



## THE GARDEN OF NATURALSOLUTION PRODUCT CATALOGUE

The one who knows NATURAL PRODUCTS





**The Garden of Naturalsolution** is a leading manufacturer of natural cosmetic ingredients located in Korea. We are specialized in and have committed to the development and supply of innovative and effective ingredients that satisfy the customer demands. With profound knowledge and experience, the researchers of The Garden of Naturalsolution dedicate to find new beneficial sources from nature and to develop unique technologies for safe and natural cosmetic ingredients.

Inspired by traditional knowledge of oriental herbal remedy, the effects and the values of natural actives are reinterpreted and rediscovered by The Garden of Naturalsolution's endeavor and passion.

# LOCATIONS



## KOREA

Headquarter  
Osan / Jeju

### The Garden of Naturalsolution Co., Ltd.

12-24, Gajangsaneopseo-ro, Osan-si, Gyeonggi-do, Republic of Korea  
Tel. +82-31-374-5240 | [info@naturalsolution.co.kr](mailto:info@naturalsolution.co.kr) | [www.naturalsolution.co.kr](http://www.naturalsolution.co.kr)

## UK

Edinburgh

### The Secrets of Caledonia Co., Ltd.

Unit 8F Edgefield Road Ind. Est., Loanhead, Edinburgh, EH20 9TB, UK  
Tel. +44-131-629-9584 | [marketing@tsocalledonia.co.uk](mailto:marketing@tsocalledonia.co.uk) | [www.tsocalledonia.co.uk](http://www.tsocalledonia.co.uk)

The Secrets of Caledonia (TSOC) is a supplier of natural cosmetic ingredients inspired by Scottish traditional herbal medicine. Taking advantage of Scotland's biodiversity and working in collaboration with established Scottish herbalists, TSOC aims to provide the most effective and innovative natural ingredients at the highest quality.

## USA

New Jersey

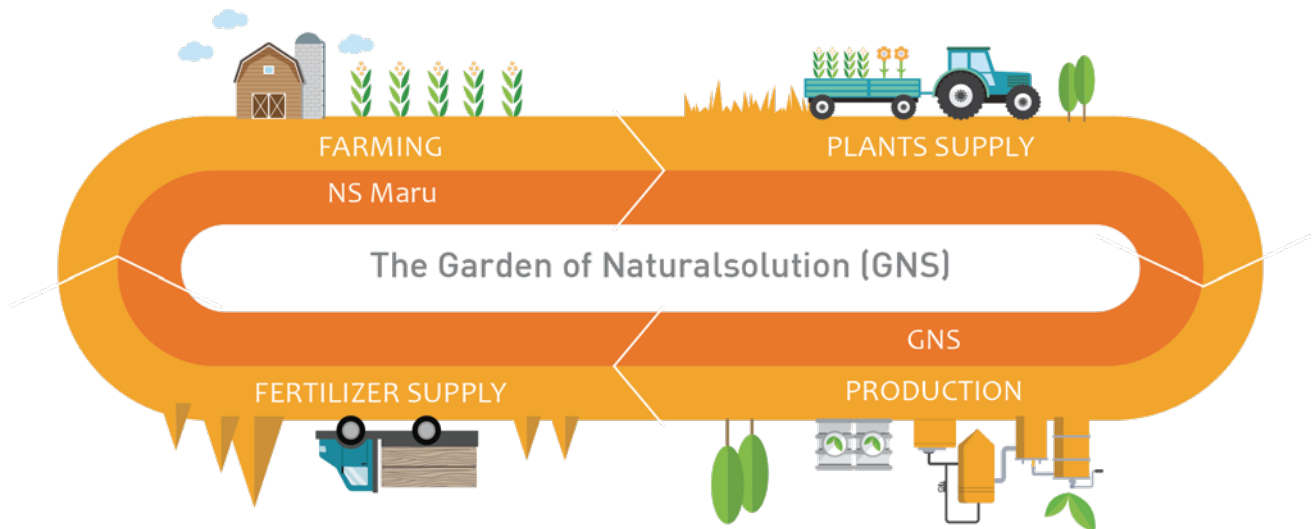
### The Art of Natural Solution, Inc.

45 Commerce Way, Unit K, Totowa, NJ 07512, USA  
Tel. +1-973-812-0500 | [sales@artofnaturalsolution.com](mailto:sales@artofnaturalsolution.com) | [www.artofnaturalsolution.com](http://www.artofnaturalsolution.com)

The Art of Natural Solution (ANS) is a manufacturer of botanical extracts, located in New Jersey, USA. ANS develops novel botanical extracts using creative and innovative technologies to uncover nature's true power.

ANS commits to maximizing each botanical's efficacies and optimizing the process for the highest quality. North America has the geographical and climate diversity, which allows the growth of a wide array of botanicals. Using North America's abundant resources, ANS continues to innovate and improve the products with advanced and reliable scientific approaches.

# SUSTAINABILITY



## Sustainability for **CUSTOMERS**

As a manufacturer of natural products, we at The Garden of Naturalsolution are always striving to improve the reliability of our supply chain to our customers. As an example, we cultivate select raw herbs at the farms, including our sister farm, NS Maru, on a contractual basis to secure stable supplies. Through such partnerships, we can meet the high expectations of our customers for the stable supply of: lotus leaf, licorice, chrysanthemum flower, Artemisia leaf, king cherry blossom flower, ginseng, and many others. Moreover, our efforts are ongoing for new partnerships with reliable farms for contract cultivation.

## Sustainability for **ENVIRONMENT**

As all our resources are provided by Mother Nature, we operate our business to give back to nature. In accordance with this, we return the plant materials back to the farms to nourish the soil and the produces. Thereby, we can reduce cost and the farms get free natural fertilizer: a win-win strategy.

## Sustainability for **SOCIETY**

To create a virtuous circle of growth with local communities, The Garden of Naturalsolution commits a range of social programs to foster the sustainable growth of local communities. Besides the donation to various nonprofit organizations, we closely communicate with local farms for their needs to continue sustainable farming.

# PUBLICATIONS: HERB BOOKS

We are excited to introduce a series of books published by The Garden of Naturalsolution, which provide information on herbs that can be used as cosmetic ingredients. As a natural ingredient manufacturer, we have been developing active ingredients from various medicinal herbs using our technology to prove their efficacies and to find potential benefits as cosmetic ingredients. These herb books are our passion and knowledge on natural ingredients. In 2019-20, our sister company, The Art of Natural Solution, has published the books titled 'Herbs of North America' (2019) and 'Herbs of South America' (2020) which provide information on North and South American plants and their benefits as cosmetic ingredients. We hope our herb books provide ideas for your new products.



**Herbalist's Notebook of Cosmetics**  
(2022)



**Herbs of South America**  
(2020)



**Herbs of North America**  
(2019)



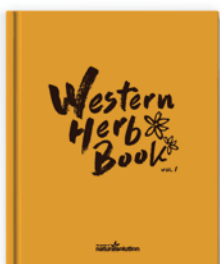
**Herbs on the Table**  
(2018)



**Tea Story**  
(2017)



**Jeju Herb Story**  
(Special Edition, 2016)



**Western Herb Book**  
(2016)



**Oriental Herb Book, Vol.I-III**  
(2013-2015)

# KEY PROCESSING



## Pretreatment

- Fermentation
- Steaming
- Roasting



## Extraction

- Ultrasonic Extraction
- Ceramic Extraction
- Infrared Ray Extraction
- Cold Drip Extraction (CDE)
- Steam Distillation
- Megasonic Extraction



## Concentration

- Evaporation
- Freeze Drying
- Vacuum Drying
- Spray Drying



## Stabilization

- Powder
- Liposome
- Capsule



## Safety Evaluation

- Mutagenicity
- Phototoxicity
- Skin Irritation



## Efficacy Evaluation

- *in tubo* Evaluation
- *in vitro* Evaluation
- Clinical Trials

# PRODUCT RANGE



## ORGANIC SERIES

Beyond 'natural,' we supply 'organic' products with organic farming raw materials and manufacturing process that conforms to COSMOS Certified standard.



## ORIENTAL SERIES

Botanical extracts from oriental medicinal herbs. Oriental Series are the essence of valuable traditional knowledge from our ancestors and our know-how to make medicinal herbs suitable as cosmetic ingredients for skin care.



## JEJU SERIES

Endemic plants from Jeju islands, Korea. Jeju Island is known for the cleanest and beautiful area in Korea. To use this uniqueness of Jeju Island, we developed Jeju Series based on the research studies in Jeju Island.



## SCOTI SERIES

Botanical extracts from Scottish plants. Through the collaborative research projects with organizations in Scotland, we developed a product range made of Scottish plants.



## FERMENT SERIES

Processed by Korean traditional fermentation method. The useful byproducts that are produced through the fermentation with using various types of microorganisms are easily absorbed to skin.



## FLOWER SERIES

Luxury and privilege floral extracts. The beneficial effects of flowers for skincare are proved with various studies. Beautiful flowers give not only a luxurious concept in skincare but also products biological activities in skincare products.



## FRUIT SERIES

Botanical extracts from fruits. The ingredients of fresh fruit, which are rich in vitamins and fibers, act on the skin and exert powerful effects.



## MARINE SERIES

Natural ingredients from seaweeds. Seaweeds are commonly called as vegetables of the sea because of abundant vitamins, minerals, and fibers. These components of seaweeds are effective for the skin as well.



# PRODUCT LIST

Product Name	INCI Name	Anti-acne	Anti-allergy	Anti-glycation	Anti-inflammatory	Anti-microbial	Anti-oxidation	Anti-photoaging	Anti-pollution	Anti-wrinkle	Energy Boosting	Exfoliation	Hair Care	Moisturizing	Sebum Control	Skin Barrier Improvement	Skin Brightening	Skin Firming	Skin Soothing	Wound Healing	COSMOS	★	Page
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## [ NEW PRODUCT ]

NokduFerm	Lactobacillus/Bean Seed Extract /Sodium Glutamate Ferment Filtrate				●			●						●				●				○	12
SUNBOOSTER 55	Drometrizole Trisiloxane, Diethylamino Hydroxybenzoyl Hexyl Benzoate, Isoamyl p-Methoxycinnamate																					○	13
Spicules	Hydrolyzed Sponge				●				●					●		●			●	●		○	14
AntiPolea	Achillea Millefolium Extract	●			●		●		●							●			●			○	15
Groccoli	Brassica Oleracea Italica (Broccoli) Sprout Extract				●	●							●									○	16
Dokollagen	Xanthium Strumarium Fruit Extract			●						●												○	17
TrueCICA(S)	Asiatic Acid, Asiaticoside, Madecassic Acid, Madecassoside				●					●				●		●	●		●	●		○	18
CPL-Gamtae	Ecklonia Cava Extract				●	●	●															○	19

## [ ORGANIC SERIES ]

RiFerm	Saccharomyces/Rice Ferment Filtrate					●			●				●					●				○	○	20
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## [ ORIENTAL SERIES ]

Byungpul Extract	Centella Asiatica Extract	●			●		●												●	●		○	○	21
Clean Saver	Sophora Flavescens Root Extract Psoralea Corylifolia Fruit Extract Platycarya Strobilacea Extract	●					●										●					○		22
Ma Extract	Dioscorea Japonica Root Extract	●					●		●					●			●					○	○	-



9-2800-18-100-00

All the products in our portfolio using palm oil derived solvents (Propanediol, Caprylic/Capric Triglyceride, and Glycerin) are available in RSPO Mass Balance grade.

# PRODUCT LIST

Product Name	INCI Name	Anti-acne	Anti-allergy	Anti-glycation	Anti-inflammatory	Anti-microbial	Anti-oxidation	Anti-photoaging	Anti-pollution	Anti-wrinkle	Energy Boosting	Exfoliation	Hair Care	Moisturizing	Sebum Control	Skin Barrier Improvement	Skin Brightening	Skin Firming	Skin Soothing	Wound Healing	COSMOS	🇨🇳	Page	
[ ORIENTAL SERIES]																								
MultiCalm-RH	Rhododendron Brachycarpum Extract				●		●												●				-	
Natural Repair-RA	Lagerstroemia Indica Extract						●			●												○	-	
Natural Skin Renewal	Saururus Chinensis Leaf/Root Extract						●										●					○	-	
Oriental Beauty Fruits Newplex	Punica Granatum Fruit Extract Ficus Carica (Fig) Fruit Extract Morus Alba Fruit Extract Ginkgo Biloba Nut Extract						●			●												○	○	-
Oriental Tea Complex	Diospyros Kaki Leaf Extract Cinnamomum Cassia Bark Extract Artemisia Princeps Leaf Extract Chrysanthellum Indicum Extract Chaenomeles Sinensis Fruit Extract Camellia Sinensis Leaf Extract						●			●							●					○	○	-
PhelloCure	Phellodendron Amurense Bark Extract		●		●											●						○	○	23
Phytobright-FR	Fraxinus Rhynchophylla Leaf Extract						●										●					◎	-	
Phytoceutical	Lycium Chinense Stem Extract				●		●			●												○	◎	-
Phytogen	Cimicifuga Racemosa Root Extract Dioscorea Japonica Root Extract Lithospermum Erythrorhizon Root Extract Papaver Rhoeas Petal Extract Punica Granatum Fruit Extract Trifolium Pratense (Clover) Leaf Extract Ziziphus Jujuba Fruit Extract									●												○	○	-
Portulaca Extract-TLS	Portulaca Oleracea Extract		●		●		●												●	●		○	○	24
PureCalm	Houttuynia Cordata Extract	●			●		●															○	25	

◎ China\_compliant version is available.

# PRODUCT LIST

Product Name	INCI Name	Anti-acne	Anti-allergy	Anti-glycation	Anti-inflammatory	Anti-microbial	Anti-oxidation	Anti-photoaging	Anti-pollution	Anti-wrinkle	Energy Boosting	Exfoliation	Hair Care	Moisturizing	Sebum Control	Skin Barrier Improvement	Skin Brightening	Skin Firming	Skin Soothing	Wound Healing	COSMOS	★	Pg
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## [ ORIENTAL SERIES ]

Red Ginseng Active-R	Panax Ginseng Root Extract																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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## [ JEJU SERIES ]

Jeju Blossom	Prunus Yedoensis Flower Extract				●	●											●	●			○	●	31
Jeju Changpo	Acorus Calamus Root Extract						●						●				●				○	○	32
Jeju Jori	Sasa Quelpaertensis Extract					●											●				○	○	-
Jeju White Blossom	Sophora Japonica Flower Extract				●	●			●								●				○	○	-
Jeju Winter Flower	Camellia Japonica Flower Extract					●																○	-
Leafresh	Nelumbo Nucifera Leaf Extract		●			●	●	●					●				●				○	○	33

○ China\_compliant version is available.

# PRODUCT LIST

Product Name	INCI Name	Anti-acne	Anti-allergy	Anti-glycation	Anti-inflammatory	Anti-microbial	Anti-oxidation	Anti-photoaging	Anti-pollution	Anti-wrinkle	Energy Boosting	Exfoliation	Hair Care	Moisturizing	Sebum Control	Skin Barrier Improvement	Skin Brightening	Skin Firming	Skin Soothing	Wound Healing	COSMOS	★	Pg
<b>[ SCOTI SERIES ]</b>																							
Scoti-Hops	Humulus Lupulus (Hops) Extract				●		●						●								○	○	34
Scoti-Horsetail	Equisetum Fluviatile Extract				●												●				○		35
Speedwell	Veronica Officinalis Extract				●		●			●											○	○	36
<b>[ FERMENT SERIES ]</b>																							
Beauty Plus One-F	Lactobacillus/Punica Granatum Fruit Ferment Extract						●			●											○	○	37
DulseaFerm	Palmaria Palmata Extract Saccharomyces Ferment									●												○	38
MYFerm	Undaria Pinnatifida Extract Lactobacillus Ferment									●				●				●				○	39
Greentium	Aspergillus/Camellia Sinensis Leaf Ferment Extract	●	●			●				●							●					○	40
<b>[ FLOWER SERIES ]</b>																							
Arnimo	Arnica Montana Flower Extract				●		●						●		●						○	○	41
Pomegrande	Punica Granatum Flower Extract		●				●	●		●											○	○	42
<b>[ FRUIT SERIES ]</b>																							
Greenth	Vitis Vinifera (Grape) Fruit Extract Pyrus Malus (Apple) Fruit Extract Prunus Mume Fruit Extract Carica Papaya (Papaya) Fruit Extract						●					●		●		●	●				○	○	43
<b>[ MARINE SERIES ]</b>																							
Brown Energy	Ascophyllum Nodosum Extract Pelvetia Canaliculata Extract Himanthalia Elongata Extract			●		●	●		●					●								○	44
Gulfweed Extract	Sargassum Fulvellum Extract									●												○	-
Seactive	Ecklonia Cava Extract	●		●		●	●	●													○	○	45

# NokduFerm NEW PRODUCT

**Product Name\_** NokduFerm

**INCI Name\_** Lactobacillus/Bean Seed Extract/Sodium Glutamate Ferment Filtrate

**Dosage\_** 1-5%

**Efficacy\_** Skin Barrier, Skin Firming, Anti-Aging

Mung beans, scientifically known as *Phaseolus radiatus*, are small, oval in shape, and green in color. Mung beans offer several skin benefits, including gentle exfoliation, anti-inflammatory properties, detoxification, and a cooling effect. Mung beans help remove impurities, reduce inflammation, soothe sunburns or heat rashes, and are rich in vitamins that promote healthy, glowing skin. These qualities make mung beans a popular ingredient in natural skincare routines. NokduFerm is an extract of fermented mung bean, which contains GABA (gamma-aminobutyric acid), which is a neurotransmitter known for anti-wrinkle, anti-aging and stress-relieving effects.

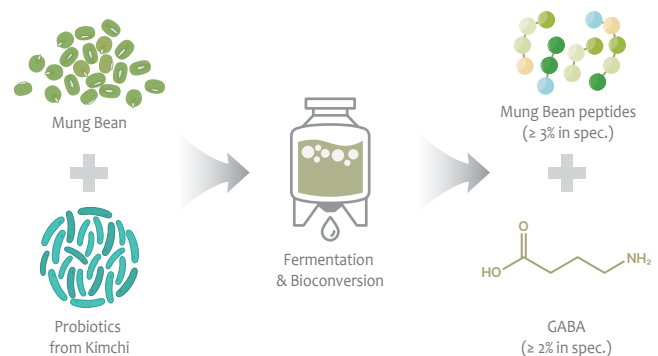


## Active ingredients in specification

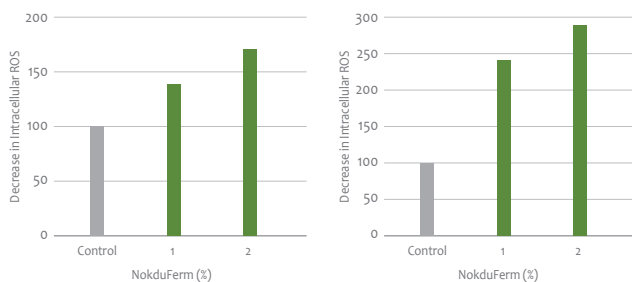
- ☒ GABA:  $\geq 2\%$
- ☒ Mung bean peptide:  $\geq 3\%$



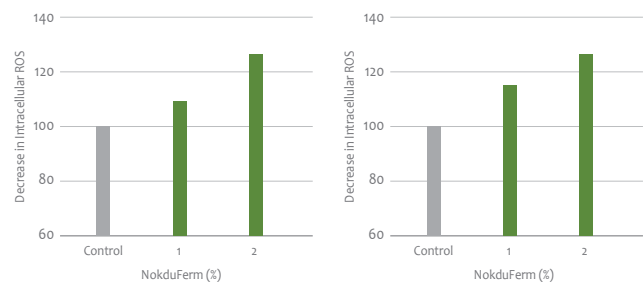
## Bioconversion through fermentation



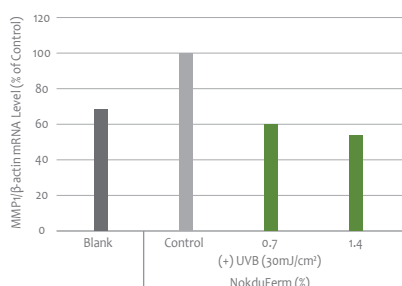
## NMF Production Boosting Enhancement



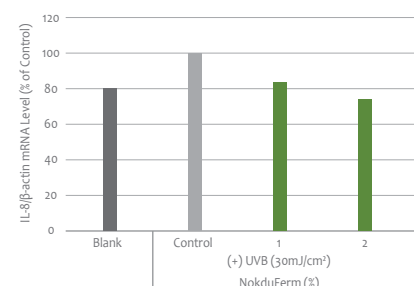
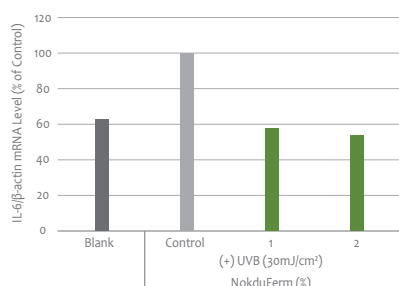
## Skin Firming Effect



## Anti-photoaging Effect



## Anti-inflammatory Effect



# SUNBOOSTER 55

NEW  
PRODUCT

Product Name\_ SUNBOOSTER 55

INCI Name\_ Drometrizole Trisiloxane, Diethylamino Hydroxybenzoyl Hexyl Benzoate, Isoamyl p-Methoxycinnamate

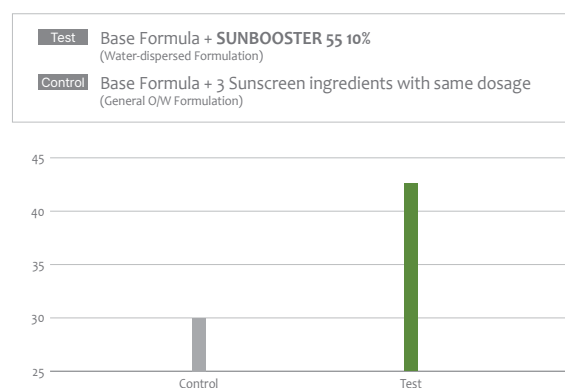
Dosage\_ -

Efficacy\_ Sun Care

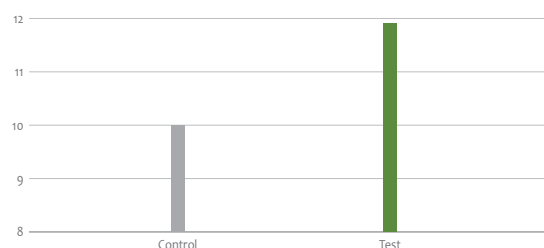
SUNBOOSTER 55 is a complex of 3 organic sunscreen ingredients: Drometrizole Trisiloxane, Diethylamino Hydroxybenzoyl Hexyl Benzoate, Isoamyl p-Methoxycinnamate. Prepared with D Phase emulsification, SUNBOOSTER 55 provides up to 40% better UV protection effect compared to the same amount of sunscreen agents. It has watery texture, less oily and greasy feeling, and less odor. Its particle size is about 200 nm and is very stable due to the repulsion between particles. It's easy to formulate because it is easily dispersible in the water phase.



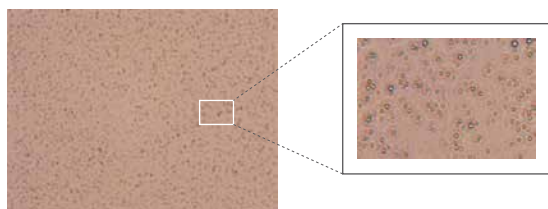
## SPF Boosting Effect (in vitro)



## PFA Boosting Effect (in vitro)



## Microscope (X400) 3-month stability test



## 1. Composition

INCI Name (IECIC Name)	Content (%)
1 Drometrizole Trisiloxane	25.0
2 Diethylamino Hydroxybenzoyl Hexyl Benzoate	15.0
3 Isoamyl p-Methoxycinnamate	15.0

Three types of organic sunscreen ingredients make up a total of 55% in SUNBOOSTER 55:

- 1 UVA and UVB absorber
- 2 UVA absorber
- 3 UVB absorber

## 2. Watery texture



Provides watery texture without being oily or heavy.

## 3. Easy formulation in water



Easily dispersible in water and applicable to formulations without precipitation or separation.

# Spicule Series

NEW  
PRODUCT

**Product Name\_** Spicule Series (Cicacule, Collacule, Hyalcule, Melacule, Pepticule)

**INCI Name\_** Hydrolyzed Sponge

**Dosage\_** -

**Efficacy\_** Anti-wrinkle, Wound Healing, Skin Soothing, Anti-inflammation, Moisturizing, Skin Barrier Improvement

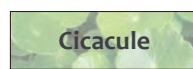
Spicules are structures found in most sponges living in clean freshwater or seas. They are in the form of microneedles, composed of a porous bone structure with a needle-shaped interior that is hollow. After going through refining and purification processes, it can be used in cosmetics and medical industries, helping transdermal delivery of active ingredients deep into the skin. It is believed that the mechanism of actions by spicules is either microablative technique or puncture-resembling mesotherapy. The small and sharp thorns of spicules creates deep punctures in skin, facilitating active ingredients to permeate into deeper skin layers.



## Ready-to-use Spicules with Beneficial Active Ingredients



Hydrolyzed Sponge



Cicacule

Centella Asiatica



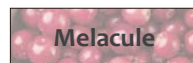
Collacule

Hydrolyzed Collagen



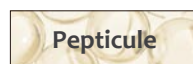
Hyalcule

Sodium Hyaluronate,  
Hydrolyzed Hyaluronic Acid



Melacule

Arbutin, Niacinamide



Pepticule

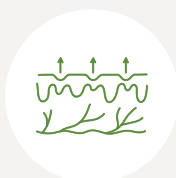
Acetyl Hexapeptide-8

## Mechanism of Spicules in Skin Care



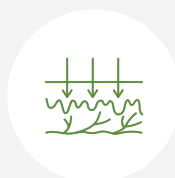
### Penetration

Spicules penetrate the outer skin layers, creating micro-channels that enhance the absorption of active ingredients.



### Absorption

Deeper, more efficient absorption of active ingredients through the micro-channels created by spicules.



### Regeneration & exfoliation

Mechanical stimulation promotes skin regeneration and exfoliation of dead cells, improving texture and appearance.



### Expulsion

Over time, spicules are gradually eliminated through the desquamation process and are naturally removed from the skin.



# AntiPolea NEW PRODUCT

Product Name\_ AntiPolea

INCI Name\_ Achillea Millefolium Extract

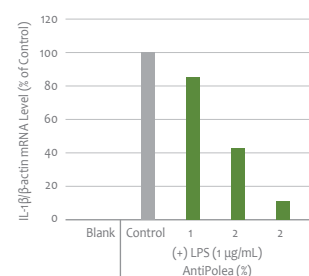
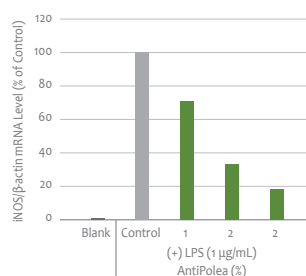
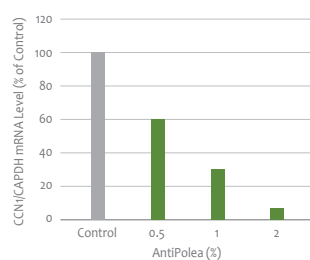
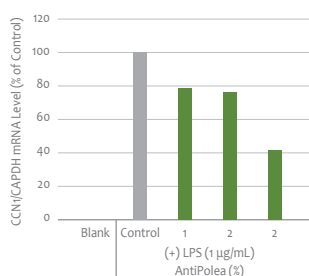
Dosage\_ 1-5%

Efficacy\_ Skin Barrier, Soothing, Anti-aging, Anti-oxidant, Anti-allergy, Anti-inflammation, Anti-pollution

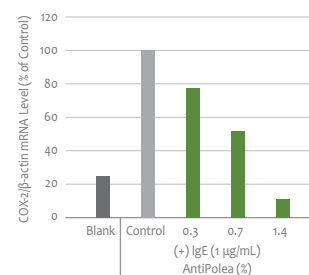
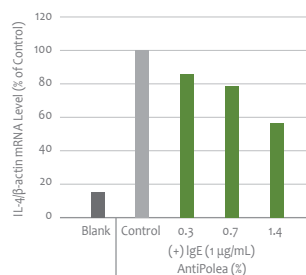
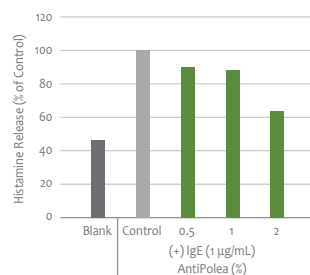
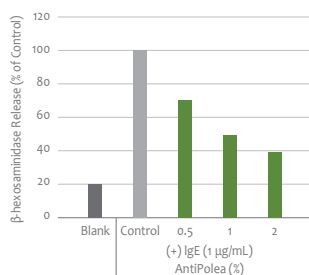
AntiPolea is a natural cosmetic ingredient made of the extract of yarrow, a plant widely used for wound healing in European herbal remedies. It shows excellent beneficial effects on skin such as anti-inflammatory properties, itch relief, and skin barrier enhancement. This helps improve a range of skin issues and ultimately boosts the immunity of sensitive skin irritated by harmful environmental factors.



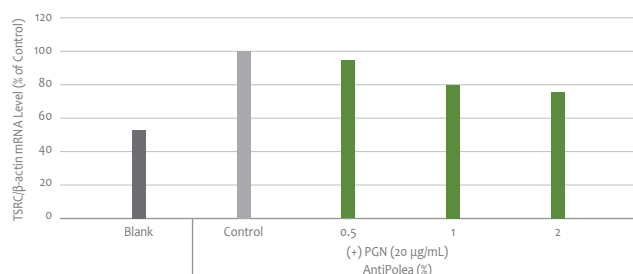
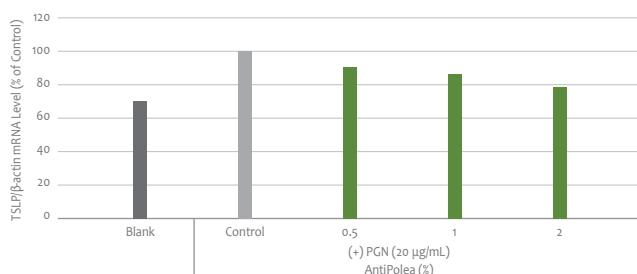
## Anti-inflammatory Effect



## Anti-itchy Effect



## Improved Immunity of Skin Barrier





# Groccoli

NEW  
PRODUCT

Product Name\_ Groccoli(GPD)

INCI Name\_ Brassica Oleracea Italica (Broccoli) Sprout Extract

Dosage\_ 1-5%

Efficacy\_ Anti-aging, Anti-dandruff, Anti-inflammation, Anti-pollution, Hair Care, anti-stress

Polluted environments, extreme diet, and increased cortisol hormone levels due to stress can disrupt the signal transduction system that plays a vital role in hair formation. They also interfere nutrients supply to hair cells, sometimes leading to cell death. The Garden of Naturalsolution (GNS) has investigated the causes of hair loss. As a solution, we introduce Groccoli.



## Groccoli's total care solution for healthy hair

01

Essential  
Hair Care

#Hair growth  
#Anti-inflammation  
#Anti-dandruff

#Dermal papilla cell proliferation  
#ECM strengthening  
#Inhibition of dandruff bacteria  
#Anti-inflammatory effect

02

Anti-pollution  
Hair Care

#3-STEP Care

Stimulated by PMs  
#Hair cell growth signal ON  
#Hair cell growth signal enhancement  
#Hair growth promotion

03

Anti-stress  
Hair Care

#2-STEP Care

#Stimulated by cortisol  
#Hair cell growth signal ON  
#Nourishing hair

## Main Efficacy Data of Groccoli

Hair  
Growth

83% ↑ HDP proliferation increase  
63% ↑ β-catenin mRNA expression increase

Healthy  
Scalp

60% ↑ Growth inhibition of Malassezia furfur increase  
63% ↓ NO production decrease

Anti-pollution  
Hair Care  
against PM  
(Particulate Matters)

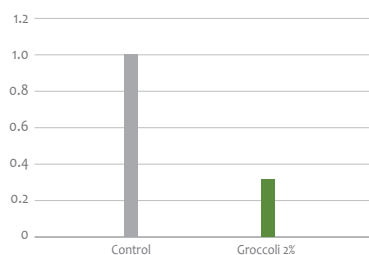
56% ↑ Wnt5a mRNA expression increase  
44% ↓ DKK-1 mRNA expression decrease  
45% ↓ GSK-3β mRNA expression decrease  
54% ↓ AXIN mRNA expression decrease  
42% ↑ β-catenin mRNA expression increase

Anti-stress  
Hair Care  
against cortisol

66% ↓ DKK-1 mRNA proliferation decrease  
85% ↑ ALP mRNA expression increase  
314% ↑ VEGF mRNA expression increase

## Hair cell growth signal ON

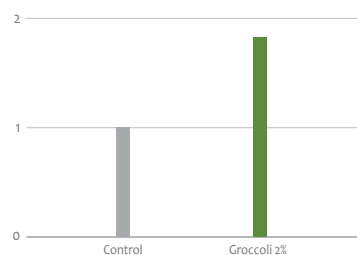
DKK-1 mRNA proliferation



Groccoli turns the signaling switch back on by suppressing the gene expression of DKK-1, a Wnt inhibitor that is increased by cortisol.

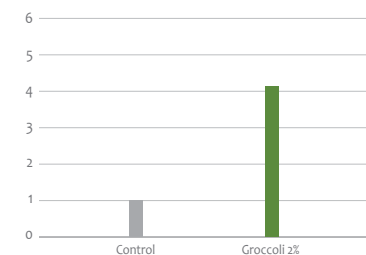
## Hair nourishing

ALP mRNA expression



Groccoli increases the gene expression of the growth factor VEGF and the enzyme ALP, which induce blood vessel formation. It leads to hair nutrition and hair growth promotion through the formation of microvessels around the hair follicle.

VEGF mRNA expression



# Dokollagen

NEW  
PRODUCT

Product Name\_ Dokollagen(GPD)

INCI Name\_ Xanthium Strumarium Fruit Extract

Dosage\_ 1-5%

Efficacy\_ Skin Barrier, Firming, Anti-aging, Anti-glycation

The DEJ (Dermal Epidermal Junction) is where the dermis meets the epidermis along its curved surface. The DEJ flattens as skin ages. This weakens the bond between the two layers and contributes to reduced skin elasticity. Restore firmness to sagging skin with Dokollagen. This product increases the expression of genes that strengthen DEJ and preserve elastic fibers.



## Anti-gravity Actions

01

Anti-wrinkle

- ☒ Procollagen synthesis
- ☒ Wrinkle-related gene expression

UP ↑

DO  
WN ↓

02

Anti-sagging

- ☒ Dermis-epidermis connection
- ☒ DEJ function
- ☒ Structural protein
- ☒ Collagen network

UP ↑

03

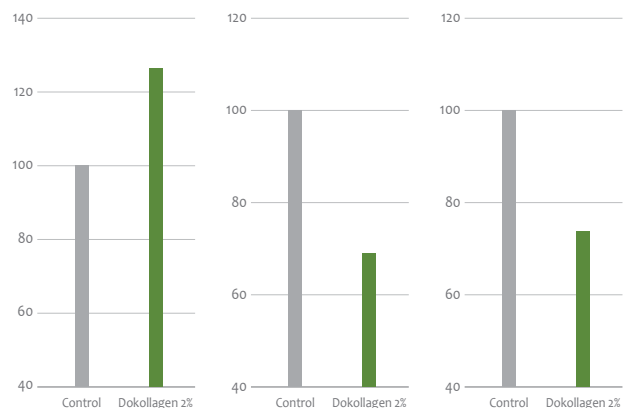
Anti-glycation

- ☒ Toxic sugar (AGEs)
- ☒ Glycation-related gene expression

DO  
WN ↓

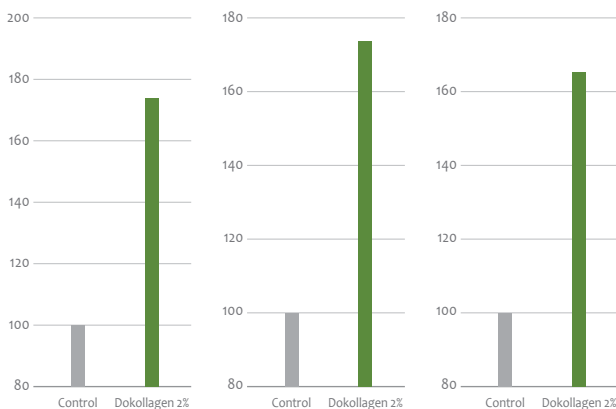
## Anti-wrinkle

Dokollagen induces collagen synthesis and inhibits collagen degradation.



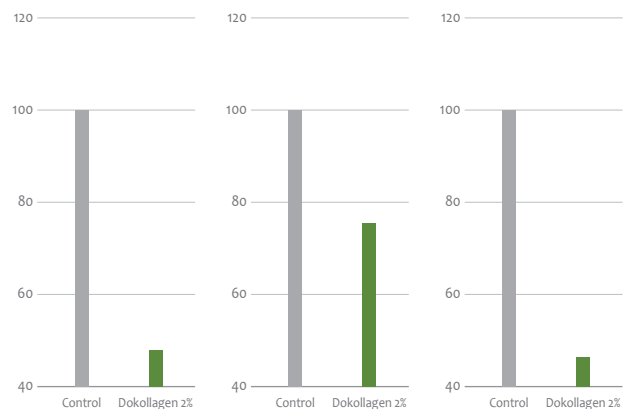
## Anti-sagging

Dokollagen enriches proteins that anchors epidermis to dermis, ultimately improving the function of DEJ.



## Anti-glycation

Dokollagen prevents skin aging by interfering glycation.



# TrueCICA(S) NEW PRODUCT

**Product Name\_** TrueCICA(S)

**INCI Name\_** Asiatic Acid, Asiaticoside, Madecassic Acid, Madecassoside

**Dosage\_** 1-10%

**Efficacy\_** Moisturizing, Skin Barrier, Anti-inflammation

In India, after seeing a wounded tiger rolling around in a place with a lot of centella asiatica to heal, it is called tiger plant and has been used as medicine for a long time. As it was discovered that the ingredient called madecassic acid in the leaves and stems of Centella asiatica has the power to relieve inflammation and heal wounds such as tumors and ulcers. TrueCICA(S) is designed so that the four quantitative indicators of Centella asiatica, madecassic acid, madecassoside, asiaticoside, and asiatic acid, can be quantified by more than 1% using Triterpene.



## Centella asiatica

Tiger plant for wound healing!

Anti-inflammatory

Skin barrier improvement

- ✓ Asiatic Acid
- ✓ Asiaticoside
- ✓ Madecassic Acid
- ✓ Madecassoside

Quantitative  
Triterpene

**1%**

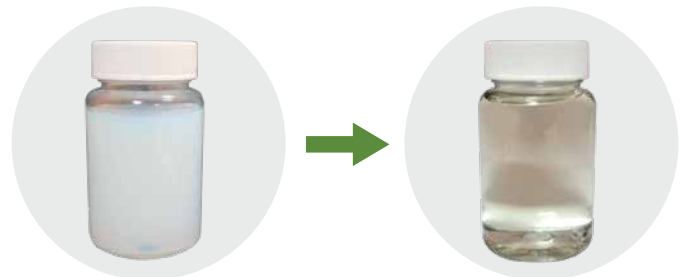
**4**

major CICA ingredients

## Solubility

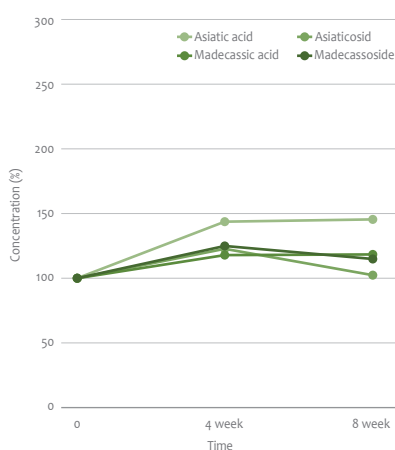
Clear liquid: TrueCICA(S) is different!

Transparently dispersed four insoluble cica components, to be easily applied to the water phase of formulation

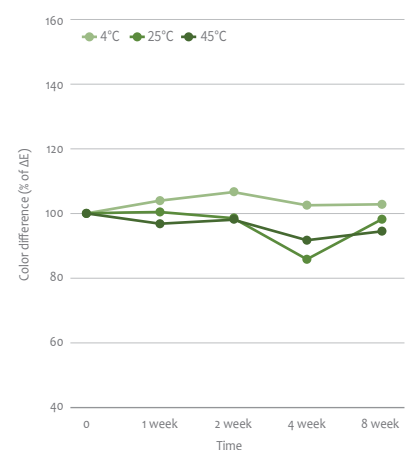
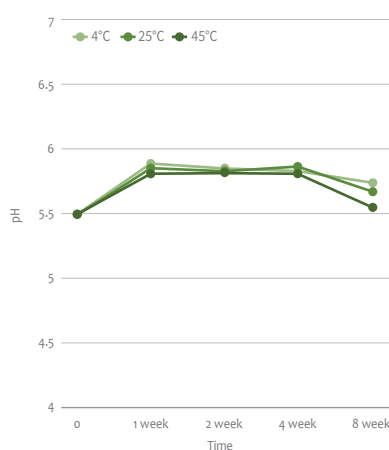


## Stability

Stability of TrueCICA(S)



Stability of pH and color



# CPL-Gamtae

NEW  
PRODUCT

Product Name\_ CPL-Gamtae

INCI Name\_ Ecklonia Cava Extract

Dosage\_ 1-5%

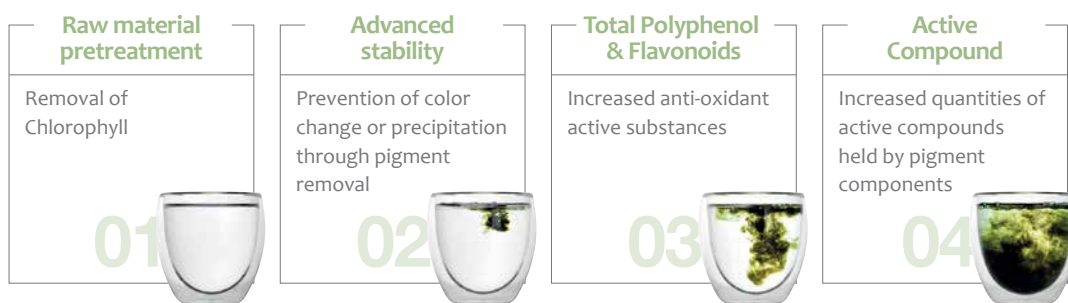
Efficacy\_ Anti-aging, Anti-oxidant, Anti-allergy, Anti-wrinkle

CPL-Gamtae is produced through the Chlorophyllless method, with *Ecklonia cava* obtained from the pristine island, Jeju. CPL-Gamtae has a total tannin content of 1126.7 ppm, which is known to be abundant in *Ecklonia cava*. Also total polyphenol content of 423.1  $\mu$ g/mL and total flavonoid content of 111.6  $\mu$ g/mL were detected. Meanwhile, 8 heavy metals that may exist in seaweed were not detected. *in vitro* result showed that CPL-Gamtae reduced ROS,  $\beta$ -hexosaminidase and histamine levels. Moreover, CPL-Gamtae also increased Procollagen type I peptide synthesis for anti-wrinkle effect.



## CPL-Gamtae

Benefits of Chlorophyllless(CPL) technique



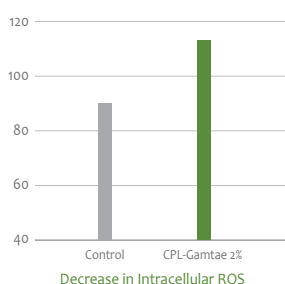
## Active Compound Content

By applying Chlorophyllless technique, the active compound content increased compared to pre-treatment with water.

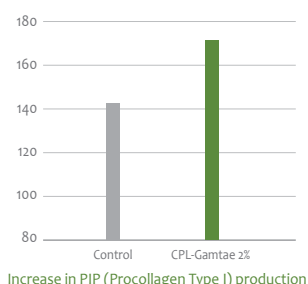
Total Polyphenol	✓ CPL-Gamtae: 423 $\mu$ g/mL W (pre-treatment w/water): 132 $\mu$ g/mL	↑ 222% higher than W.
Total Flavonoid	✓ CPL-Gamtae: 112 $\mu$ g/mL W (pre-treatment w/water): 57 $\mu$ g/mL	↑ 97% higher than W.
Total Tannin	✓ CPL-Gamtae: 1127 $\mu$ g/mL W (pre-treatment w/water): 367 $\mu$ g/mL	↑ 207% higher than W.

## Main Efficacy Data of CPL-Gamtae

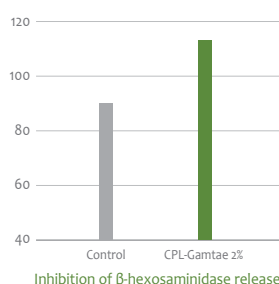
Anti-oxidant



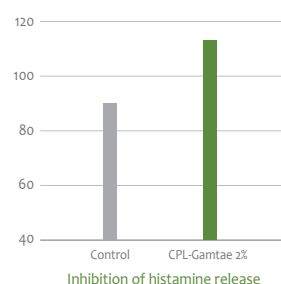
Anti-wrinkle



Anti-allergic



Anti-allergic





# RiFerm



raw material certified by Control Union Korea,  
conform to the COSMOS Standard

**Product Name\_** RiFerm-BS, RiFerm-NPG

**INCI Name\_** Saccharomyces/Rice Ferment Filtrate

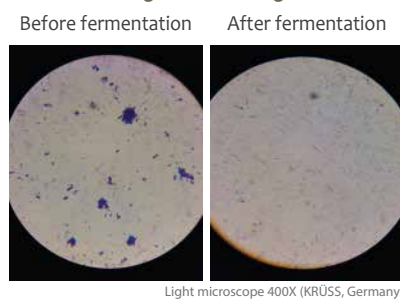
**Dosage\_** RiFerm-BS (10-100%), RiFerm-NPG (10-50%)

**Efficacy\_** Skin Firming, Anti-wrinkle, Skin Moisturizing, Anti-oxidant

Rice water, milky white water left after washing rice, has been traditionally used as facial and hair rinse for centuries by Asian women to improve skin complexion and hair condition. Nutritious rice water fermented by *Saccharomyces* became a favorable ingredient for cosmetics through chemical and physical changes during the fermentation process. RiFerm® exhibits strong anti-oxidant and anti-wrinkle activities *in vitro* and shows significant skin hydration and skin elasticity *in vivo*.

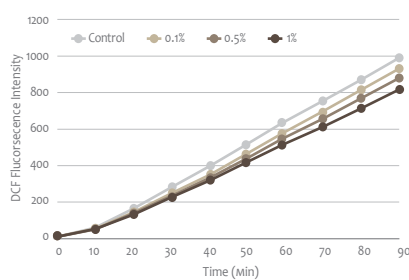


## Rice Starch Degradation during Fermentation



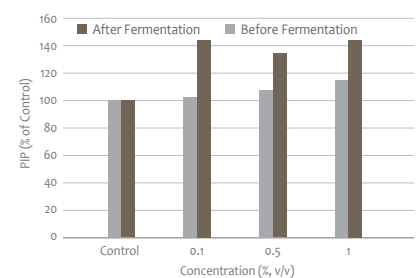
## Anti-oxidant Effect (*in vitro*)

### ROS Generation Inhibition Activity



## Anti-wrinkle Effect (*in vitro*)

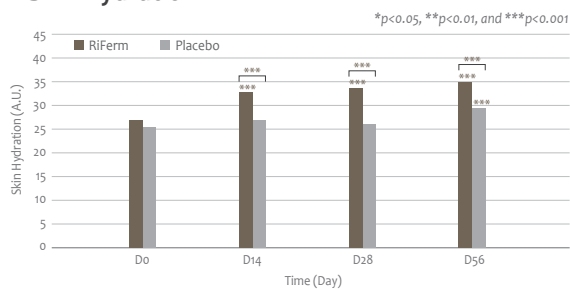
### Collagen Synthesis Activity in Fibroblasts (Before & After Fermentation)



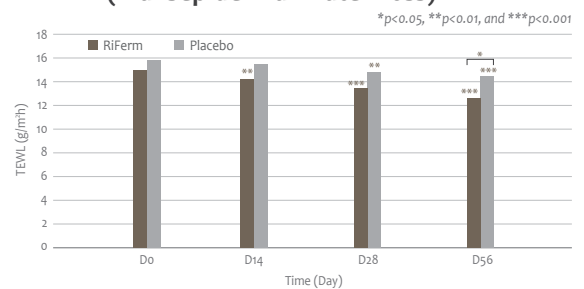
## Skin Moisturizing Effect (*in vivo*)

30 volunteers aged between 35 to 60 years old applied a cream containing 94% RiFerm twice a day for 56 days on face.

### Skin Hydration



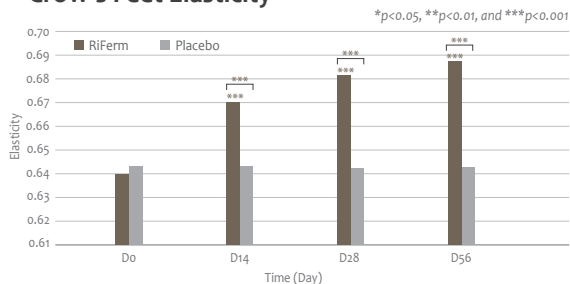
### TEWL (Transepidermal Water Loss)



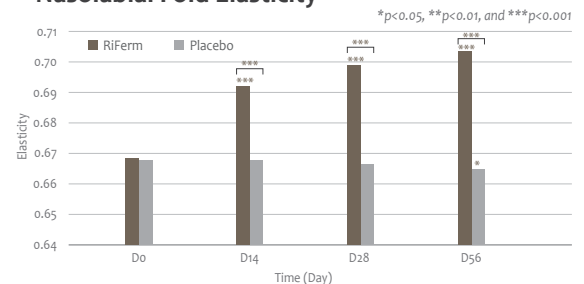
## Skin Firming Effect (*in vivo*)

30 volunteers aged between 35 to 60 years old applied a cream containing 94% RiFerm twice a day for 56 days on crow's feet and nasolabial folds.

### Crow's Feet Elasticity



### Nasolabial Fold Elasticity



# Byungpul Extract™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Byungpul Extract, Byungpul Extract(PD)-RSPO, Byungpul Extract(GOL)-RSPO

**INCI Name\_** Centella Asiatica Extract

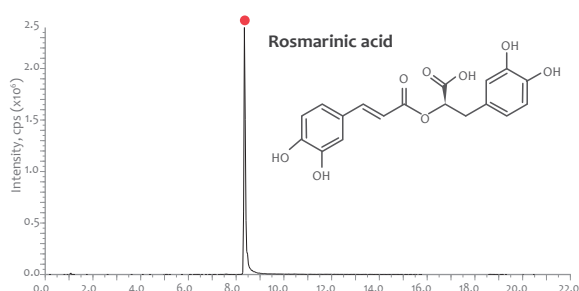
**Dosage\_** 1-3%

**Efficacy\_** Anti-allergic, Anti-inflammatory, Anti-oxidant, Skin Soothing, Wound Healing

*Centella asiatica*, commonly known as Gotu kola, is a medicinal herb widely used in Traditional Oriental Medicine as well as in Ayurvedic medicine for the treatment of skin diseases and wound healing. According to folklore, an injured tiger often rolls against *C. asiatica* for wound healing. Because of this, *C. asiatica* is well known as a tiger's herb in Asia. Scientific studies reported that topical application of *C. asiatica* on the wounded area increased the rate of healing by stimulating the production of type I collagen. It is also reported that *C. asiatica* contains bioactive compounds which show anti-inflammatory activities.

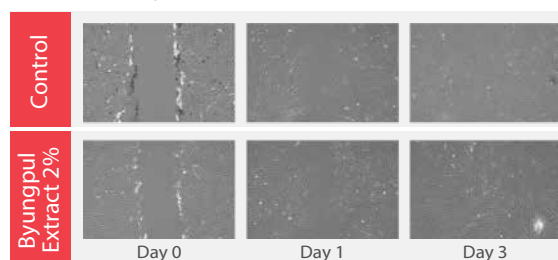


## Identification of Active Compound



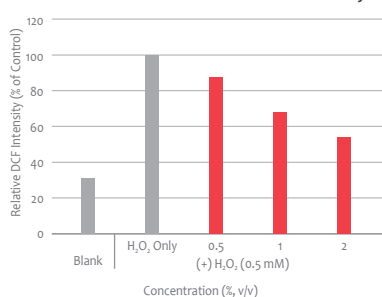
## Wound Healing Effect (in vitro)

Scratch Assay in Human Fibroblast



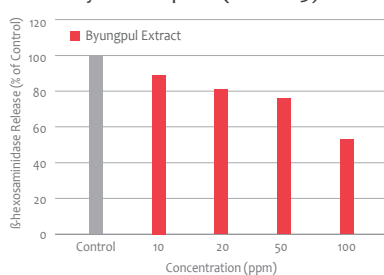
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



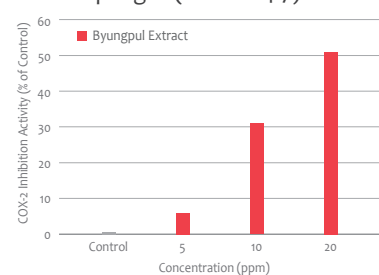
## Anti-allergic Effect (in vitro)

β-hexosaminidase Release Inhibition Activity in Basophils (RBL-2H3)



## Anti-inflammatory Effect (in vitro)

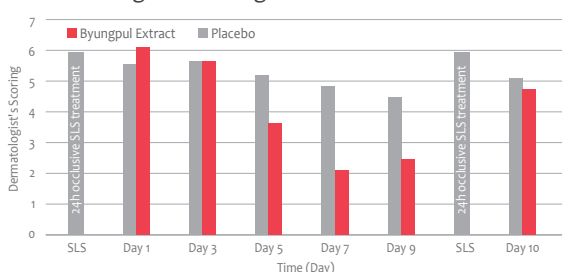
COX-2 Inhibition Activity in Macrophages (RAW 264.7)



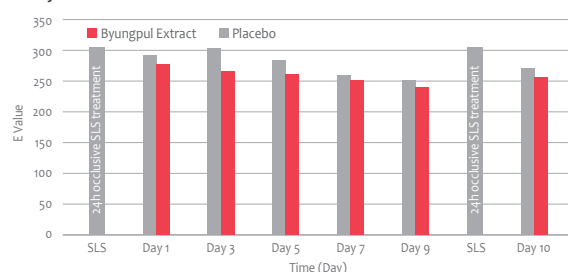
## Skin Soothing Effect (in vivo)

On Day 0, patches containing 3% SLS (sodium lauryl sulfate) solution were applied for 24 hours to induce erythema onto the forearms of 8 female volunteers aged between 18 and 65. On Day 9, erythema was re-induced by applying 3% SLS solution for 24 hours. A cream containing 2% Byungpul Extract was applied to the irritated skin twice a day for 10 days.

Dermatologist's Scoring



Erythema Value



# Clean Saver™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Clean Saver(PD)-RSPO, Clean Saver(PG), Clean Saver(GOL)-RSPO

**INCI Name\_** Sophora Flavescens Root Extract, Psoralea Corylifolia Fruit Extract, Platycarya Strobilacea Extract

**Dosage\_** 1-3%

**Efficacy\_** Anti-acne, Anti-oxidant, Skin Brightening

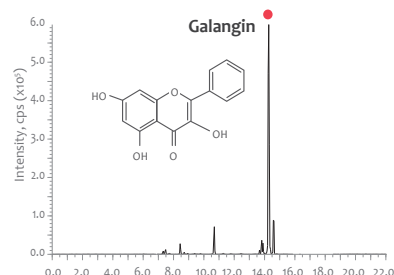
Clean Saver is a plant complex containing extracts from three plants, *Sophora flavescens*, *Psoralea corylifolia* and *Platycarya strobilacea*, which are all well-known oriental medicinal plants for anti-oxidant, anti-inflammatory, and anti-microbial activities. Clean Saver shows the anti-acne effect by decreasing the sebum release and by inhibiting the growth of *Cutibacterium acnes*, which is an aerotolerant and anaerobic bacteria causing acne in the skin.



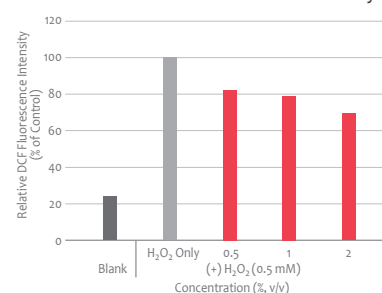
## Action Mode of Clean Saver



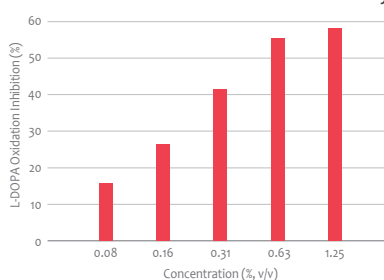
## Identification of Active Compound



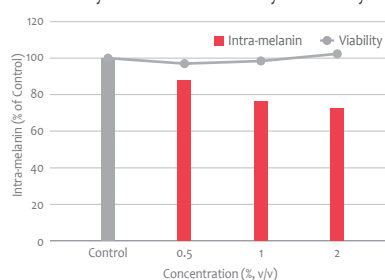
## Anti-oxidant Effect (in vitro) ROS Generation Inhibition Activity



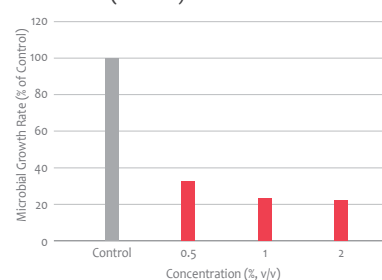
## Skin Brightening Effect (in tubo) L-DOPA Oxidation Inhibition Activity



## Skin Brightening Effect (in vitro) Melanin Synthesis Inhibition Activity in Melanocytes



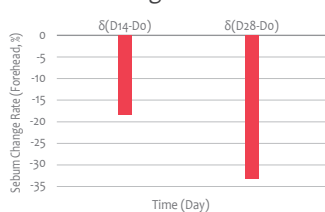
## Anti-acne Effect (in vitro) Microbial (C. acnes) Growth Inhibition Activity



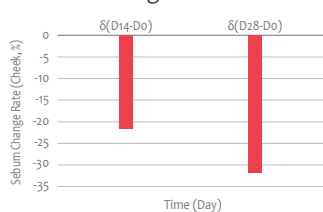
## Anti-acne Effect (in vivo)

18 male and female volunteers aged between 18 and 40 years old applied a cream containing 2% Clean Saver on cheek and forehead for 28 days.

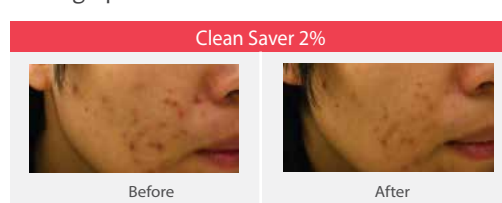
### Sebum Change on Forehead



### Sebum Change on Cheek



### Photograph Visualization





**Product Name** PhelloCure(GPD)-RSPO  
**INCI Name** Phellodendron Amurense Bark Extract  
**Dosage** 1-3%  
**Efficacy** Improving Skin Barrier, Anti-inflammatory, Anti-allergic

Skin aging exposome refers to the external and internal environmental factors and their interactions that affect human individuals. This concept is getting more and more attention in the skincare industry while the environmental condition worsens. Environmental stressors such as air pollution and solar radiation weaken the skin barrier and transform normal skin into sensitized skin. *Phellodendron amurense*, also known as the amur cork tree, has been selected as the reducing the fine dust by the Korea Forest Service. The bark of this tree has been used to treat several skin diseases such as redness and skin scabies traditionally in Korea. We could find the bark's various favorable effects on the skin barrier and developed PhelloCure. So, we expect PhelloCure can act as a core ingredient for improving skin conditions and protecting our skin from harmful environments.

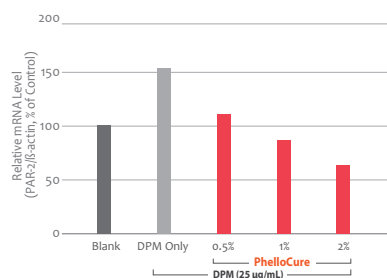


## Efficacy summary

<b>Strong Skin Barrier</b>	<b>Strong Skin Barrier Function</b>
	- Occludin - ZO-1
<b>Anti-inflammation</b>	<b>Inflammatory Cytokines Inhibition Activity</b>
	- PAR-2 - TNF-α - IL-6 - IL-8
<b>Anti-allergy</b>	<b>Allergic Inhibition Activity</b>
	- Histamine - β-hexosaminidase

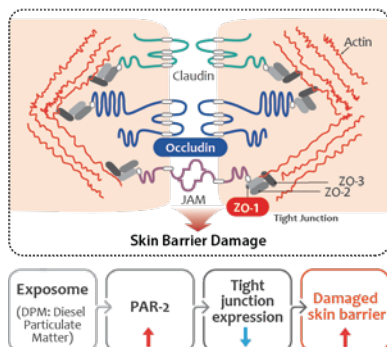
## Anti-inflammatory Effect

PAR-2 Gene Expression in DPM-induced HaCaT cells  
PhelloCure

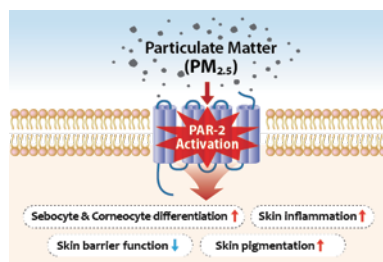


\*DPM: Diesel Particulate Matter

## Tight Skin Junction

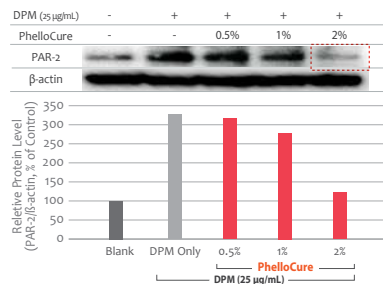


## PAR-2 (Protease Activated Receptor-2) Mechanism

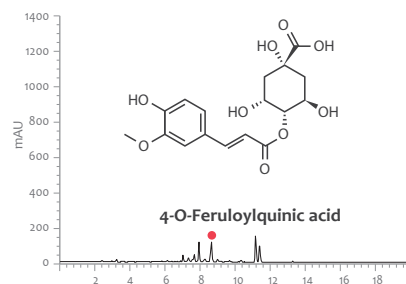


## Anti-inflammatory Effect

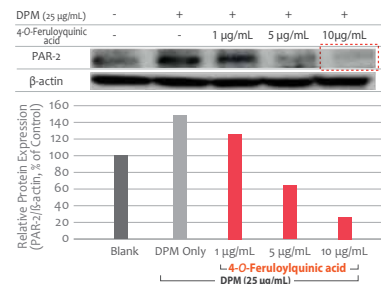
PAR-2 Protein Expression in DPM-induced HaCaT cells  
PhelloCure



## Identification of Active Compound

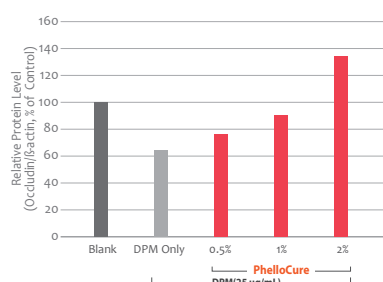


## 4-O-Feruloylquinic acid

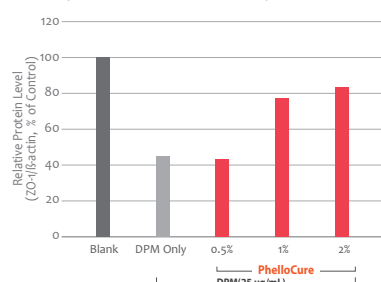


## Improving Skin Barrier Effect

Protein Expression in DPM-induced HaCaT cells  
Occludin



## ZO-1 (Zonula Occludens-1)





# Portulaca Extract-TLS™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Portulaca Extract-TLS, Portulaca Extract-TLS(PD)-RSPO,  
Portulaca Extract-TLS(PG), Portulaca Extract-TLS(GOL)-RSPO

**INCI Name\_** Portulaca Oleracea Extract

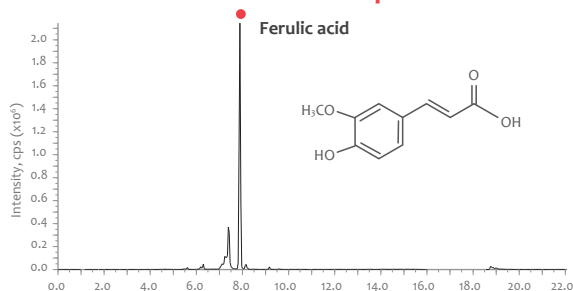
**Dosage\_** 1-3%

**Efficacy\_** Skin Soothing, Anti-inflammatory, Anti-allergic, Anti-oxidant

*Portulaca oleracea* is an annual succulent with bright yellow flowers surrounded by a cluster of leaves. The plant is known as purslane, little hogweed or pusley, and *Machihyun* in Korean meaning 'horse teeth amaranth' due to its resemblance to horse's teeth. It is an edible and nutritious vegetable with a global distribution. It is a well-known plant in Korean traditional medicine, generally used to treat infection and relieve irritated skin. Clinical evaluation has shown that Portulaca Extract-TLS, an extract of *P. oleracea*, shows excellent skin soothing efficacy.

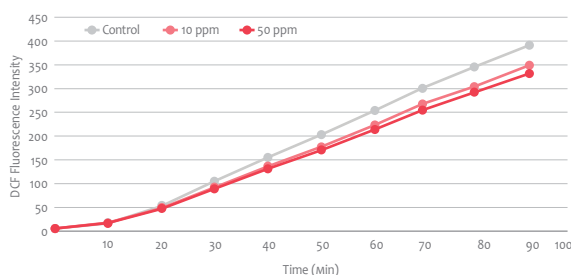


## Identification of Active Compound



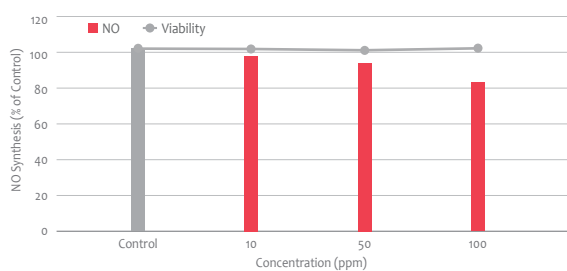
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



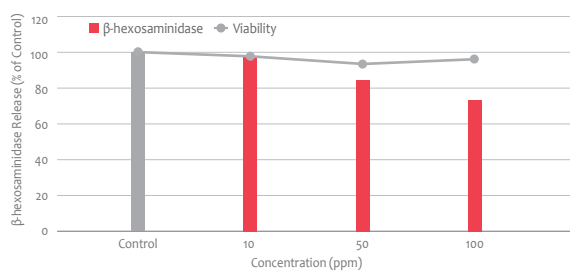
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



## Anti-allergic Effect (in vitro)

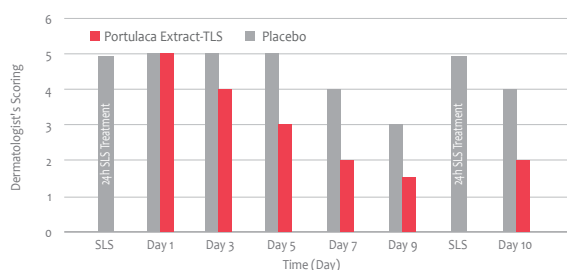
β-hexosaminidase Release Inhibition in Basophils (RBL-2H3)



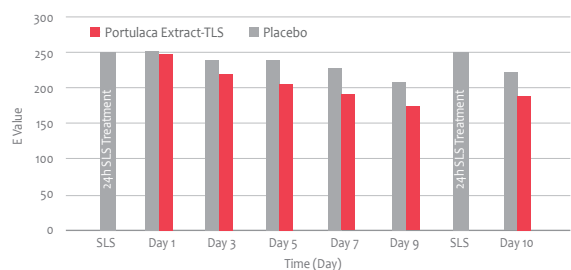
## Skin Soothing Effect (in vivo)

On Day 0, patches containing 3% SLS (sodium lauryl sulfate) solution were applied for 24 hours to induce erythema onto the forearms of 10 female volunteers aged between 18 and 65. On Day 9, erythema was re-induced by applying 3% SLS solution for 24 hours. A cream containing 2% Portulaca Extract-TLS was applied to the irritated skin twice a day for 10 days.

Dermatologist's Scoring



Erythema Value



# PureCalm

**Product Name\_** PureCalm(PD)-RSPO

**INCI Name\_** Houttuynia Cordata Extract

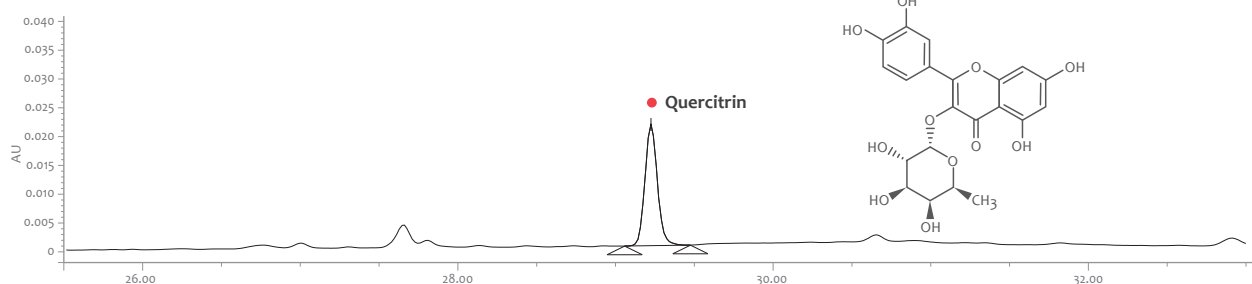
**Dosage\_** 1-3%

**Efficacy\_** Anti-inflammatory, Anti-oxidant

PureCalm is a plant extract of *Houttuynia cordata*, commonly known as heartleaf or fishwort, used as a traditional medicine to treat inflammatory diseases, especially skin wounds and skin diseases. In Asian folk medicine, a tea made from the dried leaves of *H. cordata* is consumed to detoxify the body. PureCalm has a good effect on soothing irritated skin with anti-inflammatory and anti-oxidant effects.

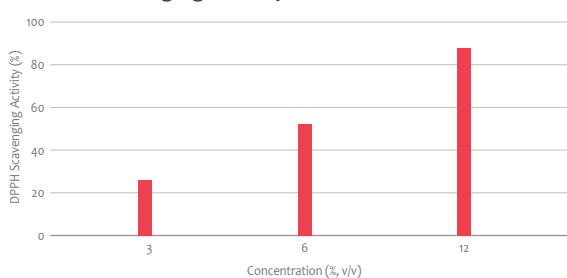


## Identification of Active Compound



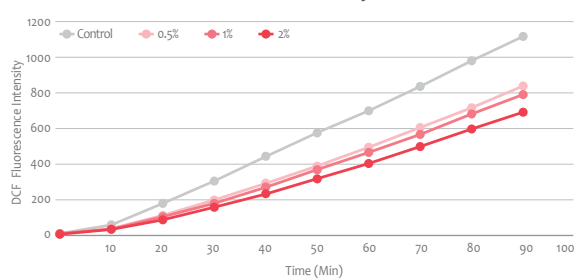
## Anti-oxidant Effect (in tubo)

DPPH Scavenging Activity



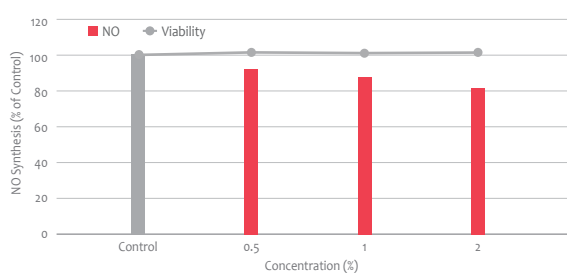
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



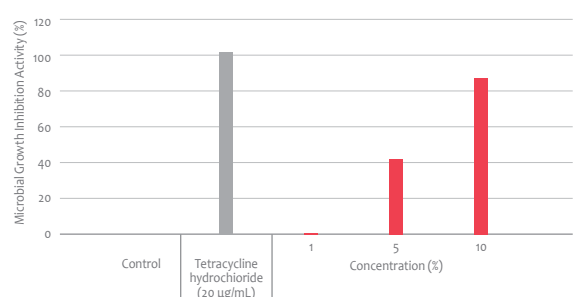
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



## Anti-acne Effect (in vitro)

Microbial (C.acnes) Growth Inhibition Activity



# Red Ginseng Active-R™



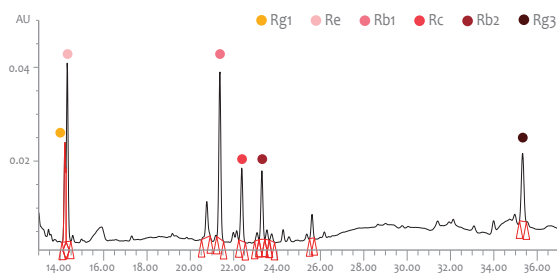
raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Red Ginseng Active-R(NB), Red Ginseng Active-R(PD)-RSPO,  
Red Ginseng Active-R(GOL)-RSPO  
**INCI Name\_** Panax Ginseng Root Extract  
**Dosage\_** 1-3%  
**Efficacy\_** Anti-wrinkle, Energy Boosting, Anti-inflammatory, Anti-oxidant

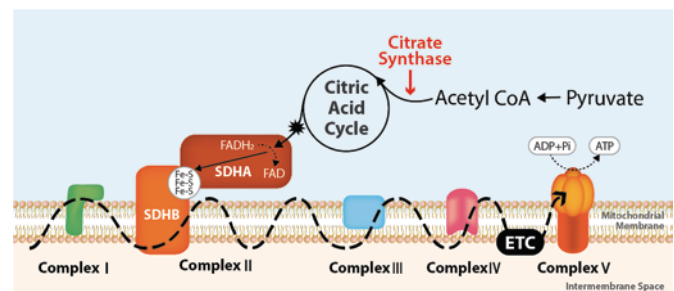
As a representative medicinal herb in Traditional Korean Medicine, red ginseng has been used for many purposes including promoting Yang energy, improving circulation and restoring balance. The color of red ginseng is obtained from a traditional process of repetitive steaming and drying of a *Panax ginseng* root. The pharmacological activities are improved after this process by the formation and accumulation of ginsenosides. Red Ginseng Active-R, an extract from 6-year-old Korean red ginseng, shows anti-oxidant and anti-wrinkle activities as well as energy boosting activity.



## Ginsenosides from Red Ginseng Active-R

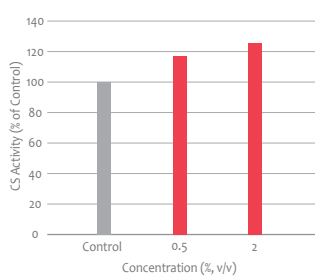


## Mechanism of Energy Boosting

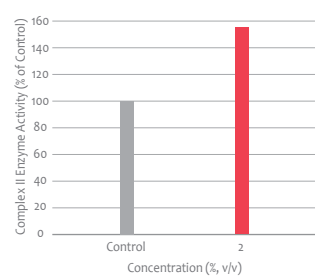


## Energy Boosting Effect (in vitro)

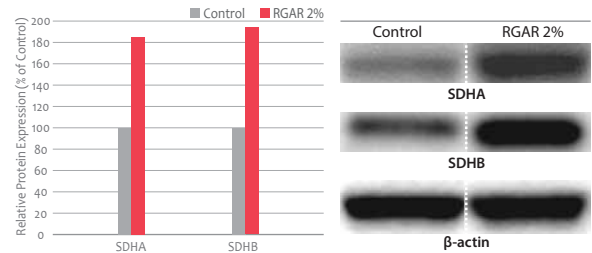
### CS (Citrate Synthase) Activity



### Complex II Enzyme Activity



### Increase of Complex II Subunit Protein Level

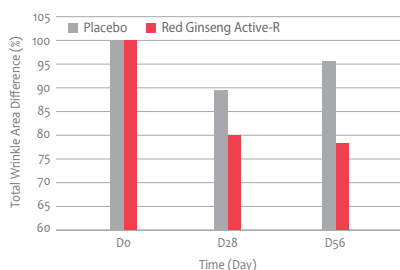


\*SDHA/SDHB: Succinate Dehydrogenase Complex subunits A/B  
RGAR : Red Ginseng Active-R

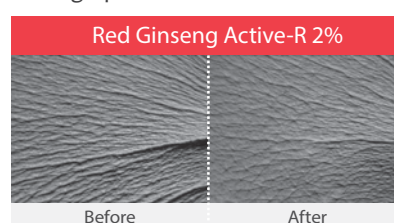
## Anti-wrinkle Effect (in vivo)

21 female volunteers aged between 45 and 65 years old applied a cream containing 2% Red Ginseng Active-R twice a day for 56 days on face.

### Total Wrinkle Area Difference

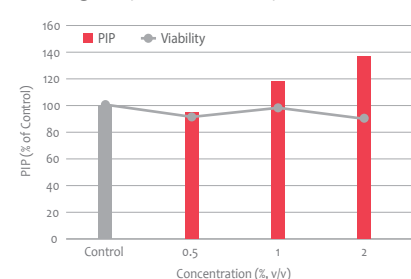


### Photograph Visualization



## Anti-wrinkle Effect (in vitro)

### Collagen Synthesis Activity in Fibroblasts



# Sangmodan™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Sangmodan, Sangmodan(PD)-RSPO, Sangmodan(GOL)-RSPO

**INCI Name\_** Sophora Flavescens Root Extract, Capsicum Annuum Fruit Extract, Lycium Chinense Fruit Extract, Camellia Sinensis Leaf Extract, Angelica Gigas Root Extract, Angelica Dahurica Root Extract, Rubus Coreanus Fruit Extract, Morus Alba Root Extract, Pinus Palustris Leaf Extract, Lithospermum Erythrorhizon Root Extract, Polygonum Multiflorum Root Extract

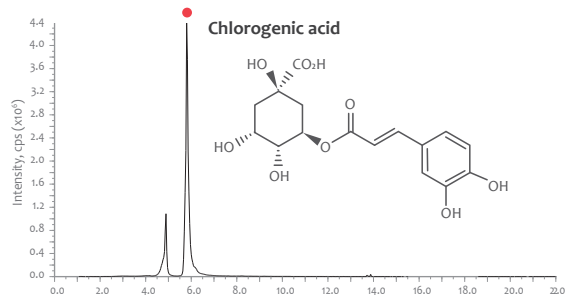
**Dosage\_** 2-4%

**Efficacy\_** Hair Care, Anti-oxidant

Hair loss, hair thinning and itchiness of the scalp can be caused by a number of environmental factors such as air pollution and direct sunlight. A stressful modern lifestyle is also related to hair loss problems. These problems can be improved however by making a change in lifestyle and/or improving health conditions. Commonly in East Asia, oriental medicine is used in the treatment of alopecia and scalp conditions. Although this approach is slow to show results, it is effective and has the benefit of being natural. Sangmodan has been developed as a natural hair care ingredient and is composed of 11 oriental medicinal herbs based on traditional remedies. It provides anti-inflammatory effects and improves blood circulation to the scalp aiding in the prevention of hair loss or thinning.

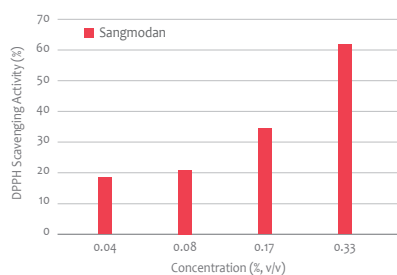


## Identification of Active Compound

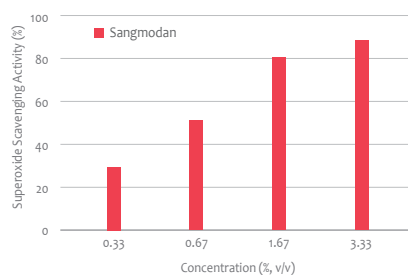


## Anti-oxidant Effect (in tubo)

DPPH Scavenging Activity

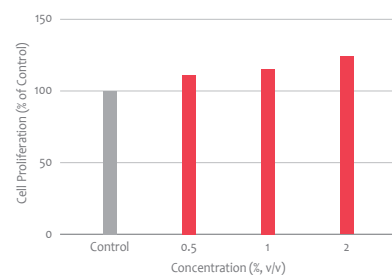


Superoxide Scavenging Activity



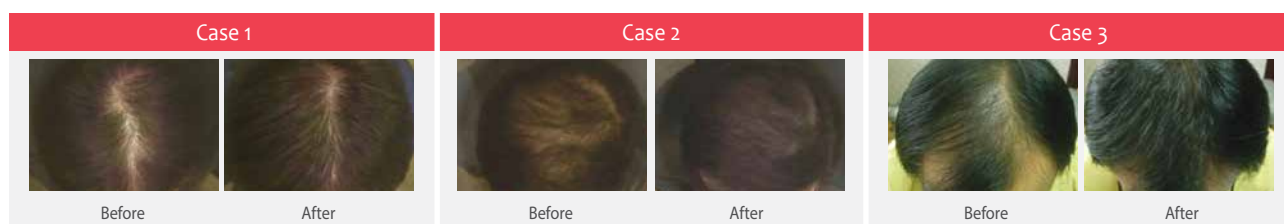
## Hair Growth Effect (in vitro)

Hair Cell Proliferation in Human Dermal Papilla Cell (HDPCs)



## Hair and Scalp Care (in vivo)

\_Subject : 30 male and female alopecia patients  
\_Period : 6-12 months  
\_Application : 2 to 4 times a day with a hair product containing Sangmodan





**Product Name** Truecalm, Truecalm(GPD)-RSPO, Truecalm(GOL)-RSPO

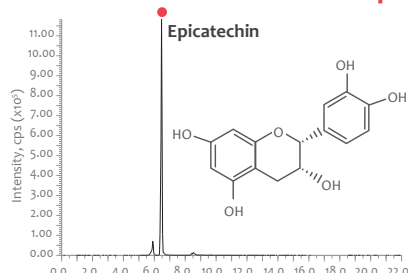
**INCI Name** Viola Mandshurica Flower Extract, Glycyrrhiza Uralensis (Licorice) Root Extract, Camellia Sinensis Leaf Extract, Centella Asiatica Extract, Polygonum Cuspidatum Root Extract, Scutellaria Baicalensis Root Extract

**Dosage** 1-3%

**Efficacy** Skin Soothing, Anti-inflammatory, Anti-oxidant

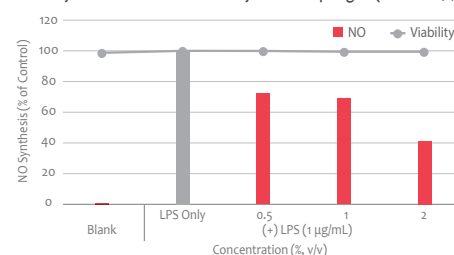
Truecalm is a mixture of six different plant extracts well-known for the beneficial effects on the skin. Among these six different plants, Manchurian violet, sourced from Jeju Island, works as the main component for the extraordinary anti-inflammatory and skin soothing effects. Furthermore, each plant collaborates to maximize the beneficial effects through having additional anti-inflammatory and anti-oxidant efficacies. When tested on human skin, Truecalm alleviated the irritated skin caused by UV rays and SLS (sodium lauryl sulfate).

## Identification of Active Compound



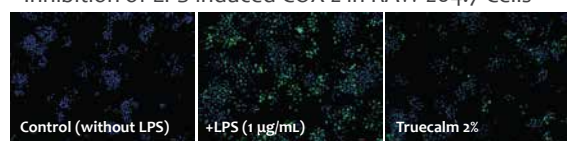
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)

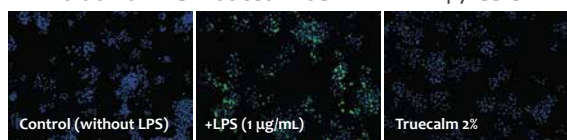


## Anti-inflammatory Effect (in vitro)

Inhibition of LPS-induced COX-2 in RAW 264.7 Cells



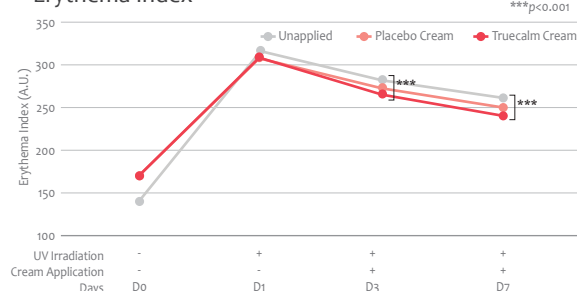
Inhibition of LPS-induced iNOS in RAW 264.7 Cells



## UV-induced Irritation Alleviation Effect (in vivo)

On Day 0, 800 µm<sup>2</sup> UV-rays were irradiated to induce erythema onto the forearms of 21 female volunteers aged between 20 and 59. A cream containing 2% Truecalm was applied to the irritated skin twice a day for 7 days.

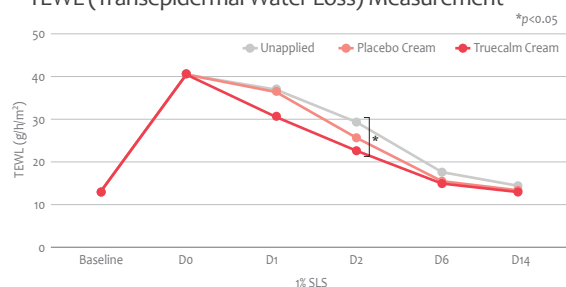
Erythema Index



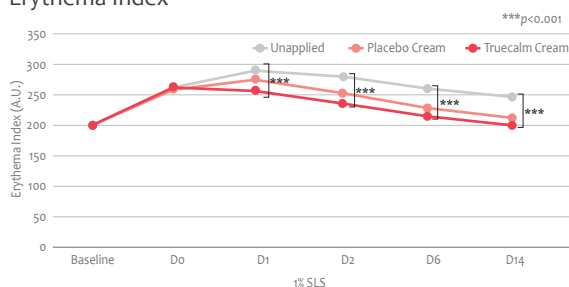
## Skin Soothing Effect (in vivo)

On Day 0, patches containing 1% SLS (sodium lauryl sulfate) solution were applied for 24 hours to induce erythema onto the forearms of 23 female volunteers aged between 30 and 59. A cream containing 2% Truecalm was applied to the irritated skin twice a day for 14 days.

TEWL (Transepidermal Water Loss) Measurement



Erythema Index



# Narcisture™

**Product Name**\_\_ Narcisture(GPD)

**INCI Name**\_\_ Narcissus Tazetta Bulb Extract

**Dosage**\_\_ 1-5%

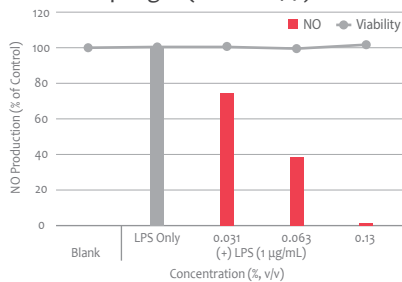
**Efficacy**\_\_ Anti-aging, Skin Barrier Improvement, Skin Moisturizing, Anti-inflammatory

Narcisture is a bulb extract of *Narcissus tazetta*, commonly known as Chinese sacred lily or cream narcissus. Narcisture possesses powerful anti-inflammatory and skin moisturizing effects leading to the improvement in skin barrier and alleviation of skin problems. During this pandemic era, people suffer from skin problems such as eczema and acne caused by wearing masks, and Narcisture can provide a good solution to these skin problems.

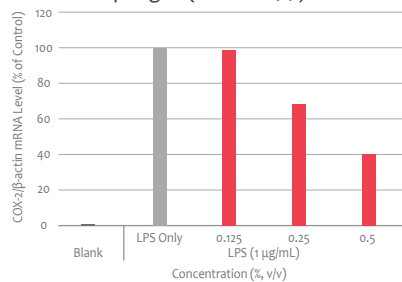


## Anti-inflammatory Effect (in vitro)

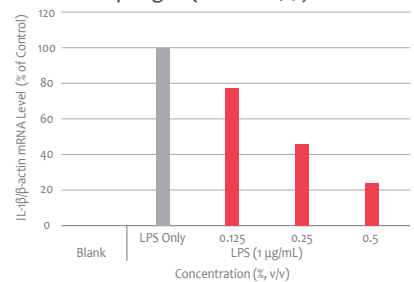
NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



COX-2 Gene Expression Inhibition Activity in Macrophages (RAW 264.7)

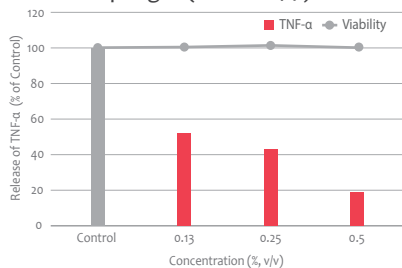


IL-1β Gene Expression Inhibition Activity in Macrophages (RAW 264.7)

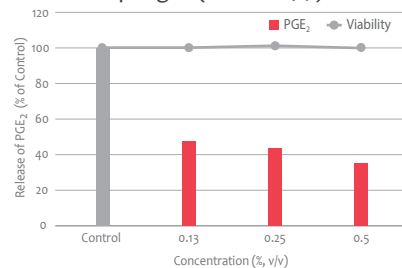


## Anti-inflammatory Effect (in vitro)

TNF-α Synthesis Inhibition Activity in Macrophages (RAW 264.7)

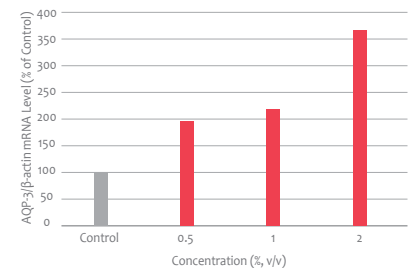


PGE<sub>2</sub> Synthesis Inhibition Activity in Macrophages (RAW 264.7)



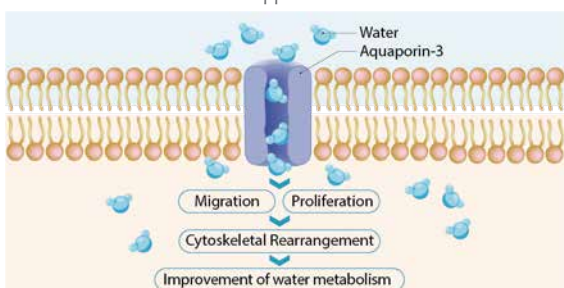
## Skin Moisturizing Effect (in vitro)

AQP-3 (Aquaporin-3) Synthesis Increase Activity



## The Role of Aquaporin in Skin Moisturization

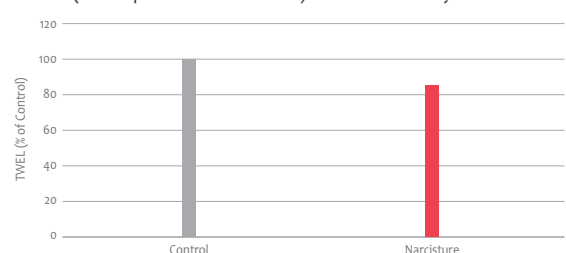
Aquaporin is the water channel located in cell membranes, playing a role of water transportation between cells. More aquaporin in skin cells means more moisture supplied to the skin cells.



## Skin Moisturizing Effect (in vivo)

10 volunteers aged between 25 and 45 applied a cream containing 5% Narcisture on forearms for 2 hours.

TEWL (Transepidermal Water Loss) Decrease Activity After 2 Hours



# BotaCair™

**Product Name\_** BotaCair(GPD)

**INCI Name\_** Sophora Flavescens Root Extract, Scutellaria Baicalensis Root Extract, Coptis Japonica Root Extract, Morus Alba Bark Extract

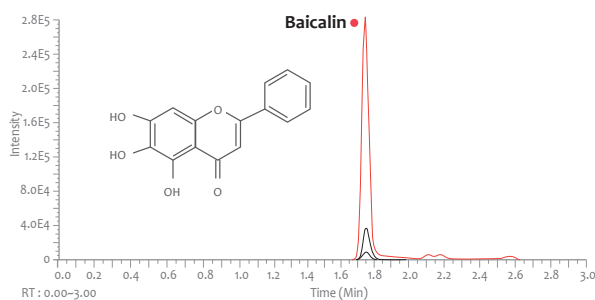
**Dosage\_** 1-5%

**Efficacy\_** Hair Care, Anti-photoaging, Anti-microbial, Anti-oxidant

BotaCair is a complex of extracts from 4 plants: *Coptis japonica* root, *Sophora flavescens* root, *Scutellaria baicalensis* root, and *Morus alba* bark. It is manufactured using the ultrasonic extraction method to maximize the extraction yield and the stability is secured through the aging process. BotaCair has beneficial effects on both scalp and hair care. It improves the scalp condition with anti-microbial and anti-photoaging effects while it extends the anagen (the first step of the hair growth cycle) period helping to reduce the hair loss. It also improves the expression of genes related to hair growth.

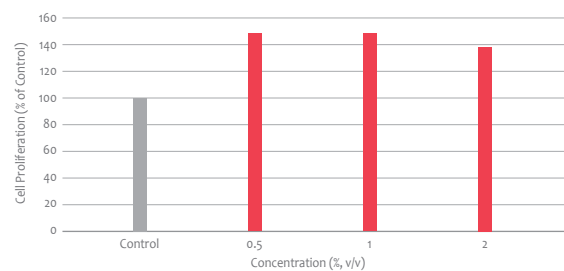


## Identification of Active Compound



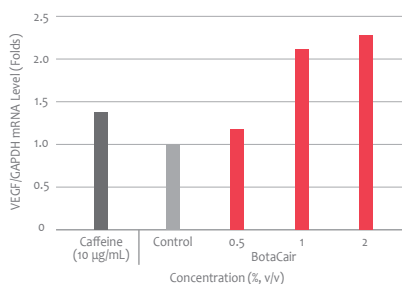
## Hair Growth Effect (in vitro)

Hair Cell Proliferation Effect

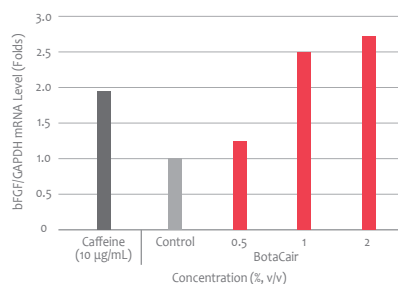


## Hair Growth Effect (in vitro)

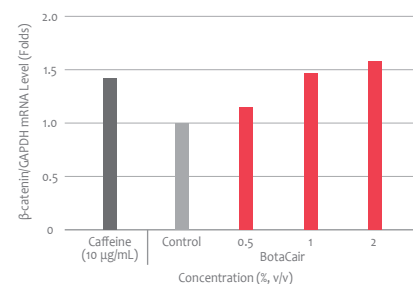
Increase in VEGF Gene Expression



Increase in bFGF Gene Expression

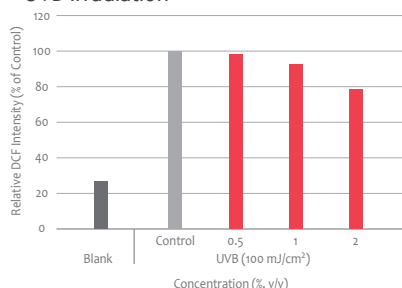


Increase in  $\beta$ -catenin Gene Expression



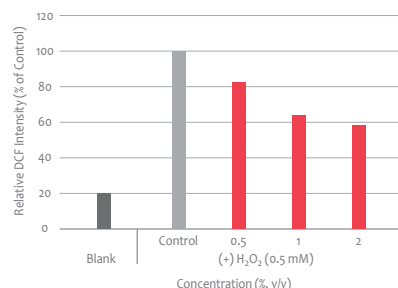
## Anti-photoaging Effect (in vitro)

ROS Generation Inhibition Activity After UVB Irradiation



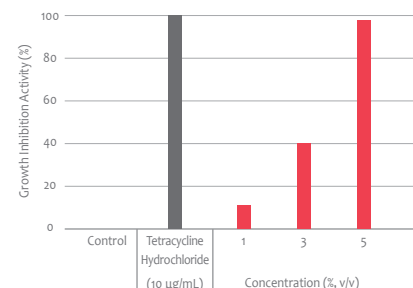
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



## Anti-microbial Effect (in vitro)

*S. aureus* Growth Inhibition Activity



# Jeju Blossom™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name** Jeju Blossom(GPD)-RSPO, Jeju Blossom(GOL)-RSPO, Jeju Blossom(PG)

**INCI Name** Prunus Yedoensis Flower Extract

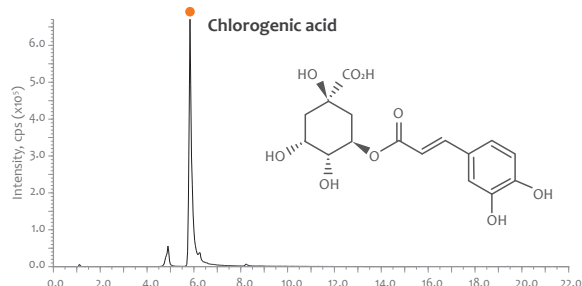
**Dosage** 2-4%

**Efficacy** Skin Soothing, Anti-inflammatory, Anti-oxidant, Skin Brightening

Jeju Blossom is a flower extract of Yoshino cherry (*Prunus yedoensis*) originally from Jeju Island in Korea. The fragrant, light pink flowers are known as 'Jeju King Cherry Flowers', and they are in full bloom in April. Although the trees can be seen all over Jeju Island, the full blossoms only last for a couple of days, and people celebrate this period during the Jeju Cherry Flower Festival. The Jeju Blossom exhibits skin soothing effects through anti-inflammatory and anti-allergic actions.

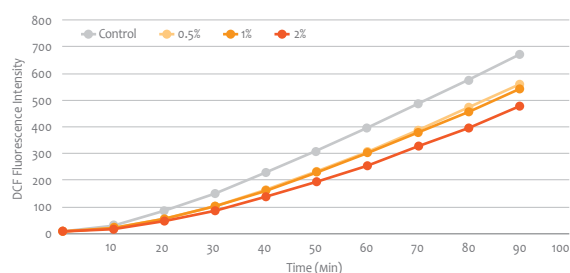


## Identification of Active Compound



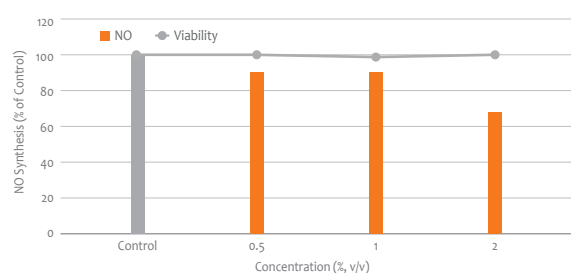
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



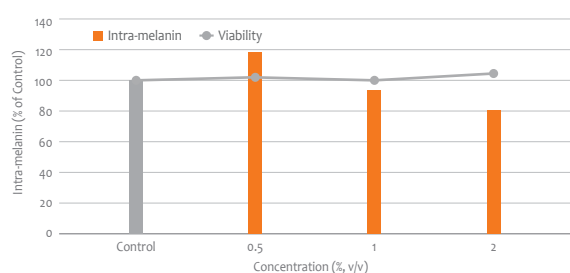
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition in Macrophages (RAW 264.7)



## Skin Brightening Effect (in vitro)

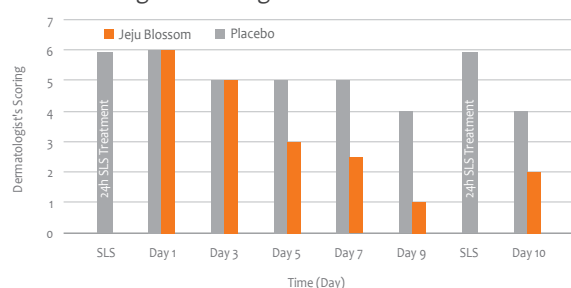
Melanin Synthesis Inhibition Activity in Melanocytes



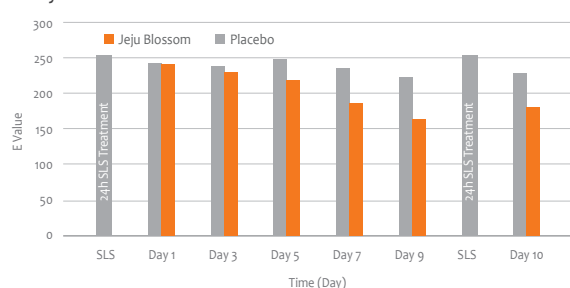
## Skin Soothing Effect (in vivo)

On Day 0, patches containing 3% SLS (sodium lauryl sulfate) solution were applied for 24 hours to induce erythema onto the forearms of 10 female volunteers aged between 18 and 65. On Day 9, erythema was re-induced by applying 3% SLS solution for 24 hours. A cream containing 3% Jeju Blossom was applied to the irritated skin twice a day for 10 days.

Dermatologist's Scoring



Erythema Value





# Jeju Changpo™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Jeju Changpo(PD)-RSPO, Jeju Changpo(GOL)-RSPO

**INCI Name\_** Acorus Calamus Root Extract

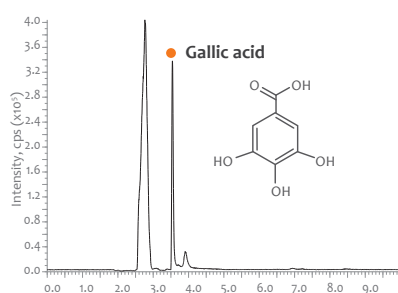
**Dosage\_** 1-3%

**Efficacy\_** Hair Care, Anti-oxidant, Skin Brightening

*Acorus calamus*, commonly known as calamus or sweet flag, is a tall perennial plant living in a wetland. Traditionally in Korea, on the day of Dano, which is the fifth day of May of the lunar calendar, ladies washed their hair and body with boiled water of calamus root to make the skin and hair soft and shiny. Indeed, calamus is widely employed in modern herbal medicine to treat skin eruptions, rheumatic pains, and neuralgia. Jeju Changpo uses calamus root from Jeju Island, and it has significant hair growth, skin brightening and anti-oxidant effects.

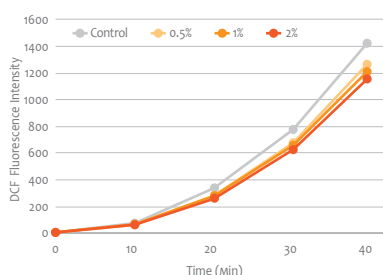


## Identification of Active Compound



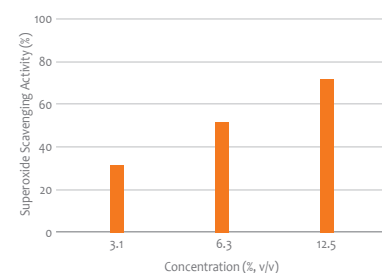
## Anti-oxidant Effect (in vitro)

### ROS Generation Inhibition Activity



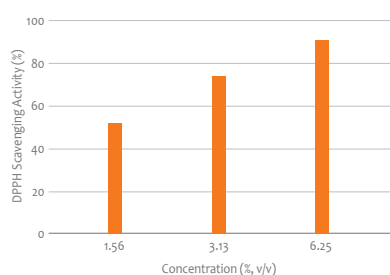
## Anti-oxidant Effect (in tubo)

### Superoxide Scavenging Activity



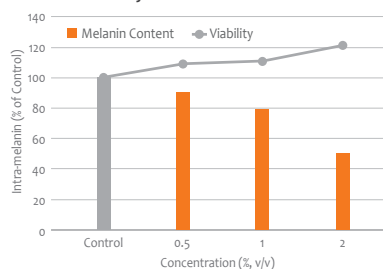
## Anti-oxidant Effect (in tubo)

### DPPH Scavenging Activity



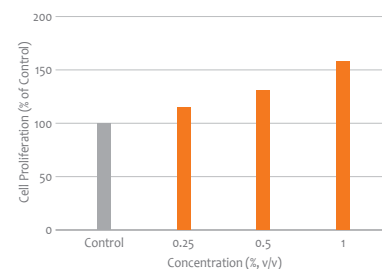
## Skin Brightening Effect (in vitro)

### Melanin Synthesis Inhibition Activity in Melanocytes



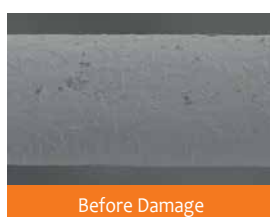
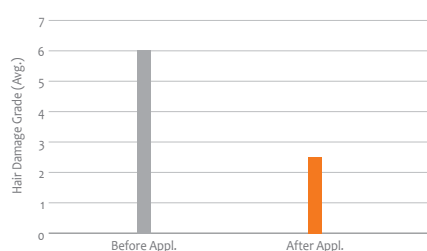
## Hair Growth Effect (in vitro)

### Hair Cell Proliferation in Human Dermal Papilla Cells (HDPCs)



## Hair Damage Recovery Effect (in vivo)

20 hair tresses are scanned by SEM before and after 3% of Jeju Changpo containing hair essence to damaged hair by hair dye. Each hair is graded by visual evaluation according to 'hair damage grade.'



**Product Name\_** Leafresh(NB), Leafresh(PD)-RSPO, Leafresh(PG), Leafresh(GOL)-RSPO

**INCI Name\_** Nelumbo Nucifera Leaf Extract

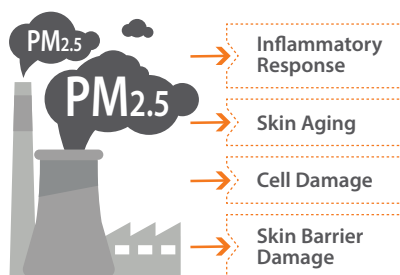
**Dosage\_** 1-3%

**Efficacy\_** Anti-pollution, Anti-photoaging, Anti-oxidant, Skin Brightening, Anti-glycation, Anti-senescence

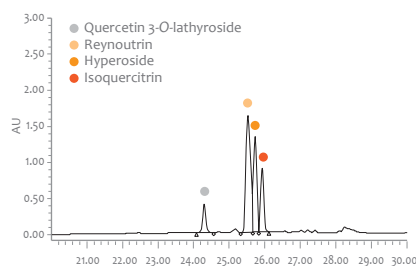
*Nelumbo nucifera*, also known as lotus, is one of the aquatic plants which rises through muddy water and produces pure and uncontaminated flowers. This feature makes it a symbol of purity and resurrection. Lotus leaf is widely consumed as food, tea, and folk medicine. It is believed that all diseases are treated by drinking the tea consistently for a long time. Leafresh, an extract from lotus leaves, shows recovery from pollution-caused damage and protects skin from UV radiation and oxidative stress.



## Damages Caused by PM<sub>2.5</sub>

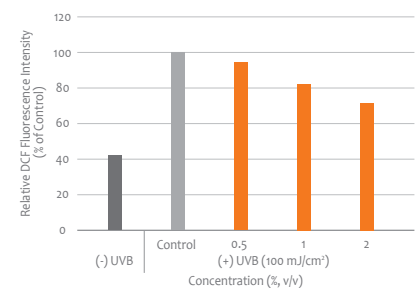


## Identification of Active Compounds



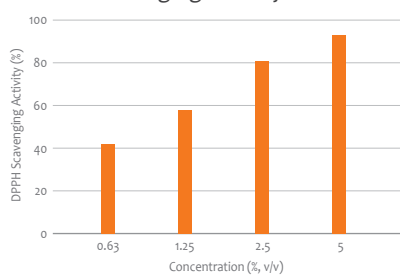
## Anti-photoaging Effect (in vitro)

### ROS Generation Inhibition Activity



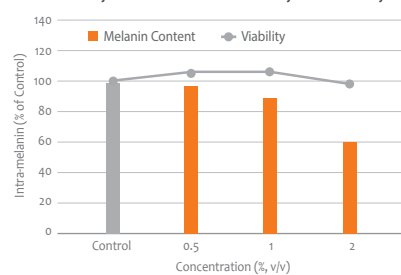
## Anti-oxidant Effect (in tubo)

### DPPH Scavenging Activity



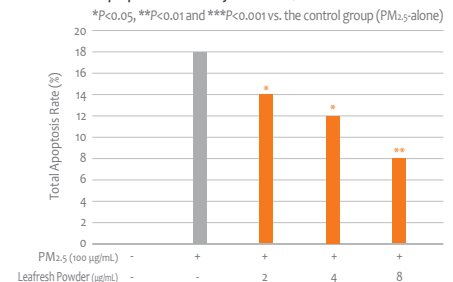
## Skin Brightening Effect (in vitro)

### Melanin Synthesis Inhibition Activity in Melanocytes



## Anti-pollution Effect (in vitro)

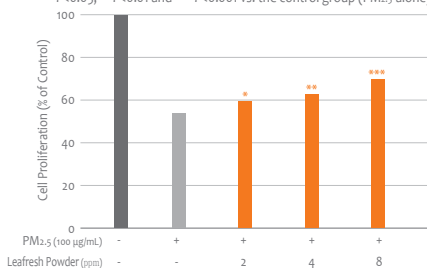
### Anti-apoptotic Activity on PM<sub>2.5</sub>-treated HaCaT Cells



## Anti-pollution Effect (in vitro)

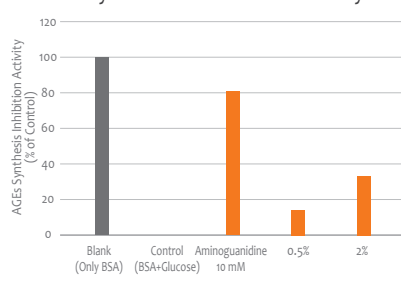
### Cell Proliferation Activity in PM<sub>2.5</sub>-treated HaCaT cells

\*P<0.05, \*\*P<0.01 and \*\*\*P<0.001 vs. the control group (PM<sub>2.5</sub>-alone)



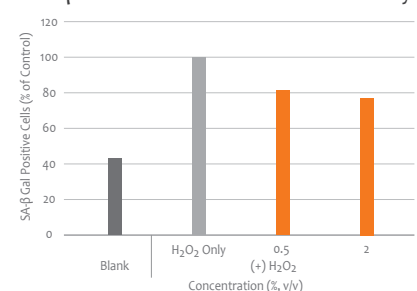
## Anti-glycation Effect (in tubo)

### AGEs Synthesis Inhibition Activity



## Anti-senescence Effect (in vitro)

### SA-β Gal Positive Cells Inhibition Activity



# Scoti-Hops™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Scoti-Hops(PD)-RSPO, Scoti-Hops(PG), Scoti-Hops(GCR)-RSPO,  
Scoti-Hops(GOL)-RSPO

**INCI Name\_** Humulus Lupulus (Hops) Extract

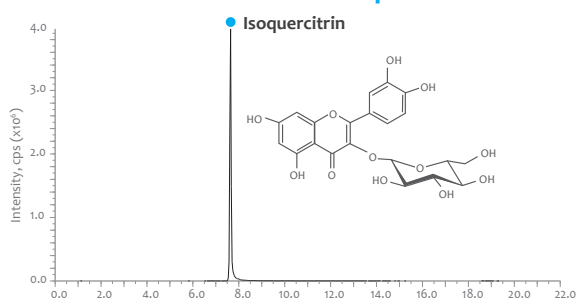
**Dosage\_** 1-3%

**Efficacy\_** Hair Care, Anti-inflammatory, Anti-oxidant

*Humulus lupulus*, known as hop, is a flowering plant consumed mainly as a flavoring and stabilizing agent in the brewing industry. Beer factory workers in the medieval and modern era rarely experienced hair-loss problems because of hops and brewer's yeast. Modern people with hair loss issues feel that hair loss affects their whole look and thus they try to take alternatives to stimulate natural hair growth. Washing hair with beer is one of the home therapies for hair care. Scoti-Hops exhibits obvious hair care effects by both promoting hair growth and by improving scalp condition through anti-inflammatory and anti-oxidant activities.

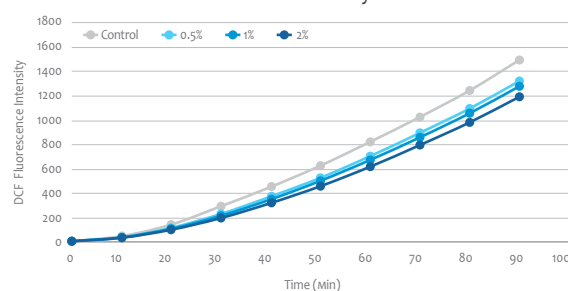


## Identification of Active Compound



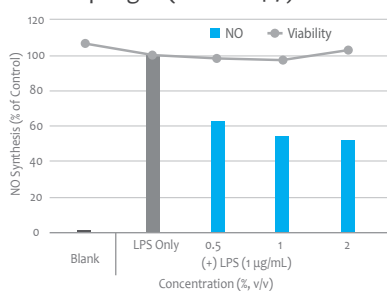
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



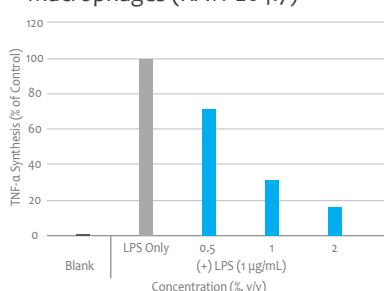
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



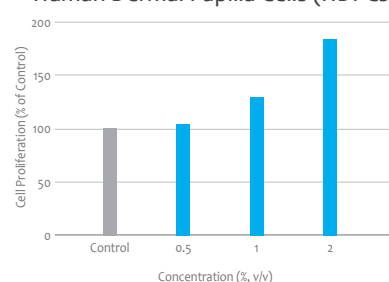
## Anti-inflammatory Effect (in vitro)

TNF-α Synthesis Inhibition Activity in Macrophages (RAW 264.7)



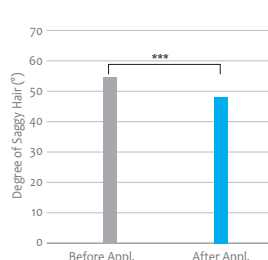
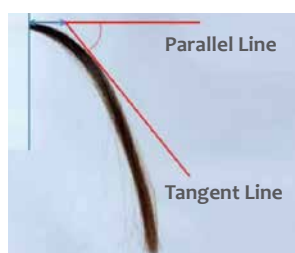
## Hair Growth Effect (in vitro)

Hair Cell Proliferation in Human Dermal Papilla Cells (HDPCs)



## Enhancing Hair Elasticity Effect (in vivo)

The degree between parallel line and tangent line that made by hair tresses is measured before and after applying 2 mL of hair essence containing 3% of Scoti-Hops.

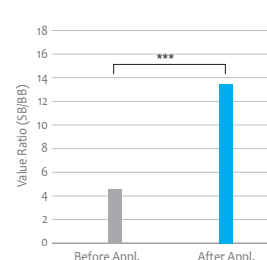


## Enhancing Hair Shine Effect (in vivo)

V value of BB and SB are measured before and after applying 2 mL of hair essence containing 3% of Scoti-Hops.



\*BB: Black band SB: Shining band



# Scoti-Horsetail™



Royal  
Botanic Garden  
Edinburgh



COSMOS APPROVED

raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

\* This is a product developed by the co-research project  
in association with the Royal Botanic Garden Edinburgh.

**Product Name\_** Scoti-Horsetail SPD-RSPO

**INCI Name\_** Equisetum Fluvatile Extract

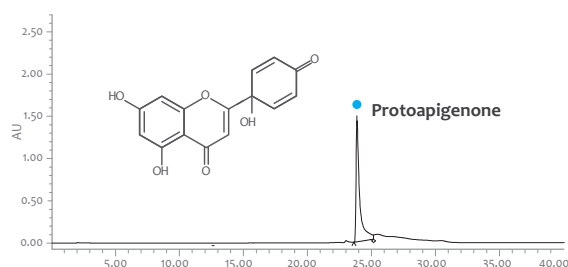
**Dosage\_** 1-3%

**Efficacy\_** Skin Brightening, Anti-inflammatory

*Equisetum fluvatile*, commonly known as water horsetail, is a perennial horsetail growing in a damp and swamp area. It grows in great abundance in Great Britain and particularly in Scotland. They have hollow stems and lack proper leaves and flowers. The stems contain the constituents desired in skin care. *E. fluvatile* is one of the plants selected for the collaborative research project with the Royal Botanic Garden Edinburgh and collected from Scotland. The extract from *E. fluvatile* shows anti-inflammatory and skin brightening properties. A natural derivative of apigenin, protoapigenone was found in *E. fluvatile* as one of the active compounds.

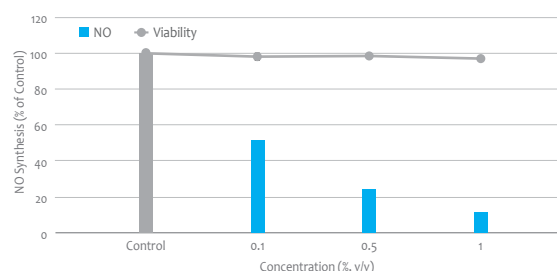


## Identification of Active Compound



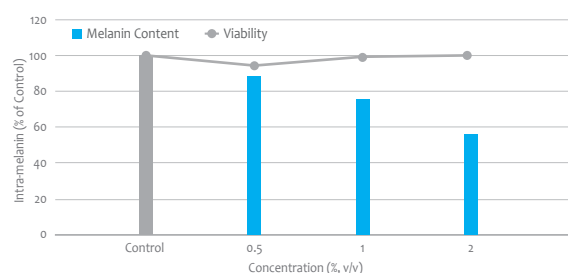
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



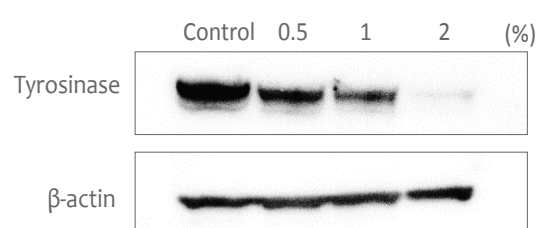
## Skin Brightening Effect (in vitro)

Melanin Synthesis Inhibition Activity in Melanocytes



## Skin Brightening Effect (in vitro)

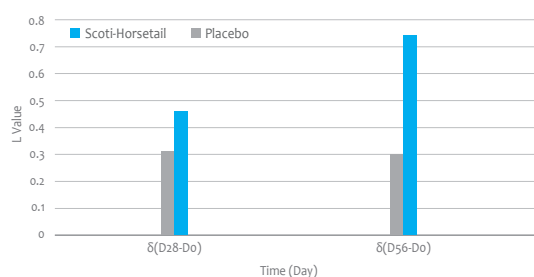
Inhibition of Tyrosinase Expression



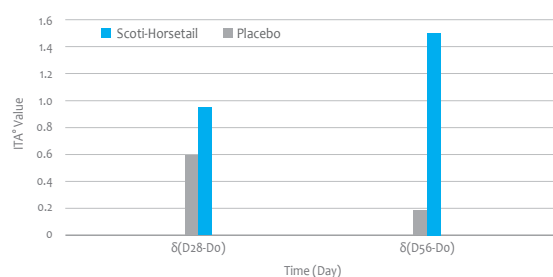
## Skin Brightening Effect on Facial Dark Spot Area (in vivo)

22 female volunteers aged between 30 and 55 years old applied a cream containing 2% Scoti-Horsetail twice a day on face for 56 days.

Lightness Value



ITA° Value





# Speedwell™



Royal  
Botanic Garden  
Edinburgh



COSMOS APPROVED

raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

\* This is a product developed by the co-research project  
in association with the Royal Botanic Garden Edinburgh.

**Product Name\_** Speedwell(PD)-RSPO, Speedwell(GOL)-RSPO

**INCI Name\_** Veronica Officinalis Extract

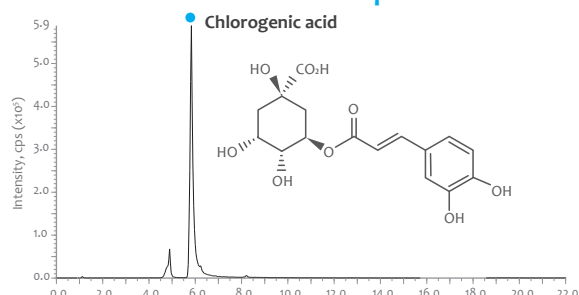
**Dosage\_** 1-3%

**Efficacy\_** Anti-wrinkle, Anti-oxidant, Anti-inflammatory

*Veronica officinalis*, commonly called as speedwell, is an herbaceous perennial native to Europe. It is well-known for anti-inflammatory activity and used in herbal medicine for the treatment of eczema and wounds. In the 19<sup>th</sup> century, Speedwell was being used as a tea substitute in France where it was called “Europe tea” due to its bitter and astringent taste and tea-like smell. Scoti-Speedwell™ is an extract of *V. officinalis* and shows anti-oxidant, anti-inflammatory and anti-wrinkle activities.

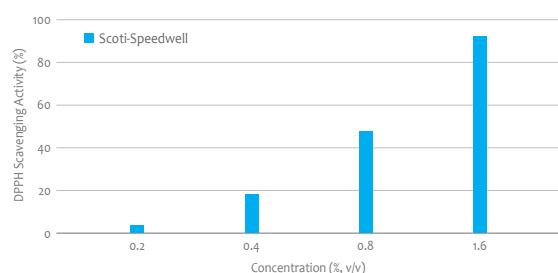


## Identification of Active Compound



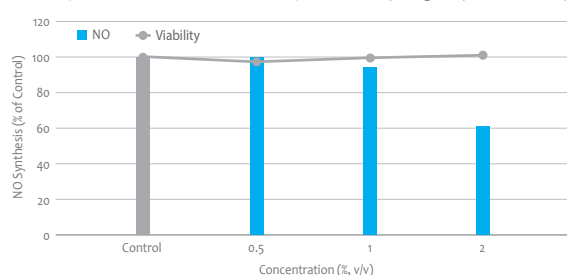
## Anti-oxidant Effect (in tubo)

DPPH Scavenging Activity



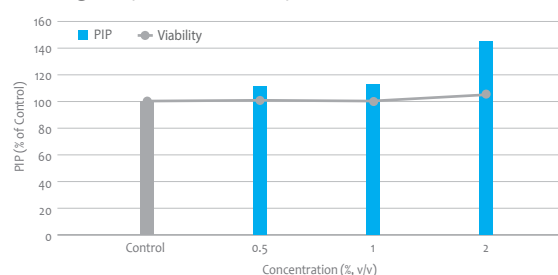
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



## Anti-wrinkle Effect (in vitro)

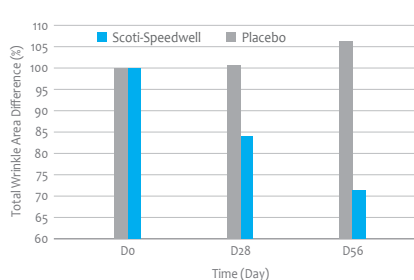
Collagen Synthesis Activity in Fibroblasts



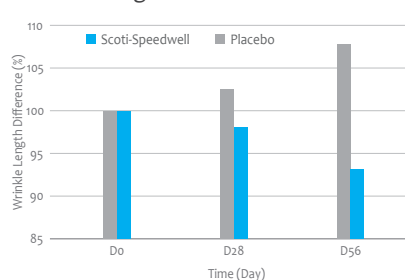
## Anti-wrinkle Effect (in vivo)

18 female volunteers aged between 45 and 65 years old applied a cream containing 2% Scoti-Speedwell twice a day for 56 days to the eye contour area.

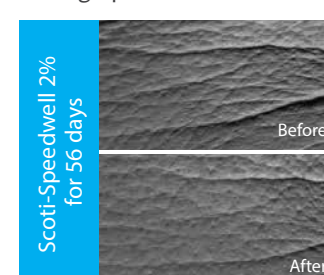
Total Wrinkle Area Difference



Wrinkle Length



Photograph Visualization



\*The product name has been changed from Scoti-Speedwell to Speedwell, but the clinical test was conducted under the original name.

# Beauty Plus One-F™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Beauty Plus One-F, Beauty Plus One-F(PD)-RSPO

**INCI Name\_** Lactobacillus/Punica Granatum Fruit Ferment Extract

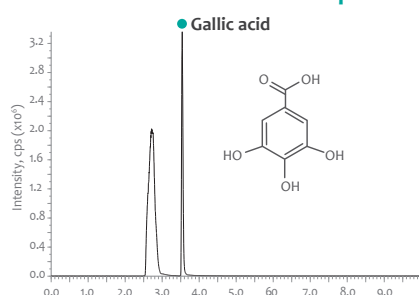
**Dosage\_** 1-3%

**Efficacy\_** Anti-wrinkle, Anti-oxidant

*Punica granatum*, also known as pomegranate, is native to Persia and is widely cultivated in the Middle East and Asian countries including Iran, Iraq, India, China, Japan, and Korea. The sweet and sour seeds surrounded by a fleshy aril are consumed fresh or as a juice. Pomegranate is a good source of vitamins and polyphenolic compounds such as ellagitannins and flavonoids, which are very powerful antioxidants. Beauty Plus One-F is a natural ingredient from fermented pomegranate fruit processed by Korean Traditional Solid Fermentation. Beauty Plus One-F shows anti-oxidant activity as well as anti-wrinkle activity.



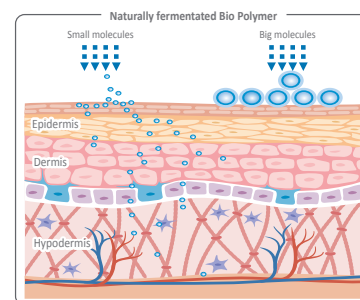
## Identification of Active Compound



## Fermentation Process

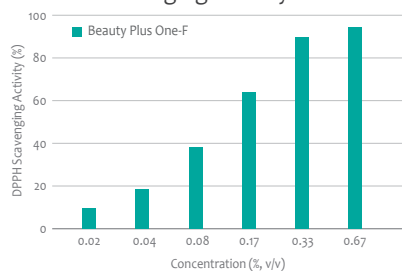
The penetration of the active compounds depends on the molecular weight.

It is difficult for most polymers to penetrate the epidermis because of big molecular weight. Beauty Plus One-F were processed by Korean Traditional Solid Fermentation method in order to convert large biopolymers in the raw material to small compounds.



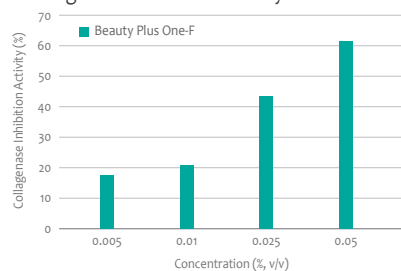
## Anti-oxidant Effect (in tubo)

DPPH Scavenging Activity



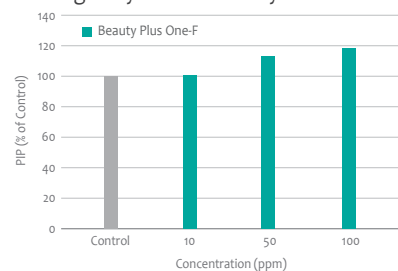
## Anti-wrinkle Effect (in vitro)

Collagenase Inhibition Activity in Fibroblasts



## Anti-wrinkle Effect (in vitro)

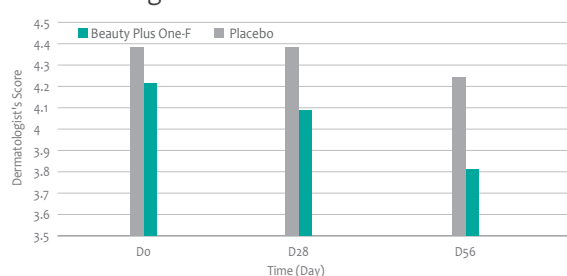
Collagen Synthesis Activity in Fibroblasts



## Anti-wrinkle Effect (in vivo)

21 female volunteers aged between 45 and 65 years old applied a cream containing 2% Beauty Plus One-F twice a day on a face.

Dermatologist's Score



Photograph Visualization



# DulseaFerm™

**Product Name\_** DulseaFerm(GPD)-RSPO, DulseaFerm(SOL)

**INCI Name\_** Palmaria Palmata Extract, Saccharomyces Ferment

**Dosage\_** 1-3%

**Efficacy\_** Anti-wrinkle

*Palmaria palmata*, known as dulse or sea lettuce flakes, is an edible red alga growing in northern coasts of the Atlantic and the Pacific Ocean. It is a nutritious seaweed containing vitamins, minerals and higher levels of protein than other vegetables. It can be eaten raw, dried or cooked as a snack or added into a salad, and it can be used as a mineral-rich salt replacement. DulseaFerm is a product with a strong anti-wrinkle efficacy. DulseaFerm is manufactured by the solid fermentation process using *Saccharomyces* with improved odor and clarity compared to non-fermented dulse extract.

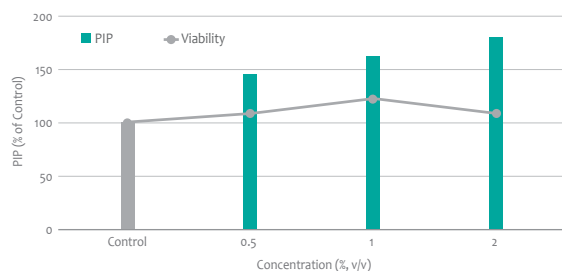


## Appearance Difference of Raw Material of DulseaFerm



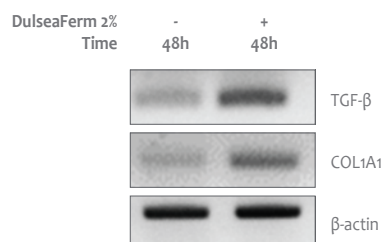
## Anti-wrinkle Effect (in vitro)

Collagen Synthesis Activity in Fibroblasts

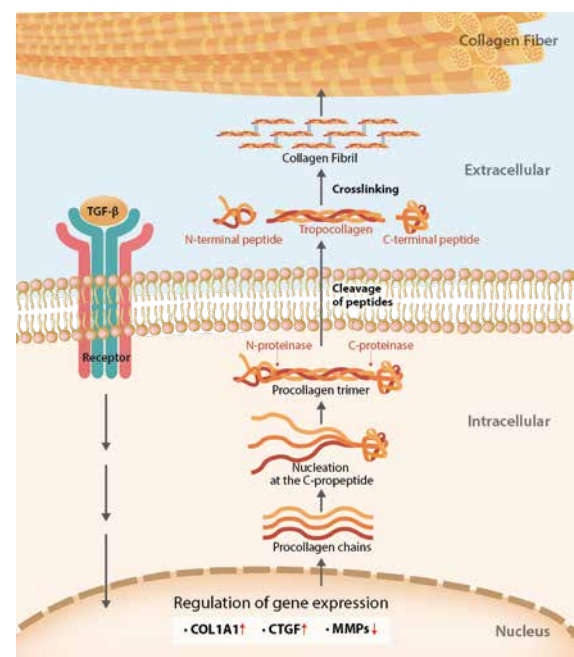


## Anti-wrinkle Effect (in vitro)

TGF-β and COL1A1 Synthesis Activity

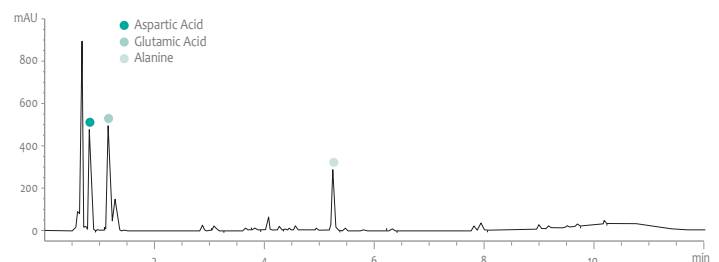


## Mechanism of Collagen Synthesis



## Identification of Amino Acids

Total Amino Acid Analysis





# MYFerm™

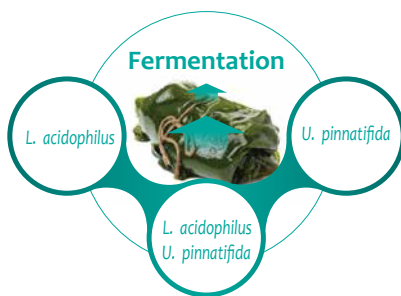
**Product Name\_** MYFerm-WP, MYFerm-NPG

**INCI Name\_** Undaria Pinnatifida Extract, Lactobacillus Ferment

**Dosage\_** 5-10%

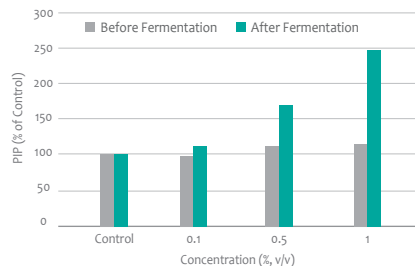
**Efficacy\_** Skin Firming, Anti-wrinkle, Skin Moisturizing

*Undaria pinnatifida* is commonly called sea mustard in English, *miyok* in Korean, and *wakame* in Japanese. It is an edible brown seaweed native to and growing in East and Southeast Asia. In traditional medicine, this seaweed is well-known for blood purification and detoxification. MYFerm is a liquid fermented extract of *U. pinnatifida* by probiotics *L. acidophilus* to break down complex polymers for better penetration and absorption of active compounds into the skin. The collagen synthesis level was significantly increased when fermented.



## Anti-wrinkle Effect (in vitro)

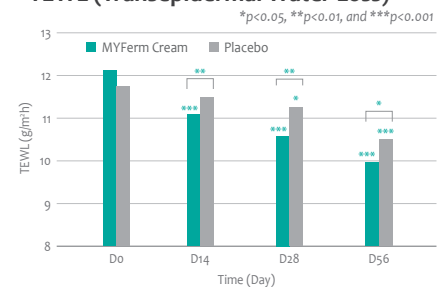
### Collagen Synthesis Activity in Fibroblasts (Before & After Fermentation)



## Skin Moisturizing Effect (in vivo)

30 volunteers aged between 35 to 60 years old applied a product containing 10% MYFerm twice a day for 56 days on face.

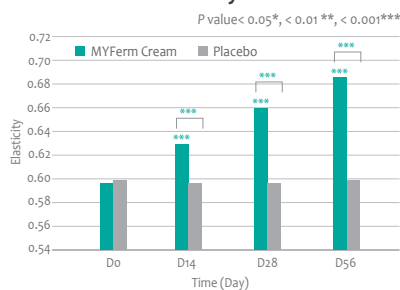
### TEWL (Transepidermal Water Loss)



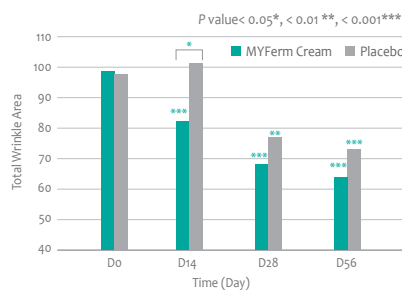
## Skin Firming Effect (in vivo)

30 volunteers aged between 35 to 60 years old applied a product containing 10% MYFerm twice a day for 56 days on crow's feet and nasolabial fold.

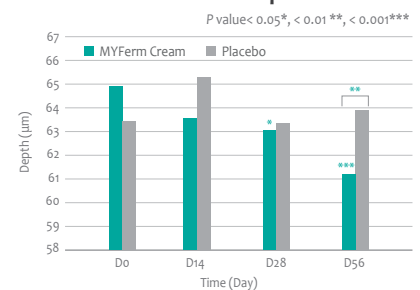
### Crow's Feet Elasticity



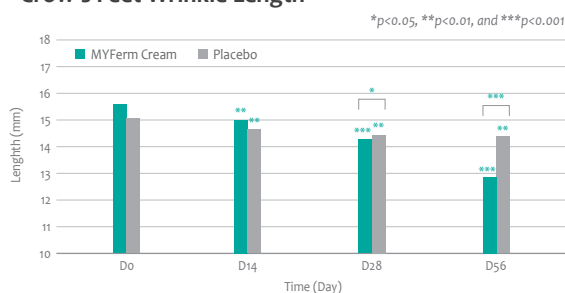
### Crow's Feet Total Wrinkle Area



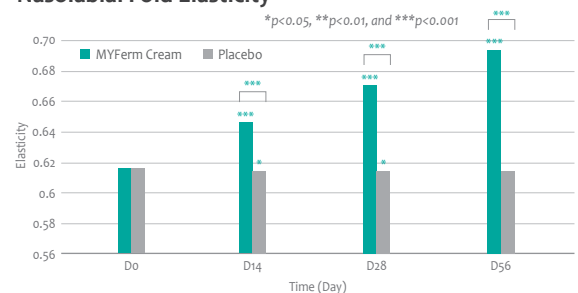
### Crow's Feet Wrinkle Depth



### Crow's Feet Wrinkle Length



### Nasolabial Fold Elasticity





# Greentium™

**Product Name\_** Greentium(GPD)

**INCI Name\_** Aspergillus/Camellia Sinensis Leaf Ferment Extract

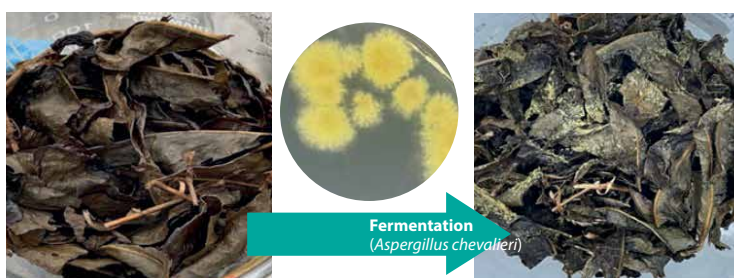
**Dosage\_** 1-5%

**Efficacy\_** Anti-aging, Anti-wrinkle, Anti-allergic, Anti-oxidant, Skin Brightening

Green tea is very well-known for powerful anti-oxidant and anti-aging effects which is due to the high content of vitamins and polyphenolic compounds such as flavonoids and catechins in tea leaves. Greentium is an extract of naturally fermented tea leaves, fermented with a special gold-colored fungus called *Aspergillus chevalieri*. Greentium can be a solution for a well-aging as it shows powerful anti-oxidant and anti-wrinkle effects. Additionally, it also shows anti-allergic and skin brightening effects.

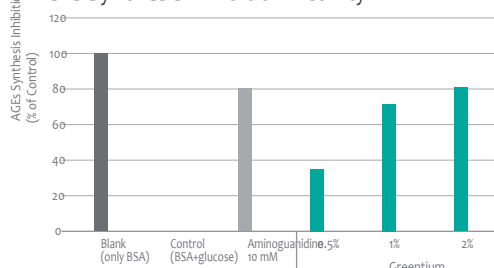


## Green Tea Leaf Fermented with *Aspergillus chevalieri*



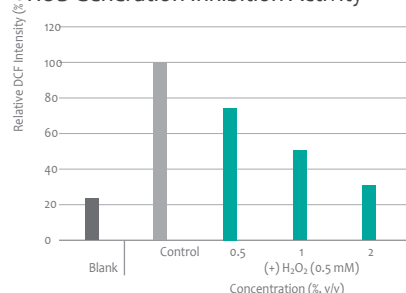
## Anti-glycation Effect (in tubo)

AGEs Synthesis Inhibition Activity



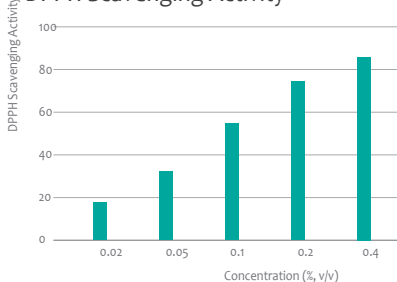
## Anti-oxidant Effect (in vitro)

ROS Generation Inhibition Activity



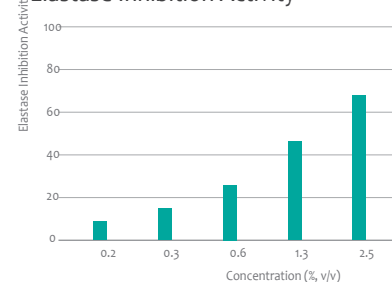
## Anti-oxidant Effect (in tubo)

DPPH Scavenging Activity



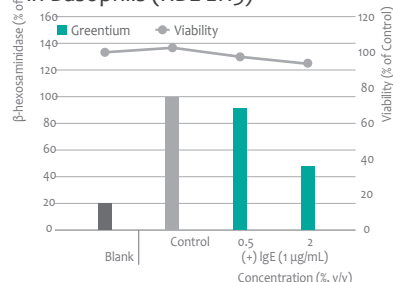
## Anti-wrinkle Effect (in tubo)

Elastase Inhibition Activity



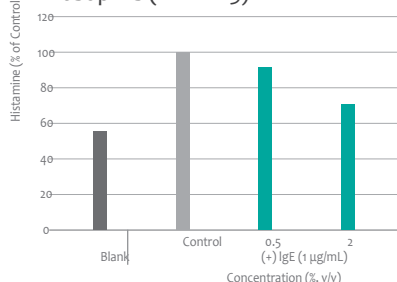
## Anti-allergic Effect (in vitro)

$\beta$ -hexosaminidase Release Inhibition in Basophils (RBL-2H3)



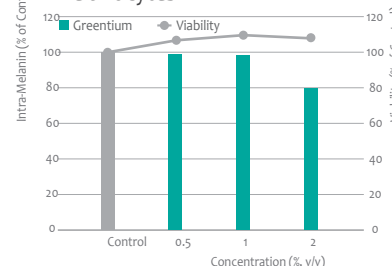
## Anti-allergic Effect (in vitro)

Histamine Release Inhibition in Basophils (RBL-2H3)



## Skin Brightening Effect (in vitro)

Melanin Synthesis Inhibition Activity in Melanocytes



**Product Name\_** Arnimo(NB), Arnimo(PG), Arnimo(PD)-RSPO, Arnimo(GOL)-RSPO

**INCI Name\_** Arnica Montana Flower Extract

**Dosage\_** 1-3%

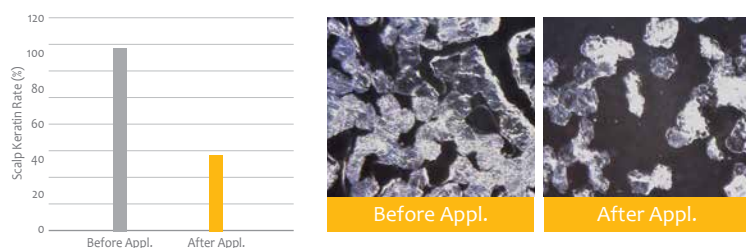
**Efficacy\_** Hair Care, Sebum Control, Anti-inflammatory, Anti-oxidant

*Arnica montana*, commonly known as arnica, is an alpine plant that grows at nearly 3,000 m altitudes. Arnica is one of the best-known homeopathic remedies and has been medicinally used for centuries. It is used on the skin to treat mostly inflammation-related diseases. Also, it is widely applied for hair treatment such as hair growth, stimulating hair follicles, and rejuvenating the scalp. Arnimo affects and improves hair growth and shows excellent sebum control, anti-inflammatory and anti-oxidant effects.



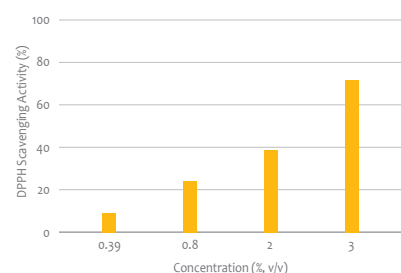
## Scalp Keratin Removal Effect (in vivo)

20 females aged 45 in average applied a shampoo containing 5% of Arnimo on their scalp. The scalp keratin is measured before and after the application.



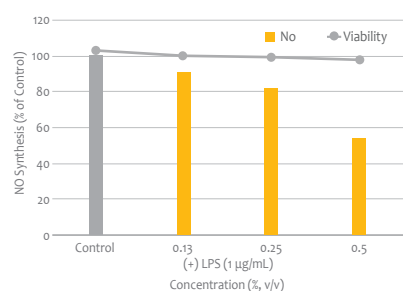
## Anti-oxidant Effect (in tubo)

DPPH Scavenging Activity



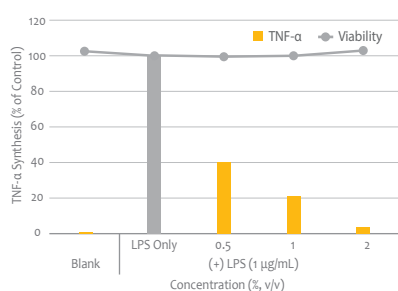
## Anti-inflammatory Effect (in vitro)

NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



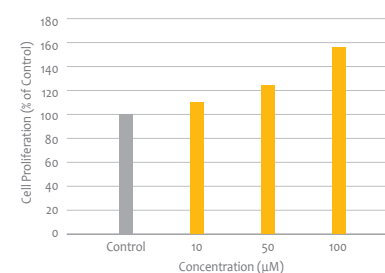
## Anti-inflammatory Effect (in vitro)

TNF-α Synthesis Inhibition Activity in Macrophages (RAW 264.7)



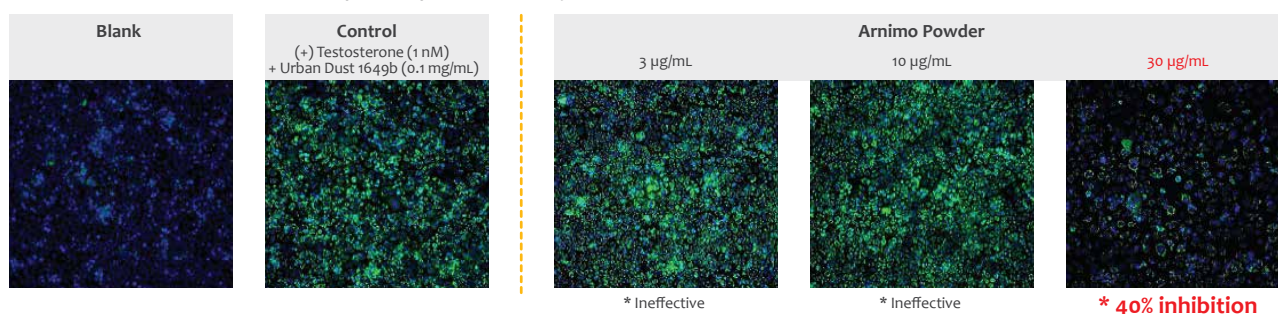
## Hair Growth Effect (in vitro)

Hair Cell Proliferation in Human Dermal Papilla Cells (HDPCs) of 1,5-dicaffeoylquinic Acid



## Sebum Control Effect (in vitro)

Inhibition of the Formation of Lipid Droplets in Sebocytes



# Pomegrande™



raw material approved by ECOCERT GREENLIFE,  
conform to the COSMOS Standard

**Product Name\_** Pomegrande(NB), Pomegrande(PD)-RSPO, Pomegrande(GOL)-RSPO

**INCI Name\_** Punica Granatum Flower Extract

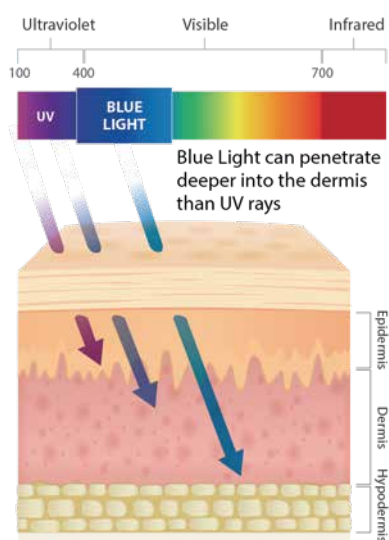
**Dosage\_** 1-3%

**Efficacy\_** Anti-allergic, Anti-blue light, Anti-inflammatory, Anti-oxidant, Anti-photoaging

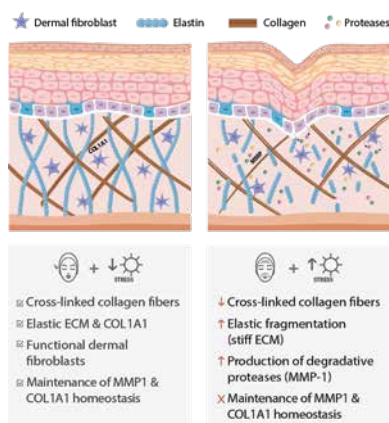
The flower of *Punica granatum*, also known as pomegranate, is beautifully blooming in summer with very red color. Pomegranate is one of the beloved fruits in western and eastern cultures, and the use of pomegranate is widely known. The pomegranate flower has been applied to treat a blister and for bathing. In Hanbang, or Traditional Korean Medicine, infusion of the pomegranate flower is used to treat women's health and for the treatment of a toothache, asthma, and so on. Pomegrande, a cosmetic ingredient developed by The Garden of Natural Solution, shows strong anti-oxidant effects.



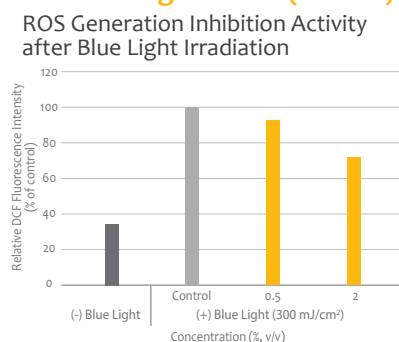
## ■ Skin Damage by Blue Light



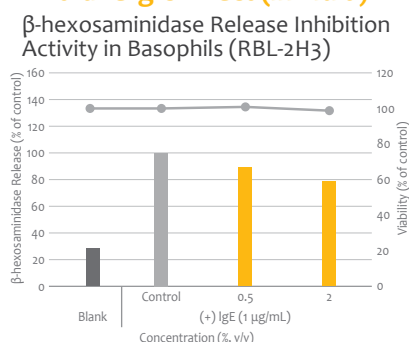
## ■ Young & Old Skin Structure



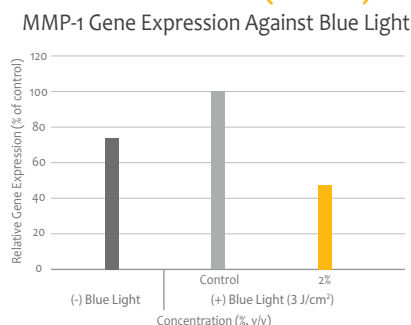
## ■ Anti-blue light Effect (in vitro)



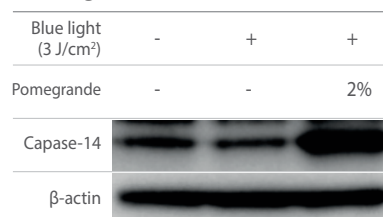
## ■ Anti-allergic Effect (in vitro)



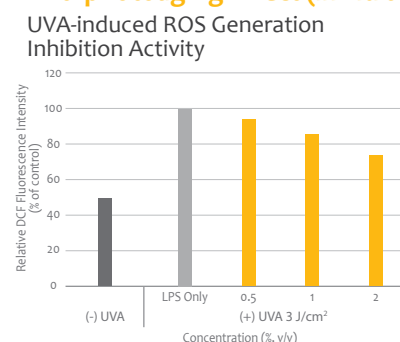
## ■ Anti-wrinkle Effect (in vitro)



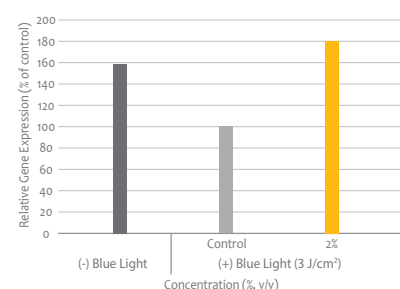
## Caspase 14 Gene Expression Against Blue Light



## ■ Anti-photoaging Effect (in vitro)



## COL1A1 Gene Expression Against Blue Light





**Product Name** Greenth(NB), Greenth(GPD)-RSP0

**INCI Name** Carica Papaya (Papaya) Fruit Extract, Pyrus Malus (Apple) Fruit Extract, Prunus Mume Fruit Extract, Vitis Vinifera (Grape) Fruit Extract

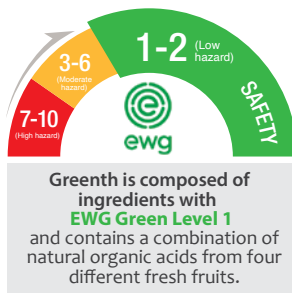
**Dosage** 1-5%

**Efficacy** Skin Barrier Improvement, Exfoliation, Anti-oxidant, Skin Moisturizing, Skin Brightening, Anti-wrinkle

The interest in healthy and glowy skin has been grown for years. Glow skin starts from a healthy skin barrier so the efforts to balance the skin condition and enhance the skin barrier are becoming the skincare market's prevalence. Greenth is designed based on these ideas to aid keeping balanced and healthy skin. Greenth's main properties can be emphasized by fortifying the skin barrier, skin moisturizing, and exfoliating effects. Greenth comprises the extracts from four green fruits: apple, shine muscat, papaya, and green plum. We have detected AHA, BHA, and PHA, known for natural exfoliating agents in Greenth. Through the several tests, we confirmed the strengthening skin barrier function and exfoliating effect of Greenth.

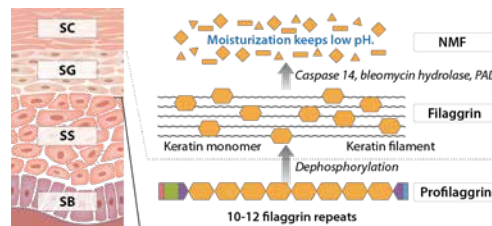


## Naturality of Greenth



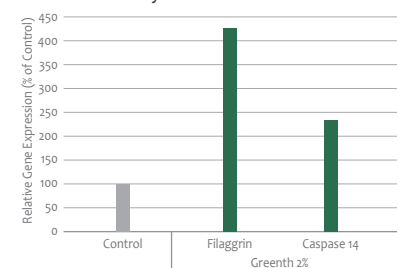
## Skin Barrier Mechanism

Filaggrin is a protein that firmly supports skin barrier and creates moisturizing factors. Caspase 14 breaks down filaggrin and helps to produce NMF (Natural Moisturizing Factors).

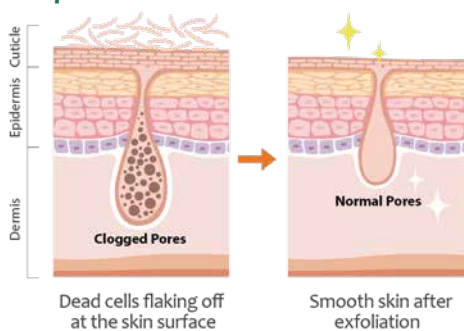


## Improvement of Skin Barrier (in vitro)

Filaggrin, Caspase 14 Gene Expression in Keratinocytes

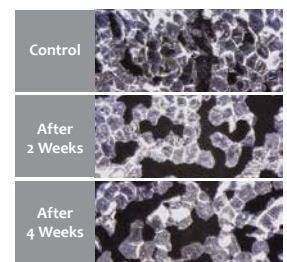
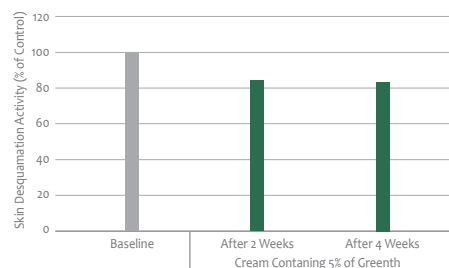


## Importance of Exfoliation

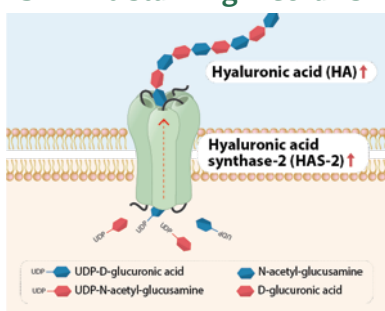


## Skin Exfoliation Effect (in vivo)

22 Females aged 48 in average applied a cream containing 5% of Greenth on their face for 4 weeks.

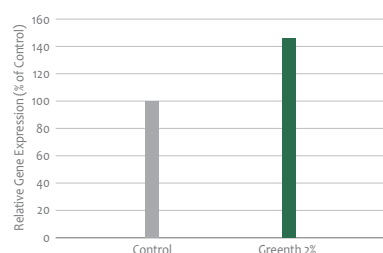


## Skin Moisturizing Mechanism



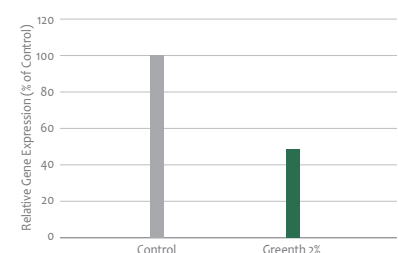
## Skin Moisturizing Effect (in vitro)

HAS-2 Gene Expression in Keratinocytes



## Anti-wrinkle Effect (in vitro)

MMP-1 (Matrix Metalloproteinase-1) Gene Expression in Keratinocytes







**Product Name\_** Seactive(PD)-RSPO

**INCI Name\_** Ecklonia Cava Extract

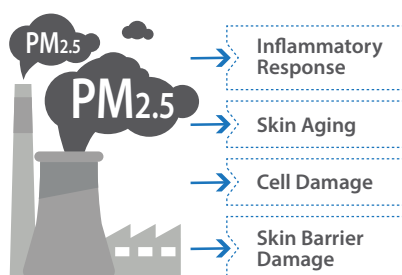
**Dosage\_** 1-3%

**Efficacy\_** Anti-oxidant, Anti-inflammatory, Anti-allergic, Anti-photoaging, Anti-wrinkle

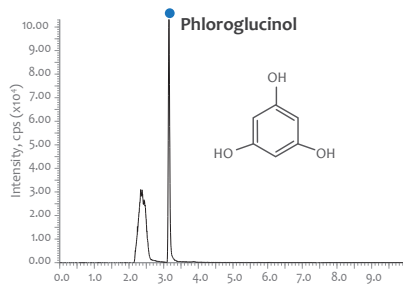
*Ecklonia cava*, one of the edible brown alga, known as sea trumpet, is found in Korea and Japan. *E. cava* used in Seactive is sourced from Jeju Island. It has an essential function as a food resource to marine organisms and has a critical role in keeping the sea environment clean. Abundant phlorotannins in *E. cava* is a big difference compared to other plants, and it is reported to have various biological activities including anti-oxidant, radioprotective, anti-inflammatory effects, and so on. Seactive shows powerful anti-oxidant, anti-photoaging, cell-protective, and anti-allergic effects *in vitro*.



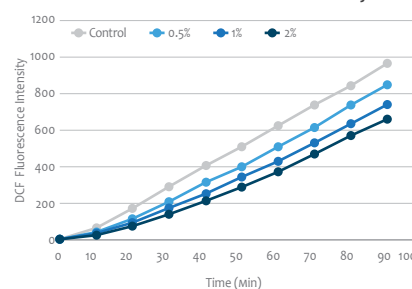
## Damages Caused by PM<sub>2.5</sub>



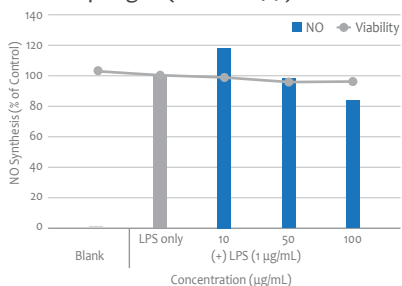
## Identification of Active Compound



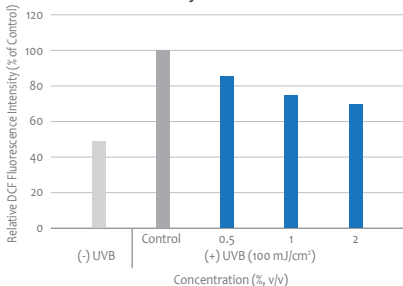
## Anti-oxidant Effect (*in vitro*) ROS Generation Inhibition Activity



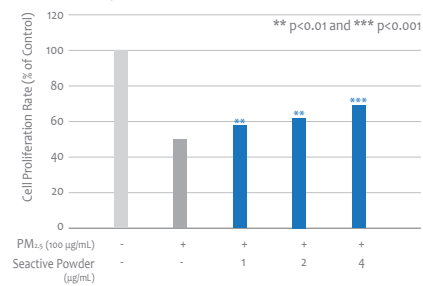
## Anti-inflammatory Effect (*in vitro*) NO Synthesis Inhibition Activity in Macrophages (RAW 264.7)



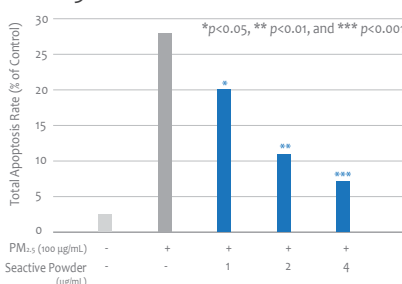
## Anti-photoaging Effect (*in vitro*) UVB-induced ROS Generation Inhibition Activity



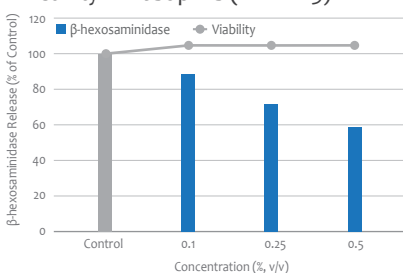
## Cell Proliferating Effect (*in vitro*) Cell Proliferation Activity in PM<sub>2.5</sub>-treated HaCaT Cells



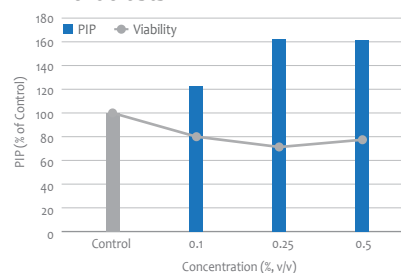
## Anti-apoptotic Effect (*in vitro*) Cell Apoptosis Inhibition Activity on PM<sub>2.5</sub> treated HaCaT Cells



## Anti-allergic Effect (*in vitro*) β-hexosaminidase Release Inhibition Activity in Basophils (RBL-2H3)



## Anti-wrinkle Effect (*in vitro*) Collagen Synthesis Activity in Fibroblasts







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