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(54) **Title:** USE OF CAFTARIC ACID AND DERIVATIVES IN FOOD OR BEVERAGES FOR REGULATING SKIN PIGMENTATION

(57) **Abstract:** The present invention relates generally to the field of food and beverage products for cosmetic purpose. More specifically, the present invention aims to provide an ingredient containing caftaric acid and/or derivatives for preventing and/or treating hyper-pigmentation of skin, skin color imperfections such as age-spots and other skin disorders characterized by abnormal pigments. The present invention also aims at improving skin tone as well as providing a skin lightening agent.

Use of caftaric acid and derivatives in food or beverages for regulating skin pigmentation

The present invention relates generally to the field of food or beverage products for cosmetic purpose. More specifically, the present invention aims to provide an ingredient containing caftaric acid and/or derivatives for preventing and/or treating hyper-pigmentation of skin, skin color imperfections such as age-spots and other skin disorders characterized by abnormal pigments. The present invention also aims at improving skin tone as well as providing a skin lightening or whitening agent.

Background of the invention

Skin color is primarily determined by the amount and type of melanin, a brown pigment present in the skin. Lower amounts of melanin result in lighter skin color while higher amounts result in darker skin color. Also, hyper-pigmentation in the skin is caused by the over expression or accumulation of melanin in the skin. As a result, the pathway involved in melanin production has been the target for many inhibitors so as to reduce the levels produced. One of the principal enzymes involved in the melanin pathway is tyrosinase.

The synthesis of melanin is a process under hormonal control, including the melanocyte stimulating hormone (MSH) and adrenocorticotropic hormone (ACTH) peptides that are produced from the precursor proopiomelanocortin. It is stimulated by the DNA damages that are caused by UVB-radiations as well.

Then, exposure to the sun over time can induce many biochemical reactions in the skin, leading to sunburn and tanning, for example. Other consequences of exposure to the sun accumulate over time. These changes can result in the development of age spots and create an uneven, mottled skin tone. Unfortunately, many of the commercially available products in today's market are either only marginally effective, or contain active agents that are unstable and lose their potency when incorporated into a final formula.

The ability to modify the expression of pigment content in the skin, to promote an evenness skin tone or lightening skin tone, is highly desired in today's society. Many people desire to modify their skin tone, to reduce aging spots, etc., or for purely cosmetic reasons.

As a result, efforts to develop effective compositions have focused on agents that inhibit the

activity of tyrosinase. For example, a variety of tyrosinase inhibitors, such as hydroquinone, vitamin C, cystein, kojic acid, arbutin and glutathione among others have been proposed in topical compositions. Also, a variety of dermatological compositions have been suggested for improving the appearance of pigment disorders such as that observed in melasma, freckles, vitiligo, piebaldism, phenylketonuria, and the like, and/or for cosmetic purposes.

Also, the use of skin bleaching compositions is widely expanded. However, they either destroy melanin or inhibit its formation. Many of these contain harsh chemicals such as peroxides, acids or formaldehyde, or thiolated materials. Less stringent therapies have other disadvantages.

Topical retinoids and topical corticosteroids have been suggested as hypo-pigmenting agents, as have laser treatment and chemical peels, but these fall short of desirable responses.

Other compositions suggested the use on the skin of natural materials, which have in some cases been used for centuries in Asia or Europe to bleach skin and skin areas, or enhance the appearance of fair skin. These include the use of lemon, orange, cucumber, ginko, carob, rose fruit, geraniuim herb, cinnamon, sweet marjoram, rosemary, etc...

In order to combat disorders related to abnormal pigment or to lighten skin tone, various compounds which, when applied topically to the skin, are capable of reducing tyrosinase activity and consequently limiting melanin production, have thus been proposed. Unfortunately, the treatments currently available are not entirely satisfactory, in particular in terms of the side effects which are frequently associated therewith, such as irritant side effects with certain topical agents.

It would thus be highly desirable to have alternative preparations that do not have the drawbacks of those described in the prior art. In particular, it would be highly desirable to develop nutritional cosmetic compositions to be administered via oral route that have improved stability and efficacy to promote an evenness skin tone or to lighten skin tone.

There also remains a need to active agents that are effective for treating and/or preventing skin pigmentation disorders, in particular those due to environmental factors or aging.

The object of the present invention is to meet these needs.

Summary of the invention

The present inventors could achieve this object by providing a food or beverage composition that comprises at least an ingredient containing caftaric acid and/or derivatives.

Thus, according to a first subject, the invention relates to the cosmetic use of an effective amount of at least an ingredient containing caftaric acid and/or derivatives as an active agent for treating and/or preventing skin pigmentation disorders. Such skin disorder are in particular those due to age or to environmental factors (e.g. UV), such as age-spots. It may also be skin disorders that are observed in melasma, freckles, vitiligo, piebaldism, phenylketonuria, and the like.

The present inventors have discovered that caftaric acid and derivatives effectively suppress the formation of melanin, melanogenesis, despite the fact that the extracts show little to no inhibition of tyrosinase activity. This result is surprising and unexpected considering the pivotal role of tyrosinase in melanogenesis and the focus of development efforts in the art to inhibit this enzyme.

For the purpose of the present invention, the term "skin" is intended to mean the skin of the face or of the body.

For the purpose of the present invention the term "effective amount", is intended to mean an amount sufficient to obtain the expected effect.

For the purpose of the present invention the term "prevent" is intended to mean the fact of reducing the risk of occurrence of the manifestation of the disorder under consideration.

The present invention is also directed towards the cosmetic use of the abovementioned ingredient, as an active agent for treating and/or preventing the skin pigment imperfections. As a result, the complexion becomes brighter and more homogeneous, without areas of dyschromia, or of dryness.

The present invention is also directed towards the cosmetic use of an effective amount of at least an ingredient containing caftaric acid and/or derivatives according to the invention, as an active agent for whitening or lightening skin tone.

The present inventors have also discovered that the ingredient according to the invention further improves hydration and/ or skin barrier function.

A use in accordance with the present invention may also comprises the use of at least an ingredient containing caftaric acid and/or derivatives, in combination with an effective amount of at least one active agent for further improving skin hydration or skin ageing, in particular as described hereinafter.

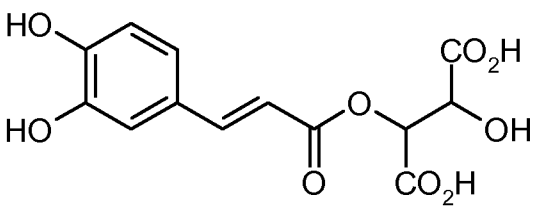
According to another of its aspects, the subject of the invention is a method, in particular a cosmetic method, for treating and/or preventing skin tone imperfections and the disorders associated with hyper-pigmentation, in particular aesthetic disorders, in an individual, comprising at least one step of administering, to said individual, at least an ingredient containing caftaric acid and/or derivatives according to the invention.

Compositions according to the present invention are orally administrable. This has the advantage of acting globally on the entire skin, in its deep layers (dermis, hypodermis), by means of a rapid and relatively non-restrictive mode of administration. Specifically, the metabolites and other active nutriments are in particular distributed within the dermal matrix by means of the bloodstream. Oral administration also has the advantage of a rapid and relatively non-restrictive mode of administration.

Detailed description of the invention

Ingredient containing caftaric acid and or derivatives

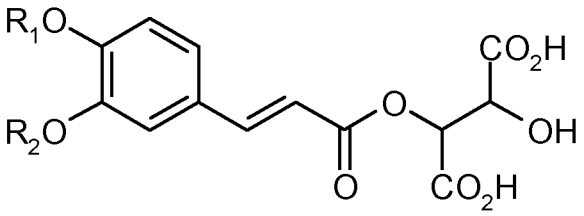
Caftaric acid is



and its derivatives include compounds which exhibit at least one C1-C3 alkylation of an OH-group and/or a C02H-group. For example both phenolic OH-groups may be alkylated. Alternatively and/or additionally both carboxyl groups may be transformed into the corresponding alkylesters. In one embodiment all OH-groups and all C02H-groups are alkylated.

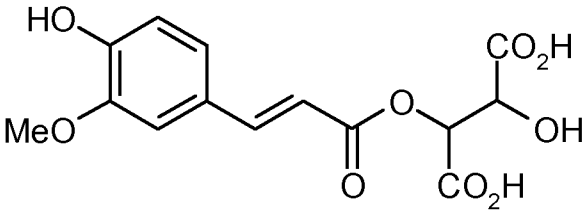
Typical derivatives are compounds in which both phenolic OH-groups are methylated, and/or compounds in which both carboxyl groups are methylated.

Further typical derivatives include compounds with the following formula



wherein R1 and/or R2 are selected from the group consisting of H; CH3; aryl, such as phenyl, benzyl, tolyl, o-xylylalkyl; C1-C3-acyl, amino acids, monosaccharides. R1 and/or R2 may be identical or may differ from each other.

One caftaric acid derivative is the following compound:



The ingredient containing caftaric acid and/or derivatives thereof may be any ingredient that contains caftaric acid and/or derivatives thereof, either naturally or in added form, but is preferably a natural foodstuff such as lettuce, chicory, dandelion, grape, grape pomace; or combinations or extracts thereof.

In a preferred embodiment, the plant material is in the form of chicory or an extract thereof. The chicory extract can be made from any suitable part of the plant material includes, for example, the root, the pulp, the like or combinations thereof.

Suitable extracts of chicory for the purpose of the present invention are also extracts that are commercially available, such as for example Leroux MS55 (commercially available from Leroux, France).

In a particular preferred embodiment of the present invention, suitable extracts of chicory may be prepared by any means that are known in the art, e.g., by steam extraction, solvent extraction, distillation, pressing or grinding. In particular, the extract is obtainable by extraction with a solvent from Chicory plant material, by a water extraction or an alcohol/water extraction, for example by a ethanol/water extraction or methanol/water extraction. The extract can be used as liquid (e.g. Leroux MS55, Leroux MS70) or as powder form (e.g. Leroux Sol B).

For ease of handling, the plant material is preferably in a dried and comminuted or powder form. As described below, the processes utilize dried, comminuted chicory and/or extracts thereof. However, it is to be understood that any suitable plant material may be used in any suitable form and added to the product according to the present invention.

The extract is processed such that its flavor can be enhanced. For example, bitter flavors which are typically associated with plant materials, such as chicory, can be removed by processing the plant into an extract. The extract can also be prepared such that the amount of bioactive agent in the final extract product can be desirably controlled.

It should be appreciated that the plant material can be processed to form an extract in a variety of different and suitable ways. In general, the plant material, such as the chicory root, is ground, powdered or provided in any suitable form. The plant material can then be further processed in a number of different stages to produce the product extract. In an embodiment, a defatting procedure is performed on the plant material to produce an extract that results from fats removed from the plant material. The defatting procedure can be conducted under any suitable defatting process conditions with any suitable types and amounts of solvents including, for example, hexane.

In an embodiment, the resultant extract of the defatting procedure can be further processed via acid hydrolysis to produce another type of plant extract that can be added to the nutritional composition of the present invention. The acid hydrolysis procedure can be conducted under any suitable process condition with any suitable types and amounts of solvents, including, for example, ethyl acetate.

In an embodiment, the extract from the defatting procedure can be further processed via a solvent extraction procedure. The solvent extraction can be carried out under any suitable process conditions and in the presence of any suitable amount and type of solvent. In an embodiment, the solvent includes a solution of methanol ("MeOH") and water mixed in a 1:1 volume ratio. The resultant solution of the solvent extraction procedure can be further processed by evaporation of the solvent under suitable conditions to produce another extract. Alternatively, the resultant solution can be treated with an adsorbant agent, such as polyvinylpolypyrrolidone or the like, to trap polyphenols. The adsorbant agent treatment can be carried out under any suitable process conditions.

The product comprising caftaric acid or derivatives may be for example a food product, a beverage, a pet food product or a pharmaceutical product.

The amount of caftaric acid and/or natural source thereof in the product will depend on several factors, such as the nature of the extract, the condition of the plant, the age, condition and size of the person or animal to be treated, the frequency, the product will be administered and/or the specific kind of skin disorder or damage to be treated or prevented or desired cosmetic effect.

The present inventors have found that the effectiveness of chicory or an extract thereof according to the present invention is generally dose dependant and follows a dose response curve. If generally mild skin disorders or damages are to be prevented and the product will be used frequently, very small amounts of chicory or an extract thereof will be sufficient to achieve the desired effect. If a severe skin pigment disorder is to be treated, larger amounts of chicory or an extract thereof will be more appropriate, although also small amounts will produce an effect.

Generally, it is preferred if the ingredient is enriched in caftaric acid and/or derivatives thereof. For example, the ingredient and/or the composition may comprise caftaric acid and/or derivatives thereof in an amount in the range of 0,001-99,99 weight-% of dry weight,

preferably 0,1-50 weight-% of dry weight, most preferred 0,1-10 weight-% of dry weight. The ingredient and/or the composition may comprise the lactic acid bacterium capable of hydrolyzing caftaric acid and/or derivatives thereof to generate tartaric and/or caffeic acid in an amount in the range of 0,001-99,99 weight-% of dry weight, preferably 0,1-50 weight-% of dry weight, most preferred 0,1-10 weight-% of dry weight.

In another embodiment, product contains chicory or an extract thereof in an amount in the range of about 0,1 g/l to 10 g/l, preferably in the range of 0,5 g/l to 3 g/l product. If the total amount of product cannot be measured in litres it is preferred if the product contains chicory or an extract thereof in an amount in the range of about 0,1 g/kg to 10 g/kg, preferably in the range of 0,5 g/kg to 3 g/kg product.

Preferably the product contains chicory or an extract thereof in a daily dose of 0,01 g-100g, preferably 0,25 g-10g.

The compositions according to the invention may be in any of the galenical forms usually available for the method of administration selected.

Oral compositions

The food compositions according to the invention may be in any of the galenical forms normally available for the method of administration selected. The carrier may be of diverse nature depending on the type of composition under consideration.

Nutritional complete formula, dairy product such as milk, yogurt, cheese, fermented milks, milk-based fermented products, ice-creams, cereal-based products or fermented cereal-based products, milk-based powders, infant and baby formulas, chilled or shelf stable beverages, food products of confectionary, chocolate or cereal type, animal feed, in particular for domestic animals. In particular, the chicory or extract thereof may be incorporated into any other form of enriched food, for example food bars or compacted or non-compacted powders. The powders may be diluted in water, soda, milk products or soya bean derivatives, or be incorporated into food bars.

The food product may also further comprise a protein source, a carbohydrate source, a lipid source, a mineral source and/or a vitamin source. The presence of proteins, carbohydrates, lipids, minerals and/or vitamins may have several advantages. These compounds generally

contribute to the taste and mouthfeel of the final product. They also provide the body with nutrients that it may need urgently when it is affected by skin disorders. They also allow formulating the product of the present invention as a complete nutritional formula, so that no additional nutrition is needed.

The individual ingredients may comprise any kind of edible compound. Typical ingredients for food compositions, in particular drinks, are well known in the art, e.g. milk, cream, coffee whiteners, and coffee creamers. Alternatively, ingredients could also be a salad dressing or parts thereof, for example. Such compounds are used by consumers to modify e.g. the aroma, appearance and texture of a composition. The ingredients may be in liquid or dry form, e.g. as powders, that are dissolved and/or suspended in a drink.

The composition of the invention may further comprise further ingredient suitable for inclusion in a food composition. Usual ingredients may e.g. be sugars, artificial sweeteners, emulsifiers, stabilisers, thickeners, flowing agents, colours, flavours, aromas, and the like. Suitable artificial sweeteners include saccharin, cyclamates, acetosulfame, L-aspartyl based sweeteners such as aspartame, and mixtures of these. Suitable emulsifiers include monoglycerides, diglycerides, lecithin, diacetyl tartaric acid esters of mono-diglycerides, emulsifying starches, and mixtures thereof. Suitable stabilisers include dipotassium phosphate and sodium citrate. A suitable flowing agent is sodium silica aluminate. In one embodiment the composition comprises milk protein and/or vegetable protein. In a further embodiment the composition comprises milk fat and/or vegetable fat.

Use

The products of the invention may be efficiently used for treating or preventing skin pigmentation disorders or cosmetically lightening skin tone e.g. by decreasing the production of melanin. Indeed caftaric acid and chicory extracts were shown to decrease in vitro the synthesis of melanin (Example **1,** Figure **1).** The production of tyrosinase was also decreased but to a limited extent (Figure **2),** suggesting that the decrease in melanin was not due to tyrosinase inhibition but rather to mechanisms acting upstream or downstream of this enzyme.

The ingredients according to the present invention have further a positive effect on strengthening skin barrier and maintaining skin hydration.

As a result, the pigment imperfections are reduced, the complexion becomes brighter and more homogeneous, without areas of dyschromia, or of dryness.

Thus, according to one subject, the invention relates to the cosmetic use of an effective amount of at least one ingredient containing caftaric acid and/or derivatives as an active agent for treating and/or preventing skin pigmentation disorders, in particular those due to age or environmental factors such as UV.

The present invention is also directed towards the cosmetic use of an effective amount of at least one ingredient containing caftaric acid and/or derivatives as an active agent for whitening or lightening skin tone, which is particularly desirable for asian population.

A use in accordance with the present invention may also comprises the use of at least one ingredient containing caftaric acid and/or derivatives, in combination with an effective amount of at least one active agent for improving skin hydration or skin ageing, in particular as described hereinafter.

According to another of its aspects, the subject of the invention is a method, in particular a cosmetic method, for treating and/or preventing skin tone imperfections and/ or disorders associated with hyper-pigmentation, in particular aesthetic disorders, in an individual, comprising at least one step of administering, to said individual, at least one ingredient containing caftaric acid and/or derivatives according to the invention.

The cosmetic treatment method of the invention may be carried out in particular by orally administering at least an effective amount of at least one ingredient containing caftaric acid and/or derivatives in accordance with the invention. Oral administration comprises ingesting, in one or more intakes, an oral composition as defined above.

It may comprise a single application. According to another embodiment, the application is repeated, for example, 2 to 3 times a day, for one day or more, and generally for a sustained period of at least 4, or even 1 to 15, weeks.

In addition, combinations of treatment with, optionally, oral or topical forms may be envisaged in order to supplement or reinforce the activity of the ingredients as defined by the invention.

Thus, a topical or oral treatment with a composition containing Chicory or an extract thereof in accordance with the invention, combined with an oral or topical composition optionally containing another active ingredient, in particular a probiotic microorganism, or other probiotics in dead, live or semi-active form or an hydrating or anti-ageing agent could be imagined as a kit. The ingredients are mixed, before they are formulated, in the order and under conditions readily determined by those skilled in the art.

The ingredients are mixed, before they are formulated, in the order and under conditions readily determined by those skilled in the art.

Further advantages and features of the present invention are apparent from the following Examples and Figures. The examples hereinafter are thus presented by way of non-limiting illustration of the field of the invention. In these examples, unless otherwise indicated, the percentages are percentages by weight and the ranges of values written in the form "between ... and ..." include the upper and lower limits specified.

Figures

Figure 1 : Melanin production by murine melanocytes pre-treated with caftaric acid or chicory extract vs controls (positive / negative).

Figure 2 : tyrosinase production by murine melanocytes pre-treated with caftaric acid or chicory extract vs controls (positive / negative).

Figure 3: Filaggrin synthesis by human primary epidermal keratinocytes pre-treated with caftaric acid or chicory extract vs controls (positive / negative).

EXEMPLES

Exemple 1 : Effect of caftaric acid on skin pigmentation

In order to evaluate the potential beneficial effect of ingredients towards skin de- or pro-pigmentation we used 2D culture of murine melanocytes (B16) and we performed 2 tests: 1- assessment of melanin production and 2- assessment of tyrosinase production.

1. *The cell culture conditions.*

B16 cells were cultured in DMEM 1g/L glucose without phenol red supplemented with 10 % foetal calf serum, in a humidified chamber at 37 °C and containing 5% $C0_2$.

2. *The production of melanin by B16 murine melanocyte cell line.*

Cells were incubated with the selected ingredients or the test references (Kojic acid at 40C^g/ml_) for 72 hours, in the presence or absence of NDP-MSH an analog of MSH. The total quantity of melanin (extracellular and intracellular) was evaluated by measurement of the optical density at 405 nm of each sample against melanin standards in presence or in absence of NDP-MSH.

3. *The production of tyrosinase by B16 murine melanocyte cell line.*

Cells were incubated with the selected ingredients or the test references (Kojic acid at 400 µg/mL) for 48 hours. The production of tyrosinase was evaluated by immunolabeling.

INGREDIENTS:

We have tested two chicory extracts MS-55 (concentre MS-55 LEROUX) and MS-70 (pate MS-70 LEROUX) and Caftaric acid. The tested concentrations are showed in Table 1 below.

Ingredient	Highest non cytotoxic conc. on HDF (mg/mL)	Highest non cytotoxic conc. on HPEK (mg/mL)	Tested conc. on HDF (mg/mL)	Tested conc. on HPEK (mg/mL)
MS55 10mg/ml in NaPO4 10mM pH 7.0	10	10	0.4	10
Caftaric acid 10mM ie 3.12mg/ml	1 mM	1 mM	0.2 mM	0.04 mM
MS70 10mg/ml in NaPO4 10mM pH 7.0	2	10	0.4	10

Table 1

Results

Results are expressed in percentage relative to the control. Test reference (Kojic acid) induced, as expected, a decrease in melanin production. Figure 1 shows melanin production by B16 melanocytes treated for 72 hours with the selected ingredients.

Caftaric acid decreased the production of melanin *in vitro,* more efficiently than the tested

chicory extract MS-70 (Figure 1). The production of tyrosinase was also decreased by these ingredients but to a limited extent (Figure 2), suggesting that the decrease in melanin was not due to tyrosinase inhibition but rather to mechanisms acting upstream or downstream of this enzyme.

Exemple 2: Effect of caftaric acid on skin barrier function and skin hydration

The potential beneficial effect of the Extracts of Example 1 towards skin barrier function and skin hydration was evaluated by using 2D culture of human primary epidermal keratinocytes and we assessed their synthesis of filaggrin.

The cell culture conditions.

Human epidermal keratinocytes were cultured in control keratinocytes-SFM medium, in a humidified chamber at 37 °C and containing 5% C02.

The synthesis of filaggrin by human epidermal keratinocytes.

Cells were incubated with the selected ingredients or the test references (CaCI2 at 1.5mM) for 144 hours. The production of filaggrin by was evaluated by immunolabeling.

Results

Both chicory extracts MS-55 and MS-70 as well as caftaric acid increased filaggrin production suggesting a positive effect of these compounds to strengthen skin barrier (Figure 2). A stronger skin barrier ensures a better protection of the body from the environment and pathogens' attack. It also limits the loss of water through the epidermis, thus ensuring an appropriate skin hydration.

CLAIMS

1. Cosmetic use of an effective amount of at least an ingredient containing caftaric acid and/ or derivatives, as an active agent for the preparation of a food product, a beverage or a pharmaceutical oral composition for treating and/or preventing skin pigment disorders and/ or skin imperfections.

2. Use in accordance with one of the preceding claims, characterized in that the skin disorders are that observed in melasma, freckles, vitiligo, piebaldism, phenylketonuria, and the like, and/or age spots.

3. Use in accordance with one of the preceding claims for improving skin tone and/or skin complexion.

4. Cosmetic use of an effective amount of at least an ingredient containing caftaric acid and/or derivatives, as an active agent for the preparation of a food product, a beverage or a pharmaceutical oral composition for whitening or lightening skin tone.

5. Use in accordance with one of the preceding claims, wherein the composition further improves hydration of the skin.

6. Use in accordance with one of the preceding claims, wherein the composition further improves skin barrier function.

7. Use in accordance with one of the preceding claims, wherein the extract is obtainable by extraction with a solvent from Chicory plant material, in particular by a water extraction or an alcohol/water extraction, for example by a ethanol/water extraction.

8. Use in accordance with one of the preceding claims, wherein the caftaric acid containing ingredient is a natural foodstuff such as lettuce, chicory, dandelion, grape, grape pomace; or combinations or extracts thereof.

9. Use in accordance with one of the preceding claims, wherein the product contains Chicory or an extract thereof in an amount in the range of about 0,1 g/l to 10 g/l,

preferably in the range of 0,5 g/l to 3 g/l.

10. Use in accordance with one of the preceding claims, wherein the product contains Chicory or an extract thereof in a daily dose of 0,01 g-1 OOg, preferably 0,25 g-1 Og.

11. Use in accordance with one of the preceding claims, wherein the composition further comprises at least one kind of food grade micro-organisms, in particular probiotics, in dead, live or semi-active form.

12. Use in accordance with one of the preceding claims, in combination with an effective amount of at least one active agent for improving skin hydration or skin ageing.

13. A kit for treating and/or preventing skin pigment disorders and/ or skin imperfections, comprising an oral treatment with a composition containing Chicory or an extract, combined with an oral or topical composition optionally containing a probiotic microorganism in dead, live or semi-active form, or an hydrating or anti-ageing agent.

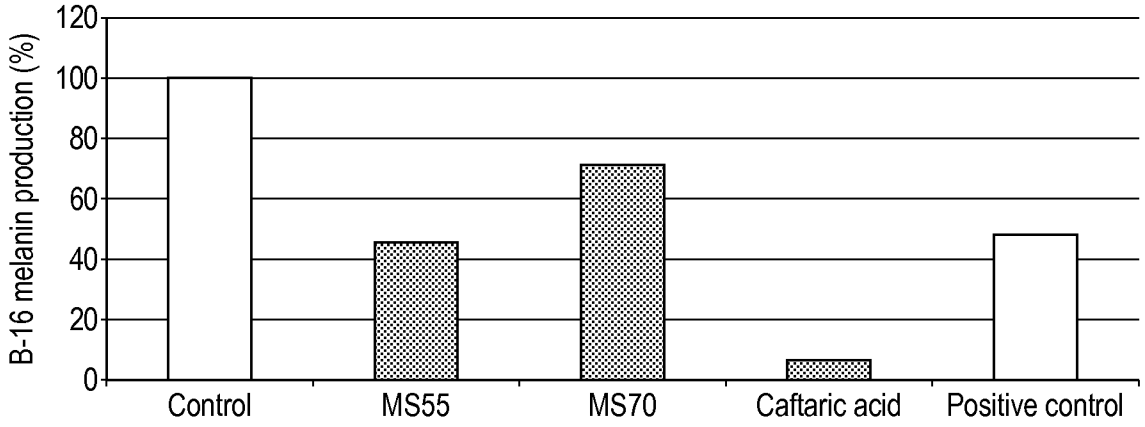

B-16 melanin production (%)
120
100
80
60
40
20
0
Control
MS55
MS70
Caftaric acid
Positive control

FIG. 1

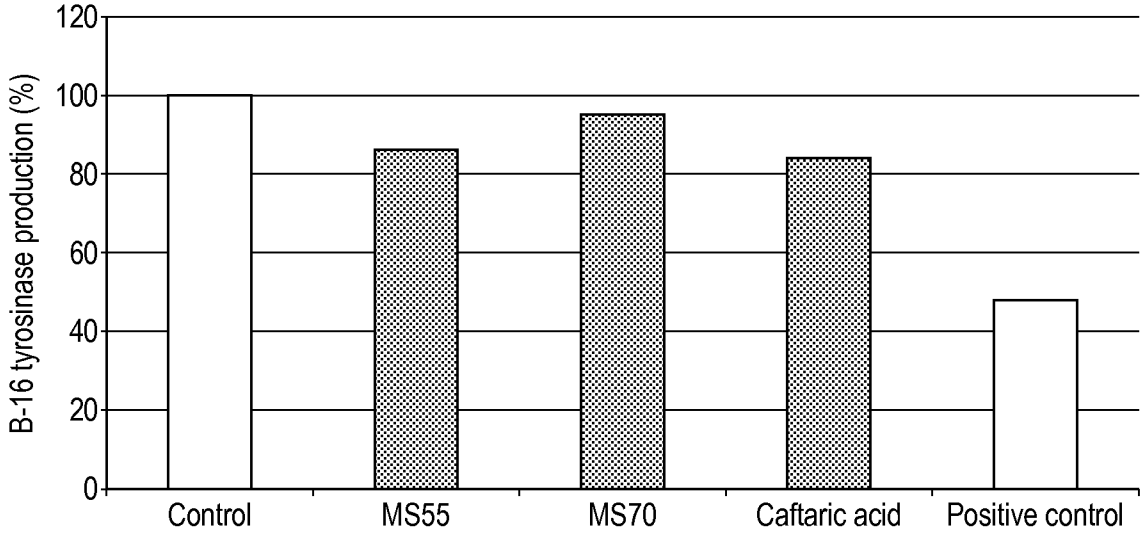

B-16 tyrosinase production (%)
120
100
80
60
40
20
0
Control
MS55
MS70
Caftaric acid
Positive control

FIG. 2

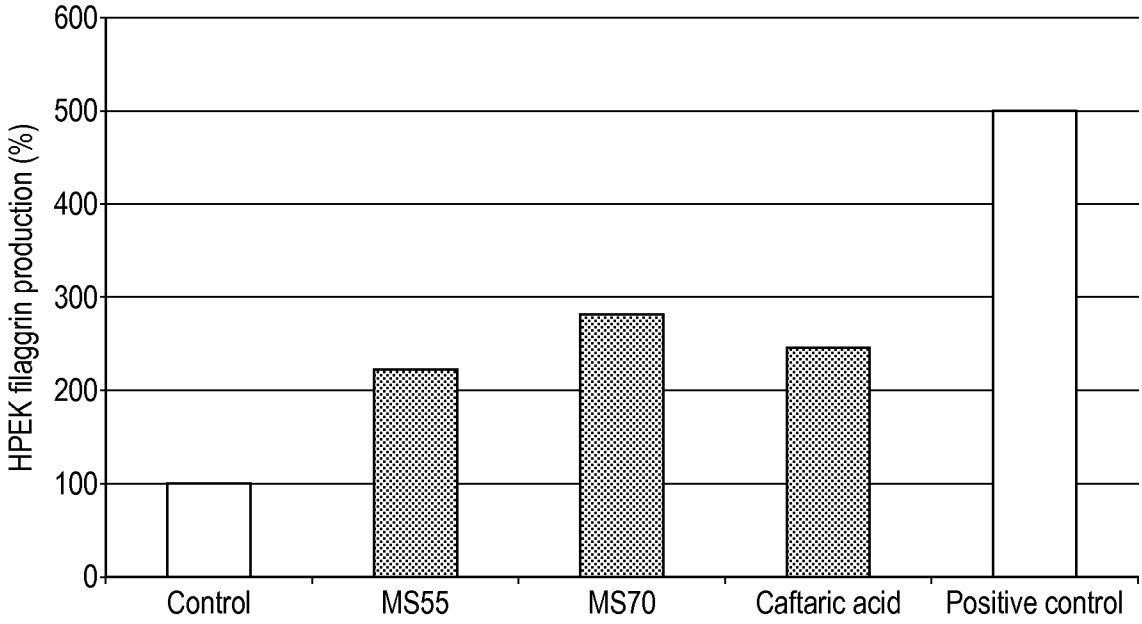

600
500
400
300
200
100
0
HPEK filaggrin production (%)
Control
MS55
MS70
Caftaric acid
Positive control

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/060760

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K8/36 A61K8/37 A61K8/66 A61K8/97 A61K8/99
A61Q19/00 A61Q19/02 A61Q19/08 A23L1/30 A61K8/368
ADD.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K A61Q A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 October 2011	20/10/2011

Name and mailing address of the ISA/	Authorized officer
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 1 261 315 Bl (UNI LEVER PLC [GB] ; UNI LEVER NV [NL]) 19 July 2006 (2006-07-19) claims	1-13

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