

DESCRIPTION

TITLE OF INVENTION: ORAL COMPOSITION

5 TECHNICAL FIELD

[0001]

The present invention relates to an oral composition. The present invention also relates to, for example, an inhibitor for oral staining caused by an astaxanthin compound and use thereof for reducing oral staining caused by an astaxanthin compound.

BACKGROUND ART

[0002]

Astaxanthin is a red carotenoid widely distributed in the animal kingdom, including crustacean shells and eggs, salmon flesh, and the skin of Splendid alfonsino, and is involved in the coloration of flesh and body surfaces. Astaxanthin has been used as a red pigment (Patent Literature 1) and, owing to its strong antioxidant activity, has been investigated for use as an active pharmaceutical ingredient (Patent Literature 2). In addition to its antioxidant activity, astaxanthin has also been reported to exhibit various other beneficial effects (e.g., Patent Literature 3). Thus, astaxanthin is a promising active ingredient for pharmaceutical products and functional foods.

CITATION LIST

- Patent Literature

25 [0003]

Patent Literature 1: JP 2023-119768 A

Patent Literature 2: JP 3163127 B

Patent Literature 3: JP H09-124470 A

Patent Literature 4: JP 2017-218431 A

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SUMMARY OF INVENTION

- Technical Problem

[0004]

However, the present inventors found through their investigation that, when an oral composition containing an astaxanthin compound is taken into the mouth, the oral

cavity becomes red due to staining caused by the astaxanthin compound.

[0005]

The present invention aims to provide an oral composition containing an astaxanthin compound with reduced oral staining caused by an astaxanthin compound.

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- Solution to Problem

[0006]

The present inventors thus performed studies to solve the above issue and thereby found that incorporating ergothioneine or a salt thereof into an oral composition containing an astaxanthin compound reduces staining in the oral cavity caused by the astaxanthin compound when the composition is present in the oral cavity, solving the above issue.

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[0007]

Ergothioneine is an amino acid found in, for example, mushrooms. L-ergothioneine is present in nature. L-ergothioneine is known to have physiological activities such as antioxidant activity. With regard to the physiological activities of ergothioneine, Patent Literature 4 reports an activity that promotes the production of immune response-activating cytokine. However, ergothioneine has not been reported to exhibit any activity of reducing staining in the oral cavity, and the present inventors have found for the first time that ergothioneine has an activity of reducing oral staining caused by an astaxanthin compound.

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20

[0008]

The present invention relates to, for example, the following oral composition.

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(1) An oral composition containing: an astaxanthin compound; and ergothioneine or a salt thereof.

(2) The oral composition according to the clause (1), wherein a ratio of an astaxanthin-equivalent weight of the astaxanthin compound to an ergothioneine-equivalent weight of the ergothioneine or a salt thereof (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of ergothioneine or salt thereof) is 15 or less.

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(3) The oral composition according to the clause (1) or (2), wherein oral staining caused by the astaxanthin compound is reduced.

(4) The oral composition according to any one of the clauses (1) to (3), wherein the astaxanthin compound is at least one compound selected from the group consisting of astaxanthin and derivatives thereof.

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(5) The oral composition according to any one of the clauses (1) to (4), wherein the astaxanthin compound is contained in an astaxanthin-equivalent amount of 0.03% by weight or more.

(6) The oral composition according to any one of the clauses (1) to (5), wherein
5 the oral composition is in the form of a capsule, tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy.

(7) An inhibitor for oral staining caused by an astaxanthin compound, comprising ergothioneine or a salt thereof.

(8) Use of ergothioneine or a salt thereof for reducing oral staining caused by
10 an astaxanthin compound.

- Advantageous Effects of Invention

[0009]

The present invention can provide an oral composition containing an
15 astaxanthin compound with reduced oral staining caused by the astaxanthin compound.

The oral composition containing an astaxanthin compound of the present invention reduces staining in the oral cavity caused by the astaxanthin compound when it is orally ingested, for example, when a tablet containing an astaxanthin compound is held in the mouth or when the composition is taken as a beverage. Accordingly, the
20 composition can be taken with confidence without causing concern about the appearance of the user.

DESCRIPTION OF EMBODIMENTS

[0010]

25 The oral composition of the present invention contains an astaxanthin compound and ergothioneine or a salt thereof.

In the present invention, the oral composition refers to an orally ingestible composition, which can be taken orally, and an oral-cavity composition, which is applicable to the oral cavity. Examples of the oral-cavity composition include
30 mouthwash compositions for care of the oral cavity (for oral care). In an embodiment, the oral composition of the present invention is a mouthwash composition to be expelled after cleaning the oral cavity. The oral composition of the present invention is preferably an orally ingestible composition, which can be taken orally.

The oral composition of the present invention is a composition with reduced
35 staining in the oral cavity caused by the astaxanthin compound. By containing

ergothioneine or a salt thereof, the oral composition of the present invention can further reduce oral staining caused by the astaxanthin compound compared with a composition not containing ergothioneine or a salt thereof. Oral staining caused by an astaxanthin compound refers to red staining in the oral cavity caused when an astaxanthin
 5 compound comes into contact with the oral cavity, such as the tongue. The oral composition of the present invention is preferably a composition with reduced tongue staining caused by the astaxanthin compound.

The mechanism by which the presence of ergothioneine or a salt thereof in the oral composition of the present invention reduces oral staining caused by the
 10 astaxanthin compound remains unclear. However, combining other powdery substances with an astaxanthin compound does not provide such an effect, and the effect is therefore considered to be specific to ergothioneine or a salt thereof.

[0011]

(Astaxanthin compound)

15 In the present invention, the astaxanthin compound is a collective term for compounds including astaxanthin and derivatives thereof. The astaxanthin compound may be one compound or may include two or more compounds.

Astaxanthin (3,3'-dihydroxy- β,β -carotene-4,4'-dione) is a carotenoid and is a red pigment contained, for example, in crustaceans such as shrimp and crab, fish such as
 20 salmon and sea bream, algae such as the green alga *Haematococcus*, and yeasts such as the red yeast *Phaffia*.

Astaxanthin exists as three types of stereoisomers, 3S,3'S, 3S,3'R (meso), and 3R,3'R, depending on the configuration of the hydroxy groups at the 3(3') positions in the ring structures at the respective ends of the molecule. In addition, cis and trans
 25 geometric isomers of the conjugated double bonds in the middle of the molecule are also present. Specific examples of the geometric isomers include all-trans-astaxanthin, 9-cis-astaxanthin, and 13-cis-astaxanthin. Astaxanthin may be any one of these compounds or may include two or more of these compounds.

[0012]

30 The derivatives of astaxanthin are any compounds in which, for example, a substituent is bonded to a functional group of astaxanthin, such as esters.

The hydroxy groups at the 3(3') positions can form an ester with a fatty acid, and the esters of astaxanthin include monoesters and diesters.

Hydrolyzing an ester of astaxanthin can generate astaxanthin.

35 The fatty acid to form an ester is preferably, but not limited to, a C1-C30 fatty

acid.

In the present invention, the astaxanthin compound is preferably astaxanthin, an ester of astaxanthin, or a combination thereof.

[0013]

5 The astaxanthin compound used in the present invention is not limited, for example, by its form or production method. Any of naturally occurring astaxanthin compounds and synthetic astaxanthin compounds can be used.

Examples of naturally occurring astaxanthin compounds include astaxanthin compounds derived from microorganisms, plants, or marine organisms, including algae
10 such as *Haematococcus*; yeasts such as *Phaffia*; crustaceans such as shrimp, krill, and crab; cephalopods such as squid and octopus; various marine organisms; plants such as *Adonis*; bacteria such as *Paracoccus* sp. N81106, *Brevundimonas* sp. SD212, and *Erythrobacter* sp. PC6; actinomycetes such as *Gordonia* sp. KANMONKAZ-1129; labyrinthulids such as *Schizochytrium* sp. KH105; fungi such as *Blakeslea trispora*; and
15 genetically engineered organisms capable of producing astaxanthin. In the present invention, for example, an astaxanthin compound-containing extract may be extracted from the above microorganisms, plants, or marine organisms by a known method and this extract can be used to incorporate an astaxanthin compound into an oral composition. Alternatively, an astaxanthin compound purified as appropriate from the
20 above astaxanthin compound-containing extract may be incorporated into an oral composition. The astaxanthin compound is preferably an astaxanthin compound derived from a microalgae extract from microalgae such as *Haematococcus* or an astaxanthin compound derived from a fungi extract from fungi such as *Blakeslea trispora*, more preferably an astaxanthin compound derived from a *Haematococcus*
25 algae extract from *Haematococcus* algae.

Examples of synthetic astaxanthin compounds include AstaSana (DSM) and Lucantin Pink® (BASF).

Examples of synthetic astaxanthin compounds obtained by chemically converting other naturally occurring carotenoids include AstaMarine (PIVEG).

30 [0014]

Examples of *Haematococcus* algae capable of providing an astaxanthin compound include *Haematococcus pluvialis*, *Haematococcus lacustris*, *Haematococcus capensis*, *Haematococcus deroebakensis*, and *Haematococcus zimbabwiensis*.

[0015]

35 The above *Haematococcus* algae may be cultured by any method, preferably a

closed culture method in which contamination and growth of heterologous microorganisms are prevented and introduction of other impurities is minimized.

Examples of such culture methods include: a culture method using a culture medium provided with a partially open-type dome, conical, or cylindrical culture device and a gas-discharge device movable within the device (WO 1999/050384); a method in which Haematococcus algae are subjected to drying stress to induce encystment of the algae, followed by collecting astaxanthin from the culture of the encysted algae (JP H08-103288 A); a method in which a light source is placed inside a closed culture device and light is applied therein; and a method in which a flat-plate culture tank or a tubular culture layer is used.

[0016]

Alternatively, the astaxanthin compound that can be used in the present invention may be, for example, in the form of an astaxanthin compound-containing extract obtained by subjecting the above Haematococcus algae to cell-wall disruption as necessary in accordance with the method disclosed in JP H05-068585 A, for example, and then adding an organic solvent such as acetone, ether, chloroform, or an alcohol (e.g., ethanol, methanol), or an extraction solvent or agent such as supercritical carbon dioxide or in the form of a product obtained by purifying this astaxanthin compound-containing extract as necessary and as appropriate, which may be incorporated into a composition. The amount of the astaxanthin compound contained in the astaxanthin compound-containing extract is preferably 3 to 40% by weight, more preferably 3 to 12% by weight, still more preferably 5 to 10% by weight.

[0017]

In the present invention, the astaxanthin compound or an extract containing the astaxanthin compound used may be a commercially available product. Examples of the commercially available product include AstaReal, Astavita, and Astamate series products (registered trademarks; AstaReal Co., Ltd. and Fuji Chemical Industries Co., Ltd.) such as AstaReal Oil 200SS (fat-soluble extract from Haematococcus algae, containing about 20% astaxanthin compound as free form (astaxanthin)), AstaReal L10, AstaReal Oil 50F, AstaReal Oil 50FC, AstaReal Oil 5F, AstaReal P2AF, AstaTROL-X, AstaReal Oil 50FC, AstaReal Powder 20F, water-soluble AstaReal Liquid, AstaReal WS Liquid, AstaReal 10WS Liquid, AstaReal ACT, Astavita e, Astavita Sport, and Astamate; ASTOTS series products (ASTOTS is registered trademark; FUJIFILM Wako Pure Chemical Corp.) such as ASTOTS-S, ASTOTS-100, ASTOTS-ECS, ASTPTS-2.0PW, and ASTOTS-3.0MB; BioAstin (registered trademark; Cyanotech

Corp.); Astazine TM (BGG Japan); Astaxanthin Powder 1.5%, Astaxanthin Powder 2.5%, Astaxanthin Oil 5%, and Astaxanthin Oil 10% (Bio Actives Japan); Astaxanthin (Oryza Oil&Fat Chemical Co., Ltd.); SunActive AX (registered trademark; Taiyo Kagaku Co., Ltd.); Haematococcus WS30 (Yaegaki Biotechnology, Inc.); and

5 AstaMarine (PIVEG).

[0018]

(Ergothioneine or salt thereof)

Ergothioneine is a type of sulfur-containing amino acid.

The salt of ergothioneine is any pharmacologically acceptable salt or any food-
 10 grade salt, and may be either an acid salt or a basic salt. Examples of the acid salt include inorganic acid salts such as hydrochloride, sulfate, nitrate, and phosphate; and organic acid salts such as acetate, citrate, maleate, malate, oxalate, lactate, succinate, fumarate, and propionate. Examples of the basic salt include alkali metal salts such as sodium salt and potassium salt, and alkaline earth metal salts such as calcium salt and
 15 magnesium salt.

[0019]

Ergothioneine or a salt thereof is not limited in any way by its form, production method, and the like. Ergothioneine or a salt thereof may be a chemically synthesized product or may be a purified extract from a naturally occurring product. Ergothioneine
 20 is abundantly present in golden/yellow oyster mushroom (scientific name: *Pleurotus cornucopiae* var. *citrinopileatus*) belonging to the genus *Pleurotus* of the family *Pleurotaceae*. Ergothioneine is also present in mushrooms such as cultivated mushroom (scientific name: *Agaricus bisporus*), including white button mushroom, cremini mushroom, and portabella mushroom; grey oyster mushroom (scientific name:
 25 *Pleurotus ostreatus*), shiitake (scientific name: *Lentinula edodes*), maitake (scientific name: *Grifola frondosa*), reishi (scientific name: *Ganoderma lucidum*), yamabushitake (scientific name: *Hericium erinaceus*), Yanagi-matsutake (scientific name: *Agrocybe aegerita*), girolle (scientific name: *Cantharellus cibarius*), porcini (scientific name: *Boletus edulis*), and common morel (scientific name: *Morchella esculenta*). In the case
 30 of obtaining ergothioneine from a naturally occurring product, it is preferably extracted from golden/yellow oyster mushroom, for example. Ergothioneine or a salt thereof can also be produced by microbial fermentation. Ergothioneine or a salt thereof may be in an isolated form.

Naturally occurring ergothioneine mainly exists as an L-isomer, and thus
 35 ergothioneine or a salt thereof used in the oral composition of the present invention is

preferably L-ergothioneine or a salt thereof.

[0020]

Ergothioneine or a salt thereof is a compound that is present in naturally occurring products and food and beverages and that has been consumed. Thus, for
5 example, long-term ingestion of ergothioneine or a salt thereof is less likely to cause problems in terms of safety.

[0021]

In the oral composition of the present invention, the ratio of the astaxanthin-equivalent weight of the astaxanthin compound to the ergothioneine-equivalent weight
10 of the ergothioneine or a salt thereof (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of ergothioneine or salt thereof) is preferably 15 or less. This is because maintaining the above weight ratio (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of
15 ergothioneine or salt thereof) at 15 or less in the oral composition enables effective reduction in oral staining caused by the astaxanthin compound.

The weight ratio (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of ergothioneine or salt thereof) in the oral composition is more preferably 10 or less, still more preferably 6 or less, particularly preferably 4 or less, most preferably 3.75 or less.

20 The weight ratio (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of ergothioneine or salt thereof) in the oral composition is preferably 0.01 or more, more preferably 0.1 or more, still more preferably 0.5 or more. In an embodiment, the weight ratio (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of ergothioneine or
25 salt thereof) in the oral composition is preferably 0.01 to 15, more preferably 0.1 to 10, still more preferably 0.1 to 6, even more preferably 0.1 to 4, particularly preferably 0.5 to 3.75. In the case of using two or more astaxanthin compounds, the weight of the astaxanthin compound refers to the sum of the weights of these. In the case of using two or more types of ergothioneine or a salt thereof, the weight of the ergothioneine or a
30 salt thereof refers to the sum of the weights of these.

[0022]

In the case where the astaxanthin compound is a compound other than astaxanthin, the astaxanthin-equivalent herein refers to a value converted to astaxanthin. Specifically, the astaxanthin-equivalent amount or a similar expression herein means the
35 amount of astaxanthin in the case where the astaxanthin compound is astaxanthin or, in

the case where the astaxanthin compound is a compound other than astaxanthin, means a value obtained by multiplying the number of moles of the compound by the molecular weight of astaxanthin.

5 The amount of the astaxanthin compound contained in the composition can be determined by high-performance liquid chromatography (HPLC).

In the case where the astaxanthin compound is a derivative of astaxanthin, treatment such as hydrolysis enables quantification thereof as astaxanthin.

[0023]

10 In the case where ergothioneine is a salt of ergothioneine, the ergothioneine-equivalent herein refers to a value converted to ergothioneine. Specifically, the ergothioneine-equivalent amount or a similar expression herein means the amount of ergothioneine in the case where the ergothioneine or a salt thereof is ergothioneine or, in the case where the ergothioneine is a salt of ergothioneine, means a value obtained by multiplying the number of moles of the salt by the molecular weight of ergothioneine.

15 The amount of ergothioneine or a salt thereof can be determined by high-performance liquid chromatography (HPLC).

[0024]

The (astaxanthin-equivalent) amount of the astaxanthin compound contained in the oral composition of the present invention can be set in accordance with the form, for example, without limitation.

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The astaxanthin-equivalent amount of the astaxanthin compound contained in the oral composition of the present invention may be, for example, 0.001% by weight or more, and is preferably more than 0.02% by weight, more preferably 0.03% by weight or more, still more preferably 0.05% by weight or more, while preferably 10% by weight or less, more preferably 5% by weight or less in the composition.

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In an embodiment, the astaxanthin-equivalent amount of the astaxanthin compound contained may be 0.001 to 10% by weight, preferably more than 0.02% by weight and not more than 10% by weight, more preferably 0.03 to 10% by weight, still more preferably 0.05 to 5% by weight in the oral composition.

30 The numerical range of the (astaxanthin-equivalent) amount of the astaxanthin compound contained in the oral composition of the present invention can be an appropriate combination of the above suitable lower and upper limits in accordance with the form of the composition.

[0025]

35 The amount of the ergothioneine or a salt thereof contained in the oral

composition of the present invention can be set in accordance with the form, for example, without limitation.

The ergothioneine-equivalent amount of the ergothioneine or a salt thereof contained in the oral composition of the present invention is preferably, for example,
5 0.0001% by weight or more, more preferably 0.001% by weight or more, still more preferably 0.002% by weight or more, particularly preferably 0.003% by weight or more, while preferably 90% by weight or less, more preferably 50% by weight or less. In an embodiment, the ergothioneine-equivalent amount of the ergothioneine or a salt thereof in the oral composition of the present invention is preferably 0.0001 to 90% by
10 weight, more preferably 0.001 to 50% by weight, still more preferably 0.002 to 50% by weight, particularly preferably 0.003 to 50% by weight.

The numerical range of the (ergothioneine-equivalent) amount of the ergothioneine or a salt thereof contained in the oral composition of the present invention can be an appropriate combination of the above suitable lower and upper limits in
15 accordance with the form of the composition.

[0026]

The oral composition of the present invention is a composition with reduced staining in the oral cavity caused by the astaxanthin compound. Thus, the oral composition of the present invention does not encompass naturally occurring foods that
20 do not cause staining in the oral cavity caused by an astaxanthin compound, such as crustacean shells and eggs, salmon flesh, and the skin of Splendid alfonso.

[0027]

The oral composition of the present invention can be provided in the form of a food or beverage, a pharmaceutical product, a quasi-pharmaceutical product, feed, or
25 the like, but is not limited thereto.

As long as the effect of the present invention is not impaired, the oral composition of the present invention may contain optional additives and optional components in addition to the aforementioned astaxanthin compound and ergothioneine or a salt thereof. These additives and components may be selected depending on the
30 form of the composition, for example, and those commonly usable in oral compositions such as food and beverages, pharmaceutical products, quasi-pharmaceutical products, and feed can be used. In an embodiment, the oral composition of the present invention may be one containing an astaxanthin compound and ergothioneine or a salt thereof.

[0028]

35 The oral composition of the present invention may be in any form such as solid

(e.g., powder, granules, tablet, or gel) or liquid, and is preferably in the form of solid. In an embodiment, the oral composition of the present invention is preferably a solid oral composition. The oral composition may be in the form of a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy, for example.

[0029]

In an embodiment where the oral composition of the present invention is an orally ingestible composition, the orally ingestible composition may be in any form such as solid (e.g., powder, granules, tablet, or gel) or liquid, and is preferably in the form of solid. The orally ingestible composition is preferably a solid orally ingestible composition, and may be in the form of a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy, for example.

In an embodiment where the oral composition of the present invention is an oral-cavity composition, the oral-cavity composition may be in the form of paste, liquid, or gum, for example.

[0030]

The astaxanthin compound is soluble in fat. In an embodiment, the oral composition of the present invention is preferably dissolved, emulsified, or dispersed in edible oil so as to achieve effective ingestion of the astaxanthin compound. From this viewpoint, the oral composition of the present invention also preferably contains edible oil. The edible oil is preferably one capable of dissolving an astaxanthin compound, and examples include MCT oil, soybean oil, rapeseed oil, safflower oil, olive oil, and palm oil. One edible oil may be used, or two or more edible oils may be used.

[0031]

The oral composition of the present invention preferably contains at least one selected from the group consisting of an emulsifier, an antioxidant, and a thickening agent. In the present invention, the antioxidant contains neither an astaxanthin compound nor ergothioneine or a salt thereof.

[0032]

In order to make the astaxanthin compound more stable, the oral composition of the present invention preferably contains an antioxidant. Examples of the antioxidant include vitamin C, vitamin E, BHT, BHA, sodium erythorbate, propyl gallate, sodium sulfite, potassium sulfite, potassium pyrosulfite, and sulfur dioxide. One of these may be used or two or more of these may be used.

[0033]

In the case where the oral composition of the present invention is provided as a food or beverage, the astaxanthin compound and the ergothioneine or a salt thereof may be combined with a component usable for foods and beverages (e.g., food material, beverage material, optional additives) to provide various types of foods and beverages. Examples of the foods and beverages include, but are not limited to, general foods and beverages, health foods, food additives, and materials thereof. The foods and beverages may be in any form, such as solid, semi-fluid, and fluid. In the case of a food or beverage, the oral composition of the present invention may be in the form of solid such as a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy; or liquid such as oral liquid or syrup, and is preferably in the form of solid.

In the case of a food or beverage, the oral composition of the present invention is preferably in the form of a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy.

[0034]

In the case where the oral composition of the present invention is provided as a pharmaceutical product or a quasi-pharmaceutical product, the astaxanthin compound and the ergothioneine or a salt thereof may be combined with components such as a pharmaceutically acceptable vehicle to provide various dosage forms of pharmaceutical products. The dosage form is for oral administration. Examples of the dosage form of the oral composition include oral solid dosage forms such as a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, and gummy; oral gel dosage forms such as jelly; and oral liquid dosage forms such as oral liquid and syrup.

In the case of a pharmaceutical product or a quasi-pharmaceutical product, the oral composition of the present invention is preferably in the form of a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy.

[0035]

In the case where the oral composition of the present invention is provided as feed, the astaxanthin compound and the ergothioneine or a salt thereof may be combined with a component usable for feed to provide feed. Examples of the feed include livestock feed for animals such as cows, pigs, chickens, sheep, and horses; feed for small animals such as rabbits, guinea pigs, rats, and mice; and pet food for animals

such as dogs, cats, and birds.

In the case of feed, the oral composition of the present invention is preferably in the form of a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy.

5 [0036]

In the case where the oral composition of the present invention is a solid composition such as a capsule (soft capsule, hard capsule), tablet, coated tablet, fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy, the (astaxanthin-equivalent) amount of the astaxanthin compound contained may be, for
10 example, 0.001% by weight or more, and is preferably more than 0.02% by weight, more preferably 0.03% by weight or more, still more preferably 0.05% by weight or more, while preferably 10% by weight or less, more preferably 5% by weight or less.

In an embodiment where the oral composition is in the form of solid, the (astaxanthin-equivalent) amount of the astaxanthin compound contained in the
15 composition may be 0.001 to 10% by weight, preferably more than 0.02% by weight and not more than 10% by weight, more preferably 0.03 to 10% by weight, still more preferably 0.05 to 5% by weight.

[0037]

In the case where the oral composition of the present invention is provided as a
20 food or beverage, pharmaceutical product, quasi-pharmaceutical product, feed, or the like, the oral composition may be produced by any method, and can be produced by a common method using an astaxanthin compound and ergothioneine or a salt thereof.

In production of the oral composition of the present invention, the astaxanthin compound and the ergothioneine or a salt thereof used may be purified compounds, or
25 may be a material that is derived from an animal, plant, or microorganism abundantly containing an astaxanthin compound and a material that is derived from a plant or microorganism abundantly containing ergothioneine or a salt thereof.

[0038]

In an embodiment where the oral composition of the present invention is
30 ingested by or administered to a human (adult), the total astaxanthin-equivalent amount of the astaxanthin compound administered is preferably 0.5 to 200 mg, more preferably 1 to 100 mg, still more preferably 3 to 80 mg per day per 60 kg body weight.

In the case of containing two or more astaxanthin compounds, the total amount of the astaxanthin compound administered refers to the sum of the amounts of these.

35 [0039]

In an embodiment where the oral composition of the present invention is ingested by or administered to a human (adult), the total ergothioneine-equivalent amount of the ergothioneine or a salt thereof administered is preferably 0.03 to 100 mg, more preferably 0.07 to 100 mg, still more preferably 0.2 to 80 mg per day per 60 kg body weight.

[0040]

The oral composition of the present invention may be ingested by or administered to any subject (administration subject), such as a human and an animal other than a human.

The administration subject of the oral composition of the present invention is preferably a human or a non-human mammal, more preferably a human.

[0041]

The present invention also encompasses an inhibitor for oral staining caused by an astaxanthin compound, containing ergothioneine or a salt thereof. The inhibitor for oral staining of the present invention is used for reducing staining in the oral cavity caused by an astaxanthin compound.

[0042]

The present invention also encompasses use of ergothioneine or a salt thereof for reducing oral staining caused by an astaxanthin compound.

[0043]

In the above inhibitor for oral staining caused by an astaxanthin compound and the above use, preferred embodiments of the astaxanthin compound and the ergothioneine or a salt thereof are the same as described above for the aforementioned oral composition of the present invention. For example, incorporating ergothioneine or a salt thereof into an astaxanthin compound or an oral composition containing the astaxanthin compound can reduce staining in the oral cavity caused by the astaxanthin compound when the oral composition is orally ingested, for example. For a preferred amount of ergothioneine or a salt thereof used, preferred embodiments of the proportion, amount, and the like thereof in the oral composition of the present invention are the same as those of the aforementioned oral composition of the present invention.

For example, ergothioneine or a salt thereof is used such that the ratio of the astaxanthin-equivalent weight of the astaxanthin compound to the ergothioneine-equivalent weight of the ergothioneine or a salt thereof (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent weight of ergothioneine or salt thereof) is preferably 0.01 to 15, more preferably 0.1 to 10, still more preferably 0.1 to

6, even more preferably 0.1 to 4, particularly preferably 0.5 to 3.75.

[0044]

The numerical range defined by the lower limit and the upper limit herein, i.e., “the lower limit to the upper limit”, includes the lower limit and the upper limit. For example, the range defined by “1 to 2” means 1 or more and 2 or less, with 1 and 2 being included. Herein, the range may be any combination of any upper limit and any lower limit.

EXAMPLES

10 [0045]

The present invention is described in more detail below with reference to examples. The present invention is not limited to these examples.

[0046]

In the tests to be described below, the following astaxanthin material, ergothioneine material, dextrin material, cellulose material, and MCT oil were used.

Astaxanthin material: oil containing 5% astaxanthin

Ergothioneine material: powder, L-ergothioneine purity 100%

Dextrin material: powder, dextrin 100%

Cellulose material: powder, cellulose 100%

20 MCT oil: available from The Nisshin Oil Group, Ltd.

In the following tests, the astaxanthin material, i.e., the oil containing 5% astaxanthin, was brought to room temperature after being taken out of a refrigerator, warmed to 40°C to 50°C, and then returned to room temperature again. The ergothioneine material was a powder material brought to room temperature.

25 The astaxanthin material is an oily material obtained by diluting a Haematococcus (algae) extract as is, and is a material containing 5.0% by weight (astaxanthin-equivalent) of an astaxanthin compound.

[0047]

<Test for evaluating effect of ergothioneine on reducing oral staining caused by astaxanthin>

<Comparative Example 1>

(Sample 1: astaxanthin material)

A 10-mg portion of the astaxanthin material was weighed. A 990-mg portion of the MCT oil was weighed and mixed therewith so that the concentration of the astaxanthin compound was 0.5 mg/g in an astaxanthin-equivalent amount. Thereby,

Sample 1 was obtained (1000 mg). The astaxanthin-equivalent amount of the astaxanthin compound contained in Sample 1 was 0.05% by weight.

[0048]

<Example 1>

5 (Sample 2: astaxanthin material and ergothioneine material)

A 10-mg portion of the astaxanthin material was weighed. A 990-mg portion of the MCT oil was weighed and mixed therewith so that the concentration of the astaxanthin compound was 0.5 mg/g in an astaxanthin-equivalent amount. Then, a 0.83-mg portion of the ergothioneine material was weighed. The mixture of the
 10 astaxanthin material and the MCT oil obtained above (1000 mg) was thoroughly mixed with the ergothioneine material (0.83 mg) using a spatula on a spoon, whereby Sample 2 was obtained (1000.83 mg). The astaxanthin-equivalent amount of the astaxanthin compound and the amount of the ergothioneine contained in Sample 2 were respectively 0.05% by weight and 0.083% by weight. The ratio of the (astaxanthin-equivalent)
 15 weight of the astaxanthin compound to the weight of the ergothioneine (astaxanthin/ergothioneine) in Sample 2 was 0.6.

[0049]

(Evaluation of staining)

The samples prepared were placed on the tongues of panelists and staining in
 20 the oral cavity caused by the astaxanthin compound was evaluated. In the evaluation, the whole amount of the sample prepared (e.g., 1000 mg for Sample 1) was placed on the tongue.

Specifically, three panelists each placed the sample (Sample 1 or Sample 2) maintained at room temperature on a spoon on the upper surface of the tongue in the
 25 oral cavity. Using the back of the spoon, each panelist gently spread the sample so that the sample covered the front area of the upper surface of the tongue, and then closed the mouth and moved the tongue for 10 seconds to distribute the sample throughout the oral cavity. Next, they took 50 mL of water in the oral cavity and performed a rinsing gargle. The gargle was performed by taking the entire 50 mL of water in the mouth at
 30 once and, while keeping the mouth closed, alternately puffing out and relaxing the cheeks 10 times for rinsing the inside of the oral cavity, followed by expelling the water. This process of taking 50 mL of water in the mouth, rinsing, and expelling the water was defined as one gargle. After performing one gargle, the panelists observed the tongue using a mirror. The cases where red staining was observed on 10% or more
 35 of the total area of the upper surface of the tongue were evaluated as “○”, the cases

where red staining was observed on 10% or less of the total area as “△”, and the cases where no red staining was observed were evaluated as “×”. For the cases evaluated as “○” or “△”, a gargle was again performed in the same manner and the tongue was observed using a mirror and evaluated in the same manner. The above gargle using 50 mL of water and the following evaluation of tongue staining were repeated until no red staining was observed on the upper surface of the tongue (until the evaluation reached “×”).

[0050]

The test results for Samples 1 and 2 are shown in the following Table 1. The staining-reducing effect was evaluated by the total number of gargles until no tongue staining and the total score shown in the table. The smaller the total number of gargles is, the more the tongue staining caused by the astaxanthin compound is reduced. The total score in the table refers to the sum of the scores by each panelist for tongue observation results from the first gargle to no staining, with “○” being 2 points, “△” being 1 point, and “×” being 0 points. This total score indicates the degree of tongue staining; the smaller the total score is, the more the tongue staining caused by the astaxanthin compound is reduced. For example, in the case of Sample 1, Panelist 1 evaluated the result after the first gargle as “○” (2 points), the result after the second gargle as “△” (1 point), and the result after the third gargle as “×” (0 points). Thus, the evaluation of Sample 1 by Panelist 1 is such that the total number of gargles is 3 and the total score is 3, with one “○” (2 points), one “△” (1 point), and one “×” (0 points). The total numbers of gargles and the total scores of the three panelists were averaged. The “Ast/Erg (wt. ratio)” in Table 1 to Table 4 indicates the ratio of the astaxanthin-equivalent weight of the astaxanthin compound (Ast) to the weight of ergothioneine (Erg) in the sample.

[0051]

[Table 1]

	Ast/Erg (wt. ratio)		Number of gargles					Total number of gargles	Total score
			1	2	3	4	5		
Comparative Example 1	Sample 1	-	Panelist 1	○	△	×	-	3	3
			Panelist 2	○	△	×	-	3	3
			Panelist 3	○	○	○	△	5	7
			Average					3.7	4.3
Example 1	Sample 2	0.6	Panelist 1	△	×	-	-	2	1
			Panelist 2	△	×	-	-	2	1
			Panelist 3	○	△	△	×	4	4
			Average					2.7	2.0
Staining reduction by Erg			Panelist 1	-					0.33
			Panelist 2	-					0.33
			Panelist 3	-					0.57
			Average					0.70	0.41

[0052]

As shown in Table 1, all panelists showed that the oral staining caused by the astaxanthin compound in Sample 2 containing the ergothioneine material was more easily removed than the oral staining caused by the astaxanthin compound in Sample 1. The “Staining reduction by Erg” in Table 1 refers to the values calculated for each panelist by “(Total number of gargles in Example 1)/(Total number of gargles in

Comparative Example 1)” and “(Total score in Example 1)/(Total score in Comparative Example 1)”. Since all of the values are less than 1, staining in the oral cavity caused by the astaxanthin compound was reduced in Example 1, which contained the ergothioneine material.

5 Although the degree of tongue staining caused by the astaxanthin compound differs between the panelists, this is an individual difference. Thus, the activity of reducing tongue staining caused by the astaxanthin compound is confirmed by calculating the staining reduction, which represents the comparison between the tongue staining caused by Sample 1 in Comparative Example 1 and the tongue staining caused
10 by Sample 2 in Example 1 for a single panelist (e.g., Panelist A). The same applies to the following examples.

[0053]

<Comparative Example 2>

(Sample 3: astaxanthin material alone)

15 A 120-mg portion of the astaxanthin material was weighed, which was used as Sample 3.

[0054]

<Example 2>

(Sample 4: astaxanthin material and ergothioneine material)

20 A 120-mg portion of the astaxanthin material was weighed. A 10-mg portion of the ergothioneine material was weighed. The astaxanthin material (120 mg) and the ergothioneine material (10 mg) were thoroughly mixed using a spatula on a spoon, whereby Sample 4 was obtained (130 mg). The astaxanthin-equivalent amount of the astaxanthin compound and the amount of the ergothioneine contained in Sample 4 were
25 respectively 4.6% by weight and 7.7% by weight. The ratio of the (astaxanthin-equivalent) weight of the astaxanthin compound to the weight of the ergothioneine (astaxanthin/ergothioneine) in Sample 4 was 0.6.

[0055]

30 For Samples 3 and 4 obtained, staining was evaluated by three panelists in the same manner as in Example 1, except that the experiment was performed with N = 3. The results obtained are shown in the following Table 2.

[0056]

[Table 2]

	Ast/Erg (wt. ratio)		Number of gargles									Total number of gargles	Total score	
			1	2	3	4	5	6	7	8	9			
Comparative Example 2	-	Sample 3	Panelist 1	○	○	○	○	○	○	△	△	×	9	14
				○	○	○	○	○	○	△	△	×	9	14
				○	○	○	○	○	○	△	×	-	8	13
		Panelist 2	○	○	○	○	△	△	×	-	-	7	10	
			○	○	○	○	△	△	△	×	-	8	11	
			○	○	○	○	△	△	△	△	×	9	12	
		Panelist 3	○	○	△	△	△	×	-	-	-	6	7	
			○	○	○	○	△	△	×	-	-	7	10	
			○	○	○	○	△	△	△	△	×	9	12	
		Average												8
Example 2	0.6	Sample 4	Panelist 1	△	×	-	-	-	-	-	-	-	2	1
				△	×	-	-	-	-	-	-	-	2	1
				○	×	-	-	-	-	-	-	-	2	2
		Panelist 2	○	△	△	×	-	-	-	-	-	4	4	
			○	○	△	△	△	×	-	-	-	6	7	
			○	△	△	△	×	-	-	-	-	5	5	
		Panelist 3	○	○	△	△	×	-	-	-	-	5	6	
			○	△	△	×	-	-	-	-	-	4	4	
			○	○	△	△	×	-	-	-	-	5	6	
		Average												3.9
Staining reduction by Erg	Panelist 1	-									0.23	0.09		
	Panelist 2	-									0.33	0.18		
	Panelist 3	-									0.52	0.38		
	Average												0.40	0.22

[0057]

As shown in Table 2, all panelists showed that the oral staining caused by the astaxanthin compound in Example 2, which contained the ergothioneine material, was more easily removed than the oral staining caused by the astaxanthin compound in Comparative Example 2. The “Staining reduction by Erg” in Table 2 refers to the values calculated for each panelist by “(Total number of gargles in Example 2)/(Total

number of gargles in Comparative Example 2)” and “(Total score in Example 2)/(Total score in Comparative Example 2)”. Since all of the values are well below 1, staining in the oral cavity caused by the astaxanthin compound was reduced in Example 2, which contained the ergothioneine material.

5 [0058]

<Comparative Example 3>

(Sample 5: astaxanthin material)

A 120-mg portion of the astaxanthin material was weighed, which was used as Sample 5.

10 [0059]

<Example 3>

(Sample 6: astaxanthin material and ergothioneine material)

A 120-mg portion of the astaxanthin material was weighed. A 1.0-mg portion of the ergothioneine material was weighed. They were thoroughly mixed using a spatula on a spoon, whereby Sample 6 was obtained (121 mg). The astaxanthin-equivalent amount of the astaxanthin compound and the amount of the ergothioneine contained in Sample 6 were respectively 5.0% by weight and 0.83% by weight. The ratio of the (astaxanthin-equivalent) weight of the astaxanthin compound to the weight of the ergothioneine (astaxanthin/ergothioneine) in Sample 6 was 6.

20 [0060]

For Samples 5 and 6 obtained, staining was evaluated in the same manner as in Example 1. The results obtained are shown in the following Table 3.

[0061]

[Table 3]

	Ast/Erg (wt. ratio)		Number of gargles							Total number of gargles	Total score	
			1	2	3	4	5	6	7			
Comparative Example 3	-	Sample 5	Panelist 1	○	○	△	△	×	-	-	5	6
			Panelist 2	○	○	△	△	×	-	-	5	6
			Panelist 3	○	○	○	△	△	△	×	7	9
			Average							5.7	7.0	
Example 3	6	Sample 6	Panelist 1	○	△	×	-	-	-	-	3	3
			Panelist 2	○	△	△	×	-	-	-	4	4
			Panelist 3	○	○	△	×	-	-	-	4	5
			Average							3.7	4.0	
Staining reduction by Erg		Panelist 1	-							0.60	0.50	
		Panelist 2	-							0.80	0.67	
		Panelist 3	-							0.57	0.56	
		Average							0.70	0.57		

[00902]

As shown in Table 3, all panelists showed that the oral staining caused by the

astaxanthin compound in Example 3, which contained the ergothioneine material, was more easily removed than the oral staining caused by the astaxanthin compound in Comparative Example 3. The “Staining reduction by Erg” in Table 3 refers to the values calculated for each panelist by “(Total number of gargles in Example 3)/(Total number of gargles in Comparative Example 3)” and “(Total score in Example 3)/(Total score in Comparative Example 3)”. Since all of the values are well below 1, staining in the oral cavity caused by the astaxanthin compound was sufficiently reduced in Example 3, which contained the ergothioneine material.

In Tables 2 and 3, the amount of the astaxanthin material and the astaxanthin concentration were the same between Sample 3 in Comparative Example 2 and Sample 5 in Comparative Example 3, but the total number of gargles and the total score were different between the panelists. These differences occurred because the condition of the tongue of each panelist varied depending on the test day and the test time period. Thus, in this test, the effect of reducing tongue staining caused by the astaxanthin compound was confirmed by comparing the tests performed on the same day during the same time period for the same panelist. The same applies to the other tests.

[0063]

<Comparative Example 4>

(Sample 7: astaxanthin material)

A 300-mg portion of the astaxanthin material was weighed, which was used as Sample 7.

[0064]

<Example 4>

(Sample 8: astaxanthin material and ergothioneine material)

A 300-mg portion of the astaxanthin material was weighed. A 1.0-mg portion of the ergothioneine material was weighed. They were thoroughly mixed using a spatula on a spoon, whereby Sample 8 was obtained (400 mg). The astaxanthin-equivalent amount of the astaxanthin compound and the amount of the ergothioneine contained in Sample 8 were respectively 5.0% by weight and 0.33% by weight. The ratio of the (astaxanthin-equivalent) weight of the astaxanthin compound to the weight of the ergothioneine (astaxanthin/ergothioneine) in Sample 8 was 15.

[0065]

For Samples 7 and 8 obtained, staining was evaluated in the same manner as in Example 1. The results obtained are shown in the following Table 4.

[0066]

[Table 4]

	Ast/Erg (wt. ratio)		Number of gargles								Total number of gargles	Total score	
			1	2	3	4	5	6	7	8			
Comparative Example 4	-	Sample 7	Panelist 1	○	○	○	△	×	-	-	-	5	7
		Panelist 2	○	○	○	○	△	△	△	×	8	11	
		Panelist 3	○	○	○	○	△	△	×	-	7	10	
		Average								6.7	9.3		
Example 4	15	Sample 8	Panelist 1	○	○	△	×	-	-	-	-	4	5
		Panelist 2	○	○	△	△	×	-	-	-	5	6	
		Panelist 3	○	○	△	△	×	-	-	-	5	6	
		Average								4.7	5.7		
Staining reduction by Erg		Panelist 1	-								0.60	0.50	
		Panelist 2	-								0.80	0.67	
		Panelist 3	-								0.57	0.56	
		Average								0.70	0.57		

[0067]

As shown in Table 4, all panelists showed that the oral staining caused by the astaxanthin compound in Example 4, which contained the ergothioneine material, was more easily removed than the oral staining caused by the astaxanthin compound in Comparative Example 4. The “Staining reduction by Erg” in Table 4 refers to the values calculated for each panelist by “(Total number of gargles in Example 4)/(Total number of gargles in Comparative Example 4)” and “(Total score in Example 4)/(Total score in Comparative Example 4)”. Since all of the values are below 1, staining in the oral cavity caused by the astaxanthin compound was reduced in Example 4, which contained the ergothioneine material.

[0068]

<Comparative Example 5>

(Sample 9: astaxanthin material alone)

A 120-mg portion of the astaxanthin material was weighed, which was used as Sample 9.

[0069]

<Comparative Example 6>

(Sample 10: astaxanthin material and dextrin material)

A 120-mg portion of the astaxanthin material was weighed. A 10-mg portion of the dextrin material was weighed. They were thoroughly mixed using a spatula on a spoon, whereby Sample 10 was obtained (130 mg). The astaxanthin-equivalent amount of the astaxanthin compound and the amount of the dextrin contained in Sample 10 were respectively 4.6% by weight and 7.7% by weight. The ratio of the (astaxanthin-equivalent) weight of the astaxanthin compound to the weight of the dextrin (astaxanthin/dextrin) in Sample 10 was 0.6.

[0070]

For Samples 9 and 10 obtained, staining was evaluated in the same manner as in Example 1. The results obtained are shown in the following Table 5.

[0071]

[Table 5]

			Number of gargles							Total number of gargles	Total score
			1	2	3	4	5	6	7		
Comparative Example 5	Sample 9	Panelist 1	○	△	△	×	-	-	-	3	4
		Panelist 2	○	○	○	△	△	×	-	5	8
		Panelist 3	○	○	○	△	×	-	-	4	7
										4	6.3
Comparative Example 6	Sample 10	Panelist 1	○	○	△	×	-	-	-	3	5
		Panelist 2	○	○	○	○	△	△	×	6	10
		Panelist 3	○	○	○	△	△	×	-	5	8
										4.7	7.7
Staining reduction by dextrin		Panelist 1				-				1.00	1.25
		Panelist 2				-				1.20	1.25
		Panelist 3				-				1.25	1.14
		Average								1.20	1.21

[0072]

As shown in Table 5, all panelists showed that the oral staining caused by the astaxanthin compound in Comparative Example 6, which contained the dextrin material, was harder to remove than the oral staining caused by the astaxanthin compound in Comparative Example 5. The “Staining reduction by dextrin” in Table 5

refers to the values calculated for each panelist by “(Total number of gargles in Comparative Example 6)/(Total number of gargles in Comparative Example 5)” and “(Total score in Comparative Example 6)/(Total score in Comparative Example 5)”. All of the values exceed 1, which demonstrates that staining in the oral cavity caused by the astaxanthin compound was harder to remove in Comparative Example 6, which contained the dextrin material, and therefore use of the powdery dextrin material alone failed to reduce staining in the oral cavity caused by the astaxanthin compound.

[0073]

<Comparative Example 7>

10 (Sample 11: astaxanthin material alone)

A 120-mg portion of the astaxanthin material was weighed, which was used as Sample 11.

[0074]

<Comparative Example 8>

15 (Sample 12: astaxanthin material and cellulose material)

A 120-mg portion of the astaxanthin material was weighed. A 10-mg portion of the cellulose material was weighed. They were thoroughly mixed using a spatula on a spoon, whereby Sample 12 was obtained (130 mg). The astaxanthin-equivalent amount of the astaxanthin compound and the amount of the cellulose contained in Sample 12 were respectively 4.6% by weight and 7.7% by weight. The ratio of the (astaxanthin-equivalent) weight of the astaxanthin compound to the weight of the cellulose (astaxanthin/cellulose) in Sample 12 was 0.6.

20

[0075]

For Samples 11 and 12 obtained, staining was evaluated in the same manner as in Example 1. The results obtained are shown in the following Table 6.

25

[0076]

[Table 6]

			Number of gargles							Total number of gargles	Total score
			1	2	3	4	5	6	7		
Comparative Example 7	Sample 11	Panelist 1	○	△	△	×	-	-	-	3	4
		Panelist 2	○	○	○	△	△	×	-	5	8
		Panelist 3	○	○	○	△	×	-	-	4	7
									4	6.3	
Comparative Example 8	Sample 12	Panelist 1	○	○	○	△	×	-	-	4	7
		Panelist 2	○	○	○	○	△	△	×	6	10
		Panelist 3	○	○	○	○	△	×	×	6	10
									5.3	9	
Staining reduction by cellulose		Panelist 1	-							1.30	1.75
		Panelist 2	-							1.20	1.25
		Panelist 3	-							1.5	1.43
		Average							1.3	1.48	

[0077]

As shown in Table 6, all panelists showed that the oral staining caused by the astaxanthin compound in Comparative Example 8, which contained the cellulose material, was harder to remove than the oral staining caused by the astaxanthin compound in Comparative Example 7. The “Staining reduction by cellulose” in Table 6

refers to the values calculated for each panelist by “(Total number of gargles in Comparative Example 8)/(Total number of gargles in Comparative Example 7)” and “(Total score in Comparative Example 8)/(Total score in Comparative Example 7)”. All of the values exceed 1, which demonstrates that staining in the oral cavity caused by the astaxanthin compound was harder to remove in Comparative Example 8, which contained the cellulose material, and therefore use of the powdery cellulose material alone failed to reduce staining in the oral cavity caused by the astaxanthin compound. [0078]

Production examples for the oral composition of the present invention are shown below.

(Production Example 1) Tablet

Powder containing 2% astaxanthin 100 g (astaxanthin 2g)
 L-ergothioneine 3 g
 Vitamin E 50 g
 Starch 129 g
 Sucrose fatty acid ester 9 g
 Silicon oxide 9 g

These were mixed and compressed using a single station tablet press to produce a tablet having a diameter of 9 mm and a mass of 300 mg.

[0079]

(Production Example 2) Capsule

Gelatin 60%
 Glycerol 30%
 Methyl para-oxybenzoate 0.15%
 Propyl para-oxybenzoate 0.51%
 Water appropriate amount

The shell of a soft capsule composed of the above components was filled with the following composition by a common method, whereby a soft capsule with a weight of 360 mg per capsule was obtained.

Oil containing 5% astaxanthin 120 mg (astaxanthin 6 mg)
 L-ergothioneine 10 mg
 Glycerol fatty acid ester 15.0 mg
 Beeswax 15.0 mg
 Wheat germ oil 245 mg

CLAIMS

[Claim 1] An oral composition comprising:
an astaxanthin compound; and
5 ergothioneine or a salt thereof.

[Claim 2] The oral composition according to claim 1,
wherein a ratio of an astaxanthin-equivalent weight of the astaxanthin
compound to an ergothioneine-equivalent weight of the ergothioneine or a salt thereof
10 (astaxanthin-equivalent weight of astaxanthin compound/ergothioneine-equivalent
weight of ergothioneine or salt thereof) is 15 or less.

[Claim 3] The oral composition according to claim 1 or 2,
wherein oral staining caused by the astaxanthin compound is reduced.
15

[Claim 4] The oral composition according to claim 1 or 2,
wherein the astaxanthin compound is at least one compound selected from the
group consisting of astaxanthin and derivatives thereof.

[Claim 5] The oral composition according to claim 1 or 2,
wherein the astaxanthin compound is contained in an astaxanthin-equivalent
20 amount of 0.03% by weight or more.

[Claim 6] The oral composition according to claim 1 or 2,
25 wherein the oral composition is in the form of a capsule, tablet, coated tablet,
fine granules, granules, powder, pill, dry syrup, chewable tablet, jelly, or gummy.

[Claim 7] An inhibitor for oral staining caused by an astaxanthin compound,
comprising ergothioneine or a salt thereof.
30

[Claim 8] Use of ergothioneine or a salt thereof for reducing oral staining
caused by an astaxanthin compound.