【DESCRIPTION】

【TITLE OF THE INVENTION】

COMPOSITION OF ANTI-AGING EXTERNAL APPLICATION SKIN PREPARATION, CONTAINING CYANIDIN-3-O-GLUCOSIDE AND NATTO GUM AS ACTIVE INGREDIENTS

【Technical Field】

The present invention relates to an external use skin preparation composition for anti-aging comprising cyanidin-3-O-glucoside and natto gum as active ingredients. More specifically, the present invention relates to an external use skin preparation composition for anti-aging comprising a mixture of cyanidin-3-O-glucoside and natto gum, thereby exhibiting a collagenase inhibition effect.

【Background Art】

The skin is a primary defense barrier of the human body, which functions to protect various organs in the body from changes in temperature and humidity, and external environmental stimuli such as UV and pollutants, and plays an important role in maintaining homeostasis *in vivo*. However, excessive physical and chemical stimuli from the external environment, stresses, nutritional deficiency and the like deteriorate the normal function of the skin and accelerate skin aging phenomena such

as loss of elasticity, keratinization and wrinkle formation and the like.

To prevent such phenomena and to maintain more healthy and more elastic skin, there have been efforts to manufacture cosmetics containing physiologically active substances obtained from various plants, microorganisms and the like, so as to maintain the intrinsic function of the skin and activate skin cells, thus effectively suppressing skin aging. However, most of the existing cosmetic raw materials have various problems such as exhibiting insufficient effectiveness or inducing skin side effects.

Cyanidin-3-O-glucoside is a type of anthocyanin and is also referred to as chrysanthemin, and it has a structure in which cyanidin is linked by a glycosidic bond to carbon number 3 of glucose. It is a pigment that indicates colors as it is richly contained in fruits such as berries and cereals, and is known to have antioxidant effects. Also, it has been reported recently that cyanidin-3-O-glucoside is effective in preventing cancer or heart diseases (Cooke *et al.*, *International journal of cancer* 119.9 (2006): 2213-2220; Serraino *et al.*, *Life sciences* 73.9 (2003): 1097-1114). However, it is not yet known whether cyanidin-3-O-glucoside has anti-aging effects in maintaining skin elasticity and improving wrinkles by inhibiting the action of collagenase.

Meanwhile, natto gum is a highly viscous substance obtained

when soybeans are fermented into gram-positive bacteria called *Bacillus subtilis*. In recent years, cosmetics containing natto gum having a strong moisturizing effect as well as acting as a thickening agent have been released. However, similarly to cyanidin-3-O-glucoside, it is not yet known whether natto gum has anti-aging effects in maintaining skin elasticity and improving wrinkles by inhibiting the action of collagenase or whether natto gum enhances the antioxidant effects or anti-aging effects of cyanidin-3-O-glucoside.

Accordingly, the present inventors have made extensive efforts to discover a natural substance which can maximize the skin anti-aging effect, and as a result, ~~they~~it was found that an external use skin preparation composition comprising cyanidin-3-O-glucoside and natto gum can inhibit the formation of radicals and effectively suppress the expression of collagenase and thus exhibits excellent antioxidant effects and anti-aging effects, thereby completing the present invention.

[Prior Art Literature]

[Non-Patent Literature]

1. Cooke *et al.*, *International journal of cancer* 119.9 (2006): 2213-2220

2. Serraino *et al.*, *Life sciences* 73.9 (2003): 1097-1114

【DETAILED DESCRIPTION OF THE INVENTION】

【Technical Problem】

It is one object of the present invention to provide an external use skin preparation composition containing cyanidin-3-O-glucoside and natto gum as active ingredients which inhibits the formation of free radicals in the skin and suppresses the expression of collagenase, thereby exhibiting anti-aging effects.

【Technical Solution】

In order to achieve the object above, the present invention provides an external use skin preparation composition for anti-aging comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

The present invention also provides an external use skin preparation composition for improving skin elasticity comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

In addition, the present invention provides an external use skin preparation composition for improving skin wrinkles comprising cyanidin-3-O-glucoside and natto gum as active ingredients

Further, the present invention provides use of cyanidin-3-O-glucoside and natto gum as agents for improving skin elasticity in the preparation of an external use skin preparation composition (in particular, a cosmetic composition or a pharmaceutical composition).

Further, the present invention provides use of cyanidin-3-O-glucoside and natto gum as agents for improving skin wrinkles in the preparation of an external use skin preparation composition (in particular, a cosmetic composition or a pharmaceutical composition).

【ADVANTAGEOUS EFFECTS】

The use of the external use skin preparation composition according to the present invention provides excellent antioxidant effects such as the effective removal of free radicals, which are harmful to the skin, and excellent anti-aging effects such as the strengthening of skin elasticity and the alleviation of skin wrinkles through the inhibition of collagenase expression and activity.

【DETAILED DESCRIPTION OF THE EMBODIMENTS】

Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the technical field to which the present invention belongs. In general, the nomenclatures used herein are those well-known and commonly used in the art.

In an embodiment of the present invention, the inhibitory effect of cyanidin-3-O-glucoside and natto gum on DPPH oxidation was measured by mixing cyanidin-3-O-glucoside and natto gum in

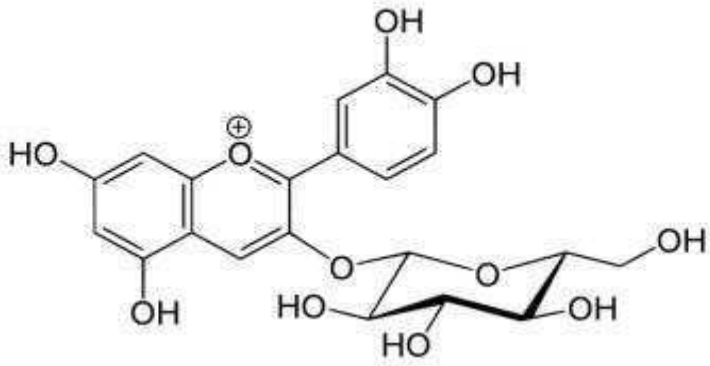
equal amounts, and as a result, it was confirmed that it showed superior antioxidant effects compared to using cyanidin-3-O-glucoside or natto gum alone, or using natto gum in combination with delphinidin-3-O-glucoside, which is another pigment of anthocyanin. In addition, the inhibitory effect of cyanidin-3-O-glucoside and natto gum on collagenase was measured by mixing cyanidin-3-O-glucoside and natto gum in equal amounts or close to equal amounts, and as a result, it was confirmed that it showed superior anti-aging effects compared to using cyanidin-3-O-glucoside or natto gum alone, or using natto gum in combination with delphinidin-3-O-glucoside.

Therefore, in one aspect, the present invention relates to an external use skin preparation composition for anti-aging comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

In addition, in another aspect, the present invention relates to an external use skin preparation composition for improving skin elasticity or improving skin wrinkles comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

The cyanidin-3-O-glucoside of the present invention has a structure represented by Chemical Formula 1 below, and it can be directly extracted from plants rich in cyanidin-3-O-glucoside by using conventional methods in the art and used, or purified cyanidin-3-O-glucoside can be purchased and used.

[Chemical Formula 1]



In the present invention, the natto gum is produced by inoculating activated *Bacillus subtilis* or *Bacillus licheniformis* into soybeans and fermenting the same. The natto gum is a viscous substance produced on the surface of soybeans when *Bacillus subtilis* or *Bacillus licheniformis* are inoculated into soybeans and fermented at a predetermined temperature, and it may be used in the composition of the present invention in the form of powder after purification and crystallization. As the kind of bean to be fermented for the production of natto gum, soybean is most preferable, but not limited thereto.

When a composition, in which natto gum is mixed with cyanidin-3-O-glucoside, is used, it is presumed that the negative charge on polygamma-glutamic acid contained in the natto gum interacts with the positive charge on cyanidin-3-O-glucoside to stabilize the structure of cyanidin-3-O-glucoside, thereby further enhancing antioxidant and anti-aging effects of cyanidin glucoside.

In the present invention, the external use skin preparation composition for anti-aging comprising the

cyanidin-3-O-glucoside and natto gum as active ingredients has a feature in that it exhibits anti-aging effects, in particular, the skin wrinkle-improving effect and skin elasticity-improving effect by suppressing the expression of collagenase which degrades collagen of the skin tissue and thus reduces skin elasticity. In addition, as used herein, “collagen degrading enzyme” and “collagenase” are used interchangeably.

Further, in the present invention, the cyanidin-3-O-glucoside and natto gum may be mixed in the range of about 1:1 to 1:10, preferably about 1:1 to 1:9, preferably about 1:1 to 1:7, more preferably about 1:1 to about 1:5, even more preferably about 1:1 to 1:3, further more preferably 3:2 to 2:3, and further more preferably 5:4 to 4:5, and they may be most preferably mixed in a weight ratio of 1:1. When they are mixed in the weight ratio within the above range, it is appropriate to maximize the inhibitory effect of the cyanidin-3-O-glucoside and natto gum on the expression of collagenase and can satisfy the stability of the composition.

Furthermore, in the present invention, the cyanidin-3-O-glucoside may be contained in an amount of 0.01% to 5% by weight based on the total weight of the composition, and the natto gum may be contained in an amount of 0.01% to 5% by weight based on the total weight of the composition. When the total amount of the two active ingredients is less than 0.02% by weight, the inhibitory effect on the expression of collagenase

is insignificant, and when it exceeds 10% by weight, the viscosity of the composition excessively increases.

When the external use skin preparation composition according to the present invention is formulated in the form of a cosmetic, it may be formulated in the form of a softening cosmetic water, astringent cosmetic water, nourishing cosmetic water, eye cream, nourishing cream, massage cream, cleansing cream, cleansing foam, cleansing water, powder, essence, or facial pack, and the formulation thereof is not particularly limited. Further, the composition according to the present invention may contain additives which are conventionally used in the cosmetic field or the skin science field including fatty substances, organic solvents, solubilizing agents, thickeners, gelling agents, softening agents, antioxidants, suspending agents, stabilizers, foaming agents, fragrant agents, surfactants, water, ionic emulsifying agents or non-ionic emulsifying agents, fillers, sequestering agents, chelating agents, preservatives, vitamins, blockers, wetting agents, essential oils, dyes, pigments, hydrophilic activators or hydrophobic activators, lipid vesicles or any other components commonly used in cosmetics. These additives are contained in amounts which are generally used in the cosmetic field or the skin science field. In addition, the composition of the present invention may contain a skin absorption promoting substance to increase the skin-improving effects.

In addition to the above-mentioned substances, the external use skin preparation composition according to the present invention may include other components within a range that does not impair the main effect, preferably which can exert a synergistic effect on the main effect. Further, the external use skin preparation composition according to the present invention may further include moisturizers, emollients, ultraviolet absorbers, preservatives, disinfectants, antioxidants, pH adjusters, organic dyes or inorganic dyes, flavoring agents, cooling agents or antiperspirants. The mixing amount of the above components can be easily selected by a person skilled in the art within a range that does not impair the objects and effects of the present invention, and the mixing amount may be 0.01% to 5% by weight, specifically, 0.01% to 3% by weight based on the total weight of the composition.

【DETAILED DESCRIPTION OF THE EMBODIMENTS】

The present invention will be described in detail by way of examples. However, it will be apparent to those skilled in the art that these examples are given for illustrative purposes only, and are not intended to limit the scope of the invention thereto. Therefore, the substantial scope of the present invention will be defined by the accompanying claims and their equivalents

[Reference Example 1]

Cyanidin-3-O-glucoside for testing the efficacy of the composition of the present invention was purchased from Sigma and used.

[Reference Example 2]

As a Comparative Example of the composition of the present invention, delphinidin-3-O-glucoside, which is a type of anthocyanin, was purchased from Sigma and used.

[Reference Example 3]

Natto gum for testing the efficacy of the composition of the present invention was prepared and used as follows:

(1) Heat sterilization process:

Soybeans were soaked in water for about 10 to 15 hours, washed thoroughly with ionized water (primary distilled water), and subjected to heat sterilization in an autoclave in a temperature range of 100°C to 121°C for about 2 hours.

(2) Culturing process:

The sterilized soybeans were cooled to 40°C, and the activated inoculum of *Bacillus subtilis* was inoculated to 5 to 10% of the total soybean mass and then cultured at 35°C to 40°C for about 36 hours. The *Bacillus subtilis* inoculated at 1×10^7 cells/㎖ to 1×10^8 cells/㎖ in a nutrient broth at a concentration of 8 g/ℓ was used as the inoculum.

(3) Extraction and purification processes:

An appropriate amount of ionized water was added to the cultured soybean culture medium, and the mixture was sufficiently stirred to allow the viscous material on the surface of the soybeans to be dissolved in the ionized water and then filtered to obtain a transparent extract.

(4) Crystallization process:

An appropriate amount of a solvent such as methanol, ethanol, acetone and the like was added to the transparent extract to reduce the solubility in water to obtain a white precipitate. Then, the solvent contained in the thus-obtained precipitate was dried by evaporation to obtain natto gum powder.

[Preparation of Examples 1 to 3 and Comparative Examples 1 to 3]

Examples 1 to 3 were prepared by mixing the cyanidin-3-O-glucoside of Reference Example 1 and the natto gum prepared in Reference Example 3 in the weight ratios shown in the following Table 1, and the total weight was the same for all.

In addition, as Comparative Examples for the Examples 1 to 3, Comparative Examples 1 to 3 were prepared by mixing the delphinidin-3-O-glucoside of Reference Example 2 and the natto gum prepared in Reference Example 3 in the weight ratios shown in the following Table 1, and the total weight was the same as those in Examples 1 to 3.

【Table 1】

(Unit: wt%)

	Example 1	Example 2	Example 3	Comparative Example 1	Comparative Example 2	Comparative Example 3
Cyanidin-3-O-glucoside	50	25	10	-	-	-
Delphinidin-3-O-glucoside	-	-	-	50	25	10
Natto gum	50	75	90	50	75	90
Total	100	100	100	100	100	100

[Test Example 1] Test of antioxidant potency

To investigate the antioxidant effect of Examples 1 to 3 which are mixtures of cyanidin-3-O-glucoside and natto gum, the inhibitory effect of cyanidin-3-O-glucoside alone, natto gum alone, and Comparative Examples 1 to 3 in which delphinidin-3-O-glucoside and natto gum were mixed, on DPPH oxidation was measured by the change in the absorbance generated by the reduction of DPPH (1,1-diphenyl-2-picryl hydrazyl) and compared.

Cyanidin-3-O-glucoside (Reference Example 1), natto gum (Reference Example 3), Examples 1 to 3, Comparative Examples 1 to 3, and trolox which is a synthetic antioxidant(positive control), were mixed with 190 μl of a 100 μM (in ethanol) DPPH solution and prepared to the same concentration of 10,000 ppm each. The mixture was diluted to a final reaction concentration

of 500 ppm, 250 ppm, 125 ppm, 62.5 ppm, 31.25 ppm, and 15.63 ppm, respectively, and 10 μl of each mixture was added to make a reaction solution and then reacted at 37°C for 30 minutes, and absorbance was measured at 540 nm. The results of the analysis are shown in Table 2 below, and the IC_{50} means a sample concentration when the absorbance is reduced by 50% by the added sample.

【Table 2】

Test substances	IC_{50}(ppm)
Trolox (positive control)	43.3
Cyanidin-3-O-glucoside	231.5
Delphinidin-3-O-glucoside	287.5
Natto gum	Not effective
Example 1	39.2
Example 2	108.5
Example 3	203.7
Comparative Example 1	58.6
Comparative Example 2	143.5
Comparative Example 3	255.8

As shown in Table 2, when the natto gum was used alone, there was substantially no antioxidant effect. However, Example 1 in which the cyanidin-3-O-glucoside and natto gum were mixed in a weight ratio of 1:1 showed a IC_{50} value similar to that of Trolox, indicating that it had a much superior antioxidant effect compared to when the cyanidin-3-O-glucoside was used alone. In addition, in the cases of Example 2 in which the cyanidin-3-O-glucoside and natto gum were mixed in a weight ratio

of 1:3 and Example 3 in which the cyanidin-3-O-glucoside and natto gum were mixed in a weight ratio of 1:9, the antioxidant effect was not as superior as that of Example 1 having a weight ratio of 1:1, but the effect was much superior compared to when the cyanidin-3-O-glucoside was used alone. Further, Examples 1 to 3 had a superior antioxidant effect compared to Comparative Examples 1 to 3, in which delphinidin-3-O-glucoside was mixed with natto gum in place of cyanidin-3-O-glucoside in an equivalent amount. Thus, it was confirmed that the composition of the present invention has excellent antioxidant effects.

[Test Example 2] Test of anti-aging potency

In order to investigate the anti-aging effects of Examples 1 to 3, which are mixtures of cyanidin-3-O-glucoside and natto gum, the inhibitory ability of cyanidin-3-O-glucoside alone, natto gum alone, and Comparative Examples 1 to 3 in which delphinidin-3-O-glucoside and natto gum were mixed, on the collagenase production was each measured by comparison with tocopherol or EGCG. Tocopherol and EGCG are substances known to function in preventing skin aging by regenerating epidermal cells of the skin.

Human fibroblasts (manufactured by Cascade Biologics) (Portland, OR, USA) were seeded at 5,000 cells/well in a 96-well microtiter plate containing DMEM medium containing 2.5% by weight of fetal bovine serum, and cultured until it grew to about 90%.

Thereafter, the cells were cultured in serum-free DMEM for 24 hours, then treated with 10μg of the cyanidin-3-O-glucoside (Reference Example 1), natto gum (Reference Example 2), Examples 1 to 3, Comparative Examples 1 to 3 dissolved in the serum-free DMEM at the same concentration of 50 ppm for 24 hours and then treated with tocopherol and EGCG (manufactured by Sigma Aldrich) each at a concentration of 50μM for 24 hours. And, then the cell culture medium was collected.

Subsequently, the production level of collagenase in the collected cell culture medium was measured using a collagenase measurement device (Amersham Pharmacia, USA). First, the cell culture medium collected was added to a 96-well plate uniformly coated with primary collagenase antibodies, and the antigen-antibody reaction was carried out in a thermostat(36°C) for 3 hours.

After 3 hours, secondary collagenase antibodies bound to a chromophore was added to the 96-well plate and reacted for another 15 minutes. After 15 minutes, a color development-inducing substance was added to carry out a color development at room temperature for 15 minutes, and when 1 M sulfuric acid was added again to stop the reaction (color development), the color of the reaction solution appeared yellow, and it was confirmed that the degree of yellow color was different depending on the progress of the reaction.

The absorbance of the 96-well plate appearing in yellow

was measured at 450 nm using an absorptiometer, and the degree of collagenase synthesis was calculated by Calculation Equation 1 below. Herein, the reaction absorbance of the cell culture medium collected from the group in which no composition was treated was used as a control. That is, the expression level of collagenase in the untreated group was set to 100, and the expression level of collagenase in the groups treated with the test substances was determined relatively. The results are shown in Table 3 below.

【Calculation Equation 1】

$$\text{Expression level of collagenase (\%)} = \frac{\text{Absorbance of test substance-treated cell group}}{\text{Absorbance of control group}} \times 100$$

【Table 3】

Test substances	Expression level of collagenase (%)
Untreated group	100
Tocopherol	73
EGCG	59
Cyanidin-3-O-glucoside	78
delphinidin-3-O-glucoside	84
Natto gum	94
Example 1	51
Example 2	67
Example 3	75

Comparative Example 1	61
Comparative Example 2	73
Comparative Example 3	80

As shown in Table 3, when the natto gum was used alone, the expression of collagenase was hardly inhibited. However, Example 1 in which the cyanidin-3-O-glucoside and natto gum were mixed in a weight ratio of 1:1 effectively inhibited the expression of collagenase *in vitro* compared to when the cyanidin-3-O-glucoside was used alone, and had an excellent inhibitory ability on the expression of collagenase compared to tocopherol and EGCG, which are known as anti-aging substances. In addition, in the cases of Example 2 in which the cyanidin-3-O-glucoside and natto gum were mixed in a weight ratio of 1:3, and Example 3 in which the cyanidin-3-O-glucoside and natto gum were mixed in a weight ratio of 1:9, the inhibitory effect on the expression of collagenase was not as superior as that of Example 1 having a weight ratio of 1:1, but the effect was much superior compared to when the cyanidin-3-O-glucoside was used alone. Further, Examples 1 to 3 had a superior inhibitory effect on the expression of collagenase compared to Comparative Examples 1 to 3, in which delphinidin-3-O-glucoside was mixed with natto gum in place of cyanidin-3-O-glucoside in an equivalent amount. Thus, it was confirmed that the composition of the present invention had excellent anti-aging effects, in particular, the skin elasticity-improving and skin wrinkle-improving effects by the inhibition of collagenase

expression.

Although specific parts of the present invention have been described in detail, it will be apparent to those skilled in the art that these specific techniques are merely a preferred embodiment and that the scope of the present invention is not limited thereto. Therefore, the substantial scope of the present invention will be defined by the accompanying claims and their equivalents.

In addition, Formulation Examples of the external use skin preparation compositions including the composition of the present invention will be described in more detail below. However, it will be apparent that the scope of the present invention is not limited thereto

[Formulation Example 1] Nourishing cosmetic water

A nourishing cosmetic water was prepared in a conventional manner according to the composition shown in Table 4 below (unit: wt%).

【Table 4】

Ingredients	Amount
Purified water	Residual amount
Glycerin	8.0
Butylene glycol	4.0
Hyaluronic acid extract	5.0

Beta glucan	7.0
Carbomer	0.1
Cyanidin-3-O-glucoside and natto gum (Example 1)	0.05
Caprylic/capric triglyceride	8.0
Squalene	5.0
Cetearyl glucoside	1.5
Sorbitan stearate	0.4
Cetearyl alcohol	1.0
Triethanolamine	0.1

[Formulation Example 2] Nourishing cream

A nourishing cream was prepared in a conventional manner according to the composition shown in Table 5 below (unit: wt%).

【Table 5】

Ingredients	Amount
Purified water	Residual amount
Glycerin	3.0
Butylene glycol	3.0
Liquid paraffin	7.0
Beta glucan	7.0
Carbomer	0.1
Cyanidin-3-O-glucoside and natto gum (Example 1)	3.0
Caprylic/capric triglyceride	3.0
Squalene	5.0
Cetearyl glucoside	1.5
Sorbitan stearate	0.4

Polysorbate 60	1.2
Triethanolamine	0.1

[Formulation Example 3] Massage cream

A massage cream was prepared in a conventional manner according to the composition shown in Table 6 below (unit: wt%).

【Table 6】

Ingredients	Amount
Purified water	Residual amount
Glycerin	8.0
Butylene glycol	4.0
Liquid paraffin	45.0
Beta glucan	7.0
Carbomer	0.1
Cyanidin-3-O-glucoside and natto gum (Example 1)	1.0
Caprylic/capric triglyceride	3.0
Beeswax	4.0
Cetearyl glucoside	1.5
Sorbitan Sesquioleate	0.9
Vaseline	3.0
Paraffin	1.5

[Formulation Example 4] Facial pack

A facial pack was prepared in a conventional manner according to the composition shown in Table 7 below (unit: wt%).

【Table 7】

Ingredients	Amount
Purified water	Residual amount
Glycerin	4.0
Polyvinyl alcohol	15.0
Hyaluronic acid extract	5.0
Beta glucan	7.0
Allantoin	0.1
Cyanidin-3-O-glucoside and natto gum (Example 1)	0.5
Nonylphenyl ether	0.4
Polysorbate 60	1.2
Ethanol	6.0

[Formulation Example 5] Ointment in external use skin preparation

An ointment was prepared in a conventional manner according to the composition shown in Table 8 below (unit: wt%).

【Table 8】

Ingredients	Amount
Purified water	Residual amount
Glycerin	8.0
Butylene glycol	4.0
Liquid paraffin	15.0
Beta glucan	7.0

Carbomer	0.1
Cyanidin-3-O-glucoside and natto gum (Example 1)	1.0
Caprylic/capric triglyceride	3.0
Squalene	1.0
Cetearyl glucoside	1.5
Sorbitan stearate	0.4
Cetearyl alcohol	1.0
Beeswax	4.0

【CLAIMS】

【Claim 1】

An external use skin preparation composition for anti-aging comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

【Claim 2】

An external use skin preparation composition for improving skin elasticity comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

【Claim 3】

An external use skin preparation composition for improving skin wrinkles comprising cyanidin-3-O-glucoside and natto gum as active ingredients.

【Claim 4】

An external use skin preparation composition of any one of claims 1 to 3, wherein the natto gum is produced by inoculating activated *Bacillus subtilis* or *Bacillus licheniformis* into soybeans and fermenting the same.

【Claim 5】

The external use skin preparation composition of any one of claims 1 to 3, wherein the composition exhibits an anti-aging effect by inhibiting the expression of collagenase.

【Claim 6】

The external use skin preparation composition of any one of claims 1 to 3, wherein the cyanidin-3-O-glucoside and natto

gum are mixed in a weight ratio of 1:1 to 1:10.

【Claim 7】

The external use skin preparation composition of any one of claims 1 to 3, wherein the cyanidin-3-O-glucoside is contained in an amount of 0.01% to 5% by weight based on the total weight of the composition, and the natto gum is contained in an amount of 0.01% to 5% by weight based on the total weight of the composition.

【Claim 8】

The external use skin preparation composition of any one of claims 1 to 3, wherein when the external use skin preparation composition is formulated in the form of a cosmetic, it is formulated into any one form selected from the group consisting of softening cosmetic water, astringent cosmetic water, nourishing cosmetic water, eye cream, nourishing cream, massage cream, cleansing cream, cleansing foam, cleansing water, powder, essence, or facial pack.

【Claim 9】

Use of cyanidin-3-O-glucoside and natto gum as agents for improving skin elasticity in the preparation of an external use skin preparation composition.

【Claim 10】

Use of cyanidin-3-O-glucoside and natto gum as agents for improving skin wrinkles in the preparation of an external use skin preparation composition.