Oryza
ORYZA OIL & FAT CHEMICAL CO., LTD.

PERILLA SEED EXTRACT

Anti-allergy Ingredient

■ PERILLA SEED EXTRACT-P
(Powder, Food Grade)
■ PERILLA SEED EXTRACT-WSP
(Powder, Food Grade)
■ PERILLA SEED EXTRACT-L
(Liquid, Food Grade)
■ PERILLA SEED EXTRACT-PC
(Powder, Cosmetic Grade)
■ PERILLA SEED EXTRACT-WSPC
(Powder, Cosmetic Grade)
■ PERILLA SEED EXTRACT-LC
(Liquid, Cosmetic Grade)

ORYZA OIL & FAT CHEMICAL CO., LTD.
Ver. 9.2 YF

PERILLA SEED EXTRACT
Anti-allergy Ingredient

1. Introduction

The patients with allergies are increasing every year, and the diet is said to be one of the most important factor of this disease. Daily intake of Ω-6 fatty acids, commonly found in fish or plant oil such as safflower, are accumulated as arachidonic acid which is converted to allergic mediators.

PERILLA SEED EXTRACT inhibits the production of allergic mediators, leukotrienes (LTs). The mediators are metabolites of arachidonic acid through 5-lipoxygenase (5-LO) pathway. PERILLA SEED EXTRACT selectively inhibits 5-LO activity (*in vitro*).

PERILLA SEED EXTRACT also inhibits type IV allergy as well as TPA-induced inflammation (*in vivo*).

Moreover, the serum IgE levels were suppressed by administration of PERILLA SEED EXTRACT, and allergic rhinitis, hay fever and urticaria were significantly improved on human.


Perilla


Perilla seeds

2. What is Perilla Seed ?

Perilla frutescens and a lot of herbs like lavandula belong to *Fam. LABIATAE*. Perilla seed has been cultivated in Japan, China, Korea and Southeast Asia and used as spices and also main supply for α-linolenate rich oil.

3. The Functional Compounds of PERILLA SEED EXTRACT

The functional compounds of PERILLA SEED EXTRACT are flavonoid aglycons, such as luteolin, apigenin, chrysoeriol, and rosemarinic acid. Though flavonoids are normally exist as glycosides in the plant, perilla seeds contain aglycons. It is known that antioxidative activity and lipoxygenase inhibitory activity of flavonoid aglycons are stronger than that of corresponding glycosides.

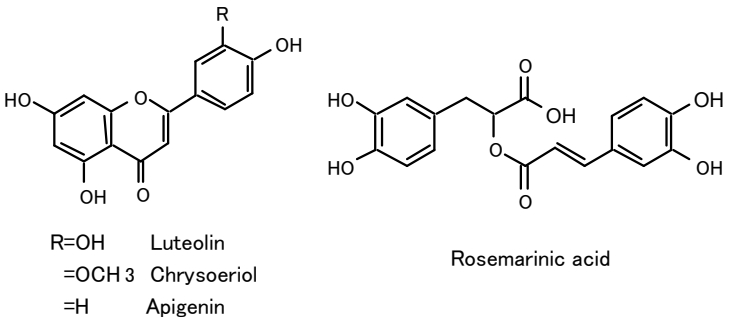


Fig.1 Polyphenols Isolated from Perilla Seed

4. Allergy and Metabolites of Arachidonic Acid

Arachidonic acid is released from cell membrane by a stimulation and converted to prostaglandins (PGs), thromboxanes (TXs), leukotrienes (LTs). LTs, the product of 5-lipoxygenase (5-LO) path way, induce allergic reactions so that the specific inhibitors of 5-LO have the potentialities to regulate or prevent allergy and inflammation.

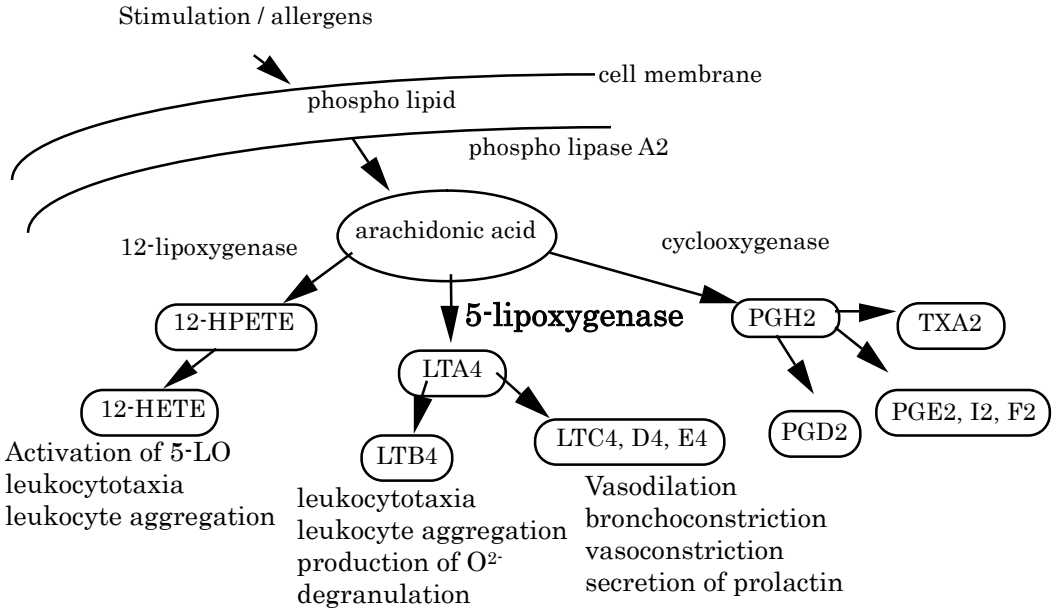


Fig.2 Arachidonic Acid Cascade

5. Effects of PERILLA SEED EXTRACT
5-1. Lipoxygenase Inhibitory Activity (*in vitro*)

PERILLA SEED EXTRACT control allergy and inflammatory responses due to its lipoxygenase inhibitory activity. The anti-lipoxygenase activity of PERILLA SEED EXTRACT is more than 50 times stronger than Ten-cha (Chinese tea) and more than 100 times stronger than perilla leaves. Ten-cha and perilla leaves contain mainly glycosides which anti-lipoxygenase activity is weaker than that of aglycons.

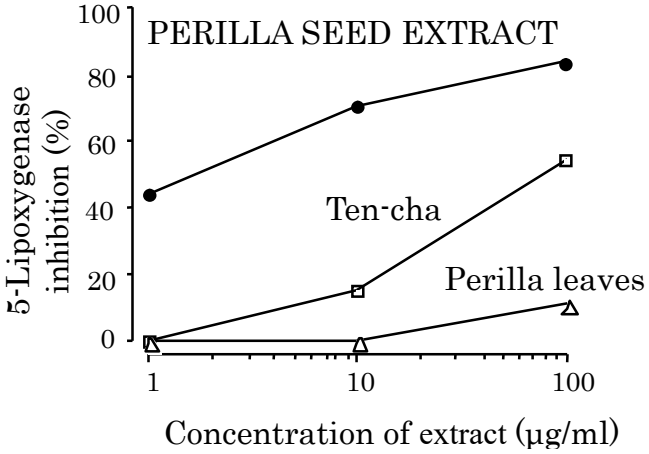


Fig.3 5-Lipoxygenase Inhibitory Activity of Plant Extract

Table 1 shows the IC_{50} values of phenolic compounds isolated from perilla seed as well as other chemicals reported having anti-lipoxygenase activity. IC_{50} of luteolin was 100 times stronger than that of caffeic acide isolated from olive.

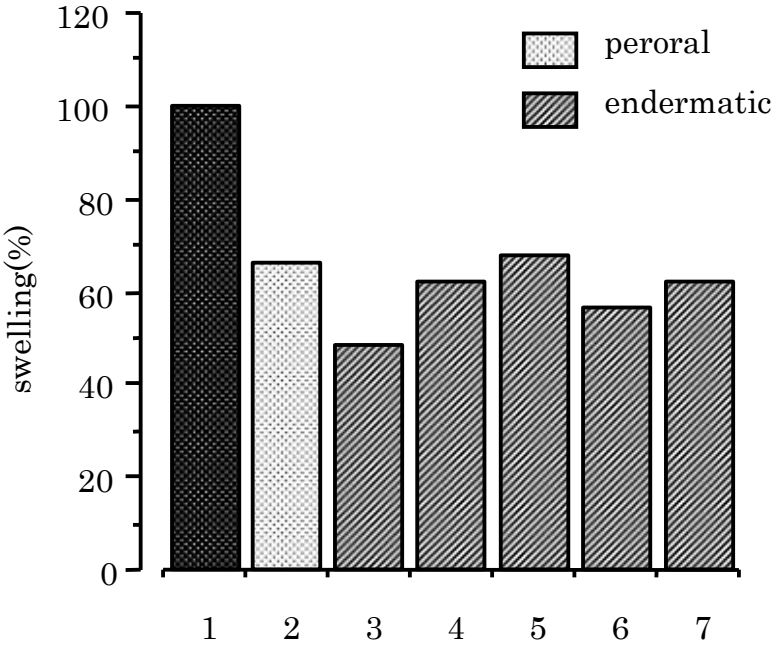
Table 1. IC_{50} Values for Inhibition of Lipoxygenase Activities by Phenolic Compounds

Compound	IC_{50}(μ M)
Luteolin*	0.1
Chrysoeriol*	38.9
Rosmarinic acid*	6.4
Quercetin	0.2
Caffeic acid	72.0

*Main compounds of PERILLA SEED EXTRACT

5-2. Anti-allergic Activity (*in vivo*)

Anti-allergic action of PERILLA SEED EXTRACT was examined by means of ear edematization test in mice. PERILLA SEED EXTRACT proved to oxazolone-induced type IV allergy. In endermatic test, luteolin have much strong inhibitory activity than other samples which are known for antihistamines or antiphlogistics.

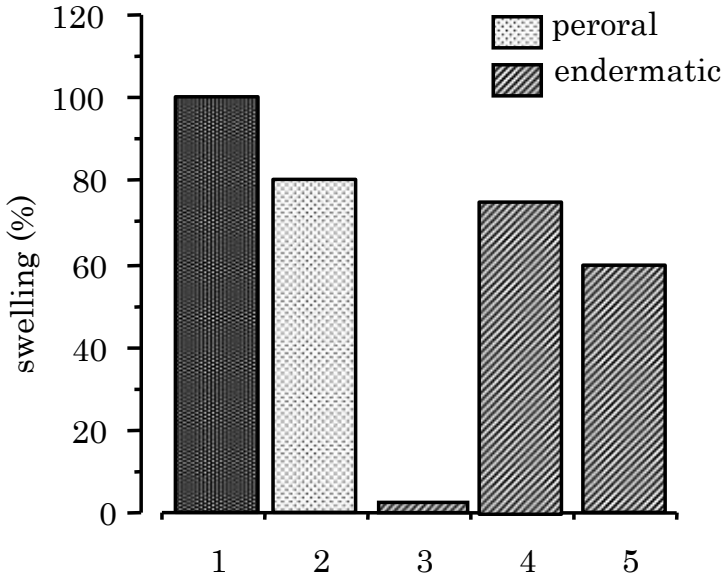


1. Control (100%)
2. 1% PERILLA SEED EXTRACT (2weeks)
3. Luteolin (0.3mg/ear)
4. NDGA (1.0mg/ear)
5. Ketoprefen (1.0mg/ear)
6. Phenidone (1.0mg/ear)
7. Mebrophehydramine (1.0mg/ear)

Fig.4 The Effect of PERILLA SEED EXTRACT on Oxazolone-induced Inflammation in Mice

5-3. Anti-inflammatory Activity *(in vivo)*

Anti-inflammatory action of PERILLA SEED EXTRACT was examined by edematization test in ears of mice. PERILLA SEED EXTRACT proved to inhibit on TPA-induced inflammation.



1. Control(100%)
2. 1%PERILLA SEED EXTRACT (1month)
3. Luteolin(0.3mg/ear)
4. PERILLA SEED EXTRACT (0.5mg/ear)
5. NDGA(0.5mg/ear)

Fig.5 The Effect of PERILLA SEED EXTRACT on TPA-induced Inflammation in Mice

5-4. Inhibitory Effect on Histamine Release (*in vitro*)

PERILLA SEED EXTRACT have inhibitory efficacy on histamine release. Studies on histamine release, PERILLA SEED EXTRACT have been found to inhibit the release of histamine from mast cell in a dose-dependent manner, thus PERILLA SEED EXTRACT was considered to be effective for improving symptoms of hay fever.

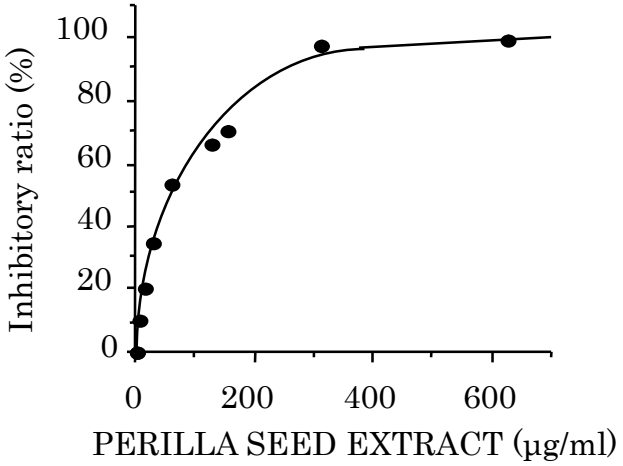


Fig.6 Inhibitory Activity of PERILLA SEED EXTRACT on Histamine Release

PERILLA SEED EXTRACT is mixture of phenolic compounds and showed synergistic inhibitory effect which was stronger than that of sodium cromoglycate, a mast cell stabilizer and other flavonoids such as catechin, quercetin and caffeic acid.

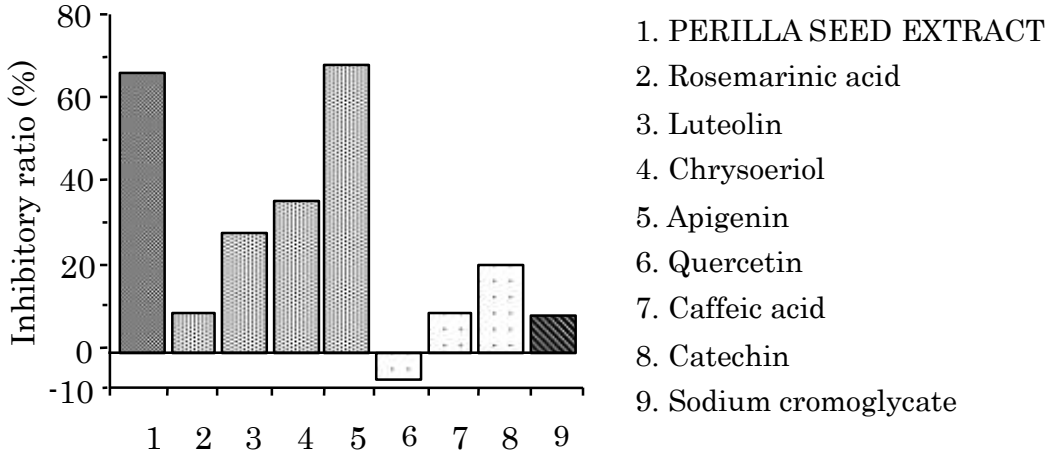


Fig.7 Inhibitory Activity of PERILLA SEED EXTRACT and Compounds 2-9 on Histamine Release (125μg /ml)

6. Effect on Serum IgE Level

The effect of PERILLA SEED EXTRACT on human serum IgE level was conducted. PERILLA SEED EXTRACT demonstrated selective inhibitory effect on serum IgE production as illustrated in graphs A and B below. PERILLA SEED EXTRACT has significantly reduced serum IgE level 150 mg/day, but increased again after discontinuation of PERILLA SEED EXTRACT SEED EXTRACT.

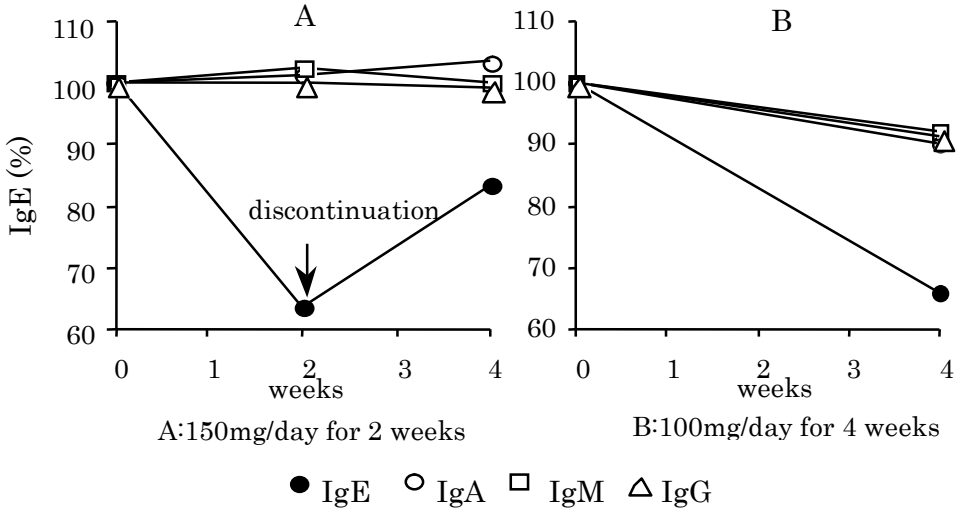


Fig.8 Serum IgE Level Before and After Administration of PERILLA SEED EXTRACT

7. Effect on Patient with Allergy

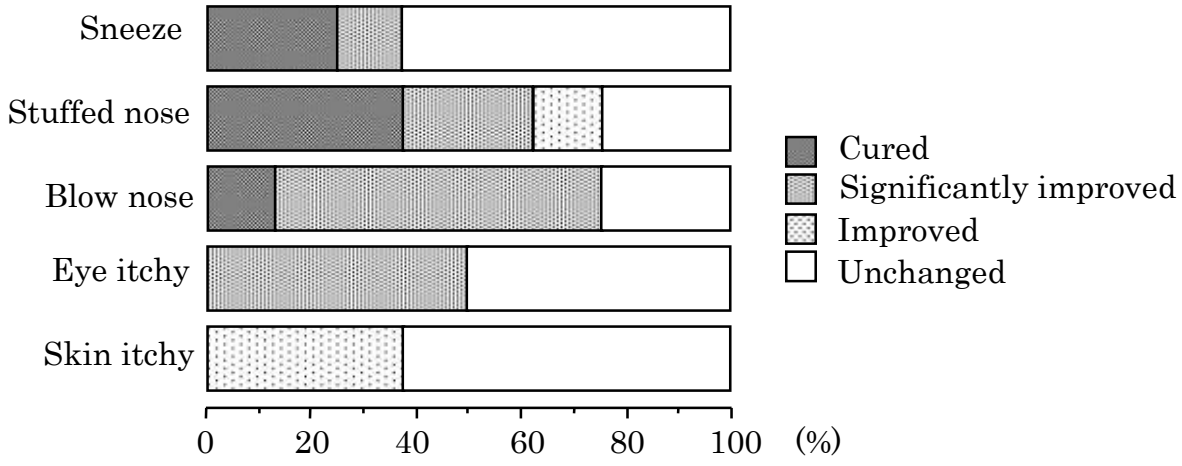


Fig.9 The Effect of PERILLA SEED EXTRACT on Patient with Allergy Before and After Administration of PERILLA SEED EXTRACT for Two Weeks (100mg-150mg/day)

8. Effect on Deodorization

PERILLA SEED EXTRACT has deodorizing effect on acetaldehyde, ammonia and methylmercaptan, which are commonly found in tobacco, alcohol, sweat and bad breath.

	Ingridient
acetaldehyde	The smell of Tobacco and Alcohol
ammonia	The smell of Tobacco, Alcohol and Sweat
methylmercaptan	Bad breath

PERILLA SEED EXTRACT has demonstrated similar deodorizing effect to Oreganon powder against acetaldehyde, ammonia and methylmercaptan.

Thus, PERILLA SEED EXTRACT is an effective deodorizing against tobocco, alcohol, sweat and bad breath.

(Protocol)

After deodorization sample is dissolved to distilled water, smelly substance is added. The concentration of acetaldehyde, ammonia and methylmercaptanin headspace is measured with Gas Detector Tubes.

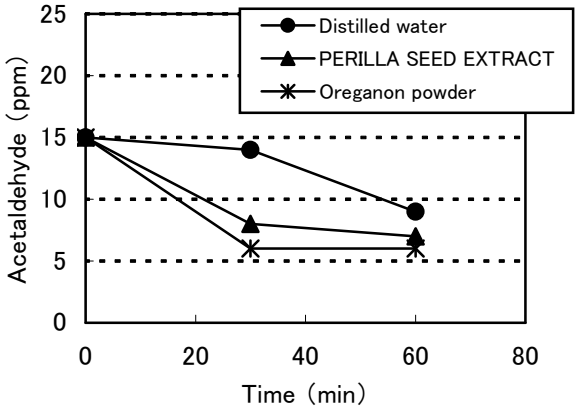


Fig.10 Effective against acetaldehyde

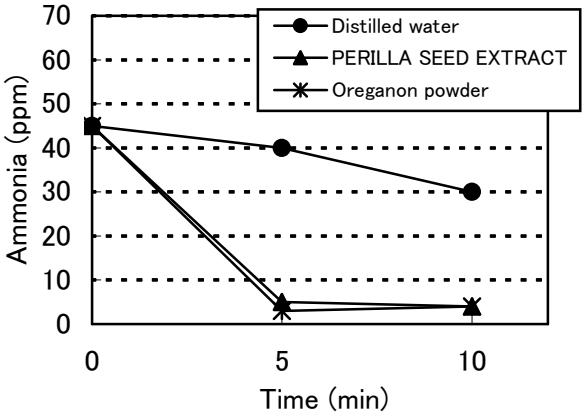


Fig11. Effective against ammonia

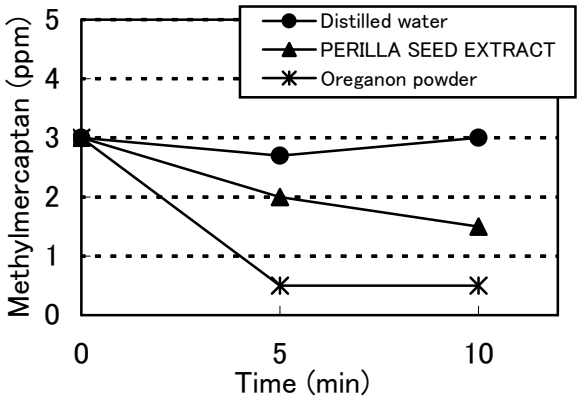


Fig.12 Effective against methylmercaptan

In addition, we evaluated the effect of PERILLA SEED EXTRACT on ageing smell (aldehyde smell) in human. We gave PERILLA SEED EXTRACT-WSP (100 mg/day) to healthy male volunteers (n=6) and determined aldehyde in under wear. As a result, PERILLA SEED EXTRACT-WSP suppressed aldehyde smell from 1 to 3 weeks compared to the control group (Fig. 13).

As a result of questionnaire, improvement of subjective symptoms was observed in 3 volunteers. Thus, PERILLA SEED EXTRACT-WSP was found to reduce aging smell.

[Method]

PERILLA SEED EXTRACT-WSP (100 mg) was given for 3 weeks. After 1- and 3-week ingestion. Amount of aldehyde in undershirt (wearing a day) was determined by a gas analyzer.

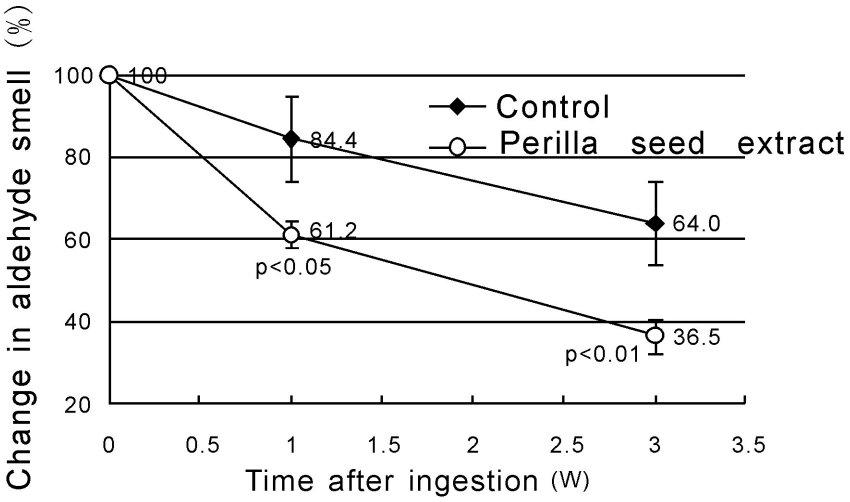


Fig.12 Change in aldehyde smell (mean±S.E., n=6)

9. Comparison of Perilla Leaf and Seed

(1) Contents of polyphenol and flavonids

Contents			Defatted seed	Leaf
Total polyphenol			0.59%	0.091%
Constituents	Rosmarinic acid		0.13%	0.022%
	Flavonoids	Luteorin (aglycon)	0.058%	Not detected
		Apigeninn (aglycon)	0.011%	Not detected
		Crysoeriol (aglycon)	0.015%	Not detected

① Total polyphenol is 6 times higher than leaves.
② Active constituents in seeds are rosmarinic acid and flavonoids. The leaf contains rosmarinic acid only one sixth of leaves.
③ The seeds contain large amount of flavonoids as aglycons which are easily absorbed from intestine. On the other hand, flavonoids in the leaves are glycoside forms and the contents are little.

(2) Anti-allergic mechanism

Seeds : Inhibition of 5- and 12-lipoxygenase
Inhibition of mast cell degranulation
Leaves : Inhibition of TNF-α production

(3) Perillaldehyde, perilla ketone and perilla alcohol

Seeds: As a result of GC analysis, the seeds were found to contain no perillaldehyde, perilla ketone and perilla alcohol (Fig. 13). In addition, the seed has no perilla flavor.
Leaves: Perilla flavor is based on perillaldehyde and peril ketone. These compounds cause contact dermatitis.

Thus, perilla seeds are more effective and safety than the leaves. Moreover, the seeds contain more than 40% lipids and the more than 60% of the lipid is α-linolenic acid. α-linolenic acid is easily oxidized, however the lipid is quite stable in the seeds. Polyphenols in the seeds are thought to protect lipids from oxidization.

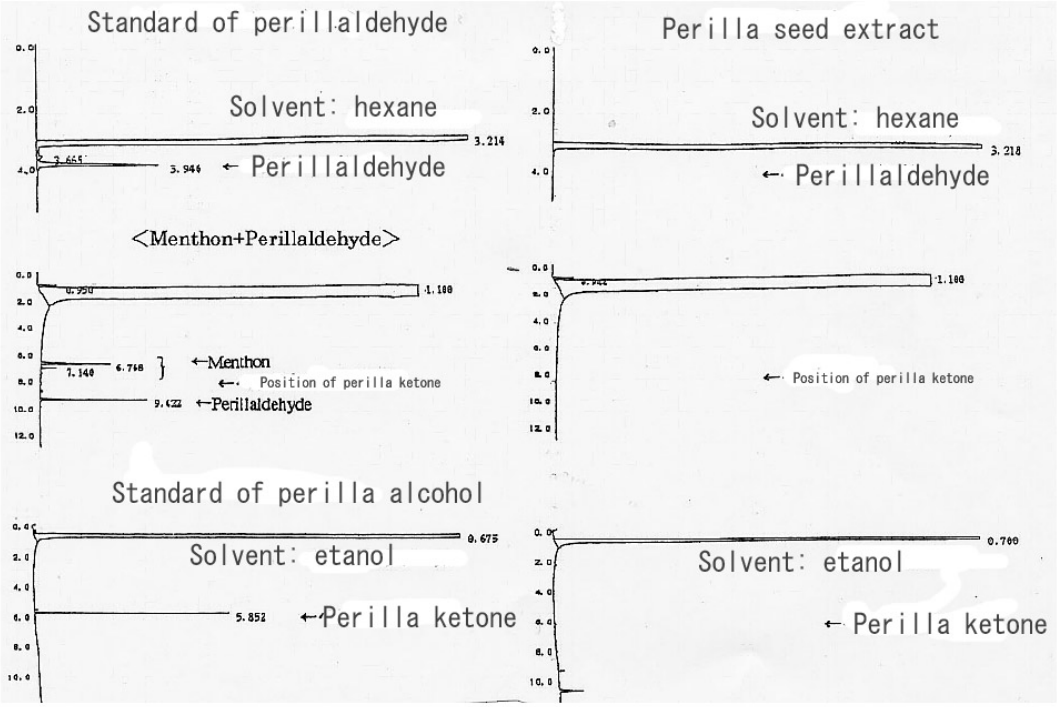
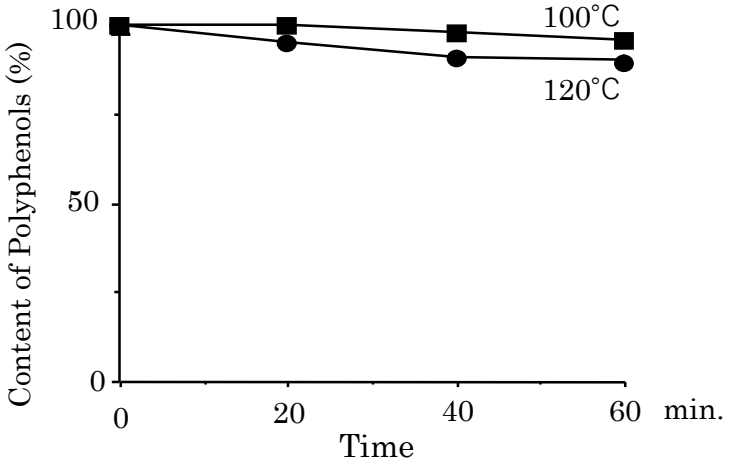


Fig. 13. Identification of perillaldehyde, perilla ketone and perilla alcohol by GC anlalysis.

10. Stability of PERILLA SEED EXTRACT
10-1. Thermal Resistance

Evaluation of the heat stability of PERILLA SEED EXTRACT showed no changes in the content of polyphenols even after heating at a normal food processing temperature.

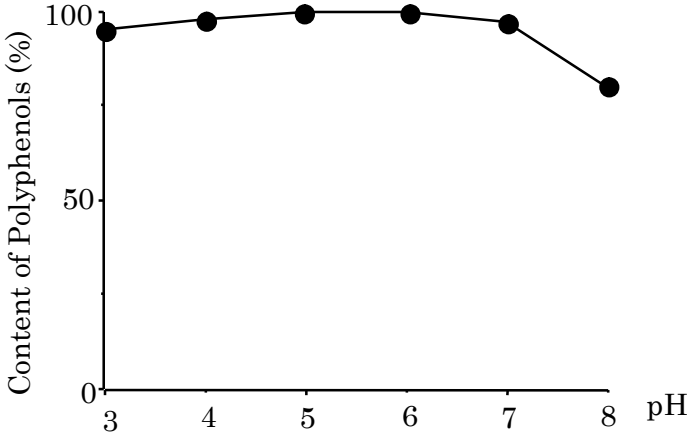


X-axis：% of initial polyphenols

Fig.14　Thermal Resistance of PERILLA SEED EXTRACT

10-2. pH Stability

Polyphenols in the PERILLA SEED EXTRACT was found to be stable from acid to alkali range of pH.



X-axis：% of PERILLA SEED EXTRACT polyphenols
in 0.05% solution (30% aqueous ethanol)

Fig.15　pH stability of the Polyphenols in the PERILLA SEED EXTRACT

10-3. Solubilty

Stability of solubilized PERILLA SEED EXTRACT-WSP in water (pH 3.5) was examined at stipulated in the following conditions. PERILLA SEED EXTRACT-WSP was dissolved in water (pH 3.5) and stored at room temperature, 40℃ and 5℃ for 16 weeks and sedimentation and color change was observed.

		Water solubility (0.5 % solution)		
		Room temperature (light shielding)	40°C (dark)	5°C (dark)
Acid (pH 3.5)	Sedimentation	Negative (observed in 16 weeks)	Negative (observed in 16 weeks)	Negative (observed in 16 weeks)
	Change color	Negative (observed in 16 weeks)	Negative (observed in 16 weeks)	Negative (observed in 16 weeks)

PERILLA SEED EXTRACT-WSP was without any sedimentation and color change observed in 16 weeks.

11. Daily Dosage of PERILLA SEED EXTRACT

PERILLA SEED EXTRACT-P (powder)
PERILLA SEED EXTRACT-WSP (powder) } 100～150mg/day
PERILLA SEED EXTRACT-L (liquid) 150～225mg/day

12. Nutrition Facts of PERILLA SEED EXTRACT

Items Analyzed	Result
Water	3.1 g/100g
Protein*1	0.9 g/100g
Fat	0.2 g/100g
Ash	0.8 g/100g
Available carbohydrate*2	95.0 g/100g
Energy*3	385 kcal/100g
Dietary Fiber	0 g/100g
Sodium	7.1 mg/100g

*1 N×6.25
*2 100-(Moisture + Protein + Fat + Ash + Dietary fiber)
*3 Factors for calculating the energy value:
Protein - 4, Fat - 9, Available carbohydrate -4
Tested by : Japan Food Research Center Foundation
Research result issue number : 397060549-001

13. Residual Agricultural Chemicals

Assayed Items	Results	Detection Limits	Assay Method
BHC	Not Detected	0.02ppm	Gas Chromatography
DDT	Not Detected	0.02ppm	Gas Chromatography
Aldrin	Not Detected	0.01ppm	Gas Chromatography
Dieldrin	Not Detected	0.01ppm	Gas Chromatography
Endrin	Not Detected	0.01ppm	Gas Chromatography
Diazinon	Not Detected	0.05ppm	Gas Chromatography
Parathion	Not Detected	0.05ppm	Gas Chromatography
Malathon	Not Detected	0.05ppm	Gas Chromatography

Tested by: Japan Food Research Center Foundation
Research results issue number 397060549-002

Moreover, we determined 456 agricultural chemicals in 2006. No chemicals were determined in PERILLA EXTRACT.

14. Acute Toxicity and Safety

14-1. Acute Toxicity

After administering 2,000 mg/kg for 2 weeks, no toxic effects were observed, thus the LD_{50} (mouse) is more than 2000 mg/kg.

After administering 7.0g/day for two consecutive weeks on human, no toxic effects were observed.

14-2. Primary Cutaneous Irritation Test on the Albino Rabbit.

PERILLA SEED EXTRACT was applied on normal skin in 3 rabbits for 4 hours. The methodology indicated in the Official EEC Gazette of September 19, 1984 was used in this study. Examination of the skin at hour 1, 24, 48 and 72 after removed of the dressing reveals the absence of a desquamation reaction or a reduction in the cutaneous extensive range. The local tolerance is good. In these conditions, the product can be rated as : **NON IRRITANT**.

14-3. Test to Assess the Sensitizing Power on the Albino Guinea Pig.

PERILLA SEED EXTRACT at the Maximum Non Irritant Concentration did not display any sensitizing potential in the animals tested. The positive reference (1-chloro -2-4 dinitrobenzene 1 %), tested in the same conditions displayed 100 % of positive reactions. The product in accordance with the method described in the protocol displays a **VERY SLIGHT** sensitizing power in the albino guinea pig.

14-4. Ocular Irritation Test.

PERILLA SEED EXTRACT was instilled in the fornix of the conjunctiva of 3 rabbits, by a 0.1 ml dosage. The eye was not rinsed. The procedure used in

this study complies with OECD guidelines No 405 of February 24, 1987 and EEC guidelines 67/548. In these conditions, the product is rated as : **SLIGHTLY IRRITANT.**

14-5. Ocular Irritation Test.

0.03 g of PERILLA SEED EXTRACT -LC was spread over film.The film was patched on 12 subject for just stick and 24 hours. No irritation on skin of human ware found.

15. Practical Applications of PERILA SEED EXTRACT

Applications	Examples
Confectionery	Candies, Gum, Cookies, Pudding, Jelly, Yogurt and Chocolate.
Drinks	Tea, Blended tea, Functional drinks and Nutritional drinks.
Others	Functional foods, Health foods and Nutraceutical foods.
Cosmetics	Base cosmetics (Lotion, Milk, Cream and so on) Body cosmetics (Body lotion, Body cream, and so on) Cleansing cosmetics (Soap, and so on) Make up cosmetics (Lipstick, Foundation, and so on) and so on.

16. Packing

PERILLA SEED EXTRACT-P (Powder, for food)
PERILLA SEED EXTRACT-WSP (Powder, for food)
5kg Interior packaging : a double-layerd plastic plastic bag, can
Exterior packaging : cardboard box
PERILLA SEED EXTRACT-L (Liquid, for food)
5kg Interior packaging : cubic polyethylene container
Exterior packaging : cardboard box
PERILLA SEED EXTRACT-LC (Liquid, for cosmetics)
5kg Interior packaging : cubic polyethylene container
Exterior packaging : cardboard box

17. Storing Method

Store in cool, dry place. Avoid humidity

18. Expression of PERILLA SEED EXTRACT

PERILLA SEED EXTRACT
*Please refer to your nation's standard.

19. Others

PERILLA SEED EXTRACT-LC is recommended for cosmetics.
CTFA FILE NUMBER：426
INCI name：Water (and) Butylene Glycol (and) Perilla Ocymoides Seed Extract

20. United States Patent

US006217875B1

(12) **United States Patent**
Murai et al.

(10) **Patent No.: US 6,217,875 B1**
(45) **Date of Patent: Apr. 17, 2001**

(54) **INHIBITORS OF LIPOXYGENASE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/053,064**

(22) Filed: **Apr. 1, 1998**

(30) **Foreign Application Priority Data**

Apr. 23, 1997 (JP) 9-105959

(51) **Int. Cl.**[7] **A61K 35/78**
(52) **U.S. Cl.** **424/195.1**
(58) **Field of Search** 424/195.1

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(57) **ABSTRACT**

Novel inhibitors of the enzyme action of lipoxygenase, especially 5-lipoxygenase and 12-lipoxygenase that are derived from the extraction of the seeds of the perilla (crispa) or perilla (frutescens) plant. These inhibitors are suitably extracted from these seeds using alcohol, preferably ethanol, to form an extract or more preferably to further extract the alcoholic extract with ethyl acetate and water to partition the active inhibitors to the ethyl acetate. The particularly preferred inhibitors are luteolin and chrysoeriol.

24 Claims, 8 Drawing Sheets

PRODUCT STANDARD

PRODUCT NAME

PERILLA SEED EXTRACT-P

(FOOD)

This product is extracted from the seeds of perilla (Perilla frutescens var. frutescens) with aqueous ethanol. It guarantees a minimum of 3.0 % polyphenols.

Appearance	Yellowish powder with slightly unique smell.
Certification Test Flavonoid	To 1.0g of this product, add 8.5ml of 90% diethlene glycol and 0.5ml of 1N NaOH. Then it changes yellow. (DAVIS method)
Polyphenols	Min. 3.0% (Folin-Denis method)
Loss on Drying	Max. 5.0% (Analysis for Hygienic Chemists,1g, 105℃, 2h)
Purity Test	
(1) Heavy Metals (as Pb)	Max. 30 ppm (Sodium Sulfide Colorimetric Method)
(2) Arsenic (as As_2O_3)	Max. 1 ppm (Standard Methods of Analysis in FoodSafety Regulation, The Third Method, Apparatus B)
Standard Plate Counts	Max. 1×10^3 cfu/g (Analysis for Hygienic Chemists)
Moulds and Yeasts	Max. 1×10^2 cfu/g (Analysis for Hygienic Chemists)
Coliforms	Negative (Analysis for Hygienic Chemists)

Composition

Ingredients	Contents
Maltodextrin	70 %
Perilla seed extract	30 %
Total	100 %

PRODUCT STANDARD

PRODUCT NAME

PERILLA SEED EXTRACT-WSP

(FOOD)

This product is extracted from the seeds of perilla (Perilla frutescens var. frutescens) with aqueous ethanol. It guarantees a minimum of 3.0 % polyphenols. This product is water-soluble.

Appearance	Yellowish powder with slightly unique smell.	
Certification Test Flavonoid	To 1.0g of this product, add 8.5ml of 90% diethlene glycol and 0.5ml of 1N NaOH. Then it changes yellow.	(DAVIS method)
Polyphenols	Min. 3.0%	(Folin-Denis method)
Loss on Drying	Max. 5.0% (Analysis for Hygienic Chemists,1g, 105℃, 2h)	
Purity Test		
(1) Heavy Metals (as Pb)	Max. 30 ppm (Sodium Sulfide Colorimetric Method)	
(2) Arsenic (as As_2O_3)	Max. 1 ppm (Standard Methods of Analysis in Food Safety Regulation, The Third Method, Apparatus B))	
Standard Plate Counts	Max. 1×10^3 cfu/g	(Analysis for Hygienic Chemists)
Moulds and Yeasts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Coliforms	Negative	(Analysis for Hygienic Chemists)

Composition

Ingredients	Contents
Maltodextrin	70 %
Perilla seed extract	30 %
Total	100 %

PRODUCT STANDARD

PRODUCT NAME

PERILLA SEED EXTRACT-L

(FOOD)

This product is extracted from the seeds of perilla (Perilla frutescens var. frutescens) with aqueous ethanol. It guarantees a minimum of 2.0 % polyphenols.

Appearance	Dark brown liquid with unique smell.
Certification Test Flavonoid	To 1.0g of this product, add 8.5ml of 90% diethlene glycol and 0.5ml of 1N NaOH. Then it changes yellow. (DAVIS method)
Polyphenols	Min. 2.0% (Folin-Denis method)
Residue on Evaporation	18.0 to 22.0% (Analysis for Hygienic Chemists)
Purity Test	
(1) Heavy Metals (as Pb)	Max. 20 ppm (Sodium Sulfide Colorimetric Method)
(2) Arsenic (as As_2O_3)	Max. 1 ppm (Standard Methods of Analysis in Food Safety Regulation, The Third Method, Apparatus B)
Standard Plate Counts	Max. 1×10^3 cfu/g (Analysis for Hygienic Chemists)
Moulds and Yeasts	Max. 1×10^2 cfu/g (Analysis for Hygienic Chemists)
Coliforms	Negative (Analysis for Hygienic Chemists)

Composition

Ingredients	Contents
Ethanol	50 %
water	30 %
Perilla seed extract	20 %
Total	100 %

PRODUCT STANDARD

PRODUCT NAME

PERILLA SEED EXTRACT-PC

(COSMETIC)

The product is extracted with aqueous ethanol from the seeds of perilla (*Perilla frutescens* var.*japonica*, *P.frutescens* var.*frutescens* or *Perilla frutescens* var.*crispa*). It includes more than 3.0 % of polyphenols.

Appearance	Yellowish powder with slightly unique smell.	
Certification Test Flavonoid	To 1.0g of this product, add 8.5ml of 90% diethlene glycol and 0.5ml of 1N NaOH. Then it changes yellow.	(DAVIS method)
Polyphenols	Min. 3.0%	(Folin-Denis method)
Loss on Drying	Max. 5.0% (1g, 105℃, 2 h)	
Purity Test		
(1) Heavy Metals (as Pb)	Max. 30 ppm	(The Second Method of The Japanese Standards of Quasi-Drug Ingredients)
(2) Arsenic (as As_2O_3)	Max. 1 ppm	(The Third Method of The Japanese Standards of Quasi-Drug Ingredients)
Standard Plate Counts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Moulds and Yeasts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Coliforms	Negative	(Analysis for Hygienic Chemists)

Composition

Ingredients	Contents
Dextrin	70 %
Perilla Ocymoides Seed Extract	30 %
Total	100 %

PRODUCT STANDARD

PRODUCT NAME

PERILLA SEED EXTRACT-WSPC

(COSMETIC)

This product is extracted from the seeds of perilla (*perilla frutescens* var. *japonica*, *p.frutescens* var. *frutescens* or *perilla frutescens* var. *crispa*) with aqueous ethanol. It guarantees a minimum of 3.0 % polyphenols. This product is water-soluble.

Appearance	Yellowish powder with slightly unique smell.	
Certification Test Flavonoid	To 1.0g of this product, add 8.5ml of 90% diethlene glycol and 0.5ml of 1N NaOH. Then it changes yellow.	(DAVIS method)
Polyphenols	Min. 3.0%	(Folin-Denis method)
Loss on Drying	Max. 5.0%	(1g, 105℃, 2h)
Purity Test		
(1) Heavy Metals (as Pb)	Max. 30 ppm	(The Second Method of The Japanese Standards of Quasi-Drug Ingredients)
(2) Arsenic (as As_2O_3)	Max. 1 ppm	(The Third Method of The Japanese Standards of Quasi-Drug Ingredients)
Standard Plate Counts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Moulds and Yeasts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Coliforms	Negative	(Analysis for Hygienic Chemists)

Composition

Ingredients	Contents
Dextrin	70 %
Perilla Ocymoides Seed Extract	30 %
Total	100 %

PRODUCT STANDARD

PRODUCT NAME

PERILLA SEED EXTRACT-LC

(COSMETIC)

This product is extracted from the seeds of perilla perilla frutescens var. frutescens with aqueous ethanol and is dissolved in aqueous 1,3-butylene glycol.

Appearance	Yellow or pale brown clear liquid with slightly characteristic odor	
Certification Test		
(1) Tannins	The solution (1→5) of this product shows blue color after ferric chloride is added.	
(2) Polyphenols	The solution (1→5) of this product shows no color after potassium permanganate is added.	
Polyphenols	Min. 0.1%	(Folin-Denis method)
pH	5.00 to 6.50	(10% solution)
Specific Gravity	1.020 to 1.060	(25 ºC)
Purity Test		
(1) Heavy Metals (as Pb)	Max. 20 ppm	(The Second Method of The Japanese Standards of Quasi-Drug Ingredients)
(2) Arsenic (as As_2O_3)	Max. 1 ppm	(The Third Method of The Japanese Standards of Quasi-Drug Ingredients)
Standard Plate Counts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Moulds and Yeasts	Max. 1×10^2 cfu/g	(Analysis for Hygienic Chemists)
Coliforms	Negative	(Analysis for Hygienic Chemists)

Composition

Ingredients	Contents
Butylene Glycol	69 %
Water	30 %
Perilla Ocymoides Seed Extract	1 %
Total	100 %

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 :

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