and cerebral performances. On 2016, Polinat has conducted new studies: Electroencephalographic studies (EEG) showed that animal supplementation with Rhodiolife® have an increased neurotransmitter production in the studied areas. This effect lasts at least for 5 hours until the end of measurements, and so even more. Besides of a stimulatory effect, the results indicate an improvement of memory and an increased activity in brain regions related to motivation and reward.

Preserved actives from Pomegranate
P40P™ is the unique carrier-free Pomegranate extract standardized to the whole spectrum of the real actives offered in pomegranate. P40P™ brings the punicosides and more specifically the highly potent punicagallins (ellagic acids are only the metabolized compounds of those ellagitannins across the mitochondrial membrane), the highly active carbonic anhydrase inhibitor and the major player behind the antioxidant capacity of pomegranate juice. P40P™ is soluble in water and has high bioavailability.

Bio-efficace SOD GliSODin® and oncology
Different studies have shown the great interest of our clinically proven enhanced SOD and oncology / radiations. It includes recent published 1 "Impact of Superoxide Dismutase-Gliadin on Radiation-induced Fibrosis" and 'stress to γ-radiation'. GliSODin® has been also evaluated for its prevention of inflammation of benign fibrosarcoma cells, and effective role in azoxymethane-induced colon cancer in animal model suggesting it can act as an effective chemo-preventive agent.

GliSODin® in accelerating symptom relief in children with allergy
In the present randomized, placebo - controlled, double-blind clinical trial, the clinical efficacy of GliSODin® in accelerating symptom relief in children with allergic asthma and house dust mite allergy (receiving house dust mite immunotherapy) was demonstrated. Forty subjects aged 6–17 years old with asthma, tested positive for house dust mite allergy on skin prick test, and received immunotherapy were enrolled in this study. "Use of Superoxide Dismutase in Accelerating Symptom Relief in Asthmatic and House Dust Mite Allergic Children Receiving House Dust Mite Immunotherapy", Anang Endaryanto, Zahrah Hikmah, Arianyo Harsono

Curcuma C3 Complex® - Body fat and interleukin-1β
In an animal study on HDF (high fat diet)-fed mice extending 53 weeks, the scientists concluded that the nutrient combination, curcumin-piperine, works well to reduce total body fat, reduces cellular aging as indicated by preserving telomere length, and enhance the CR effects for the prevention of metabolic syndrome by reducing the low grade chronic inflammation that always persists in obese conditions.

Curcuma C3 Complex and metabolic syndrome
A significant study on Curcumin C3 Complex® (in combination with Bioperine®) in patients with metabolic syndrome has been published on end of 2014, showing the significantly greater effect of Curcuminoids in reducing the serum concentrations of LDL-C, non-HDL-C, total cholesterol, triacylglycerides and Lp(a), when serum HDL-C concentration was elevated significantly. Serum sdLDL levels were comparable (randomized, double-blind, placebo, 117 patients, 8 weeks).

100% Natural and ORAC > 1 200 000
FruitOx™ is the ingredient developed by Nektium with the idea of a fruits-based, water soluble and antioxidant natural extract, offering a wide and effective spectrum of anti-radical properties and stimulation of cellular defenses. Besides other proved properties, FruitOx™ has been controlled at its ORAC value of 1 259 340 (Trolox equivalent / 100g).

Some of the last Sabinsa's newsroom
Shagandha
Sabinsa Shagandha™ Ashwagandha Root Extract 2.5% Designed to Meet USP Monograph, Verified by Prominent Botanical Testing Expert Alkemist Labs

Nigellin
Sabinsa's Nigellin™ Black Cumin Seed Extract Identified as a Potent Favorable Immunomodulation in Asthma Inflammation

Lactospore
Sabinsa’s Shelf Stable Probiotic LactoSpore® May Improve Cholesterol Levels, Study Suggests

Research on Flow Cytometry as an Effective Test Method to Assess Viable Spore Count in LactoSpore®

C3 Complex
New Diabetic Research on C3 Complex® and Bioperine® Combination Published

Research on Curcumin’s Positive Effects on Microbiome

DigeZyme®
Demonstrated Efficacy in Management of Dyspeptic Symptoms with Functional Dyspepsia: Published Clinical Study

Experiments presented in Experimental Biology Meeting 2016, San Diego showed a clear synergy in action in reducing cancer cachexia in MAC-16 colon tumor-bearing mice. This combination Omega-3 EPA and C3 Complex is expected to attenuate weight loss caused by health conditions, and improve quality of life. [Abstract, the FASEB Journal]
The plants decree has been published July 17th, 2014 «laying down the list of plants, other than mushrooms, authorized in food supplements and their conditions of use». You’ll find here below a reading of the publication - especially annexes II et III

is applicable when the plant preparation cannot refer to an existing and traditional use enough to guarantee the safety of a plant preparation (or food supplements), as it exists and has existed on the market.

Thus, a plant extract may be traditionally produced in a PER of 15:1 and by using a high solvent (eg, pure ethanol). It is this extract which is known, and can prove its safety - and so would need an Annex III. Speaking of food safety, we can refer only to what is clearly known.

Collect of information
The traditional use can be justified by various ways, including probably monographs, references in pharmacopoeias (with specific description of the extract and not only of the plant), references to EMA, relation to the WEU (Well Established Use), or from pharmaceutical agency, etc... describing the extract (plant part, solvents and concentration processes, ratio), and with the Annex II to confirm that the plant extract that is offered is conform to traditional extract.

From Risk analysis to Annex III
3 possible cases
The preparation is described in the literature to demonstrate the history of use and safety. It is sufficient to indicate.

The preparation is not described in the literature but the argument shows that the extract is equivalent to one described preparation. It should provide the rationale for comparing the described preparation and its extract.

The preparation is not described in the literature and no equivalent that can be demonstrated: it is necessary to bring the safety analyzes - including toxicology - in relation to the identified hazards to be indicated in Annex III.
Notre Lecture de l’Arrêté Plante

L’arrêté plantes a été publié le 17 juillet 2014 dans le journal officiel : « Arrêté du 24 juin 2014 établissant la liste des plantes, autres que les champignons, autorisées dans les compléments alimentaires et les conditions de leur emploi ». La liste des champignons, ainsi sans doute que les huiles essentielles, fera l’objet de dispositions ultérieures.


Annexe I
L’Annexe I liste les 540 plantes autorisées (à la date de Juin 2014), avec : Leur nom scientifique et la famille : plusieurs cas de synonymes existent. Au besoin, vous pouvez également vous aider du site www. theplantlist.org
Leur nom vernaculaire
Les parties utilisées
Les substances à surveiller : il ne s’agit pas nécessairement de substances qui doivent être absentes ou non détectables, mais des substances que l’arrêté demande de vérifier spécifiquement.
Les restrictions d’utilisation : essentiellement des étiquetages spécifiques de mise en garde (enfant, femmes enceintes), parfois du process.

Annexe II
L’Annexe II présente les informations susceptibles d’être communiquées par les opérateurs du secteur afin de bien comprendre la préparation. A ce titre, une modèle a été proposé par Synadiet et Food Supplements Europe. Le modèle est déjà décomposé et peut être adapté par les parties. Il n’y a pas obligations de compléter chaque champ, s’agissant bien d’un modèle :

Plante (ie. Matière première)
Description de la plante : Nom scientifique, vernaculaire, famille, monographie existante, risque de falsification (par une autre plante similaire par exemple)

Méthode de culture (origine géographique, mode de culture, accords spécifiques, licenciés, réglement 338/97 et de collecte (parties de la plante collectée, mécanique ou manuelle, nettoyage, séchage)

Partie de la plante utilisée et son identification (contrôles, marqueurs, pureté)
Procédé de production (partant de la plante)
Localisation géographique du process (unité, producteur, préparation avant process (bruyage, séparation, …)
Description du procédé d’extraction depuis la matière première (ex. s’il s’agit d’une extraction depuis une oléorésine, il convient de mentionner le process avant) : solvants (concentration, RQ) pour l’extraction, purification, ainsi qu’une autre étape (élimination de composés ou de résidus).

Autres informations liées au process, lots
La « Préparation de plante »
Dénomination, PER (Plant Extract Ratio : rapport entre le ratio final après extraction et avant tout autre ajout, et la quantité initiale de plante extraite, en rapport sec/sec s’il s’agit d’un extrait sec), DER (Drug Extract Ratio : rapport entre le ratio final de la préparation et la quantité initiale, donc après ajout des supports, …). L’extrait produit sans support à un PER=DER. Parfois indiqué, le NER correspond au ratio natif.
Composition intégrale (en %, avec la nature et l’objet de chaque constituant, critère de pureté des additifs - 231/2012)
Standardisation (marchés, actifs) avec pour chacun la méthode d’analyse détaillée (validée ou non) et le standard utilisé comme référence
Substances à surveiller : en référence à l’annexe I ou toute autre molécule susceptible d’être surveillée

Annexe III
L’Annexe III est applicable dès lors que la préparation de plante n’a pas un usage existant et traditionnel suffisant pour justifier de la sécurité d’une préparation de plantes, tel qu’elle existe et existait.
La traditionalité porte donc sur l’extrait tel qu’il est connu ou défini – et il convient de démontrer que la préparation de plante est bien conforme à la préparation traditionnelle. Le texte de l’Annexe III démontre qu’il est faux de penser qu’un extrait à l’eau ou à l’éthanol faible, ou avec un faible PER (alors que l’extrait dit traditionnel serait obtenu par une autre voie), permettrait de s’affranchir d’une Annexe III—l’inverse étant tout aussi vrai.

Quelques soient les cas, l’analyse de risque doit être effectuée.
Il est impossible de fournir une règle stricte applicable à tous extraits de plantes existants, mais une bonne explication de votre position bien étayée de données (techniques, chimiques, réglementaires) et en accord avec le texte publié ne peut que tomber dans une oreille réceptive. Synadiet a travaillé à un guide ainsi qu’à une aide à la décision.

Collecte des informations
L’usage traditionnel peut être justifiée par différents moyens, dont les monographies, les rapports de ventes en quantités suffisamment significatives depuis - peut-être – plus d’une ’une génération’, le référencement dans des pharmacopées nationales (avec description spécifique de l’extrait et pas seulement de la plante), des références EMA, en rapport au WEU (Well established Use), voire des journaux de l’agence (cahiers n°3), etc… décrivant l’extrait (partie de plante, solvants et leurs concentration, process, ratio). L’annexe II permettra de confirmer que l’extrait de plante qui vous est proposé est bien conforme à l’extrait traditionnel.

De l’analyse de risque à l’Annexe III : 3 cas
La préparation est décrite dans la littérature, permettant de démontrer le recul d’utilisation et sa sécurité. Il suffit alors de l’indiquer.
La préparation n’est pas décrite dans la littérature mais l’argumentaire démontre que l’extrait proposé est équivalent à une préparation décrite. Il convient d’apporter l’argumentaire permettant la comparaison à la préparation décrite.
La préparation n’est pas décrite dans la littérature et aucune évolution ne peut être démontrée : il convient d’apporter les analyses de sécurité - notamment toxicologiques - en rapport avec les dangers identifiés, à indiquer dans l’annexe III.
This is a non-exhaustive list of the number of decrees published by the European members, the European Parliament, the Council and Commission Regulations relating to food supplements. Each link of the chain from the early grower of the plants to the end-product must carefully check that its product fulfills the regulation and totally satisfy the safety needs.

**Plant names**

Different countries, associations, working groups, etc... are working on the harmonization of plant and plant extracts in Europe, as for instance Syna-diet, Federsalus, EHPM, etc... It works towards developing an appropriate regulatory framework throughout the EU for its members’ products.

**Synonyms accepted for plant**

The Plant List is a working list of all known plant species. It aims to be comprehensive for species of Vascular plant (flowering plants, conifers, ferns and their allies) and of Bryophytes (mosses and liverworts): see www.theplantlist.org/

**Protection (Cites)**

EC No 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein

**Food supplements**

**Directive 2002/46/EC**


**Organic**

EC 834/2007 and its implementing regulation of the European Commission 889/2008 gives the very strict rules for Organic products. These regulations define rules at all stages of production, processing, labeling, control and import from third countries.

**Contaminants**

**General purposes**

EC 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs

**Toxins**

EU 1259/2011 of 2 December 2011 amending Regulation EC 1881/2006 as regards maximum levels for dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs - aflatoxin B1, total aflatoxins, Ochratoxin A, Patulin, Zearalenone, Fumonisins - and most of other toxins are in 1881/2006.

**PAH**

EU 2015/1933 of 27 October 2015 amending Regulation EC No 1881/2006 as regards maximum levels for polycyclic aromatic hydrocarbons in cocoa fibre, banana chips, food supplements, dried herbs and dried spice. Usually:

- Benzo(a)pyrene ≤10 ppb
- Sum of Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene and Chrysene ≤50 ppb

**Heavy Metals**

EC 629/2008 of 2 July 2008 amending Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs (especially heavy metals). The limits vary depending on the origin and the use. However, we usually refer to:

- Total Heavy metals: usually 10 ppm
- Lead: usually 1 or 3 ppm (3 ppm in subsection 3.1.18)
- Arsenic: usually 1 ppm
- Cadmium: usually 1 ppm (3.0 for seaweed derivatives)
- Mercury: usually 0.1 ppm

**Pesticides**


**Other Quality specificities**

**Allergen**


**Bacteriology**

Usually Eur. Ph. 5.1.8 (limits) and 2.6.12/2.6.31 (methods)

**GMO**


**Nano technology / material**

Commission recommendation of 18 October 2011 on the definition of nanomaterial - 2011/696/EU

**Novel Food**

Novel Food is defined as food that had not been consumed to a significant degree by humans in the EU before 15 May 1997, when the first Regulation on novel food came into force. ‘Novel Food’ can be newly developed, innovative food, food produced using new technologies and production processes, as well as food which is or has been traditionally eaten outside of the EU. The Novel Food Catalogue is a non-exhaustive list and serves as orientation. A plant may be not novel food when its extract is. EC 2002/46 of 10 June 2002, Substances

Substances are more and more concerned in Europe, although each country may still have its own considerations, and although the definition of a substance is not fully clear yet. France publishes its Order regarding the use of other substances in supplements. It confirms that the use of substances other than those listed in Annex I, which lays down specific conditions of use for four ingredients, may be used in supplements provided they are not novel. NOR: ECFC1518714A on legifrance.gouv.fr
Sabinsa manufactures and markets phytonutrients and standardized herbal extracts, specialty & fine chemicals, and organic intermediates used in the nutritional, cosmetics, pharmaceutical, intermediary chemicals and food industries.

Founded in 1988 by Dr. Muhammed Majeed, Ph.D., Sabinsa is a company dedicated to the principles of tradition, innovation and research. Sabinsa’s efforts have begun to earn the company vast recognition, in addition to growing sales. Sabinsa confirms everyday its position of leader on botanical extract, and at the origin of so many objectivized products (Bioperine from Black Pepper, Garcinia Cambogia, Coleus Forslean, etc...).

Sabinsa is a group which includes all the needed activities to provide high quality botanical extracts - and not only ayurvedic plants. Sabinsa has a research and development facility in India and near Princeton, NJ and six manufacturing facilities in and around Bangalore, India, and in Utah. Today, Sabinsa manufactures over 100 such plant-derived products, besides some synthetic and hemisynthetic products for perfumery. Sabinsa also provides custom manufacturing from lab scale to pilot / semi-commercial scale, and process development.

ISOCELL is at the cutting edge of scientific research in the field of aging, and oxidative stress in particular. That’s how they developed GLiSODin®, an oral grade of improved SOD. Based in Paris, Founded in 2001, ISOCELL has an international dimension, being present in over 30 countries. ISOCELL also hold several international patents (Europe, US, Japan) in these areas of research and development. Innovative products have been developed to strengthen the antioxidant and immune systems and protect the body at the cellular level against external stresses and aging. The products of the GLiSODin® line are manufactured in accordance with Good Manufacturing Practices (GMP)

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Founded in 1988 by Dr. Muhammed Majeed, Ph.D., Sabinsa is a company dedicated to the principles of tradition, innovation and research. Sabinsa’s efforts have begun to earn the company vast recognition, in addition to growing sales. Sabinsa confirms everyday its position of leader on botanical extract, and at the origin of so many objectivized products (Bioperine from Black Pepper, Garcinia Cambogia, Coleus Forslean, etc...).

Sabinsa is a group which includes all the needed activities to provide high quality botanical extracts - and not only ayurvedic plants. Sabinsa has a research and development facility in India and near Princeton, NJ and six manufacturing facilities in and around Bangalore, India, and in Utah. Today, Sabinsa manufactures over 100 such plant-derived products, besides some synthetic and hemisynthetic products for perfumery. Sabinsa also provides custom manufacturing from lab scale to pilot / semi-commercial scale, and process development.

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WHAT IS AN EXTRACT?

A plant extract is a substance or an active with desirable properties that is removed from the tissue of a plant, usually by treating it with a solvent, to be used for a particular purpose. Extracts may be used in various sectors of activities: Food and functional properties for foodstuffs (antioxidant, texturizers, etc.), Processors – chemical replacements, pharmaceutical for therapeutic properties - preventive and/or curative – cosmetic for functional properties for beauty and well-being, etc…

Some sectors of activities clearly define an extract. For cosmetic uses, for instance, a "cosmetic product" shall mean any substance or preparation intended to be placed in contact with the various external parts of the human body (epidermis, hair system, nails and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance and/or correcting body odors and/or protecting them or keeping them in good conditions.

An extract may be common to different sectors based on its chemical description, although different sectors mean different technologies (different forms, solubility, stability), different regulation, different claim, different problematic. As representing manufacturers, we feel very concerned by the request of the end-users and may adapt its proposal.

An extract must also respect:
- The quality constraints in terms of irradiation, allergens, toxicity, adulation, activity, stability, sustainable resources, traceability, etc…
- The chemical and physical request in terms of description (TLC, physical recognition, genotype) as well as heavy metals, nitrates, solvents, residues such as pesticides or residual solvents, additives, foreign bodies, etc…
- The regulation in terms of assay, solvents, environmental components, legal uses, registration or notification (reach, organic grades…), labeling, claims, certification (GMP, ISO), etc…

Raw Material

It's important to understand that an extract starts from the raw material: the plants. The identification of a good source includes the description of areas and type of collect, the capacity of collect, the use and not-used area and the impact of our needs for extraction to guarantee a sustainable source. It's so important to analyze the supply chain starting from the collect, including the exporters and the different middle men, which may cause variability on the quality besides the natural variability linked to the weather and the soils. Finally, an overview of the needs of the local citizens and the risk (government, war, weather, etc…) allows to find the right partners for the long run, and minimize the impact on the nature while checking the return to the people.

Preparation

All equipment may not use the same materials and the quality of the extract may vary depending on the preparation of the raw materials. This goes from the cleaning to avoid foreign bodies to the cut or grinding. Dried hardwoods are more common, with the risk to put out some gaseous components and the benefit that the plant does not start to hydrolyze or produce non-needed metabolites. Preparation may also consist in thawing (fruits may be frozen for instance), cooking (to produce aromas for instance), decoating, destemming, or even enzymatic reaction before the extraction.

Solvents

A solvent must comply with the local regulation, be effective and be selective enough (when needed). Most common are Water, Ethanol, Ethyl acetate, CO2, Methanol, Aceton, Acetic acid, Hexane… the choice of the solvent will impact on the yield of extraction (acquitance with the targeted active) in the full respect of the request from customers and environmental components (depletion of the ozone layer, soil in atmosphere, groundwater pollution, air pollution).

On a chemical point of view, the best solvent may be chosen after looking at the polarity of the solvent: an electric dipole is a separation of positive and negative charges, characterized by their dipolar moment, a vector quantity (Coulomb. meter or Delta).<ref>
- (cf. : Van der Waals Forces).
- Apolar and low polar solvent, mainly lipophilic characteristic, with a moment from 0 to 1.5 (Hexane, cyclohexane, dimethoxymethane, Chloroform, Ethyl ether, phenol)
- Polar aprotic solvent, mainly hydrophilic characteristic

Protoic solvent (a protoic solvent is a solvent that has a hydrogen atom bound to an oxygen or a nitrogen as in an amine group). Polar protoic solvents are solvents that share ion dissolving power with aprotic solvents but have an acidic hydrogen. These solvents generally have high dielectric constants and high polarity.

Moment of most common solvents : Hexane (0), Ethanol (1.69), Methanol (1.70), Ethyl acetate (1.78), water (1.85), aceton (2.88). Depending on their miscibility, solvents may be used together (combined solvents, or separation from one solvent to another solvent).

Extraction process

The process must generally be simple, fast, economic, in compliance with the local regulation, effective and selective when needed. However, certain steps may require a long time of process.

Pressing: One of the more usual extraction (the morning orange juice), pressing may be used complementary or prior to other process, for instance to prepare the materials, dry it, etc… It causes mechanical perturbation and gives a liquid product.

Distillation and hydro-distillation: By direct heating or steam, this process is mainly used for oils and volatile components. It may cause degradation (oxidation, hydrolysis, enzymatic reaction, …).

Solid / Liquid extraction: It consist in the extraction or separation of one active or more from solid materials working on the solubility in a liquid to obtain the soluble part and the insoluble part, or fractionation of an homogenous solution. The typical Solid / Liquid extractions are:
- Maceration : solid in solvent, room temperature
- Digestion: solid in solvent, over room temperature, below ebullition
- Decoction (equalflux): solid in solvent, temperature of ebullition, then cooling of the suspension
- Elution, leaching (Lixiviation) : solvent goes through the solid
- Sublimation: always with cold, fresh and new solvent
- Percolation: solvent goes on and through the solid
- Concentration: solvent goes on and through the solid

Concentration

This step consists in the increase of the dry matter content to facilitate the further steps, using for instance evaporation.

Separation / Purification

Different type of separation, based on size, weight, charge, hydrophilic / lipophilic capacity (separation liquid / liquid), solubility, volatility (liquid / steam), etc…

Filter press: the filter press uses increased pressure to maximize the rate of filtration and produce a final filter cake with a low water content.

Membranes, Ultra filtration, Nano filtration: membrane filtration or cross-flow filtration technology which ranges between ultrafiltration (UF), nanofiltration (NF) and reverse osmosis (RO). The fundamental principle of Nanofiltration membrane technology is the use of pressure to separate soluble ions through a semi permeable material.

Liquid / Liquid: Liquid-Liquid Extraction (LLE) is a method used in the recovery of a key component from a multi-component stream using an immiscible solvent. The two steams are contacted and separated. The solvent absorbs the key component stripping it from the original stream.

Crystallization

Crystallization is the (natural or artificial) process of formation of solid crystals precipitating from a solution. Crystallization is also a chemical solid-liquid separation technique, in which mass transfer of a solute from the liquid solution to a pure solid crystal phase occurs. The crystallization process consists of two major events, nucleation (the solute molecules dispersed in the solvent start to gather into clusters, on the nanometer scale) and crystal growth (subsequent growth of the nuclei that succeed in achieving the critical cluster size). Nucleation and growth continue to occur simultaneously while the supersaturation exists.

Single-solvent recrystallization:
- «compound A» and «impurity B» are dissolved in the smallest amount of hot solvent to fully dissolve the mixture, thus making a saturated solution. The solution is then allowed to cool to different solubility of compounds in solution drops to compound dropping (recrystallizing) from solution.

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slower the rate of cooling, the bigger the crystals formed. The solid crystals are collected by filtration.

- Multi-solvent recrystallization: similar to the single-solvent but where two (or more) solvents are used. The proportion of first and second solvents is critical. Possible removal by distillation or by an applied vacuum.

- Hot filtration-recrystallization: separate <compound A> from both impurity B and some insoluble matter C.

- Seeding: this can be spontaneous or can be done by adding a small amount of the pure compound (a seed crystal)

Chromatography

Chromatography is used for separation of mixtures. A mixture dissolved in a "mobile phase" passes through a stationary phase, which separates the analyte. The ultimate goal of chromatography is to separate different components. The stationary phase or adsorbent in column chromatography is a solid. The most common stationary phase for column chromatography is silica gel, followed by alumina. Also possible are ion exchange chromatography, reversed-phase chromatography (RP), affinity chromatography or expanded bed adsorption (EBA). The mobile phase or eluent is either a pure solvent or a mixture of different solvents. It is chosen so that the retention factor. The Van Deemter equation in chromatography relates the variance per unit length of a separation column to the linear mobile phase velocity by considering physical, kinetic, and thermodynamic properties of a separation.

- Column chromatography: the stationary bed is within a tube. The particles of the solid stationary phase or the support coated with a liquid stationary phase may fill the whole inside volume of the tube (packed column) or be concentrated on or along the inside tube wall leaving an open unrestricted path for the mobile phase in the middle part of the tube (open tubular column). Differences in rates of movement through the medium are calculated to different retention times of the sample.

- Flash column chromatography: the solvent is driven through the column by applying positive pressure. This allowed most separations to be performed in less than 20 minutes, with improved separations.

- Thin layer chromatography (TLC) is similar to paper chromatography. However, instead of using a stationary phase of paper, it involves a stationary phase of a thin layer of adsorbent like silica gel, alumina, or cellulose on a flat, inert substrate. Compared to paper, it has the advantage of faster runs, better separations, and the choice between different adsorbents.

- Ion exchange chromatography uses ion exchange mechanism to separate analytes. It uses a charged stationary phase to separate charged compounds, including amino acids, peptides, and proteins. In conventional methods the stationary phase is an ion exchange resin that carries charged functional groups which interact with oppositely charged groups of the compound to be retained. Ion exchange chromatography is commonly used to purify proteins using FPLC (fast protein liquid chromatography).

- Chiral chromatography involves the separation of stereoisomers.

HPLC (High Pressure Liquid Chromatography) and LPLC (low pressure). Preparative high performance liquid chromatography is similar to analytical HPLC but features increased injected mass with possibility to "stack" injections automatically. There's technically no product limitation, but usually expensive.

Semisynthesis

Hemisynthesis or Semisynthesis or partial chemical synthesis is a type of chemical synthesis that uses compounds isolated from natural sources (e.g., plant material) as starting materials. These natural biomolecules are usually large and complex molecules. This is opposed to a total synthesis where large molecules are synthesized from a stepwise combination of small and cheap (petrochemical) building blocks. It is also possible that the semisynthetic derivative outperforms the original biomolecule itself with respect to potency, stability or safety. Drugs derived from natural sources are usually produced by harvesting the natural source or through semisynthetic methods.

Drying

Drying means putting out the liquid. Dryers may be atmospheric (spray dryer, fluid bed dryer, etc.), or vacuum (belt dryer, tray dryer, etc.).

Spray Dryer

By definition, spray drying is the transformation of feed from a fluid state into a dried form by spraying the feed into a hot drying medium. The process is a one step continuous operation. The feed can be either a solution, suspension or a paste. The spray dried product conforms to powder consisting of single particles or agglomerates, depending upon the physical and chemical properties of the feed and the dryer design and operation.

Vacuum dryer

At constant volume, when the pressure decreases, the boiling temperature decreases. Evaporation at a lower temperature makes possible to get a preserved product. In addition the high rate of heat efficiency is said to result in the best drying performance in the world. The drying process is greatly accelerated due to the fact that the loaded material makes contact with the heating panel in the form of a thin layer. Vacuum drying does not cause the emission of any exhaust gases or hazardous smells.

Lyophilization or cryodesiccation

A lyophilizer needs to cool (for freezing and trapping water), create a vacuum (to sublime water), generate heat and transfer heat energy to the product.

Others: Rotary Drum Dryer: Wet material is introduced from one end of the dryer, and then stirred evenly by the air of the inner barrel. Plate Dryer: kind of high-efficiency conductive and continuous drying - Blade Dryer: drying or cooling paste-like, granular, powdery and pulpy material - etc...

Before Packing

Further steps before packing consist in Milling, compacting (to increase the bulk density for instance), grinding (to tune the size reduction in a safe way, especially with fragile particle or components) and then homogenization and standardization: those steps guarantee a optimized repartition and the correct and needed content of actives as mentioned in our CoA (certificate of analysis).
Personal Care
STANDARDIZED PLANT EXTRACTS
Olepent®
Firming and repairing peptide

Olepent® is the last innovation from Sabinsa, 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. The over activity of elastase and collagenase enzymes result in wrinkles, fine expression lines, thinning of skin, hyperpigmentation, dark circles of eyes and premature aging. The triterpenoid peptides have dual action for skin aging and collagen insufficiency. These act by inhibiting oxidation and excess activity of elastase and collagenases. Addition of peptides which augment collagen and other matrix protein, triterpenoid peptides provide complete protection against anti-aging. Similarly, oleanolic acid act as an effective agent in reducing the signs of aging due to oxidation, collagen insufficiency and over activity of enzymes like elastase and collagenase.

Centellin®
Centella extract and cracked feet

A new study published has evaluated the efficacy and safety of a formulation with Centellin® CG in the management of cracked heels through cell culture and human clinical studies. It shows a beneficial effect on cell proliferation, collagen synthesis and significantly improves wound healing in the fibroblast scratch wound model. It also increased skin moisturizing. The findings demonstrate that CCFC helps in healing of cracks, reducing scaling and pain. None of the volunteers experienced any hypersensitivity reactions. Therefore, it may be concluded that the CCFC is safe and efficacious in management of foot cracks.

LactoSporin®: Novel Probiotic Metabolite For Skin and Hair

Sabinsa announces the introduction of LactoSporin®, an ingredient for cosmeceutical products that has anti-microbial, anti-oxidant, 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. 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 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®.

Glabridin 98 or Pterowhite ?
Skin lightening

We offer from 4% Glabridin licorice extract, to a unique lyophilisation process to ensure that the solids retain optimum biological activity. It is non-irritating to the skin and rich in nutrients that provide long-term moisturization and support blood circulation. “The Nourishment Factor”. Cococin® targets cell growth (in the hair follicle), as well as inhibiting 5-α reductase. It is recommended for use in regenerative skincare products and preparations, thanks to its cytokine and mineral concentrations. It also improves skin elasticity and tone and decrease roughness, while nurturing keratinous tissue to potentially reduce the appearance of the signs of aging.

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Cococin®
Fresh and Long moisturizer, Hair

Cococin® is a tender coconut extract, produced by a unique lyophilisation process to ensure that the solids retain optimum biological activity. It is non-irritating to the skin and rich in nutrients that provide long-term moisturization and support blood circulation. “The Nourishment Factor”. Cococin® targets cell growth (in the hair follicle), as well as inhibiting 5-α reductase. It is recommended for use in regenerative skincare products and preparations, thanks to its cytokine and mineral concentrations. It also improves skin elasticity and tone and decrease roughness, while nurturing keratinous tissue to potentially reduce the appearance of the signs of aging.

Boswellin®
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 from Sabinsa, Boswelia serrata Roxb extract 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. 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. Changes in ‘modified’ Psoriasis Activity Severity Index (PASI) & above biomarkers from the baseline values along with remissions in clinical lesions observed through photographic images were considered for efficacy evaluation. The evidence shows superior anti-inflammatory responses rates, demonstrating that this non-toxic treatment is beneficial for those suffering from this condition. Study: “Clinical evaluation of AKBBA in the management of psoriasis”

Tetrapure®
Skin, Hair & Nails

Tetrapure® is a proprietary natural pterostilbene ingredient for cosmetic application, extracted from the dried heartwood of Pterocarpus marsupium. It functions as a skin conditioning agent with skin lightening and antioxidant properties. Pterostilbene is a double-methylated version of resveratrol exhibiting a higher bioavailability as it is more easily transported into the cell and more resistant to degradation and elimination. It also enhances the properties produced by resveratrol.

Tetrapure® shows great anti-myosis 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 100 cfu / ml. As other actives of the family of THC, Tetrapure shows tyrosinase inhibition as well as great inhibition of Melamin.
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 European 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, Inoreal, … 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’.

BECARRE Natural
149 rue d’Estienne d’Orves
F-92140 Clamart
contact@becarre-natural.com
www.becarre-natural.com
**Tetrapure®**

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

- **Source**: 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**
- It completely inhibits the growth of dermatophytes Trichophyton rubrum, Microsporum gypseum and Epidermophyton floccosum
- It enhances the activity against Malassezia furfur - all tested concentration
- 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 IC50 µg/ml - so much better than Kojic acid (7) or Arbutin (100).

**LactoSporin®**

**Novel Probiotic Metabolite For Skin and Hair**

- **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)
- **Pale yellow to brown color clear to hazy liquid with characteristic odor**
- **Protein**: Bacillus Ferment Filtrate Extract
- **Antimicrobial activity**: nlt 200 AU / ml against Micrococcus luteus
- **Launched on 2019**
- **Olepent®**

**Unique patented pentapeptide : Firming and repairing**

- **Inci**: Oleanoyl sh-Pentapeptide-4
- **Off white powder, slightly hygroscopic**
- **Launched on 2019**
- **Peptides are the newest ingredients in anti-ageing skin care that are highly effective and are utilized in the most premium care products. Olepent® has a dual mechanism both as a firming and repairing peptide**

**Firming Peptide**
- Stimulated the skin’s natural production of collagen
- Stimulates the growth of follicular cells and by increasing the proliferation of dermal papilla cells and by inhibiting 5α-reductase activity.

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

**Glabridine 98%**

**Skin whitening, Anti-inflammatory**

- **Source**: Glycyrrhiza Glabra
- **Inci**: Glycyrrhiza Glabra (Licorice) Root Extract
- **Bio-active ingredients**: 4% to 90% Glabridine (98% in partnership)
- **Glabridine is the main compound in the hydrophobic fraction of licorice extract, It is known for its beneficial effects on the skin due to its anti-inflammatory and antioxidant properties. In addition, Glabridine greatly inhibits melanogenesis. Some researchers have established that this effect may be due to the inhibition of tyrosinase activity, and Inhibition of the production of active oxygen species.**
**Venocin® 90**

**Blood Circulation, Wound Healing Effects, Anti-inflammatory**

**Source:** Aesculus hippocastanum  
**Indi:** Aesculus hippocastanum Seed Extract  
**Dose:** 0.2-1% w/w  
**Bio-active ingredients:** 10% b-Glucogallin, 50% gallates (tanins)  
**Skin Whitening:**  
Skin whitening by inhibition of melanin formation, stronger melarain 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 321μg/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  
**Soroac:** 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.  
**S-Alpha reductase inhibitory activity (about 80%)**

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**Saberry**

**Water Soluble Skin Lightening Agent, Hair Care**

**Source:** Emblica officinalis fruits (Amla)  
**Indi:** Emblica Officinalis Fruit Extract  
**Dose:** 0.2-1% w/w  
**Bio-active ingredients:** 10% b-Glucogallin, 50% gallates (tanins)  
**Skincare:**  
Skin whitening by inhibition of melanin formation, stronger melarain 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 321μg/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  
**Soroac:** 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.  
**S-Alpha reductase inhibitory activity (about 80%)**

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**Centellin CG**

**Wound Healing, Aged Skin, Dermal Itch, Cracked Feet and Heels**

**Source:** Centella asiatica  
**Indi:** Centella Asiatica Extract  
**Dose:** 0.5-2.0% in soothing creams / lotions  
**Bio-active ingredients:** 40% Saponins Triterpenes  
**Wound Healing:** 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. Recent studies (dec. 2016) has evaluated the efficacy and safety of a formulation with Centellin® CG in a foot care cream, and demonstrated that it helps in healing of cracks, reducing scaling and pain, without any reports of hypersensitivity reactions.

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**Bacopa**

**Skin Damage, Premature Wrinkles, Age Spots**

**Source:** Bacopa monniera Extract  
**Dose:** 3 x 50 mg (children) to 3 x 100 mg (adult)  
**Bio-active ingredients:** 20% and 50% total Bacosides (as A & B)  
**Hair Care:** Hair care for conditioning and repair

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**Cococin**

**Hair Growth, Moisturizer**

**Restore the Skin Health in Aged and Damaged Skin**

**Source:** Fresh tender coconuts Cocos Nucifera  
**Indi:** Cocos Nucifera (Coconut) Fruit Juice  
**Dose:** 0.5% - 2.0%  
**Cococin** is «The Nourishment Factor®» that provides a valuable nutrient reservoir of vitamins, minerals, RNA phosphates and aid in healthy cell growth and differentiation for additional skin restoration. Cococin is «The Nourishment Factor®» that provides a valuable nutrient reservoir of vitamins, minerals, RNA phosphates and aid in healthy cell growth and differentiation for additional skin restoration. Cococin can be safely used in oral care as well as lip care compositions. Cococon + Saberry, synergistic formulation to promote healthy hair growth granted patent for «Protective Compositions for Dermal Papilla Cells».

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**Xymenynic**

**Skin Firmer / Cellulite, Anti-Inflammatory, Hair Care**

**Source:** Santalum album seeds  
**Indi:** Xymenynic acid  
**Dose:** 0.05-2.0% in creams / lotions  
**Bio-active ingredients:** Xymenynic acid  
**Skin Whitening:** 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% Xymenynic acid shows an MSH® 90 efficiency” (CVI) of the skin (Hyaluronidase and Collagenase inhibition). Xymenynic acid improves the skin elasticity and minimizes the damage and imperfections linked to cellulite (orange peel aspect).

---

**SabiWhite**

**Skin Lightener, Evening Skin Tone, UVB Protectant**

**Source:** Curcuma longa  
**Indi:** Tetrahydrodiferuloylmethane  
**Dose:** 0.05-2.0% in creams / lotions  
**Bio-active ingredients:** 95% Tetrahydrocurcumin  
**Skin Whitening:** 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% Xymenynic acid shows an MSH® 90 efficiency” (CVI) of the skin (Hyaluronidase and Collagenase inhibition). Xymenynic acid improves the skin elasticity and minimizes the damage and imperfections linked to cellulite (orange peel aspect).
**Pomegranate Seed Oil**

*Moisturizing, Nourishing, Elasticity, Eczema*

**Source:** Punica granatum – seeds  
**Ind:** Punica Granatum Seed Extract  
**Dose:** 0.1% - 1%  
**Bio-active ingredients:** Punicic acid ≥ 80% (CLA)  
Remarkable ability to nourish, moisturize and repair the epidermis and improve skin elasticity.  
Pomegranate seed oil is commonly used in cosmetic products to revitalize dull or mature skin, assist with wrinkles, and to soothe minor skin irritations, due to its unique composition of fatty acids, mainly punicic acid (CLA). The high content of conjugated fatty acids in pomegranate oil gives it strong anti-inflammatory properties and makes it a highly beneficial ingredient in formulations intended to reduce swelling and ease muscular aches and pains. Pomegranate oil can promote pro-collagen synthesis and strengthen the epidermis. It provides relief from minor skin irritations and inflammation, including dry skin, eczema, psoriasis and sunburned skin.

**Rhodiola**

*Anti-ageing, Anti wrinkle, Sensitive, Sun*

**Source:** Rhodiola rosea – roots from Altai mountains under social responsibility program, more than 5 years aged – unique licence and partnership with Russia  
**Ind:** Rhodiola Rosea Root Extract  
**Dose:** 0.1%-0.3%  
**Bio-active ingredients:** Rosavins 3-15%, Salidroside 1-5%  
**Skin barriers:** Study (2008, *Journal of Cosmetic Dermatology*) showed that extracts of Rhodiola rosea improved the skin’s defensive barrier functions against the stress of ultra violet rays. Subjects of this study were classified as having sensitive skin.  
**Elastin:** increases components needed by the body to create elastin.  
**Collagen:** elevates the number of hydroxyproline and hexosamine molecules, needed to make collagen (dermis, 2nd layer).  
**Antioxidant:** pharmacological active compounds (esp. rosavins), which are able to assist the body systems with oxygen deprivation, stress and immune support - all important considerations for skin management.

**Pomegranate Seed Oil**

*Antioxidant, Anti-ageing, Lightening*

**Source:** Punica granatum – mashed fruits  
**Ind:** Punica Granatum Extract  
**Dose:** 0.5% - 5%  
**Bio-active ingredients:** Total punicosides ≥ 40%, Punicalagins A+B ≥ 30%, Total polyphenols ≥ 50%  
There are several cosmetic formulations that include an extract of pomegranate juice or oil. Pomegranate is rich in ingredients such as vitamins B5 and C, potassium, polyphenols etc., that enhance the beauty and life of skin. It is a good source of ellagic acid and antioxidants, which are helpful in destroying free radicals. It’s so a great remedy for skin that is damaged due to sun exposure or aging, to get smooth and youthful skin.  
Pomegranate is said to extend the life of fibroblasts, for the production of collagen and elastin. Collagen and elastin pump up the skin and render it elasticity. This in turn, keeps the skin youthful for years and minimizes the visibility of wrinkles.  
Natural pomegranate extract contains very few ellagic although it’s the usual mentioned assay, which is a metabolite by hydrolyzation of the punicalagin (1 punicalagin gives 2 ellagic acid). However, Ellagic acid has been studied orally for its activity as skin lightening.

**Fucoidan**

*Anti-ageing, Skin lightening, Skin protection*

**Source:** Laminaria japonica – whole plant  
**Ind:** Laminaria Japonica Extract  
**Bio-active ingredients:** Sulfo-Polysaccharides ≥ 40% (85% upon request)  
Further testing in rats confirmed that polysaccharides from Laminaria japonica protected from the oxidative damage induce by ionizing radiation.  

**Fucoxanthin [U-HPLC]**

*Antioxidant, Protection against UV induced damage in the skin, Anti-pigmentary activity*

**Source:** Undaria Wakame  
**Ind:** Fucoxanthin / Laminaria Japonica Extract  
**Dose:** 0.05-1.5%  
**Bio-active ingredients:** Fucoxanthin UPLC, Fatty acids (PUFA)  
Fucoxanthin pigmentary activity  
Antioxidant, Protection against UV induced damage in ultraviolet B-irradiated hairless mice, possibly through the antioxidant and anti-angiogenic effects of fucoxanthin: sunscreen for photoaging.  
Topical treatment with fucoxanthin prevents skin photoage and wrinkle formation.

**FruitOx®**

*In-vivo cellular antioxidant, ORAC > 1 000 000 µmol TE / 100g  
Water soluble, no carrier*

**Origin:** Nektium (Spain)  
**Source and Bio-active ingredients:** polyphenols and other actives compounds from plum, blueberry, apple, pomegranate, grape Leaves  
FruitOx® is a formulation based on actives from different fruits and plants, developed by Nektium with the idea of a fruits based antioxidant, and offering a wide spectrum of anti-radical properties (hence the selection of only certain specific polyphenols from each source) and stimulation of cellular defenses.  
FruitOx™ has been controlled at its ORAC value of 1 259 340 (Trolox equivalent /100g) - by French accredited laboratory.
...A selection for Hair care

COCCIN: Extract of tender coconut, in freeze-dried free flowing powder form (also available in liquid form for compatible solubility for skin and hair care formulations). Coconut water works at cellular level due concentrated amounts of Cytokines (involved in the cell growth and differentiation for a perfect copy of its DNA). Cococin® has been shown to promote the proliferation of fibroblasts (wound healing potential). It’s also a long term moisturizer.

- Cococin for hair care was compared in vitro on dermal papilla cells with Minoxidil vs Minoxidil alone, with evaluation of “Human Hair Follicle Dermal Papilla Cell Proliferation assay” and “5α Reductase Inhibition assay”. Minoxidil 5.0% + Cococin CG 0.25% was found to be the most potent for human hair follicle dermal cell proliferation (41.21%) as compared to a 5% Minoxidil solution (32.01%). And inhibition of 5α-reductase (14.88%) in comparison to 3.01% for 5% Minoxidil solution.

- Sabinsa developed and patented a formulation based on Cococin and Sabin (Amila extract) to promote healthy hair growth

LASTOSPORIN: Studies demonstrated that LactoSporin® stimulated the anagen phase of follicular cell growth by increasing the proliferation of dermal papilla cells and by inhibiting 5α-reductase activity.

TETRAPURE: 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.

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

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common actives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesculus hippocastanum</td>
<td>Venocin, beta Escin, Terpen</td>
</tr>
<tr>
<td>Amaranthus caudatus</td>
<td>Amarantus, Squalene</td>
</tr>
<tr>
<td>Andrographis paniculata</td>
<td>Andrographis, Andrographolides</td>
</tr>
<tr>
<td>Artocarpus lakka</td>
<td>Artonox, Resveratrol - OxyResveratrol</td>
</tr>
<tr>
<td>Asparagus racemosus</td>
<td>Shatavari, Saponins</td>
</tr>
<tr>
<td>Bacopa monniera</td>
<td>Bacopin, Bacosides</td>
</tr>
<tr>
<td>Berberis aristata</td>
<td>Berberine, Berberine</td>
</tr>
<tr>
<td>Boswellia serrata</td>
<td>Boswellin, Boswell Corid, AKBBA, Poly sacch.</td>
</tr>
<tr>
<td>Boswellia serrata</td>
<td>Boswellia Oil, Oil</td>
</tr>
<tr>
<td>Camelina sinensis</td>
<td>Green Tea, Catechins, Polyphenols</td>
</tr>
<tr>
<td>Capsicum annum</td>
<td>Paprika, Capsacin, Chilivenoids, Carotenoids</td>
</tr>
<tr>
<td>Centella asiatica</td>
<td>Centella, Terpen, Asiaticosides, Saponins</td>
</tr>
<tr>
<td>Citrus sinensis</td>
<td>Hesperidin, Hesperidin</td>
</tr>
<tr>
<td>Cocos nucifera</td>
<td>Cococin, Carbohydrate, Minerals, Proteins</td>
</tr>
<tr>
<td>Coleus forskohlii</td>
<td>Forslean, Forskolin</td>
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<tr>
<td>Coleus forskohlii Oil</td>
<td>Forslean, Oil, Pinenes</td>
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<td>Croton rauvoul</td>
<td>Lupeol, Lupeol</td>
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<tr>
<td>Curcuma longa</td>
<td>Curcumin, Turmerones</td>
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<tr>
<td>Curcuma longa</td>
<td>Sabwhite, THC, Tetradrocumcinuloids</td>
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<tr>
<td>Eclipta alba</td>
<td>Eclipta, Wdrolactone</td>
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<td>Embelia ribes</td>
<td>Embelia, Embelin</td>
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<td>Emblica officinalis</td>
<td>Amila Saberry, beta-Glucogallin</td>
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<td>Ginkgo biloba</td>
<td>Ginkgo Biloba, Flavone, Terpen, Lactones</td>
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<tr>
<td>Glycine max</td>
<td>Soy, Isolavones</td>
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<tr>
<td>Glycyrhiza glabra</td>
<td>Glabridin, Glabridin (4-98)%</td>
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<tr>
<td>Inula racemosa</td>
<td>Inula, Lactones</td>
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<tr>
<td>Kaempferia galanga</td>
<td>Galanga, Cinnamate</td>
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<tr>
<td>Laminaria japonica</td>
<td>Fucoidan, Sulfolysaccharides, Fucoidan</td>
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<tr>
<td>Mangifera indica</td>
<td>Mango, Mangiferin</td>
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<tr>
<td>Melia azadirachta</td>
<td>Neemoids, Limonoids</td>
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</table>

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common actives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Momordica charantia</td>
<td>Momordica, Bitter Principles, Charantin</td>
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<tr>
<td>Ocimum sanctum</td>
<td>Tulsi, Eugenol, Caryophyllene, Ursolic acid</td>
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<tr>
<td>Olea europea</td>
<td>Olive, Oleic Acid, Oleuropein</td>
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<tr>
<td>Phyllanthus amarus</td>
<td>Phyllanthus, Bitter Principles, Phyllanthin, Tannins</td>
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<tr>
<td>Piper nigrum</td>
<td>Cosmopine, Tetrazydroperine</td>
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<tr>
<td>Plant Formula</td>
<td>Acnezero, Policosanol, Coleus, Monolaurin, Vites</td>
</tr>
<tr>
<td>Plant Formula</td>
<td>Policosanol, Coleus, Monolaurin, Vites</td>
</tr>
<tr>
<td>Plant Formula</td>
<td>Coleus, Monolaurin, Vites</td>
</tr>
<tr>
<td>Plecithanthus barbarus</td>
<td>Forslean, Forskolin</td>
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<tr>
<td>Polygonum cuspidatum</td>
<td>Resvenox, Resveratrol, Stilbens</td>
</tr>
<tr>
<td>Pterocarpus marsupium</td>
<td>Pterocarp, Tannins, Stilbens, Pterocarpaside</td>
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<tr>
<td>Punica granatum</td>
<td>Pomegranate, Punicosides, Punicalagins, Polyph.</td>
</tr>
<tr>
<td>Punica granatum</td>
<td>Pomegranate, Punicasides, Punicalagins, Polyph.</td>
</tr>
<tr>
<td>Quercus infectoria</td>
<td>Quercus, Punic acid CLnA</td>
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<tr>
<td>Rhodolila rosa</td>
<td>Gallnut, Polyphenols</td>
</tr>
<tr>
<td>Rosmarinus officinalis</td>
<td>Rhodolila, Rosavins, Salidroside</td>
</tr>
<tr>
<td>Rosmarinus officinalis</td>
<td>Rosemary, Carnosic,Ursolic,Rosmarin, Betulinic</td>
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<tr>
<td>Saccharum officinarum</td>
<td>Policosanol, Policosanol</td>
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<tr>
<td>Salvia officinalis</td>
<td>Sage, Ursolic Acid, Na Ursolate</td>
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<tr>
<td>Santalum album</td>
<td>Xyremenic, Xyremenic Acid</td>
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<tr>
<td>Sapindus trifoliatum</td>
<td>Sapindin, Saponins</td>
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<tr>
<td>Serenoa repens</td>
<td>Saw Palmetto, Fatty Acids</td>
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<tr>
<td>Sesamum indicum</td>
<td>Sesamin, Sesamin</td>
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<tr>
<td>Syntesis</td>
<td>Alpha Lipoic, 1,2-Hexanediol, Octanediol, Decanediol</td>
</tr>
<tr>
<td>Terminalia</td>
<td>Terminalia, Arjunolic, Saponins, Tannins, Ellagic</td>
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<tr>
<td>Undaria pinnatifida</td>
<td>Fucocanthin, Fucocanthin</td>
</tr>
<tr>
<td>Vitis agnus castus</td>
<td>Vites, Armetin</td>
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<tr>
<td>Vitis nepunga</td>
<td>Vites, Aegnuside</td>
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<tr>
<td>Withania somnifera</td>
<td>Ashwagandha, Withanolides, Alkaloids, Withaferin</td>
</tr>
<tr>
<td>Zingiber officinalis</td>
<td>Ginger, Gingerols</td>
</tr>
</tbody>
</table>

Minerals: Chromium Picolinate, Selenium-Methionine, Methyl Selenium, Molybden Methionate, Gamma-Glutamyl-L-Selenomethionine, N-Acetyl-L-Cyst, etc. ...
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 create 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 Donning 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
-avourable physiochemical properties (solubility)
- Favorable pharmacokinetic properties (absorption, distribution, metabolism, and excretion)

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 Pedros 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 main extrinsic factor that generates the ROS leading to sun-induced skin ageing (photo-ageing) (Poljak and Dahmane 2012; Xu et al., 2017).
- LactoSporin® showed dose-dependent DPPH scavenging effect with an IC50 of 0.43%. This result emphasizes 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% at 1%, 36% at 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 penetrate 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 Pedros 2014).
- The phototoxic (UV-A and UV-B light-induced toxicity) preventive effects of LactoSporin® was studied using mouse fibroblast cell line (Balb/C 313).
- 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® capability of hair growth promotion was assessed by estimating the proliferation of Human Follicle Dermal Papilla cells (HFDC) 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.

Hair growth promotion with LactoSporin®
Hair is one of the fastest growing tissues of the human body. Hair follicles undergo repetitive regeneration cycles consisting of anagen (rapid growth, active stage), catagen (regression, physiological involution stage), and telogen (resting stage). Hair proliferation one). Androgens shorten the anagen phase by targeting androgen receptors in DPCs. Thus, extending the anagen phase is an effective treatment for the prevention of hair loss.

LactoSporin® is a non-living microbial cell product having biological activity: Antimicrobial activity, antiaging 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:

- Oral hygiene
- Anti-inflammatory
- Anti-collagenase
- UV protection
- Anti-glycation
- Anti-aging
- Antioxidant

LactoSporin® is a non-living microbial cell product having biological activity: Antimicrobial activity, antiaging effects and hair growth promotion.
**Olepent® Skin Firming and repairing peptide**

**Firming Peptide**
- Stimulated the skin’s natural production of collagen
- Restores the structure of the skin and smoothens 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 photodamage

**INCI Name :** Oleanoyl sh-Pentapeptide-4  
**Description :** Off-white powder, slightly hygroscopic  
**Purity** Oleanyl Pentapeptide (HPLC) ≥90% w/w  
**Shelf-life :** 2 years

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**LactoSporin®**

...continued

**Antimicrobial activity**
According to Riazi et al., 2012, LactoSporin® 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). The PMF is important for physiological processes such as ATP generation, ion transport as well as motility, thus affecting the sustenance of the organism.

**Results** : LactoSporin® was found to be highly active against the important skin pathogens such as Staphylococcus aureus, Streptococcus epidermis, 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 minimum inhibitory concentration (MIC) against various pathogenic groups was found to be in the range of 0.5 to 4.0% v/v. LactoSporin® was effective in killing the tested harmful bacteria at varied pH (2-5) and temperature ranges (70 – 90 °C). Also, LactoSporin® retained the antimicrobial efficacy in varied storage conditions (Stable & Accelerated condition).

**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 (Forsten et al., 2010).

LactoSporin® 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 LactoSporin® treatment.

**Biofilm inhibitory potential of LactoSporin®**
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). LactoSporin® exhibited a concentration-dependent biofilm inhibitory effect against S. mutans, S. aureus, P. aeruginosa and E. Coli (broth micro-dilution method).

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

Pepptides 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

---

**LactoSporin® Skin Firming and Repairing Peptide**

**Shelf-life** 2 years

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**LactoSporin®**

...continued

**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 (Forsten et al., 2010).

LactoSporin® 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 LactoSporin® treatment.

**Biofilm inhibitory potential of LactoSporin®**
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). LactoSporin® exhibited a concentration-dependent biofilm inhibitory effect against S. mutans, S. aureus, P. aeruginosa and E. Coli (broth micro-dilution method).

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**LactoSporin®**

...continued

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Skin Lightening

Two forms of melanin are produced in the epidermis: phenomelanin, 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-tyrosine 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 skin 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 Sabiwhitite tetrahydrocumarinoids: anti-tyrosinase activity along with High ORAC value, and Inhibition of Melanogenesis
- Glabridine (from 4% to 98% from licorice): the well-known whitening agent from licorice
- 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
- Fucconthane (wakame): lessened UVB-induced epidermal hypertrophy, VEGF, and MMP-13 expression
- Apple polyphenols & Phloridzin: skin whitening (restrict the tyrosinase) and treat the ace by sebum secretion
- Soy extract: lightening action in solar lentigines (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:
- Regulation/inhibition of tyrosinase, dopachrome oxidoreductase and dopachrome tautomerase involved in melanogenesis
- Regulation of the 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. Aloesin from Aloe is reported to be a non-competitive inhibitor of tyrosinase, affecting (...)
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 AKBBB-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).

...the action of tyrosinase complex in the stratum 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 gallocatechin moiety in the major catechin constituents epicatechin gallate, epigallocatechin gallate and epigallocatechin gallate.

Comparative table sheet

<table>
<thead>
<tr>
<th></th>
<th>Orac</th>
<th>DPPH</th>
<th>Tyrosinase</th>
<th>Melanin</th>
<th>Elastase</th>
<th>Collagenase</th>
<th>UV Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artrox</td>
<td>19 735</td>
<td>2,700</td>
<td>0,049</td>
<td>12 000</td>
<td>120 000</td>
<td>92 000</td>
<td>n.c.</td>
</tr>
<tr>
<td>Glabridine 40%</td>
<td>3 256</td>
<td>49,000</td>
<td>0,250</td>
<td>3 000</td>
<td>n.c.</td>
<td>n.c.</td>
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</tr>
<tr>
<td>Pterowhite</td>
<td>12 508</td>
<td>4,900</td>
<td>6,900</td>
<td>0,550</td>
<td>n.c.</td>
<td>n.c.</td>
<td>30</td>
</tr>
<tr>
<td>Resveratrol</td>
<td>25 223</td>
<td>3,010</td>
<td>5,500</td>
<td>2,500</td>
<td>n.c.</td>
<td>n.c.</td>
<td>31</td>
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<tr>
<td>Saberry</td>
<td>2 682</td>
<td>n.c.</td>
<td>321,000</td>
<td>14,000</td>
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<td>n.c.</td>
<td>15 (LVA) 42 (LVB)</td>
</tr>
<tr>
<td>Sabirwhite</td>
<td>10 786</td>
<td>n.c.</td>
<td>1,770</td>
<td>3,000</td>
<td>n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
</tr>
<tr>
<td>Tetrupure</td>
<td>10 212</td>
<td>1,300</td>
<td>1,800</td>
<td>3,200</td>
<td>n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
</tr>
<tr>
<td>Kojic Acid</td>
<td>-</td>
<td>500,000</td>
<td>7,000</td>
<td>100,000</td>
<td>n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
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<tr>
<td>Vitamin C</td>
<td>3 400</td>
<td>1,930</td>
<td>9,330</td>
<td>25,000</td>
<td>n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
</tr>
<tr>
<td>Arbutin</td>
<td>-</td>
<td>500,000</td>
<td>193,600</td>
<td>100,000</td>
<td>n.c.</td>
<td>n.c.</td>
<td>n.c.</td>
</tr>
</tbody>
</table>

- 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 (microns).

Some of the common causes of acne:
- Growth and multiplication of acne causing bacterium Propionibacterium acnes.
- Higher levels of the hormone Dihydrotestosterone by the activity of the enzyme 5-alpha 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

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 alcohols and long chain fatty acids like lauric, myristic, palmitic, stearic, oleic, linoleic and linolenic acids. The oil has potential anti-microbial activity. 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 (associated with acne) : 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 including acne) : 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 the 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 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%).

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

Recommended use : 0.01% to 0.1%
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...

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.

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-Falk et al.; 2000). Other reported applications include use in total parenteral nutrition (TPN) (Petroianu, et al.; 2004), and sports beverages (FAQ, 1998).

C
Coconut water is often described as a ‘natural isotonic sports drinks’, 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 the skin from the inside out.

Cococin is The Nourishment Factor® capturing the goodness of coconut water in a convenient powder form. Coconut water solids are freeze-dried using a special process that preserves the activity of nutrients...
Rhodiola: Stress Support and Wrinkles

While Rhodiola as a genus may have originated in the mountainous regions of Southwest China and the Himalayas, botanists have established that Rhodiola rosea naturally display a circumpolar distribution in mountainous regions in the higher latitudes and elevations of the Northern Hemisphere. 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 RhodioLife® is wildcraft collected from this part, under the Russian Government License. Altai Most mountainous areas are protected from pollution and 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.

Active Ingredients

Activities related to Rhodiola rosea have been traditionally attributed to the presence of four principal active ingredients: salidrose, rosin, rosavin and rosinar (Sokolov, 1985; Furmanov, 1998).

The root of R. rosea shows six distinct groups of chemical compounds. The Phenylalkanoids are the main contributors, incl.:

- Phenylpropanoids: Rosavins are products of the phenylpropanoid metabolism. Rosavins (ie. rosavin, rosin and rosarin) are specific to the root from Rhodiola roseaa. The rosavins are the constituents currently most often selected as the marker compounds for standardization of extracts, although they are not necessarily the only pharmacologically active ingredients for its medicinal properties.

- Principal phenylethanoids consist of glycosides and salidrose has been reported as the most active tyrosol glycoside, being associated, together with rosavins, to the anti-depressive and anxiolytic effects (Maslowska, 1994; Tolonen, 2003). Other phenylethanoids have also been isolated but with today limited scientific literature concerning the bioactivity (Jiménez 1994).

Supplementing with Rhodiola rosea is a whole-body approach to maintaining health and wellness. While most supplements address specific conditions, Rhodiola rosea acts on many biological systems and can counteract one of the primary causes of illness – chronic stress, asthma and premature aging. In today’s frenetic society, a one-size-fits-all supplement regimen with herbs and vitamins is ineffective. Each person is physiologically unique and requires a specific protocol for health. Supplementing with Rhodiola rosea is the foundation for an individualized supplement protocol because of its ability to heighten the body’s innate ability fight stress – related illness. Rhodiola rosea has been demonstrated to be effective in different important applications:

Stress

The effects of the stress on skin have been extensively proved. Stress is a well-known triggering factor in the appearance or exacerbation of psoriasis, alopecia areata, atopic dermatitis, acne, and other skin disorders. Panconesi et al. described the psychophysiologic stress in dermatology and found that the skin and central nervous system are related embryologically. The parasympathetic nervous system is critical to regulating our stress response. 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 due to extrinsic factors such as photodamage caused by exposure to UV radiation. Rhodiola rosea extract can help in the prevention or retarding skin aging, including wrinkles lines appearance, skin atrophy and thinning appearance reduction.

Those properties of Rhodiola rosea extract are associated with:

- DNA Repair
- Collagen synthesis
- Oxidative scavenger
- UV Radiation absorption

Figure on the right shows dose-dependent sunburn cell formation in living skin equivalents cells. Pretreatment with Rhodioila rosea significantly reduces the formation of sunburn cells via UBV irradiation. Rhodiola rosea pre-treatment significantly reduces UBV induced sunburn cell formation in LSE. Looking at the U-V-Vis spectrum of Rosavins (Rosarin, Rosavin, Rosin), the absorption spectrum has a maximum in same wavelength than UV radiations.

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. One study published in the June 2008 issue of the «Journal of Cosmetic Dermatology» showed that extracts of Rhodiola rosea improved the skin’s defensive barrier functions against the stress of UV rays. Subjects of this study were classified as having sensitive skin.

Supports Elastin Production: Elastin is the rubber band effect in the skin that enables it to bounce back instead of sagging or wrinkling. Genetics play the largest role in determining how fast skin will wrinkle with the fairer skin having the highest risk of damage, according to the experts at SkinCarePhysicians.com. Applying Rhodiola rosea extract to the 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 due to extrinsic factors such as photodamage caused by exposure to UV radiation. Rhodiola rosea extract can help in the prevention or retarding skin aging, including wrinkles lines appearance, skin atrophy and thinning appearance reduction.

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Forslein® 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. Fors-Lean® 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.

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### Anti-fungal remedy for Skin, Hair & Nails

<table>
<thead>
<tr>
<th>Disease</th>
<th>Causative Organism</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malassezia furfur</td>
<td>Malassezia furfur</td>
<td>Common</td>
</tr>
<tr>
<td>Checking the activity against MF</td>
<td>Seborrhoeic dermatitis including</td>
<td></td>
</tr>
<tr>
<td>Dilution Method - Sabourauds</td>
<td>Dandruff and Follicular pityriasis-</td>
<td></td>
</tr>
<tr>
<td>Tinea pedis</td>
<td>Trichophyton rubrum, Microsporum</td>
<td>Rare</td>
</tr>
<tr>
<td>White piedra</td>
<td>gypseum and Epidermophyton floccosum</td>
<td></td>
</tr>
<tr>
<td>Black piedra</td>
<td>Piedraia hortae</td>
<td>Rare</td>
</tr>
<tr>
<td>«Dermatophytois</td>
<td>Dermatophytes (Microsporum, Trichophytois, Epidermophyton)</td>
<td>Common</td>
</tr>
<tr>
<td>Ringworm of the scalp, glabrous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>skin and nails</td>
<td>Candiasis of skin, mucous membranes and nails</td>
<td>Common</td>
</tr>
<tr>
<td>Candidiasis of skin, mucous membranes and nails</td>
<td>Candiasis of skin, mucous membranes and nails</td>
<td>Common</td>
</tr>
<tr>
<td>Dermatomycosis</td>
<td>Non-dermatophile moulds</td>
<td>Rare</td>
</tr>
<tr>
<td>Hendlerssula toruloides, Sceyaldum hyaum, Scopulariopsis brevicaulis</td>
<td>Common</td>
<td></td>
</tr>
</tbody>
</table>

**Forslein®** is standardized for a minimum of 99% of Tetrahydrocucurmin (INCI Name: Tetrahydrodiferuloylmethane) : research reveals that Tetrahydrocucurmin (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 Affecting 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).

**Mechanism of Action**
The mechanism of action on how Forslein® works is well defined: «Forskolin, the active compound in Forslein®, 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. Ronnard 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 jejunileal bypass surgery, fat was seen to be absorbed more slowly in the thigh region than the abdominal region. 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 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.