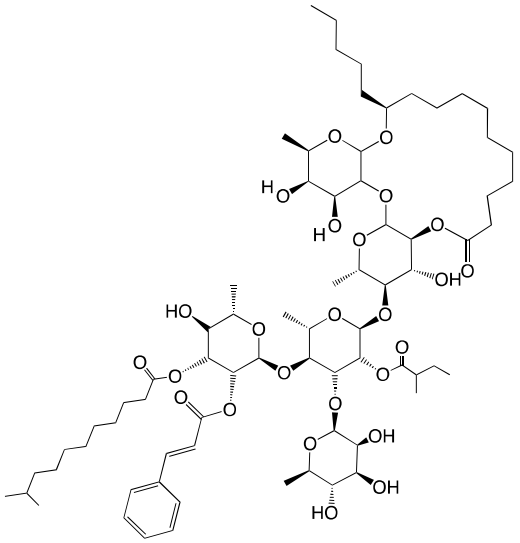
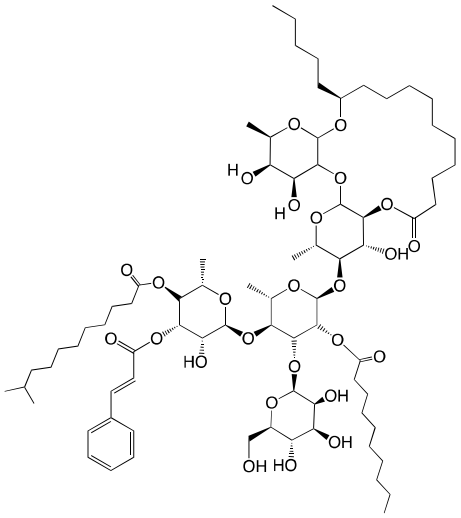
Claims

1. An extract comprising at least one resin glycoside selected from the group consisting of Batataoside I, Batataoside II, Batatoside III, Pescaprein XXVII, Batatoside F, Batatoside H, a resin glycoside of Formula (I),



(I),

a resin glycoside of Formula (II)

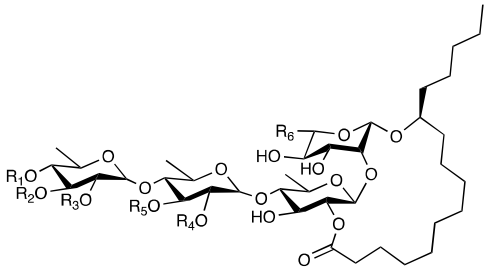


(II),

wherein the resin glycoside is extracted from a plant selected from Ipomoea batatas (sweet potato)<u>; and/or</u>~~.~~

<u>comprising at least one resin glycoside selected from the group consisting of Batatoside F, Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II,</u>

Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII),



(Type A)

wherein Formula (III) is when R_1 is n-dodecanoyl, R_2 is cinnamoyl, R_3 is 2-methylbutanoyl, R_4 is H, R_5 is rhamnopyranosyl, and R_6 is methyl;

wherein Formula (IV) is when R_1 is isobutanoyl, R_2 is H, R_3 is H, R_4 is n-octanoyl, R_5 is glucopyranosyl, and R_6 is methyl;

wherein Formula (V) is when R_1 is n-octanoyl, R_2 is n-octanoyl, R_3 is H, R_4 is 2-methylbutanoyl, R_5 is n-octanoyl, and R_6 is methyl;

wherein Formula (VI) is when R_1 is n-dodecanoyl, R_2 is H, R_3 is H, R_4 is H, R_5 is n-octanoyl, and R_6 is methyl;

wherein Formula (VII) is when R_1 is n-octanoyl, R_2 is H, R_3 is n-octanoyl, R_4 is 2-methylbutanoyl, R_5 is glucopyranosyl, and R_6 is methyl; and

wherein the resin glycoside is extracted from a plant selected from Ipomoea aquatica (kangkong);

~~2. The extract according to claim 1,~~ wherein when Batataoside I is present, the concentration is about 0.5 mg/g to about 500 mg/g relative to the extract;

wherein when Batataoside II is present, the concentration is ~~about~~ 0.1 mg/g to ~~about~~ 5 mg/g relative to the extract;

wherein when Batataoside III is present, the concentration is ~~about~~ 0.1 mg/g to ~~about~~ 10 mg/g relative to the extract;

wherein when Batatoside F is present, the concentration is ~~about~~ 2 mg/g to ~~about~~ 40 mg/g relative to the extract;

wherein when Batatoside H is present, the concentration is ~~about~~ 2 mg/g to ~~about~~ 8 mg/g relative to the extract;

wherein when Pescaprein XXVII is present, the concentration is ~~about~~ 0.1 mg/g to ~~about~~ 5 mg/g relative to the extract;

wherein when resin glycoside of Formula (I) is present, the concentration is ~~about~~ 0.1 mg/g to ~~about~~ 4 mg/g relative to the extract; and

when resin glycoside of Formula (II) is present, the concentration is ~~about~~ 10 mg/g to ~~about~~ 500 mg/g relative to the extract.

~~3~~2. The extract according to claim 1 ~~or 2~~, comprising a mixture of at least 2 resin glycosides.

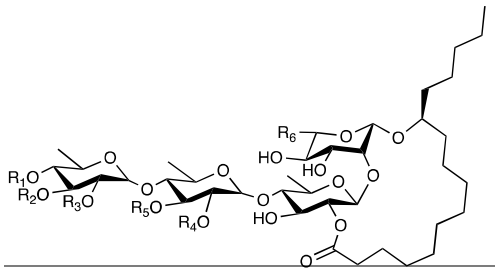
~~4~~3. The extract according to ~~any one of~~ claim~~s~~ 1 or 2 ~~to 3~~, wherein the at least one resin glycoside is Batatoside I and resin glycoside of Formula (I).

~~5~~4. The extract according to any one of claims 1 to ~~4~~3, having a lipase inhibition activity IC_{50} value of less than 15 µg/mL.

5. The extract according to any one of claims 1 to 4, wherein the extract is at least 80% pure.

6. The extract according to any one of claims 1 to 5, wherein the extract further comprises an impurity present at about 15% to about 20% in the extract, the impurity is selected from oligosaccharides, polysaccharides, chlorophyll, polyphenols, vitamin E, carotenoids, lipids, fatty acids, or a combination thereof.

~~6. An extract comprising at least one resin glycoside selected from the group consisting of Batatoside F, Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II, Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII),~~



~~(Type A)~~

~~wherein Formula (III) is when R_1 is n-dodecanoyl, R_2 is cinnamoyl, R_3 is 2-methylbutanoyl, R_4 is H, R_5 is rhamnopyranosyl, and R_6 is methyl;~~

~~wherein Formula (IV) is when R_1 is isobutanoyl, R_2 is H, R_3 is H, R_4 is n-octanoyl, R_5 is glucopyranosyl, and R_6 is methyl;~~

~~wherein Formula (V) is when R_1 is n-octanoyl, R_2 is n-octanoyl, R_3 is H, R_4 is 2-methylbutanoyl, R_5 is n-octanoyl, and R_6 is methyl;~~

~~wherein Formula (VI) is when R_1 is n-dodecanoyl, R_2 is H, R_3 is H, R_4 is H, R_5 is n-octanoyl, and R_6 is methyl;~~

~~wherein Formula (VII) is when R_1 is n-octanoyl, R_2 is H, R_3 is n-octanoyl, R_4 is 2-methylbutanoyl, R_5 is glucopyranosyl, and R_6 is methyl; and~~

~~wherein the resin glycoside is extracted from a plant selected from Ipomoea aquatica (kangkong).~~

7. An edible composition, comprising:

at least one resin glycoside selected from the group consisting of Batataoside I, Batataoside II, Batatoside III, Pescaprein XXVII, Batatoside F, Batatoside H, a resin glycoside of Formula (I), a resin glycoside of Formula (II), Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II, Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII);

wherein the resin glycoside is extracted from a plant selected from Ipomoea batatas (sweet potato) and/or Ipomoea aquatica (kangkong);

wherein the edible composition is provided as a capsule.

8. The edible composition according to claim 7, further comprising a component selected from protein, fiber, polyphenolic compound, lipid or a combination thereof.

~~9. The edible composition according to claim 7 or 8, the edible composition is provided as a capsule.~~

~~10~~9. The edible composition according to ~~any one of~~ claim~~s~~ 7 or 8~~7 to 9~~, for use in weight loss or weight management.

~~11~~10. A pharmaceutical composition comprising

at least one resin glycoside selected from the group consisting of Batataoside I, Batataoside II, Batatoside III, Pescaprein XXVII, Batatoside F, Batatoside H, a resin glycoside of Formula (I), a resin glycoside of Formula (II), Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II, Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII);

wherein the resin glycoside is extracted from a plant selected from Ipomoea batatas (sweet potato) and/or Ipomoea aquatica (kangkong);

or a pharmaceutically acceptable salt, or solvate ~~or isomer~~ thereof, optionally in combination with a pharmaceutically acceptable carrier, excipient or diluent;

wherein when Batataoside I is present, the concentration is about 0.5 mg/g to about 500 mg/g relative to the pharmaceutical composition;

wherein when Batataoside II is present, the concentration is 0.1 mg/g to 5 mg/g relative to the pharmaceutical composition;

wherein when Batataoside III is present, the concentration is 0.1 mg/g to 10 mg/g relative to the pharmaceutical composition;

wherein when Batatoside F is present, the concentration is 2 mg/g to 40 mg/g relative to the pharmaceutical composition;

wherein when Batatoside H is present, the concentration is 2 mg/g to 8 mg/g relative to the pharmaceutical composition;

wherein when Pescaprein XXVII is present, the concentration is 0.1 mg/g to 5 mg/g relative to the pharmaceutical composition;

wherein when resin glycoside of Formula (I) is present, the concentration is 0.1 mg/g to 4 mg/g relative to the pharmaceutical composition; and

when resin glycoside of Formula (II) is present, the concentration is 10 mg/g to 500 mg/g relative to the pharmaceutical composition.

~~12~~11. A method of extracting at least one resin glycoside from a plant selected from the Convolvulaceae family, comprising:

a) subjecting the plant to a solvent extraction process for obtaining a crude extract;

b) purifying the crude extract for obtaining a partially purified extract; and

c) further purifying the partially purified extract for obtaining the resin glycoside

wherein the resin glycoside is selected from the group consisting of Batataoside I, Batataoside II, Batatoside III, Pescaprein XXVII, Batatoside F, Batatoside H, a resin glycoside of Formula (I), a resin glycoside of Formula (II), Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II, Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII);

wherein the resin glycoside is extracted from a plant selected from Ipomoea batatas (sweet potato) and/or Ipomoea aquatica (kangkong);

wherein when Batataoside I is present, the concentration is about 0.5 mg/g to about 500 mg/g relative to the extract;

wherein when Batataoside II is present, the concentration is 0.1 mg/g to 5 mg/g relative to the extract;

wherein when Batataoside III is present, the concentration is 0.1 mg/g to 10 mg/g relative to the extract;

wherein when Batatoside F is present, the concentration is 2 mg/g to 40 mg/g relative to the extract;

wherein when Batatoside H is present, the concentration is 2 mg/g to 8 mg/g relative to the extract;

wherein when Pescaprein XXVII is present, the concentration is 0.1 mg/g to 5 mg/g relative to the extract;

wherein when resin glycoside of Formula (I) is present, the concentration is 0.1 mg/g to 4 mg/g relative to the extract; and

when resin glycoside of Formula (II) is present, the concentration is 10 mg/g to 500 mg/g relative to the extract.

~~13~~12. The method according to claim ~~12~~11, wherein the resin glycoside is extracted from a tuber, leaf, latex, and stem of Ipomoea batatas (sweet potato), or from a seed, leaf or stem of Ipomoea aquatica (kangkong).

~~14~~13. The method according to claim~~s~~ 11 or 12~~12 or 13~~, wherein the step of subjecting the plant to a solvent extraction process (step a) comprises homogenising the plant in a solvent and liquid-liquid extracting the resin glycoside as a crude extract.

~~15~~14. The method according to any one of claims ~~12~~ 11 to ~~14~~13, wherein the step of purifying the crude extract (step b) comprises fractionating the crude extract.

~~16~~15. The method according to any one of claims ~~12~~ 11 to ~~15~~14, wherein the step of purifying the crude extract (step b) comprises eluting the crude extract through a liquid chromatography column with a predetermined mobile phase~~.~~

~~17. The method according to claim 16~~, wherein the mobile phase is selected from:

a) a gradient of hexane:ethyl acetate (hexane:EtOAc; 1:1) to pure ethyl acetate, followed by pure methanol~~.~~

~~18. The method according to claim 16 or 17, wherein the mobile phase is~~

b) a gradient of dichloromethane:methanol (DCM:MeOH; 7:1) to pure MeOH~~.~~

~~19. The method according to any one of claims 16 to 18, wherein the mobile phase is~~

c) a gradient of H_2O:MeOH (100:0) to pure MeOH.

~~20~~16. The method according to any one of claims ~~12~~ 11 to ~~19~~15, wherein the further purifying step (step c) comprises fractionating the partially purified extract.

~~21~~17. The method according to any one of claims ~~12~~ 11 to ~~20~~16, wherein the further purifying step (step c) comprises eluting the partially purified extract through a liquid chromatography column with a predetermined mobile phase, wherein the mobile phase is selected from:~~.~~

~~22. The method according to any one of claims 12 to 21, wherein the further purifying step (step c) comprises eluting the partially purified extract through a liquid chromatography column with a mobile phase having~~ a) a gradient of MeOH-H_2O (90:10) to MeOH-H_2O (100:0)~~; or~~.

~~23. The method according to any one of claims 12 to 22, wherein the further purifying step (step c) further comprises eluting a faction from the liquid chromatography column with a mobile phase having~~ b) a gradient of MeOH-H_2O (90:10) to MeOH-H_2O (100:0) with acetonitrile or with ACN-MeOH (80:20).

~~24~~18. A method of treating a disease or disorder associated with excessive body fat in a subject in need thereof, comprising administering resin glycoside from a plant selected from the Convolvulaceae family;

wherein the resin glycoside is selected from the group consisting of Batataoside I, Batataoside II, Batatoside III, Pescaprein XXVII, Batatoside F, Batatoside H, a resin glycoside of Formula (I), a resin glycoside of Formula (II), Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II, Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII).

~~25~~19. The method according to claim ~~24~~18, wherein the disease or disorder is selected from obesity ~~overweight~~, and metabolic syndrome.

20. A method of reducing excess body fat and/or preventing excess body fat accumulation in a subject in need thereof, comprising administering resin glycoside from a plant selected from the Convolvulaceae family;

wherein the resin glycoside is selected from the group consisting of Batataoside I, Batataoside II, Batatoside III, Pescaprein XXVII, Batatoside F, Batatoside H, a resin glycoside of Formula (I), a resin glycoside of Formula (II), Batatoside E, Batatoside D, Aquaterin VI, Aquaterin V, Aquaterin XI, Aquaterin II, Stoloniferin VIII, Aquaterin XIV, Batatoside C, Batatinoside I, Aquaterin VII, Aquaterin III, Murucoidin XVIII, Aquaterin XIII, Aquaterin XII, a Type A resin glycoside of Formula (III), Formula (IV), Formula (V), Formula (VI), and Formula (VII).