



ORYZA OIL & FAT CHEMICAL CO., LTD.

BIRD'S NEST EXTRACT

—Contains Natural EGF—

Promote wound healing & skin beautifying

Reinforce skin tight junction

Prevent virus/influenza infections

- **BIRD'S NEST EXTRACT-P**
(Water-soluble Powder, Food Grade)
- **BIRD'S NEST EXTRACT-PC**
(Water-soluble Powder, Cosmetic Grade)
- **BIRD'S NEST EXTRACT-LC**
(Liquid, Cosmetic Grade)

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Ver. 1.2 YF

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BIRD'S NEST EXTRACT

1. Introduction

“Bird’s Nest” or swallow’s nest is referring to the nest of swiftlet (Figure 1). It is usually built during the breeding season by the interwoven strands of solidified salivary of male swiftlets in South East Asia and Southern China. Traditionally, it has been used to replenish strength and revitalize energy. According to ancient Chinese literature, bird’s nest was shown to have healing effects on tuberculosis, haematoemesis, chronic diarrhea, chronic malaria, pulmonary infections ¹⁾²⁾. Besides, bird’s nest has been regarded as precious delicacy in Chinese cuisine for maintenance of general health and radiant youthful looking skin.



Figure 1. Bird’s Nest

In Oryza Oil & Fat Chemical Co., Ltd., with ultra-high pressure enzyme processing method, we produce extract from Bird’s Nest of highest quality from Thailand which contains intact functional components. Oryza BIRD’S NEST EXTRACT is standardized to contain sialic acid, with known effect on boosting immunity, improving brain function, and prevention of virus/influenza infections. Oryza BIRD’S NEST EXTRACT-Powder has excellent aqueous solubility and it is suitable to be used in food and topical applications (Figure 2).

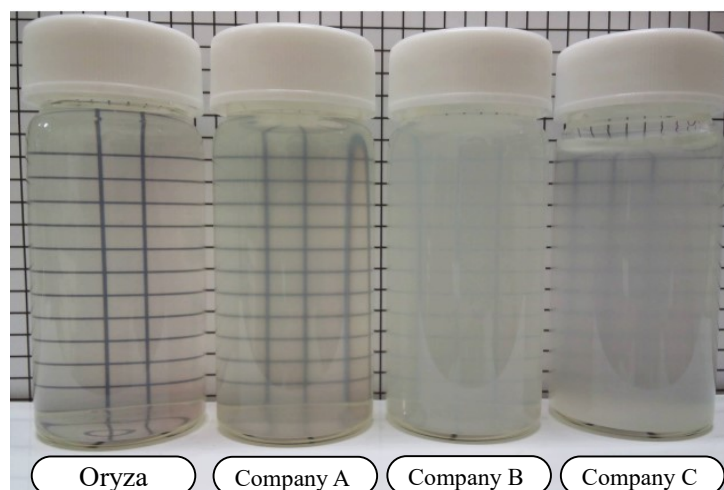


Figure 2. Comparison on aqueous solubility of 1% Oryza BIRD’S NEST EXTRACT-Powder with other commercially available products.

¹ Haruo Ogura, Sialic acid - Regarding the invention of modern medicine and ancient remedy -
² Dictionary of Chinese Traditional Drugs, Shanghai Science and Technology Publisher, Shogakukan, Inc.,1985

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2. BIRD'S NEST EXTRACT – Functional Components

2-1. Sialic Acid

Sialic Acid, is a generic term of the acyl derivative of neuraminic acid (5-amino-3, 5-dideoxy D-glycerol-D-galactononurone acid). There are more than 30 types of naturally occurring sialic acid³. N-acetylneuraminic acid was found to be the main sialic acid in Bird's Nest (Figure 3). Sialic acid acts as an antenna at the glycoproteins and glycolipids end of cell membrane (Figure 4), plays important functions in many cellular functions, preventing influenza infections, and cellular fluid uptake.

Food rich in sialic acid includes milk (sialic acid content 0.2mg/mL), egg yolk (dry weight, sialic acid content 0.2%), there is about 10% sialic acid content in solubilized enzyme treated Bird's Nest ¹, and it is one of the richest natural food source of sialic acid.

Documented pharmacological effects of sialic acid includes enhance learning ability ⁴, boost immunity ⁵and prevent influenza infections⁶.

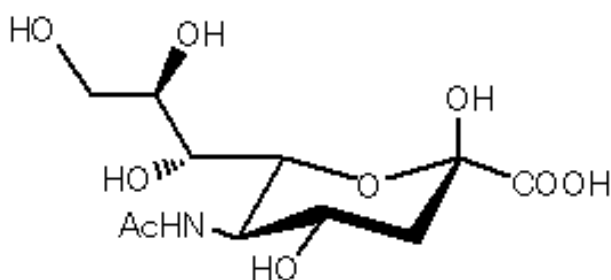


Figure 3. Structure of N-acetylneuraminic acid

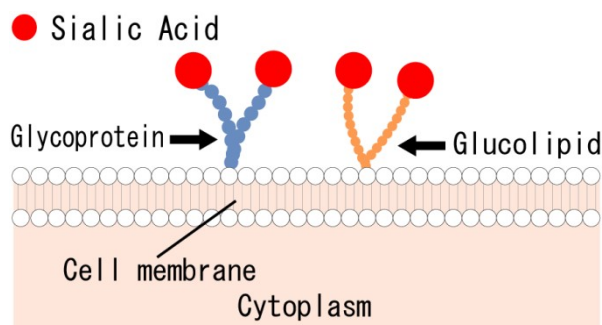


Figure 4. Location of sialic acid

³ Jangho Lee, Manabu Seno, Sialic acid and its derivatives, Production Research, volume 1, issue 1 (1949.10).

⁴ Morgan BL., Winick M., Effects of administration of N-acetylneuraminic acid (NANA) on brain NANA content and behavior. J Nutr. Mar;110(3):416-24(1980).

⁵ Bagriaçik EU., Miller KS., Cell surface sialic acid and the regulation of immune cell interactions: the neuraminidase effect reconsidered. Glycobiology. Mar;9(3):267-75(1999).

⁶ Biddle F., Belyavin G., The haemagglutination inhibitor in edible bird-nest: its biological and physical properties. J Gen Microbiol. Apr;31:31-44 (1963).

2-2. Epidermal Growth Factor (EGF)

Epidermal growth factor (EGF), is a low molecular weight, 53-amino acid polypeptide that stimulate cell growth and proliferation. It was first isolated from the male mouse submandibular glands. In the human body, EGF is present in milk, saliva, urine, blood platelet, macrophages, tears and semen which is important for cell differentiation ^{7,8,9}. In a study conducted by Uchihashi et al., reported that urinary excretion of human EGF decreases with age (Figure 5), and the decrease of EGF is age-related, thus it is a contributing factor to aging. It is suggestive that replenishing EGF may benefit the regeneration and normalization of aging cell functions. Bird's Nest is well known for its rich content of EGF, with ultra-high pressure treatment, Oryza Oil & Fat Chemical Co., Ltd. has been able to produce BIRD'S NEST EXTRACT with EGF content 5x higher than other commercially available products (Figure 6).

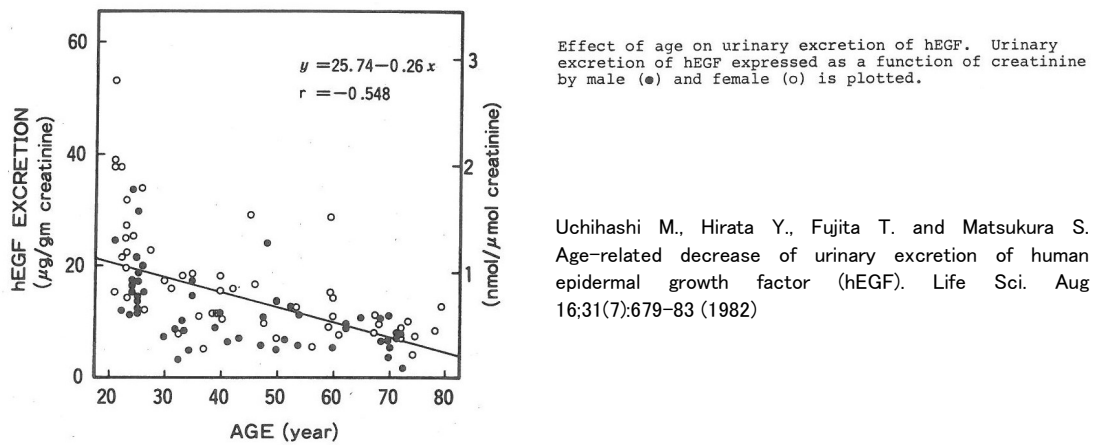


Figure 5. Age-related decrease in EGF

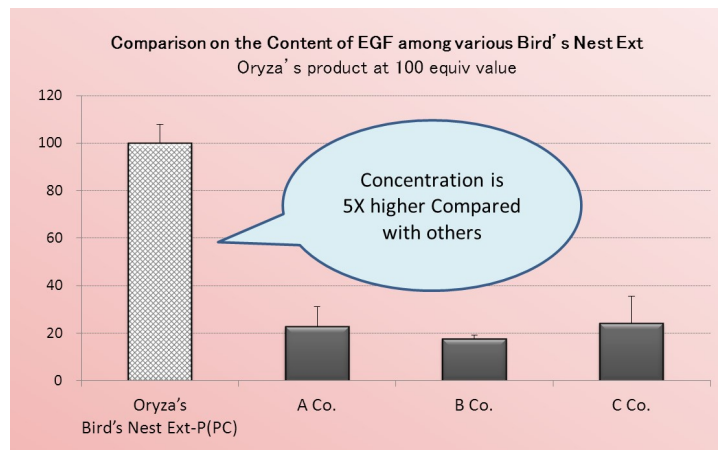


Figure 6. Comparison on EGF content among different producers of BIRD'S NEST EXTRACT

⁷ Hirata Y., Orth DN. Concentrations of Epidermal Growth Factor, Nerve Growth Factor, and Submandibular Gland Renin in Male and Female Mouse Tissue and Fluids. *Endocrinology*, vol.105, 1382-1387 (1979).

⁸ Tsutsumi O., Tsutsumi A. and Oka T. Epidermal growth factor-like, corneal wound healing substance in mouse tears. *J Clin Invest.* Apr;81(4):1067-71(1988).

⁹ Elson SD., Browne CA. and Thorburn GD. Identification of epidermal growth factor-like activity in human male reproductive tissues and fluids. *J Clin Endocrinol Metab.* Apr;58(4):589-94(1984).

3. Functional Effect of BIRD'S NEST EXTRACT

3-1. Human skin cells proliferation (*in vitro*)

There are studies documented that Bird's Nest containing EGF promotes and activates the synthesis of DNA, thus cell proliferation¹⁰.

Further experiment was prompted to study the effect of BIRD'S NEST EXTRACT, with rich EGF, on human skin cells (epidermal keratinocytes and dermal fibroblasts) proliferation. Results showed that BIRD'S NEST EXTRACT promoted the proliferation of normal keratinocytes and fibroblasts dose-dependently (Figure 7, 8). Keratinocytes plays important role in healthy skin barrier function, improved proliferation on keratinocytes directly improves skin barrier function, thus promote skin suppleness and improve overall skin texture. Meanwhile, fibroblasts synthesize extracellular matrix and collagen, plays critical role in wound healing, influence skin elasticity and physical apparent age. The excellent cell proliferative effect demonstrated by BIRD'S NEST EXTRACT is beneficial in promoting healthy youthful looking skin.

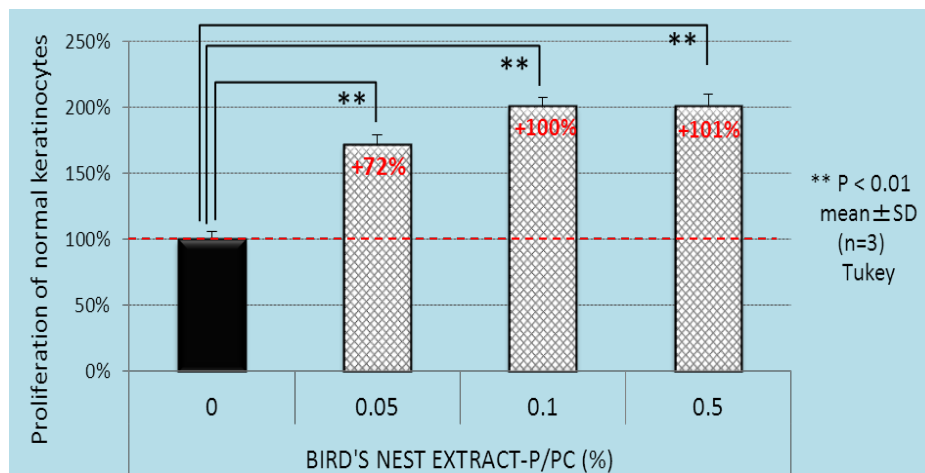


Figure 7. The Effect of BIRD'S NEST EXTRACT on Keratinocytes Proliferation

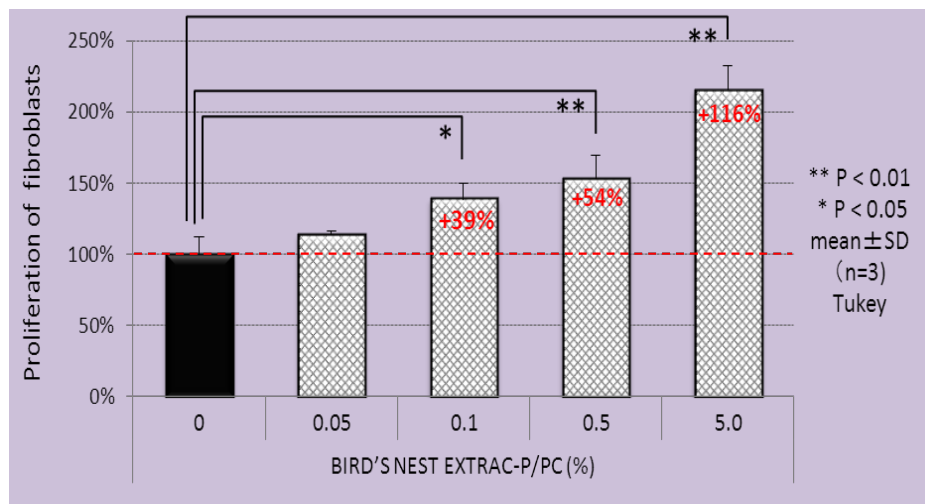


Figure 8. The Effect of BIRD'S NEST EXTRACT on Fibroblasts Proliferation

¹⁰ Y. C. Kong, et al. Evidence that epidermal growth factor is present in swiftlet's (Collocalia) nest. Comparative Biochemistry and Physiology B, vol. 87, no. 2, pp. 221-226(1987).

3-2. Wound Healing Effect (*in vitro*)

Epidermal Growth Factor (EGF) plays important role in the process of wound healing. Studies showed that wound healing is delayed in mice which submandibular gland is removed as submandibular gland is the organ producing EGF¹¹). Proliferation and migration of epithelial cells plays critical role in wound healing, EGF is a known factor in promoting fibroblast proliferation and epithelial cells migration, thus promote wound healing.

The effect of BIRD'S NEST EXTRACT on wound healing was examined by scratch test. Normal human keratinocytes was cultured in petri dish. Damage model was induced by scratching a line in the centre of the dish. Wound healing at scratched area was observed after 24-hour (Figure 9). As presented in Figure 10, accelerated wound healing effect was observed in dish treated with BIRD'S NEST EXTRACT, the effect is dose-dependent. Thus, it is suggestive that BIRD'S NEST EXTRACT promotes wound healing.

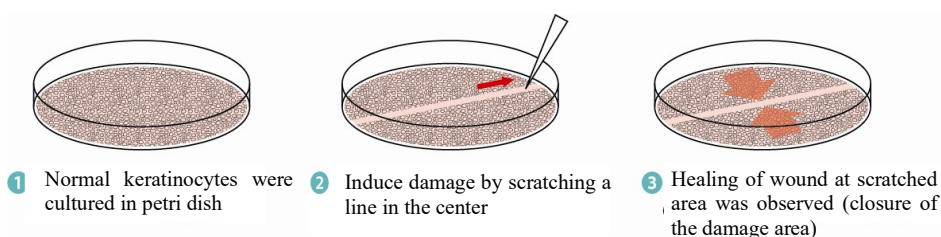


Figure 9. Experimental protocol of scratch test

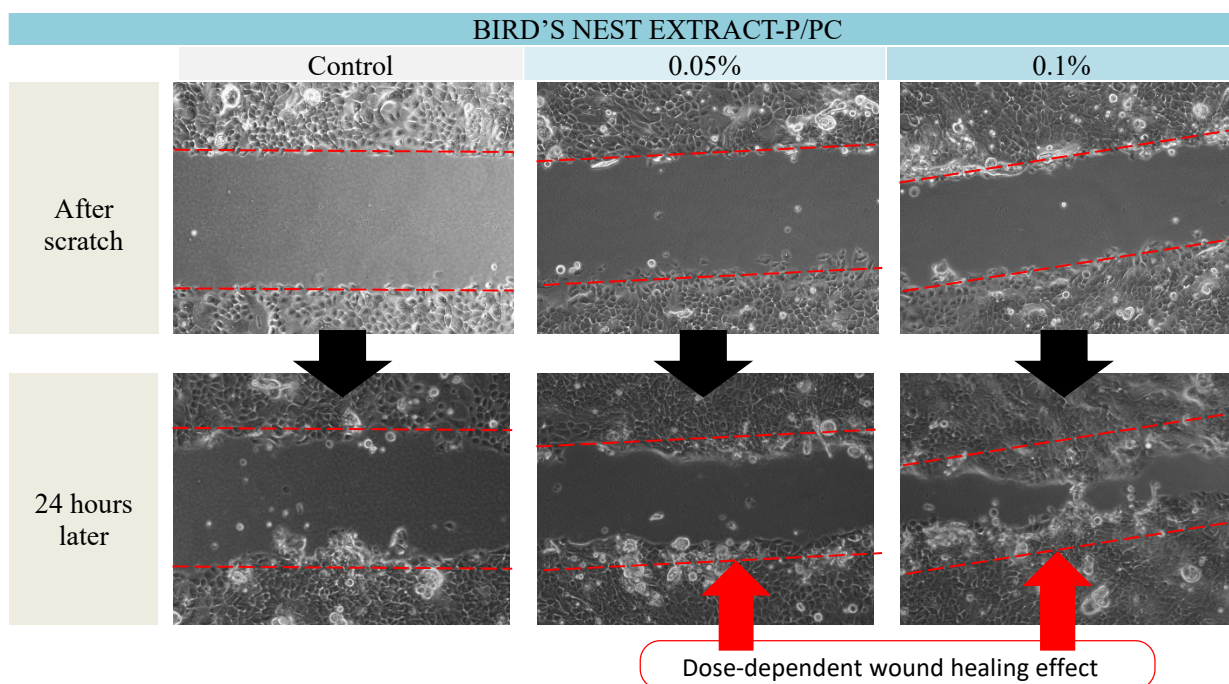


Figure 10. The effect of BIRD'S NEST EXTRACT on Wound Healing

¹¹ Niall M., Ryan GB., O'Brien BM. The effect of epidermal growth factor on wound healing in mice. Aug;33(2):164-9 (1982)

3-3. Strengthening of skin tight junction (*in vitro*)

Tight junctions (TJ) refer to closely associated area of two adjacent cells whose membrane join together forming a virtually impermeable barrier to fluid. In the epidermis, TJ plays crucial role in the formation and maintenance of epithelial barriers prevent invasion of foreign particles. In the stratum corneum, ceramide acts as first line of skin barrier function. TJ in the stratum granulosum acts as second line of skin barrier function. Occludin and claudin are integral plasma membrane proteins located at the tight junctions¹². They forms important barrier that protects from external organism, preventing excessive water loss and selectively transport of small solutes through the skin¹³ (Figure 11).

Bird's Nest in the form of Bird's Nest soup has been widely consumed as delicacy in Chinese cuisine for healthy youthful skin maintenance. This has prompted further understanding into the effect of Bird's Nest on skin barrier function where experiment was conducted to evaluate the effect of BIRD'S NEST EXTRACT on skin tight junctions. Among the TJ proteins, claudin-1 (Cldn-1) and claudin-4 (Cldn-4) have been demonstrated to have a role in skin barrier function^{14,15}. The effect of BIRD'S NEST EXTRACT on TJ proteins expression was examined. As showed in Figure 12, both genetic expression and protein expression of Cldn-1 and Cldn-4 has been up-regulated by BIRD'S NEST EXTRACT-P(PC) 0.1% *in vitro*. In addition, the effect of BIRD'S NEST EXTRACT on protein expression of Cldn-4 of normal keratinocytes was examined and observed using fluorescence microscopy. Results showed that the protein expression of Cldn-4 was up-regulated by BIRD'S NEST EXTRACT-P(PC) 0.1% (indicated by red region in Figure 13).

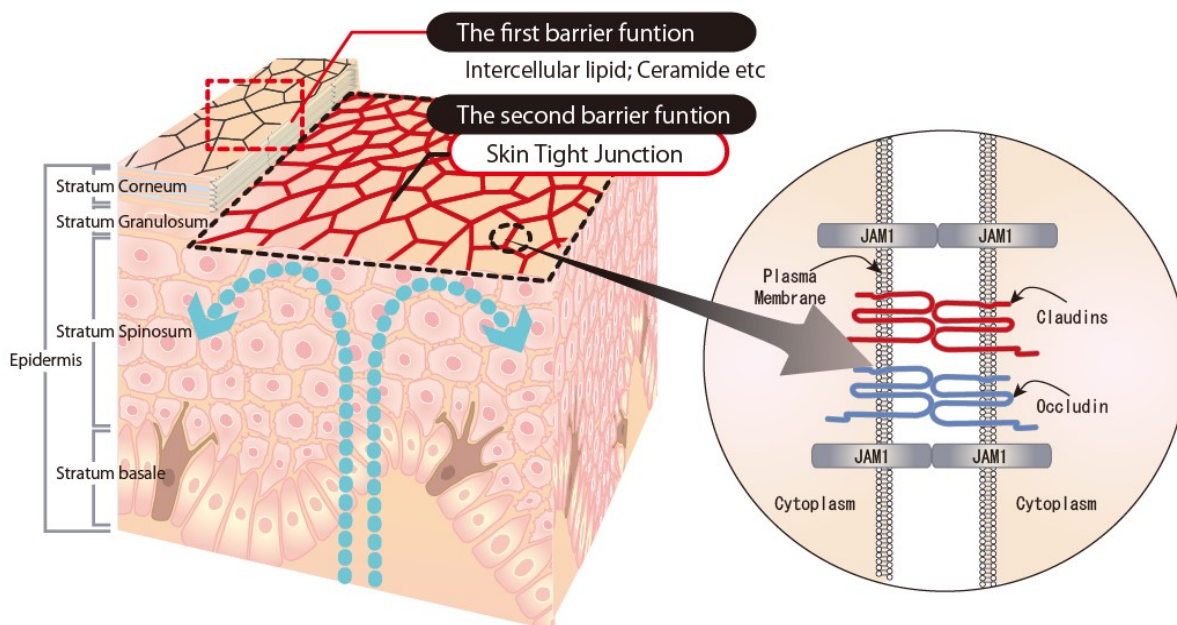


Figure11. Structure of tight junctions

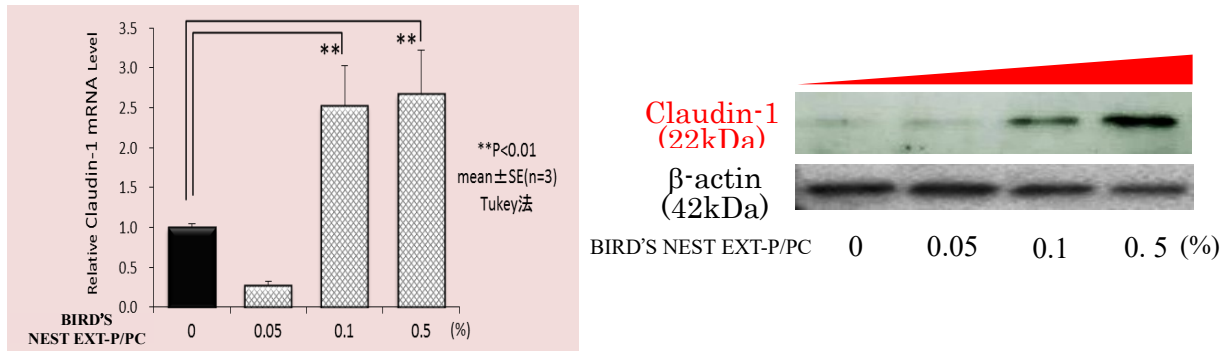
¹² Niessen CM. Tight junctions/adherens junctions: basic structure and function. *J Invest Dermatol.* Nov;127(11):2525-32.(2007)

¹³ Yamamoto T.et al. Effect of RNA interference of tight junction-related molecules on intercellular barrier function in cultured human keratinocytes. *Arch Dermatol Res.* Oct;300(9):517-24.(2008)

¹⁴ Furuse M.et al. Claudin-based tight junctions are crucial for the mammalian epidermal barrier: a lesson from claudin-1-deficient mice. *J Cell Biol.* Mar 18;156(6):1099-111.(2002)

¹⁵ Yuki T.et al.Characterization of tight junctions and their disruption by UVB in human epidermis and cultured keratinocytes. *J Invest Dermatol.* Mar;131(3):744-52.(2011)

《A》



《B》

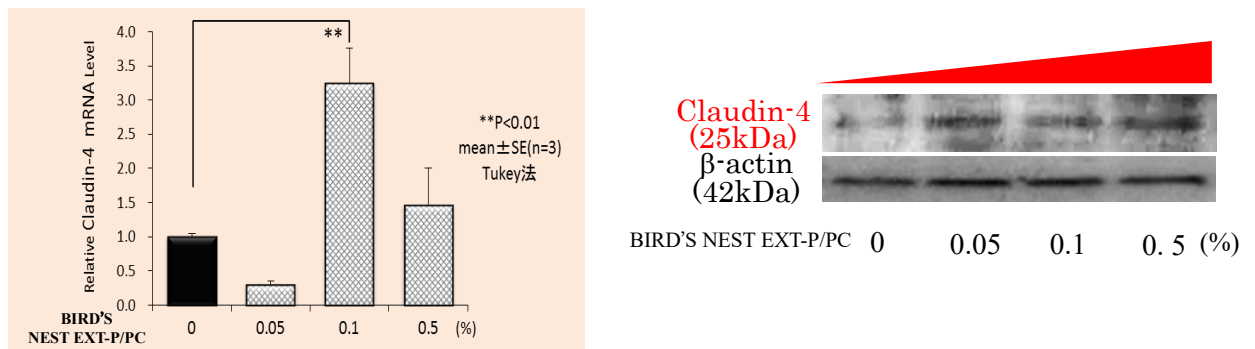


Figure 12. The effect of BIRD'S NEST EXTRACT on the genetic and protein expression of Claudin-1(A) and Claudin-4(B)

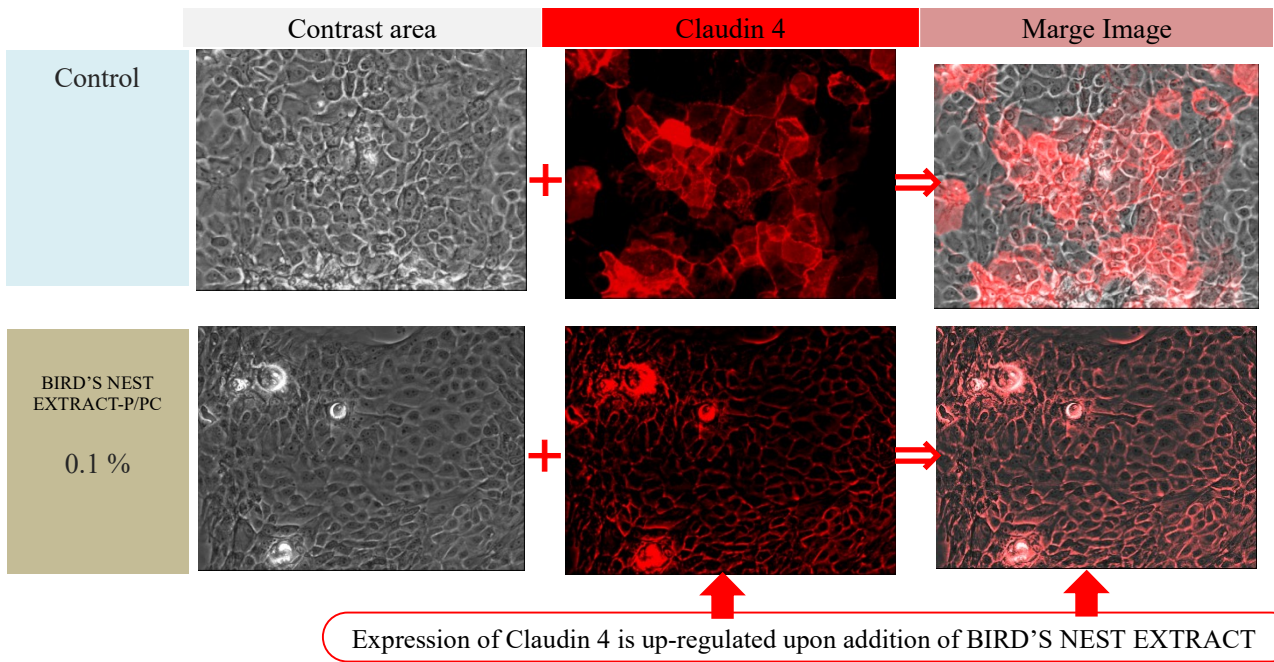


Figure 13. The effect of BIRD'S NEST EXTRACT on the protein expression of claudin-4 under fluorescence microscopy

3-4. Human Monitor Test – ORAL administration of BIRD’S NEST EXTRACT capsule

The effect of BIRD’S NEST EXTRACT on human was tested via ORAL route.

Test protocol:

Test subjects: 5 healthy FEMALES

Dosage: ORAL administration of capsule containing BIRD’S NEST EXTRACT-P 70mg (1 capsule per day)

Duration: 1 month

Analysis parameter:

- Trans epidermal water loss
- Skin dryness by CuDerm D-Squame disc.
- Skin elasticity
- Ultrasound imaging on dermal collagen density

Results showed tremendous improvement on skin moisture where transepidermal water loss is reduced by 30% (Figure 14). Analysis by CuDerm d-Squame disc showed that the white region which indicative of dryness is significantly reduced (Figure 15), it is suggestive that skin barrier function is significantly improved after 1 month ORAL intake of BIRD’S NEST EXTRACT-P. Besides, Figure 16 showed that skin elasticity improved in 3 out of 5 test subjects after 1 month ORAL intake of BIRD’S NEST EXTRACT-P while DermaLab Ultrasound Imaging System confirmed that dermal collagen score of test subjects increased by 7% (Figure 17).

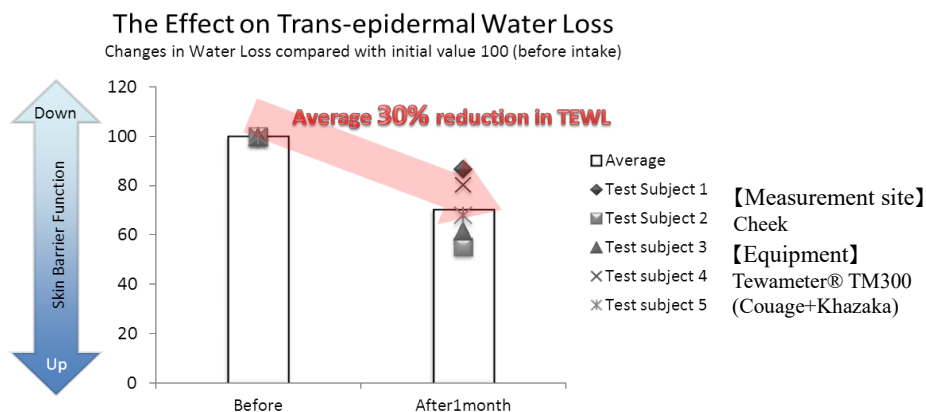


Figure 14. The effect of BIRD’S NEST EXTRACT-P 70mg/day (ORAL) on trans epidermal water loss (TEWL)

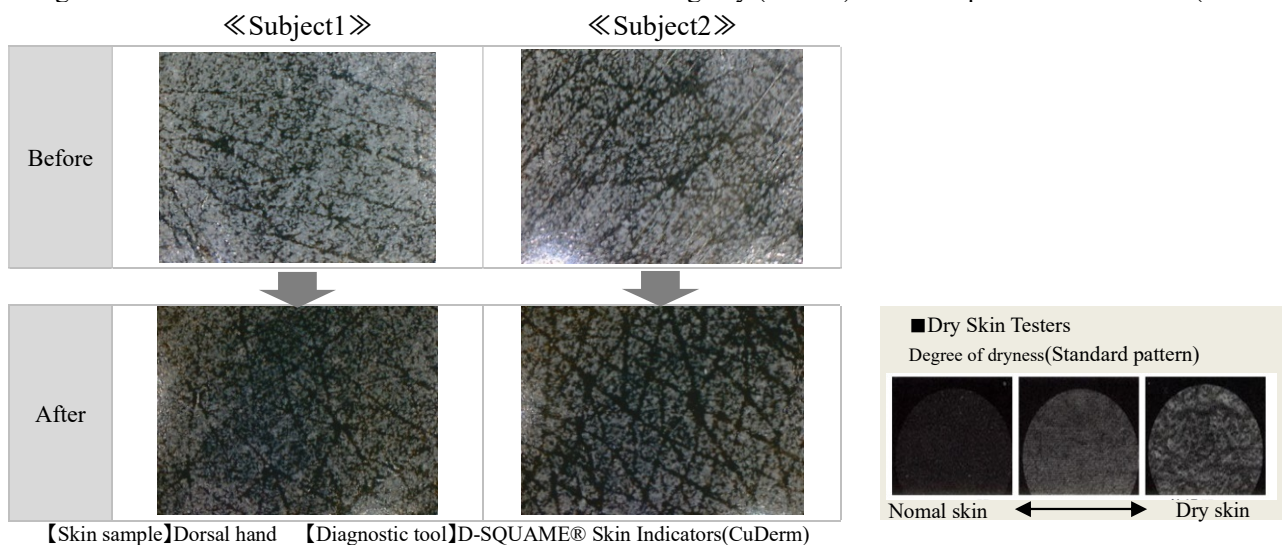


Figure 15. The effect of BIRD’S NEST EXTRACT-P 70mg/day (ORAL) on skin dryness

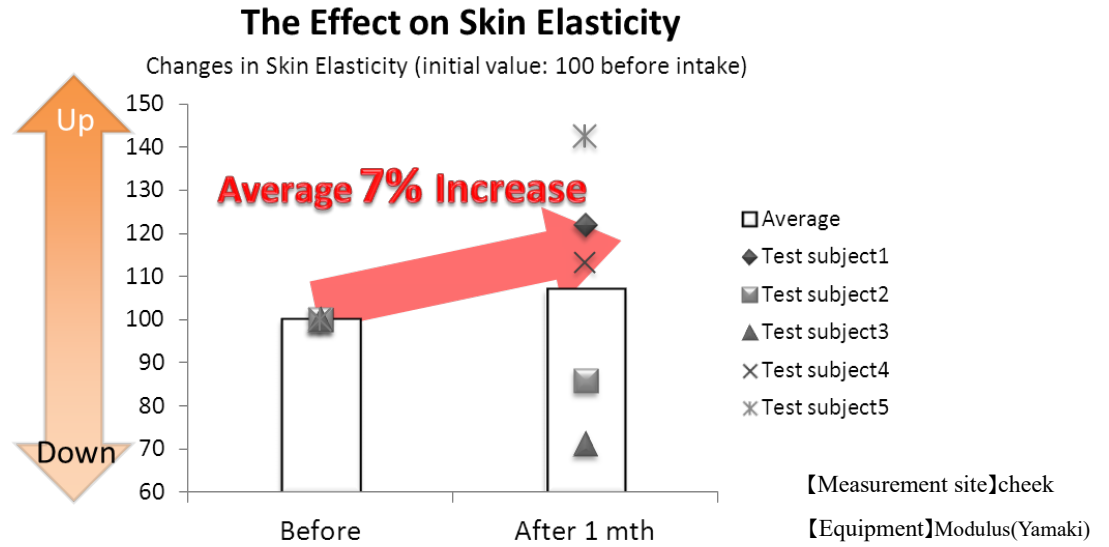


Figure 16. The effect of BIRD'S NEST EXTRACT-P 70mg/day (ORAL) on skin elasticity

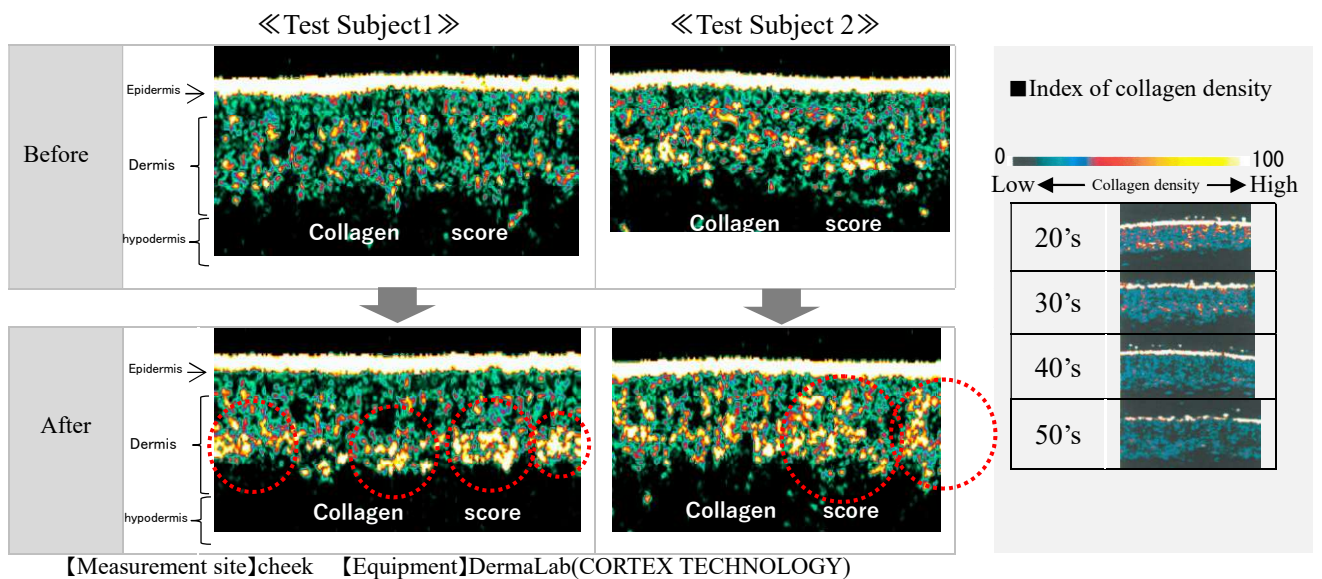


Figure 17. The effect of BIRD'S NEST EXTRACT-P 70mg/day (ORAL) on dermal collagen density

3-5. Human Monitor Test – TOPICAL application of BIRD'S NEST EXTRACT

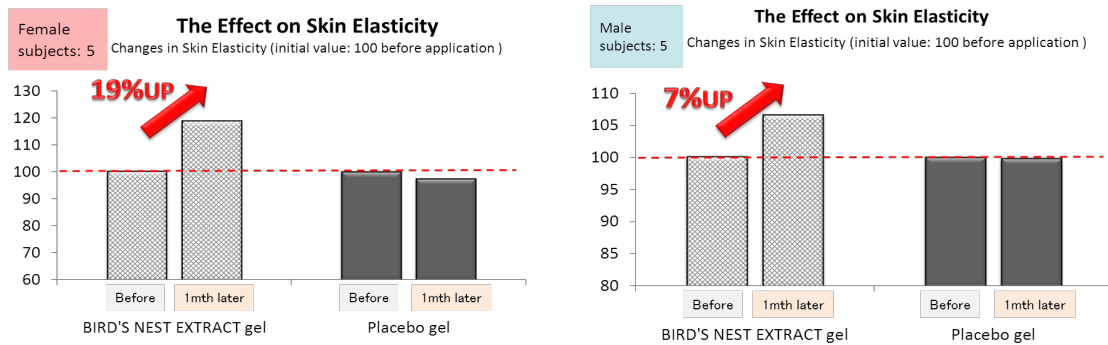
Further test was prompted to evaluate the effect of BIRD'S NEST EXTRACT on human skin via TOPICAL application.

The test was conducted on healthy subjects and the effect of TOPICAL application of BIRD'S NEST EXTRACT on the following parameters was evaluated:

- Skin elasticity
- Trans epidermal water loss
- Cracked heel

As illustrated in Table 1, there are 2 formulations, formulation 1 is a gel containing BIRD'S NEST EXTRACT-PC 0.5% while formulation 2 is placebo gel. The gel was TOPICALLY applied to the upper arms, and the heels respectively on a twice daily basis for 1 month. Results showed that skin elasticity improved 19% in 5 female test subjects and 7% in 5 male test subjects respectively. Meanwhile, there was no change observed in test subjects using placebo gel (Figure 18).

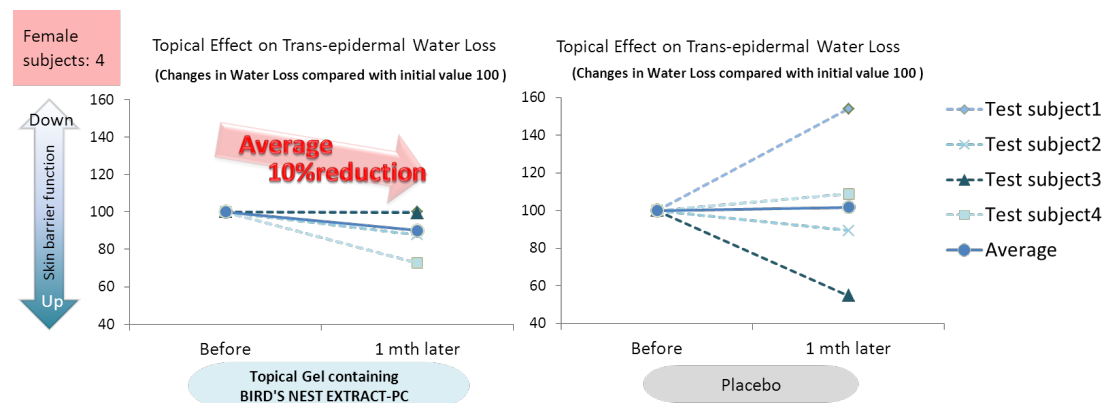
There was an average of 10% reduction (compared with placebo) in transepidermal water loss in 4 female test subjects after 1 month application of BIRD'S NEST EXTRACT containing gel (Figure 19). Furthermore, Figure 20 showed that significant improvement achieved in healing cracked heels with 1 month TOPICAL application of BIRD'S NEST EXTRACT containing gel.



【Application site】upper arm (Left) BIRD'S NEST EXTRACT gel, (Right) Placebo

【Equipment】Modulus(Yamaki)

Figure 18. The effect of BIRD'S NEST EXTRACT (TOPICAL) on changes of skin elasticity



【Application site】Heel (Left) BIRD'S NEST EXTRACT gel, (Right) Placebo

【Equipment】Tewameter® TM300 (Couage+Khazaka)

Figure 19. The effect of BIRD'S NEST EXTRACT (TOPICAL) on trans epidermal water loss

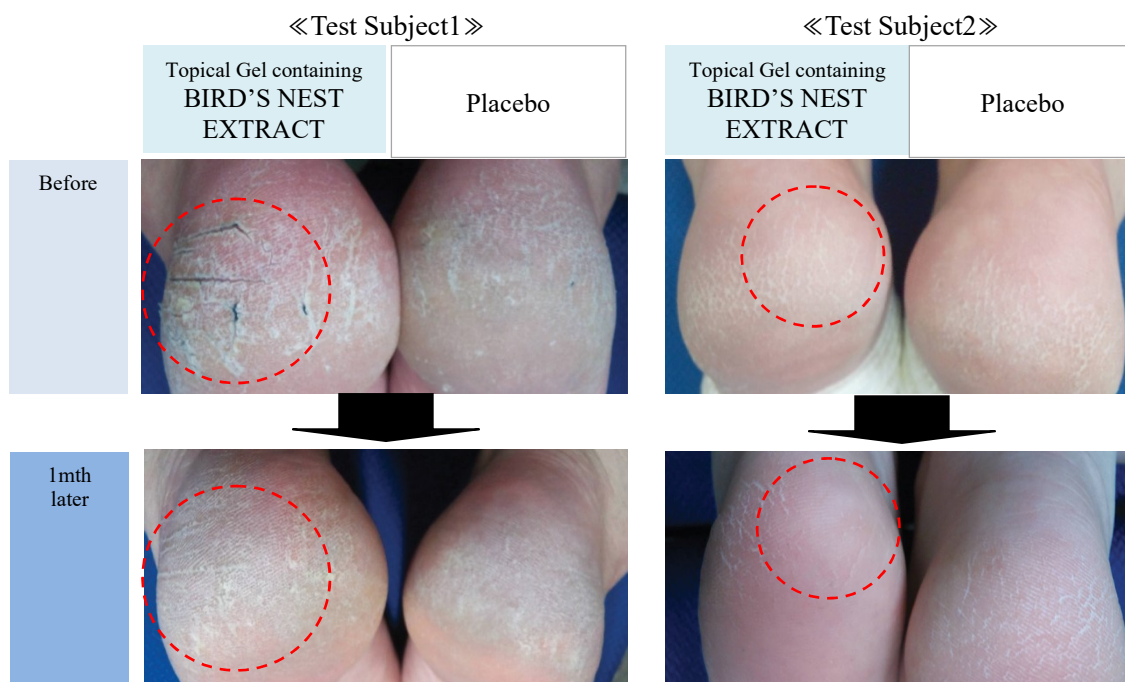


Figure 20. The effect of BIRD'S NEST EXTRACT (TOPICAL) on cracked heels

Table 1: TOPICAL GEL formulations

Formulation 1	INCI Name	Dose (%)
BIRD'S NEST EXTRACT containing gel	WATER	93.55
	PROPANEDIOL	5.00
	(BIRD'S NEST EXTRACT-PC) DEXTRIN	0.50
	HYDROLYZED SWIFTLET NEST EXTRACT	
	CARBOMER	0.35
	PEG-60 HYDROGENATED CASTOR OIL	0.30
	METHYLPARABEN	0.20
	SODIUM HYDROXIDE	0.10
Formulation 2	INCI Name	Dose (%)
Placebo gel	WATER	94.05
	PROPANEDIOL	5.00
	CARBOMER	0.35
	PEG-60 HYDROGENATED CASTOR OIL	0.30
	METHYLPARABEN	0.20
	SODIUM HYDROXIDE	0.10

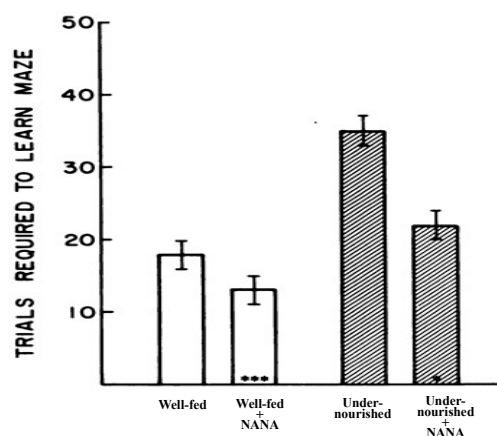
4. Other Functional Benefits of Bird's Nest and active component containing in Bird's Nest

4-1. Prevention of Influenza

The mucoid of Bird's Nest (glycoprotein) inhibits viral enzyme neuraminidase and therefore prevent influenza-induced haemagglutination ^{1),6)}. Zanamivir (Relenza), a widely used anti-influenza drug is an analogue of sialic acid (an important component in Bird's Nest) ¹⁾.

4-2. Improvement on learning ability

In a study conducted by Morgan BL *et al.*, discussed on the possibility of brain concentration of N-acetylneuraminic acid (NANA) affects behaviour. In his study, experimental rats were given sialic acid [N-acetylneuraminic acid (NANA)] 20mg/kg/day via oral route while placebo group were given glucose 20mg/kg/day, and were tested in Y-maze. Findings showed that rats treated with NANA demonstrated an improved learning ability compared with control. When similar test was performed against malnutrition rats, similar findings revealed that learning ability is better and fasted in group treated with sialic acid ⁴⁾.



4-3. Anti-inflammatory

B. Vimala *et al.*, reported that hydrolysed Bird's Nest significantly suppressed the secretion of TNF- α and nitric oxide production while no cytotoxicity in lipopolysaccharide-stimulated RAW 264.7 macrophages ¹⁶⁾.

4-4. Enhancement on hair growth

In another Japanese study, the effect of sialic acid on male baldness was evaluated. 6 test subjects with male baldness pattern were treated with sialic acid (N-acetylneuraminic acid) 0.01% TOPICALLY once daily at night for 5 months. It was reported that improvement was observed in 5 test subjects (83.3%), it is believed that the effect on hair growth was stimulated by sialic acid which in-turn stimulate the production of IGF-1, an important factor for cell growth and survival ¹⁷⁾.

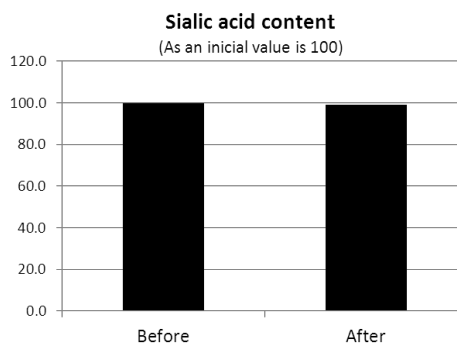
¹⁶ B. Vimala. *et al.*, Effects of edible bird's nest on tumour necrosis factor-alpha secretion, nitric oxide production and cell viability of lipopolysaccharide-stimulated RAW 264.7 macrophages, *Food Agr Immunol.* Vol.23, 4(2012)

¹⁷ Kenji Okajima, Hair-growing effect of a saliva component sialic acid: the molecular mechanism and possible therapeutic application for alopecia, *FRAGRANCE JOURNAL* 37(10), 43-47, 2009-10-00

5. Stability

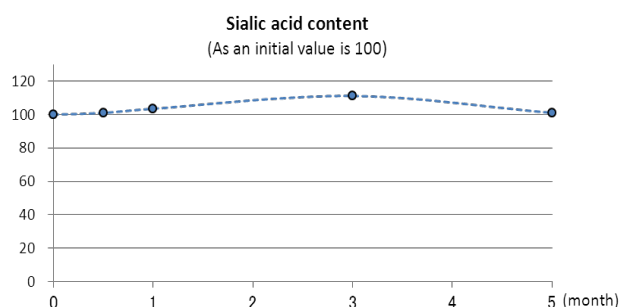
5-1. Heat stability

The heat stability of BIRD'S NEST EXTRACT-P was studied. As illustrated in side, content of sialic acid remained stable after continue heating at 120°C for 1 hour. It is highly stable at normal food processing temperature.



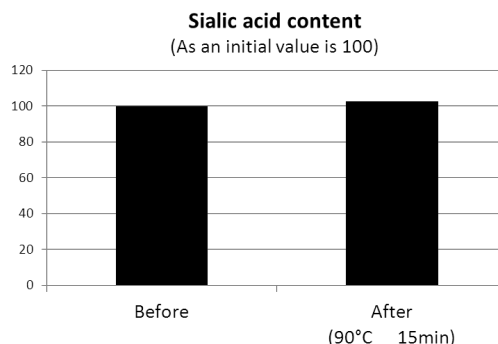
5-2. Long-term stability

BIRD'S NEST EXTRACT-P was stored at 40°C for 5 months. As illustrated on the right, content of sialic acid remained stable in the term.



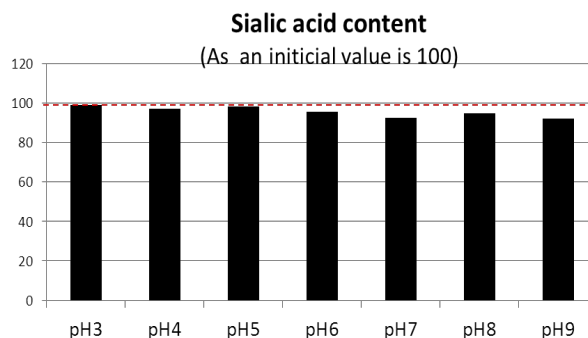
5-3. Heat stability in aqueous solution

Aqueous solution of BIRD'S NEST EXTRACT-P(70 mg/30mL) was prepared and heated at 90°C for 15 minutes. As illustrated on the right, content of sialic acid remained stable after heating, hence it was considered stable at normal beverage processing temperature.



5-4. pH stability

pH stability of BIRD'S NEST EXTRACT was examined by dissolving BIRD'S NEST EXTRACT-P(70 mg/30mL) in distilled water with different pH, and stored at 4°C in darkness for one week. As illustrated on the right, bioactive component sialic acid was highly stable at acidic condition but began to disintegrate at alkaline condition. The solution of pH 3 was a little turbidity but the pH between 4-9 wasn't.



6. Nutritional Profile

Description	BIRD'S NEST EXTRACT-P/100g	Analysis Method
Energy	374 kcal/100 g	Refer note 1
Water	4.6 g/100 g	Heat drying at atmospheric pressure
Protein	8.2 g/100 g	Combustion method
Fat	0.1 g/100 g	Acid degradation
Sugar	84.2 g/100 g	Refer note 2
Food Fiber	2.1 g/100 g	Prosby's method
Ash	0.9 g/100 g	Direct incineration
Sodium	221 mg/100 g	Atomic absorption spectrophotometry

The nutritional information of BIRD'S NEST EXTRACT was analyzed according to the standard in nutrition labeling (April 26, 1999; No 13 Eishin)

Note 1: Energy conversion factor: Protein 4, fat 9, sugar 4; dietary fiber 2

Note 2: Calculation: 100-(water + protein + fat + ash)

Test trustee: SUNATECH / Date of analysis: March 27, 2013 / Test No.: 130313166-001-01

7. Safety Profile

7-1. Residual Agricultural Chemicals

BIRD'S NEST EXTRACT (for excipient, additive-free product) was analyzed for 534 items of residual agricultural chemicals stipulated under the Food Sanitation Act (by Ministry of Health, Labour and Welfare). Results indicated that BIRD'S NEST EXTRACT conforms to the stipulated standard.

Test Trustee: Masis Co., Ltd.; Center for Food Safety Evaluation and Analysis

Date: March 29, 2013

Test No: 61488

7-2. Acute Toxicity (LD₅₀)

Acute Toxicity on BIRD'S NEST EXTRACT was conducted according to the Guidelines for Single-Dose Toxicity Tests for Pharmaceutical Products where BIRD'S NEST EXTRACT (without binder) 2000mg/kg was orally given to mice (ICR, male and female, 5-week old, weight approximately 30g) for 14 days. During the test period, the mice were housed at 23 ± 2°C at 50 ± 10% humidity with free access to feed and drinking water. No abnormalities and fatal event observed at 2000mg/kg. No abnormalities of organs observed under macroscopic examination upon autopsy. Thus, LD₅₀ of BIRD'S NEST EXTRACT is deduced to be >2000mg/kg.

7-3. Mutagenicity (AMES test)

Ames test was conducted to evaluate the mutagenicity of BIRD'S NEST EXTRACT (without binder) using Salmonella typhimurium TA98 and TA100. No increased in the number of colonies observed with or without metabolic activation, BIRD'S NEST EXTRACT is non-mutagenic.

7-4. Patch Test

Patch test using BIRD'S NEST EXTRACT -PC was conducted among 20 healthy Japanese men

and women (8 men, 12 women) aged between 20 to 60. A patch test was applied to each subject in their back (para vertebral part) for 24 hours then skin irritation was observed. Skin irritation index of BIRD'S NEST EXTRACT –PC was considered as very good.

8. Recommended dose

The recommended daily dose of BIRD'S NEST EXTRACT-P: 70mg/day

The Recommended dose for TOPICAL application :

BIRD'S NEST EXTRACT-PC: 0.1 – 0.5%

BIRD'S NEST EXTRACT-LC: 4 – 20%

9. Applications

Uses	Claims	Examples
Foods	Wound healing, skin beautifying, strengthening of epidermal tight junctions, prevention of influenza, promote skin elasticity, anti-aging, improve learning ability, prevent thinning of hair	Beverages (soft drinks etc), hard and soft capsules, tablets, candies, chewing gum, cookies, chocolate wafers, jelly, <i>etc.</i>
Cosmetics	Wound healing, skin beautifying, strengthening of epidermal tight junctions, improve skin elasticity, anti-aging, prevent thinning of hair	Sunscreen, toner, lotion, body gel, shampoo, conditioner and bath salts, <i>etc.</i>

10. Packaging

BIRD'S NEST EXTRACT-P (water soluble powder, food grade)

BIRD'S NEST EXTRACT-PC (water soluble powder, cosmetic grade)

1kg, 5kg Interior Packaging: Aluminium bag
Exterior Packaging: Cardboard box

BIRD'S NEST EXTRACT-LC (liquid, cosmetics grade)

1kg Interior Packaging: Bottle
Exterior Packaging: Cardboard
5kg Interior Packaging: Cubic polyethylene container
Exterior Packaging: Cardboard

11. Storage

Store in cool, dry and dark place. Avoid places with high humidity and direct heat

12. Expression

{Food}

BIRD'S NEST EXTRACT-P

Expression: BIRD'S NEST EXTRACT and starch degradation product/ DEXTRIN

{Cosmetics}

BIRD'S NEST EXTRACT-PC

INCI: DEXTRIN (and) HYDROLYZED SWIFTLET NEST EXTRACT

BIRD'S NEST EXTRACT-LC

INCI: WATER (and) PROPANEDIOL (and) HYDROLYZED SWIFTLET NEST EXTRACT

PRODUCT STANDARD

BIRD'S NEST EXTRACT-P (FOOD)

This product is enzymatically extracted from the nest of swiftlet (*Collocaliini* tribe) under high pressure condition. It guarantees minimum 1.5% Sialic acid.

<u>Appearance</u>	White to pale yellowish powder with slightly unique scent.									
<u>Sialic Acid</u>	Min. 1.5 %	(Ehrlich method)								
<u>Loss on Drying</u>	Max. 10.0 %	(Analysis for Hygienic Chemists, 1 g, 105°C, 2 hr)								
<u>Purity Test</u>										
<u>(1) Heavy Metals (as Pb)</u>	Max. 20 ppm	(Sodium Sulfide Colorimetric Method)								
<u>(2) Arsenic (as As₂O₃)</u>	Max. 1 ppm	(Standard Methods of Analysis in Food Safety Regulation, The Third Method, Apparatus B)								
<u>Standard Plate Counts</u>	Max. 1×10 ³ cfu/g	(Analysis for Hygienic Chemists)								
<u>Moulds and Yeasts</u>	Max. 1×10 ³ cfu/g	(Analysis for Hygienic Chemists)								
<u>Coliforms</u>	Negative	(Analysis for Hygienic Chemists)								
<u>Composition</u>	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Ingredient</th> <th style="text-align: right; border-bottom: 1px solid black;">Content</th> </tr> </thead> <tbody> <tr> <td>Maltodextrin</td> <td style="text-align: right;">80 %</td> </tr> <tr> <td>Hydrolyzed Swiftlet Nest Extract</td> <td style="text-align: right;">20 %</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">100 %</td> </tr> </tbody> </table>		Ingredient	Content	Maltodextrin	80 %	Hydrolyzed Swiftlet Nest Extract	20 %	Total	100 %
Ingredient	Content									
Maltodextrin	80 %									
Hydrolyzed Swiftlet Nest Extract	20 %									
Total	100 %									
<u>Expiry date</u>	2 years from date of manufacturing.									
<u>Storage</u>	Store it in a cool, dry, ventilated area with desiccant. Keep it away from high temperature and sunlight, and store it in a closed container.									



PRODUCT STANDARD

BIRD'S NEST EXTRACT-PC (COSMETICS)

This product is enzymatically extracted from the nest of swiftlet (*Collocalini* tribe) under high pressure condition. It guarantees minimum 1.5% Sialic acid.

<u>Appearance</u>	White to pale yellowish powder with slightly unique scent.								
<u>Sialic Acid</u>	Min. 1.5 % (Ehrlich method)								
<u>Loss on Drying</u>	Max. 10.0 % (Analysis for Hygienic Chemists, 1 g, 105°C, 2 hr)								
<u>Purity Test</u>									
<u>(1) Heavy Metals (as Pb)</u>	Max. 20 ppm (The Second Method of The Japanese Standards of Quasi-Drug Ingredients)								
<u>(2) Arsenic (as As₂O₃)</u>	Max. 1 ppm (The Third Method of The Japanese Standards of Quasi-Drug Ingredients)								
<u>Standard Plate Counts</u>	Max. 1×10 ² cfu/g (Analysis for Hygienic Chemists)								
<u>Moulds and Yeasts</u>	Max. 1×10 ² cfu/g (Analysis for Hygienic Chemists)								
<u>Coliforms</u>	Negative (Analysis for Hygienic Chemists)								
<u>Composition</u>									
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Dextrin	80 %								
Hydrolyzed Swiftlet Nest Extract	20 %								
Total	100 %								
<u>Expiry date</u>	2 years from date of manufacturing.								
<u>Storage</u>	Store it in a cool, dry, ventilated area with desiccant. Keep it away from high temperature and sunlight, and store it in a closed container.								

PRODUCT STANDARD

BIRD'S NEST EXTRACT-LC (COSMETICS)

This product is enzymatically extracted from the nest of Collocalini and dissolved in aqueous propanediol.

Appearance

Transparent to pale yellowish liquid with slightly unique scent.

Certification Test

(Sialic acid)

Add 400 µl 5% *p*-dimethylaminobenzaldehyde hydrochloride into 2.5 mL of this product, followed by heated for 30 minutes at 100 °C. The solution will be a red-purple color.

Purity Test

(1) Heavy Metals (as Pb)

Max. 10 ppm

(The Second Method of The Japanese Standards of Quasi-Drug Ingredients)

(2) Arsenic (as As₂O₃)

Max. 1 ppm

(The Third Method of The Japanese Standards of Quasi-Drug Ingredients)

Standard Plate Counts

Max. 1×10² cfu/g

(Analysis for Hygienic Chemists)

Moulds and Yeasts

Max. 1×10² cfu/g

(Analysis for Hygienic Chemists)

Coliforms

Negative

(Analysis for Hygienic Chemists)

Composition

<u>Ingredient</u>	<u>Content</u>
Water	69.5 %
Propanediol	30.0 %
<u>Hydrolyzed Swiftlet Nest Extract</u>	<u>0.5 %</u>
Total	100.0 %

Expiry date

1 year from date of manufacturing.

Storage

Store it in a cool, dry, ventilated area with desiccant.

Keep it away from high temperature and sunlight, and store it in a closed container.

ORYZA OIL & FAT CHEMICAL CO., LTD. striving for the development of the new functional food materials to promote health and general well-being.

From product planning to OEM - For any additional information or assistance, please contact:

Headquarters:

ORYZA OIL & FAT CHEMICAL CO., LTD.

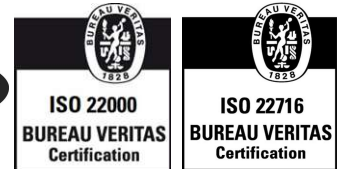
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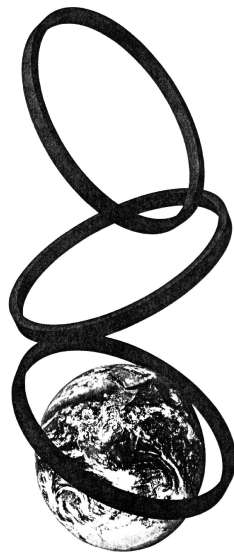
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