

COSMETIC COMPOSITIONS COMPRISING SENNOSIDE

The present invention relates to cosmetic compositions comprising a compound of formula (I) as described hereafter or an optical isomer thereof, or a cis–trans isomer thereof, or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof, such as a hydrate thereof, and their use for promoting and/or speeding up skin regeneration, for preventing and/or treating signs of aging, and for promoting and/or speeding up wound healing. The invention also concerns cosmetic methods comprising the application of such compositions.

Human skin is made up of two compartments: a deep compartment, the dermis, and a superficial compartment, the epidermis. The epidermis is in contact with the external environment, and its role is to protect the body from dehydration and external chemical or mechanical aggression.

Accelerated wound closure is an area of intense scientific research to improve healing that follows skin injury, or within skin that has compromised barrier function. For example, the cutaneous barrier can be unbalanced for example after a cosmetic procedure such as laser treatments and chemical peels, or in the presence of external aggressions, such as irritant agents (detergents, acids, bases, oxidants, reducing agents, concentrated solvents, toxic gases or fumes), mechanical stresses (friction, shocks, abrasion, tearing of the surface, projection of dust, particles, shaving or hair removal), thermal or climatic imbalances (cold, dryness, radiation), xenobiotics (undesirable microorganisms, allergens) or internal attacks such as psychological stress. Following such external aggressions, a healing process is triggered, aimed at rapidly and completely restoring this barrier. This physiological process is dependent on complex biological mechanisms involving numerous molecules and enzymes.

There is a need for compositions that promote skin healing, and in particular, that accelerate cutaneous healing.

The aim of the invention is therefore to provide a cosmetic composition that meets all these requirements.

The inventors made the surprising discovery that the natural molecules of formula (I) are able to accelerate wound healing and thus are potentially of utility for skin regeneration.

The present application provides compositions to accelerate skin regeneration following skin wounding or following cosmetic procedure, to promote recovery following said skin injury and/or improve the efficacy of cosmetic skin procedures. Use of the compositions

will result in a faster healing time and recovery from the procedure, resulting in greater willingness of the patient to undergo cosmetic procedures.

Thus, the present invention relates to a cosmetic composition, comprising in a cosmetically acceptable medium:

- at least one compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof, or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof, or a solvate thereof such as a hydrate thereof, and

- at least one compound chosen among thickeners, preservatives, perfumes, bactericides, pigments, dyes, carbon and/or silicone oils of inorganic, waxes, fillers, emulsifiers, co-emulsifiers, UVA and/or UVB light protection agents also called UV filters, polymers, hydrophilic and lipophilic gelling agents.

Within the meaning of the present invention, and unless a different indication is given:

- an "alkyl" radical is a saturated, linear or branched hydrocarbon radical, in particular C₁-C₆, preferably C₁-C₄ ;

- a "(poly)(hydroxy)(C₁-C₆)alkyl" radical denotes a C₁-C₆, preferably a C₁-C₄, alkyl radical, optionally substituted with one or more hydroxy radicals, preferably substituted with 1 to 4 hydroxy groups, more particularly with 1 to 3 hydroxy groups;

- a "sugar" radical is a monosaccharide or a disaccharide radical. Examples of sugar radicals are sucrose (or saccharose), glucose, galactose, ribose, fucose, maltose, fructose, mannose, arabinose, xylose or lactose;

- a "monosaccharide" means a monosidic sugar comprising at least 5 carbon atoms of formula C_x(H₂O)_x, with x being an integer greater than or equal to 5, preferably x is greater than or equal to 6, in particular x is from 5 to 7, preferably x = 6; They may be of D or L configuration, and of alpha or beta anomer, as well as one of its salts or one of its solvates such as hydrates;

- "disaccharide" means a di-osidic sugar which is a compound consisting of two oses linked together by O-osidic bonds, the said compounds consisting of two monosaccharides (also called mono-osidic) as defined above, the said monosaccharide units comprising at least 5 carbon atoms, preferably 6, in particular the monosaccharide units are linked to one another in 1,4 or 1,6, of alpha or beta anomer, each osidic unit being of L or D configuration, as well as one of its salts or its solvates such as the hydrates. A disaccharide is more particularly a polymer formed from two oses (or monosaccharides) having the general formula: [C_x(H₂O)_y]₂ or [(CH₂O)_x]₂, with x being an integer greater than or equal to 5,

preferably x is greater than or equal to 6, in particular x is from 5 to 7, preferably x = 6, and y is an integer which represents x-1;

- by "mineral or organic salt" is meant salt of bases or of alkaline agents, such as alkali metal hydroxides such as soda, potash, ammonia, amines, alkanolamines, or salts of so-called "basic" amino acids such as lysine or arginine.

Another object of the invention is the use of said compound or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, or a composition according to the invention, to promote and/or speed up skin regeneration.

Another object of the invention is the use of said compound or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, or a composition according to the invention, to prevent and/or treat signs of aging.

Another object of the invention is the use of said compound or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, or a composition according to the invention, to promote and/or speed up wound healing.

The present invention also relates to a non-therapeutic method of treatment of the skin comprising the step of applying said at least one compound or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof, or a salt thereof, or a solvate thereof, or the composition according to the invention, on the skin.

Another object of the invention is a method of treating skin to promote and/or speed up wound healing after aesthetic procedures, the method comprising:

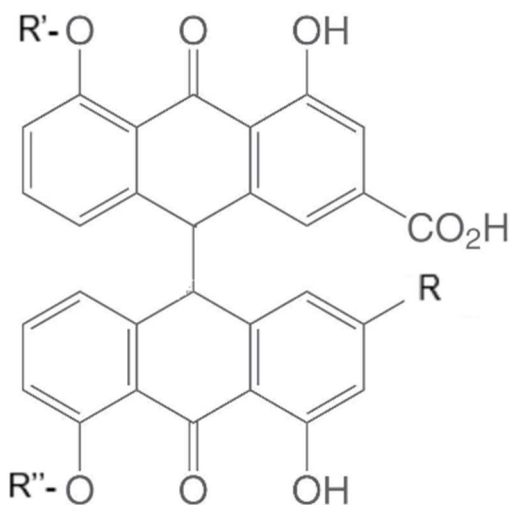
- (a) treating the skin with at least one skin modification stimulus, and
- (b) after the step (a) applying a composition comprising a compound of formula (I) as described in claim 1 or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, to the skin.

Other subjects and characteristics, aspects and advantages of the invention will emerge even more clearly on reading the description and the examples that follows.

Compositions

The composition according to the invention comprises at least one compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or

beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof:



Formula (I)

wherein:

- R' and R'' are identical or different, preferably identical, and represent H or a monosaccharide or a polysaccharide comprising up to 20 sugar units, preferably up to 6 sugar units, in pyranose and/or furanose form and of L and/or D series, the said mono- or polysaccharide may be substituted by an obligatorily free hydroxyl group, and optionally one or more amine function(s), optionally protected amine function(s), and the said monosaccharide or polysaccharide optionally being substituted on its CH₂OH group by a -C(O)-CO₂H group;

- R represents H or -C(O)-O-R₁ or -Alk-X-R₁, preferably -C(O)-O-R₁ or Alk-O-R₁, with X being O, S or -NR₁, preferably O; R₁ being H or a saturated or unsaturated hydrocarbon chain, preferably saturated in C₁-C₆, more preferably R₁ corresponds to H, and Alk corresponds to a C₁-C₆ alkylene group, preferably -CH₂-.

Advantageously, R' and R'' are identical or different and represent a monosaccharide or a polysaccharide containing up to 6 sugar units, in pyranose and/or furanose form and of L and/or D series, said mono- or polysaccharide having at least one obligatorily free hydroxyl function and/or optionally one or more obligatorily protected amine function(s).

Advantageously, the monosaccharide is chosen from D-glucose, D-galactose, D-mannose, D-xylose, D-lyxose, L-fucose, L-arabinose, L-rhamnose, D-glucuronic acid, D-galacturonic acid, D-iduronic acid, N-acetyl-D-glucosamine and N-acetyl-D-galactosamine.

Monosaccharide advantageously means D-glucose, L-rhamnose, D-xylose, N-acetyl-D-glucosamine or L-fucose, and more preferably D-glucose.

Advantageously, the polysaccharide containing up to 6 sugar units is chosen from D-maltose, D-lactose, D-cellobiose, D-maltotriose, a disaccharide combining a uronic acid chosen from D-iduronic acid or D-glucuronic acid with a hexosamine chosen from D-galactosamine, D-glucosamine, N-acetyl-D-galactosamine, N-acetyl-D-glucosamine, a disaccharide combining L-rhamnose and D-galactose, an oligosaccharide containing at least one xylose which may advantageously be chosen from xylobiose, methyl- β -xylobioside, xylotriose, xylotetraose, xylopentaose and xylohexaose and in particular xylobiose which is composed of two xylose molecules linked by a 1-4 bond.

More preferably, R' and R" are identical and represent a monosaccharide chosen from D-glucose, D-xylose, L-fucose, L-rhamnose, D-galactose and D-maltose, preferably D-glucose.

The monosaccharide or polysaccharide of R' and/or R" may be substituted on one or more hydroxymethyl residue(s) by a -C(O)-COOH group.

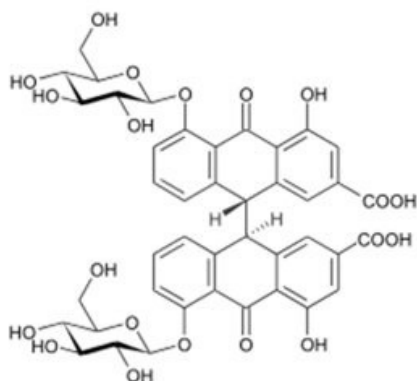
Advantageously, the said compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof such as a hydrate thereof, is in the form of a plant extract.

Preferably, the compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, is chosen from sennosides A, B, C, D, E and F, preferably it is chosen from sennosides A and B, even more preferably the compound of formula (I) is sennoside A or one of its salts.

The compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, preferably Sennoside A or one of its salts, is present in solubilized form in the composition. By "in solubilized form" is meant that the compound does not form crystals visible to the naked eye in the composition.

Sennoside A ($C_{42}H_{38}O_{20}$) (or (9*R*)-9-[(9*R*)-2-carboxy-4-hydroxy-10-oxo-5-[(2*S*,3*R*,4*S*,5*S*,6*R*)-3,4,5-trihydroxy-6-(hydroxymethyl)oxan-2-yl]oxy-9*H*-anthracen-9-yl]-4-hydroxy-10-oxo-5-[(2*S*,3*R*,4*S*,5*S*,6*R*)-3,4,5-trihydroxy-6-(hydroxymethyl)oxan-2-yl]oxy-

9*H*-anthracene-2-carboxylic acid in IUPAC name) has the CAS number 81-27-6 and is of formula (I').



Formula (I')

5 Sennoside, and preferably sennoside A can also be present in salt form.

By "salt" it is meant a cosmetically acceptable salt, i.e. one that is compatible with application to the skin, mucous membranes and/or appendages. The salt of the compound of formula (I), preferably the salt of sennoside A, can be an alkali or alkaline-earth metal salt, preferably a calcium, magnesium, sodium or potassium salt.

10 Typically, the salt of the compound of formula (I), preferably the sennoside salt such as the sennoside A salt, can exist once the compound has been introduced into the composition. In fact, the compound of formula (I) is introduced into the composition in non-salified form.

15 Preferably, the composition comprises sennoside A, for example the sennoside A commercialized by INTERCHIM under the name Sennoside A.

Preferably, the composition comprises a mixture of sennosides containing at least sennoside A.

20 Preferably, the composition comprises between 0.01% and 5% by weight relative to the total weight of the composition, more preferably between 0.2 and 4%, even more preferably between 0.3 and 3%, or between 0.4 and 1% by weight relative to the total weight of the composition of the compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof.

25 Preferably, the composition comprises between 0.1 and 5% by weight of sennoside A or one of its salts relative to the total weight of the composition, preferably between 0.2 and 4% by weight, more preferably between 0.3 and 3% by weight, most preferably between 0.4 and 1% by weight.

Unless mention of the contrary, the percentages are expressed by weight of the total weight of the composition.

Eventually the composition according to the invention comprise ingredients customary in the cosmetic field.

The composition according to the invention comprises at least one compound chosen among thickeners, preservatives, perfumes, bactericides, pigments, dyes, carbon and/or silicone oils of inorganic, waxes, fillers, emulsifiers, co-emulsifiers, UVA and/or UVB light protection agents also called UV filters, polymers, hydrophilic and lipophilic gelling agents. A person skilled in the art can adjust the type and amount of these ingredients in the compositions according to the invention by means of routine operations, so that the desired cosmetic properties and stability properties for these compositions are not negatively affected. The quantities of these various ingredients are conventionally the quantities used in the particular domain, for example from 0.01% to 20% of the total weight of the composition.

In an embodiment, the composition of the invention further comprises one or more skin active agents chosen among anti-aging agents and wound healing agents.

The term "anti-aging agents" denotes any cosmetic agents known to those skilled in the art suitable for reducing and/or slowing the progression of the signs of aging of the skin such as marked microrelief of the skin, fine lines, appearance of wrinkles, loss of tonicity, loss of density loss of firmness, loss of elasticity, decrease in the thickness of the dermis and/or epidermis, dryness, withered skin, loss of the radiance of the skin complexion, appearance of a wizened appearance of the skin, sagging of the skin, withering of the skin and loss of the capacity of the skin to regenerate.

The term "wound healing agents" denotes any cosmetic agents known to those skilled in the art suitable for promoting and/or speeding up wound healing.

The one or more skin active agents may be included in the cosmetic composition in an amount ranging from 0.001% to 5% by weight relative to the total weight of the composition, more preferably between 0.01 and 2%, even more preferably between 0.02 and 1%, or between 0.05 and 1% by weight relative to the total weight of the composition.

In another embodiment, the composition of the invention only comprises the at least one compound of formula (I) or an optical isomer thereof, or a cis-trans isomer thereof

(such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof, or a solvate thereof such as a hydrate thereof, as skin active agent.

The composition according to the invention comprises a cosmetically acceptable medium.

Here, "cosmetically acceptable medium" means a non-toxic support that can be applied on keratin materials such as the skin and mucous membranes. Thus a cosmetically acceptable medium is compatible with the skin, teguments and/or mucous membranes, it does not induce any sensations of discomfort, or more generally disorders able to lead the user to suspend or stop the administration of the cosmetic composition.

More particularly, said cosmetically acceptable medium can comprise water and/or one or more water-miscible organic solvents. Said solvent may be chosen from polyols and alcohols, such as glycerin, sorbitol, glycols such as butylene glycol, propylene glycol, isoprene glycol, dipropylene glycol, hexylene glycol, polypropylene glycol, ethanol or propanediol.

Preferably, the composition according to the invention has a water content ranging from 20% to 95% by weight, more preferably from 30% to 70% by weight in relation to the total weight of the composition.

A composition according to the invention may comprise an oily phase.

The compositions according to the invention can have all the dosage forms conventionally used for a topical application and in particular in the form of aqueous solutions, hydroalcoholic solutions, oil-in-water (O/W) or water-in-oil (W/O) or multiple (triple: W/O/W or O/W/O) emulsions, aqueous gels, or dispersions of an oily phase in an aqueous phase using spheres, these spheres potentially being lipid vesicles of the ionic and/or non-ionic type (liposomes, niosomes, oleosomes). These compositions are prepared using routine methods.

The cosmetic compositions of the instant disclosure are preferably stable. The term "stable" as used herein means that the cosmetic composition does not visually phase separate or crystallize and does not completely degrade.

In a preferred embodiment, compositions used in the framework of the invention are intended for topical administration. In a preferred embodiment, compositions used in the framework of the invention are intended for application on the skin.

In the framework of the invention, the term "skin" designates any cutaneous surface of the body, preferably the skin of the face or the neck or the legs, and more particularly the skin of the face or the neck.

Advantageously the compositions according to the invention have the form of a gel, or an emulsion, powder or paste. Furthermore, the composition according to the invention can be more or less fluid and have the appearance of a white or colored cream, an ointment, a milk, a lotion, a serum, a paste, a foaming gel, a peeling, a mask, a care, a tonic or a foam.

The compositions according to the invention can be applied directly on the skin or, alternatively, on cosmetic supports of the occlusive or non-occlusive type, intended to be applied locally on the skin. As non-limiting examples of cosmetic supports, mention can be made of a patch, a wipe, a mask on a support. The composition can be rinsed or not after having been applied to the skin, preferably it is not rinsed.

Uses

The present invention also relates to the use of at least one compound of formula (I) as described herein or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, to promote and/or speed up skin regeneration.

Preferably, the compound of formula (I) or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, is chosen from sennosides A, B, C, D, E and F, preferably it is chosen from sennosides A and B, even more preferably the compound of formula (I) is sennoside A or one of its salts.

The present invention also relates to the use of a composition according to the invention, to promote and/or speed up skin regeneration.

Skin regeneration is the innate capacity of the living organisms to repair their skin, by a healing process. In the context of the invention, skin regeneration can follow skin injury, skin that has compromised barrier function, for example, during or after cosmetic surgery procedures.

Here, the term "promote" refers to increasing the effects of the phenomenon. For example, promoting skin regeneration can lead to greater skin regeneration than without the use of according to the invention.

Here, the term "speed up" refers to the acceleration of the phenomenon. For example, speeding up skin regeneration can lead to same amount of regenerated skin but in less time than without the use of according to the invention.

The present invention relates to use of at least one compound of formula (I) as described herein or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, according to the invention, to prevent and/or treat signs of aging.

Preferably, the compound of formula (I) or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, is chosen from sennosides A, B, C, D, E and F, preferably it is chosen from sennosides A and B, even more preferably the compound of formula (I) is sennoside A or one of its salts.

The present invention relates to use of composition according to the invention, to prevent and/or treat signs of aging.

Here, the term "prevent" or "prevention" designates any action that aims to prevent the appearance of a discomfort or uneasiness of an individual. This term therefore covers the stoppage or limitation of the symptoms, but is limited to the cosmetic aspects.

Here, the term "treat" or "treatment" designates any action that aims to improve the comfort or the well-being of an individual. This term therefore covers the attenuation, slowing down, easing or suppression of the symptoms, but is limited to a cosmetic treatment.

The term "signs of aging" means here that all of the modifications that take place in a subject with age. Preferably, the signs of aging according to the invention are signs of aging of the skin.

The term "signs of aging of the skin" or "signs of skin aging" means here that all the modifications of the skin that take place with age and which are sometimes not visible in the early stages. Signs of aging of the skin include marked microrelief of the skin, fine lines, appearance of wrinkles, loss of tonicity, loss of density loss of firmness, loss of elasticity, decrease in the thickness of the dermis and/or epidermis, dryness, withered skin, loss of the radiance of the skin complexion, appearance of a wizened appearance of the skin, sagging of the skin, withering of the skin and loss of the capacity of the skin to regenerate.

The present invention relates to the use at least one compound of formula (I) as described herein or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, to promote and/or speed up wound healing.

Preferably, the compound of formula (I) or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, is chosen from sennosides A, B, C, D, E and F, preferably it is chosen from sennosides A and B, even more preferably the compound of formula (I) is sennoside A or one of its salts.

The present invention relates to the use of a composition according to the invention, to promote and/or speed up wound healing and in particular, skin wound healing.

Wound healing is the innate capacity of the living organisms to recover from wound, by a healing process. In the context of the invention, skin regeneration can follow skin injury, or skin wound.

Preferably, uses according to the invention are topical uses. Preferably, the composition is applied on the skin, more preferably on the face, the legs or the body, more preferably on the face.

Methods

The invention relates to a non-therapeutic, preferably cosmetic, method of treatment of the skin comprising the step of applying the composition according to the invention on the skin.

Preferably, the step of applying the composition is done by the topical application of said composition, more preferably on the face, the legs or the body, more preferably on the face or the neck.

Preferably, the skin displays at least one sign of skin aging as defined here above.

Preferably, the application is carried out on the skin of a subject that needs it and in an effective quantity of the composition. Here, the term "subject" means a human being.

Preferentially, the subject does not suffer from dermatologic lesion and/or from dermatologic disease, more preferentially the subject does not suffer from any disease.

Here, the term "effective quantity" refers to the quantity of composition according to the invention, that, as a whole, makes it possible to:

- promote and/or speed up skin regeneration, and/or
- prevent and/or treat signs of aging, and/or
- promote and/or speed up wound healing.

According to the present invention, the methods are non-therapeutic methods.

The methods of the invention can comprise a single administration. In another embodiment, the administration is repeated for example 2 to 3 times per day for one day or more and generally during an extended period of at least 4 weeks or 4 to 15 weeks, or as long as necessary.

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The invention also relates to a non-therapeutic, preferably cosmetic method of treating skin to promote and/or speed up wound healing after aesthetic procedures, the method comprising:

- (a) treating the skin with at least one skin modification stimulus, and
- 10 (b) after the step (a) applying a composition comprising a compound of formula (I), or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof according to the invention to the skin.

- 15 Preferably, the compound of formula (I) or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, is chosen from sennosides A, B, C, D, E and F, preferably it is chosen from sennosides A and B, even more preferably the compound of formula (I) is sennoside A or one of its salts.

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In still further embodiments, the non-therapeutic, preferably cosmetic method according to the invention comprises:

- (a) treating skin with at least one type of skin modification stimulus, for example a peeling agent, a laser, radiofrequency, an electrical, heat, a low-level light, a needle, or an abrasive instrument; and
- 25 (b) after the step (a) applying a composition comprising a compound of formula (I), or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, according to the invention to the skin, in particular within about 6 hours after step (a).
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- Preferably, the compound of formula (I) or an optical isomer thereof, or a cis–trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, notably a mineral or organic salt thereof or a solvate thereof such as a hydrate thereof, is
- 35 chosen from sennosides A, B, C, D, E and F, preferably it is chosen from sennosides A and B, even more preferably the compound of formula (I) is sennoside A or one of its salts.

By "skin modification stimulus" it is meant an action on skin that will induce a modification of the skin, such stimulus may temporarily compromise the barrier function of the skin. For example skin modification comprises a peeling agent, a laser, radiofrequency, an electrical, heat, a low-level light, a needle, or an abrasive instrument.

The invention also relates to a non-therapeutic, preferably cosmetic method of treating skin to promote and/or speed up wound healing after aesthetic procedures, the method comprising:

- (a) treating the skin with at least one skin modification stimulus, and
- (b) after the step (a) applying a composition according to the invention to the skin.

In still further embodiments, the method according to the invention comprise:

- (a) treating skin with at least one type of skin modification stimulus, for example a peeling agent, a laser, radiofrequency, an electrical, heat, a low-level light, a needle, or an abrasive instrument; and
- (b) after the step (a) applying a composition according to the invention to the skin, in particular within about 6 hours after step (a).

Figures:

Figure 1: Acceleration of wound closure within 3D reconstructed skin. Treatment of full-thickness reconstructed skin commencing day 10 post-commencement of reconstruction resulted in statistically significant acceleration of wound closure at days 14 as determined by OCT. Data represents boxplots. ** represents $p < 0.01$, 1-way ANOVA, $n=6$, representative of 3 independent experiments.

Figure 2: Acceleration of wound closure within 3D reconstructed skin. Treatment of full-thickness reconstructed skin commencing day 10 post-commencement of reconstruction resulted in statistically significant acceleration of wound closure at days 15 as determined by OCT. Data represents boxplots. ** represents $p < 0.01$, 1-way ANOVA, $n=6$, representative of 3 independent experiments.

Example:

Materials & Methods

Organotypic 3D reconstructed skin wound healing

T skin reconstructed skin models were constructed as described previously (Bataillon, *et al.*, Characterization of a New Reconstructed Full Thickness Skin Model, T-SkinTM, and its Application for Investigations of Anti-Aging Compounds. *Int J Mol Sci.* 2019 May;20(9)) . In brief, keratinocytes and fibroblasts were isolated from skin biopsies. A ring was placed on the surface of the epidermis which would preclude keratinocyte coverage of that area, providing an area of exposed collagenized dermis and simulating a partial-thickness wound. At day 10, the ring was removed and the wound treated with either an indicated raw material or vehicle control of 1/1000 DMSO in PBS. The wound is treated every third day. Oncostatin (10ng/ml) and Vitamin C (100µg/ml) were used as positive controls. Closure speed was determined by optical coherence tomography (OCT) to follow the closure of the wound. Closure speed is expressed as a percentage of increased closure over that of the control. Data is presented as boxplots with 3 replicates per condition in Figures 1 and 2. Statistical analysis was done using one-way ANOVA with post-hoc analysis and Levene's test for homogeneity of variance. Data is representative of three independent experiments.

Results

Compound of formula (I) accelerates wound healing in an Organotypic 3D reconstructed skin model

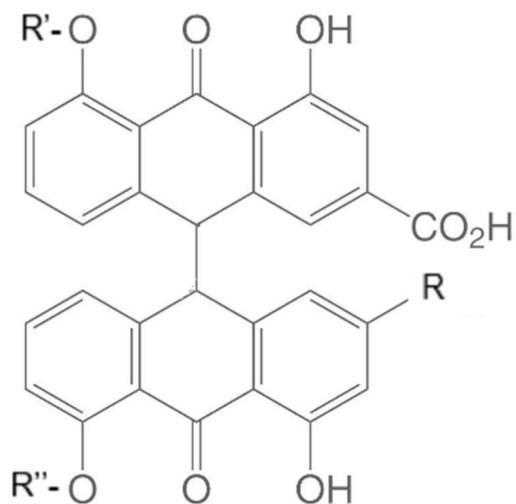
A wound-healing model was used to determine the ability to sennoside A (50µM) to accelerate wound healing closure over the course of twenty days. Both positive controls Oncostatin M (2ng/ml) and Vitamin C (100µg/ml) accelerated wound closure at days 14 (figure 1) and 15 (figure 2), as anticipated. Sennoside similarly accelerated wound closure. These data demonstrate that sennoside can accelerate skin wound healing and regeneration.

Conclusion

These data demonstrate that a compound of formula (I) drives wound closure within a 3D reconstructed skin wound-healing model. The invention therefore has clear indications for use in skin regeneration, wound healing, promotion of skin recovery following surgical/cosmetic procedure, and associated skin health endpoints requiring modulation of skin cells.

CLAIMS

- 1.- A cosmetic composition, comprising in a cosmetically acceptable medium:
 - at least one compound of formula (I) or an optical isomer thereof, or a cis-trans
 isomer thereof, or a tautomer thereof or a salt thereof, or a solvate thereof ,



(I);

wherein:

R' and R'' are identical or different, preferably identical, and represent H or a monosaccharide or a polysaccharide comprising up to 20 sugar units, preferably up to 6 sugar units, in pyranose and/or furanose form and of L and/or D series, the said mono- or polysaccharide may be substituted by an obligatorily free hydroxyl group, and optionally one or more amine function(s), optionally protected amine function(s), and the said monosaccharide or polysaccharide optionally being substituted on its CH₂OH group by a -C(O)-CO₂H group;

R represents H or -C-(O)-O-R₁ or -Alk-X-R₁, preferably -C-(O)-O-R₁ or Alk-O-R₁,

with X being O, S or -NR₁, preferably O; R₁ being H or a saturated or unsaturated hydrocarbon chain, preferably saturated in C₁-C₆, more preferably R₁ corresponds to H, and Alk corresponds to a C₁-C₆ alkylene group, preferably -CH₂-;

and;

- at least one compound chosen among thickeners, preservatives, perfumes, bactericides, pigments, dyes, carbon and/or silicone oils of inorganic, waxes, fillers,

emulsifiers, co-emulsifiers, UVA and/or UVB light protection agents also called UV filters, polymers, hydrophilic and lipophilic gelling agents.

2.- The composition according to claim 1, wherein said compound is a sennoside.

3.- The composition according to claim 2, wherein said sennoside is sennoside A, B, C, D, E, F, an enantiomer thereof, or cis-trans isomer thereof.

4.- The composition according to any one of claims 1-3 further comprising one or more skin active agents chosen among anti-aging agents and wound healing agents.

5. The composition according to any one of claims 1 to 4, characterized in that concentration of said at least one compound of formula (I) is between 0.01% and 5% by weight relative to the total weight of the composition.

6.- Use of at least one compound of formula (I) as described in claim 1, or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, or a composition according to any one of claims 1 to 5, to promote and/or speed up skin regeneration.

7.- The use of at least one compound of formula (I) as described in claim 1, or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, or a composition according to any one of claims 1 to 5, to prevent and/or treat signs of aging.

8.- The use according to claim 7, wherein sign of aging are signs of skin aging.

9.- The use of at least one compound of formula (I) as described in claim 1, or an optical isomer thereof, or a cis-trans isomer thereof (such as an alpha or beta anomer), or a tautomer thereof or a salt thereof, or a solvate thereof, or a composition according to any one of claims 1 to 5, to promote and/or speed up wound healing.

10.- A non-therapeutic method of treatment of the skin comprising the step of applying the composition according to any one of claims 1 to 5 on the skin.

11.- The method according to claim 10, wherein the skin displays at least one sign of skin aging.

12.- A non-therapeutic method of treating skin to promote and/or speed up wound healing after aesthetic procedures, the method comprising:

(a) treating the skin with at least one skin modification stimulus, and

(b) after the step (a) applying a composition comprising a compound of formula (I) as described in claim 1 or an optical isomer thereof, or a cis-trans isomer thereof, or a tautomer thereof or a salt thereof, or a solvate thereof, to the skin.