

【DESCRIPTION】

【Invention Title】

GINSENOSIDE FATTY ACID ESTER COMPOUND, METHOD FOR
PREPARING SAME, AND COSMETIC COMPOSITION COMPRISING

5 SAME

【Technical Field】

The present application claims priority to and
the benefit of Korean Patent Application No. 10-2015-
0137303 filed on September 30, 2015, the entire
10 contents of which are incorporated herein by
reference.

The present invention relates to a novel
ginsenoside fatty acid ester compound having skin
whitening and antioxidative effect, a method for
15 preparing thereof, and a cosmetic composition
comprising the same.

【Background Art】

Ginseng (*Panax ginseng* C.A. Meyer) is a plant
belonging to the genus Ginseng of the family
20 *Araliaceae*, is a herbal medicine that has been used in
Korea, China, Japan, etc., for over 2,000 years and
has been used empirically to prevent disease and
prolong the life span. The efficacy and effects of

ginseng so far known include actions on the central nervous system, anticarcinogenic and anticancer activities, immune function-regulating action, antidiabetic action, hyperfunction of liver function, improvement of cardiovascular disorders and anti-arteriosclerosis, blood pressure control action, improvement of menopausal disorder, effect on osteoporosis, anti-stress and anti-fatigue action, antioxidant activity, Anti-aging efficacy and the like.

The various efficacy and effects of the above-mentioned ginseng are due to a component called 'ginsenoside' (glycoside contained in ginseng, known as a saponin), which is a type of saponin. The ginsenosides have a structure in which a sugar is attached to steroid skeleton, and the structure is changed by heat. Steroid-sugar bonds are cleaved by heating by steam, and as sugars fall off, ginsenosides exhibit different effects with each other depending on which sugar is left at any number of positions. Also, as the water-soluble sugars are cleaved off and thus the ginsenosides become lipid-soluble, which makes them easy to pass through cell membranes.

There are more than 30 kinds of ginsenosides, and they do not all have the same ingredients and efficacy. These ginsenosides are classified into protopanaxadiol (PPD) and protopanaxatriol (PPT) depending on the number of hydroxyl groups (OH) in the structure. Among them, PPD based ginsenosides include Ra1, Ra2, Ra3, Rb1, Rb2, Rb3, Rc, Rd, Rg3, Rh2 and the like, and PPT based ginsenosides include Re, Rg1, Rg2, Rf, Rh1 and the like.

10 The PPD based and PPT based ginsenosides are applicable to various fields, and for example, Korean Patent Publication No. 2015-0083290 discloses that Rb1, Rd, F1, Fe, Rg1, F2, compound K (CK), Rg3, Re, Rh1, Rh2, Rg5, Rk1 and PPD and derivatives thereof have whitening and wrinkle improvement effects without skin side effects. And Korean Patent No. 10-146981 discloses that Rd, a kind of PPD based ginsenoside, promotes biosynthesis of collagen and inhibits the production of MMP-1, and thus is applicable to cosmetic compositions.

In addition, Korean Patent No. 10-1233833 discloses that Re, a kind of PPT based ginsenoside, exfoliates in the skin and promotes the activity on cell cycle, thereby preventing transdermal loss of

water and wrinkle formation and improving the skin.
And Korean Patent No. 10-1427572 discloses that a
mixture of ginsenoside Re and compound K promotes the
production of hyaluronic acid and thus is applicable
5 to external dermatological compositions.

Meanwhile, in terms of the structure of the
skin, the intercellular space and the corneum, which
is the outermost layer, are mostly composed of lipids
and the surface of the skin is covered with sebum (oil
10 component) secreted by the cells. Unfortunately, it is
difficult for the hydrophilic substance to penetrate
through the skin. For penetration of the hydrophilic
substance, it is necessary to increase the use
concentration or to apply an electric shock such as
15 iontophoresis.

The PPD based or PPT based ginsenoside compounds
have two or more OH groups in the molecular structure
and thus exhibit high hydrophilicity. Accordingly, the
penetration ability of the PPD based or PPT based
20 ginsenoside compounds through the skin is very low.
Therefore, even if the cosmetic composition contains
these compounds, the amount of penetration or
absorption into the skin is small and thus the effect
which is substantially obtained is insufficient.

[Prior Art Literature]

[Patent Literature]

(Patent Literature 1) Korean Patent Publication
No. 2015-0083290, "Method for preparing ginsenoside
5 derivative and composition comprising ginsenoside
derivative prepared by the same for whitening and
improving wrinkle"

(Patent Literature 2) Korean Patent No. 10-
146981, "Cosmetic composition containing Ginsenoside
10 Rd and Ginsenoside F2 for improving skin wrinkle"

(Patent Literature 3) Korean Patent No. 10-
1233833, "Cosmetic composition containing ginsenoside
Re for improvement of skin"

(Patent Literature 4) Korean Patent No. 10-
15 1427572, "Skin external composition for promoting the
production of hyaluronic acid containing ginsenoside
Re and ginsenoside compound K"

【Disclosure】

【Technical Problem】

20 In order to solve the above problem, the
inventors of the present invention prepared a novel
compound by reacting the PPD based or PPT based
ginsenoside compound with a fatty acid vinyl ester

compound to increase its hydrophobicity, and identified that the compound thus obtained has superior penetration ability to the corneum, inhibits the production of melanic pigment, exhibits a skin whitening effect, significantly inhibits collagenase, MMP-1, and thus exhibits a superior wrinkle improvement effect, thereby completing the present invention.

Accordingly, it is an object of the present invention to provide a novel ginsenoside fatty acid ester compound.

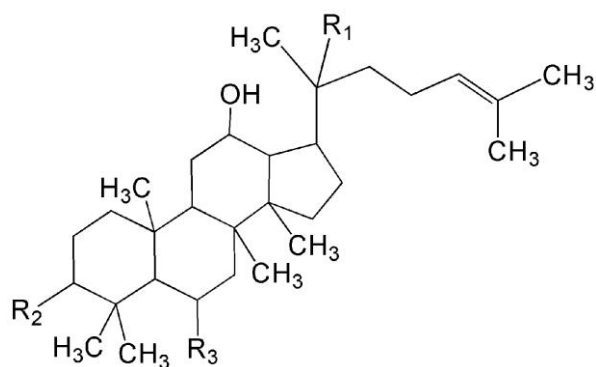
In addition, it is another object of the present invention to provide a method for preparing the ginsenoside fatty acid ester compound.

In addition, it is still another object of the present invention to provide an use of the ginsenoside fatty acid ester compound as a cosmetic composition.

【Technical Solution】

According to an object of the present invention, the present invention provides a ginsenoside fatty acid ester compound represented by the following Formula 1:

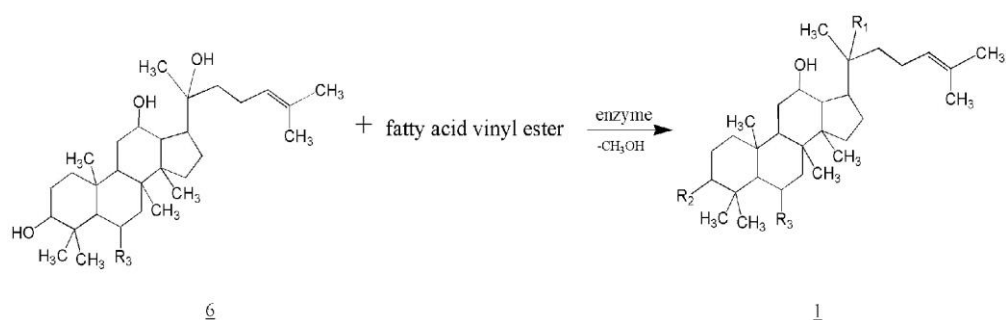
[Formula 1]



wherein R_1 to R_3 are as described in the specification.

According to another object of the present invention, the present invention provides a method for preparing a ginsenoside fatty acid ester compound of Formula 1, which comprises reacting a compound of Formula 6 and a saturated or unsaturated fatty acid vinyl ester compound of C12 to C22 by an enzyme conversion reaction as represented by the following Reaction Scheme 1:

[Reaction Scheme 1]



wherein R_1 to R_3 are as described in the specification.

According to still another object of the present invention, the present invention also provides a cosmetic composition comprising the ginsenoside fatty acid ester compound represented by Formula 1 as an active ingredient.

【Advantageous Effects】

The ginsenoside fatty acid ester compound according to the present invention not only has whitening effect and wrinkle improvement effect which are exhibited by the conventional PPD based or PPT based ginsenoside compound, but also has skin penetration ability through the corneum by improving hydrophobicity.

Specifically, the compound suppresses the production of melanic pigment by acting on tyrosinase, an enzyme that produces melanic pigment that causes freckles and stains, and thus exhibiting skin whitening effect. And the compound can inhibit expression of MMP-1, an enzyme that degrades collagen, more significantly than retinoic acid, thereby resulting in wrinkle improvement effect. Therefore, the compound can be formulated into various cosmetic products, thereby enhancing the satisfaction of consumers.

【Description of Drawings】

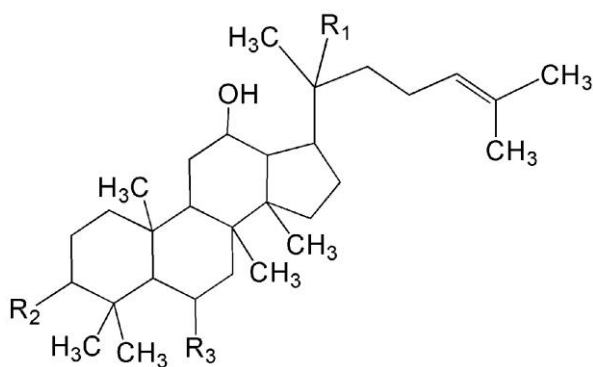
Fig. 1 is a graph showing MMP-1 inhibitory effect of compounds of example 1 and comparative example 1.

5 【Best Mode】

Hereinafter, the present invention will be described in detail.

The present invention provides a novel compound which is modified to have hydrophobicity in order to
10 increase the skin absorbency of a PPD based or PPT based ginsenoside compound. Preferably, the novel compound is a ginsenoside fatty acid ester compound represented by the following Formula 1:

[Formula 1]



wherein R₁ is OH or a saturated or unsaturated fatty acid group of C12 to C22,

R₂ is a saturated or unsaturated fatty acid group of C12 to C22 and

R₃ is H or OH.

The saturated fatty acid group of C12 to C22 as used herein may be a lauryl group (C12:0), a tridecyl group (C13:0), a myristyl group (C14:0), a pentadecyl group (C15:0), a palmityl group (C16:0), a margaryl group (C17:0), a stearyl group (C18:0), a nonadecyl group (C19:0), an arachidyl group (C20:0), a heneicosyl group (C21:0) or a behenyl group (C22:0).

Also, the unsaturated fatty acid group of C12 to C22 as used herein may be a palmitoleyl group (C16:1), an oleyl group (C18:1), a myristoleyl group (C14:1), a linoleyl group (C18:2) or an arachidonyl group (C20:3).

Preferably, R₁ may be OH, a palmityl group, a stearyl group or an oleyl group, more preferably OH or a palmityl group.

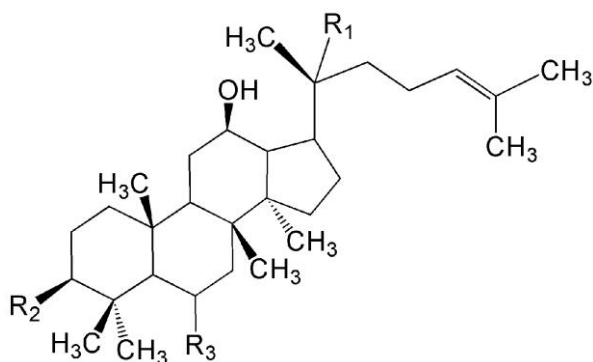
Also, preferably, R₂ may be a palmityl group, a stearyl group or an oleyl group, more preferably a palmityl group.

The compound of Formula 1 of the present invention may include all isomers unless specifically stated otherwise. As the isomers, all stereoisomers, for example, isomers (including enantiomers, which may exist even in the absence of asymmetric carbon and

partial stereoisomers) which may exist due to the asymmetric carbon on the various R and Z substituents may be contemplated within the scope of the present invention. Each stereoisomer of the compound of the present invention may, for example, be substantially free of other isomers, or may exist, for example, as a racemate, or may be mixed with all stereoisomers or selected stereoisomers.

For example, the compound of the present invention may be represented by the isomer of Formula 1a:

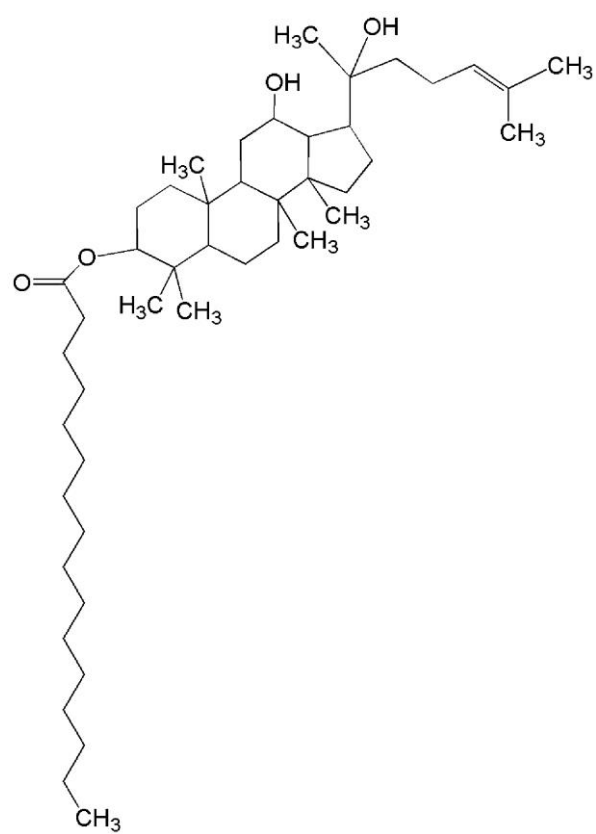
[Formula 1a]



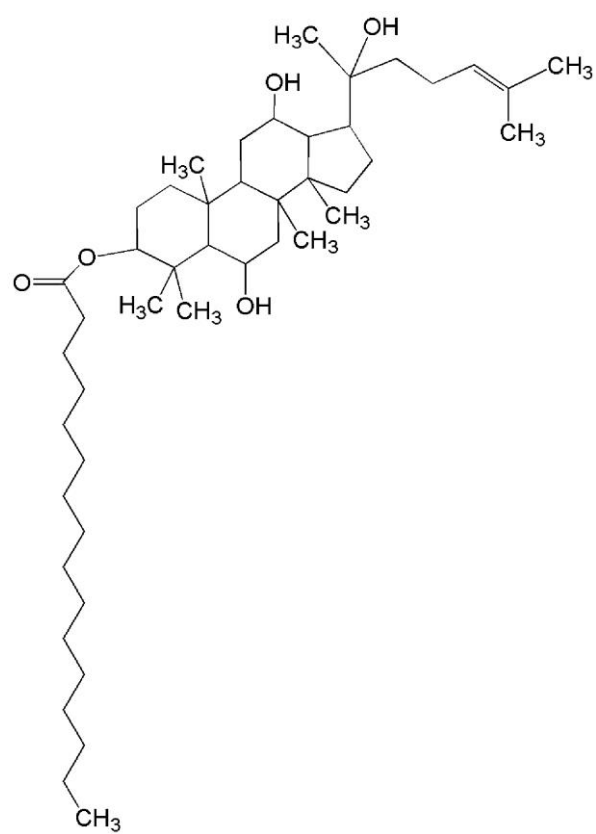
wherein, R₁ to R₃ is as defined above.

Examples of the compounds represented by Formula 1 may include the following compounds:

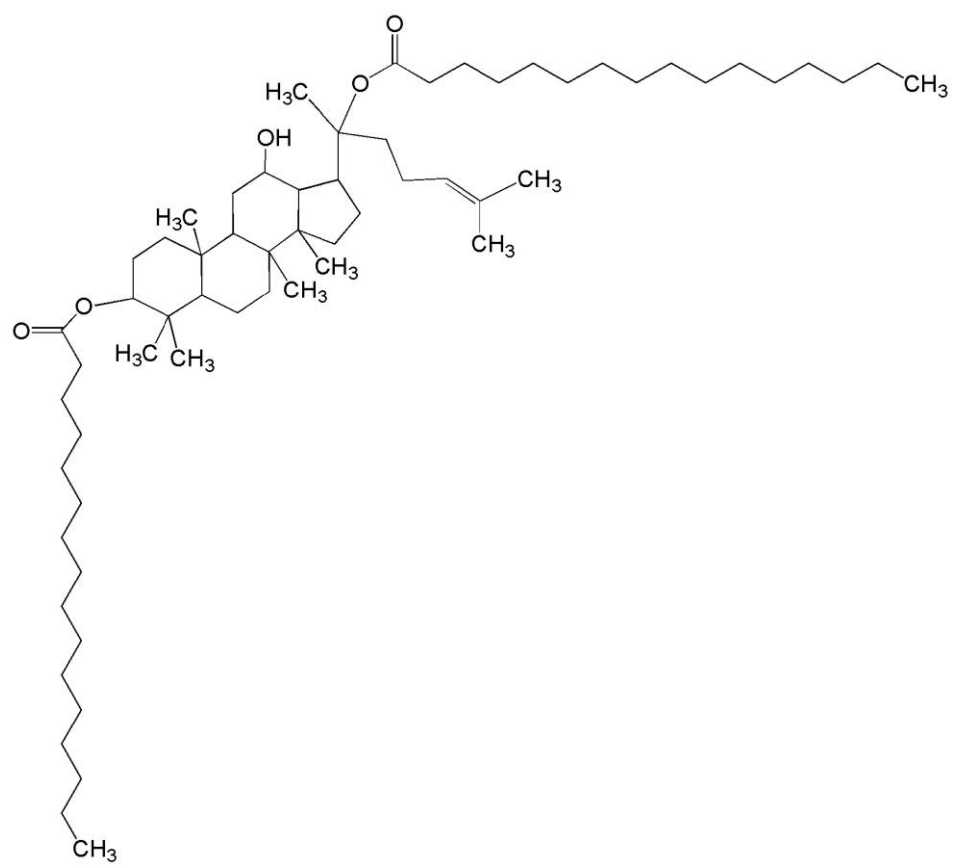
[Formula 2]



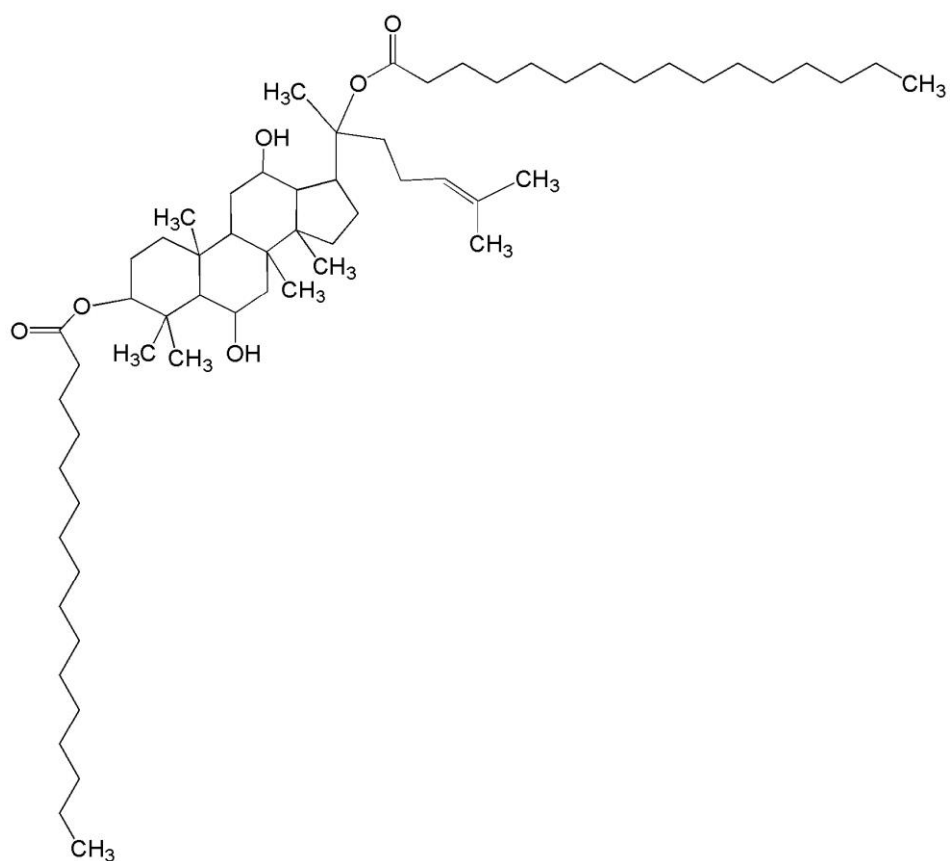
[Formula 3]



[Formula 4]

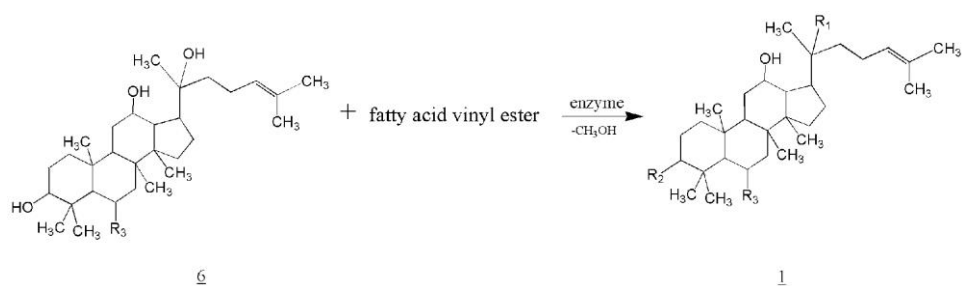


[Formula 5]



In addition, the present invention provides a method for preparing a ginsenoside fatty acid ester compound of Formula 1, which comprises reacting a compound of Formula 6 and a saturated or unsaturated fatty acid vinyl ester compound of C12 to C22 by an enzyme conversion reaction as represented by the following Reaction Scheme 1:

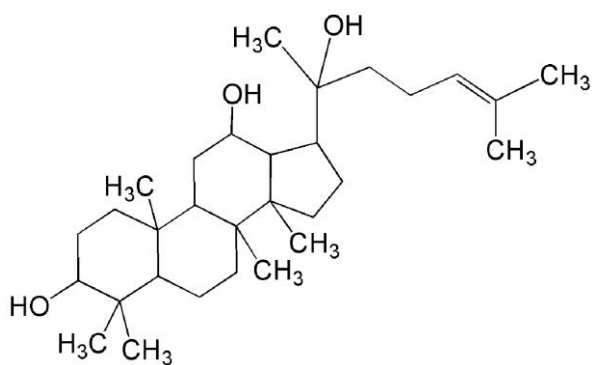
[Reaction Scheme 1]



wherein R₁ to R₃ are as defined above.

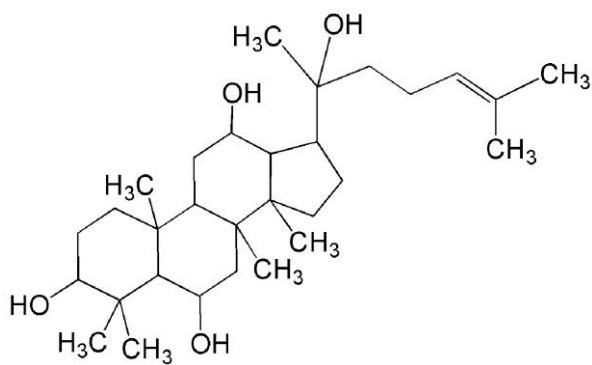
The compound of Formula 6, which is the starting material in Reaction Scheme 1, may be a ginsenoside compound. For example, the compound of Formula 6 may be PPD (R₃ = H) represented by Formula 7, PPT (R₃ = OH) represented by Formula 8 or derivatives thereof.

[Formula 7]



10

[Formula 8]



The starting materials can be obtained from extracts from ginseng, red ginseng, white ginseng, fresh ginseng(susam), misam(gingseng tail), ginseng
5 leaves, ginseng fruit or the like, or can be directly prepared therefrom, or is commercially available.

As an example, the starting materials can be prepared by hydrolyzing ginseng purified saponin with acid, alkali or enzyme to remove sugar from ginseng
10 saponin and then passing the reaction solution through a silica column. Examples of the enzymes that can be used herein may include exo-glycosidases such as β -glucosidase, α,β -arabinosidase and α,β -rhamnosidase which degrade the saponin-sugar bond, and complex
15 enzymes containing them, etc.

Also, in Reaction Scheme 1, the fatty acid vinyl ester compound may be a saturated or unsaturated fatty acid vinyl ester compound of C12 to C22 as a compound for introducing R_1 and R_2 into the chemical structure
20 of Formula 1.

Preferably, the saturated fatty acid vinyl ester compound of C12 to C22 may be lauric acid vinyl ester (C12: 0), tridecylic acid vinyl ester (C13: 0), myristic acid vinyl ester (C14: 0), pentadecylic acid

vinyl ester (C15: 0), palmitic acid vinyl ester (C16: 0), margaric acid vinyl ester (C17: 0), stearic acid vinyl ester (C18: 0), nonadecylic acid vinyl ester (C19: 0), arachidic acid vinyl ester (C20: 0),
5 heneicosylic acid vinyl ester (C21: 0) or behenylic acid vinyl ester (C22: 0).

In addition, the unsaturated fatty acid vinyl ester compound of C12 to C22 may be palmitoleic acid vinyl ester (C16:1), oleic acid vinyl ester (C18:1),
10 myristoleic acid vinyl ester (C14:1), linoleic acid vinyl ester (C18:2) or arachidonic acid vinyl ester (C20:3).

More preferably, the fatty acid vinyl ester compound may be palmitic acid vinyl ester, stearic
15 acid vinyl ester or oleic acid vinyl ester, and most preferably palmitic acid vinyl ester.

The reaction may proceed by an enzyme conversion reaction.

The enzymes may be hydrolytic enzymes such as
20 *protease* or *lipase*, and the examples of the hydrolytic enzymes may include *flavourzyme*, *protease A*, *alcalase*, *savinase*, *protamex*, *esperase*, *novozyme*, *esterase*, *acylase* and mixtures thereof, but not limited thereto. Also, as the enzyme source, a microorganism containing

the hydrolytic enzyme may be used. Preferably, in the example of the present invention, *novozyme* 435 (Novozymes) was used.

The examples of the enzyme source may include
5 *Bacillus* sp., *Aspergillus oryzae*, *Aspergillus niger*, *Candida antarctica* and mixtures thereof, but any strain or microorganism containing hydrolytic enzymes can be used without limitation.

The type and using method of the enzyme in
10 Reaction Scheme 1 are not particularly limited as long as the enzyme does not inactivate, and a method commonly used in this field is possible.

The reaction temperature is a temperature at which no inactivation of the enzyme occurs, that is,
15 in the case of *novozymes*, the reaction may be carried out with stirring in the range of from 20 to 60 °C for 1 to 120 hours, preferably 36 to 72 hours.

In the reaction, the solvent used may be water, a lower alcohol such as methanol, ethanol, propanol or
20 the like. As the organic solvent, acetone, dimethylformamide (DMF), methylene chloride (MC), diisopropyl ether, diethyl ether, tetrahydrofuran (THF), dimethylacetamide (DMA), dimethylsulfoxide (DMSO), chlorobenzene, toluene, benzene, etc., may be

used alone or in combination, and acetone is preferably used.

The ginsenoside fatty acid ester compound of the Formula 1 according to the present invention can be
5 applied to various fields and is preferably used as an effective ingredient of a cosmetic composition.

The ginsenoside fatty acid ester compound of Formula 1 is a ginsenoside compound, especially a ginsenoside compound that shows hydrophobicity and
10 thus excellent permeability to the corneum while intactly maintaining the whitening effect and wrinkle improvement effect of ginsenoside PPD and PPT.

In addition, as the ginsenoside fatty acid ester compound of the present invention exhibits
15 hydrophobicity and thus has improved reactivity with tyrosinase, an enzyme that produces melanic pigment that causes freckles and stains. Therefore, as shown in Experimental Example 1, the ginsenoside fatty acid ester compound of the present invention can obtain an
20 excellent whitening effect as compared with conventional kojic acid or lucinol having excellent whitening effect.

Additionally, as a result of measuring the inhibitory effect of expression of MMP-1, an enzyme

that degrades collagen(see Experimental Example 2), it can be seen that the ginsenoside fatty acid ester compound of the present invention inhibits the expression of MMP-1 more significantly than retinoic acid, thereby ensuring the wrinkle improvement effect.

Therefore, the ginsenoside fatty acid ester compound of Formula 1 can be used as an active ingredient of cosmetic compositions. The content thereof varies depending on the formulation and may be 0.001 to 99% by weight. When the active ingredient is contained in the above described range, such an amount is not only suitable for exhibiting the intended effect in the present invention but also can satisfy both stability and solubility of the composition. Even from the viewpoint of cost effectiveness, it may be appropriate that the active ingredient is included in the above range.

The cosmetic composition may be prepared as any formulation conventionally prepared in the art, and for example, can be formulated, but is not limited thereto, into solution, suspension, emulsion, paste, gel, cream, lotion, powder, oil, powder foundation, emulsion foundation, wax foundation and spray, etc. Specifically, the cosmetic composition may be prepared

as a formulations of sun cream, softening lotion, astringent lotion, nourishing lotion, nourishing cream, massage cream, essence, eye cream, pack, spray or powder.

5 In addition, the cosmetic composition according to the present invention may contain additives conventionally used in the field of cosmetics or dermatology, such as fatty substances, organic solvent, solubilizers, thickeners, gelling agents,
10 softener, antioxidants, suspending agents, stabilizers, foaming agent, air freshener, surfactants, water, ionic or nonionic type emulsifiers, fillers, metal ion sequestrants, chelating agents, preservatives, vitamin, blocking
15 agents, wetting agents, essential oil, dyes, pigment, hydrophilic or lipophilic active agents, lipid vesicle or any other ingredient commonly used in cosmetics. The additives may be introduced in amounts commonly used in the field of cosmetics or dermatology.

20 When the formulation is a paste, a cream or a gel, animal oil, vegetable oil, wax, paraffin, starch, tragacanth, cellulose derivative, polyethylene glycol, silicone, bentonite, silica, talc, zinc oxide or the like may be used as a carrier component.

When the formulation is a powder or a spray, lactose, talc, silica, aluminum hydroxide, calcium silicate, polyamide powder or the like may be used as a carrier component. Particularly, in the case of the
5 spray, it may further comprise propellants such as chlorofluorohydrocarbons, propane/butane or dimethyl ether.

When the formulation is a solution or a emulsion, a solvent, a solubilizing agent or an
10 emulsifying agent may be used as a carrier component, and examples thereof may include water, ethanol, isopropanol, ethyl carbonate, ethyl acetate, benzyl alcohol, benzyl benzoate, propylene glycol, 1,3-butyl glycol oil, glycerol aliphatic ester and fatty acid
15 esters of polyethylene glycol or sorbitan.

When the formulation is a suspension, liquid diluents such as water, ethanol or propylene glycol, suspending agents such as ethoxylated isostearyl alcohol, polyoxyethylene sorbitol ester and
20 polyoxyethylene sorbitan ester, microcrystalline cellulose, aluminum metahydroxide, bentonite, agar or tragacanth, etc., can be used as a carrier component.

Hereinafter, the present invention will be described in more detail by the following examples. It

is to be understood, however, that the following examples are illustrative of the present invention only and are not intended to limit the scope of the present invention.

5 **Example 1: Preparation of compound of Formula 2**

To a pressure tube, the compound of Formula 7 (PPD, 1eq), vinyl palmitate (2.5 eq), 4Å molecular sieve (100 wt.%), Novozyme 435 and anhydrous acetone (500 wt.%, 5 times the substrate) were added and
10 stirred at 45 °C for 3 days to conduct the reaction.

After completion of the reaction, the obtained product was purified by silica gel column chromatography (ethyl acetate: methanol = 10:1) to obtain a compound of Formula 2 (white solid, yield
15 78%).

¹H-NMR(300MHz, CDCl₃) d 7.26(1H), 7.00(1H), 5.26(1H), 4.31(1H), 3.94(1H), 2.32-2.29(3H), 2.18-2.16(2H), 1.93-1.55(19H), 1.49-1.41(3H), 1.37-1.24(29H), 1.07-0.86(21H).

20 **Example 2: Preparation of compound of Formula 3**

The compound of Formula 3 was prepared by the same procedure as Example 1, except that the compound

of Formula 8 (PPT, 1 eq) was used as the starting material (yield 82%).

¹H-NMR(300MHz, CDCl₃) d 7.27(1H), 6.99(1H), 5.26(1H), 5.24(1H), 4.47(1H), 4.31(1H), 3.84(1H),
5 2.40(1H), 2.27-2.17(4H), 2.03-1.55(20H), 1.4-1.27(29H), 1.15-0.77(21H).

Example 3: Preparation of compound of Formula 4

The compound of Formula 4 was prepared by the same procedure as Example 1, except that the compound
10 of Formula 7 (PPD, 2 eq) was used as the starting material (yield 90%).

¹H-NMR(300MHz, CDCl₃) d 7.27(1H), 5.12(1H), 4.31(1H), 3.91(1H), 2.62(1H), 2.30(4H), 2.09-1.96(4H), 1.87-1.49(20H), 1.41-1.24(53H), 1.14-0.86(26H).

Example 4: Preparation of compound of Formula 5

The compound of Formula 5 was prepared by the same procedure as Example 1, except that the compound of Formula 8 (PPT, 2 eq) was used as the starting material (yield 87%).

20 ¹H-NMR(300MHz, CDCl₃) d 7.27(1H), 5.26(1H), 5.12(1H), 4.47(1H), 4.31(1H), 3.98(1H), 2.71(1H), 2.30(4H), 2.12(1H), 2.03-1.90(4H), 1.82-1.55(19H), 1.41-1.24(52H), 1.16-0.86(25H).

**Experimental Example 1: Melanin production
inhibitory effect in melanic pigment-producing cells**

The melanin production inhibitory effect in melanic pigment-producing cells of the compound
5 prepared in example 2 was measured by Dooley's method.

The cell line used was mouse-derived B16 F10 (melanoma cells) purchased from Korean Cell Line Bank. DMEM (Cat No. 11995), FBS (Cat No. 16000-044) and antibiotic-antifungal agent (Cat No. 15240-062)
10 required for cell culture were purchased from Invitrogen (GIBCO).

The cell lines were cultured under the conditions of 37 °C and 5% CO₂. The cultured B16F10 cells were removed with 0.05% trypsin-EDTA and
15 inoculated again in the same number (1X10⁴ cells/well) into a 48-well plate, and then the medium was replaced three consecutive days from the second day by the medium containing the compounds of each example at a concentration of 10 ppm. At this time, kojic acid and
20 rucinol were used as comparative examples.

After 5 days, the cells were treated with 1N NaOH and reacted at 60 °C for 2 hours to dissolve the melanin contained in the cells, and then the amount of melanin was measured by measuring the absorbance at

405 nm. From this, the concentration of the compounds required to reduce the melanocyte-induced melanin production by half (IC₅₀) was calculated and the results are shown in the table below.

5 Table 1:

Tested substance	IC ₅₀
Kojic acid	>500 µM
Rucinol	16 µM
Compound of Example 1	7.4 µM
Compound of Example 2	7.3 µM
Compound of Example 3	7.6 µM
Compound of Example 4	7.8 µM

Referring to Table 1, the compounds according to the present invention can inhibit melanin production even in a small amount as compared with kojic acid and
10 lucinol. Accordingly, it can be seen that the ginsenoside fatty acid ester compounds according to the present invention inhibit melanin production and thus have an excellent skin whitening effect.

15 **Experimental Example 2: Inhibitory effect of MMP-1 expression**

In order to evaluate the inhibitory effect on MMP-1 expression of ginsenoside fatty acid ester compound, the fibroblasts were plated in 24 well plates at 1×10^4 cells per well and cultured in

medium containing 10% FBS for about 24 hours until about 80% confluency was reached. Thereafter, the medium was replaced with a medium without FBS and then cultured for 24 hours.

5 For UV irradiation, the cells were washed once with PBS, and then UVB 15 mJ/cm² was irradiated with addition of 100 mℓ of PBS. After removing the PBS, the ginsenoside fatty acid ester compound prepared in Example 1 was diluted to a final concentration of 0.01,
10 0.05, 0.1 and 0.5% in a fresh medium without the FBS, and retinoic acid was used as a comparative example 1. After 48 hours of treatment with the test substance, the culture supernatant was collected and the expression of MMP-1 was evaluated using an ELISA kit
15 (enzyme-linked immunosorbent assay kits; RPN 2610, Biotrak Amersham Pharmacia Biotech, UK). The amount of each measured MMP-1 was corrected for the total amount of protein, and the results are shown in Table 2 and FIG. 1. At this time, FIG. 1 is a graph comparing MMP-
20 1 inhibition ratio of compounds of example 1 and comparative example 1.

Table 2: Inhibition ratio (%) of MMP-1 expression

Concentration (%)	Example 1	Example 2	Example 3	Example 4	Comparative Example 1
0	100	100	100	100	100
0.01	98.1	98.1	97.9	97.6	98.1
0.05	76.7	76.3	78.2	77.5	87.3
0.1	65.3	67.1	61.7	68.0	82.5
0.5	41.1	43.0	41.3	44.1	72.2

Referring to Table 2 and FIG. 1, it can be seen that the ginsenoside fatty acid ester compound according to the present invention inhibits the expression of MMP-1 more significantly than the retinoic acid of Comparative Example 1.

From these results, it can be seen that the ginsenoside fatty acid ester compound proposed in the present invention inhibits skin aging and has an effect on wrinkle improvement by inhibiting the biosynthesis of MMP-1, a skin tissue degrading enzyme caused by internal aging or external environmental factors.

Hereinafter, another Formulation Examples of the present invention will be described. However, the cosmetic formulation containing the ginsenoside fatty acid ester compound according to the present invention is not limited to these examples.

Formulation Example 1: Lotion

The lotion was prepared according to the

conventional method with the composition shown in the following table.

Table 3:

Component	Content (% by weight))
Compound of Example 1	0.1
Glycerin	3.0
Butylene glycol	2.0
Propylene glycol	2.0
Carboxyvinyl polymer	0.1
PEG 12 Nonyl phenyl ether	0.2
Polysorbate 80	0.4
Ethanol	10.0
Triethanolamine	0.1
Preservative, Coloring, Flavoring	appropriate amount
Purified water	remainder

5 **Formulation Example 2: Nourishing cream**

The nourishing cream was prepared according to the conventional method with the composition shown in the following table.

Table 4:

Component	Content (% by weight)
Compound of Example 1	2.0
Polysorbate 60	1.5
Sorbitan sesquioleate	0.5
PEG 60 Hydrogenated castor oil	2.0
Liquid paraffin	10.0
Squalane	5.0
Caprylic/capric triglyceride	5.0
Glycerin	5.0
Butylene glycol	3.0
Propylene glycol	3.0
Triethanolamine	0.2
Preservative, Coloring, Flavoring	appropriate amount

Purified water	remainder
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Formulation Example 3: Massage cream

The massage cream was prepared according to the conventional method with the composition shown in the following table.

Table 5:

Component	Content (% by weight)
Compound of Example 1	1.0
Beewax	10.0
Polysorbate 60	1.5
PEG 60 Hydrogenated castor oil	2.0
Sorbitan sesquioleate	0.8
Liquid paraffin	40.0
Squalane	5.0
Caprylic/capric triglyceride	4.0
Glycerin	5.0
Butylene glycol	3.0
Propylene glycol	3.0
Triethanolamine	0.2
Preservative, Coloring, Flavoring	appropriate amount
Purified water	remainder

Formulation Example 4: Pack

The pack was prepared according to the conventional method with the composition shown in the following table.

Table 6:

Component	Content (% by weight)
Compound of Example 1	0.2
Polyvinyl alcohol	13.0
Sodium carboxymethyl cellulose	0.2
Glycerin	5.0

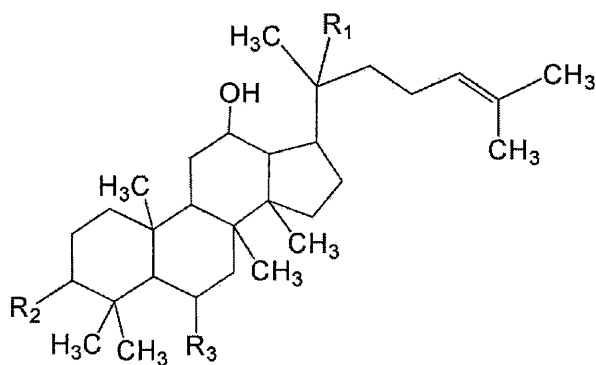
Allantoin	0.1
Ethanol	6.0
PEG 12 Nonyl phenyl ether	0.3
Polysorbate 60	0.3
Preservative, Coloring, Flavoring	appropriate amount
Purified water	remainder

【CLAIMS】

【Claim 1】

A ginsenoside fatty acid ester compound represented by the following Formula 1:

[Formula 1]



wherein R₁ is OH or saturated or unsaturated fatty acid group of C12 to C22,

R₂ is saturated fatty acid group of C13 to C22 and

R₃ is H or OH.

【Claim 2】

The ginsenoside fatty acid ester compound of claim 1, wherein R₁ is OH, a lauryl group, a tridecyl group, a myristyl group, a pentadecyl group, a palmityl group, a margaryl group, a stearyl group, a nonadecyl group, an arachidyl group, a heneicosyl group, a behenyl group, a palmitoleyl group, an oleyl group, a myristoleyl group, a linoleyl group or an arachidonyl group,

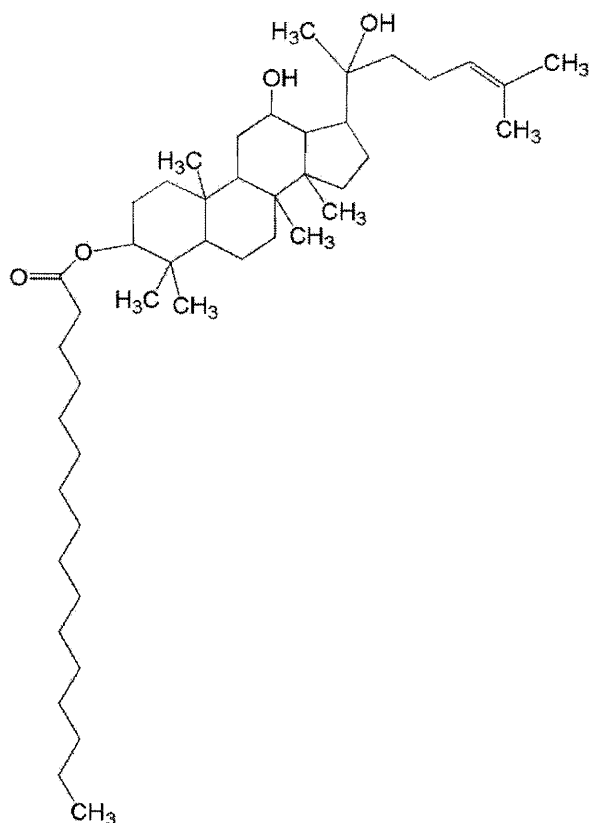
R₂ is a tridecyl group, a myristyl group, a pentadecyl group, a palmityl group, a margaryl group, a stearyl group, a nonadecyl group, an arachidyl group, a heneicosyl group or a behenyl group, and

R₃ is H or OH.

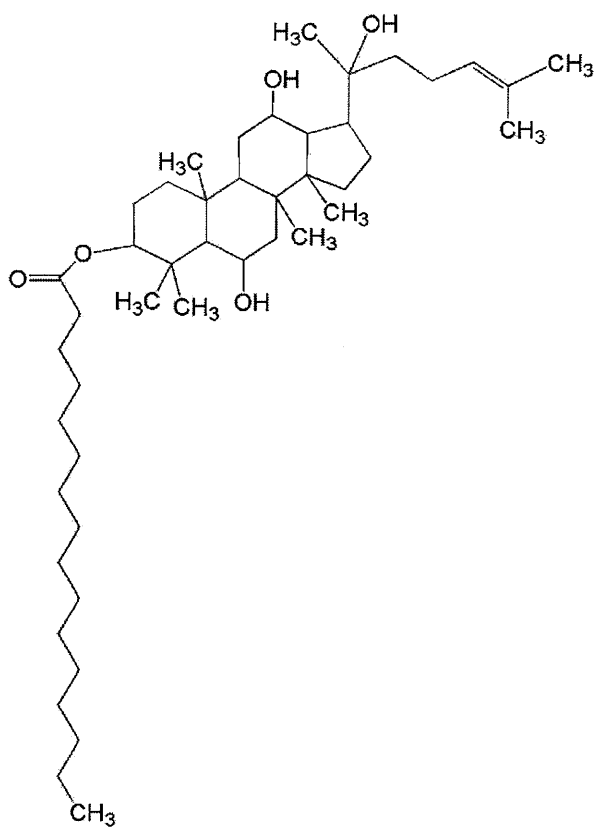
【Claim 3】

The ginsenoside fatty acid ester compound of claim 1 or 2, wherein the ginsenoside fatty acid ester compound is one of the compounds represented by the following Formulas 2 to 5:

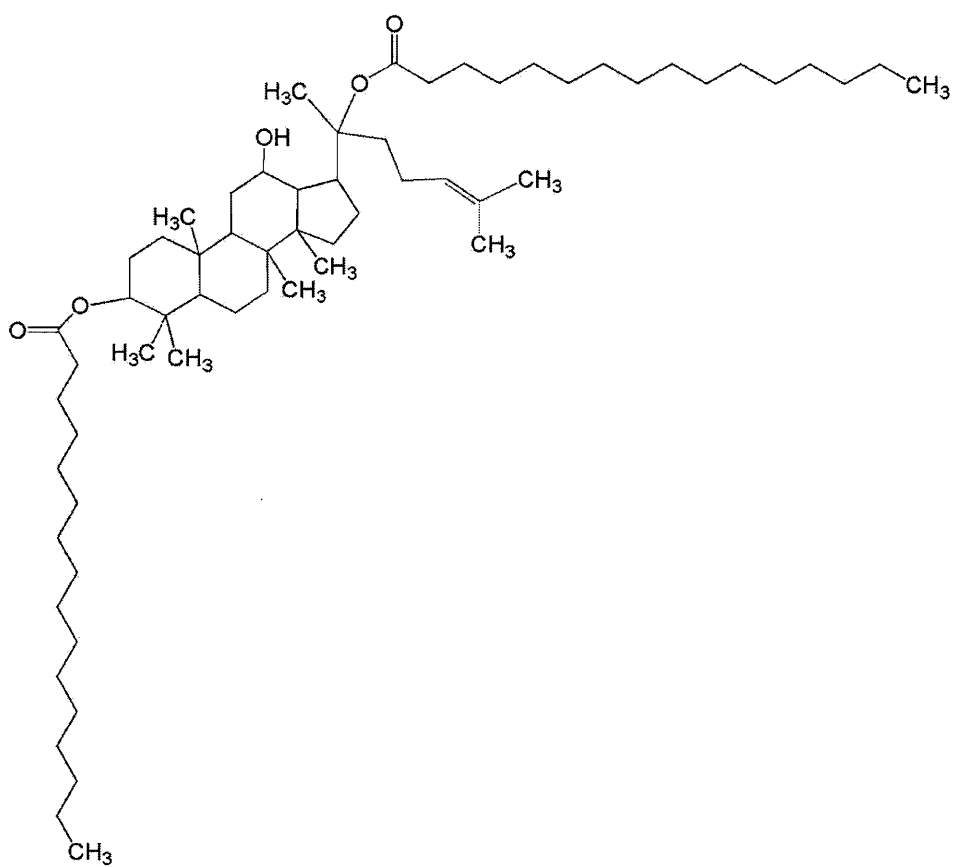
[Formula 2]



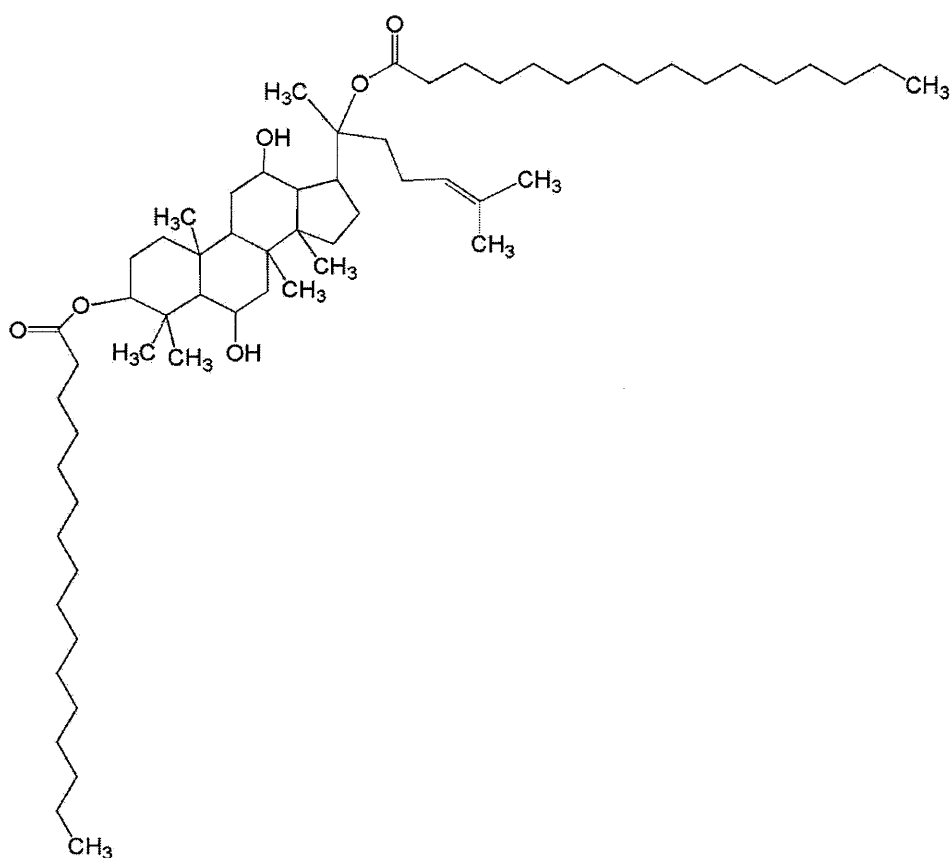
[Formula 3]



[Formula 4]



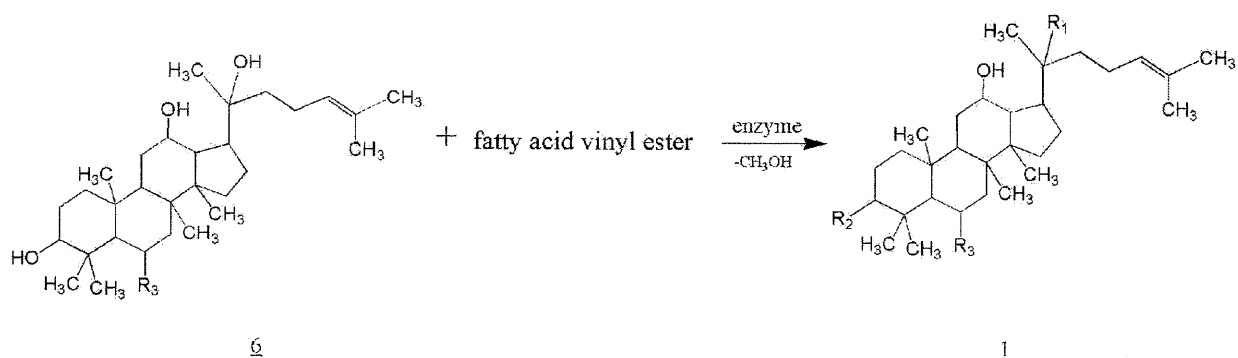
[Formula 5]



【Claim 4】

A method for preparing a ginsenoside fatty acid ester compound of Formula 1, which comprises reacting a compound of Formula 6 and a saturated or unsaturated fatty acid vinyl ester compound of C12 to C22 by an enzyme conversion reaction as represented by the following Reaction Scheme 1:

[Reaction Scheme 1]



wherein R_1 is OH or a saturated or unsaturated fatty acid group of C12 to C22,

R_2 is a saturated fatty acid group of C13 to C22 and

R_3 is H or OH.

【Claim 5】

The method for preparing the ginsenoside fatty acid ester compound of claim 4, wherein R_1 is OH, a lauryl group, a tridecyl group, a myristyl group, a pentadecyl group, a palmityl group, a margaryl group, a stearyl group, a nonadecyl group, an arachidyl group, a heneicosyl group, a behenyl group, a palmitoleyl group, an oleyl group, a myristoleyl group, a linoleyl group or an arachidonyl group,

R_2 is a tridecyl group, a myristyl group, a pentadecyl group, a palmityl group, a margaryl group, a stearyl group, a nonadecyl group, an arachidyl group, a heneicosyl group or a behenyl group, and

R_3 is H or OH.

【Claim 6】

The method for preparing the ginsenoside fatty acid ester compound of claim 4, wherein the enzyme conversion reaction is carried out by using at least one enzyme selected from the group consisting of *flavourzyme*, *protease A*, *alcalase*, *savinase*, *protamex*, *esperase*, *novozyme*, *esterase* and *acylase*.

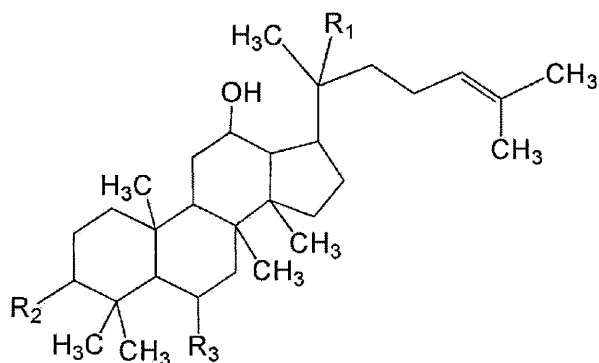
【Claim 7】

A cosmetic composition comprising the ginsenoside fatty acid ester compound according to any one of claims 1 to 3 as an active ingredient.

[Claim 8]

Use of a ginsenoside fatty acid ester compound represented by the following Formula 1:

[Formula 1]



wherein R_1 is OH or saturated or unsaturated fatty acid group of C12 to C22,

R_2 is saturated fatty acid group of C13 to C22 and

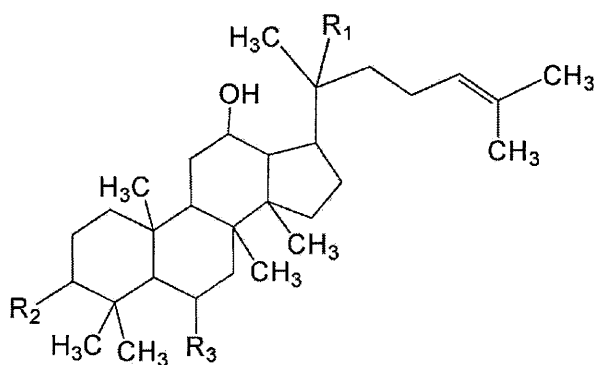
R_3 is H or OH

in a cosmetic composition.

[Claim 9]

A cosmetic method of skin whitening and wrinkle reduction, the method comprising administering a cosmetic composition comprising a ginsenoside fatty acid ester compound as an active ingredient to a subject, wherein the ginsenoside fatty acid ester compound is represented by the following Formula 1:

[Formula 1]



wherein R₁ is OH or saturated or unsaturated fatty acid group of C12 to C22,

R₂ is saturated fatty acid group of C13 to C22 and

R₃ is H or OH.