# DESCRIPTION

## COSMETIC COMPOSITION CONTAINING GULFWEED EXTRACT, SEA STAGHORN EXTRACT, AND BROWN SEAWEED EXTRACT

### Technical Field

The present invention relates to a cosmetic composition containing a gulfweed extract, a sea staghorn extract and a brown seaweed extract as active ingredients, and more particularly to a cosmetic composition containing, as an active ingredient, at least one selected from the group consisting of a gulfweed extract, a sea staghorn extract and a brown seaweed extract, which have an excellent antioxidant effect and excellent effects of improving skin elasticity and reducing skin wrinkles.

### Background Art

The skin is composed of three layers: the outer epidermis, the middle dermis and the inner subcutaneous tissue. The skin functions to protect the body from external physical and chemical influences. Particularly, the skin regulates the evaporation of water from the body having a water content of about 65-70%. The epidermis of the skin is composed of a horny layer, a granular layer, a squamous layer, and a basal layer in order from top to bottom. The horny layer of the epidermis has a water content of about 10-20%, forms the outermost layer of the skin, and functions to inhibit the evaporation of water from the body while preventing excessive penetration of external substances (*J. Invest. Dermatol. 80(Suppl.), 44-49. 1983*). The dermis of the skin is composed of a papillary layer and a reticular layer. The papillary layer is made of connective tissue that includes tough collagenous fibers and elastic fibers, which makes the skin tough and elastic, and thus it plays a crucial role in skin elasticity (wrinkles). The subcutaneous tissue of the skin is a layer made of connective layer and is sometimes called the fat tissue layer. The subcutaneous tissue is mainly made of loose connective tissue distributed in the subcutaneous fat layer, and adipocytes in the subcutaneous tissue function to store heat and as a buffer.

The causes of skin aging are largely classified into two categories: intrinsic aging and extrinsic aging. Intrinsic aging occurs naturally with increasing age. Extrinsic aging refers to skin damage resulting from long-term exposure to sunlight and includes photo-aging, and aging caused by reactive oxygen species. When the horny layer is damaged by the UV radiation of sunlight, the over-proliferation of cells in the horny layer occurs, and as a result, the thickness of the horny layer increases while photo-aging occurs. Further, due to skin damage caused by UV radiation, the collagen production ability of the dermal layer decreases, and as a result, the dermal layer becomes gradually thinner so that thicker and deeper wrinkles than those caused by intrinsic aging are produced. It is well known from many studies that reactive oxygen species (ROS) are involved in skin aging. The free radical theory of aging was proposed by Harman in 1956, and according to this theory, various reactive oxygen species produced during normal metabolic processes cause cumulative oxidative damage, resulting in aging and death. A living body has the ability to protect itself against damage caused by reactive oxygen species, but the protection is not complete, and thus the body is damaged by some reactive oxygen species. This cumulative oxidative damage occurs slowly and chronically over a period of several years or throughout the life in some cases to reduce the functions of skin cells or tissues, resulting in disease and aging. As the consumer's desire to look younger and the demand for functional cosmetic products increased, studies on cosmetic products for improving skin elasticity and reducing skin wrinkles have been actively conducted.

Generally, cosmetic products aim to keep the body clean, make the skin beautiful and attractive and protect the skin or hair from UV radiation or a dry environment to prevent aging. Recently, with the development of industrial society and an increase in social activity, the consciousness to positively express oneself has increased, and the desire to keep the skin beautiful and healthy using cosmetic products greatly increased. Thus, skin care and makeup cosmetic products of various types and formulations have been studied and developed, and among them, cosmetic products for improving skin elasticity and reducing skin wrinkles have been recognized as the most important products.

Accordingly, various cosmetic raw materials for improving skin elasticity and reducing skin wrinkles have been developed, and natural plant-derived raw materials have recently received a great deal of attention compared to animal-derived raw materials. Extracts from seaweeds which keep vitality in an extreme marine environment and contain large amounts of good nutrients are believed to show more potent effects and have a high consumer preference. In fact, seaweeds which are used as foods are excellent sources of vitamins and minerals, and thus it is believed that, when these seaweeds are applied to the skin, the effects thereof can be transferred directly to the skin.

## Disclosure

### Technical Problem

Accordingly, the present inventors have conducted extensive studies on the effects of seaweed extracts on the skin, and as a result, have found that a gulfweed extract, a sea staghorn extract and a brown seaweed extract have the effects of reducing oxidative stress in the skin and reducing skin wrinkles, thereby completing the present invention.

Therefore, it is an object of the present invention to provide a cosmetic composition which has an antioxidant effect and excellent effects of improving skin elasticity and reducing skin wrinkles.

### Technical Solution

In order to accomplish the above object, the present invention provides a cosmetic composition for providing antioxidant protection to the skin, improving skin elasticity and reducing skin wrinkles, the composition containing a gulfweed extract, a sea staghorn extract and a brown seaweed extract as active ingredients.

### Advantageous Effects

The cosmetic composition of the present invention contains a gulfweed extract, a sea

staghorn extract and a brown seaweed extract, which enhance antioxidant activity in the skin and have excellent effects of improving skin elasticity and reducing skin wrinkles.

**Description of Drawings**

FIG. 1 is a graphic diagram showing the effects of a gulfweed extract, a sea staghorn extract and a brown seaweed extract, which are used in the present invention, on the protection of keratinocytes from UV-induced damage.

**Best Mode**

A cosmetic composition according to the present invention contains, as an active ingredient, at least one selected from the group consisting of a gulfweed extract, a sea staghorn extract and a brown seaweed extract.

Hereinafter, the present invention will be described in further detail.

Gulfweed (*Sargassum fulvellum*) which is used as an active ingredient in the cosmetic composition of the present invention has roots, stems and leaves, which are clearly distinguished from each other, and the roots are holdfast. Gulfweed has one main branch and grows over 1-3 m. The stems are pillar or triangular in shape and twist. The leaves grow from the stem toward the base and twist. Also, the leaves are wooden spoon-shaped or oval shaped and have mid veins. The upper leaves are lancet-shaped and have sawtooth-shaped protrusions at the edges, and bubbles are formed from the stem of the body. Gulfweed is deep yellowish brown in color and is distributed in the seashores in Korea. Gulfweed contains, as main components, alginic acid, chlorophyll a-c, β-carotene, fucoxanthin, laminarin and mannitol. Gulfweed has very low dietary fiber and fat contents when analyzed in an unprocessed state, but has a dietary fiber and fat content of 30% or more when analyzed in a state processed into powder. The content of dietary fiber in gulfweed is higher than the content of carbohydrates. In Korea, many species of the genus *Sargassum* are used as foods and are also used for the production of alginic acid and the like in the industrial field or as fertilizers. Alginic acid is known to help in the digestive process of the

stomach, help in bowel movement to reduce constipation, and is effective for the prevention of colorectal cancer. Gulfweed is effective against hypertension and osteoporosis due to its high mineral content and is effective against thyroid dysfunctions due to its high iodine content.

Sea staghorn (*Codium fragile*) which is used as an active ingredient in the cosmetic composition of the present invention has smooth feeling, is dark blue in color, and is plain in taste to improve the taste of Kimchi, as recorded in JaSanEoBo (the Korean fisheries science book written by the scholar Jeong Yak-Jeon), suggesting that sea staghorn has been used as a material for improving the taste of Kimchi. Sea staghorn is known as Miru in Japanese, which means a pine living in the sea. It has a height of 10-30 cm and a thickness of 1.5-3 mm, and the lower portion thereof is slightly thicker than the upper portion. The branches are split like an antler, grow straight and reach the same height to form a fan shape. The surface is soft like cotton flannel, and colorless and transparent thread-like tissues are irregularly entangled as can be seen with a microscope. Young sea staghorn has hair at the fore part, particularly the upper part, but the hair is removed with the passage of time, leaving a mark. All the parts of the body of sea staghorn are connected to each other without having a membrane between cells so that several cell nuclei are contained in one cell. Sacks containing spores are club-shaped, the length is 5-7 times the thickness, and the top is pointed. Sea staghorn has a high dietary fiber content and contains large amounts of minerals, including calcium, iron, vitamin A, vitamin C, and niacin.

Brown seaweed (*Undaria pinnatifida*) which is used in the cosmetic composition of the present invention is a thalloid plant whose root, stem and leaf are clearly distinguished from each other. Brown seaweed is distributed in all the coasts in Korea, but is not distributed in areas which are strongly influenced by cold and warm currents. It lives on rocks near the low-water line, but tends to live in deep water in the southern district of Korea and in shallow water in the northern district. It is collected mainly during the period from winter to spring and has the best taste during this period. It propagates during the period from spring to summer. It is main feed for ear shells and conches and is used for edible purposes in Korea, Japan, China and the like. It is rich in dietary fiber, potassium, calcium, iodine and the like, activates metabolism and has excellent effects on

postnatal care, the prevention of constipation and obesity and the supplement of iron and calcium. Thanks to such advantages, brown seaweed has been long ago. There is a record that brown seaweed was exported to China from the Goryeo period. Goryeo Dogyeong (a book about the Goryeo Dynasty written by a Chinese scholar) describes that "brown seaweed is frequently taken irrespective of rank. It is salty in taste and smells fishy, but is good to eat if it is taken for a long period of time". Also, Goryeosa (a compilation on the history of Goryeo) describes that King Munjong, the 11$^{th}$ king of Goryeo, granted a place for collecting brown seaweed in the year 1058. King Chungsun, the 26$^{th}$ king of Goryeo, gave brown seaweed to the Empress Dowager of the Yuan Dynasty in the year 1301." Also, Donguibogam (a medical encyclopedia compiled during the Joseon Kingdom) describes that brown seaweed is cold in nature, salty in taste and non-poisonous. It reduces fever, eliminates oppression, treats "Ki" and promotes urination. Dried brown seaweed contains 12.7% protein, 52% carbohydrate, 1.1% fat, 1300 mg% Ca, 140 IU vitamin A, 0.11 mg% vitamin B1, 0.14 mg% vitamin B2, 10 mg% nicotinic acid, and 15 mg% vitamin C. Brown seaweed has a high calcium content comparable to that of powdered milk, contains 100 mg% iodine and is strongly alkaline food. Also, brown seaweed contains alginic acid as a viscous substance, and the content of alginic acid is lower in the root than the leaf or the stem. Main carotenoid pigments in brown seaweed include fucoxanthine, violaxanthine, lutein, and β-carotene.

The gulfweed extract, sea staghorn extract and brown seaweed extract of the present invention can be prepared according to a conventional method known in the art. For example, these extracts can be prepared by distilling each of freeze-dried gulfweed, sea staghorn and brown seaweed with steam, extracting the distillation products using glycerin as a solvent, and purifying the extracts.

The cosmetic composition of the present invention contains each of the gulfweed extract, the sea staghorn extract and the brown seaweed extract in an amount of 0.001-30 wt% based on the total weight of the composition. If the content of each extract in the cosmetic composition is less than 0.001 wt%, the composition will have no distinct effect, and if the content is more than 30

wt%, an increase in the content will not lead to a distinct increase in effects.

When the cosmetic composition of the present invention contains a mixture of the gulfweed extract, the sea staghorn extract and the brown seaweed extract, the effects of providing antioxidant protection to the skin, reducing skin wrinkles and improving skin elasticity can further be increased. Also, when the cosmetic composition of the present invention contains a mixture of the gulfweed extract, the sea staghorn extract and the brown seaweed extract, the active ingredients will show synergistic effects, and thus the effects of providing antioxidant protection to the skin, reducing skin wrinkles and improving skin elasticity will be significantly increased.

The cosmetic composition for skin external application according to the present invention contains a cosmetically and skin-scientifically acceptable medium and/or base. The cosmetic composition may be provided in any form for topical application. For example, the cosmetic composition may be provided in the form of solution, gel, solid or pasty anhydrous product, oil-in-water emulsion, suspension, microemulsion, microcapsule, microgranule, or ionic (liposome) and/or non-ionic vesicle dispersion. Alternatively, it may be provided in the form of cream, skin, lotion, powder, ointment, spray, or conceal stick. In addition, the composition for skin external application according to the present invention may be prepared according to a conventional method known in the art. Further, the cosmetic composition for skin external composition according to the present invention may also be used in the form of a foam composition or an aerosol composition further containing a compressed propellant.

The cosmetic composition for skin external application according to the present invention may contain additives which are generally used in the cosmetic field or the skin science field, for example, fatty substance, organic solvent, solubilizing agent, thickener, gelling agent, softener, antioxidant, suspending agent, stabilizer, foaming agent, fragrance, surfactant, water, ionic or non-ionic emulsifying agent, filler, metal ion sequestering agent, metal ion chelating agent, preservative, vitamins, blocker, wetting agent, essential oil, dye, pigment, hydrophilic or hydrophobic activator, lipid vesicle, or other components which are generally used in the cosmetic field or the skin science field. These additives are introduced in amounts which are generally used

in the cosmetic field or the skin science field.

**Mode for Invention**

Hereinafter, the present invention will be described in further detail with reference to examples and test examples, but the scope of the present invention is not limited to these examples.

Preparation Example 1: Preparation of gulfweed extract

1 kg of freeze-dried gulfweed was distilled with steam for 12 hours, and the distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Preparation Example 2: Preparation of sea staghorn extract

1 kg of freeze-dried sea staghorn was distilled with steam for 12 hours, and the distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Preparation Example 3: Preparation of brown seaweed

1 kg of freeze-dried brown seaweed was distilled with steam for 12 hours, and the distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Preparation Example 4: Preparation of extract of mixture of gulfweed, sea staghorn and brown seaweed

Freeze-dried gulfweed, sea staghorn and brown seaweed were mixed with each other at a weight ratio of 1:1:1 and distilled with steam for 12 hours. The distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Preparation Example 5: Preparation of extract of mixture of gulfweed and sea staghorn

Freeze-dried gulfweed and sea staghorn were mixed with each other at a weight ratio of 1:1 and distilled with steam for 12 hours. The distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Preparation Example 6: Preparation of extract of mixture of gulfweed and brown seaweed

Freeze-dried gulfweed and brown seaweed were mixed with each other at a weight ratio of 1:1 and distilled with steam for 12 hours. The distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Preparation Example 7: Preparation of extract of mixture of sea staghorn and brown seaweed

Freeze-dried sea staghorn and brown seaweed were mixed with each other at a weight ratio of 1:1 and distilled with steam for 12 hours. The distillation product was macerated in 70% glycerin at 4 ℃ for 7 days, and then purified.

Test Example 1: Effect on protection from UV-induced cell damage

Keratinocytes isolated from human epidermal tissue were added to each well of a 96-well cell culture plate at a density of $1\times10^4$ cells per well and attached for 24 hours. After 18 hours, the medium was removed and 50 ㎕ of phosphate buffered saline (PBS) was added to each well. The keratinocytes were irradiated with 30 mJ/㎠ of UV light from a UV-B lamp (Model: F15T8, UV B 15W, Sankyo Dennki, Japan), after which PBS was removed and 200 ㎕ of keratinocyte growth media (Clonetics, BioWhittaker, MD, USA) was added to each well. Then, the cells were treated with each of the gulfweed extract, sea staghorn extract, brown seaweed extract and mixed extracts prepared in Preparation Examples 1 to 7 and were cultured for 20 hours. After a specific amount of time, a suitable amount of the culture supernatant was collected and the amount of lactate dehydrogenase (LDH) indicative of cell damage was quantified for 20 hours. The amount of LDH in the culture supernatant was measured using Cytotox 96 non-radioactive cytotoxicity assay™ kit (Promega, Madison, WI, USA). The LDH secretion (%) could be obtained by calculating the value of each group relative to the vehicle control group taken as 100, and the results of the calculation are shown in FIG. 1.

As can be seen in FIG. 1, the results of comparison between the group treated with each of the gulfweed extract, the sea staghorn extract and the brown seaweed extract and the group treated with the extract of the mixture of two or more of gulfweed, sea staghorn and brown seaweed indicated that treatment with each of the gulfweed extract, the sea staghorn extract and the brown

seaweed extract could somewhat inhibit the increase in LDH caused by UV-induced damage to the human keratinocytes, but treatment with the extract of the mixture of two or more of the active ingredients more significantly inhibited the increase in LDH. Particularly, the LDH level of the cells treated with the extract of the mixture of gulfweed, sea staghorn and brown seaweed was reduced to the level similar to that of the control group (vehicle) not treated with UV light.

Therefore, it was found that the gulfweed extract, sea staghorn extract and brown seaweed extract of the present invention have excellent effects of protecting skin cells from external stimuli such as UV radiation.

Examples 1 to 7 and Comparative Example 1

According to the compositions shown in Table 1 below, cream formulations of Examples 1 to 7 and Comparative Example 1 were prepared.

Table 1 (unit: wt%)

| | Components | Example 1 | Example 2 | Example 3 | Example 4 | Example 5 | Example 6 | Example 7 | Comparative Example 1 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Preparation Example 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Preparation Example 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Preparation Example 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4 | Preparation Example 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 5 | Preparation Example 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 6 | Preparation Example 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 7 | Preparation Example 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 8 | Purified water | balance | balance | balance | balance | balance | balance | balance | balance |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Glycerin | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 10 | Butylene glycol | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 11 | Hyaluronic acid extract | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 12 | Beta-glucan | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 13 | Carbomer | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 14 | Triethanolamine | q.s. | q.s. | q.s. | q.s. | q.s. | q.s. | q.s. | q.s. |
| 15 | caprylic/capric triglyceride | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 16 | Squalane | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 17 | Cetearyl glucoside | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| 18 | Sorbitan stearate | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 19 | Cetearyl alcohol | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 20 | Preservative | q.s. | q.s. | q.s. | q.s. | q.s. | q.s. | q.s. | q.s. |

Method for preparation of cream formulations of Examples 1 to 7 and Comparative Example 1

1) Components (1) to (12) in Table 1 above were uniformly mixed with heating to 70 ℃ to prepare an aqueous phase part.

2) Components (15) to (20) were uniformly mixed with heating to 70 ℃ to prepare an oil phase part.

3) The oil phase part of step 2) was added to the aqueous phase part of step 1) and homogeneously mixed at 7,200 rpm for 6 minutes.

4) The mixture of step 3) was cooled to room temperature.

Test Example 2: Effect on improvement in skin elasticity

In order to test the effect of improving the elasticity of human skin, the formulations of Examples 1 to 7 and Comparative Example 1 were tested in the following manner. Each of the formulations was applied to the face of each of twenty 25-35 years old women twice (morning and evening) a day for 8 weeks, and then the effect of improving skin elasticity was measured using Cutometer SEM 575 (C+K Electronic Co., Germany), and the results of the measurement are

shown in Table 2 below. The values in Table 2 are the viscoelasticities measured by the Cutometer SEM 575.

Table 2: Effects on improvement in skin elasticity

| Test material | Effect on skin elasticity |
|---|---|
| Example 1 | 0.31±0.10 |
| Example 2 | 0.27±0.10 |
| Example 3 | 0.37±0.10 |
| Example 4 | 0.49±0.10 |
| Example 5 | 0.33±0.10 |
| Example 6 | 0.40±0.10 |
| Example 7 | 0.41±0.10 |
| Comparative Example 1 | 0.22±0.09 |

As can be seen from the results in Table 2 above, the group treated with each of the gulfweed extract, the sea staghorn extract and the brown seaweed extract showed increased skin elasticity, and the skin elasticity of the group treated with the extract of the mixture of two or more of gulfweed, sea staghorn and brown seaweed was further improved. Particularly, the group treated with the extract of the mixture of gulfweed, sea staghorn and brown showed the highest skin elasticity.

Therefore, it was found that the gulfweed extract, sea staghorn extract and brown seaweed extract of the present invention have excellent effects of improving skin elasticity.

Test Example 3: Effects on stimulation of collagen production

For the comparison of the ability to produce collagen, a negative control (untreated) and vitamin C as a positive control were used. Using fibroblast cell line hs68, the ability to produce type 1 procollagen and the ability to inhibit collagenase synthesis were measured.

Fibroblasts were added and attached to a FALCON 48-well plate at a density of $5\times10^4$/well, and then treated with 1 ppm of each of the gulfweed extract, the sea staghorn extract, the brown seaweed extract or the mixture of two or more thereof. The cells were cultured for 24

hours, and then the production of type 1 procollagen in the culture supernatant was measured using a type 1 pN collagen EIA kit. The production of type 1 procollagen was normalized by the total amount of protein and compared between the control group and the test groups. The results of the measurement are shown in Table 3 below.

Table 3

| Groups | Collagen production |
|---|---|
| Vitamin C | 27.8% increase |
| Gulfweed extract | 15.2% increase |
| Sea staghorn extract | 11.5% increase |
| Brown seaweed extract | 18.1% increase |
| Extract of mixture of gulfweed and sea staghorn | 15.2% increase |
| Extract of mixture of gulfweed and brown seaweed | 20.4% increase |
| Extract of mixture of sea staghorn and brown seaweed | 19.2% increase |
| Extract of mixture of gulfweed, sea staghorn and brown seaweed | 22.9% increase |

As can be seen from the results in Table 3 above, the group treated with each of the gulfweed extract, the sea staghorn extract and the brown seaweed extract showed increased collagen production, and the production of collagen in the group treated with the extract of the mixture of two or more of gulfweed, sea staghorn and brown seaweed was further increased. Particularly, the group treated with the extract of the mixture of gulfweed, sea staghorn and brown showed the highest collagen production.

Therefore, it was found that the gulfweed extract, sea staghorn extract and brown seaweed extract of the present invention have excellent effects of reducing skin wrinkles by stimulating collagen production.

Test Example 4: Effect on inhibition of collagenase synthesis

In order to measure the ability to inhibit collagenase synthesis, a negative control (untreated) and retinoic acid as a positive control were used.

Fibroblasts were added and attached to a FALCON 48-well plate at a density of $5\times10^4$/well, and then irradiated with 15 mJ/㎠ of UVB. Then, the cells were treated with 1 ppm of each of the gulfweed extract, the sea staghorn extract, the brown seaweed extract or the mixture of two or more thereof. The cells were cultured for 24 hours, and then the production of MMP-1 (matrix metalloproteinases-1; a kind of collagenase) in the culture supernatant was measured using an MMP-1 ELISA kit. The amount of MMP-1 was normalized by the total amount of protein, and the results of the measurement are shown in Table 4 below.

Table 4

| Groups | MMP-1 synthesis |
|---|---|
| Retinoic acid (1M) | 51.6% decrease |
| Gulfweed extract | 23.1% decrease |
| Sea staghorn extract | 19.7% decrease |
| Brown seaweed extract | 28.1% decrease |
| Extract of mixture of gulfweed and sea staghorn | 23.6% decrease |
| Extract of mixture of gulfweed and brown seaweed | 33.1% decrease |
| Extract of mixture of sea staghorn and brown seaweed | 30.9% decrease |
| Extract of mixture of gulfweed, sea staghorn and brown seaweed | 46.7% decrease |

As can be seen from the results in Table 4 above, the group treated with each of the gulfweed extract, the sea staghorn extract and the brown seaweed extract showed reduced collagenase synthesis, and the synthesis of collagenase in the group treated with the extract of the mixture of two or more of gulfweed, sea staghorn and brown seaweed was further inhibited.

Particularly, the group treated with the extract of the mixture of gulfweed, sea staghorn and brown showed the best effect on the inhibition of collagenase synthesis.

Therefore, it was found that the gulfweed extract, sea staghorn extract and brown seaweed extract of the present invention have excellent effects of reducing skin wrinkles by effectively inhibiting collagenase synthesis.

## CLAIMS

1. A cosmetic composition for anti-aging, improving skin elasticity and reducing skin wrinkles containing, as an active ingredient, a mixture of a gulfweed extract, a sea staghorn extract and a brown seaweed extract.

2. The cosmetic composition of claim 1, wherein each of the gulfweed extract, sea staghorn extract and brown seaweed extract is contained in an amount of 0.001-30 wt% based on the total weight of the composition.

3 The cosmetic composition of claim 1, wherein the respective extracts are obtained by steam distillation of a gulfweed, a sea staghorn, a brown seaweed.

4. The cosmetic composition of claim 1, wherein the mixture contains a gulfweed extract, a sea staghorn extract and a brown seaweed extract at the same weight ratio.