CLAIMS

1. A method for forming a protective coating on a plant tissue, the method comprising consecutive steps of:

    (a) providing a plant having an external surface, wherein a portion of the external surface comprises an exposed surface comprising an accidentally or intentionally damaged surface of the plant tissue which is not covered by natural skin, and wherein the plant comprises a postharvest plant matter;

    (b) applying a first aqueous solution comprising a crosslinking agent to the external surface of the plant; and

    (c) applying a second aqueous solution comprising a polysaccharide, which is susceptible to crosslinking by the crosslinking agent, to the external surface of the plant;

    thereby forming a protective coating on the exposed surface of the plant following crosslinking of the polysaccharide by the crosslinking agent.

2. The method according to claim 1,

    ~~2.~~ wherein the first aqueous solution and the second aqueous solution are applied to the entire external surface of the plant~~.~~;

    ~~3. The method according to any one of claims 1 or 2~~or/preferably, wherein the protective coating is formed essentially exclusively on the exposed surface of the plant.

~~4. The method according to any one of claims 1 to 3, wherein the plant is selected from a postharvest plant matter and a growing plant.~~

~~5.~~3. The method according to claim ~~4~~1, wherein the postharvest plant matter comprises a fruit.

~~6.~~4. The method according to claim ~~5~~3, wherein said fruit is a ready-to-eat fruit.

5. The method according to claim ~~6~~4,

    ~~7.~~ wherein the ready-to-eat fruit comprises pomegranate arils~~.~~;

    ~~8. The method according to claim 7~~preferably, wherein at least about 5% of the pomegranate arils' surface is exposed, wherein 100% represents the entire external surface of the total amount of arils~~.~~;

    ~~9. The method according to claim 6~~or, wherein the ready-to-eat fruit comprises grape berries~~.~~;

~~The method according to claim 9~~preferably, wherein the grape berries are separated from their pedicels and wherein at least about 0.5% of the grape berries' surface is exposed, wherein 100% represents the entire external surface of the total amount of berries.

~~10.~~

~~11. The method according to claim 4, wherein the growing plant comprises a tree.~~

6. The method according to any one of claims 1 to 5~~11~~,

~~12.~~ wherein the polysaccharide is selected from the group consisting of gellan, alginate, pectin, carrageenan, and combinations and derivatives thereof~~.~~;

~~13. The method according to any one of claims 1 to 12~~or/preferably, wherein the crosslinking agent comprises a cation selected from the group consisting of calcium ion, magnesium ion, potassium ion, aluminum ion, barium ion, strontium ion, copper ion, lead ion, zinc ion, and combinations thereof~~.~~;

~~14. The method according to claim 13~~preferably, wherein the crosslinking agent is selected from the group consisting of calcium chloride, calcium lactate, potassium chloride, barium chloride, barium sulfate, strontium chloride, strontium carbonate, copper chloride, copper sulfate, lead chloride, lead sulfate, lead carbonate, zinc chloride, aluminum chloride, and magnesium chloride.

7. The method according to any one of claims 1 to ~~14~~6,

~~15.~~ wherein the concentration of the polysaccharide in the second aqueous solution ranges from about 0.05% (w/w) to about 10% (w/w~~).)~~;

~~16. The method according to any one of claims 1 to 15~~or/preferably, wherein the concentration of the crosslinking agent in the first aqueous solution ranges from about 0.05% (w/w) to about 25% (w/w).

8. The method according to any one of claims 1 to 7~~16~~,

~~17.~~ wherein the step of applying a first aqueous solution comprising a crosslinking agent (step (b)), applying a second aqueous solution comprising a polysaccharide (step (c)) or both are performed by a process selected from immersing, spraying, coating, dipping, falling-film enrobing technique, brushing, smearing, and any combination thereof~~.~~;

~~18. The method according to claim 17~~preferably, wherein the step of applying a first aqueous solution comprising a crosslinking agent comprises immersing the plant into said solution for a time period ranging from about 5 sec to about 10 min and/or wherein the step of applying a second aqueous solution comprising a polysaccharide comprises immersing the plant into said solution for a time period ranging from about 10 sec to about 5 min~~.~~;

~~19. The~~ or/preferably, wherein the method ~~according to any one of claims 1 to 18,~~ further ~~comprising~~ comprises a step of drying the plant for a time period ranging from about 5 sec to about 3 hours, wherein drying is performed at a temperature ranging from about 5ºC to about 80ºC~~.~~;

~~20. The method according to any one of claims 1 to 19~~or/preferably, wherein the second aqueous solution comprising a polysaccharide, the first aqueous solution comprising a crosslinking agent, or both further comprise at least one additive selected from the group consisting of an antioxidant, food grade acidulant, preservative, pH modifier, aroma compound, colorant, sweetener, viscosity former, antifoaming agent, adhesion-promoter, plasticizer, emulsifier, surface-tension modifier, humectant, and hydrophobic component.

~~21. The method according to any one of claims 1 – 4 and 11 – 19, wherein the second aqueous solution comprising a polysaccharide, the first aqueous solution comprising a crosslinking agent, or both comprise at least one additive selected from the group consisting of an antioxidant, acidulant, preservative, viscosity former, humectant, fungicide, bactericide, antifoaming agent, adhesion-promoter, plasticizer, emulsifier, surface-tension modifier, surfactant, and hydrophobic component.~~

~~22. A postharvest plant matter comprising a protective coating formed by the method according to any one of claims 1 – 10 and 12 – 22.~~

~~23. The postharvest plant matter according to claim 22, wherein the protective coating has a thickness ranging from about 5 um to about 3000 um.~~

~~24. The postharvest plant matter according to any one of claims 22 or 23, wherein said postharvest plant matter is a ready-to-eat fruit, selected from pomegranate arils and grape berries.~~

~~25.~~9. A postharvest plant matter comprising:

a first segment, which is covered by natural skin; and

a second segment, which has an exposed surface comprising an accidentally or intentionally damaged surface which is not covered by natural skin,

wherein the second segment is coated by a protective coating comprising a polysaccharide and the first segment is essentially free of said protective coating.

26.10. The postharvest plant matter according to claim 259, comprising a fruit.;

preferably,

27. The postharvest plant matter according to claim 26, wherein said fruit is a ready-to-eat fruit.

28.11. The postharvest plant matter according to claim 2710, wherein the ready-to-eat fruit is selected from pomegranate arils and grape berries.

29. The postharvest plant matter according to claim 28,11 comprising pomegranate arils, wherein the second segment constitutes at least about 5% of the entire surface of the total amount of arils. or

30.12. The postharvest plant matter according to claim 28, comprising grape berries being separated from their pedicels, wherein the second segment constitutes at least about 0.5% of the entire surface of the total amount of grape berries.

31.13. The postharvest plant matter according to any one of claims 25 9 to 3012, wherein the polysaccharide is selected from the group consisting of gellan, alginate, pectin, carrageenan and combinations thereof.;

32. The postharvest plant matter according to any one of claims 25 to 31or/preferably, wherein the polysaccharide is present in the protective coating in a weight percent ranging from about 0.5% to about 85% of the total weight of the protective coating.

14. The postharvest plant matter according to any one of claims 25 9 to 3213,

33. wherein the polysaccharide is crosslinked by a crosslinking agent.;

34. The postharvest plant matter according to claim 33preferably, wherein the crosslinking agent comprises a cation selected from the group consisting of calcium ion, magnesium ion, potassium ion, barium ion, strontium ion, copper ion, lead ion, zinc ion, aluminum ion, and combinations thereof.

15. The postharvest plant matter according to any one of claims 25 9 to 3414,

~~35.~~ wherein the protective coating further comprises at least one additive selected from the group consisting of ascorbic acid, L-cysteine, citric acid, malic acid, fumaric acid, lactic acid, succinic acid, pyruvic acid, oxaloacetic acid, quinic acid, tartaric acid, oleic acid, linoleic acid, stearic acid, sulfuric acid, hydrofluoric acid, sodium chloride, sodium hypochlorite, sodium bisulfite, sodium carbonate, sodium hydroxide, sodium silicate, sodium phosphate, lime, potassium sorbate, sodium benzoate, potassium oleate, glucose, fructose, sucrose, sucralose, aspartame, sorbitol, sorbitan, polysorbate, glycerol, propylene glycol, propylene glycol monostearate, ethylene glycol monostearate, ethanol, locust bean gum (LBG), gum tragacanth, pullulan, POLYOX, gelatin, xanthan, guar gum, karya gum, fenugreek, lecithin, ammonium lauryl sulfate, sodium steroyl-2-lactylate, sodium alkyl sulfate, sodium hexametaphosphate, beeswax, carnauba wax, candelilla wax, Japan wax, soy wax, castor wax, bayberry wax montan wax, microcrystalline wax, paraffin wax, phosphated monoglyceride, phosphated diglyceride, acetylated monoglyceride, alkyl polyacrylate, polyether, synthetic fragrance, semi-synthetic fragrance, natural fragrance, natural-identical fragrance, synthetic pigment, semi-synthetic pigment, and natural pigment~~.~~ ;

~~36. The postharvest plant matter according to any one of claims 25 to 35~~or/preferably, wherein the protective coating has a thickness ranging from about 5 um to about 3000 um.