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(71) Applicant: DUPONT NUTRITION BIOSCIENCES
APS [DK/DK]; Langebrogade 1, P.O. Box 17, DK-1001
Copenhagen K (DK).

(72) Inventors: DE SAINT-AUBERT, Claire; Chutzenstrasse
36, CH-3007 Bern (CH). SWORN, Graham; 165 Place
des Epicéas, F-95680 Montlignon (FR). IWATA, Rei;
DSP Gokyo Food & Chemical Co., Ltd., Ogura Build., 6-6
Kofunecho Nihonbashi, Chuo-ku, Tokyo 103-0024 (JP).

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(54) Title: USE OF SUCCINOGLYCAN AND ONE OR MORE GLUCOMANNAN(S) OR GALACTOMANNAN(S)

(57) Abstract: The present invention relates to a composition such as a food or feedstuff product and/or an additive comprising suc-
cinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B).



USE OF SUCCINOGLYCAN AND ONE OR MORE GLUCOMANNAN(S) OR GALACTOMANNAN(S)

FIELD OF THE INVENTION

The present invention relates to a composition such as a food or feedstuff product and/or an additive comprising succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B). The invention further relates to a method for preparing such a composition. The invention further relates to method of using and use of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) for increasing the viscosity, preferably in a total amount which provides a synergistic increase in viscosity.

10 BACKGROUND OF THE INVENTION

As also described in WO 2010/112499 two of the key functionalities of xanthan gum that has set it apart from other hydrocolloid thickeners are its rheology and its ability to interact synergistically with galactomannans.

JP2012-235717 is directed to the use of liquid seasoning comprising one type of fermented cellulose, psyllium seed gum, native gellan gum, succinoglycan, or xanthan gum.

The rheology by adding the above hydrocolloids may be characterised by the development of very high viscosity at low shear rates and pseudoplastic flow which provide suspension stability to finished products and low viscosity at higher shear rates for ease of filling, pouring and pumping.

Xanthan gum also has the ability to interact with galactomannans such as guar gum, cassia gum, tara gum and locust bean gum and with structurally similar polysaccharides such as the glucomannan konjac. This interaction results in either a synergistic increase in viscosity in the case of guar gum or the formation of strong self-supporting gels as seen with locust bean gum and konjac glucomannan.

These functionalities are used in a wide range of food applications; however, in some products such as dressings/sauces/beverages while an increase in viscosity is required, formation of gel is unwanted.

SUMMARY OF THE INVENTION

It has been found by the present inventor(s) as shown in the examples that, when using succinoglycan together with a galactomannan such as locust bean gum, guar gum, tara gum or cassia gum or together with a glucomannan such as konjac gum in a composition in which an increased viscosity is desired, a synergistic increase in viscosity may be provided without formation of gel, and still providing a desirable mouth feel. The feature of synergy when adding succinoglycan and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) is a very prominent and important feature of the present invention, which allows for the preparation of products where the amount of succinoglycan and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) may be reduced without impeding the properties of the combined products.

So, in a first aspect the present invention relates to a composition comprising A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s).

In a further aspect, the present invention relates to a method for preparing a composition as disclosed herein, wherein A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) are brought together with the other composition ingredients sequentially in any order or at the same time..

In a further aspect, the present invention relates to an additive comprising A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s).

In a further aspect, the present invention relates to a method of using an additive as disclosed herein for increasing the viscosity of a composition such as a food or feedstuff.

In a further aspect, the present invention relates to a method of using A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) for increasing the viscosity of a composition.

In a further aspect, the present invention relates to the use of A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) for increasing the viscosity of a composition.

LEGENDS TO THE FIGURES

Fig. 1 shows the viscosity obtained at a constant total gum concentration for different ratios of konjac gum and succinoglycan when mixing succinoglycan and konjac gum as a function of the concentration of konjac gum and succinoglycan respectively compared with the viscosity obtained with succinoglycan alone, the viscosity obtained with konjac gum alone and the theoretical viscosity obtained as the sum of the viscosity obtained by succinoglycan alone and with konjac gum alone as further described in example 1.

Fig. 2 shows the % increase in viscosity compared with the theoretical viscosity of different samples containing succinoglycan in combination with locust bean gum (LBG), succinoglycan in combination with tara gum, succinoglycan in combination with guar gum, succinoglycan in combination with cassia gum and succinoglycan in combination with konjac gum in the following ratios (% (w/w)): succinoglycan:glucomannan/galactomannans: 0.5:0; 0.4:0.1; 0.3:0.2; 0.25:0.25; 0.1:0.4; 0:0.5 as further described in example 1.

Fig. 3 shows photos taken 3 days after production (samples stored at +5°C) of salad dressings with succinoglycan at different dosages as further described in example 2.

Fig. 4 shows photos taken 3 days after production (samples stored at +5°C) of salad dressings with succinoglycan and locust bean gum at different dosages as further described in example 2.

DETAILED DISCLOSURE OF THE INVENTION

Definitions

In accordance with this detailed description, the following abbreviations and definitions apply. It should be noted that as used herein, the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "a protein" includes a plurality of such proteins, and reference to "the composition" includes reference to one or more compositions and equivalents thereof known to those skilled in the art, and so forth.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art. The following terms are provided below.

When discussing viscosity of compositions as disclosed herein, these parameters are generally determined by use of the methods and apparatus specifically referred to in the examples. For example, viscosity expressed as is generally measured using a Brookfield LVT dial reading viscometer at the indicated spindle speed (typically 0.3 to 60 rpm rpm).

- 5 In the present context, the term "synergy" refers in general to the interaction of two or more agents so that their combined effect is greater than the sum of their individual effects.

- In the present context, the term "a synergistic increase in viscosity" in relation to viscosity of a composition as disclosed herein comprising both succinoglycan and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) refers to the increase in the resulting viscosity when adding both said succinoglycan and said one or more hydrocolloid(s) in a total amount compared to the theoretical viscosity which is the sum of the viscosity obtained when adding succinoglycan alone and of the viscosity obtained when adding said one or more hydrocolloid(s) alone each in the same amount as the said total amount. In one aspect, the synergistic increase in viscosity is at least 5% higher than the theoretical viscosity such as at least 7% higher or such as at least 10% higher.
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The term "food" as used herein refers to an edible material suitable for human consumption.

The term "feedstuff" as used herein refers to an edible material suitable for non-human animal consumption.

20 Succinoglycan (A)

- Succinoglycan (also named SGG herein) is an anionic polysaccharide, with a molecular backbone consisting of repeatedly 3 D-glucose units and 1 galactose unit, with side-chains of 4 D-glucose units on which both succinate acid and pyruvate acid units are present. Succinoglycan has a high molecular weight, up to $9 \cdot 10^6$ Dalton (in 0.1M aqueous NaCl at 25°C). Succinoglycan expresses a very high degree of pseudoplastic flow, which stretches from gel like behaviour when at rest to a very low viscous fluid upon pouring and pumping. In one aspect, succinoglycan gum may be prepared as a biosynthesised gum made by fermentation of *Agrobacterium tumefaciens*. More particularly, said strain of *Agrobacterium tumefaciens* I-736 has been deposited under the provisions of the Budapest Treaty with the National Collection of Cultures of Microorganisms (CNCM) on Mar. 1, 1988, under No. I-736. This strain originates from the National Collection of Phytopathogenic Bacteria and is recorded under No. CNBP 291 in the 1974 catalog of the organism curator.
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The strain *Agrobacterium tumefaciens*, a producer of succinoglycan, has also been deposited at the National Collection of Cultures of Microorganisms (CNCM) Institut Pasteur under the provisions of the Budapest Treaty by DANISCO FRANCE S.A.S., 20 Rue de Brunel, F-75017 Paris, France and carries the reference CNCM I-4789 on 25 July 2013. Succinoglycan may be prepared as for example described in US 5,348,675 or US 5,252,727, or a commercial available succinoglycan may also be used. In one aspect, the succinoglycan is obtained from said *Agrobacterium tumefaciens* CNCM I-4789.

In one aspect, succinoglycan is used in a solid form. The succinoglycan may for example be used in the form of a powder. Succinoglycan may in another aspect be used in the form of a dry mix with sugar. In another aspect, the succinoglycan is added either hydrated separately or with other hydrocolloids, optionally during heating.

The exact dosage used is dependent on the desired viscosity of the resulting composition as disclosed herein.

The one or more hydrocolloid(s) (B)

Galactomannans are multifunctional macromolecular carbohydrates found in various albuminous or endospermic seeds. The seed galactomannan from the carob (or locust bean) tree (*Ceratonia siliqua* L.) and from the guar plant (*Cyamopsis tetragonoloba* L.) are widely used, while the kernels from the tara shrub (*Cesalpinia spinosa* L.) or the cassia shrub (*Cassia* L.) are used to a less extent. The galactomannans are composed entirely of linear (1 → 4)-β-D-mannan chains with varying amounts of single D-galactose substituents linked to the main backbone by (1 → 6)-α-glycosidic bonds. They can be easily distinguished from each other by their overall mannose-galactose ratios between about 1.1:1 and about 5:1. (locust bean gum ≈ 4:1; guar gum ≈ 2:1; tara gum ≈ 3:1; cassia gum ≈ 5:1).

Konjac mannan is a main component of tubers of konjac which is a perennial plant of *Araceae*. It is a heteropolysaccharide consisting of β-D-glucose (G) and β-D-mannose (M) with a G/M ratio of 1 to 1.6. The degree of branching is about 8% through β-(1 → 6)-glucosyl linkages. Konjac is a water-soluble polysaccharide that is considered as dietary food and it belongs to the glucomannan group.

Typically, the one or more hydrocolloid(s) (B) is a galactomannan selected from the group consisting of guar gum, tara gum, locust bean gum, cassia gum. In another aspect, the one or more hydrocolloid(s) (B) is a glucomannan such as konjac glucomannan.

In one aspect, the one or more hydrocolloid(s) (B) as used herein is konjac gum. In one aspect, the one or more hydrocolloid(s) (B) as used herein is locust bean gum. In one aspect, the one or more hydrocolloid(s) (B) as used herein is guar gum. In one aspect, the one or more hydrocolloid(s) (B) as used herein is tara gum. In one aspect, the one or more hydrocolloid(s) (B) as used herein is cassia gum.

Succinoglycan (A) and the one or more hydrocolloid(s) (B)

In one aspect, the weight ratio of succinoglycan (A) and the at least one galactomannan or glucomannan is at least 5:95, such as at least 10:90, at least 15:85, at least 20:80, at least 25:75, at least 30:70, at least 35:65, at least 40:60, at least 45:55, at least 50:50, at least 55:45, at least 60:40, at least 65:35, at least 70:30, at least 75:25, at least 80:20, at least 85:15, at least 90:10, and at least 95:5. On the other hand, the weight ratio between the succinoglycan (A) and the at least one galactomannan or glucomannan is typically at most 95:5, such as at most 90:10, at most 85:15, at most 80:20, at most 75:25, at most 70:30, at most 65:35, at most 60:40, at most 55:45, at most 50:50, at most 45:55, at most 40:60, at most 35:65, at most 30:70, at most 25:75, at most 20:80, at most 15:85, at most 10:90, and at most 5:95.

In one aspect, the weight ratio of succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 5:95 to 95:5. In one aspect, the weight ratio of succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 10:90 to 90:10. In one aspect, the weight ratio of succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 15:85 to 85:15. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 20:80 to 80:20. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 25:75 to 75:25. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 30:70 to 70:30. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 35:65 to 65:35. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 40:60 to 60:40. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 45:55 to 55:45. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 55:45 to 45:55. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 60:40 to 40:60. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 65:35 to 35:65. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 30:70 to 70:30. In one aspect, the weight ratio of the succinoglycan

(A) and the at least one galactomannan or glucomannan (B) is from 25:75 to 75:25. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 20:80 to 80:20. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 15:85 to 85:15. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 10:90 to 90:10. In one aspect, the weight ratio of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) is from 5:95 to 95:5.

In a further aspect, the composition as disclosed herein comprises an effective amount of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) to provide a synergistic increase in viscosity. In one aspect, the composition as disclosed herein comprises a total amount of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition. In one aspect, the composition as disclosed herein comprises a total amount of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) from 0.1 % (w/w) to 1.5 % (w/w) based on the weight of the composition. In one aspect, the composition as disclosed herein comprises a total amount of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) from 0.1 % (w/w) to 1.0 % (w/w) based on the weight of the composition. In one aspect, the composition as disclosed herein comprises a total amount of the succinoglycan (A) and the at least one galactomannan or glucomannan (B) from 0.1 % (w/w) to 0.7 % (w/w) based on the weight of the composition.

Compositions

An interesting group of compositions of the invention is constituted by food or feedstuff products. These will comprise a succinoglycan (A) discussed above, where also a glucomannan or galactomannan (B) is included. In one aspect, the composition is a food product. A typical food or feedstuff product disclosed herein is selected from the group consisting of a sauce, a dressing, a soup, a gravy, a jam, a fruit preparation, a frozen product, a bakery product, an ice cream, a beverage, a dairy product and an emulsion. In one aspect, the food product is a sauce, dressing or beverage. Food compositions as disclosed herein may be made in a similar fashion to prior products except that succinoglycan and the at least one galactomannan or glucomannan is added, and adjustment of the pH may be needed.

In one aspect, the food or feedstuff is a sauce. In general a sauce is a liquid, creaming or semi-solid food served on or used in preparing other foods. Sauces are not normally consumed by themselves; they add flavor, moisture, and visual appeal to another dish. Sauces for salads are often called "dressings".

The current invention is also directed to soup. Soup is primarily a liquid food, generally served warm (but may be cool or cold), that is made by combining ingredients such as meat and vegetables with stock, juice, water, or another liquid. Hot soups are additionally characterized by boiling solid ingredients in liquids in a pot until the flavors are extracted, forming a broth.

The current invention is also directed to gravy. Gravy is a sauce, made often from the juices that run naturally from meat or vegetables during cooking. The gravy may be further colored and flavored with gravy salt (a simple mix of salt and caramel food colouring) or gravy browning (gravy salt dissolved in water) or ready-made cubes and powders can be used as a substitute for natural meat or vegetable extracts.

The current invention is also directed to jam. Jam is a preparation of fruits, vegetables and sugar, often canned or sealed for long-term storage. The preparation of fruit preserves today often involves adding commercial or natural pectin as a gelling agent, although sugar or honey may be used, as well.

The current invention is also directed to fruit preparations. Fruit preparations are preparations from fruit (whole or pieces or from fruit purée or fruit concentrate), sugar/sugar syrup, thickening agents, buffering salts. Depending on the product, the soluble solids content of these fruit preparations may be between 20% and 60%. When added to a dairy product such as milk product the pH-value is usually set to approx. pH 4. T and is thus adjusted to the natural pH of the milk product.

The current invention is also directed to dairy products. A "dairy product" as used herein may be any food composition wherein one of the major constituents is milk-based. In one aspect the milk is selected from the list consisting of cows'milk, buffalo milk, goat milk, camel milk and sheep milk.

The current invention is also directed to ice cream. Ice cream is a frozen dessert usually made from dairy products, such as milk and cream and often combined with fruits or other ingredients and flavours. Most varieties contain sugar, although some are made with other sweeteners. In some cases, artificial flavourings and colourings are used in addition to, or instead of, the natural ingredients.

The current invention is also directed to emulsions. An emulsion is a colloid consisting of a stable mixture of two immiscible phases, typically liquid phases in which small droplets of one phase are dispersed uniformly throughout the other. A typical emulsion is an oil and water emulsion, such as a water-in-oil or oil in water emulsion. Emulsions may, for example, be

industrial emulsions such as water- containing crude oils emulsified by addition of surface active substances, or oil containing water, edible emulsions such as mayonnaise and salad cream or edible oil-in-water emulsions such as margarine. Emulsions are typically formed and stabilized by the addition of an emulsifier and many effective emulsifiers are known.

- 5 Emulsions can be further stabilized but the addition of viscosity modifying agents and many effective viscosity modifying agents are known.

In formulating the compositions and food products disclosed herein further emulsifiers may be used. In the food technology are any of the numerous chemical additives that facilitate two non-miscible liquids to form an emulsion, as in the mixture of oil and water in margarine,
10 shortening and salad dressing.

Preferred emulsifiers may be selected from the group consisting of propylene glycol monostearate (PGMS), sodium stearyl lactylate (SSL), calcium stearyl lactylate (CSL), monoglycerides, diglycerides, monodiglycerides, polyglycerol esters, lactic acid esters of monoglycerides, lactic acid esters of diglycerides, lactic acid esters of monodiglycerides,
15 polysorbate, sucrose esters of monoglycerides, sucrose esters of diglycerides, sucrose esters of monodiglycerides, diacetyl tartaric acid esters of monoglycerides, diacetyl tartaric acid esters of diglycerides, diacetyl tartaric acid esters of monodiglycerides (DATEM), citric acid esters of monoglycerides, citric acid esters of diglycerides, citric acid esters of monodiglycerides (CITREM) and combinations thereof.

- 20 The current invention is also directed to a bakery product. The current invention is also directed to a beverage. The current invention is also directed to a frozen composition.

Formulation of compositions

In formulating the compositions such as food or feedstuff products as disclosed herein, typical pH modifiers, such as citric acid or maleic acid, hydrocolloids such as starch, other
25 hydrocolloids such as pectin, and/or cellulose gum, sweeteners, such as natural and high intensity sweeteners, preservatives, such as sodium benzoate, flavorings such as flavor emulsion bases, other common additives such as sodium citrate and *ascorbic* acid, and *colorings*, may also be added to the compositions of the present invention.

Processes for blending the various ingredients of the compositions and producing the food
30 products disclosed herein are well-known in the art and include but are not limited to dry blending and wet blending such as in agglomeration/hydration followed by drying (e.g., spray drying, fluidized bed drying or drum drying). It is also well-known that water quality may vary widely across the consumer market, thus, sequestration agents such as sodium

hexametaphosphate may be added to the compositions in order to allow for consistency and ease of use in differing markets.

The compositions as disclosed herein typically have a pH from between 1 to 8, depending on the field of use, where the lower end is e.g. useful for toilet cleaners etc, and the higher end values are useful in food and feedstuffs. Preferred pH values are about 1, about 1.5, about 2.0, about 2.5, about 3.0, about 3.5, about 4.0, about 4.5, about 5.0, about 5.5, about 6.0, about 6.5 and about 7.0.

The compositions herein are typically prepared by adding A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) either sequentially in any order or at the same time to obtain a composition as disclosed herein.

In one aspect, when using the glucomannan(s) and/or galactomannan(s) in dry form, the glucomannan(s) and/or galactomannan(s) may be hydrated before addition, or in the composition. In another aspect, the composition is heated either before or after addition of the glucomannan(s) and/or galactomannan(s). In another aspect, A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) are added at the same time.

Additive

In one aspect, an additive comprising A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s), is provided. Such an additive will typically also comprise one or more further ingredients such as selected from the group of emulsifiers, starch, and other hydrocolloids. In one aspect, the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5 in the additive. The amount of the additive added to a composition for increasing the viscosity is typically such that the total amount of A and B is from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition. In one aspect, the additive is added such that the total amount of A and B is from 0.1 % (w/w) to 1.5 % (w/w) based on the weight of the composition. In one aspect, the additive is added such that the total amount of A and B is from 0.1 % (w/w) to 1.0 % (w/w) based on the weight of the composition. In one aspect, the additive is added such that the total amount of A and B is from 0.1 % (w/w) to 0.7 % (w/w) based on the weight of the composition. In one aspect, the additive is added such that succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) provides a synergistic increase in viscosity. In one aspect, the additive

may be used in the types of compositions as further disclosed herein such as food or feedstuff products.

Specific numbered embodiments of the invention

Embodiment 1. A composition comprising A) succinoglycan and B) one or more
5 hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s).

Embodiment 2. The composition according to embodiment 1, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.

Embodiment 3. The composition according to any one of embodiments 1-2,
10 wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 10:90 to 90:10.

Embodiment 4. The composition according to any one of embodiments 1-3,
15 wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 20:80 to 80:20.

Embodiment 5. The composition according to any one of embodiments 1-4 comprising succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) in a total amount which provides a
20 synergistic increase in viscosity.

Embodiment 6. The composition according to any one of embodiments 1-5, wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition.

25 Embodiment 7. The composition according to any one of embodiments 1-6, wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.1 % (w/w) to 1.5 % (w/w) based on the weight of the composition.

Embodiment 8. The composition according to any one of embodiments 1-7, wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.1 % (w/w) to 1.0 % (w/w) based on the weight of the composition.

- 5 Embodiment 9. The composition according to any one of embodiments 1-8, wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.1 % (w/w) to 0.7 % (w/w) based on the weight of the composition.

- 10 Embodiment 10. The composition according to any one of embodiments 1-9, wherein the one or more hydrocolloid(s) is a glucomannan.

Embodiment 11. The composition according to embodiment 10, wherein the glucomannan is konjac gum.

Embodiment 12. The composition according to any one of embodiments 1-11, wherein the one or more hydrocolloid(s) is a galactomannan.

- 15 Embodiment 13. The composition according to embodiment 12, wherein the galactomannan is selected from the group consisting of guar gum, locust bean gum (LBG), tara gum and cassia gum.

- 20 Embodiment 14. The composition according to any one of embodiments 1-13, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is konjac gum.

Embodiment 15. The composition according to any one of embodiments 1-13, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is locust bean gum.

- 25 Embodiment 16. The composition according to any one of embodiments 1-13, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is guar gum.

Embodiment 17. The composition according to any one of embodiments 1-13, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is tara gum.

Embodiment 18. The composition according to any one of embodiments 1-13, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is cassia gum.

Embodiment 19. The composition according to any one of embodiments 1-18,
5 wherein the composition is a food or feedstuff product.

Embodiment 20. The composition according to any one of embodiments 1-19, wherein the composition is a food product.

Embodiment 21. The composition according to any one of embodiments 1-20,
10 wherein the composition is selected from the group consisting of a sauce, a dressing, a soup, a gravy, a jam, a fruit preparation, a frozen product, a bakery product, an ice cream, a beverage, a dairy product and an emulsion.

Embodiment 22. The composition according to any one of embodiments 1-21, wherein the composition is selected from the group consisting of a sauce, a dressing and a beverage.

15 Embodiment 23. The composition according to any one of embodiments 1-21, wherein the succinoglycan is obtained from said *Agrobacterium tumefaciens* CNCM I-4789.

Embodiment 24. A method for preparing a composition according to any one of
20 embodiments 1-23, wherein A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) are brought together with the other composition ingredients sequentially in any order or at the same time.

Embodiment 25. The method according to any one of embodiments 1-24, wherein A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) are added at the same time.

Embodiment 26. An additive comprising A) succinoglycan and B) one or more
25 hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s).

Embodiment 27. The additive according to embodiment 26 further comprising one or more of selected from the group of the following ingredients emulsifiers, starch, and other hydrocolloids.

Embodiment 28. The additive according to any one of embodiments 26-27, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.

Embodiment 29. The additive according to any one of embodiments 26-28, wherein
5 the one or more hydrocolloid(s) is a glucomannan.

Embodiment 30. The additive according to any one of embodiments 26-29, wherein the glucomannan is konjac gum.

Embodiment 31. The additive according to any one of embodiments 26-30, wherein the one or more hydrocolloid(s) is a galactomannan.

10 Embodiment 32. The additive according to any one of embodiments 26-31, wherein the galactomannan is selected from the group consisting of guar gum, locust bean gum (LBG), tara gum and cassia gum.

Embodiment 33. The additive according to any one of embodiments 26-31, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and
15 galactomannan(s) (B) is locust bean gum.

Embodiment 34. The additive according to any one of embodiments 26-31, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is konjac gum.

Embodiment 35. The additive according to any one of embodiments 26-31, wherein
20 the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is guar gum.

Embodiment 36. The additive according to any one of embodiments 26-31, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is tara gum.

25 Embodiment 37. The additive according to any one of embodiments 26-31, wherein the one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is cassia gum.

Embodiment 38. A method of using an additive as defined in any one of embodiments 26-37 for increasing the viscosity of a composition such as a food or feedstuff.

Embodiment 39. The method according to embodiment 38, wherein the additive is used in an amount which provides a synergistic increase in viscosity.

- 5 Embodiment 40. The method according to any one of embodiments 38-39, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.

- Embodiment 41. The method according to any one of embodiments 38-40, wherein said succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) are added to said composition in an amount
10 wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition.

- Embodiment 42. The method according to any one of embodiments 38-41, wherein
15 the food or feedstuff is selected from the group consisting of a sauce, a dressing, a soup, a gravy, a jam, a fruit preparation, a frozen product, a bakery product, an ice cream, a beverage, a dairy product and an emulsion.

- Embodiment 43. A method of using A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s)
20 for increasing the viscosity of a composition.

Embodiment 44. The method according to embodiment 43, wherein the A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) are used in a total amount which provides a synergistic increase in viscosity.

- 25 Embodiment 45. The method according to any one of embodiments 43-44, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.

- Embodiment 46. The method according to any one of embodiments 43-45, wherein said succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) are added to said composition in an amount
30 wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from

the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition.

Embodiment 47. The method according to any one of embodiments 43-46, wherein the composition is a food or feedstuff product.

- 5 Embodiment 48. The method according to any one of embodiments 43-47, wherein the composition is selected from the group consisting of a sauce, a dressing, a soup, a gravy, a jam, a fruit preparation, a frozen product, a bakery product, an ice cream, a beverage, a dairy product and an emulsion.

- Embodiment 49. Use of A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) for increasing the viscosity of a composition.
- 10

- Embodiment 50. The use according to embodiment 49, wherein succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) are used in a total amount which provides a synergistic increase in viscosity.
- 15

Embodiment 51. The use according to any one of embodiments 49-50, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.

- Embodiment 52. The use according to any one of embodiments 49-51, wherein said succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) are added to said composition in an amount wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition.
- 20

- Embodiment 53. The use according to any one of embodiments 49-52, wherein the composition is a food or feedstuff product.
- 25

- Embodiment 54. The use according to any one of embodiments 49-53, wherein the composition is selected from the group consisting of a sauce, a dressing, a soup, a gravy, a jam, a fruit preparation, a frozen product, a bakery product, an ice cream, a beverage, a dairy product and an emulsion.
- 30

All publications mentioned in the above specification are herein incorporated by reference. Various modifications and variations of the described compositions, methods and system of the present invention will be apparent to those skilled in the art without departing from the scope and spirit of the present invention. Although the present invention has been described
 5 in connection with specific preferred embodiments, it should be understood that the invention as claimed should not be unduly limited to such specific embodiments. Indeed, various modifications of the described modes for carrying out the invention which are obvious to those skilled in biochemistry, microbiology and molecular biology or related fields are intended to be within the scope of the following claims.

10 EXAMPLES

EXAMPLE 1

Synergy of succinoglycan with galactomannans and glucomannans in water system.

In the following example succinoglycan was added in water together with galactomannans (locust bean gum, tara gum, guar gum or cassia gum) or with glucomannans (konjac gum)
 15 according to the following procedure:

1. Set a water bath to 90°C
2. Weigh 600gr of deionised water in a low shape 1000mL beaker.
3. Weigh and premix the gums. 0.5% in total with the following ratios (% (w/w)):
 Succinoglycan:Gluco/Galactomannans: 0.5:0; 0.4:0.1; 0.3:0.2; 0.25:0.25; 0.1:0.4; 0:0.5.
- 20 4. Place the beaker (equipped with a propeller adjusted to a motor) in the water bath, stir at 500 rpm, add the premix in around 15s. Start the chronometer.
5. After 1min. Increase the stirring speed to 1100 rpm, and continue stirring for 25min in total.
6. Remove the beaker from the water bath and leave to cool at room temperature.
- 25 7. Measure the viscosity at 3rpm, 25°C, with a Brookfield LVT viscosimeter. Measurement read after 2 minutes.

Table 1 shows the results obtained with succinoglycan together with galactomannans (locust bean gum, tara gum, guar gum or cassia gum) or with a glucomannan (konjac gum)
 30 compared with the theoretical viscosity data which would have been obtained if no synergy were obtained. The theoretical viscosities were obtained by adding the viscosity of the succinoglycan alone and the viscosity of the galactomannan or glucomannan alone at the corresponding concentrations. For example in table 1, at the ratio SGG:LBG 80:20 (0.4% succinoglycan with 0.1% locust bean gum), the theoretical viscosity at this ratio is the sum of
 35 the viscosity of the succinoglycan solution alone at 0.4% and the viscosity of the locust bean gum solution alone at 0.1%.

Fig.1 shows the viscosity obtained when mixing succinoglycan and konjac as a function of the concentration of konjac gum compared with the succinoglycan viscosity alone, konjac viscosity alone and the theoretical viscosity obtained from the sum of the succinoglycan curve alone with the konjac curve alone.

- 5 Table 2 shows the % increase in viscosity obtained when succinoglycan is added to galactomannans or glucomannans compared with the theoretical viscosity. It has to be read like this: for example, succinoglycan + locust bean gum at the ratio 80:20 gives an increase in viscosity of 48% compared with the theoretical viscosity. Real viscosity = 7520 mPa.s; theoretical viscosity:5082 mPa.s.
- 10 Fig. 2 shows the % increase in viscosity compared with the theoretical viscosity as a function of the concentration of the galactomannans or glucomannans.

- Succinoglycan combined with galactomannans such as locust bean gum, guar gum, tara gum or cassia gum or combined with the glucomannan konjac gum showed a synergistic increase in viscosity, the obtained viscosities being higher when adding the combination of
- 15 succinoglycan with galactomannans or konjac gum compared to the sum of the viscosity obtained by adding succinoglycan alone and the viscosity obtained by adding the galactomannan or glucomannan alone. Depending on the ratio and the type of gum, the percentage increase in viscosity compared with the theoretical viscosity can vary from 0 to 834%. This property could be beneficially exploited in different applications such as
- 20 dressings/sauces/beverages where xanthan is often used together with galactomannans but gives a gel.

The absence of gel in case of succinoglycan would give a cleaner mouth-feel while the synergy would help the suspension.

Table 1:

% SGG	Viscosity SGG alone (mPa.s)	% Galacto/ Gluco-mannans	Locust bean gum (LBG)		
			Viscosity LBG alone (mPa.s)	Theoretical Viscosity (mPa.s)	Real Viscosity (mPa.s)
0.5	5420	0	0	5420	5420
0.4	5080	0.1	2	5082	7520
0.3	2970	0.2	18	2988	4990
0.25	2770	0.25	44	2814	5480

0.1	274	0.4	98	372	1530
0	0	0.5	274	274	274

			Guar gum		
% SGG	Viscosity SGG alone (mPa.s)	% Galacto/ Gluco-mannans	Viscosity Guar alone (mPa.s)	Theoretical Viscosity (mPa.s)	Real Viscosity (mPa.s)
0.5	5420	0	0	5420	5420
0.4	5080	0.1	0	5080	6340
0.3	2970	0.2	12	2982	7440
0.25	2770	0.25	24	2794	6840
0.1	274	0.4	198	472	4360
0	0	0.5	524	524	524

			Tara gum		
% SGG	Viscosity SGG alone (mPa.s)	% Galacto/ Gluco-mannans	Viscosity Tara alone (mPa.s)	Theoretical Viscosity (mPa.s)	Real Viscosity (mPa.s)
0.5	5420	0	0	5420	5420
0.4	5080	0.1	0.1	5080.1	7680
0.3	2970	0.2	2	2972	6340
0.25	2770	0.25	14	2784	5680
0.1	274	0.4	92	366	1220
0	0	0.5	194	194	194

			Cassia gum		
% SGG	Viscosity SGG alone (mPa.s)	% Galacto/ Gluco-mannans	Viscosity Cassia alone (mPa.s)	Theoretical Viscosity (mPa.s)	Real Viscosity (mPa.s)
0.5	5420	0	0	5420	5420
0.4	5080	0.1	0.1	5080.1	6600
0.3	2970	0.2	2	2972	5480
0.25	2770	0.25	2	2772	3520
0.1	274	0.4	8	282	640
0	0	0.5	8	8	8

			Konjac gum		
% SGG	Viscosity SGG alone (mPa.s)	% Galacto/ Gluco-mannans	Viscosity Konjac alone (mPa.s)	Theoretical Viscosity (mPa.s)	Real Viscosity (mPa.s)
0.5	5420	0	0	5420	5420
0.4	5080	0.1	0.1	5080.1	6860
0.3	2970	0.2	34	3004	8640
0.25	2770	0.25	90	2860	9240
0.1	274	0.4	645	919	6040
0	0	0.5	1890	1890	1890

Table 2: % increase in viscosity compared with the theoretical viscosity.

% Galacto/ Gluco-mannans	Ratio	Increase (%) versus theoretical viscosity				
	SGG: Galacto/ Glucomannans	LBG	Guar gum	Tara gum	Cassia gum	Konjac gum
0	100:0	0	0	0	0	0
0.1	80:20	48	25	51	30	35
0.2	60:40	67	149	113	84	188
0.25	50:50	95	145	104	27	223
0.4	20:80	311	824	233	127	557
0.5	0:100	0	0	0	0	0

5 EXAMPLE 2:

Synergy of succinoglycan with locust bean gum in dressing.

In the following example succinoglycan with locust bean gum was added in a dressing and compared with succinoglycan alone. The formulation in w/w can be found in table 3 below:

Table 3:

Ingredient Name							
Water (Tap)		52.03	51.97	51.91	52.05	51.98	51.85
Colzao rapeseed oil		22.00	22.00	22.00	22.00	22.00	22.00

Vinegar 12%	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Sucrose	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Salt (Sodium Chloride)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Potassium sorbate	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Dill	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Parsley	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Chilli pasta sambal oelek	0.20	0.20	0.20	0.20	0.20	0.20	0.20
GRINDSTED® LBG 246	0.02	0.03	0.04				
Succinoglycan J	0.10	0.15	0.20	0.10	0.17	0.23	0.30
Calculated total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The procedure for making the dressing under hot processing on the Thermomixer is outlined below:

Thermomixer:

- 5 1. Mix the gum(s) with some oil in the ratio 1 (stabiliser): 5 (oil).
2. Add blend to the water.
3. Add sugar
4. Mix for 2-3 minutes, speed 3-5 on a scale on 10
5. Heat to 90°C, turn off heat
- 10 6. Add the oil to the water phase. (1½ min) speed 3-5 on a scale on 10
7. Add salt, spices and preservative
8. Add vinegar
9. Mix continuously for 2 minutes, speed 3-5 on a scale on 10
10. Hot fill at 70°C

- 15 Fig. 3 shows the photos (taken 3 days after production, samples stored at +5°C) of the salad dressings with succinoglycan at different dosages.

Fig. 4 shows the photos (taken 3 days after production, samples stored at +5°C) of the salad dressings with succinoglycan and Locust Bean gum at different dosages.

- 20 As it appear in Fig. 3 and 4 succinoglycan alone seems to give a stable system from 0.23% while a clear separation is seen at lower dosage. Succinoglycan and locust bean gum gives a stable dressing at 0.18% total gum. The synergy can help reducing the dosage of the gums while keeping a good suspension.

PCT

0-1	Form PCT/RO/134 (SAFE) Indications Relating to Deposited Microorganism(s) or Other Biological Material (PCT Rule 13bis)	
0-1-1	Prepared Using	PCT Online Filing Version 3.5.000.235 MT/FOP 20020701/0.20.5.20
0-2	International Application No.	PCT/EP2014/066033
0-3	Applicant's or agent's file reference	NB40484WOPCT

1	The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:	
1-1	page	5
1-2	line	4-8
1-3	Identification of deposit	
1-3-1	Name of depositary institution	CNCM Collection nationale de cultures de microorganismes (CNCM)
1-3-2	Address of depositary institution	Institut Pasteur 28, Rue du Docteur Roux 75724 Paris Cédex 15
1-3-3	Date of deposit	25 July 2013 (25.07.2013)
1-3-4	Accession Number	CNCM I-4789
1-4	Additional Indications	It is requested that the biological material shall be made available only by the issue of a sample to an expert nominated by the requester.
1-5	Designated States for Which Indications are Made	All designations

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0-4	This form was received with the international application: (yes or no)	YES
0-4-1	Authorized officer	Corapci, Mustafa

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CLAIMS

1. A composition comprising A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s).
2. The composition according to claim 1, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.
3. The composition according to any one of claims 1-2 comprising succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) in a total amount which provides a synergistic increase in viscosity.
4. The composition according to any one of claims 1-3, wherein the total amount of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 0.05% (w/w) to 2.0% (w/w) based on the weight of the composition.
5. The composition according to any one of claims 1-4, wherein the one or more hydrocolloid(s) is konjac gum.
6. The composition according to any one of claims 1-5, wherein the one or more hydrocolloid(s) is a galactomannan.
7. The composition according to claim 6, wherein the galactomannan is selected from the group consisting of guar gum, locust bean gum (LBG), tara gum and cassia gum.
8. The composition according to any one of claims 1-7, wherein the composition is a food or feedstuff product.
9. The composition according to any one of claims 1-8, wherein the composition is selected from the group consisting of a sauce, a dressing, a soup, a gravy, a jam, a fruit preparation, a frozen product, a bakery product, an ice cream, a beverage, a dairy product and an emulsion.
10. The composition according to any one of claims 1-9, wherein the composition is selected from the group consisting of a sauce, a dressing and a beverage.

11. A method for preparing a composition according to any one of claims 1-10, wherein A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) are brought together with the other composition ingredients sequentially in any order or at the same time.

5 12. An additive comprising A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s).

13. The additive according to claim 12, wherein the ratio by weight of succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) is from 5:95 to 95:5.

10 14. Use of A) succinoglycan and B) one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) for increasing the viscosity of a composition.

15 15. The use according to claim 14, wherein succinoglycan (A) and one or more hydrocolloid(s) selected from the group consisting of glucomannan(s) and galactomannan(s) (B) are used in a total amount which provides a synergistic increase in viscosity.

FIGURE 1

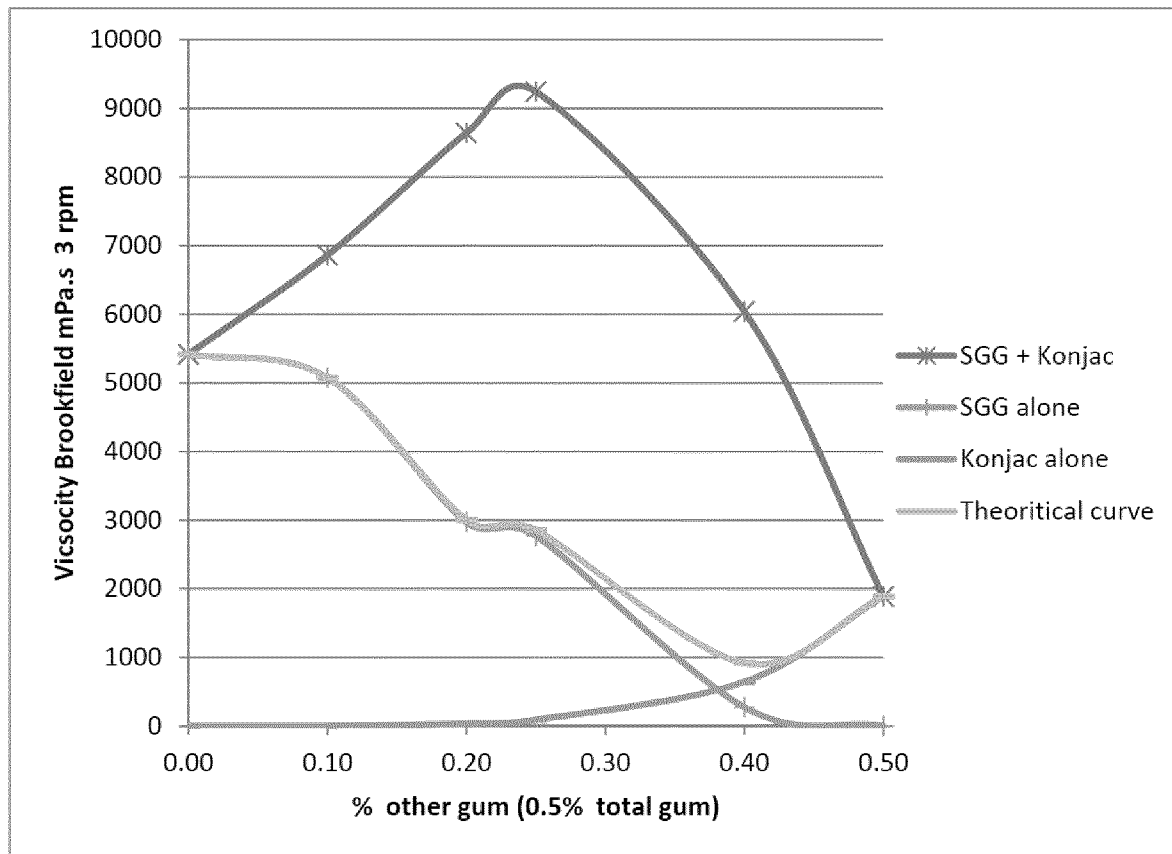


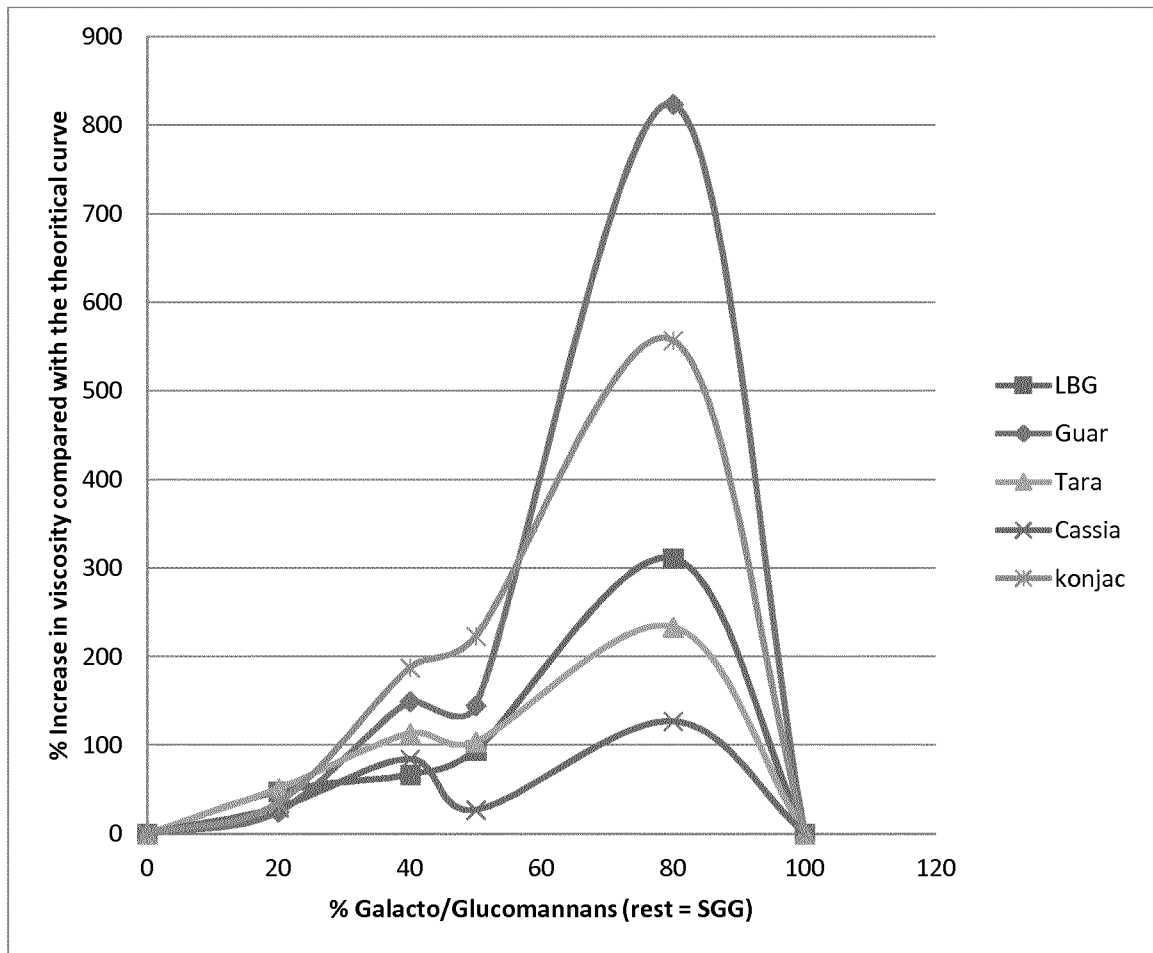
Figure 2:

FIGURE 3

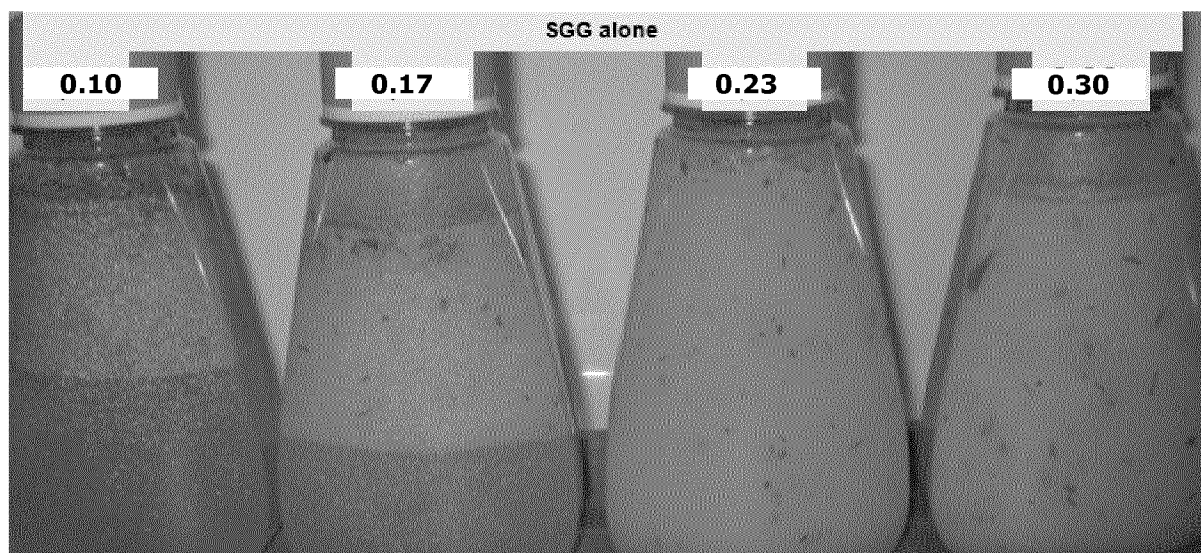


FIGURE 4



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/066033

A. CLASSIFICATION OF SUBJECT MATTER INV. A23L1/054 A23L1/24 A23L1/0526 A23L1/0528 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) A23L A23G A23C 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 practicable, search terms used) EPO-Internal, WPI Data, FSTA, BIOSIS																	
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 6 485 767 B1 (CANTIANI ROBERT [FR] ET AL) 26 November 2002 (2002-11-26) paragraphs [0003], [0045], [0046], [0082], [0083], [0136] - [0144]; claims 1,10,11,16; example 1</td> <td>1-15</td> </tr> <tr> <td>X</td> <td>JP 2005 213361 A (PILOT INK CO LTD) 11 August 2005 (2005-08-11) abstract</td> <td>1-15</td> </tr> <tr> <td>X</td> <td>JP 2012 235717 A (SANEI GEN FFI INC) 6 December 2012 (2012-12-06) cited in the application abstract</td> <td>1-15</td> </tr> <tr> <td></td> <td style="text-align: center;">----- -/--</td> <td></td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 6 485 767 B1 (CANTIANI ROBERT [FR] ET AL) 26 November 2002 (2002-11-26) paragraphs [0003], [0045], [0046], [0082], [0083], [0136] - [0144]; claims 1,10,11,16; example 1	1-15	X	JP 2005 213361 A (PILOT INK CO LTD) 11 August 2005 (2005-08-11) abstract	1-15	X	JP 2012 235717 A (SANEI GEN FFI INC) 6 December 2012 (2012-12-06) cited in the application abstract	1-15		----- -/--	
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1 October 2014		09/10/2014															
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