



# Unique Water-Soluble Propolis



World Best & Unique Propolis



**UNIQUE BIOTECH**

[www.uniquebiotech.co.kr](http://www.uniquebiotech.co.kr)



# **1. Company Overview**

# History



**July 3, 2012:** Founded the company

**July 13, 2012:** Registered its factory

**October 19, 2012:** Obtained a license as a feed manufacturer in Chungcheongbuk-do

**November 26, 2012:** Chosen as an agriculture industry–commerce convergence small- and medium-sized enterprise (SME) by the Ministry of Agriculture, Food and Rural Affairs (MAFRA)

**June 21, 2013:** Selected as a venture company by the Small & Medium Business Corporation

**February 7, 2014:** Registered as an item by the Public Procurement Service

**February 25, 2014:** Obtained a certification for its research and development (R&D) center from the Ministry of Science, ICT and Future Planning

**May 13, 2015:** Certified as a start-up and jump-up company by the Chungbuk Creative Economy Innovation Center

**May 27, 2015:** Obtained the license as a health functional food manufacturer from the Ministry of Food and Drug Safety (MFDS)

**November 10, 2016:** Entered the food production and processing industry of Yeongdong-gu

**July 1, 2017:** Selected as a promising SME by the Ministry of SMEs and Startups

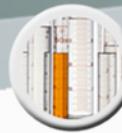
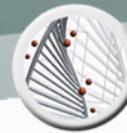
# Certification of New Excellent Technology from the MAFRA



## Certification of New Excellent Technology No. 32-029



# Certifications



## Quality Management System



### Certificate of Registration

This is to certify that the Quality Management System of

#### Unique Biotech Co., Ltd.

#310, Daehak-ro, Yeongdong-eup, Yeongdong-gun,  
Chungcheongbuk-do, Korea

Has been found to conform to the Quality Management System Standard :

#### KS Q ISO 9001:2009 / ISO 9001:2008

This certificate is valid for the following product or service ranges:

**Development, Manufacturing and Additional Services of Health Functional Food and Feed Additives**

Certificate NO. : QSC3054

Valid Until Date : 20-March-2019

Certificate Issue Date : 21-March-2016

Original Certificate Date : 21-March-2016

### KOREA INT'L STANDARDS CERTIFICATION

Lack of fulfillment of conditions described in the Guide for Certification Process may render this Certificate invalid.



Mark indicates that KIC is accredited by Korea Accreditation Board for Quality Management System (No. KAB-QC-36).



Mark indicates that KIC's Accredited by the member of International Accreditation Forum Multilateral Recognition Arrangement.

KIC (Yeouido-dong) 5F, 18, Gukhoe-daeam 68-gil, Yeongdeungpo-gu, Seoul, Korea TEL : 02-786-0705 FAX : 02-786-0706

Authorized by: Dongchun Won

Dong Chun Won, President

## ISO 9001



## New Excellent Technology

# Patents



## ● Patent Inventions

- The manufacturing method of water-soluble propolis (No. 0550165 in Korea and No. 4113520 in Japan)
- The fractions and manufacturing method of propolis, which is effective against acne and wrinkles, with an improved fragrance (No. 10-1216113)

## ● Patent Registrations

- Livestock and fish farming feed additive preparation method with fortified polyphenol using grape by-products and propolis extracts (No. 10-1273425)
- Livestock and fish farming feed additives preparation device using grape by-products and propolis extracts (No. 10-1458882)
- The manufacturing method of eco-friendly, alcohol-free, and water-soluble propolis (No. 10-1403511)
- The manufacturing method of eco-friendly, alcohol-free, and water-soluble propolis using natural honey (No. 10-1661495)
- The manufacturing method of a high-content and water-soluble propolis spray (No. 10-1765455)

## ● International Patent Application

- The manufacturing method of eco-friendly, alcohol-free, and water-soluble propolis using natural honey (PCT/KR2016/007859)

# Awards

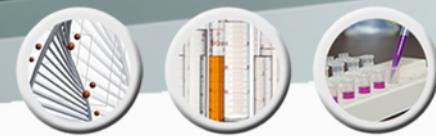


## ● Awards

- **November 2003:** Received the Administrator's Award from the Small & Medium Business Administration
- **November 2007:** Won the Minister's Award of Science and Technology at the Korea Entrepreneurial Startup Business Fair 2007
- **February 2008:** Received a citation from the Ministry of Health and Welfare
- **March 2008:** Received a letter of appreciation from the MFDS
- **May 2013:** Obtained a citation from the MFDS
- **December 2015:** Received a citation from the president of the Small & Medium Business Administration's Chungcheongbuk-do regional office



# **Yong-Kap Hur, Chief Executive Officer (CEO) of Unique Biotech Co., Ltd.**



## **● Main Career**

**2007–2009:** Chairman of the Korea Health Industry Development Institute's health functional food code amendment subcommittee

**2009–2012:** Chairman of the phenol subcommittee of the MFDS' health functional food code improvement committee

**2008–2009:** Member of the Korea Food & Drug Administration (KFDA)'s regulatory reform committee

**2009–2012:** Chairman of the Korea Health Supplements Association (KDSA)'s distribution advancement committee

**2008–2012:** Member of the KDSA's policy committee

**2007–2009:** Member of the KFDA's health functional food development council and system code improvement committee

**Present:** CEO of Unique Biotech Co., Ltd.

Director of The Apicultural Society of Korea(ASK)

Secretary-general of the World Propolis Science Forum(WPSF)

Vice president of the Korea Propolis Research Association(KPRA)

※ Conducted about 20 R&D propolis projects that were supported by the government

※ Presented 19 academic researches of propolis in Korea and foreign countries

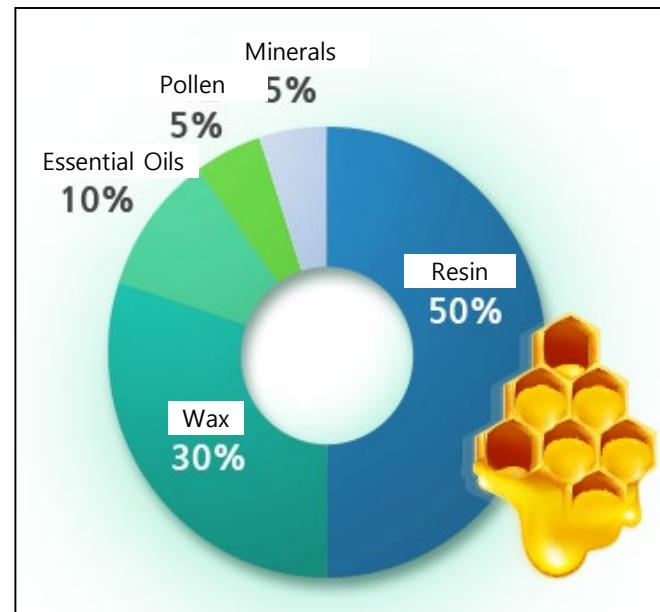
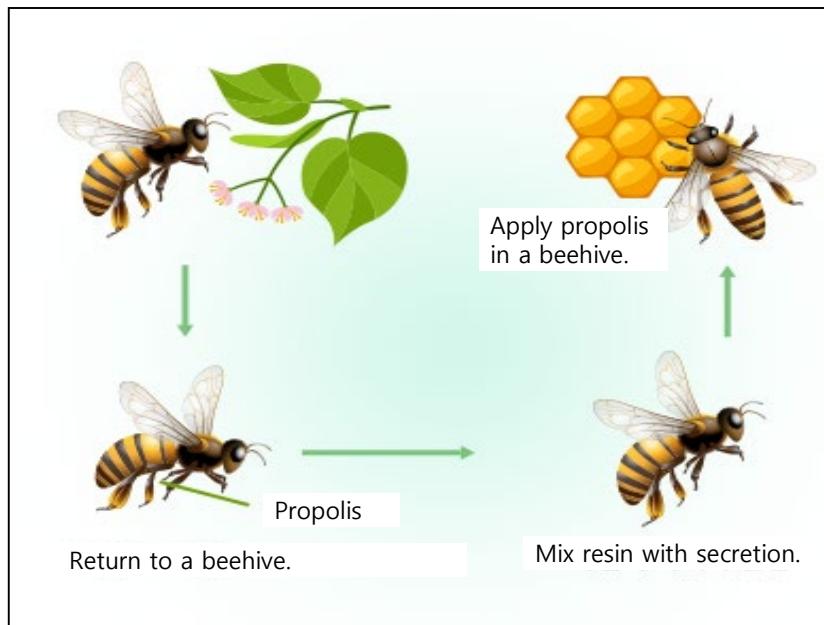


## **2. Propolis Introduction**

# What Is Propolis?



- Propolis is a substance made by honeybees by combining their secretions with the resin they collect from plants to prevent the propagation of germs and decomposition in beehives.
- Its main functional components are flavonoid compounds and phenol compounds such as quercetin, artepillin C, cinnamic acid, coumarin acid, caffeic acid, and others. Propolis is a **natural antibiotic** with physiologically active functions such as **antioxidant effects, antibacterial functions, anti-inflammation capabilities, and immunity enhancement**.



# The Story of Propolis



How **propolis** was discovered is an interesting story.

One day, while exploring the Amazon rainforest, a scholar accidentally observed a field mouse intruding into a beehive to go after honey. Upon seeing their home being invaded, hundreds of bees surrounded the mouse and simultaneously attacked it with bee strings that eventually killed it.

A few months later, the scholar passed by the same site and looked into the beehive to find the dead mouse still there and undecomposed. This made the scholar curious, and he closely observed the carcass to find some sticky substance applied all over it. He found out later on that the substance was called propolis.



**Although successful in killing the mouse, the honeybees had to use propolis to prevent the decomposition of the carcass and the generation of various harmful substances from the carcass as they could not take out such a big carcass from the beehive.**

As shown in the story, propolis is a great gift to mankind by diligent and wise honeybees.

# Composition of Propolis



(Bogdanov and Gallman, 2007)

Class	Substance
<b>Resin</b> 40%–60%	<i>Phenolics</i> Phenols, phenolic acids, esters, flavanones, dihydroflavanons, flavones, flavonols, chalkones, and phenolic glycerides
<b>Wax:</b> 20%–30%	<i>Beeswax substances</i>
<b>Essential oils</b> (Maximum: 10%)	<i>Volatiles</i> Mono- and sesquiterpenes
<b>Others:</b> 5%	<i>Minerals, carbohydrates</i> <i>Ca, Zn, Fe, Mn, Se, Si, Cu, and others</i>

(Poplar propolis is best studied; several hundred substances are identified.)

# Roles of Propolis



## 1. Physical role

- Propolis fills in the cracks of beehives, making them strong by supporting their weak areas.

## 2. Physiochemical role

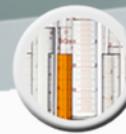
- Beehives are easily contaminated as bees enter and leave them thousands of times a day. However, applying propolis to the beehives can prevent bacterial infections and block germs coming from the outside.
- Before a queen bee lays eggs, worker bees clean her room first, and apply propolis to the room thinly and firmly to allow her to lay eggs in a completely sterilized environment.
- Propolis protects foods stored in beehives from being damaged while bee larvae grow.

# Propolis in Dongui Bogam



Propolis in Dongui Bogam (Principles and Practice of Eastern Medicine) is called Nobongbang. It treats **toothache** in Oehyeongpyeon (external medicine), and **convulsion and epilepsy**, **furuncles**, **breast boils**, **mastitis**, **breast cancer**, and **malignant furuncles** in Tangaekpyeon (remedies).

# Propolis in History



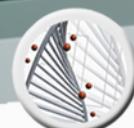
1. **Hippocrates** (406–377 BC): Used propolis to treat **pain and ulcer**
2. **Aristotle** (384–322 BC): Used propolis for **skin diseases and infectious diseases** (Source: *Animal Paper*)
3. **Planius** (23–79 AD): “Propolis removes **bad elements and irritation** in the flesh, heals swollen **edema, softens** hardened **tissues**, and relieves **pain** including those that cannot be easily cured.” (Source: *Natural History*)
4. **Abisenna**, an Iranian philosopher in the 11<sup>th</sup> century: “Apply propolis on the spot after pulling out a thorn or an arrow to **prevent the skin from being infected and to relieve pain.**”
5. Propolis was used to treat **pyrogenic infections** during the Inca Empire of the Andean region of South America during the first half of the 12<sup>th</sup> century.
6. In **France**, during the 18<sup>th</sup> and 19<sup>th</sup> centuries, propolis was mixed with Vaseline to **treat wounded** soldiers during war.
7. **Remmy Sauvin**, a professor at the Department of Biochemistry of Paris-Sorbonne University, released a paper called “Clinical Effect of Propolis” in 1966. The paper states: “There are about 20,000 honeybees in a beehive that is the size of an apple box. The inside temperature of that beehive is about 32°C, and its humidity is very high. Thus, it is a very good condition for bacterial growth. However, **there were no bacteria** in the beehive.” This shows the functionality of propolis as a natural antibiotic.

# Antibacterial Effects of Propolis Extract



- Grange and Davey (1990): The propolis extract (at a concentration of 3 mg/mL) selectively inhibits cocci and gram-positive bacillus; strongly suppresses the growth of *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Enterococcus species*, *Corynebacterium species*, *Branhamella catarrhalis*, and *Bacillus cereus*, and partially inhibits the growth of *Pseudomonas aeruginosa* and *Escherichia coli*. They found that these effects were caused by the galangin and caffeic acid phenethyl ester in the propolis extract.
- The antibacterial effect against *Bacillus subtilis*, *Staphylococcus aureus*, *Candida albicans*, and *Trichophyton mentagrophytes* among 25 substances of the flavonoid of propolis is caused by galangine, pinocembrin, pinobanksin, 3-acetyl pinobanksin, cinnamic acid, p-coumaric acid benzyl ester, caffeic acid, and the caffeic acid ester compounds of flavonoid.
- Comparing five kinds of antibiotics showed that propolis is not stronger than antibiotics but comprehensively affects all kinds of bacteria. In addition, propolis has a strong effect on *Trichophyton mentagrophytes*.
- In particular, propolis is strongly effective against *Staphylococcus epidermidis*, which causes acne; *Malassezia furfur*, which causes dandruff; and *Trichomonas vaginalis*, which causes vaginitis, compared with other antibiotics.
- The important characteristics of propolis do not generate resistant bacteria nor affect *Bifidobacterium*, which is a beneficial intestinal bacteria, and lactic acid bacteria.

# Propolis Research Trends



결과 내 재검색

· 전문용어확장 · 다국어입력 · 검색팁

NDSL

통합검색 ▾

propolis

검색

전체 (3,577)

논문 (2,769)

특허 (777)

보고서 (29)

동향 (2)

표준 (0)

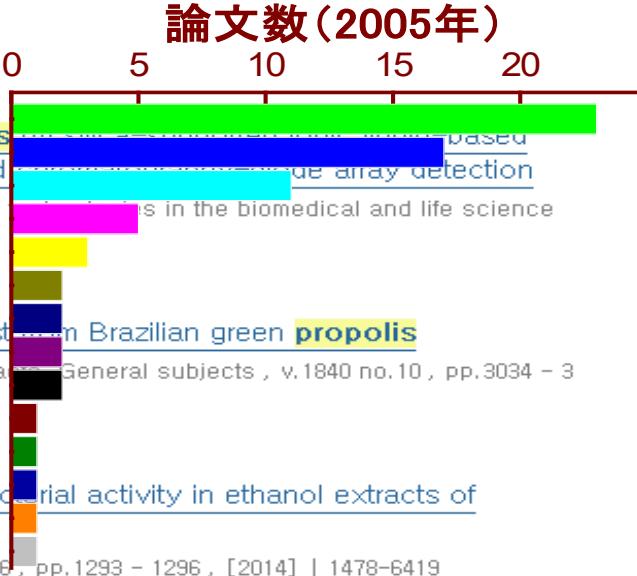
사실정보 (0)

A total of 3,454 documents, 2,506 papers, 911 patents, and 37 reports

콘텐츠별 검색건수 보기 ▾

콘텐츠별로 분류된 검색건수를 한눈에 보기를 원하시면 클릭하세요.

논문 (2,769 건)

- 1 Determination of phenolic acids and flavonoids in raw propolis matrix solid phase dispersion extraction high performance liquid chromatography coupled with array detection Wang, Z. ; Sun, R. ; Wang, Y. | Journal of chromatography. B, analytical technology in the biomedical and life sciences , v.969 , pp.205 – 212 , [2014] | 1570-0232  
초록보기 | 원문보기 | 소장처보기 | 원문복사신청  


연도	논문 수
2005	~10
2006	~12
2007	~15
2008	~18
2009	~20
2010	~22
2011	~25
2012	~28
2013	~30
2014	~32
- 2 Identification of a naturally occurring retinoid X receptor ligand in Brazilian green propolis Nakashima, K.i. ; Murakami, T. ; Tanabe, H. | Biochimica et Biophysica Acta (General subjects) , v.1840 no.10 , pp.3034 – 3041 , [2014] | 0304-4165  
초록보기 | 원문보기 | 소장처보기 | 원문복사신청
- 3 Identification of the phenolic compounds contributing to antibacterial activity in ethanol extracts of Brazilian red propolis Inui, S. ; Hatano, A. ; Yoshino, M. | Natural product research , v.28 no.16 , pp.1293 – 1296 , [2014] | 1478-6419

# Mechanisms of Propolis in the Human Body (1)



## 1. Inhibits the decomposition of adenosine triphosphate (ATP) in cells to revitalize the human body

- The flavonoid compound in propolis inhibits the reaction of ATPase, which decomposes ATP in cells to stimulate ATP and revitalize the human body.
- ATP has three phosphoric acids that combine with adenosine. The two (p) atoms at the ends have a high-energy phosphate bond, which makes them generate high energy when they are decomposed. When the human body needs energy, it uses the energy generated when ATP is decomposed by an enzyme and converted into adenosine diphosphate (ADP). Thus, the flavonoid prevents the unnecessary decomposition of ATP in cells, and efficiently controls ATP to strengthen the vital power of cells and activate the mechanism of the human body.

# Mechanisms of Propolis in the Human Body (2)



## 2. Suppresses the absorption of lipoperoxide and prevents aging

- When the flavonoid of propolis is absorbed into the human body, it binds itself to the receptors outside of cell walls to activate cell membranes. The activated cell membranes regulate phagocytosis to selectively absorb ions (e.g.,  $\text{Ca}^{++}$ ) and nutrients. When lipoperoxide is increased in the human body, an excessive amount of harmful oxygen is generated, and the excess oxygen causes an oxidative destruction of unsaturated fatty acids on cell walls and protoplasm in intracellular compartments. These lead to cell metabolism disorder and aging. Flavonoid-bound cell membranes can selectively absorb nutrients so that lipoperoxide absorption is blocked and aging is prevented.

# Mechanisms of Propolis in the Human Body (3)



## 3. Activates the immune function

- T and B cells, which play an important role in the immune system, are broken by free radicals. Propolis catches and removes these free radicals.
- When macrophages dig traps on cell surfaces and swallow enemies, flavonoids smoothen cell surfaces and stimulate the formation of traps to help in phagocytosis.
- Propolis marks the outer walls of antigens to help T cells recognize them as enemies.
- Flavonoids stimulate leukocytes to produce a lot of interferons to fight against antigens that intrude into cells.

# Mechanisms of Propolis in the Human Body (4)



## 4. Inhibits allergic reaction

- Flavonoids inhibit ATPase, which decomposes ATP, making it suppress the binding between antigens and immunoglobulin E antibodies to control the synthesis of adenosine monophosphate (AMP) and prevent histamine from being separated from mast cells for the inhibition of allergic reaction. That is, flavonoids activate calcium ( $\text{Ca}^{++}$ ) to prevent the histamine converted to (+) from being separated, and neutralize the histamine.

# Mechanisms of Propolis in the Human Body (5)



## 5. Inhibits pain

- Prostaglandins (PGs) are synthesized in the cellular tissues of animals and cause pain. The flavonoids of propolis control the creation of PGs to inhibit pain.
- When cell tissues encounter stress, arachidonic acids are secreted to create PGs. The PGs cause various types of pain and generate free radicals to break cells. Flavonoids inhibit the creation of PGs in arachidonic acids when there are excessive PGs. This process is identical with the reaction of aspirin.

# Mechanisms of Propolis in the Human Body (6)



## 6. Strengthens the connective tissues of the skin and maintains skin elasticity

- The flavonoids of propolis inhibit the hydrolase reaction that decomposes mucopolysaccharides (connective tissues) and prevent the disorder of collagen fibers or the damage of skin tissues.
- Collagen contains much hydroxyplorin. That is, the synthesis of the hydroxyl groups (OH) of amino acid and fluorine is accelerated by flavonoids. Thus, flavonoids prevent the damage of skin tissues, stimulate collagen synthesis, maintain skin elasticity, and regenerate blood vessel walls.

# Standards of Propolis Extract: Notification(1)



## 1) Production Standard

- (1) Raw Material: Propolis is made by honeybees by combining their secretions with the resin they collect from plants.
- (2) Production Method: Wax is removed from the raw material, and propolis is extracted from the material by using water, alcohol, a mixture of water and alcohol, or carbon dioxide (supercritical carbon dioxide extraction).
- (3) Content of Functional Substances: The total flavonoids should be 10 mg/g or higher, and there should be (p)-coumaric acid and cinnamic acids.
- (4) Caution during Production: Diethylene glycol should not be used.

## 2) Standards

- (1) Property: Has a unique color and flavor, does not have an off-taste and odor
- (2) Total Flavonoids
  - (A) Raw Material: Nominal quantity or higher
  - (B) Final Product: 80%–120% of the nominal quantity
- (3) Para (p)-Coumaric Acid: Detected
- (4) Cinnamic Acid: Detected
- (5) Lead (mg/kg): Below 5.0 mg/kg
- (6) Diethylene Glycol: Not detected
- (7) Tetracycline (mg/kg): Not detected
- (8) Chloretetracyclines (mg/kg): Not detected
- (9) Coliform Group: Negative

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

Journal of Ethnopharmacology 110 (2007) 548–554

[www.elsevier.com/locate/jethpharm](http://www.elsevier.com/locate/jethpharm)

*In vivo study of propolis supplementation effects on antioxidative status and red blood cells*

Ivona Jasprica<sup>a</sup>, Ana Mornar<sup>a</sup>, Željko Debeljak<sup>b</sup>, Asja Smolčić-Bubalo<sup>a</sup>, Marica Medić-Šarić<sup>a,\*</sup>, Ljiljana Mayer<sup>c</sup>, Željko Romić<sup>c</sup>, Kajo Bućan<sup>d</sup>, Tihomir Balog<sup>e</sup>, Sandra Sobočanec<sup>e</sup>, Višnja Šverko<sup>e</sup>

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<sup>c</sup> Dubrava Clinical Hospital, Zagreb, Croatia  
<sup>d</sup> Split Clinical Hospital, Split, Croatia  
<sup>e</sup> Rudjer Bošković Institute, Zagreb, Croatia

Received 31 May 2006; received in revised form 20 September 2006; accepted 19 October 2006  
Available online 20 November 2006

# Standards of Propolis Extract: Notification(2)



## 3) Final Product's Requirements

(1) Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities

※ In terms of the antibacterial activity in the oral cavity, it is limited to the type that directly comes into contact with the oral cavity (e.g., spray, tincture, or soft capsule), and the intake quantity is not applied.

(2) Daily Value

Total Flavonoids: 16–17 mg

(3) Cautions

Do not use this product if you are allergic to propolis.

## 4) Test Method

(1) Total Flavonoids: III.3.6.3

(2) Para (p)-Coumaric Acid and Cinnamic Acids:  
III.3.6.4

(3) Lead: See [Asterisk 4].

(4) Diethylene Glycol: III.2.5.3

(5) Tetracycline, Chloretracetracycline: See [Asterisk 4].

(6) Coliform Group: See [Asterisk 4].

A close-up photograph of a bee swarm hanging from a branch. The bees are densely packed, forming a large, irregular cluster. Some bees are on the honeycomb, while others are flying or hovering nearby. The background is a plain, light color.

### **3. Product Introduction**

# Manufactured Items Report



No.	Name	TF (%)	Characteristics/Use
2015001201301	Unique Water-Soluble Propolis	1.86	Water-soluble/product
2015001201302	Unique Water-Soluble Propolis	2.00	Raw material
2015001201303	Unique Water-Soluble Propolis Extract 120	1.20	Water-soluble / raw material
2015001201304	Unique Water-Soluble Propolis Extract 400	4.00	Water-soluble / raw material
2015001201305	Unique Water-Soluble Propolis Spray	0.20	Water-soluble spray product
2015001201306	Unique Water-Soluble Propolis Extract 300	3.00	Water-soluble / raw material
2015001201307	Unique Water-Soluble Propolis Extract 150	1.50	Water-soluble / raw material
2015001201308	Unique Water-Soluble Propolis Extract 200	2.00	Water-soluble / raw material
2015001201309	Unique Water-Soluble Propolis 120	1.20	Water-soluble/product
2015001201310	Unique Water-Soluble Propolis 110	1.00	Raw material
2015001201311	Unique Water-Soluble Propolis Extract 110	1.00	Water-soluble / raw material
2015001201312	Unique Water-Soluble Propolis 150	1.50	Raw material
2015001201313	Unique Water-Soluble Propolis S	1.00	Water-soluble / spray raw material
2015001201314	Unique Water-Soluble Propolis T	2.00	Water-soluble / toothpaste raw material
2015001201315	Water-Soluble GD-Polis Propolis	1.66	Water-soluble/product
2015001201316	Unique Water-Soluble Honey Propolis	1.00	Water-soluble/product
2015001201317	Unique Water-Soluble Honey Propolis Extract	1.00	Water-soluble / raw material
2015001201318	Unique Water-Soluble Propolis Extract (S-H)	1.00	Water-soluble / spray raw material
2015001201319	Unique Water-Soluble Honey Propolis Spray	0.50	Water-soluble spray / product
2015001201320	Solubpolis	1.00	For export / raw material
2015001201321	Water-Soluble Propolis	1.20	Water-soluble/product
2015001201322	Unique Water-soluble Propolis Extracts	1.00	Water-soluble / raw material
2015001201323	Unique Water-soluble Honey Propolis Spray	0.50	Water-soluble/spray raw material
2015001201324	Unibee Propolis Spray	0.50	Water-soluble / product
2015001201325	Unibee Propolis	0.70	Water-soluble/ product
2015001201326	BS Propolis	0.70	Water-soluble/ product
2015001201327	BS Propolis spray	0.50	Water-soluble/ product

# Unibee Propolis



- Type: Health functional food / dropper
- Name: Unibee Propolis
- Weight: 30 mL
- TF: 0.7% or higher
- Packaging Materials: Glass container, dropper, and paper box
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
- Usage: Take 0.77mL (17 drops) three times a day with water, milk, yogurt, tea, or other drinks.
  
- Technical Characteristics: Produced with the patented technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis Using Natural Honey" (No. 10-1661495). It is a pure water-soluble propolis product with no emulsifiers and chemical additives.



# Unibee Propolis Spray



- Type: Health functional food / spray
- Name: Unibee Propolis Spray
  
- Weight: 20 mL
- TF: 0.50%
- Packaging Materials: PET container, spray, and paper box
  
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
  
- Technical Characteristics: Using the raw materials produced with the patented technology No. 10-1661495, this product is made with the patented technology, "The Manufacturing Method of High-Content and Water-Soluble Propolis Spray" (No. 10-1765455).
- Usage: Take 1.10 g (about six injections) three times a day by directly spraying the product into your mouth.



# Unique Water-Soluble Honey Propolis



- Type: Health functional food / dropper
- Name: Unique Water-Soluble Honey Propolis
- Weight: 30 mL
- TF: 1.00% or higher
- Packaging Materials: Glass container, dropper, and paper box
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
- Usage: Take 0.55 mL (12 drops) three times a day with water, milk, yogurt, tea, or other drinks.
- Technical Characteristics: Produced with the patented technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis Using Natural Honey" (No. 10-1661495). It is a pure water-soluble propolis product with no emulsifiers and chemical additives.



# Unique Water-Soluble Honey Propolis Spray



- Type: Health functional food / spray
- Name: Unique Water-Soluble Honey Propolis Spray
- Weight: 20 mL
- TF: 0.50%
- Packaging Materials: PET container, spray, and paper box
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
  
- Technical Characteristics: Using the raw materials produced with the patented technology No. 10-1661495, this product is made with the patented technology, "The Manufacturing Method of High-Content and Water-Soluble Propolis Spray" (No. 10-1765455).
- Usage: Take 1.10 g (about six injections) three times a day by directly spraying the product into your mouth.



# Unique Water-Soluble Propolis



- Type: Health functional food / dropper
- Name: Unique Water-Soluble Propolis
- Technical Characteristics: Produced with the patented technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis" (No. 10-1403511)
- Weight: 30 mL
- TF: 1.86%
- Packaging Materials: Glass container, dropper, and paper box
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
- Usage: Take 0.30 mL (10 drops) three times a day with water, milk, yogurt, tea, or other drinks.



# Unique Water-Soluble Propolis 120



- Type: Health functional food / dropper
- Name: Unique Water-Soluble Propolis 120
- Technical Characteristics: Produced with the patented technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis" (No. 10-1403511).
- Weight: 30 mL
- TF: 1.20%
- Packaging Materials: Glass container, dropper, and paper box
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
- Usage: Take 0.45 mL (12 drops) three times a day with water, milk, yogurt, tea, or other drinks.



# Unique Water-Soluble Propolis Spray



- Type: Health functional food / spray
- Name: Unique Water-Soluble Propolis Spray
- Weight: 20 mL
- TF: 0.20%
- Technical Characteristics: Produced with the patented technology, "The Manufacturing Method of High-Content and Water-Soluble Propolis Spray" (No. 10-1765455).
- Packaging Materials: PET container, spray, and paper box
- Efficacy: Can improve oral hygiene by killing germs and has antioxidant capabilities
- Usage: Take 1.60 g (about eight injections) five times a day by directly spraying the product into your mouth.



# Unique Propolis Toothpaste



- Type: Quasi-drug/toothpaste
- Name: Unique Propolis Toothpaste
- Weight: 120 g × 4/set = (480 g/set)
- Packaging Materials: PP and box
- Technical Characteristics: Produced with the patented technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis" (No. 10-1403511).
- Usage: Brush your teeth with an appropriate amount.
- Efficacy: Removes dental plaque and makes teeth white and strong; keeps mouth clean and fresh, and prevents cavities, bad breath, gingivitis, periodontitis, and gum and periodontal diseases



# Product Characteristics(1)



- A water-soluble substance highly absorbable by the human body

- Its absorption into the mucous membrane (percutaneous) of the oral cavity or a digestive organ shows a rapid effect.
  - Liquid > Capsule, Tablet

- Efficacy

- Can improve oral hygiene by killing germs and has antioxidant capabilities

- Safety

- Its low-temperature production process does not break physiologically active substances.
  - The stability of flavonoids are secured during distribution.

# Product Characteristics(2)



The products are developed through a technical transfer from the Rural Development Administration (RDA), a government agency.

We received a technical transfer of the "Method for Manufacturing Water-Soluble Propolis Composition and Water-Soluble Propolis Composition (No. 10-1677049)," a patented technology developed by the RDA, and combined this with our technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis." As a result, we developed a technology, "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis Using Natural Honey," and a product, the **"Unique Water-Soluble Honey Propolis."**

# Product Characteristics(3)

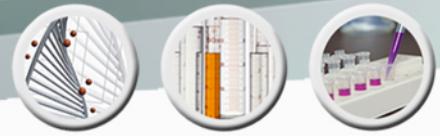


This product is alcohol-free and water-soluble, which enables it to completely dissolve in water.

Depending on your preference, you can dilute this product with water, tea, milk, yogurt, or other drinks.



# Product Characteristics(4)

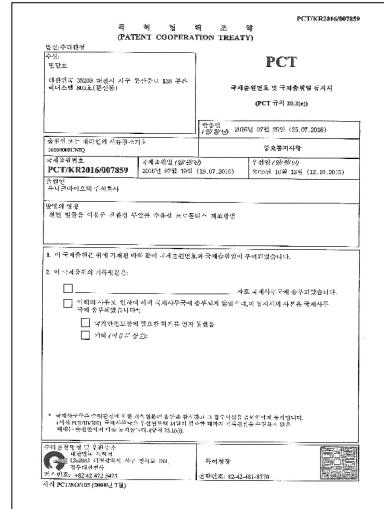


**Our product is manufactured with a patented technology unique in the world.**

- "The Manufacturing Method of Eco-Friendly, Alcohol-Free, and Water-Soluble Propolis Using Natural Honey"
- It is the first of its kind in the world as it is produced with a patented technology.

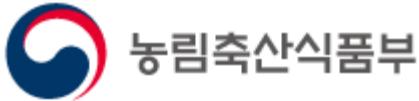


Patent in Korea  
(No. 10-1661495)



International Patent  
(PCT/KR2016/007859)

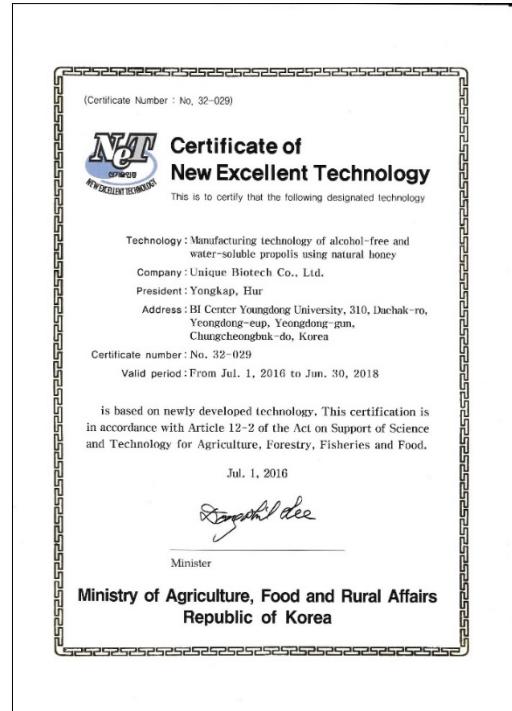
# Product Characteristics(5)



## Certified as a New Excellent Technology (NET) by the MAFRA

This technology was certified as a "New Excellent Technology (No. 32-029)" in accordance to Article 12-2 of the Act on the Promotion of Science and Technology for Food, Agriculture, Forestry and Fisheries on July 1, 2016, through the review and evaluation of the "2016 Certification of New Excellent Technology" of the MAFRA.

The NET certification, which is different from a patent, is given to a new technology through a thorough examination by the government of the technical differentiation, efficacy, and effectiveness of a technology.



# Product Characteristics(6)

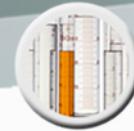
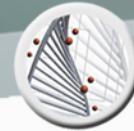


**It contains no alcohol, emulsifiers, chemical additives, and wax.**

**It is a pure water-soluble propolis product without any harmful substances.**

Typically, 50%–70% of alcohol is left in the propolis after it is extracted from alcohol. If propolis is diluted with water, wax and resin are created. It is difficult to ingest propolis due to its taste and flavor, which is caused by the alcohol left on it. To resolve this problem, some countries produce propolis by using an emulsifier or chemical additives instead of alcohol. This kind of propolis is not a genuine water-soluble product. It is not good for people whose digestive organs are weak such as children or elderly people. However, our "Unique Water-Soluble Honey Propolis" does not contain alcohol and any harmful additives such as emulsifiers and chemical additives. In addition, it is a pure water-soluble product with a mild taste and flavor, which makes it safe for people of different genders and of all ages including patients.

# Product Characteristics(7)



## Manufactured using our 3<sup>rd</sup> Generation New Extraction Technology

### ● The 1<sup>st</sup> Generation Propolis Extraction Technology

Propolis is extracted from alcohol, and 50%–70% alcohol is left. If the propolis is diluted with water, its color becomes muddy, and wax and resin residues are created. Thus, it is better to ingest the propolis with a very strong taste and flavor.

### ● The 2<sup>nd</sup> Generation Propolis Extraction Technology

Propolis is produced by using emulsifiers and chemical additives, which makes it possibly harmful to children and elderly people with a weak digestive system, as well as patients. (Emulsifiers: Sucrose fatty acid ester, propylene glycol fatty acid ester, polyglycerine fatty acid ester, polysorbate, and others)

### ● The 3<sup>rd</sup> Generation Propolis Extraction Technology

Our product does not contain alcohol and any harmful additives such as emulsifiers and chemical additives. As a pure water-soluble product, its color is light brown and is transparent, with a mild taste and flavor. Thus, our product is safe for people of different genders and of all ages including patients.

# Product Characteristics(8)



## Industrial materials that can be used as various materials.

- Taking "Unique Water-Soluble Honey Propolis" at the recommended dosage every day is similar to taking 16–17 mg of flavonoid, which is a key antibacterial and antioxidant substance.
- The raw material HUWP-X110 is water-soluble at a pH of  $9.0 \pm 0.2$  by making a natural substance that is low molecular in an advanced way to remove polysaccharides.
- The raw material HUWP-X110 may cause precipitation by sensitively responding to a polysaccharide or a change of pH.

# Product Characteristics(9)



**This product is developed and led by the best propolis experts.**

**2007–2012:** Chairman of the MFDS' health functional food code improvement committee

**2008–2009:** Member of the KFDA's regulatory reform committee

**2009–2012:** Chairman of the KDSA's distribution advancement committee

**2008–2012:** Member of the KDSA's policy committee

**2007–2009:** Member of the KFDA's health functional food development council and system code improvement committee

**Present:** CEO of Unique Biotech Co., Ltd.

Director of Korea Beekeeping Association (KBA)

Secretary-general of the WPSF

Vice president of the Korea Propolis Research Association

※ Conducted about 20 R&D propolis projects that were supported by the government

※ Presented 19 academic researches of propolis in Korea and foreign countries



MBC News and Focus  
[November 2, 2006]



MBC News Desk  
[October 29, 2006]



KBS1TV Environment Special  
[November 22, 2006]

# Product Characteristics(10)



**Unique Biotech uses propolis from Australia, one of the cleanest countries in the world.**

**The quality of a propolis product depends first and foremost on the natural environment where honeybees collect it and the type of trees surrounding the area.**



# Product Characteristics(11)



**Australian propolis has a high content of flavonoids and an even distribution of diverse physiologically active materials.**

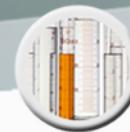
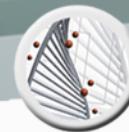
Good propolis contains a high level of flavonoids with antibacterial activities and antioxidative effects, and an even distribution of about 300 types of physiologically active substances.

According to professor Vancova, a Bulgarian world-renowned propolis expert, "Brazilian propolis has a low level of flavonoid and a high level of Artepillin-C. It does not contain diverse substances evenly."

Artepillin-C (3,5-diprenyl-4-hydroxycinnamic acid) was named by Dr. Tetsuya Matsuno of Japan. It is a kind of cinnamic acid with a spicy flavor. All propolis contain cinnamic acid.

However, Baccharis, which is grown in Brazil, contains this spicy substance and is green in color. Thus, there is a misconception that this green propolis is good. The green propolis from Baccharis has a low content of flavonoid and a high content of cinnamic acid, which exists in all propolis. However, it does not have enough biologically active substances that need to be evenly contained.

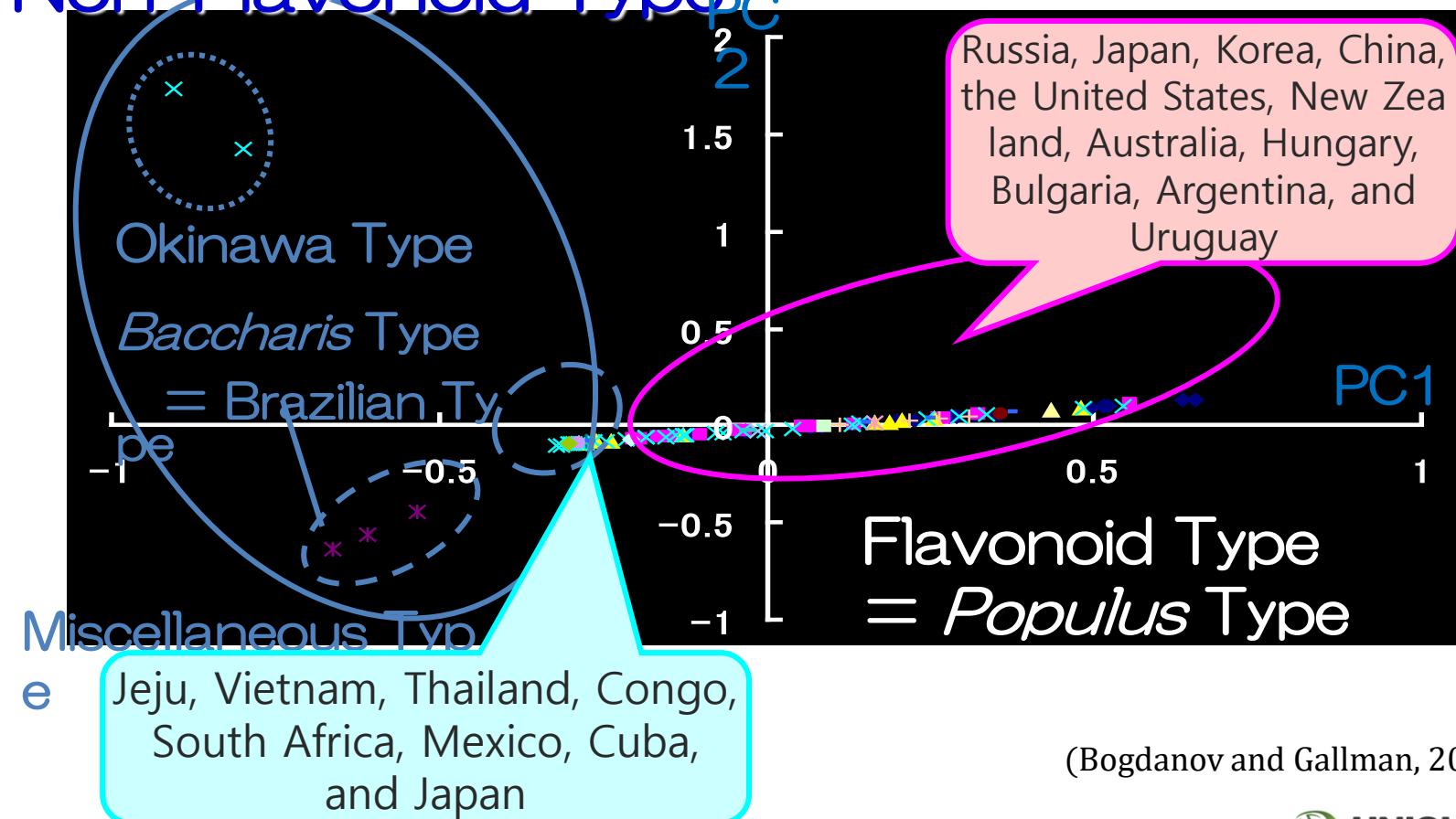
# Understanding the Raw Materials of Propolis



Propolis has two types: flavonoid type and non-flavonoid type.

Brazilian propolis is a non-flavonoid type, which means that its flavonoid content is low.

## Non-Flavonoid Type

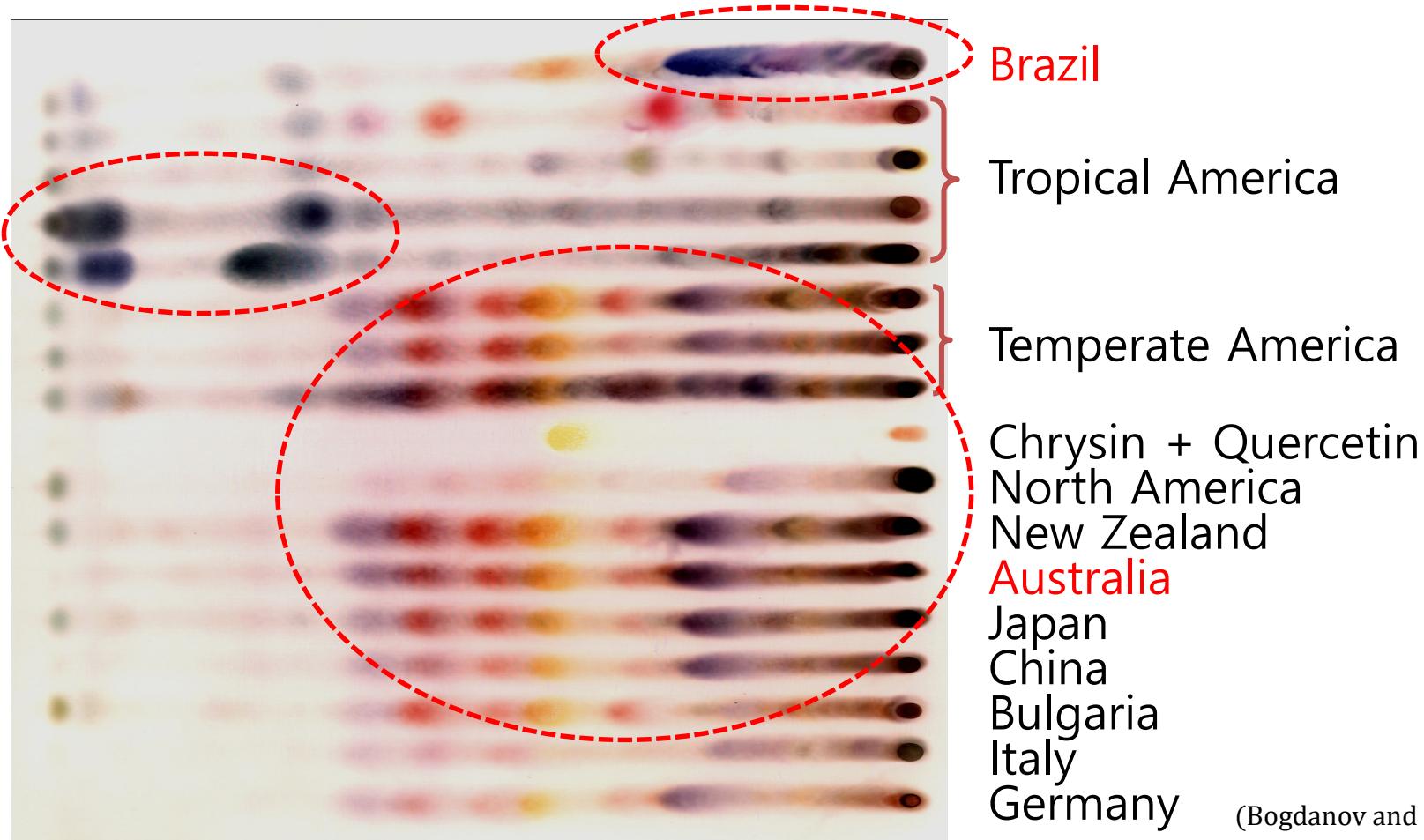


(Bogdanov and Gallman, 2007)

# Different Types of Propolis (TLC)



Brazilian propolis contains a lot of certain substances, although it does not have an even distribution of physiologically active materials. However, most propolis from Australia, North America, Europe, Oceania, and Asia tend to contain diverse substances.



(Bogdanov and Gallman, 2007)

# Main Propolis Types



(Bogdanov and Gallman, 2007)

## Poplar Propolis

*Populus, mostly Phyllostachys nigra*

Can be found in the temperate climatic zones of Asia, Europe, and North America



## Green Propolis

*Baccharis dracunculifolia (Alecrim)*

Can be found in Brazil and South America

- Green Propolis (green color, spicy taste) – Southern (Minas Gerais)  
Red Propolis (red color) – Northern
- Artepillin-C (3,5-diprenyl-4-hydroxy**cinnamic** acid)  
1991, Tetsuya Matsuno, Cancer

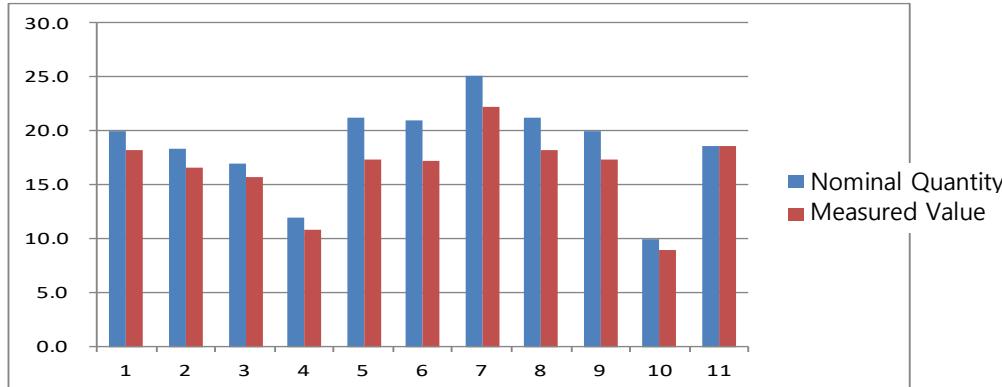


# **4.** **Experimental** **Data**

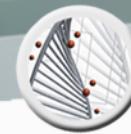
# Stability Evaluations of Flavonoid(1)



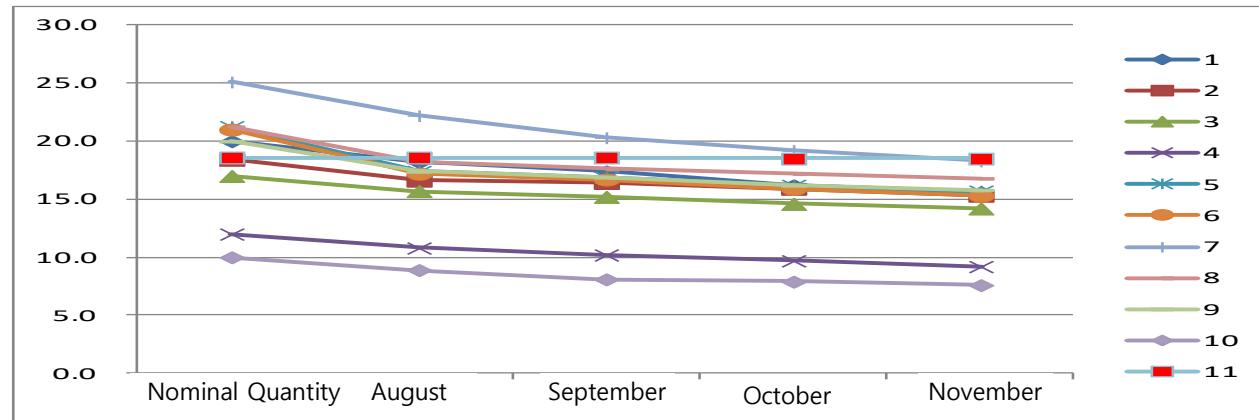
Product Name	Manufacturer/Country	Flavonoid (mg/g)		Best Used Before
		Nominal Quantity	Measured Value	
1. Propolis Liquid	JINS PHARMA PTY / Australia	20.00	18.20	July 1, 2017
2. Propolis Tincture	COMVITA / New Zealand	18.40	16.60	October 18, 2018
3. Propolis Liquid	Bee Health Limited / England	17.00	15.70	February 1, 2019
4. Propolis Liquid	Triton Pharmaceutical Ltd. / Canada	12.00	10.80	March 21, 2017
5. Mothernest Propolis	RBK NUTRACEUTICALS PTY / Australia	21.25	17.40	October 1, 2017
6. Propolis Liquid	D&H International Pty / Australia	21.00	17.20	December 1, 2017
7. Propolis Liquid	Nature's Laboratory / England	25.00	22.20	November 26, 2017
8. Propolis Liquid	Rainbow&Nature / Australia	21.25	18.20	March 1, 2016
9. Propolis Liquid	H&H Life Australia Pty / Australia	20.00	17.40	April 1, 2016
10. Water-Soluble Propolis	Cosmax Bio / Korea	10.00	8.90	May 15, 2016
11. Unique Water-Soluble Propolis	Unique Biotech / Korea	18.60	18.60	June 29, 2017



# Stability Evaluations of Flavonoid(2)



Product Name	Flavonoid (mg/g)					Normal Range
	Nominal Quantity	August	September	October	November	
1. Propolis Liquid	20.00	18.20	17.40	16.20	15.60	16.00–24.00
2. Propolis Tincture	18.40	16.60	16.40	15.90	15.30	14.70–22.10
3. Propolis Liquid	17.00	15.70	15.20	14.60	14.20	13.60–20.00
4. Propolis Liquid	12.00	10.80	10.20	9.70	9.20	9.60–14.40
5. Mothernest Propolis	21.25	17.40	16.90	16.20	15.70	17.00–25.60
6. Propolis Liquid	21.00	17.20	16.70	15.90	15.30	16.80–25.20
7. Propolis Liquid	25.00	22.20	20.30	19.20	18.30	20.10–30.10
8. Propolis Liquid	21.25	18.20	17.60	17.20	16.80	17.00–25.60
9. Propolis Liquid	20.00	17.40	16.90	16.20	15.80	16.00–24.00
10. Water-Soluble Propolis	10.00	8.90	8.10	7.90	7.60	8.00–12.00
11. Unique Water-Soluble Propolis	18.60	18.60	18.60	18.50	18.50	14.90–22.30



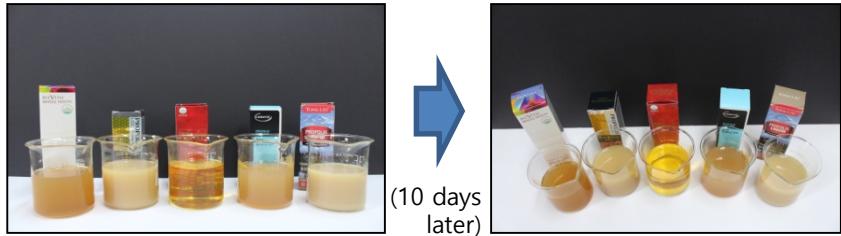
# Palatability

1st Test

Product Name	Manufacturer (Country)	Flavonoid (mg/g)		Acceptance*
		Nominal Quantity	Measured Value	
Propolis Liquid	JINS PHARMA PTY (Australia)	20.00	18.20	B
Propolis Tincture	COMVITA (New Zealand)	18.40	16.60	B
Propolis Liquid	Bee Health Limited (England)	17.00	15.70	C
Propolis Liquid	Triton Pharmaceutical (Canada)	12.00	10.80	B
Mothernest Propolis	RBK NUTRACEUTICALS (Australia)	21.25	17.40	C
Propolis Liquid	D&H International Pty	21.00	17.20	C
Propolis Liquid	Nature's Laboratory (England)	25.00	22.20	B
Propolis Liquid	Rainbow&Nature (Australia)	21.25	18.20	C
Propolis Liquid	H&H Life Australia Pty (Australia)	20.00	17.40	C
Water-Soluble Propolis	Cosmax Bio (Korea)	10.00	8.90	C



2nd Test



(A) Bee Vital Propolis Liquid (England, Nature's Laboratory Ltd.)

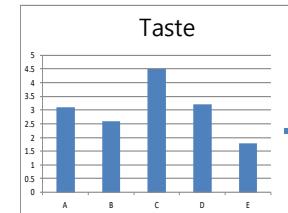
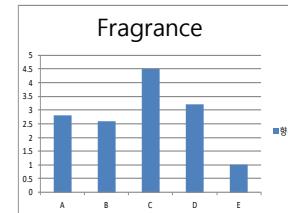
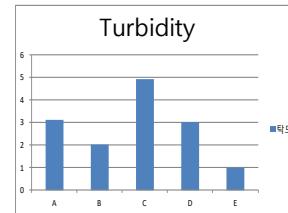
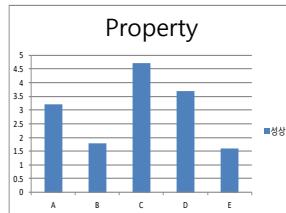
(B) Propolis Liquid (Australia, JNS Pharma PTY Ltd.)

(C) Unique Water-Soluble Propolis (produced with a patented technology)

(D) Comvita Propolis Tincture (New Zealand, Comvita New Zealand Ltd.)

(E) Tong Life Propolis Liquid (Canada, Triton Pharmaceutical Ltd.)

Survey



According to the palatability test that targeted 50 men and women, the palatability of trial product (C) is better than other famous products (A, B, D, and E) in all aspects such as property, turbidity, fragrance, taste, and purchase. The purchase intention of these men and women is the highest for the trial product. In other words, the palatability of the trial product is significantly better than that of existing products.

# Improvement of Antioxidant Effacement (DPPH Evaluation)



[Comparison of DPPH Radical Scavenging Activities of Korean and Foreign Propolis]

Concentration ( $\mu\text{g/mL}$ )	Sample			
	No. 2	No. 3	No. 7	No. 11
6.25	29.4 $\pm$ 0.1	27.0 $\pm$ 1.7	44.0 $\pm$ 3.1	45.1 $\pm$ 1.0
12.5	44.3 $\pm$ 2.3	40.3 $\pm$ 1.2	64.5 $\pm$ 0.5	64.8 $\pm$ 1.5
EDA <sup>a)</sup> (%)	25	63.8 $\pm$ 1.4	57.5 $\pm$ 2.0	89.6 $\pm$ 0.1
	50	87.6 $\pm$ 0.6	82.2 $\pm$ 0.2	88.9 $\pm$ 2.0
	100	89.2 $\pm$ 0.1	91.7 $\pm$ 0.1	88.9 $\pm$ 0.2
$\text{IC}_{50\text{b})}$ ( $\mu\text{g/mL}$ )	16.2	19.1	8.1	7.8

<sup>a)</sup>EDA: Electron Donating Ability

<sup>b)</sup> $\text{IC}_{50}$ : Concentration of each sample, indicating 50% EDA

No. 2: Propolis Tincture (New Zealand, Comvita)

No. 3: Propolis Liquid (England, Bee Health)

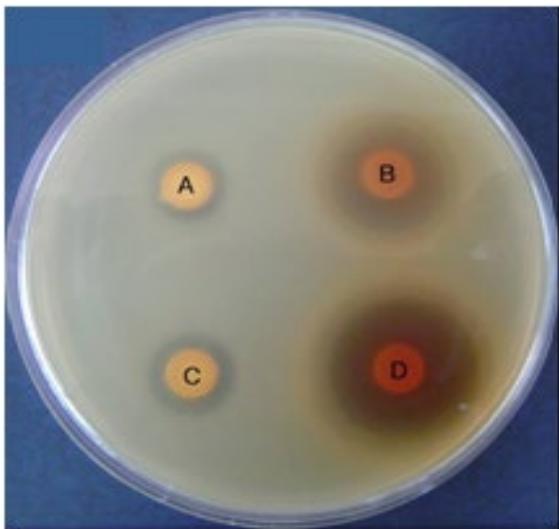
No. 7: Propolis Liquid (Australia, Natures Laboratory)

No. 11: Unique Water-Soluble Propolis (Korea, Unique Biotech)

# Antibacterial Activity Evaluation(1)



Antibacterial Activity Paper Disc of *Pseudomonas aeruginosa*



Culture ground that displays the antibacterial activity of Control Group A, and Samples B, C, and D against *Pseudomonas aeruginosa*.

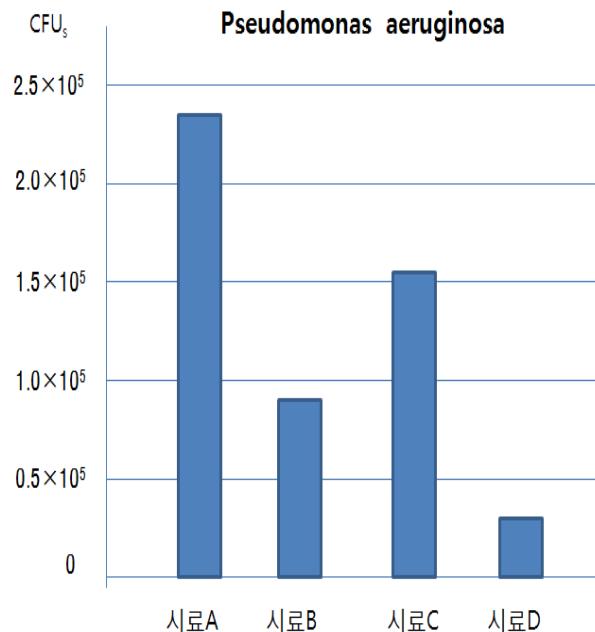
Sample A: Sterile distilled water

Sample B: EEP (70% EtOH, 5:1)

Sample C: Propolis Liquid (England, Bee Vital, Nature's Laboratory)

Sample D: Unique Water-Soluble Propolis (UWP)

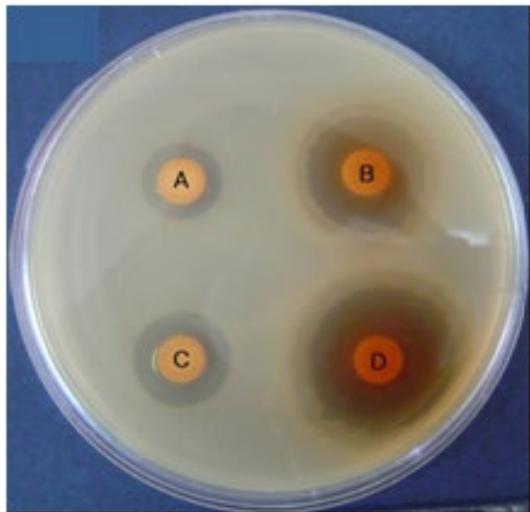
Measurement of the Number of *Pseudomonas aeruginosa*



# Antibacterial Activity Evaluation(2)

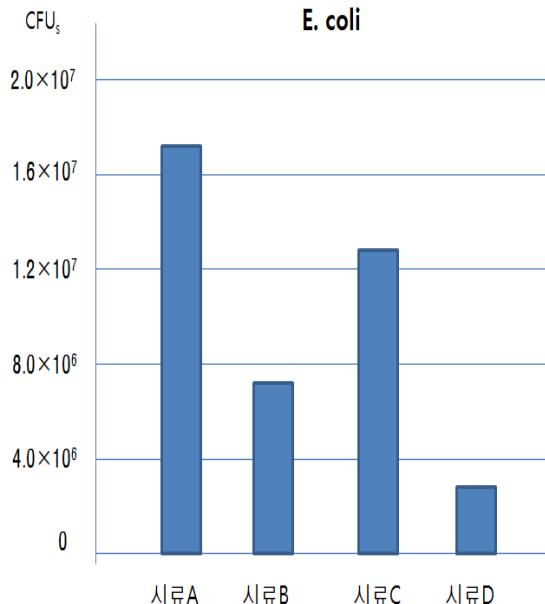


Antibacterial Activity Paper Disc of *Escherichia coli*



Culture ground that displays the antibacterial activities of Control Group A, and Samples B, C, and D against *Escherichia coli*.

Measurement of the Number of *Escherichia coli*



Sample	<i>Pseudomonas aeruginosa</i>	<i>Escherichia coli</i>
Control Group A	-	-
Sample B	++	++
Sample C	+	+
Sample D	++++	+++



Be More Unique!



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