MARINE ALGAE REHYDRATION COMPOSITIONS AND METHODS

[0001] The present invention claims priority to United States Provisional Patent Application No. 63/492,579, filed on March 28, 2023, the entirety of which is incorporated by reference herein.

FIELD OF THE INVENTION

[0002] The present invention relates to rehydration compositions comprising water, at least one electrolyte, and a marine algae polysaccharide, as well as methods for providing rehydration by orally administering a rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide, or specifically fucoidan.

BACKGROUND OF THE INVENTION

[0003] Current oral electrolyte solutions are used to promote rehydration and electrolyte replacement in both pediatric and adult populations. These solutions provide a balance of sodium, glucose and water to promote fluid and electrolyte adsorption and provide rehydration in individuals faster than rehydration with water alone. However, while these electrolyte solutions provide better rehydration than water alone, loss of water often still occurs through a stressed intestinal barrier in the gut.

[0004] In view of the above, there is a need to develop new and accessible technologies that can conveniently provide improved rehydration with food and beverage products.

SUMMARY

[0005] It is therefore an object of the disclosure to provide improved rehydration compositions and methods that provide a better hydrating ability than conventional compositions and methods through the surprising effect of a marine algae polysaccharide, or specifically, fucoidan.

[0005a] In one aspect, the disclosure provides a rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide, optionally a brown marine algae polysaccharide, optionally fucoidan.

[0005b] In another aspect, the disclosure provides a powder for forming a rehydration composition according to the disclosure by addition of water, optionally in which the powder comprises 0.00001 wt % to 0.5 wt %, optionally 0.00001 wt % to 0.2 wt %, of marine algae polysaccharide, optionally brown marine algae polysaccharide, optionally fucoidan.

[0005c] In another aspect, the disclosure provides a use of the rehydration composition according to the disclosure in the manufacture of a medicament for rehydrating a subject, wherein the medicament is to be administered orally to the subject.

[0005d] In another aspect, the disclosure provides a use of a marine algae polysaccharide, optionally a brown marine algae polysaccharide, optionally fucoidan, to improve the hydrating effect of a rehydration composition comprising water and at least one electrolyte.

[0005e] In another aspect, the disclosure provides a rehydration composition according to the disclosure for use in therapy.

[0006] In one example, the disclosure is directed to a rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide.

[0007] In another example, the disclosure is directed to a method of rehydrating a subject comprising administering a rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide, to the subject.

[0008] In another example, the disclosure is direct to a rehydration composition comprising water, at least one electrolyte, and fucoidan.

[0009] In another example, the disclosure is directed to a method of rehydrating a subject comprising administering a rehydration composition comprising water, at least one electrolyte, and fucoidan, to the subject.

[0010] In another example, the disclosure is directed to a rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide, or specifically fucoidan, in an effective amount to provide the composition with an improved hydrating effect.

[0011] In another example, the disclosure is directed to a method of rehydrating a subject comprising administering a rehydration composition comprising water, at least one electrolyte, and fucoidan, to the subject, wherein the fucoidan is effective to improve the hydrating effect of the composition.

[0012] In another example, the disclosure is directed to a rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide, or specifically fucoidan, wherein the composition is configured to increase an amount of water and electrolyte that enters a blood stream of the subject, a rate at which water and electrolyte enters a blood stream of the subject, or both (compared to consumption of the same amount of an identical rehydration composition but without the marine algae polysaccharide, or specifically fucoidan) when consumed orally.

[0013] In another example, the disclosure is directed to a method of rehydrating a subject comprising administering a rehydration composition comprising water, at least one electrolyte,

and a marine algae polysaccharide, or specifically fucoidan, to the subject, wherein an amount of water and electrolyte(s) that enters a blood stream of the subject, the rate at which water and electrolyte(s) enters a blood stream of the subject, or both, is increased compared with an administration of the same amount of an identical rehydration composition but without a marine algae polysaccharide, or specifically fucoidan.

[0014] In another example, the disclosure is directed to a method of improving the hydrating effect of a rehydration composition comprising water and at least one electrolyte through the inclusion of a marine algae polysaccharide, or specifically fucoidan.

[0015] In another example, the disclosure is directed to a use of a marine algae polysaccharide, or specifically fucoidan, to improve the hydrating effect of a rehydration composition comprising water and at least one electrolyte.

[0016] The addition of marine algae polysaccharide, or specifically, fucoidan, to rehydration compositions provides a surprising means for providing improved rehydration. These and additional objects and advantages of the disclosure will be more fully apparent in view of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The drawings are illustrative of certain embodiments of the invention and are exemplary in nature and are not intended to limit the invention defined by the claims, wherein:

[0018] **FIG. 1** illustrates water absorption in model intestinal epithelial cells obtained with a rehydration composition according to the invention compared to that obtained with a rehydration composition according to the prior art, as described in Example 1.

[0019] **FIG. 2** illustrates water absorption in model intestinal epithelial cells obtained with a rehydration composition according to the invention compared to that obtained with a rehydration composition according to the prior art, as described in Example 2.

Claims

What is claimed is:

1. A rehydration composition comprising water, at least one electrolyte, and a marine algae polysaccharide, optionally a brown marine algae polysaccharide, optionally fucoidan.

2. The rehydration composition of claim 1, wherein the rehydration composition comprises 0.1 to 10 µg/ml of marine algae polysaccharide or 10 to 150 µg/ml, optionally 10-100 µg/ml, of marine algae polysaccharide.

3. The rehydration composition of claim 1, wherein the rehydration composition comprises 0.1 to 300 µg/ml, optionally, optionally 0.5 to 300 µg/ml, optionally 0.5 to 150 µg/ml, optionally 1 to 150 µg/ml, optionally 10-100 µg/ml, of fucoidan.

4. The rehydration composition of any one of the preceding claims, further comprising at least one acid and wherein the composition has a pH of less than 6.

5. The rehydration composition of any one of the preceding claims, wherein the composition is heat sterilized.

6. The rehydration composition of any one of the preceding claims, wherein the electrolyte comprises sodium, potassium, chloride, or a combination of two or more thereof.

7. The rehydration composition of any one of the preceding claims, wherein the rehydration composition comprises 25 to 75 mEq/L of sodium, 15 to 40 mEq/L of potassium, and/or 20 to 55 mEq/L of chloride.

8. The rehydration composition of any one of the preceding claims, further comprising zinc and/or selenium.

9. The rehydration composition of any one of the preceding claims, wherein the rehydration composition comprises at least one carbohydrate, optionally wherein the one or more carbohydrates comprises fiber, human milk oligosaccharides (HMOs), maltodextrin, corn syrup, sucralose, dextrose, fructooligosaccharides, glucose, glucose polymers, sucrose, fructose, fructose polymers, lactose, maltose, amylose glycogen, galactose, galactooligosaccharides, inulin, or a combination of two or more thereof.

10. A powder for forming a rehydration composition according to any one of claims 1-9 by addition of water, optionally in which the powder comprises 0.00001 wt % to 0.5 wt %, optionally 0.00001 wt % to 0.2 wt %, of marine algae polysaccharide, optionally brown marine algae polysaccharide, optionally fucoidan.

11. The rehydration composition or powder for forming a rehydration composition of any preceding claim, wherein the fucoidan is non-hydrolyzed.

12. The rehydration composition or powder for forming a rehydration composition of any preceding claim, wherein the marine algae polysaccharide, optionally brown marine algae polysaccharide, optionally fucoidan is present in an effective amount to provide the rehydration composition with an improved hydrating effect.

13. The rehydration composition or powder for forming a rehydration composition of any preceding claim, wherein the marine algae polysaccharide, optionally brown marine algae polysaccharide, optionally fucoidan is present in an effective amount to increase an amount of water and electrolyte(s) that enters a blood stream of a subject, the rate at which water and electrolyte(s) enters a blood stream of a subject, or both, when the rehydration composition is consumed orally.

14. Use of the rehydration composition according to any one of claims 1-13 in the manufacture of a medicament for rehydrating a subject, wherein the medicament is to be administered orally to the subject.

15. The use of claim 14, wherein the subject is a pediatric subject or is recovering from exercise.

16. The use of any one of claims 14 to 15, wherein the marine algae polysaccharide, optionally brown marine algae polysaccharide, optionally fucoidan improves the rehydrating effect of the composition.

17. The use of any one of claims 14 to 16, wherein an amount of water and electrolyte(s) that enters a blood stream of a subject, the rate at which water and electrolyte(s) enters a blood stream of a subject, or both is increased compared with administration of the same amount of an identical rehydration composition but without the marine algae polysaccharide, optionally brown marine algae polysaccharide, optionally fucoidan.

18. Use of a marine algae polysaccharide, optionally a brown marine algae polysaccharide, optionally fucoidan, to improve the hydrating effect of a rehydration composition comprising water and at least one electrolyte.

19. The use of claim 18, wherein the marine algae polysaccharide, optionally a brown marine algae polysaccharide, optionally fucoidan, is present in the rehydration composition in an amount between 0.1 and 300 µg/ml, optionally between 0.1 and 200 µg/ml, optionally between 0.1 and 150 µg/ml, optionally between 0.1 and 100 µg/ml.

20. The use of any one of claims 18 and 19 wherein the marine algae polysaccharide is fucoidan, optionally wherein the fucoidan is non-hydrolyzed.

21. The rehydration composition according to any one of claims 1-13 for use in therapy.