

# Jeju Blossom



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*Flower therapy for sensitive skin*

the garden of  
**naturalsolution**  
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## Introduction of Product

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**Jeju Blossom** is a flower extract of **Yoshino cherry (*Prunus yedoensis*)** originally from **Jeju Island in Korea**. This fragrant, light pink flowers are also known as 'Jeju king cherry flowers' bloom in the beginning of April. The flowers are generally used as a folk medicine or a tea in Korea. Jeju Blossom is specially **developed for sensitive skin by ultrasonic extraction method**. The product has **excellent anti-oxidant and anti-inflammatory effects**. It is also very effective on **skin soothing and calming**.

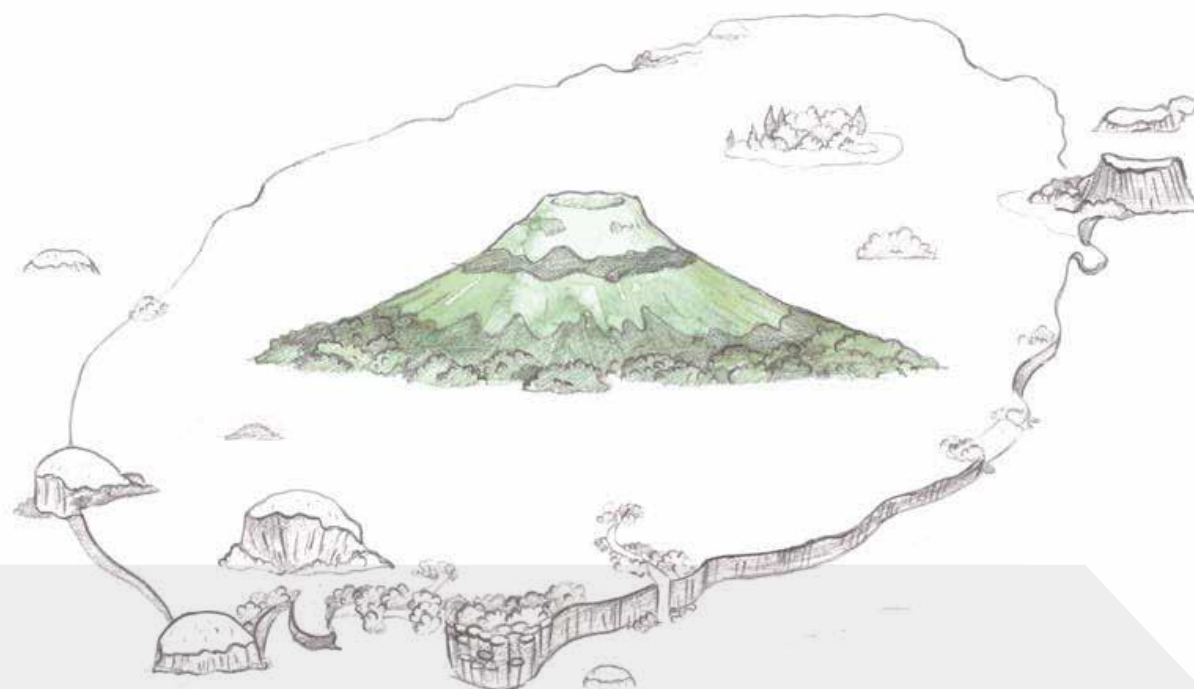
# Jeju Island

Jeju is the largest island situated in the southern coast of Korea.

This island is considered the cleanest and the most beautiful area in Korea. It is a volcanic island with Halla Mountain in the center created by volcanic eruptions about 2 million years ago.

Jeju volcanic island and lava tubes are designated as the first World Natural Heritage Sites in Korea.

Due to its unique environment, the island has many endemic plants especially in Halla Mountain where there are about 1,800 endemic plant species as well as diverse alpine plants.



## Plant Story: King Cherry Blossom

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*Prunus yedoensis* is a small, deciduous tree that at maturity grows to be 5 to 12 meters tall. The flowers emerge before the leaves in early spring time. The fragrant flowers with five white or pale pink petals grow in clusters of five or six together. The origin of this plant is known to be Jeju Island, Korea, and the tree is cultivated in southern coast of Korea as well as Jeju Island. Full bloom lasts only for a couple of days and people celebrate and enjoy the blooming as a spring festival. In Korea, the **flowers are usually consumed as a tea and known to be effective to treat diabetes and cough.**



## *in vitro* Efficacy Evaluation

### ❖ Anti-inflammatory Effect

NO Synthesis Inhibition Activity

### ❖ Anti-oxidant Effect

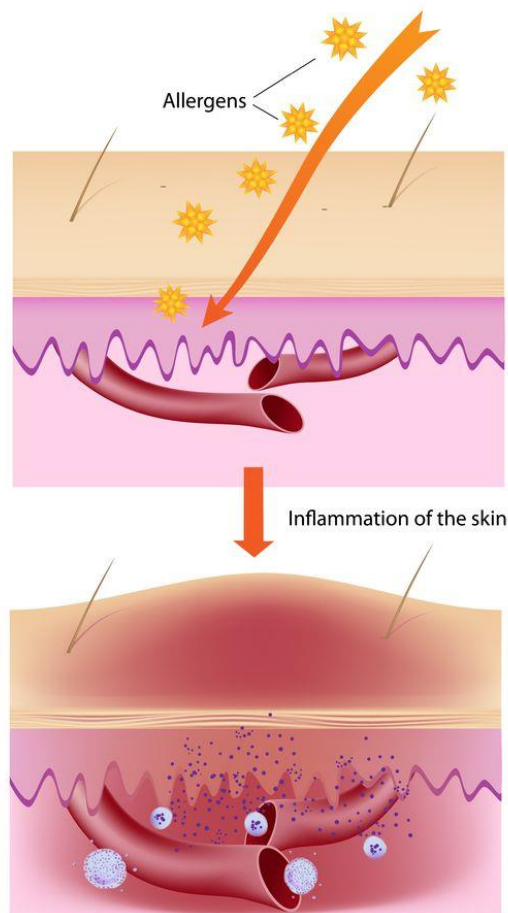
ROS Generation Inhibition Activity

### ❖ Skin Brightening Effect

Melanin Synthesis Inhibition Activity



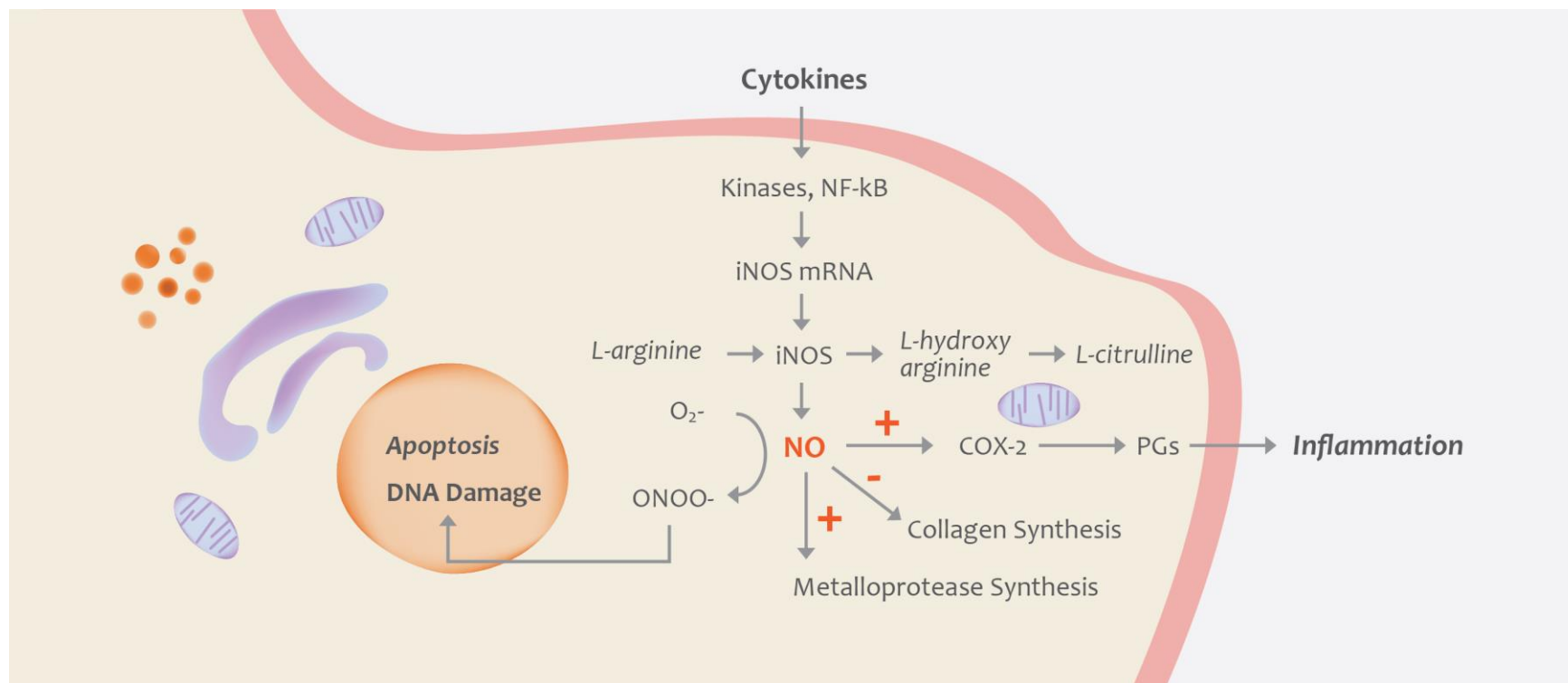
## What is Skin Inflammation?



Inflammation is part of the complex immunological responses to a wide range of harmful stimuli including skin injury, tissue necrosis, infection, and irritants. The immune system is responsible for protecting our body from the harmful stimuli and of maintaining homeostasis. Like any other part of the body, the skin can be involved in immune responses.

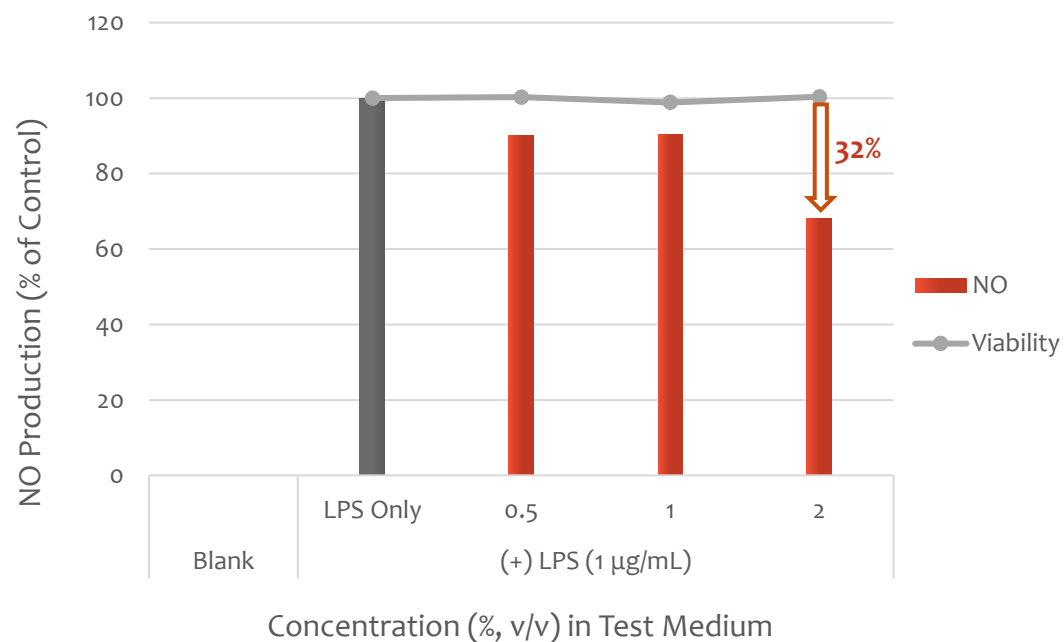
Inflammation in the skin often causes a rash to form. It's a response from the immune system to conditions such as bacterial/viral/fungal infections, allergic reactions, heat, and sunlight. The symptoms of skin inflammation are rash, skin redness, blisters or pimples, warmth, and thickening of the skin in the affected area.

# Inflammation Mechanism



## *in vitro* Efficacy Evaluation: Anti-inflammatory Effect

### •• Inhibition of NO Production in RAW 264.7 cells

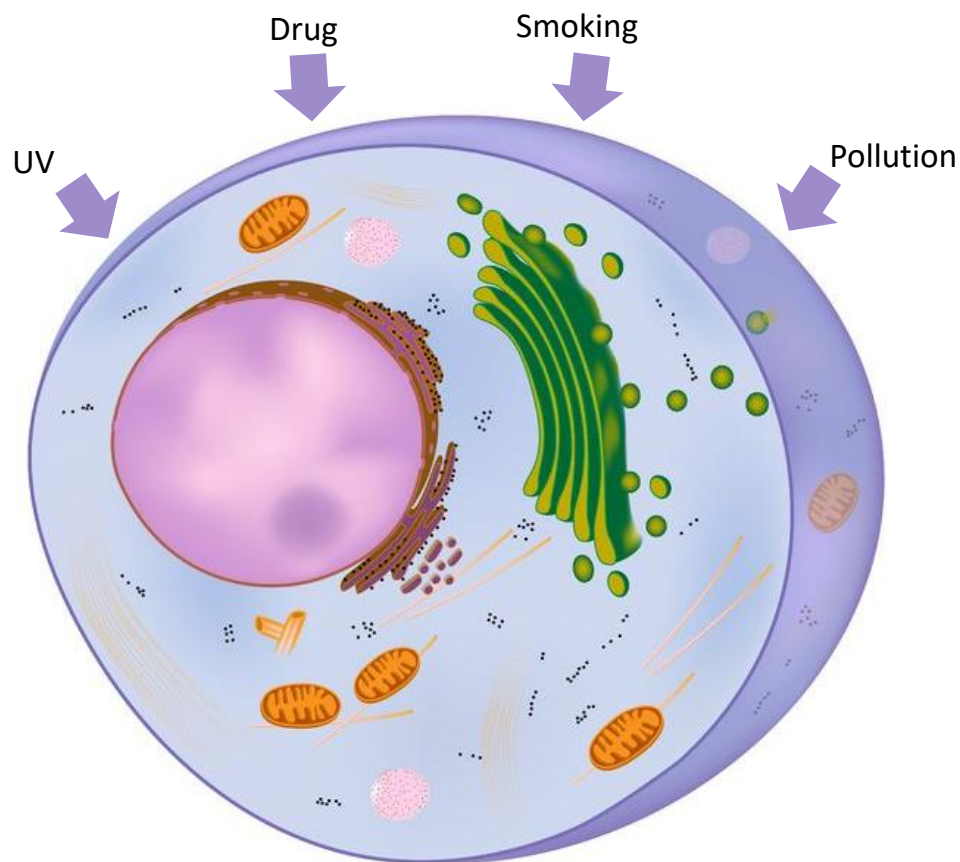


The anti-inflammatory property of **Jeju Blossom** has been identified by measuring the decrease of nitrite (NO) production in macrophage cells. As a result, it showed **32% decrease of NO production by treating 2% of Jeju Blossom**.



# Oxidative Stress

*Reactive Oxygen Species (ROS) can be increased by*



*Intracellular ROS may induce*

- DNA damage
- Lipid peroxidation
- Amino acid oxidation: protein damage
- Oxidation of co-factors: enzyme inactivation
- Chronic inflammation

ROS

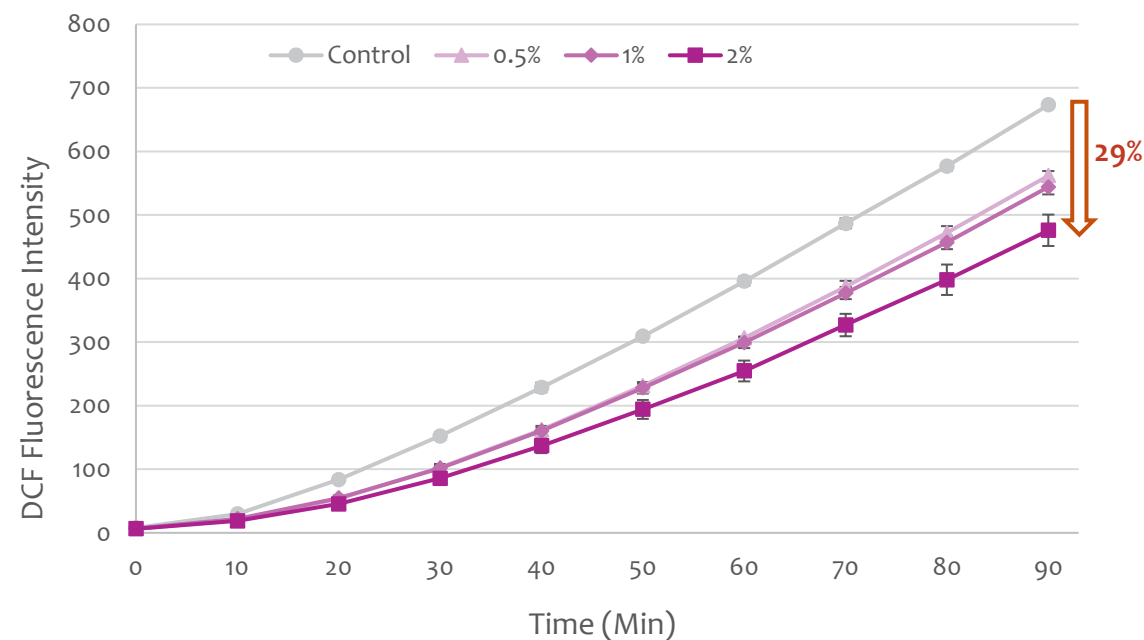


Skin Aging

Inflammation

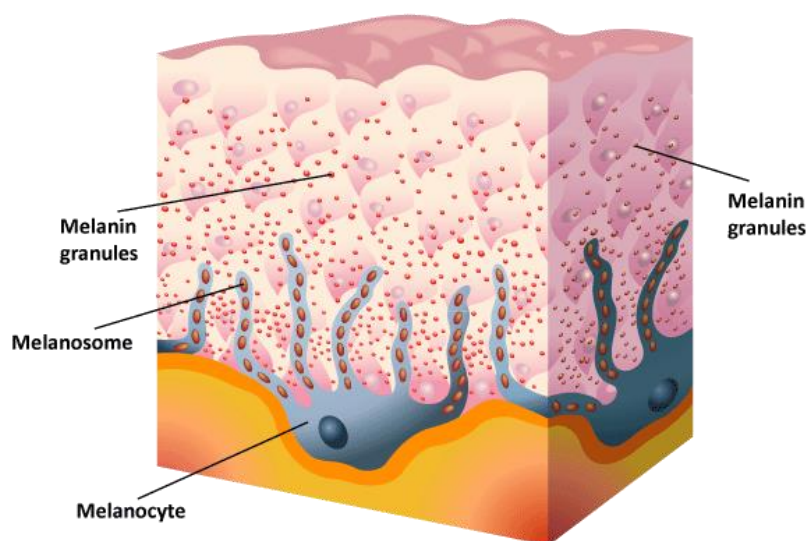
## *in vitro* Efficacy Evaluation: Anti-oxidant Effect

### ◉◉ Decrease in Intracellular ROS



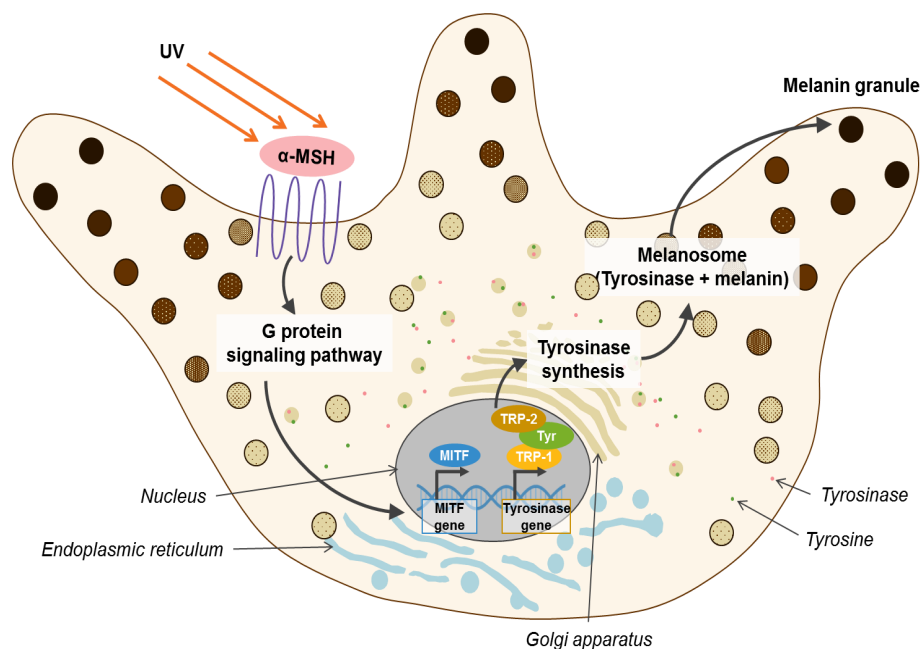
Anti-oxidant property of Jeju Blossom has been measured by measuring the decrease in the ROS content produced in cells. As a result, it showed **29% decrease in the ROS production** by treating **2% of Jeju Blossom**.

# Skin Pigmentation



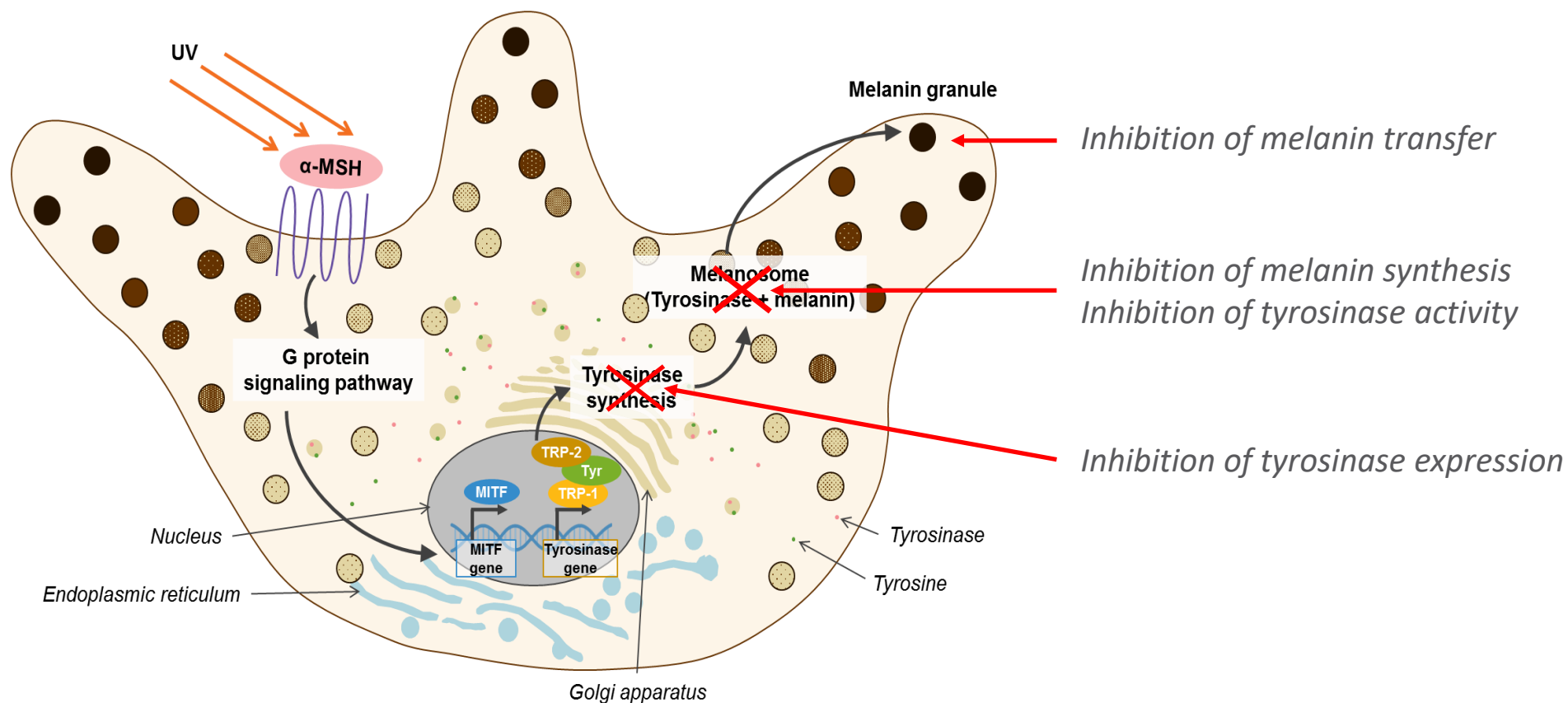
Melanin plays an important role in protecting human skin from the harmful effects of solar ultraviolet (UV) radiation and in scavenging toxic drugs and chemicals. Melanin is synthesized in melanocytes located at the dermal/epidermal border. Epidermal melanocytes occur at an approximate ratio of 1:10 among basal keratinocytes and distribute the melanin they produce to approximately 40 overlying suprabasal keratinocytes via their elongated dendrites and cell-to-cell contacts. Skin pigmentation problems, such as melasma, freckles, age spots and dark spots, are caused by the abnormal accumulation of melanin in keratinocytes.

# Melanin Synthesis



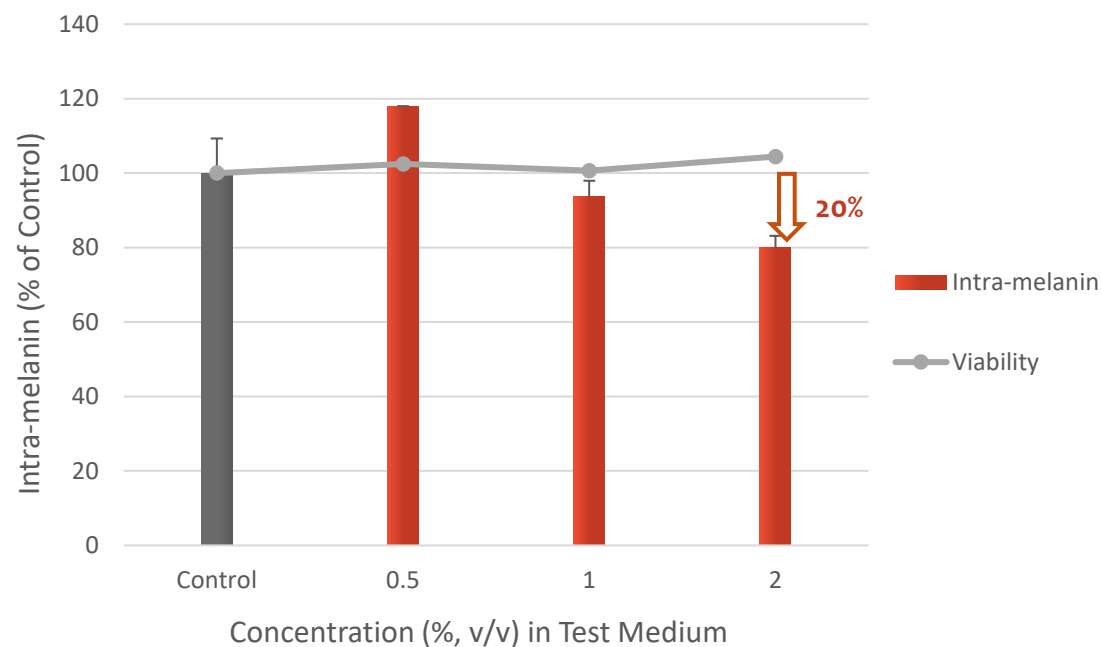
Upon exposure to UV radiation, DNA damage triggers cytokines, growth factors and other inflammatory factors to stimulate melanin production. Melanin is synthesized in melanocytes through a series of oxidative reactions involving amino acid tyrosine in the presence of the enzyme tyrosinase. This leads to the production of melanin, and melanin granules synthesized in the melanocytes are transferred to keratinocytes.

# Skin Brightening Action



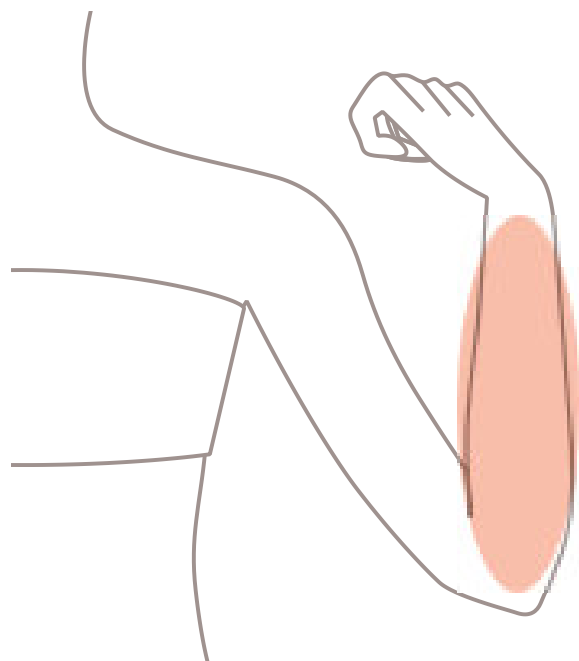
## *in vitro* Efficacy Evaluation: Skin Brightening Effect

### Decrease in Melanin Production in Melanocytes



Skin brightening property of **Jeju Blossom** has been identified by measuring the decrease of melanin production in B16-F1 melanoma cells. As a result, it showed **20% decrease** of the melanin production by treating **2% of Jeju Blossom**.

## *in vivo* Evaluation: Skin Soothing Effect



- **Target Site:** Forearm
- **Subjects:** 10 females, aged between 18 to 65 years old
- **Test Item:** Cream with 3% Jeju Blossom  
3% SLS solution patches to induce erythema
- **Application:** 40 mg of cream on application area
- **Application Area:** 20 cm<sup>2</sup>/site (4 cm \* 5 cm)
- **Measurements:** Days 1, 3, 5, 7, 9, 10 (D0: Apply the patch for 24h)
- **Test Instrument:** Mexameter MX18 (CK Electronic GmbH, Germany)
- **Dermatologist's Evaluation:**
  - Scoring Reference:

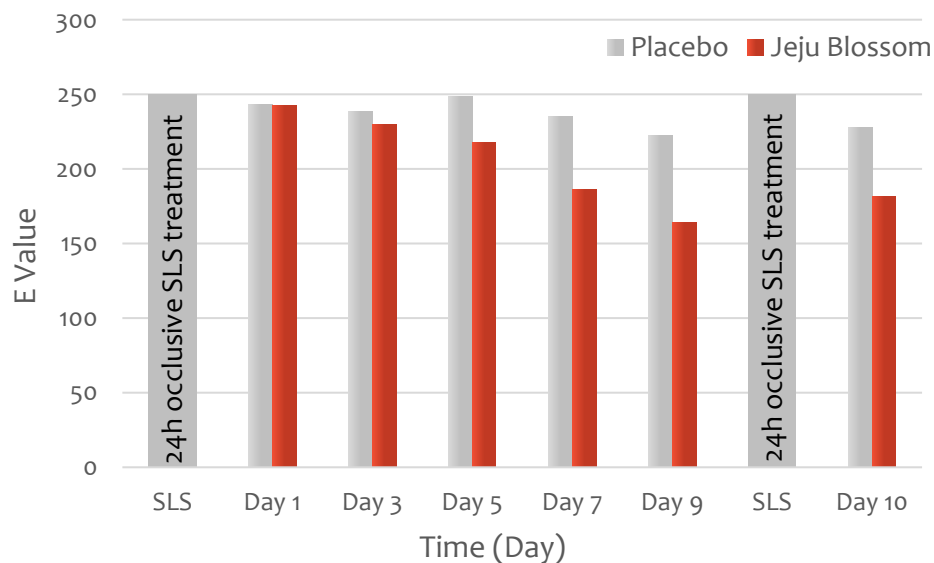


- Score 0: No erythema
- Score 1-3: Slight erythema
- Score 4-6: Moderate erythema
- Score 7-9: Severe erythema

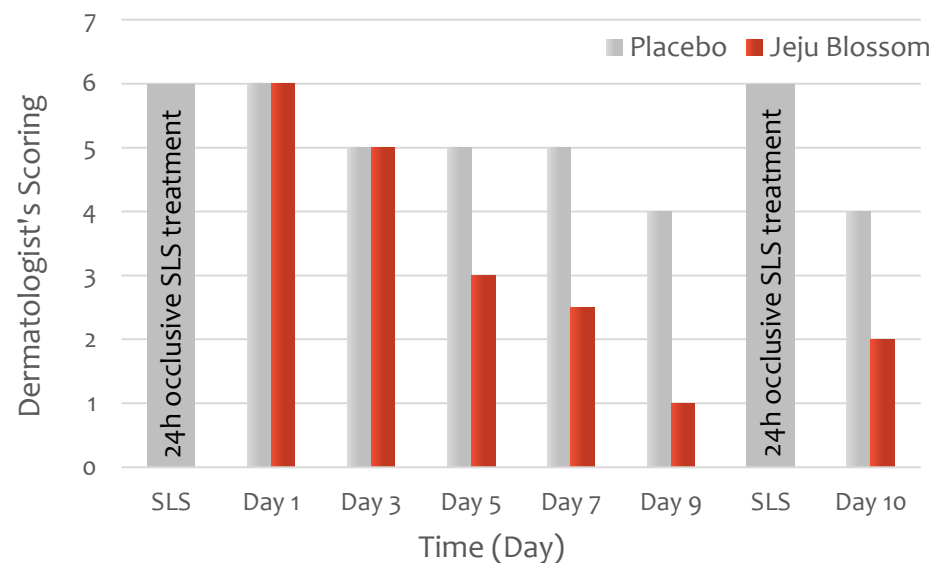
## in vivo Efficacy Evaluation: Skin Soothing

On Day 0, patches containing 3% of SLS solution were applied for 24 hours to induce erythema onto the forearms of 10 female volunteers aged between 18 and 65. The erythema was evaluated by dermatologist and by Mexameter every 2 days. 40 mg of test product and placebo were applied on forearms.

### 🔴 Erythema Value

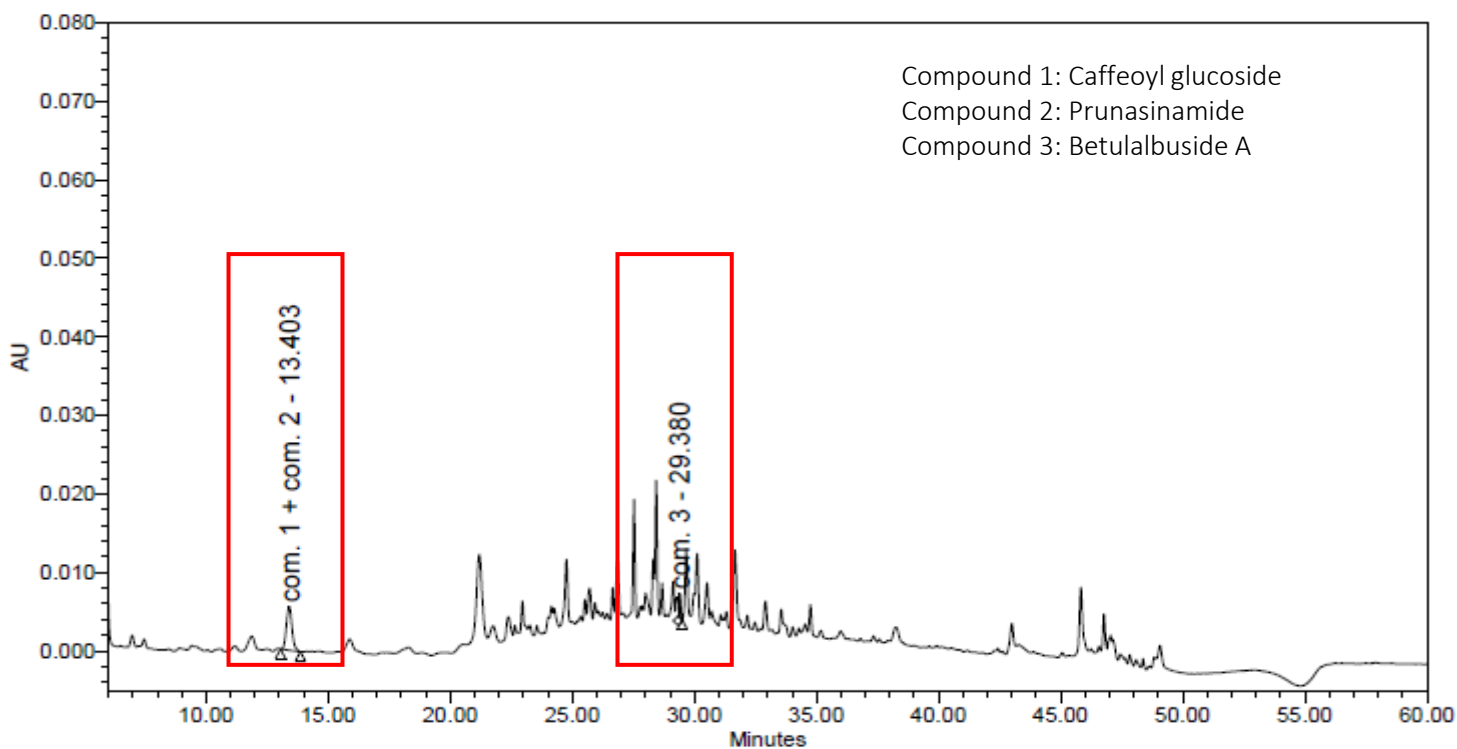


### 🔴 Dermatologist's Scoring



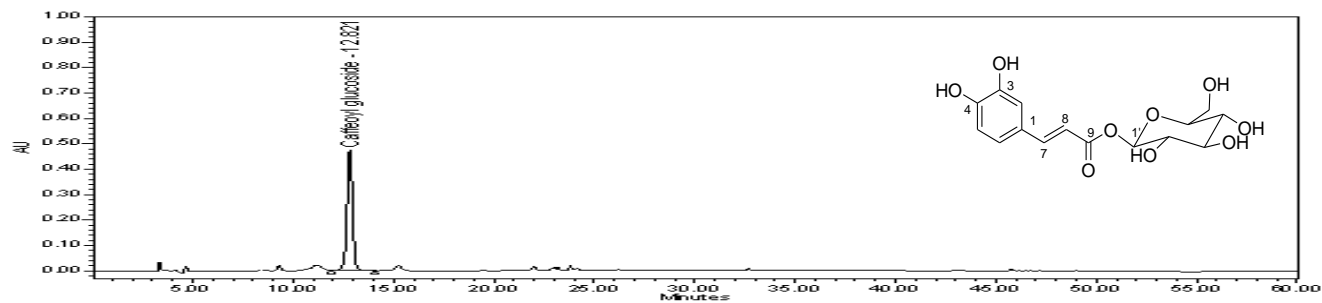


# Active Compound Analysis: HPLC Profile of Jeju Blossom

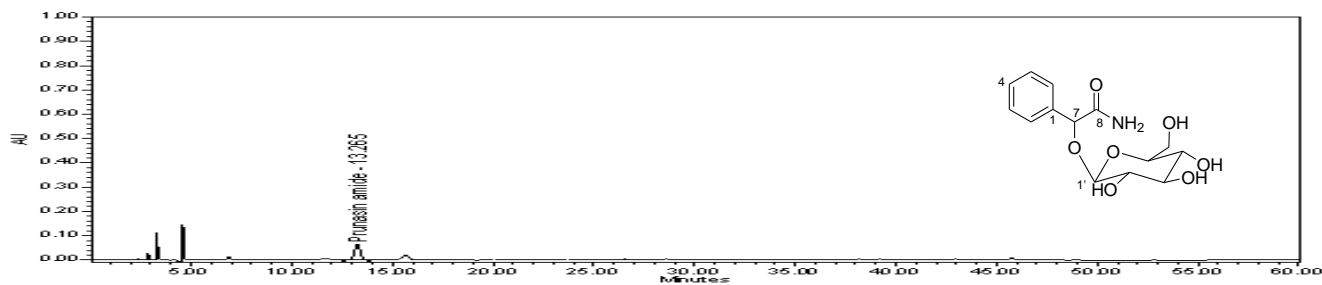


# Active Compound Analysis

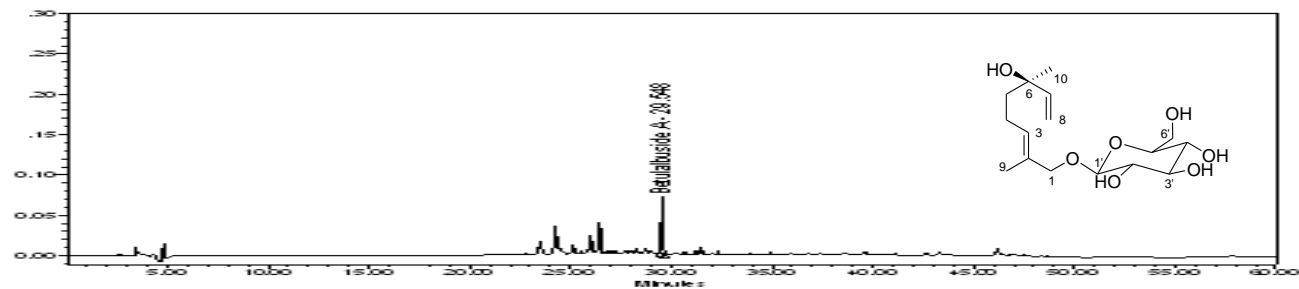
Compound 1:  
Caffeoyl glucoside



Compound 2:  
Prunasinamide

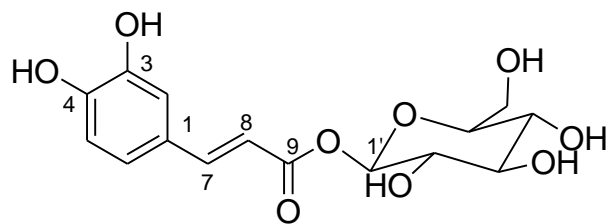


Compound 3:  
Betulalbuside A

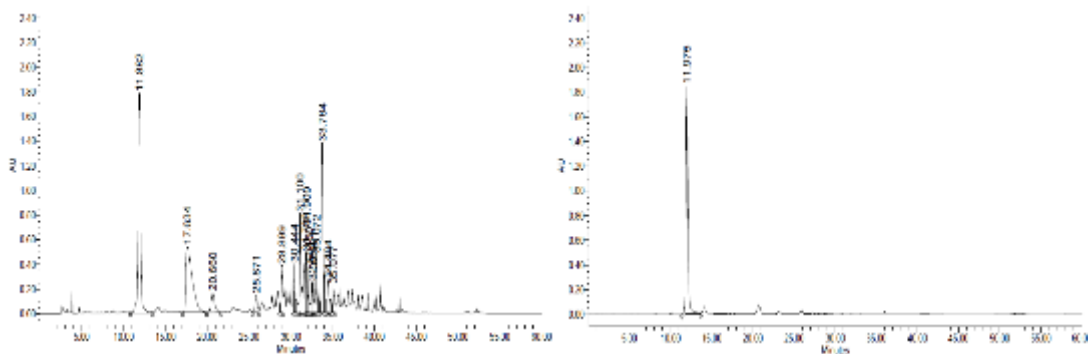


# Active Compound Identification I

## NMR Spectroscopic Data for Compound 1 (400 MHz, CD<sub>3</sub>OD)



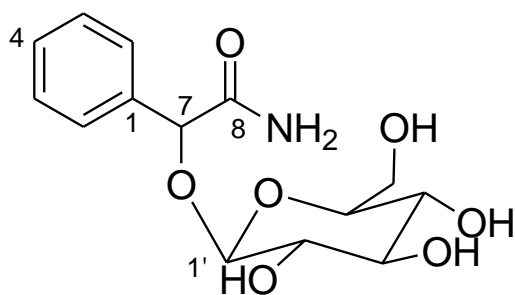
Caffeoyl glucoside



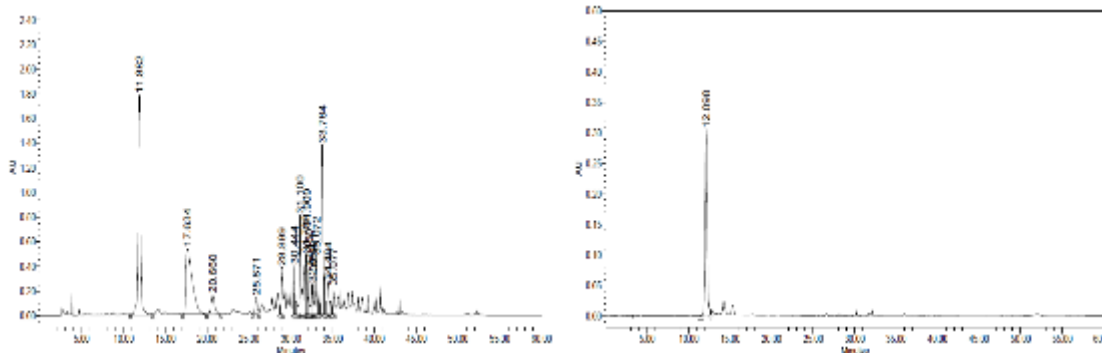
No.	Caffeoyl glucoside	
	$\delta$ H (int, multi, J Hz)	$\delta$ c (ppm)
1		127.6
2	7.06 ( <i>d</i> , 1.8)	115.3
3		146.8
4		149.9
5	6.79 ( <i>d</i> , 8.2)	116.6
6	6.96 ( <i>dd</i> , 1.8, 8.2)	123.3
7	7.65 ( <i>d</i> , 16.0)	148.4
8	6.30 ( <i>d</i> , 16.0)	114.4
9		167.8
Glu-1'	5.58 ( <i>d</i> , 7.7)	95.8
Glu-2'	<i>m</i>	74.0
Glu-3'	<i>m</i>	78.0
Glu-4'	<i>m</i>	71.1
Glu-5'	<i>m</i>	78.8
Glu-6'	<i>m</i>	62.3

# Active Compound Identification II

## NMR Spectroscopic Data for Compound 2 (400 MHz, CD<sub>3</sub>OD)



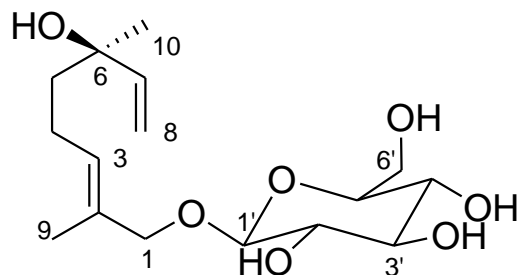
Prunasinamide



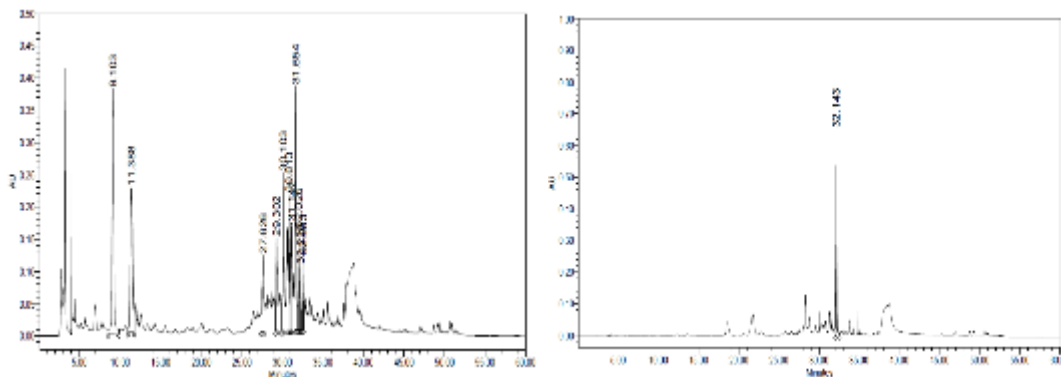
No.	Prunasinamide	
	$\delta$ H (int, multi, J Hz)	$\delta$ c (ppm)
1		137.2
2	7.45 ( <i>d</i> , 7.7)	129.7
3	7.32 ( <i>d</i> , 6.8)	129.4
4		130.0
5	7.32 ( <i>d</i> , 6.8)	129.4
6	7.45 ( <i>d</i> , 7.7)	129.7
7	5.31 ( <i>s</i> , 6.0)	79.3
8	6.30 ( <i>d</i> , 16.0)	176.1
Glu-1'	4.04 ( <i>d</i> , 7.8)	100.1
Glu-2'	<i>m</i>	75.0
Glu-3'	<i>m</i>	77.5
Glu-4'	<i>m</i>	71.6
Glu-5'	<i>m</i>	78.1
Glu-6'	3.82 ( <i>dd</i> , 2.2, 11.9) 3.63 ( <i>dd</i> , 5.9, 12.3)	62.6

# Active Compound Identification III

## NMR Spectroscopic Data for Compound 3 (400 MHz, CD<sub>3</sub>OD)



**Betulalbuside A**



No.	Betulalbuside A		
	$\delta$ H (int, multi, J Hz)	$\delta$ c (ppm)	HMBC
1	4.20 ( <i>d</i> , 11.4)	76.0	2, 3, 9, 1'
2	4.03 ( <i>d</i> , 11.4)	76.0	2, 3, 9, 1'
3	5.47 ( <i>dt</i> , 1.3, 7.3)	130.2	1, 9
4	2.08 ( <i>m</i> )	23.5	2, 3, 5
5	1.54 ( <i>m</i> )	43.0	3, 4, 6, 7, 10
6		75.1	
7	5.91 ( <i>dd</i> , 10.9, 17.4)	146.3	6
8	5.20 ( <i>dd</i> , 1.3, 17.4)	112.2	6
9	5.02 ( <i>dd</i> , 1.3, 10.9)	112.2	6
9	1.68 ( <i>s</i> )	14.2	1, 2, 3
10	1.26 ( <i>s</i> )	27.7	5, 6, 7
Glu-1'	4.24 ( <i>d</i> , 7.7)	102.6	1
Glu-2'	3.16-3.60 ( <i>m</i> )	75.1	
Glu-3'	3.16-3.60 ( <i>m</i> )	78.0	
Glu-4'	3.16-3.60 ( <i>m</i> )	71.8	
Glu-5'	3.16-3.60 ( <i>m</i> )	78.2	
Glu-6'	3.85 ( <i>dd</i> , 2.2, 11.9)	62.9	
	3.85 ( <i>dd</i> , 5.5, 11.9)	62.9	

## Research Studies

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In several studies, it is identified that cherry blossom extract has anti-oxidant and anti-inflammatory effects.

### Reference:

1. Anti-oxidative Activity and Safety of Cherry Blossom Extracts *in vitro*, Zhang *et al.*, J Diagn Ther Dermatol-Venereol, 2013(6), p.392-395.
2. The anti-inflammatory effect of cherry blossom extract (*Prunus yedoensis*) used in soothing skincare product, Zhang *et al.*, Int J Cosmet Sci, 2014, Vol. 36, No.6, p.527-530

## Marketing Points

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- ⦿ King cherry blossom native to Jeju Island, Korea
- ⦿ Anti-oxidant and anti-inflammatory effects
- ⦿ Skin soothing and recovery
- ⦿ Reduces skin erythema and relieves the irritation



## Product Information



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- Product Name: Jeju Blossom(GOL)-RSPO, Jeju Blossom(GPD)-RSPO  
Jeju Blossom(PG)
- INCI Name: Prunus Yedoensis Flower Extract
- Dosage: 2 – 4%
- Formulation: Add to the formulation when the temperature is lower than 55°C.  
Recommended to add after the cooling process.
- Storage: Avoid direct light or UV.  
Keep it in a cool and dry area.

\* Palm oil derived solvents (Propanediol, Caprylic/Capric Triglyceride, and Glycerin) are available in **RSPO** Mass Balance grade





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